



Società Italiana Gallerie
Italian Tunnelling Society



PRESS KIT

World Tunnel Congress & Exhibition



ITA - AITES General Assembly and
World Tunnel Congress

**TUNNELS AND UNDERGROUND CITIES:
ENGINEERING AND INNOVATION
MEET ARCHAEOLOGY, ARCHITECTURE AND ART**



MAY
3 | 9
MOSTRA D'OLTREMARE
NAPLES 2019

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WTC 2019 – THE ESSENTIALS

Organized by the International Tunnelling and Underground Space Association (ITA-AITES) and the Società Italiana Gallerie (SIG), the World Tunnel Congress and ITA 45th General Assembly will be held in the city of Naples, from May 3rd to 9th.

During a 6 days innovation-sharing event, the Mostra D'Oltremare will host the leading experts in the field, university professors and researchers, professionals, engineering firms, major clients and representatives from the most important construction companies in this sector.

Over 150 speakers and 2000 participants are expected from every part of the world. This scientific event will review the state of the art and the most recent innovations in tunnelling methods, technologies and equipment.

AT A GLANCE: A HIGH SKILLED AND SCIENTIFIC EVENT

Between major announcements, conferences and technical sessions, the program of the upcoming WTC promises to be rich.

Either through conventional tunnelling for urban tunnels, environment sustainability in underground construction or safety topics, the event will approach numerous major issues showcased by many examples from all over the world: **City Rail Link - New Zealand; the role of Cairo metro in saving the social costs of air pollution; Stockholm bypass; the Naples Line 6 underground metro system works: from the feasibility study to the construction; twin tunnels excavated in mixed face conditions- Brazil; Grand Paris Express Line 15 South; Brenner Base Tunnel; Anacostia River Tunnel Project – Washington - USA; the second Gotthard tunnel tube; the Genoa Bypass project; Tuen Mun - Check Lap Kok link in Hong Kong; CERN (HL-LHC) - New underground & surface structures - Switzerland.**

The WTC is also the occasion to meet and listen a prestigious panel of lecturers: from May 6th to 8th, a series of lectures, seminars and workshops will focus on the world of design and construction, in relation to works involving tunnels. On the panels, the finest authorities in the world on underground construction: **Martin Herrenknecht**, CEO of Herrenknecht AG, **Georgios Anagnostou** of ETH University in Zurich; **Raffaele Zurlo**, **Konrad Bergmeister** and **Mario Virano** administrators of the special purpose entities responsible for the construction of the great Alpine railway tunnels in Italy; **Håkan Stille** from Sweden; **Jamal Rostami** from Colorado School of Mines, who will talk about excavating equipment designed to build tunnels on the moon; **Markus Thewes** from Germany; **Pietro Lunardi** from Italy, **Mike Mooney** from USA.

NOVELTY OF THE WTC2019: SPECIAL SESSIONS ON ARCHAEOLOGY, ARCHITECTURE AND ART TOPICS

The Naples program is distinctive in the way it highlights the many connections between the world of tunnelling and the disciplines that until now have been considered unrelated to the field. They include what have been called the Triple-A sessions – Archaeology, Architecture and Art, to be held at the Mostra D'Oltremare and at Palazzo Serra di Cassano, mostly in collaboration with the **ITACUS Committee**, co-chaired by Han Admiraal and Antonia Cornaro,

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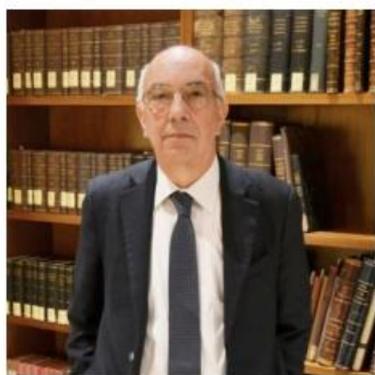
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and in the presence of other renowned designers and planners of the underground, including **Elisabeth Reynolds**, **Elsa Wifstrand** and **Dominique Perrault**, who will participate in the session dedicated to archaeology, architecture and art.

They will highlight many examples, notably the cases of **Thessoloniki Metro** and the issue of Intersecting microtunnels to support archeological findings at Sintrivani Station, the integration of archaeology in architectural design of **Milan metro** connection M2-M4 in st. Ambrogio station and the viability of underground transport construction in **Guatemala City**.

RENATO CASALE, PRESIDENT OF WTC 2019 ORGANIZING COMMITTEE:



«The main objective of WTC 2019 Naples is the succinct and original interpretation of certain needs which are increasingly manifesting themselves in the social life of national and international communities, including security, environmental quality and effective mobility.(...) All these services are essential for the life of any modern community and can be located in underground areas: from energy production plants to mobility infrastructures, telecommunications networks, dangerous waste management facilities, the storage of valuable or strategic assets, water networks, command and control centres, the storage of fossil and nuclear fuels. [...]

The constant rise in the residential density of major urban areas makes it impossible to find new unused spaces, and this is leading progressively to an increase in underground constructions. It is an opportunity, considering that it is easier, more efficient and safer to manage services underground, such as energy distribution systems, infrastructure for mobility, telecommunications networks, waste management facilities. Or the storage of valuable or strategic goods, water distribution networks, combustible fuel storage or command and monitoring centres to manage increasingly complex conurbations. The World Tunnel Congress in Naples, adds Casale, will speak to professionals in the field and to a wider public, to shed light, at a time when so much is being said about smart cities, on how to offer a concrete contribution to an idea for a future that is rapidly approaching. Many metropolitan cities are already heading in this direction: Paris, Stockholm, New York, Singapore, Shanghai and Sydney are leading the way. Furthermore, relying on the underground to build cities resilient to climate change is becoming a frequent application around the world».

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EXCLUSIVE INTERVIEW WITH TARCISIO CELESTINO, PRESIDENT OF ITA

TARCISIO CELESTINO PRESENTS THE WORLD TUNNEL CONGRESS 2019

After 3 years as ITA President, can you share your insights on global tunnelling industry ?



My views are wider than they were before. It is easier to understand why the underground and tunneling industry reaches a remarkable rate of more than 7% a year. Which is higher than the general construction growth rate.

It also comes from the fact that society is learning advantages of underground construction, but it is also the results of technological development.

Most of those developments come from the industry and they are perfectly showcased by The ITA Tunnelling Awards. This event is a very important source of inspiration, but also a source of information for so many developments that come out every year.

In addition to industry activities, we see many actions related to ITA activities. ITACUS has been successful in showing the benefits of using underground spaces to the stakeholders.

ITACOSUF, has considerably worked on safety issues and especially, insurance companies are no longer refusing to insure underground construction because working anymore because of the number of accidents. And that situation was, in part, overcome thanks to our Working Group 2 – work

related to risk analysis procedures.

All these actions have contributed to the development of tunneling industry. This broad view is something I learnt a lot during my term as ITA President.

Archeology, Architecture and Art are at the core of the WTC 2019, how do you think these concepts must interact within the underground construction ?

The relationship between architecture and underground constructions has been strong for a long time. In reality, underground facilities for transportation or for other purposes must be livable spaces. It is the case also for shopping malls, sports facilities, churches and so on... One very nice example is the new World Trade Center metro station in New York combining all these living spaces.

When it comes to art, the relationship has been also very old and got along for a long time, such as the Basilica Cistern in Istanbul. This structure built in the 6th century by the Romans and that the main purpose was to store water, but it had also to be beautiful. More recent example of

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art underground is Stockholm metro. In fact, the Swedish have produced a very nice art oriented metro.

Archeological sites in Napoli, in Rome in Athens and other places underground, have proven that underground works can not only preserves but unveil historical treasures.

« Tunnels between past and present » is one of the main topic to be approached during WTC 2019, what are the specificities to be considered for underground infrastructures maintenance and repair ?

Some of the underground facilities has been constructed more than 100 years ago, and it is natural they require maintenance. What we now know, for example, as the network of tunnels force transportation purposes has started to be constructed in the second half of the nineteenth century, some of those tunnels are old. The first type of maintenance considered for all those facilities is an upgrade related to operational safety. In the last 20 years a decrease of legal number of accidents.

There is also another type of maintenance which is the structural, maintenance to improve safety and also to increase the lifecycle. Our work in group number 6 is starting a new activity on that topic. Many of our facilities require some type of maintenance on safety and esthetical improvements topics, so that the underground are clean, nice and livable spaces.

Preserving historical monuments is a priority for underground space industry, what are the main technologies and best practices adopted to reach this goal ?

Underground construction techniques are very friendly when it comes to preserve historical monuments and buildings. I can give the great example of the metro in my home city of Sao Paulo where one of the stations constructed 40 years ago with an open trench required monuments to be removed from their original location. More recent lines of this same metro have adopted new underground construction techniques that preserve everything at the surface.

When it comes to historical buildings, underground construction is also very friendly, not only because of its purpose of preserving the surface but also because recent construction techniques secure very limited settlements, preserving structures from damages.

Not only have the construction methods evolved in that but also the ground improvement techniques have played in important role. A good example is the compensation grouting technique.

Economic development encourages cities to increase the utilization of underground constructions, especially in developing countries, do you think underground infrastructures can support sustainable urbanization ?



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Sustainable urbanization can only be achieved with intensive use of the underground space. We can even quantify how many lives underground systems save by the decreasing air pollution at the surface.

In Sao Paulo, there are studies that shows that every decade, more than 7 000 lives are saved. It is a population of a small town that would have died if we did not set underground transportation system. And even more lives can be saved when our transportation system is enlarged. It also improves life quality.

There is a report by the working group 20 of ITA, a working group on urban problems and underground solutions which contains several examples about the good consequences of underground facilities in cities.

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THE HOSTS: THE INTERNATIONAL TUNNELLING AND UNDERGROUND SPACE ASSOCIATION AND SOCIETÀ ITALIANA GALERIA

THE INTERNATIONAL TUNNELLING AND UNDERGROUND SPACE ASSOCIATION



Founded in 1974 and based in Lausanne, Switzerland, the International Tunnelling and Underground Space Association (ITA-AITES) was created in order to promote a greater use of underground space as a key instrument in sustainable development.

ITA-AITES is a non-profit nongovernmental organization and is made up of a large community of professionals. They are actively involved in the tunnel and underground space industry and it is composed by engineers, project owners, town planners, architects, industrial designers, companies specialized in public works and major structures, suppliers of construction site facilities and equipment, lawyers, politicians, researchers and academics economists and financial experts that they add on many other stakeholders.

ITA-AITES currently brings together **75 Member Nations** and **300 corporate or individual affiliate members**, including **16 major sponsors** and **60 donors**. The Association is run by an Executive Council made up of **12 members** elected by the 75 Member Nations, each representing a different dimension of the tunnel community. The President for the current 2016-2019 term is Pr. Tarcisio Celestino, from Brazil. **The next ITA General Assembly in Naples shall elect the new ITA President.**

He is assisted by four vice presidents: Mr. Alexandre Gomes (Chile), Mrs. Ruth G Haug (Norway), Mrs. Jinxiu Yan (China) and Mr. Eric Leca (France). One of the great strengths of ITA-AITES lies in the synergy created by its 20,000 international experts. These experts from internationally renowned universities and the tunnel industry share their experience at conferences and meetings organized by ITA or its Member Nations.

These discussions take place on a regular basis and have proven extremely fruitful: researchers share the latest scientific studies with the professionals in the industrial sector of tunnels and underground space. Conversely, industry players keep the researchers abreast of the new cutting-edge technologies in the sector and the fieldwork being carried out.

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THE ITA: AN INTERNATIONAL MISSION TO INFORM ON THE BENEFITS OF THE USE OF UNDERGROUND SPACES

ITA is a technical-oriented international organization that has enjoyed Special Consultative Status with the United Nations since 1987. This status has enabled ITA-AITES to get involved with several international policy programs.

ITA has signed Memorandum of Understanding with 2 UN Agencies, UN-Habitat and UN ISDR (United Nations Office for Disaster Risk Reduction) and is participating in different groups and forums:

- The World Urban Campaign, a platform dedicated to civil society as well as to public and private players eager to contribute to improving urban policies and share the tools and good practices launched for the sake of sustainable urbanization.
- The “Making Cities Resilient” Programme, developed by the UN as part of the ISDR (International Strategy for Disaster Reduction). During the 4th session of the ISDR Global Platform for disaster risk reduction organized by the UN, ITA-AITES presented its vision of the City of the Future, in which tunnels could be used as an innovative solution to the challenges posed by urban growth.
- During the World Urban Forum in April 2014, ITA organized training sessions on the use of underground space.
- ITACUS is member of the UN ISDR Urban Planning Advisory Group.
- ITA through its Committee on Underground Space is working closely with ISOCARP, ACUUS and ICLEI

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THE ITA WORKING GROUPS AND COMMITTEES (1)

ITA-AITES members share their expertise by participating in:

13 ACTIVE WORKING GROUPS:

The International Tunnelling and Underground Space Association shares its expertise by regularly publishing analyses, position papers and symposium reports, all of which are available on its corporate website.

WG2: Research	WG3: Contractual Practices	WG5: Health and Safety in Works	WG6: Maintenance and Repair
WG9: Seismic Effects	WG11: Immersed and Floating Tunnels	WG12: Spayed Concrete Use	WG14: Mechanized Tunnelling
WG15: Underground and Environment	WG17: Long Tunnels at Great Depth	WG19: Conventional Tunnelling	WG20: Urban Problems, Underground Solutions
	WG21: Life Cycle Asset Management	WG22: Information Modelling in Tunnelling	



THE ITA WORKING GROUPS AND COMMITTEES (2)

4 COMMITTEES

THE COMMITTEE ON OPERATIONAL SAFETY OF UNDERGROUND FACILITIES (ITACOSUF)

This is the Centre of Excellence for world-wide exchange of information and know-how regarding **safety** and **security** of underground facilities in operation.

Chair: Maximilian Wietek

Vice-Chair: Eric Prémat



THE COMMITTEE FOR EDUCATION AND TRAINING (ITACET)

Its role is to promote education and training throughout the tunnelling and underground space association and assist its coordination.

Co-Chairs: Robert Galler

Vice-Chair: Michel Deffayet



THE COMMITTEE FOR UNDERGROUND SPACE (ITACUS)

This 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.

Co-chairs: Antonia Cornaro and Han Admiraal



THE TECHNOLOGY COMMITTEE (ITATECH)

The aim of this fourth committee is to provide a platform for engineers, manufacturers, contractors and suppliers to draw global experience and expertise together for the benefit of the whole industry, and to find ways of supporting the introduction of new techniques and products.

Chair: Nick Chittenden



ITA YOUNG MEMBER GROUP

Officially created at the ITA General Assembly 2014 in Iguassu, Brazil, the ITA Young member Group aims to be a technical network platform dedicated to young professionals and students in order to raise awareness of tunnelling and underground space to new generations and help them start a career in the tunnelling industry.

Chair: Keith Bannerman

Vice-Chair: Jasmin Amberg

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SOCIETÀ ITALIANA GALLERIE



The Italian Tunnelling Society is an open cultural association founded in 1974 to promote and coordinate studies and research in the field of tunnel construction and great underground works.

It mainly organize meetings and conferences, as well as technical visits and courses mainly focused on the sustainable exploitation of Underground. The Society aims to gather all the actors involved in the "underground field", with their multiple specialities and professionalisms.

The association currently consists of over 700 members, which represent public companies and organizations, universities, polytechnics, engineering companies, contractors, general and specialized firms.

SIG publishes its quarter-monthly periodical, "*Gallerie e Grandi Opere Sotterranee*", aimed to disseminating technical and scientific knowledge. SIG is the "Nation Member" representative for Italy in the International Tunnelling Association (ITA), and where its delegates every year participate in assemblies and Working Group activities.

SIG has successfully organized the WTC 1986 in Florence and, together with the Swiss Tunneling Association, the WTC 2001 in Milan.

ANDREA PIGORINI, PRESIDENT OF SOCIETÀ ITALIANA GALLERIE :



«We are proud that Naples is the third Italian city, following Florence in 1986 and Milan in 2001, to be chosen as the site of the World Tunnelling Conference. The proposal to be nominated for the 2019 World Tunnel Congress was particularly original, and successful in attracting the attention of the others member nations. The title of this year's event, "Tunnels and Underground Cities: Engineering and Innovation meet Archaeology", Architecture and Art, focuses on cultural cross-pollination, merging engineering themes with some of the essential elements of Italian culture, such as archaeology, architecture and art.

The WTC 2019 is an event that explores growth and change in contemporary cities, illustrating the solutions that underground projects can offer. Professionals and experts will share best practices and the most recent innovations, with the aim of explaining how infrastructure can offer the opportunity to provide greater functionality for spaces while seeking a balance with the environment and harmony with the cultures of the past. We can therefore utilize areas available underground, making them more interesting from an aesthetic point of view and improving their potential for use».

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HIGHLIGHTS OF WTC2019

From 3rd to 9th May, lectures and technical conferences will approach many topics related to tunnelling and underground construction industry. Some moments must be highlighted:

The Opening Ceremony on **Monday 6th at 8.45-10.00am** in the presence of **Guido Tonelli, CERN scientist who participated to the discovery of the Higgs Boson**, followed by the traditional Muir Wood Lecture given by **Dr. Ing Martin Herrenknecht** on *Pushing boundaries in tunnelling together*.

The Open Session, that will be held on **Tuesday 7th**, will be devoted to **“Tunnels : a resilient link between past and future”** with the participation of representative of Grand Paris Express, Italian State railway, PwC, John Holland, Pacific Consultants, ÖBB... The exchanges will be two round tables. The first one will be about **“Tunnel life-cycle considerations. How long-term maintenance requirements are addressed during design, construction, and asset financing”**.

The second one will focus on “Surveying and maintenance work”:

In order to maintain infrastructure in operation for planned and extended operating lifetimes, a maintenance and repair strategy has to be developed. The maintenance strategy is based primarily on good and adequate survey and monitoring of the asset. The inspection of the asset is performed at intervals that can vary significantly depending of the asset and the country.

Monitoring methods of the past were limited to visual inspection and manual measurements.

However, more methods are being utilized such as non-destructive scanning, thermography, etc., and destructive methods such as coring. New technologies are being developed using IoT, AI and data analytics for example. When repairs are required, the challenge is being able to make such repairs under live conditions or during minimal outage periods.

The WTC 2019 will also offer opportunities for continuing education for young professionals and discussing the future of the tunnelling engineering. On **Friday May 3rd and Saturday May 4th**, the schedule also includes two thematic courses on technological innovation and communication, sponsored in collaboration with ITA-CET, the ITA committee responsible for training:

- *Tunnelling 4.0 and computer technology for the design, construction and maintenance of underground works*, with a focus on BIM (Building Information Modelling) methodology and how it is applied in every phase of the design process;
- *Tunnel construction, design, operative communication and stakeholder involvement*, which will cover the most up-to-date techniques for communication and involving the territory. It will feature actors who have participated in the development of the largest construction projects in the world, to confirm how the acceptance of the work by its future users has increasingly become an integral part of the infrastructure itself.

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On **Tuesday May 7th**, the WTC 2019 will also feature a focus on the **Emerald Book**, the new contract outlines and guidelines that regulate the relationship between the client and the contractor, written specifically for the tunnel construction sector, which many countries rely on as a model to refer to. During the event, SIG will present the publication **The Italian Art of Tunnelling**, an outlook on underground projects built by the major companies of Made in Italy.

A particularly important session will be the one on **transalpine tunnels**, scheduled for the afternoon of Tuesday **May 7th** with 10 specific lectures. Italy - a pioneer in the construction of this tunnel typology, having built the first tunnel in the Alps near Monviso between 1475 and 1480 and the first tunnel to actually pierce a mountain, the Frejus railway tunnel between 1857 and 1871 – will illustrate its know-how and technological capacity, acquired in meeting the challenges inherent to the orographic configuration of its territory, and examine other important projects built in neighbouring Alpine countries, such as the Gotthard railway tunnel and the Ceneri Base Tunnel, the project to double the Gotthard highway tunnel in Switzerland and the Koralm tunnel in Austria. For Italy, two focuses on the tunnel for the Milan-Genoa high-speed railway and the Gronda in Genoa.

The module dedicated to innovation in engineering systems and production, will illustrate cases of application (*Tunnel Boring Machine* - TBM) that will define the future of this sector, for example digging wells. Also on the programme is a section dedicated to special projects, such as the large underground laboratories for studies in advanced physics (a ring-shaped tunnel over 100 km long for the new particle accelerator) similar to the model of the CERN, the European Organization for Nuclear Research.

Attention to new infrastructures, as well as the maintenance of existing ones is a theme to which the **Tunnel Refurbishment section** will be dedicated, with the goal of examining techniques and innovations in this specific sector which more than others may rely on computer digital modelling systems to efficiently handle the maintenance of civil engineering works and systems. Among other themes, there will be discussion of the uses of diagnostic scanning systems, real-time monitoring systems, big data analysis and artificial intelligence.

Innovation will be at the core of the session on industry and tunnelling 4.0, with BIM or more appropriately I-BIM (on linear infrastructures), a virtuous computer-based approach that makes it possible to create the digital twin of the infrastructure starting with the design phase, and then enrich the model itself with "as built" data during construction and use it to manage the work after completion. The focus will be on best practices, illustrated with specific papers on themes such as the Naples-Bari High-Speed Railway system, as part of the Tunnelling 4.0 course May 3rd and 4th, and the Altvorland Railway Tunnel in Germany, between Stuttgart and Ulm, during the session scheduled for **Wednesday May 8th**.

Charity Partner

There will of course be moments of attention to social themes with *the Fondazione Archè*, selected by the Organizing Committee as the Charity Partner for the WTC 2019.

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Meet you
in NAPLES



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TUNNELS AND UNDERGROUND CITIES: ENGINEERING AND INNOVATION MEET ARCHAEOLOGY, ARCHITECTURE AND ART



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SPECIAL FOCUS ON THE AAA SESSIONS – WHEN ENGINEERING AND INNOVATION MEET ARCHAEOLOGY, ARCHITECTURE AND ART

Nowadays, engineering and innovation are not the ones and only major factors in underground construction. The triple A, Archaeology, Architecture and Art have also a significant place.

The importance to combine all these and to create a perfect interaction between all of them resides on one hand for the well-being and safety of users and on the other hand for the protection of natural site and a long-lasting sustainable and design construction.

Special Sessions are planned during the WTC afternoons to discuss the interaction between the triple A. These sessions take place at **PALAZZO SERRA DI CASSANO** and are followed by visits of the **BOURBON TUNNEL**.

MONDAY 6TH – OFF SITE SESSION & BOURBON TUNNEL VISIT

- Key Note Lecture « The Roman tunnels in the Phlegrean Fields » by *C. Viggiani*
- « Effective use of underground space for sustainable cities » by S.W. Chiu, K.H. Lai, K.W. Cho & S.P. Lai
- « Enabling underground transport construction Guatemala City, Central America » by *F. Birk Ruf*

TUESDAY 7TH – OFF SITE SESSION & BOURBON TUNNEL VISIT

- Key Note Lecture « Art and public Transportation - A Continuing Journey in the Development of the Yellow Metro Line in Stockholm » by *E. Wifstrand*
- « The outlets of the Albano and Fucine lakes and their influence from Roman times up to the birth of modern tunnel engineering » by *C. Callari*
- « The new Lugano tram underground station: an example to combine architectural requirements, serviceability and challenging geotechnical conditions » by *G. Barbieri, P. Bassetti & A. Galli*

WEDNESDAY 8TH – OFF SITE SESSION & BOURBON TUNNEL VISIT

MORNING PROGRAM

- Key Note Lecture « Historical cross-alpine tunnels of Piemonte: from craftsmanship to industrialisation » by *S. Pelizza*
- « The Art Stations » by The Art Stations by *F. Brenci*
- « Genoa underground: solidity, usefulness and beauty of the Grazie Bassa Tunnel during 100 year service life » by *C. Panariello, H. Mohamed Dahir & V. Molinari*

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WEDNESDAY 8TH – OFF SITE SESSION & BOURBON TUNNEL VISIT

AFTERNOON PROGRAM

- Key Note Lecture « Underground Urbanism - Embedding AAA into Contemporary Development » by *E. Reynolds*
- « Moncenisio, from Myth to history TELT–Tunnel Euralpin Lyon Turin and the collection of historic engravings on the Frejus tunnel » by *M. Virano, G. Dati, M. Ricci & G. Avataneo*
- « Comparative Analyses of Through - running vs. Dead - end Tunnel to Urban Transit Network Efficiency and Design of Through - running Tunnel in the New York Pennsylvania Station » by *J. C. Venturi, E. Chao & C. Nicolescu*

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PRESS PROGRAM

PRESS EVENTS DURING THE WORLD TUNNEL CONGRESS 2019 - NAPLES

- Press Conference: **May 6th** at 13.00 in Sardegna Room
- Press tour to the **Metro Line C in Rome**: May 8th



Line C in Rome is the first major driverless transport public infrastructure, driven and controlled by a fully automated system. Line C's route was conceived with the purpose of linking the city's eastern area with its central and north-west areas. Starting from the Pantano terminus in the Municipality of Monte Compatri, the line stretches for about 25,6 km approximately 9 of which are at surface level and 16,5km underground, traversing such historic city neighborhoods as *Centocelle*, *Alessandrino*, *Pigneto*, *Appio*, and the historic centre before reaching the *Prati* neighborhood near Piazzale.

The T3 stretch under construction extends from San Giovanni station to Fori Imperiali station, over a total length of about 2,9 km, underpassing the historical city of Rome.

The Program :

08:30 AM

Departure from Naples Central Railway Station

09:40 AM

Arrival in Rome Termini Railway Station and transfer to 'Celimontana Shaft' construction site and logistic area

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10:15 AM

Presentation of Line C Project

10:45 AM

Put on protective gear and departure for the construction site

11:00 AM

Visit to Tunnel and Stations Construction sites

13:00 PM

Return to logistic area

13:15 PM

Light lunch at logistic area (provided by Metro C S.c.p.a.)

14:00 PM

Transfer to Rome Termini Railway Station

14:50 PM

Departure from Rome Termini Railway Station

16:03 PM

Arrival in Naples Central Railway Station

PRESS INTERFACE

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The press room will be located at **Mostra D'Oltremare, Room Procida**



Daily updates will be shared on a broadcast list on WhatsApp.

Phone Number to be added to the broadcast list : + 39 388 576 2810 and send the message « Broadcast WTC 2019 »

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TUNNELLING MARKET IN ITALY

According to the most recent data by ANCE (the National Association of Building Constructors), tunnel construction was an important sector for Italian industry in this field, generating a total revenue of 15 billion euro from commissions abroad.

The 811 construction sites operated around the world by Italian companies include 43 for the construction of underground subway lines, in Saudi Arabia, Australia, Denmark, Qatar, Turkey, France and Romania. Above and beyond the downstream effects on the domestic market.

Italy is ranked first in Europe and second in the world for the overall length of its road and railway tunnels: over 2100 km, second to China alone.

- The total of tunnelling works done yearly in Italy range between 1 and 1,5bn€ corresponding to 20km of tunnels built.
- The total of already started projects and new projects reaches 11,5 bn€ and some 200 km of tunnels.

NAPLES, HOST FOR THE 45th ITA GENERAL ASSEMBLY AND WORLD TUNNEL CONGRESS

It is no coincidence that the city of Naples has been chosen to host the Congress.

The city offers many historic examples of tunnels from as far back as Greek-Roman Antiquity and in recent years has demonstrated a significant capacity for using and enhancing underground spaces, adopting innovative solutions for excavation, and successfully combining archaeology, architecture and art in the award-winning Art Stations of the Neapolitan subway system. Toledo Università and Garibaldi are just some of the most highly appreciated stations, glowing examples of how the combination of the Italian industry's construction know-how, the creative genius of international artists and architects, and the visionary capacity of a client such as the *Metropolitana di Napoli*, can guarantee a new and sophisticated reappraisal of the underground.

➤ History : Italy, the cradle of underground construction

From Roman temples to medieval crypts, cellars and tunnels, Italy is full of underground construction. Indeed, interesting layers of history and architecture lie beneath the surface of Italian cities and landscapes. Rome, Naples, Milan and many other Italian cities are the heart of underground construction with 2400 years of history.

Rome is a very ancient city containing many tunnels, crypts and underground monuments that once housed fugitives and provided roads through which people could escape in danger. Today, there are still discoveries; there are several towers in the underground of Rome for tourists wishing to make their reservations and so travel through time. For instance, the medieval church called San Lorenzo in Lucina. Beneath it, remains a Basilica and a complex of apartments.

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The Catacombs of Naples, in Campania, are millennia monuments representing the religiosity of the Neapolitans. Among these monuments, the Catacombs of San Gennaro occupy an area of about 5600 square meters dug in the tuff of the hill of Capodimonte and house about 2000 mortuary niches and 500 arcosolia.

The Crypt of San Sepolcro, the Roman theatre, the shelter 87, hundred tunnels and so many other places that testify the richness of underground constructions in Italy.

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MAJOR PROJECTS IN ITALY

BRENNER BASE TUNNEL



The Brenner Base Tunnel is a railway tunnel that runs from Innsbruck (Austria) to Fortezza (Italy) through the Alps.

This 55-kilometre railway tunnel will be the world's second-longest tunnel, after the Gotthard Base Tunnel.

The project is funded by Austria and Italy, and a contribution by the European Union.

The aim of this tunnel is to

multiply freight traffic by three and thus reduce the number of heavy goods vehicles operating in Austria. The EU's goal is also to regain control of its traffic without being dependent on a third state.

Two excavation methods are used : 30 % Drill and Blasting and 70 % Tunnel Boring Machine. The final design will consist of two tunnels, 55 kilometres long. A centre tunnel 12 metres (39 ft) below the two primary tunnels will be used during construction as a guide tunnel to determine geological conditions, and later for drainage and emergency access.

There will be a cross over between the tunnels every 333 metres (1,093 ft). Multi-function stations will be located at Trens (in Freienfeld), Steinach, and a third station towards the northern end of the tunnel to provide operational and emergency services. ETCS Level 2 will be installed to provide train control.

Construction started on April 18, 2011 and will end by 2025.

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ROME, LINE C – THE 'ARCHEOLOGICAL' METRO



When treasures of History are revealed by the construction of metro lines, what could be more natural than to make this same metro a museum accessible to all?

Line C is a Rome Metro line which runs from the eastern suburbs of Rome near the city centre where it meets Line A.

The creation of the metro line C which began in 2007, opened in 2014 and expected to continue until 2020, has revealed an impressive number of archaeological treasures. The fact that the line is dug at a depth of nearly 30 meters contributes to the exploration of unknown underground areas.

An inn, medieval houses, iron spearheads and gold coins decorated with emperors' heads, amphorae, more than 40,000 artifacts were found during the construction of the metro station and the most interesting have been put on display. Artifacts are displayed in softly-lit glass-fronted panels throughout some metro stations.

It is an immersive experience for Line C passengers because as they descend the station's stairways, they will travel back in time, from the Middle Ages to Imperial Rome and right back to Republican Rome.

Line C interacts with historic buildings and monuments; to guarantee they are unharmed, Metro C S.c.p.A. performed a series of preventive activities aimed at precisely and reliably defining the state of conservation of historic buildings and monuments.

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THE BOURBON TUNNEL



About 430 meters long, The Bourbon Tunnel, or Bourbon Gallery is a gallery dug in the 19th century by the Bourbons reigning then on the kingdom of Naples. It was opened to the public in October 2010 after five years of cleaning and restoration work by

the *Associazione Culturale Borbonica Sotterranea*.

Visit the *Bourbon Gallery* allow people to discover an underground city and hear stories of the people that lived there. The relics and treasures that were left behind from that era are also visible.

The Bourbon tunnel is managed by the *Associazione culturale borbonica Sotterranea*, which proposes to visit it through three different routes:

- The “standard route” allows to go through the entire tunnel and discover some of the objects that were stored there until 1970
- The “adventure route” offers the visitor the possibility of a rafting through a section flooded with underground, and access to a construction site of a metro line engaged for the 1990 World Cup and abandoned.
- The caving route offers an amazing and sportier journey, in narrow corridors, on a suspension bridge.

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THE VENUE

MOSTRA D'OLTREMARE



Mostra D'Oltremare is in the western part of Naples (in the Fuorigrotta district) and has 4 entrances: P.le Tecchio, viale Marconi, viale Kennedy, via Terracina.

By air

From all main Italian and European cities; from Naples Airport by taxi in approximately 15 minutes or by bus to Piazza Municipio (followed by a bus ride heading to Fuorigrotta), or to the Central Station (then take the Underground – Linea 2 – Campi Flegrei station).

By train

From the Central Station (destination of High Speed and Eurostar trains) take the Underground, Linea 2 ('Campi Flegrei', P.le Tecchio station), or directly from the Campi Flegrei rail station if on regional trains or Intercity trains from Rome to Sicily.

By car

Motorway 'Tangenziale'. Exit Fuorigrotta. Mostra d'Oltremare has its own internal car park with room for over 1,000 cars (enter from via Terracina, viale Kennedy, viale Marconi) and is surrounded by public parking spaces managed by Napolipark (viale Marconi, Stadio, viale Kennedy).



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