CONGRESS & EXHIBITION
NAPLES MAY 3-9
ITALY

45th ITA-AITES General Assembly and World Tunnel Congress

PROGRAM
Released in April 10, 2019
For any updates download the WTC 2019 App
TUNNELS AND UNDERGROUND CITIES: ENGINEERING AND INNOVATION MEET ARCHAEOLOGY, ARCHITECTURE AND ART

WTC 2019 offers the traditional topics about design and construction of underground works, focusing on tunnelling, engineering, innovation and introduces also unusual and peculiar themes fond of the Italian culture: history (Archaeology), design (Architecture), genius and creativity (Art).

This edition will be a unique opportunity to appreciate how either in ancient or new underground infrastructures, history, design and creativity are integrated in the Neapolitan underground space.

Let yourself be fascinated by the beauty of Naples!
ON TRACK TOWARDS THE FUTURE

7,062 km of railways

1,587 km of underground works

472 km of metro lines

WELCOME TO WTC 2019

- WELCOME
- PATRONAGES & PARTNERS
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- MEDIA PARTNERS
- WTC 2019 COMMITTEES
Dear Colleagues, Dear Friends

We are all meeting this year in Naples, Italy for World Tunnel Congress (WTC) and 45th ITA General Assembly. During the last 3 years, the Italian Tunnelling Society (SIG) has carefully prepared this event, which will probably be the biggest WTC ever. The numbers available so far indicate that the congress will be very successful. A total of over 1000 abstracts were received, and 670 manuscripts have been accepted for oral (170) or poster presentations (500). At the exhibition, all the booths initially planned were sold out. An additional area with more booths was created by the organizers to comply with the high demand from exhibitors.

For many of us who have attended WTCs for a long time, this is the most appropriate occasion along the year to be informed about new projects and new techniques, a unique opportunity for networking and meeting colleagues and friends. I hope those coming for the first time will have the chance of appreciating all the technical, commercial and social possibilities open in a WTC. For the newcomers, I would like to call the attention to the value and the importance, in addition to the congress itself, of the meetings to be held by the Working Groups and Committees, responsible to produce so many reports and articles that ITA has published along the years. Some of those publications have had strong impact on many aspects of our industry, like new possibilities of underground space use, operational safety of underground facilities, technical developments, contractual practices, etc. This year 6 reports will be released by the ITA Working Group, ITAttech and ITA COSUF committees.

The topic of the Open Session will be “Tunnel - A resilient link between past and future” this year, mainly dealing with maintenance and repair strategies. I am also very glad to announce that the Emerald Book on “Contracts for Underground Works” prepared by ITA and FIDIC and presented last year, will be launched at WTC.

I wish all of you fruitful discussions and networking during the Congress.

Sao Paulo, March 15, 2019
Tarcisio B. Celestino
ITA President 2016-2019

Dear Friends, Dear Colleagues,

We are delighted to welcome you in Naples, Italy, to the 45th ITA-AITES General Assembly and World Tunnel Congress, hosted by the International Tunnelling and Underground Space Association (ITA-AITES) and the Italian Tunnelling Society (SIG).

The city of Naples was the inspirational venue of this conference, starting from the title: Tunnels and Underground cities: engineering and innovation meet Archaeology, Architecture and Art. Naples is a cradle of underground works, with an extended network of Greek and Roman tunnels and underground cavities dating to the fourth century BC, but also a vibrant and innovative city boasting a modern and efficient underground transit system, whose stations represent one of the most interesting Italian experiments on the permanent insertion of contemporary artwork in the urban context.

All this has inspired and deeply enriched the scientific contributions arrived from authors coming from over 50 different countries. The Scientific Committee has reviewed more than 1,000 abstracts and 750 papers and decided the publication in the proceedings of about 670 papers - probably the biggest number ever for a WTC – subdivided in the 11 main Topics of the congress.

The WTC 2019 in Naples is also an opportunity to overlook the Mediterranean basin with all its history, culture and art, where past and traditions are blended with innovation and future. Naples has always been a melting pot of cultures, a place to share knowledge and to establish new business relationships. You will experience the atmosphere of culture, technology and good living of this historic city filled with life, good humor and full of marvelous natural, artistic and historical treasures.

The WTC 2019 is also the frame of an International Exhibition, where major companies have booked their booths to show their products, technologies and know-how. The blooming gardens of the Congress and Exhibition Centre Mostra d’Oltremare, host also an outdoor exhibition area for machineries and equipment.

Technical and cultural visits have been planned, including the Rome’s new Metro C line – that is currently under construction and is unique for the enormous historic and monumental value of the areas it underpasses – and the Brennero Base Tunnel, in the charming Alps mountain, that will be the longest railway underground connection in the world.

Finally, the WTC Organizing Committee has prepared an extraordinary social program that will represent a great opportunity for all participants to experience the beauties of Naples and its surroundings. We are sure that the Opera Musical event at the San Carlo Theatre and the historical train journey to reach Pietrarsa - the charming Italian Railway National Museum set in front of the Naples gulf - for the Gala Dinner, will leave you astonished.

Dear guests, once again you are very welcome to the WTC 2019 which we wish you to be profitable for your mind and joyful for your spirit!

Andrea Pigorini
SIG President

Renato Casale
WTC 2019 Organizing Committee President
GREETING FROM THE MAYOR OF NAPLES

On behalf of the city of Naples, I thank the members of the International Tunneling Association for choosing Naples as the host of the World Tunneling Congress in May 2019.

We give everyone a warm welcome to Naples, a city where engineering and innovation really meet archaeology, architecture and art every day. Our subsoil preserves history and the various ages follow one another layer by layer: from the Neolithic to the Greek, from the Roman to the Byzantine, from the medieval to the Aragonese up to the present day.

The technicians, the companies, the workers who built the tunnels and the subway stations have therefore intercepted history, fielding their skill and genius. They have ensured that modern execution technologies guaranteed the protection of the historical heritage, which was enhanced by the subway stations, while remaining buried. A perfect balance between ancient and modern time but in maximum security, with a past that has become present and has allowed the best respect for historical memory even on the surface.

Located in a splendid position within the homonymous gulf, Naples is a beautiful city, surrounded by a breathtaking scenery and enriched by an exceptional artistic and architectural heritage, but it is above all, a warm and welcoming city.

It is a great pleasure and an important opportunity to host the 45th ITA-AITES General Assembly and World Tunnel Congress “Tunnels and Underground Cities: Engineering and Innovation meet Archaeology, Architecture and Art” and I am waiting for you all in May 2019.

Luigi de Magistris
Mayor of Naples

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S Generations of Tunnelers

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Technology for underground construction

- Alkali-free set accelerators for shotcrete
- Products for mechanized tunneling: foaming agents for soil conditioning, polymers, sealants, lubriﬁcants
- Products for grouting and consolidating
- Products for concrete repairing, protection and coating
- Products for waterproofing: synthetic waterproofing membranes, waterproofing accessories

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hq.utt@utt.mapei.com
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WTC 2019
AT A GLANCE

• GENERAL INFORMATION
• PROGRAM OVERVIEW
• CONGRESS VENUE
• OPENING & CLOSING CEREMONY
GENERAL INFORMATION

LOCATION INFORMATION
WTC 2019 relevant congress areas are:

- **PAVILION 10**
  - **Mostra d’Oltremare**

- **PALACONGRESSI**
  - **TEATRO MEDITERRANEO**

- **PALAZZO SERRA DI CASSANO**
  - **The ITACET Training Courses will take place at:**
    - **Venue:** Palacongressi
    - **Address:** Mostra d’Oltremare, Piazzale Tecchio, Naples
  - **The Technical Sessions will take place at:**
    - **Venue:** Palacongressi and Teatro Mediterraneo
    - **Address:** Mostra d’Oltremare, Piazzale Tecchio, Naples
  - **The special AAA Off-site Events will take place at:**
    - **Venue:** Palazzo Serra di Cassano
    - **Address:** Via Monte di Dio, 14, Naples
  - **The Archaeological Working Lunch will take place at:**
    - **Venue:** Pausilypon Archaeological Site and Seiano Grotto
    - **Address:** Discesa Coroglio, 36 - Grotta di Seiano, Naples
  - **The Exhibition will take place at:**
    - **Venue:** Pavilion 10, tent A, tent B and outdoor areas
    - **Address:** Mostra d’Oltremare, Piazzale Tecchio, Naples

REGISTRATION HOURS
Attendee & Exhibitor Registration & Secretariat Opening Hours
Location: **Pavilion 10**

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday 05 May</td>
<td>08.00-19.00</td>
</tr>
<tr>
<td>Monday 06 May</td>
<td>08.00-18.00</td>
</tr>
<tr>
<td>Tuesday 07 May</td>
<td>08.00-18.00</td>
</tr>
<tr>
<td>Wednesday 08 May</td>
<td>08.00-17.30</td>
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</tbody>
</table>

2-Day ITACET Training Course Registration
Location: Palacongressi (Stromboli room)

<table>
<thead>
<tr>
<th>Date</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday 03 May</td>
<td>08.30-09.30</td>
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</tbody>
</table>

1-Day ITACET Training Course Registration
Location: Palacongressi (Panarea room)

<table>
<thead>
<tr>
<th>Date</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday 04 May</td>
<td>08.00-09.00</td>
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</table>

EXHIBITION HOURS

**Exhibition Hall Opening Hours:**

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Monday 06 May</td>
<td>10.30-18.00</td>
</tr>
<tr>
<td>Tuesday 07 May</td>
<td>08.00-18.00</td>
</tr>
<tr>
<td>Wednesday 08 May</td>
<td>08.00-17.30</td>
</tr>
</tbody>
</table>

COFFEE BREAK & LUNCH

(Exhibition Area, Pavilion 10)

**Monday 6**

- **Morning coffee break (30 min.)** 10.30-11.00
- **Lunch** 13.00-14.00
- **Afternoon coffee break (20 min.)** 15.20-15.40

**Tuesday 7**

- **Morning coffee break (30 min.)** 10.15-10.45
- **Lunch** 13.00-14.00
- **Afternoon coffee break (20 min.)** 15.20-15.40

**Wednesday 8**

- **Morning coffee break (30 min.)** 10.30-11.00
- **Lunch** 13.00-14.00
- **Afternoon coffee break (20 min.)** 15.20-15.40

Lunch is arranged from 12.30 to 14.30 every day.

PROGRAM OVERVIEW

About 700 contributions from more than 50 countries make the WTC2019 Scientific Programme outstanding and unique. A wide range of topics have been covered, from the more traditional subjects connected to technical challenges of design and construction of underground works, with emphasis on innovation in tunnelling and engineering, to the less conventional and archetypically Italian themes such as Archaeology, Architecture, and Art in underground construction.
ABSTRACTS BOOK & PROCEEDINGS USB KEY
“Tunnels and Underground Cities: Engineering and Innovation meet Archaeology, Architecture and Art” is a valuable reference text for tunnelling specialists, owners, engineers, architects and others involved in underground planning, design and building around the world, and for academics who are interested in underground construction and geotechnics.

The Scientific Board reviewed more than 1,000 abstracts and 750 papers, to end up with the publication of about 670 papers, inserted in this WTC2019 proceedings.

The book has the following main themes: Archaeology, Architecture and Art in underground construction, Environment sustainability in underground construction, Geological and geotechnical knowledge and requirements for project implementation, Ground improvement in underground constructions, Innovation in underground engineering, materials and equipment, Long and deep tunnels, Public communication and awareness, Risk management, contracts and financial aspects, Safety in underground construction, Strategic use of underground space for resilient cities, Urban tunnels.

The abstract of all manuscripts and the full-length manuscripts of all presentations are contained in a set made up of The Book of Abstracts and a USB key that you will find in your backpack.

WTC APP
The APP was conceived as a useful tool before and during the congress for quick consultation and interaction. The contents of this Program Book will be included together with additional functions:
• participants will be able to check in the APP all E-posters for the whole conference duration.
• participants will be able to vote through the APP the best E-poster presentation expressing 3 preferred choices.
• a WTC special Award will be given to the three best E-Posters during the Closing Ceremony on May 8th

Download WTC2019 in your Google Play or Apple App store or simply scan this QR code.
SOCIAL MEDIA
You are invited to follow WTC 2019 on the social media for updates and news, to share experiences and practices, or to simply ask for opinions.

Join us on Facebook, LinkedIn, Twitter and Youtube, and actively connect and interact with other professionals in the field.

PRESS CONTACTS
Italian press and media partners:
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SLIDE CENTER
A complimentary Wifi network is set up throughout the Mostra d’Oltremare venue, including the Pavilion 10, the Palacongressi and the Teatro Mediterraneo.
Name of network: wtc2019
Password: swsengineering

PRESS AREA & INTERVIEW ROOM
Location: Palacongressi
The Press area (first floor) and the Interview room (Procida Room) will be available to all accredited media journalists. The press area is a work space with desks and printers.

• Press Area Opening Hours:
  Monday 06 May 08.00-18.00
  Tuesday 07 May 08.00-18.00
  Wednesday 08 May 08.00-17.00

• Interview Room Opening Hours:
  Monday 06 May 09.00-18.00
  Tuesday 07 May 08.00-18.00
  Wednesday 08 May 08.00-17.00

Press Conference
A Press Conference will take place in the Sardegna room at Palacongressi on Monday, May 6 from 13.00 to 14.00.

INTERNET
A complimentary Wifi network is set up throughout the Mostra d’Oltremare venue, including the Pavilion 10, the Palacongressi and the Teatro Mediterraneo.
Name of network: wtc2019
Password: swsengineering

LOUNGE AREA
Participants will enjoy an indoor area close to ITA Secretariat Office in order to work, meet up colleagues, have a chat, relax and recharge mobile devices.
Location: Palacongressi, ground floor
REGISTRATION INFORMATION
As of Sunday, May 5 at 08H00 on-site registrations will be available at the registration desks.

REGISTRATION POLICY
All attendees, authors, and exhibitors of the WTC 2019 are required to be registered. Badges are required for admittance to all technical sessions, exhibits, and social events.

HOTEL RESERVATIONS
For any information please go to the registration desk in the registration area or contact the Official Housing Bureau and Travel Agency of the congress:
AIM Group International - Milan Office
Via Ripamonti, 129 - 20141 Milan, Italy
Phone: +39 02 56601851
E-mail: wtc2019.hotel@aimgroup.eu
Any change or cancellation of the hotel reservation must be sent in writing to AIM Group International - Milan Office.
AIM Group International - Milan Office reserves the right to charge on the given credit card the following cancellation fees: no refund for amendments, no-shows or cancellations.
Please Note
Rooms not occupied from the day of arrival will be seen as No-Show, unless prior arrangement has been made. Reservation will be automatically cancelled and payment not refund.

TRANSPORTATION
Delegate Transport Information
Daily transportation to the Congress Venue will be provided to participants in order to arrive at the venue prior to the first main session of the daily Scientific Program, and will depart from the Congress Venue following the last session of the daily Scientific Program or following the Congress Social Event on May 5, 2019.

Buses are available for all registered delegates on presentation of their conference badge to the driver/hostess and are free of charge. You do not have to be staying at a hotel to pick up a shuttle at that location. All Congress buses are marked with the WTC2019 logo. Please check the sign in the bus window to make sure you are on right bus.

M LINEA 2
Free tickets valid one day will be available at the entrance of the Congress venue in the Registration area.

Service frequency every 10 minutes on the route to the Congress venue from Garibaldi Station. Hostess assistance during the morning at Garibaldi Station, full-time hostess assistance at Campi Flegrei Station.

BUSES WILL OPERATE AS SHUTTLES AS PER THE TIMETABLE AND ROUTES BELOW (for more details, please download the WTC2019 App):

<table>
<thead>
<tr>
<th>HOTELS</th>
<th>Pick up Location</th>
<th>MAY 5</th>
<th>MAY 6</th>
<th>MAY 7</th>
<th>MAY 8</th>
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</thead>
<tbody>
<tr>
<td>Best Western Suites</td>
<td>Front entrance of the hotel</td>
<td>18H00</td>
<td>07H45</td>
<td>07H45</td>
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</tr>
<tr>
<td>&amp; Residence Hotel</td>
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<tr>
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<tr>
<td>Montespina Park Hotel</td>
<td></td>
<td>18H20</td>
<td>08H00</td>
<td>08H00</td>
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<tr>
<td>Hotel Nuvò</td>
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<td>18H30</td>
<td>08H10</td>
<td>08H10</td>
<td>08H10</td>
</tr>
<tr>
<td>Best Western JFK</td>
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<td>18H10</td>
<td>07H45</td>
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<tr>
<td>Hotel Serius</td>
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<td>18H20</td>
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<tr>
<td>Hotel Cristina</td>
<td></td>
<td>18H30</td>
<td>08H05</td>
<td>08H05</td>
<td>08H05</td>
</tr>
<tr>
<td>Palazzo Salgar</td>
<td>Front entrance of the hotel</td>
<td>17H45</td>
<td>07H30</td>
<td>07H30</td>
<td>07H30</td>
</tr>
<tr>
<td>Grand Hotel Parker’s</td>
<td>Front entrance of the hotel</td>
<td>17H45</td>
<td>07H30</td>
<td>07H30</td>
<td>07H30</td>
</tr>
<tr>
<td>Holiday INN</td>
<td>Front entrance of the hotel</td>
<td>17H30</td>
<td>07H30</td>
<td>07H30</td>
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</tr>
</tbody>
</table>

CONGRESS VENUE MEETING POINT A AND LISTED HOTELS BELOW TO CONGRESS VENUE

<table>
<thead>
<tr>
<th>HOTELS</th>
<th>Pick up Location</th>
<th>MAY 5</th>
<th>MAY 6</th>
<th>MAY 7</th>
<th>MAY 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best Western Suites</td>
<td>Front entrance of the hotel</td>
<td>18H00</td>
<td>07H45</td>
<td>07H45</td>
<td>07H45</td>
</tr>
<tr>
<td>&amp; Residence Hotel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Hotel</td>
<td>Front entrance of the hotel</td>
<td>18H05</td>
<td>07H50</td>
<td>07H50</td>
<td>07H50</td>
</tr>
<tr>
<td>Montespina Park Hotel</td>
<td></td>
<td>18H20</td>
<td>08H00</td>
<td>08H00</td>
<td>08H00</td>
</tr>
<tr>
<td>Hotel Nuvò</td>
<td></td>
<td>18H30</td>
<td>08H10</td>
<td>08H10</td>
<td>08H10</td>
</tr>
<tr>
<td>Best Western JFK</td>
<td>Front entrance of the hotel</td>
<td>18H10</td>
<td>07H45</td>
<td>07H45</td>
<td>07H45</td>
</tr>
<tr>
<td>Hotel Serius</td>
<td></td>
<td>18H20</td>
<td>07H55</td>
<td>07H55</td>
<td>07H55</td>
</tr>
<tr>
<td>Hotel Cristina</td>
<td></td>
<td>18H30</td>
<td>08H05</td>
<td>08H05</td>
<td>08H05</td>
</tr>
<tr>
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<td>07H30</td>
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</tr>
</tbody>
</table>
Delegate Transport for Archaeological Working lunch
A daily Conference Shuttle service is provided from the Congress Venue to the Seiano Grotto, and back.

**BUSES ARE AVAILABLE FOR ALL REGISTERED DELEGATES ON PRESENTATION OF THEIR EVENT COUPON ON THE CONFERENCE BADGE TO THE DRIVER/HOSTESS AND ARE FREE OF CHARGE:**

### FROM CONGRESS VENUE ➤ TO SEIANO GROTTO

<table>
<thead>
<tr>
<th>MEETING POINT</th>
<th>Pick up Location</th>
<th>MAY 5</th>
<th>MAY 6</th>
<th>MAY 7</th>
<th>MAY 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONGRESS VENUE</td>
<td>Mostra d’Oltremare/ Piazzale Tecchio</td>
<td>11H00</td>
<td>11H00</td>
<td>11H00</td>
<td>11H00</td>
</tr>
</tbody>
</table>

### FROM SEIANO GROTTO ➤ TO CONGRESS VENUE

<table>
<thead>
<tr>
<th>MEETING POINT</th>
<th>Pick up Location</th>
<th>MAY 5</th>
<th>MAY 6</th>
<th>MAY 7</th>
<th>MAY 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEIANO GROTTO</td>
<td>Discesa Gaiola 37 Seiano Grotto</td>
<td>13H30</td>
<td>13H30</td>
<td>13H30</td>
<td>13H30</td>
</tr>
</tbody>
</table>

Delegate Transport for AAA Off-site Events
A daily Conference Shuttle service is provided from the Congress Venue to the Bourbon Tunnel, and back.

**BUSES ARE AVAILABLE FOR ALL REGISTERED DELEGATES ON PRESENTATION OF THEIR EVENT COUPON ON THE CONFERENCE BADGE TO THE DRIVER/HOSTESS AND ARE FREE OF CHARGE:**

### FROM CONGRESS VENUE ➤ TO BOURBON TUNNEL

<table>
<thead>
<tr>
<th>MEETING POINT</th>
<th>Pick up Location</th>
<th>MAY 5</th>
<th>MAY 6</th>
<th>MAY 7</th>
<th>MAY 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONGRESS VENUE</td>
<td>Mostra d’Oltremare/ Piazzale Tecchio</td>
<td>14H00</td>
<td>14H00</td>
<td>14H00</td>
<td>14H00</td>
</tr>
</tbody>
</table>

### FROM BOURBON TUNNEL ➤ TO THE CONGRESS VENUE AND MEETING POINT

**MEETING POINT**

<table>
<thead>
<tr>
<th>Pick up Location</th>
<th>MAY 6</th>
<th>MAY 7</th>
<th>MAY 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morelli Parking, Via D. Morelli, 61c</td>
<td>-</td>
<td>-</td>
<td>12H30*</td>
</tr>
<tr>
<td>Morelli Parking, Via D. Morelli, 61c</td>
<td>17H30</td>
<td>17H30</td>
<td>17H30</td>
</tr>
</tbody>
</table>

PLEASE NOTE:
Shuttle service to get to the Bourbon Tunnel for the morning session on May 8, is not available at the moment. Please check on WTC2019 App for any updates on the shuttle service.

* Return pick up for the morning session to the congress venue.

### Gala Dinner (For registered Delegates only)
You will be able to enjoy a journey on vintage carriages from Naples to the National Railway Museum of Pietrarsa.

* There are limited number of seats on the historic train for the special journey, available on first come first served basis according to the date of your Gala dinner registration.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Location</th>
<th>Timetable and pick up Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAY 8</td>
<td>Railway National Museum of Pietrarsa</td>
<td>19H30 Garibaldi Station Travel aboard an historic train * and Trenitalia Jazz</td>
</tr>
</tbody>
</table>

**Timetable and Return pick up Location**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAY 8</td>
<td>Railway National Museum of Pietrarsa to Meeting point A B C Hotel Esedra and hotels listed on p. 35 (return transfer by bus)</td>
</tr>
</tbody>
</table>

### WTC 2022 Candidates Dinner

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Location</th>
<th>Timetable and pick up Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAY 7</td>
<td>Belvedere Carafa</td>
<td>19H30 Meeting point A B C Hotel Esedra and hotels listed on p. 35</td>
</tr>
</tbody>
</table>

**Timetable and Return pick up Location**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAY 7</td>
<td>Belvedere Carafa to Meeting point A B C Hotel Esedra and hotels listed on p. 35</td>
</tr>
</tbody>
</table>

PLEASE NOTE: For more details on social event, please see p. 63

### Technical Visits

<table>
<thead>
<tr>
<th>Date</th>
<th>Technical Visit</th>
<th>Pick up and drop off Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAY 9</td>
<td>Metro Line 1 &amp; 6</td>
<td>09H30 Naples-Bari High Speed Railway line Metropark next to Garibaldi Station</td>
</tr>
</tbody>
</table>

PLEASE NOTE: For more details on Technical Visits, please see pp. 92-93
Please note space is limited. Pick-up times may vary according to the routes and traffic.

This service is provided by

Please consult this website for further details.

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The information on the processing of personal data in accordance with European Regulation no. 679 of 2016 is published on the website of the event at www.wtc2019.com/privacy-policy.

**PROFESSIONAL CONGRESS ORGANIZER**
AIM Group International - Milan Office
Via G. Ripamonti, 129 - 20141 Milano (Italy)
wtc2019@aimgroup.eu
www.aimgroupinternational.com

**COMMUNICATION PARTNER**
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www.ppan.it

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- Comprehensive packaging options
- Guaranteed quality

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Let’s talk TUNNELS
Contact: tunnels@arcelormittal.com

Visit us at:
Stand 32-33
May 3-9 2019
<table>
<thead>
<tr>
<th>May 2019</th>
<th>Friday 3rd</th>
<th>Saturday 4th</th>
<th>Sunday 5th</th>
<th>Monday 6th</th>
<th>Tuesday 7th</th>
<th>Wednesday 8th</th>
<th>Thursday 9th</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morning</strong></td>
<td>ITACET Training Courses</td>
<td>ITACET Training Courses</td>
<td>ITACET General Assembly</td>
<td>Opening Ceremony</td>
<td>Open Session 1</td>
<td>ITA WGs &amp; Committees Reports</td>
<td>Technical Sessions</td>
</tr>
<tr>
<td></td>
<td>ITACET Training Courses</td>
<td>ITACET Training Courses</td>
<td>ITACET General Assembly</td>
<td>ITA WG Meetings</td>
<td>Technical Sessions</td>
<td>Special AAA Off-site Event</td>
<td>ITA General Assembly</td>
</tr>
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<tr>
<td>Evenining</td>
<td>ITA President’s Reception</td>
<td>Mostra d’Oltremare</td>
<td>Opening Ceremony</td>
<td>Opening Ceremony</td>
<td>Evening Events</td>
<td>Closing Ceremony</td>
<td>Evening Events</td>
</tr>
<tr>
<td></td>
<td>Italia Metro station, Line 1, Naples</td>
<td>WTC 2019 Special Event</td>
<td>WTC 2019 Special Event</td>
<td>WTC 2019 Special Event</td>
<td>For more details see p. 88</td>
<td>For more details see p. 88</td>
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</tr>
</tbody>
</table>

**Program Overview**

For more details see p. 68

Dramix®

Steel fibre tunnel applications

3D

USED IN
- NorthConnex
- WestConnex M4
- WestConnex M5

4D

USED IN
- Expolink in Dubai
- Folo Line Norway

5D

SUCCESFULLY USED IN VARIOUS INTERNATIONAL PROJECTS
- Riva Tunnel Turkey
- Jansen Mine in the USA
- Lee Tunnel - Thames Tideway in the UK

Synmix®

ALSO AVAILABLE
Synmix synthetic fibres for shotcrete, the ideal support for your mining project

PwC’s purpose is to build trust in society and solve important problems. PwC accompanies Italian companies in their process of growth by helping them deal with current business issues and complex challenges.

Because we are tunnelling
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Several stations of the underground involve sites that, although heavily stratified, remain linked to a specific moment in history. This particular moment can be discerned by aspects that are still apparent today; or by findings of particular importance that were concealed by successive transformations and then came to light during the excavations.

As a consequence, it is possible to link multiple stations to specific urban areas that are representative of a precise moment in history, considering the city, with its quotidian as well as its pivotal events, as the key to understanding the new urban infrastructure.

Hence the stations of Garibaldi, Duomo and Università can be linked to the Bourgeois City, which finds its true quintessence in the Renewal works; Toledo and Municipio, brimming with stratifications, to the Viceregal City, which maintains its original significance in the current urban layout; Chiaia, Mirelli, San Pasquale, to the development of the western area of the city; Mergellina, Lala, Viale Augusto, Piazzale Tecchio, of an essentially urban nature, to the further spread westward, spanning Fuorigrotta; Tribunale and Poggioreale, Centro Direzionale, Capodichino, to the eastern front; Museo and Dante, Materdei and Salvator Rosa, Quattro Giornate and Vanvitelli, to the stretches of residential areas along the hills, beginning with the historic district.
The Watertight and Durable
CRystalline CONCReTE

Integral System of Waterproofing and Protection of Concrete by Crystallization

The exclusive effect of PENETRON® “Self Healing” for increasing durability over time
06 May 2019

The Opening Ceremony will be held at Mostra d’Oltremare. The halls Auditorium (at Teatro Mediterraneo) and Europa (at Palacongressi) will be connected by audio-video. When registering, participants will be addressed to the assigned location.

1st PART 08.45 -10.30

08.45 Official opening by Masters of Ceremony
Serena Rossi (Performer)
Mauro Moretti (Fondazione FS Italiane President)

08.50 Institutional greetings
Luigi De Magistris (City Mayor)
Ministry of Infrastructure and Transport Representative
Maurizio Gentile (CEO Rete Ferroviaria Italiana)

09.05 Speech by WTC 2019 President
Pietro Salini (CEO Salini Impregilo)

09.20 Speech by Master of Ceremony
Mauro Moretti

09.30 Music entertainment
Serena Rossi

09.35 Greetings from SIG
Andrea Pigorini (SIG President)

09.40 Greetings from ITA
Tarcisio Celestino (ITA President)

09.45 Architecture in negative: the form of the void
Alessandro Viscogliosi (Università di Architettura La Sapienza Roma)

10.05 Tunnels for knowledge
Guido Tonelli (CERN)

10.25 Final remarks (1st part)
Renato Casale (WTC Organizing Committee President)

10.30 - 11.00
OFFICIAL OPENING OF THE EXHIBITION AREA
and Coffee break in Pavilion 10

2nd PART 11.00-13.00

11.00 Muir Wood Lecture
Pushing boundaries in tunnelling together
Martin Herrenknecht (Herrenknecht AG)

11.40 Music entertainment
Serena Rossi

11.50 Institutional greetings
Vincenzo De Luca (Regione Campania President)

11.55 Digital Tunnels
Gianluigi Castelli (Ferrovie dello Stato Italiane President)

12.10 Tunnelling the most beautiful metro in the world
Ennio Cascetta (Metropolitana di Napoli President, Università Federico II Napoli)

12.25 ITA Tunnel Landmark – The Brunel’s Tunnel of London
Martin Knights (FREng, Former President of The International Tunnelling Association and a Founding Trustee of the Brunel Museum)

12.50 ITACET Foundation Awards
Abdullah Al-Mogbel (ITACET Foundation President)

12.55 Final remarks
Serena Rossi
Mauro Moretti
08 May 2019

The Closing Ceremony will be held at Mostra d’Oltremare - Auditorium Teatro Mediterraneo.

⏰ 17.00-17.30

- Congress Scientific overview and E-Poster Awards
  Daniele Peila
  (Politecnico di Torino, WTC2019 Scientific Advisory Board)

- Speech by elected ITA President

- Italian Past WTC President, Awards ceremony
  Andrea Pigorini
  (SIG President)

- Flag Ceremony
  Andrea Pigorini
  (SIG President)
  and
  Teik Aun Ooi
  Director IEM WTC 2020 Organizing Committee Chair

- WTC 2020 Presentation
  Teik Aun Ooi
  Director IEM WTC 2020 Organizing Committee Chair

- Closing speech and invitation to Gala Dinner
  WTC 2019 Organizing Committee
SOLUTION FOR ALL TYPE OF TUNNELS’ SECTIONS

TUNNEL FORMWORKS

COGUARO 4
NOMINAL CAPACITY: 4 m³

SHOTCRETE CST 8.20
THEORETICAL OUTPUT: 2 - 20 m³/h
MAX PRESSURE ON CONCRETE: 65 bar

SHOTCRETE PCS209 D/E
MAX THEORETICAL OUTPUT: 20 m³/h
MAX PRESSURE ON CONCRETE: 90 bar

CSSE
THEORETICAL OUTPUT: 5 - 30 m³/h
MAX PRESSURE ON CONCRETE: 65 bar

SHOTCRETE CSS3 EVO
THEORETICAL OUTPUT: 5 - 30 m³/h
MAX PRESSURE ON CONCRETE: 65 bar

DINGO
THEORETICAL OUTPUT: 30 m³/h
MAX PRESSURE ON CONCRETE: 60 bar

UNDERGROUND MACHINERY RANGE

COMING SOON

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ITA-AITES PROGRAM & ITACET TRAINING COURSES

- ITA-AITES ANNUAL MEETING, WG & COMMITTEES PROGRAM
- ITA YOUNG MEMBERS INFO
- ITACET TRAINING COURSES
**ITA-AITES**

**ANNUAL MEETING PROGRAM**

You will find the ITA Secretariat at the ground floor of Palacongressi, Mostra d’Oltremare.

**SATURDAY, MAY 4**

08.00  WTC 2019 Registration  
(Palacongressi)

08.30-12.30  ITA-AITES Executive Council Meeting  
(Corsica room, Palacongressi)

14.00-17.00  WGs/Committees/ExCo meeting  
(Sardegna room, Palacongressi)

19.00-22.30  ITA President’s Reception  
(by invitation only)  
Monumental Complex of Santa Chiara  
Address: Via Santa Chiara, Naples

Discover one of the most beautiful and beloved monastery in Naples. The large Franciscan complex includes tombs, beautiful cloisters, an archaeological museum and, behind the Basilica, the Church of Santa Chiara. Here the event will involve you into a fascinating mix of Provencal-Gothic and Baroque style which will lead you to discover.

Guided visit ☑️ 19.00-20.00  
No transfer service will be provided  
Dress code: smart casual

**SUNDAY, MAY 5**

08.00  WTC 2019 Registration  
(Registration area)

08.30-13.00  ITA-AITES General Assembly  
(Italia room, Teatro Mediterraneo)

13.00-14.00  Lunch for ITA Member Nations delegates  
(Italia room terrace, Teatro Mediterraneo)

**14.00-18.00  Working groups:**

- WG 2  Sicilia 2 room, Palacongressi
- WG 3  Egadi 1 room, Palacongressi
- WG 5  Tent 1, outdoor, Palacongressi
- WG 6  Ischia 1 room, Palacongressi
- WG 9  Tent 3, outdoor, Palacongressi
- WG 11  Sicilia 1 room, Palacongressi
- WG 12  Capri room, Palacongressi
- WG 14  Eolie-Stromboli room, Palacongressi
- WG 15  Egadi 2 room, Palacongressi
- WG 17  Egadi 3 room, Palacongressi
- WG 19  Meeting room at Hotel Esedra
- WG 20  Tent 4, outdoor, Palacongressi
- WG 21  Tent 2, outdoor, Palacongressi
- WG 22  Eolie-Panarea room, Palacongressi

**SUNDAY, MAY 5**

**ITACUS THINK DEEP NATIONAL ACTION PROGRAMME**

& ITACUS Steering Board  
(Sardegna room, Palacongressi)

Through the initiative of ITACUS, THINK DEEP groups have been established in recent years or are in the process of being established in several countries. These groups aim at raising awareness of all aspects of the subsurface, and create a much-needed space for interdisciplinary exchange on urban and subsurface development. The workshop will bring together members of existing THINK DEEP Groups as well as interested conference participants to discuss the aims and setups of the National Action groups, their audiences and strategies as well as how they are working together. Join us for an exciting exchange beyond tunnelling!

Join the THINK DEEP National Action and ITACUS representatives:

- Marilu Melo, THINK DEEP Downunder, Australia
- Chris Swaine, THINK DEEP Downunder, Australia
- Loretta von der Tann, THINK DEEP UK
- Petr Salak, THINK DEEP UK
- Per Tengborg, THINK DEEP Sweden
- Abidemi Agwor, THINK DEEP Naija, Nigeria
- Rosanne Verloop, THINK DEEP Netherlands
- Antonia Cornaro, ITACUS, co-chair
- Han Admiraal, ITACUS, co-chair
**ITA-AITES ANNUAL MEETING PROGRAM**

**MONDAY, MAY 6**

08.00  WTC 2019 Registration  
(Registration area)

14.00-17.00  **Working groups:**
- WG 2  Sicilia 2 room, Palacongressi
- WG 3  Egadi 1 room, Palacongressi
- WG 5  Tent 1, outdoor, Palacongressi
- WG 9  Tent 3, outdoor, Palacongressi
- WG 11  Sicilia 1 room, Palacongressi
- WG 12  Capri room, Palacongressi
- WG 14  Eolie-Stromboli room, Palacongressi
- WG 15  Egadi 2 room, Palacongressi
- WG 17  Egadi 3 room, Palacongressi
- WG 19  Meeting room at Hotel Esedra
- WG 20  Tent 4, outdoor, Palacongressi
- WG 21  Tent 2, outdoor, Palacongressi
- WG 22  Eolie-Panarea room, Palacongressi

15.40-17.20  **Prime Sponsor Meeting**  
(Sardegna room, Palacongressi)

21.00-23.00  **ITAtech Dinner**  
(by invitation only)  
San Carlo Theatre  
Address: Via San Carlo, 98, Naples

**TUESDAY, MAY 7**

08.00  WTC 2019 Registration  
(Registration area)

08.30-10.30  **ITA COSUF Steering Board Meeting**  
(Egadi 3 room, Palacongressi)

08.30-13.00  **WG & Committees Report Presentation & Open Session**  
(Auditorium, Teatro Mediterraneo)

08.30-10.15  **PRESENTATION OF ITA PUBLICATIONS**

The following new publications will be presented by the Authors:

- **WG 2**  Guidelines for the Design of Segmental Tunnel Linings
- **WG 5**  Guide to ITA/BTS CAWG Report 10 for Clients and others not familiar with high pressure compressed air work
- **WG 14/15**  Handling, Treatment and Disposal of Tunnel Spoil Materials
- **ITAtech**  Practical approach for controlling the blasting vibration and optimizing advance in urban tunnelling
- **ITAtech**  Guidelines on rebuilds of machinery for mechanized tunnelling excavation
- **ITA COSUF**  Current practice on cross-passage design to support safety in rail and metro tunnels
- **ITA-FIDIC**  Condition of Contract for Underground Works (Emerald Book)

10.45-13.00  **TUNNELS A RESILIENT LINK BETWEEN PAST AND FUTURE**

**1st ROUND TABLE**

Tunnel life-cycle considerations. How long-term maintenance requirements are addressed during design, construction, and asset financing

- Tunnels and other underground openings are assets that require large investments
- These assets are meant to have an operating life of 100 to 120 years, but many of them have been in operation for 200 years or more.
IT-AITES ANNUAL MEETING PROGRAM

- Today, when deciding this type of investment, how is the extended operating life taken into account?
- What are the maintenance planning considerations?
- How do the maintenance and repair costs over an extended operation life impact the funding of the asset?
- How is the maintenance and repair strategy addressed in the financial model?

2nd ROUND TABLE
Surveying and maintenance works
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 on 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 roundtable participants will discuss and debate new surveying technologies and repair methods

The participants of both roundtables will consist of owners, financiers, engineers, contractors, and survey specialists drawn from different countries around the world as well as experts from the ITA Working Groups. Participants to the Round Tables are to be found in the WTC 2019 App.

For Q&A use Sli.do
Code #WTC2019

TUESDAY, MAY 7

11.00-13.00 ITA COSUF Activity Groups
(Egadi 1 room, Egadi 2 room, Egadi 3 room, Sicilia 1 room, Palacongressi)

14.00-15.20 ITAtech Steering Board Meeting
(Egadi 3 room, Palacongressi)

14.00-17.40 Nordic Forum
(Capri room, Palacongressi)

14.00-17.40 ITA-CET Steering Board Meeting
(Sicilia 1 room, Palacongressi)

15.40-17.40 ITAtech Activity Groups
(Egadi 1 room, Egadi 2 room, Egadi 3 room - Palacongressi; Tent 1 and Tent 2 outdoor)

20.00-22.30 WTC 2022 Candidates Dinner
(by invitation only)
Belvedere Carafa
Address: Via Aniello Falcone, 122, Naples

Enjoy an exclusive view of the Gulf of Naples where the sea meets the sky and a dinner in a unique and historic location dated back to the end of the seventeenth century, located on the Vomer hill. Purely breath-taking! Guests will really find it hard not to fall in love with this city after a dinner with panorama at Belvedere Carafa!

Transfer service provided.
(for more details see p. 37)

Dress code: smart casual

WEDNESDAY, MAY 8

08.30-13.00 ITA Young Members General Meeting
(Egadi room, Palacongressi)
(for more details see p. 67)

13.30-17.00 ITA-AITES General Assembly
(Italia room, Teatro Mediterraneo)
What if?

What if we showed you how we’re solving the world’s greatest challenges by transforming intangible ideas into intelligent solutions for a more connected, sustainable world?

At Jacobs, we think differently about the future. We start with “what if” to surface new possibilities and harness deep technical expertise to bring bold solutions to fruition.

#WhatIf
jacobs.com/whatif

Follow us @JacobsConnects

Our company is one of the largest and most diversified engineering companies in Italy, with an increasing presence on an international level, capable of providing tailor-made solutions in the design and upgrading of urban ecosystems. We are partners of institutions, managing authorities and state-owned enterprises that operate in the sector of infrastructure, large-scale construction, network and service design and planning.

ENGINNEERING EXPERIENCE
SINCE 1955

#WhatIf
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Follow us @JacobsConnects

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ENGINNEERING EXPERIENCE
SINCE 1955
ITA YOUNG MEMBERS INFO

The ITA Young Members group will be active at WTC 2019 and has a few events available for young professionals!

YOUNG MEMBERS DINNER
MAY 6, 2019
⏰ 21.00-01.00

El Pirata
Address: Via Mergellina Pier Luise, Naples

All young attendees are invited to join us on Monday, May 6 at 20.30. This will be an excellent opportunity to network with other young professionals from all over the world and learn what ITA-YM is up to.

Join us for an informal evening of networking!

“El Pirata” is a modern brigantine, recalling galleons which crossed the legendary Sea of Cortez. Don’t miss the YMs Dinner enjoying the beautiful scenery of the Gulf of Naples.

No transfer will be provided. Public transit available.
El Pirata is a 15-minute walk from Mergellina Metro Station, 25-minute walk from Castel dell’Ovo, 4 km from the centre of Naples and 2.4 km from San Paolo Stadium.

Access to the galleon will be by invitation only.

Invitation will be distributed by YMs and by the organizing staff proven the age and membership to a tunneling association.

GENERAL MEETING
MAY 8, 2019
⏰ 08.30-13.00
EGADI Room
Palacongressi - Mostra d’Oltremare, Naples

The event will be shared in streaming to allow the participation of Young Members worldwide.

Join us as the ITA-YM General Meeting and know more about the Steering Committee and ITAym yearly activities.
Hear from Member Nations on what is being done in different countries and don’t miss out the election of NEW steering board members.

OTHER MINOR EVENTS

APERITIF • MORNING RUN •

For more details, please download the WTC2019 App

International Tunnelling Association Young Members

ITAYM Media

For more information
ym@societaitalianagallerie.it
itaym@ita-aites.or

Visit the ITA (International Tunnelling and Underground Space Association) and SIG (Italian Tunnelling Society)
YM at the ground floor of Teatro Mediterraneo!

The ITA YM look forward to seeing you at WTC 2019!
ITACET TRAINING COURSES

ITACET FOUNDATION
The ITACET Training Courses are co-organized by SIG (the Italian Tunnelling Society) and ITACET Foundation whose function is to promote, endorse and organize international technical events to facilitate the continuing education of specialists of all levels in the various fields of Tunneling and Underground Space Use together with Italian Tunnelling Society (SIG) more on the Foundation at www.itacet.org. The program and the selection of the lecturers is developed by the ITA-CET Committee for Education and Training and SIG.

1st ITACET TRAINING COURSE
Location: Palacongressi (Stromboli room)

May 3, 2019 09.30-18.00
May 4, 2019 09.00-18.30

TUNNELLING 4.0 - INFORMATION TECHNOLOGY FOR THE DESIGN, CONSTRUCTION AND MAINTENANCE OF UNDERGROUND WORKS

The first two-day course (3-4 May 2019) is entitled “Tunneling 4.0 and IT technologies for the design, construction and maintenance of underground works” and will focus on the latest technological innovations in the different phases of design, construction and maintenance of underground works. We will talk about BIM methodology applied to all these phases, as well as about automation of the construction process and use of virtual reality and augmented as an aid to optimize the construction of tunnels. It is therefore a course of great interest to share the state-of-the-art knowledge about these technologies.

2nd ITACET TRAINING COURSE
Location: Palacongressi (Panarea room)

May 4, 2019 09.00-18.00

COMMUNICATION AND STAKEHOLDERS ENGAGEMENT

The second course (4 May 2019) is entitled “Tunnels design construction and operation communication and stakeholder engagement”. Although its less technical cut, we consider this course of extreme interest, due to the growing needs to effectively communicate the underground works (and their role for the quality of life) and to interact with the communities and all the various stakeholders, today. In the first part of the course, you will have the opportunity to know the modern techniques and strategies to face communication issues, through for example the use of new media. In the second part, the word will be given to the players involved in some of the major construction works in the world, to learn about the strategies adopted to effectively deal with communication with the populations and stakeholders for large projects.

Participate in the 2019 Awards
ENTRIES ACCEPTED UNTIL 15 JUNE 2019
awards.ita-aites.org

- A contest for 8 categories
- A 1 day conference during the Cutting Edge
  Organised by UCA of SME and Tunnelling Journal
- An award ceremony banquet

AN EVENT TO MEET, LEARN AND CELEBRATE IN MIAMI

In cooperation with

Secretariat: ITA-AITES c/o MIE 2
Chemin de Baleuret 9 - Châtelaine CH 1219 - Switzerland – Tel.: +41 22 547 74 41
Mob.: +33 695 87 13 85 – e-mail: awards@ita-aites.org – www.ita-aites.org
BUILD THE FUTURE, FUELLING THE PRESENT

©Hitachi Rail STS
TECHNICAL SESSION PROGRAM

• TECHNICAL SESSIONS OVERVIEW
• DETAILED TECHNICAL SESSIONS PROGRAM
• SPECIAL AAA OFF-SITE EVENTS
<table>
<thead>
<tr>
<th>Time</th>
<th>Monday, May 6th</th>
<th>Tuesday, May 7th</th>
<th>Wednesday, May 8th</th>
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<tbody>
<tr>
<td>08:45-10:30</td>
<td>Opening Ceremony</td>
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<td>10:30-12:00</td>
<td>Congress Opening</td>
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<td>10:30-10:30</td>
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<td>11:00-13:00</td>
<td>Opening Ceremony</td>
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<td>13:00-14:00</td>
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<tr>
<td>14:00-15:20</td>
<td>Keynote Lecture</td>
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<td>15:20-15:40</td>
<td>Coffee Break</td>
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<td>15:40-17:20</td>
<td>Panel Discussion</td>
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<td>17:00-17:30</td>
<td>Closing Ceremony</td>
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**Technical Sessions Overview**

**Monday, May 6th**
- **8:30-10:30**: Long and Deep Tunnels: Innovation in Underground Construction & Equipment
- **11:00-13:00**: Long and Deep Tunnels: Innovation in Underground Construction & Equipment
- **14:00-15:20**: Long and Deep Tunnels: Innovation in Underground Construction & Equipment
- **15:20-15:40**: Coffee Break

**Tuesday, May 7th**
- **8:30-10:30**: Long and Deep Tunnels: Innovation in Underground Construction & Equipment
- **11:00-13:00**: Long and Deep Tunnels: Innovation in Underground Construction & Equipment
- **14:00-15:20**: Long and Deep Tunnels: Innovation in Underground Construction & Equipment
- **15:20-15:40**: Coffee Break

**Wednesday, May 8th**
- **8:30-10:30**: Long and Deep Tunnels: Innovation in Underground Construction & Equipment
- **11:00-13:00**: Long and Deep Tunnels: Innovation in Underground Construction & Equipment
- **14:00-15:20**: Long and Deep Tunnels: Innovation in Underground Construction & Equipment
- **15:20-15:40**: Coffee Break

**Special AAA Off-Site Event**
- **AAA Off-Site Event**: Archaelogy, Architecture and Art in Underground Construction/Strategic Use of Underground Space for Resilient Cities
  - **Monday, May 6th**: 10:00-12:40
  - **Tuesday, May 7th**: 14:45-17:30
Enabling underground transport construction in Guatemala City, Central America.

**Coffee Break**

**OPENING CEREMONY**

Opening of the Exhibition & Coffee Break

**10.30-11.00**

& **KEYNOTE LECTURE**

**11.00-13.00**

**URBAN TUNNELS IN UNDERGROUND CONSTRUCTION**

**CONVENTIONAL TUNNELLING**

General aspects

City Rail Link, New Zealand - Reduction of land acquisition

Design of artificial ground freezing for an access tunnel

Best practice of communication for a complex of an Expressway by the underground widening excavation method

Time and risk on the City Rail Link Project

The role of Cairo metro monitoring Artificial Ground Freezing TELT and the tunnel art work project

in saving the social costs of air pollution

14.00-14.20

**14.20-14.40**

Designer and P&CM during the construction phase

Brescia Driverless Metro Line - San Faustino Station: The role of Cairo metro Monitoring Artificial Ground Freezing TELT and the tunnel art work project

in saving the social costs of air pollution

14.45-15.20

**15.20-15.40**

Practical guidelines for shotcrete work close to railway track: Envision protocol and the carbon footprint

Ground freezing and excavation of the Museum Island metro station

Designing a sustainable railway infrastructure: Special design considerations for underpinning systems

Environmental reclamation for the Gotthard Base Tunnel

Effects of spoil management on landscape stability

15.40-16.00

**16.00-16.20**

Management of the muck produced by EPB TBM tunnel excavation:

The technical management of the permeation of the Follo Line project tunnels satisfy the expectations?

Environmental risk assessment of conditioned soil:

Excavation with traditional methods through geological formations containing asbestos

Online identification of the excavation materials and geological formations containing asbestos

16.20-16.40

**16.40-17.00**

Tunnel excavation material - waste or valuable mineral resource?

Brenner Base Tunnel & Isarco River Underpass Section: Practical guidelines for shotcrete work close to railway track: Envision protocol and the carbon footprint

17.00-17.20

**17.20-18.00**

ENVIRONMENT SUSTAINABILITY

GROUND IMPROVEMENT

SAFETY IN

URBAN TUNNELS

IN UNDERGROUND CONSTRUCTION

SAFETY DURING CONSTRUCTION

MANAGEMENT OF TUNNEL MUCK
### Monday, May 6th

#### 7:50-10:15

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>08.30-10.15</td>
<td>COMMITTEES REPORTS</td>
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<tr>
<td>10.15-10.45</td>
<td>OPEN SESSION 1 - ON TUNNELS A RESILIENT LINK BETWEEN PAST AND FUTURE</td>
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#### 13.00-14.00

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<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>13.00-14.00</td>
<td>SAFETY IN UNDERGROUND RISK MANAGEMENT, CONTRACTS, OPERATIONAL SAFETY OF UNDERGROUND ENGINEERING, MATERIALS FOR TRANSPORTATION IN LONG AND DEEP TUNNELS, URBAN TUNNELS, TRANSALPINE TUNNELS, THE EMERALD BOOK: A. Pigorini (Italy), G. Seingre (Switzerland)</td>
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#### 14.20-14.40

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<th>Time</th>
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<tbody>
<tr>
<td>14.20-14.40</td>
<td>INVITED LECTURE - NORTH EAST BOUNDARY TUNNEL: APPLIED LESSONS LEARNED A. Marulanda &amp; M. Neuenschwander</td>
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#### 14.40-15.00

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#### 16.40-17.00

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<tr>
<td>16.40-17.00</td>
<td>INVITED LECTURE - HOW TO REFURBISH A TUNNEL: SHOP OPEN OR CLOSED? A. Pigorini (Italy), G. Seingre (Switzerland)</td>
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#### 17.00-17.20

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<th>Time</th>
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<tr>
<td>17.00-17.20</td>
<td>RISK MANAGEMENT FOR THE BRENNER BASE TUNNEL ON BUILDINGS DURING THE LINE 6 UNDERGROUND METRO SYSTEM WORKS, NAPLES A. Di Luccio, M. Mele &amp; G. Molisso</td>
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### Palazzo Serra di Cassano

#### 11:00-11:30

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<th>Time</th>
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<tr>
<td>11:00-11:30</td>
<td>BREAKFAST AND CONTACTS ONE ON ONE WITH ITalus.</td>
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#### 11:30-12:00

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<tr>
<td>11:30-12:00</td>
<td>EXCURSION &amp; MEETING POINTS</td>
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#### 12:00-13:30

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<th>Time</th>
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<td>12:00-13:30</td>
<td>LUNCH</td>
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#### 13:30-14:00

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<tr>
<td>13:30-14:00</td>
<td>TRAVEL FROM PALLAZZO SERRA DI CASSANO TO MEETING POINTS</td>
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#### 14:00-14:30

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<td>14:00-14:30</td>
<td>COFFEE BREAK</td>
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#### 14:30-15:00

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<tr>
<td>14:30-15:00</td>
<td>TRAVEL FROM MOSTRA D’OLTMARE TO THE PALLAZZO SERRA DI CASSANO</td>
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#### 15:30-16:00

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<tr>
<td>15:30-16:00</td>
<td>INVITED LECTURE - NEW IT SYSTEMS IN ROAD TUNNELS S. Lione, L. Brino, P. Grieco, S. Fuoco, R. Zurlo, M. Moja &amp; E. M. Pizzarotti</td>
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<td>16:00-16:30</td>
<td>INVITED LECTURE - TBM SELECTION FOR TUNNELING UNDERNEATH URBANIZED AREAS AT BRENNER BASE TUNNEL, ITALIAN SIDE M. Concilia</td>
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#### 16:30-17:00

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<tr>
<td>16:30-17:00</td>
<td>INVITED LECTURE - TUNNELS DAMAGE MANAGEMENT SYSTEM: A PRACTICAL CASE: THE MACHINE SELECTION FOR THE EXCAVATION OF METRO GRAND PARIS LINE 15 SECTION 2C S. Fuoco, R. Zurlo, M. Loffredo &amp; A. Marottoli</td>
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#### 17:00-17:30

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<tr>
<td>17:30-18:00</td>
<td>INVITED LECTURE - INNOVATIVE METHODS FOR THE CONSTRUCTION OF THE CENERI BASE TUNNEL AND SIMILAR PROJECTS M. Neuenschwander &amp; R. Zurlo</td>
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</table>
### Coffee Break

Genoa underground: solidity, usefulness and beauty of the Grazie Bassa Tunnel during 100 year service life

**Lunch**

**BOURBON TUNNEL VISIT**

**Museo Metro station, Line 1, Naples**

**TUESDAY, MAY 7TH**

**PALAZZO SERRA DI CASSANO**

**MAY 8**

#### GEOLOGICAL AND GEOTECHNICAL AND ART IN UNDERGROUND LONG AND DEEP TUNNELS CONSTRUCTION

**ITACUS SPECIAL REPORT I**

#### 3D geological modelling for the design Brenner Base Tunnel, Lots Mules, 2-3 (Italy):

- **Soil Conditioning for EPB Tunnelling:** The next level up is down - working with industry the emergency stop in Trens Relevant Foam Properties and Characterisation

- **Anisotropic convergence of tunnels in squeezing ground:** Risk Maps for Cutter Tool Wear Assessment

- **Experimental setup for studying tunnels for clogging and flow assessment**

#### EPB excavation of cohesive mixed soils: combined methodology to overcome the congestion in the Genoa area.

**Geotechnical data standardization and management to support BIM**

**Metro Thessaloniki - Intersecting microtunnels to support in Complex Site Conditions**

#### INNOVATION IN UNDERGROUND ARCHAEOLGY, ARCHITECTURE, ENGINEERING, MATERIALS AND EQUIPMENT AND ART IN UNDERGROUND EPB TUNNELLING AND BACKFILLING FOR PROJECT IMPLEMENTATION

**ITACUS SPECIAL REPORT II**

#### Contribution of continuous geophysical measurements to the success of tunnelling

**Soil improvement in tunnel face using foam**

**Soil abrasion and penetration test for the evaluation of soft ground TBMs’ excavation performance and cutter life**

**Discussion of Project Final**

#### The geological and engineering challenges.

**Relevant Foam Properties and Characterisation**

**Soil Conditioning for EPB Tunnelling:** The next level up is down - working with industry the emergency stop in Trens Relevant Foam Properties and Characterisation

**Anisotropic convergence of tunnels in squeezing ground:** Risk Maps for Cutter Tool Wear Assessment

#### Contextuality of Project Final

**EPB excavation of cohesive mixed soils: combined methodology to overcome the congestion in the Genoa area.**

**Geotechnical data standardization and management to support BIM**

**Metro Thessaloniki - Intersecting microtunnels to support in Complex Site Conditions**

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**Geotechnical data standardization and management to support BIM**

**Metro Thessaloniki - Intersecting microtunnels to support in Complex Site Conditions**
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<tr>
<td>09:00-10:30</td>
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<td>10:30-12:00</td>
<td>Strategic Use of Underground Space for Resilient Cities</td>
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**Session 1**

- **Morning Session**
  - **Keynote Lecture**
  - **Strategic Use of Underground Space for Resilient Cities**

**Session 2**

- **Technical Sessions**

**Session 3**

- **Technical Sessions**

**Coffee Break**

- **Technical Sessions**

**Closing Ceremony**

- **Technical Sessions**

**Keynote Lecture**

- "Underground Urbanization: Bridging AAA and Contemporary Development" by S. Vospern

**Strategic Use of Underground Space for Resilient Cities**

- "Shaping the future of underground cities" by A. A. Kreutzfels, G. W. Hoffmann

**Technical Sessions**

- "Strategic Use of Underground Space for Resilient Cities" by A. A. Kreutzfels, G. W. Hoffmann
- "Building Better, Building Green: Towards a Sustainable Urban Future" by J. Rostami, C. Dreyer, R. Duhme & B. Khorshidi
- "The Future of Underground Cities" by B. Grote, B. Lobbezoo, L. Prompers & D. Florie

**AAA & ITACUS Session**

- "Archaeology, Architecture and Art in Underground Construction/Strategic Use of Underground Space for Resilient Cities" by A. A. Kreutzfels, G. W. Hoffmann
Urban underground spaces are important for their history and archeology. Naples has an extremely well preserved underground city worthwhile to visit for anyone interested in the field of contemporary urban design/arts/architecture/planning and underground space use. In 2015, ITACUS commissioned a compilation of case studies from ISOCARP “Think Deep: Planning, development and use of underground spaces in cities”, illustrating how urban planners perceive underground space. One case study observed: “Naples urban area, (…) has a huge heritage of underground spaces both artificial and natural, (…), which constitute a “parallel city” laid down beneath the bustling streets of the ancient city.”

During the congress, 4 AAA off-site events are scheduled that include descending into the underground parallel city for a 1-hour tour. Each event is preceded a keynote and two lectures on archeology/architecture/art and its relationship to contemporary urban underground space use. Keynote speakers include renowned architect Dominique Perrault and architect Elizabeth Reynolds, one of the authors of the ITACUS/ISOCARP study.

Let yourself be inspired by this unique program and a descent into the parallel city!
Bourbon Tunnel and Palazzo Serra di Cassano

In conjunction with

On a first come first served basis (max 110 persons per session).

The AAA Off-site Event will offer a unique underground spaces experience. The event is organized in conjunction with ITACUS and includes presentations from world-renowned architects and paper presentations on the theme of archaeology, architecture and art in underground construction. After the presentations a tour of the Bourbon Tunnel will be provided. Guests will jump into the past, through the steep stairs caved in the tuff rock that link the basement of the Serra di Cassano Palace to the Bourbon Tunnel, accompanied by the narration of local guides.

All participants will receive a special souvenir at the end of the visit.

Registration fee: € 30,00 (VAT included)

Check at the registration desk if tickets are still available and make your reservation!

May 6, 2019
afternoon ☑ 14.00-18.00 (including travel time)
The session starts at 14.45 and ends at 17.30

May 7, 2019
afternoon ☑ 14.00-18.00 (including travel time)
The session starts at 14.45 and ends at 17.30

May 8, 2019
morning ☑ 09.15-13.10 (including travel time)
The session starts at 10.00 and ends at 12.40
afternoon ☑ 14.00-18.00 (including travel time)
The session starts at 14.45 and ends at 17.30

Return transfer service is available (for more details see p. 36)
B.Zero Tondo™ Tunnel Support System

Your safety first.

B.Zero Tondo™ Tunnel Support is a patented and semi-automated system that enhances safety and offers greater structural efficiency than traditional steel-arch supports.

The system provides the following benefits:

- less exposure of workers to risks arising from hazardous conditions (workers are always in the protected area)
- more accurate, safer and simpler installation than traditional arch support systems
TECHNICAL VISITS

• ARCHAEOLOGICAL WORKING LUNCH
• TECHNICAL VISITS
PAUSILYPON
ARCHAEOLOGICAL SITE
AND SEIANO GROTTO

Attend a fascinating tour across a man-made tunnel of 770 meters that runs through the tuffaceous promontory of Posillipo hill, connecting the Phlegraean fields with the Gaiola deep valley.

Beyond the cavern, you will be guided in a path lined with typical Mediterranean vegetation and the area called Posillipo, or “place which stops all the cares” from Greek, in order to describe its spell and beauty.

Discover all the remarkable archaeological remains and enjoy the light lunch overlooking the sea with a glance at the Roman age.

Return transfer service available
(for more details see p. 36)

Registration Fee: € 70,00 (VAT included)

Check at the registration desk if tickets are still available and make your reservation!

With the kind support of

China Railway Construction Heavy Industry Co., Ltd. (CRCHI) was founded in 2007, an affiliate of a Fortune 500 company-China Railway Construction Corporation (CRCC). The company has more than 6000 employees, of which over 20% are R&D persons.

CRCHI is benefited from CRCC to share construction experiences and technique, and has become China Construction Machinery Manufacturer Top 5 Enterprise and World Construction Machinery Manufacturer Top 50 Enterprise.

By the positioning of non-standard, specialized, characterized and customized high-end equipment, CRCHI shapes three industry sections: rail track equipment represented with turnout, fastener and clip, tunnel boring machine represented with shield machine and hard rock TBM, and specialized tunneling equipment represented with drilling jumbo and multi-function vehicle.

For the future, CRCHI will continue to focus on main industries, constantly promoting intelligent upgrading of products, and push high-end equipment into the era of artificial intelligence, becoming the World leader on the overall solution of intelligent tunnel construction equipment and high-end rail track equipment.

China Railway Construction Heavy Industry Co., Ltd.
Add: No.88, Dongqi Road, National Economic & Technical Development Zone, Changsha, Hunan, China.
Website: www.crchi.com
Fax: +86-731-84071800
Tel: +86-400-8956789
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**www.zitron.com**
THE NAPLES-BARI HIGH SPEED RAILWAY LINE (NAPLES) RETE FERROVIARIA ITALIANA (RFI) COMPANY OF THE FERROVIE DELLO STATO ITALIANE GROUP

The Naples-Bari High Speed Railway line is part of the TEN-T European Network, as it constitutes a diversion within the Scandinavian-Mediterranean corridor. The project will enable the integration of the southern railway network with the existing Italian high-speed network and will provide better intermodal transport facilities. With a total length of about 180km (from Naples to Foggia) with 120km that remain to be built, the alignment has been divided in 8 stretches and either design or construction is underway in all the eight functional lots. Tunnels are foreseen in more than 50% of the total length of the line and namely in the central stretch where the alignment will underpass the Apennine mountain chain with long and deep tunnels (up to 27km long and up to 400m overburden) in difficult geotechnical conditions (squeezing ground and explosive gas are foreseen).

Recently, the first two lots closer to Naples have been awarded by RFI to main Italian Contractors and in May 2019 the jobsites will be in operation.

The participants will have the opportunity to have a complete presentation of the project - with a special focus on the Casalnuovo and the Monte Aglio tunnels - and to listen at a special speech from Zaha Hadid Architects studio London about the project of new Naples-Afragola HS Railway station, recently completed and in operation, and then visiting the station with a guided tour with Zaha Hadid studio expert.

Check at the registration desk if tickets are still available and make your reservation!

€ 70,00 (VAT included)

METRO LINES 1 & 6 IN NAPLES - A MODERN UNDERGROUND INFRASTRUCTURE BORED THROUGH THE HISTORY

The Naples Metro Lines 1 and 6 are part of an integrated metro system serving the whole city that today embodies six underground railway lines and four funiculars. For these underground lines, participants will have the chance to visit 5 job sites for the construction of line 1 & 6 underground stations (Capodichino, Centro Direzionale, Municipio, Chiaia, San Pasquale) besides tunnels construction between Capodichino and Centro Direzionale stations.

Namely, Centro Direzionale-Capodichino represents an extension of Line 1 of Naples underground from the center to the airport of Naples. The project includes the construction of two relevant stations designed by Benedetta Tagliabue and Richard Rogers as well as works in tunnel excavated by 2 TBM EPB. The Metro Line 6 works involve four new Stations and a single tube tunnel of about 3.8 km. Each station has been designed by a different Architect: H. Kollhof (Berlin) for Arco Mirelli Station, B. Podrecca (Wien) for San Pasquale Station, U. Siola (Naples) for Chiaia Station, A. Siza e E. Souto de Moura (Porto). In San Pasquale and Chiaia Stations the civil works has been completed and the architectural finishing and the installation of plants and equipments are still in progress.

Very important and extremely interesting is also Municipio Station, located close to the Port of Naples, that is the connection station between Line 1 and 6; it has been designed by Álvaro Siza and Eduardo Souto de Moura, and represents one of the largest archeological excavation in Europe. Some parts of the station are still to be completed; once completed, the archeological treasures found during its construction will be part of the station.

Check at the registration desk if tickets are still available and make your reservation!

€ 80,00 (VAT included)
METRO LINE C IN ROME:
THE ANCIENT ROME UNDERGROUND STRETCH FROM FORI IMPERIALI TO SAN GIOVANNI STATION & GUIDED TOUR OF THE COLOSSEO

Line C is the third line of the Underground in Rome, underpassing the historical and archaeological heart of the city; it is also the first fully automated metro line in the city. The T3 stretch, from San Giovanni to Fori Imperiali, is 3-km long and is still under construction. The tunnels (6.7m diameter) run 35m below the ground level, while the stations (platforms length: 120m) are located very close to the Colosseum and the Aurelian Walls (“Mura Aureliane”).
The technical visits will give access to the new San Giovanni station/museum and to the construction site of T3 stretch (Amba Aradam and Fori Imperiali stations and tunnels). After the visit all participants will have the opportunity to enjoy a guided tour of the Colosseo.
The stations and tunnels are distinctive examples of the constructive and architectural solutions implemented in a very unique archaeological and historical context, facing bad geotechnical conditions with up to six bars of hydraulic pressure at the bottom of excavations. The project has foreseen specific technologies: cut and cover, top-down modified, trench cutter, TBM EPB, ground freezing, soil injections, compensation grouting, as well as a specialized architectural design for the underground stations.

Check at the registration desk if tickets are still available and make your reservation!

€ 220,00 (VAT included)

THE BRENNER BASE TUNNEL:
THE LONGEST UNDERGROUND RAILWAY TUNNEL IN THE WORLD (BOLZANO)

The Brenner Base Tunnel (BBT), between Italy and Austria, will be the world’s longest underground rail link and is currently under construction. Once completed, it will be 55-km long between the two main portals. However, including the rail bypass of Innsbruck, to which it is directly connected, it will have a total length of 64km. The infrastructure is a crucial element in the European TEN-T network, as it constitutes the central link within the Scandinavian-Mediterranean corridor.
The Brenner Base Tunnel consists of an exploratory tunnel, two main tunnel tubes, four lateral access tunnels and three underground security areas. The project foresees the excavation of approximately 230km of tunnels, of which roughly three quarters using open or shielded TBMs and one quarter using the conventional drill and blast method. One particular challenge for the construction is the Periadriatic fault zone that separates European and African tectonic plates: with a total length of 700km, it is the longest geological fault in the Alps and is intersected by the tunnel for approximately 700m. In May 2019, underground excavations and civil works will be in full activity and the participants will experiment the visit “at its best”!

Check at the registration desk if tickets are still available and make your reservation!

One way ticket € 325,00 (VAT included)
Return ticket € 445,00 (VAT included)
The new Sandvik operator training simulator is available for the DT922i tunneling drill rig. This light, compact, portable training solution acts like a real rig with authentic controls, enabling operators to be fully operational from day one through the use of various situations and exercises. Further boosting operational performance, it can be used to reassess operators regularly without impacting on site productivity, delivering gains of up to 5% in annual productivity.

The simulator is also available for other drill rig models.

**OPERATOR TRAINING SIMULATOR**
**LEARN ANYWHERE, ANYTIME**

Visit us at booth 5 - Area 1
Explore Sandvik operator training simulator
ROCKTECHNOLOGY.SANDVIK

**MAY 6th – 9th**
Naples Italy
No.08 Outdoor Area

We build a better connected world
We make cities more livable
We create better life for people
Delivering the Support You Need

You can count on our System Solutions
Customized for your challenging tunneling projects!

Visit us at
Booth 64-65

www.dsiunderground.com
MAY 5, 2019
WELCOME RECEPTION
MOSTRA D’OLTREMARE EXEDRA FOUNTAIN
Address: Piazzale Tecchio, Mostra D’Oltremare, Naples
A spectacular show of sounds and lights and extraordinary water special effects will be performed during the Welcome Reception: the ideal pre congress atmosphere, you will never forget!

- 19.30-21.30
- Dress code: smart casual

This reception is included in the registration fee.
Transfer service from/to the congress venue (for more details see pp. 34-35)

MAY 6, 2019
WTC 2019 SPECIAL EVENT
SAN CARLO THEATRE
Address: Via San Carlo, 98, Naples
Do not miss the chance to attend an open concert in one of the most famous and prestigious Opera House in the world.

The San Carlo Theatre is the most ancient in Europe, built in 1737. An amazing scenery where to experience a typical Italian atmosphere.

- 19.30-20.45
- Dress code: Business formal

Concert on a first come first served basis (for registered delegate to the event only)
No transfer service will be provided

MAY 8, 2019
GALA DINNER
PIETRASRA RAILWAY MUSEUM
Address: Via Pietrarsa, Naples
A fascinating Gala Dinner through time among the locomotives and trains!

This is where the Italian railway history began with the first railway track from Naples to Portici, the same route that runs by the museum today. Nestling between the sea and the Volcano Vesuvius, the museum is housed in the carefully restored Bourbon factory.

Guests will be able to enjoy a journey on vintage carriages from Naples to the National Railway Museum of Pietrarsa.

Transfer service from/to the meeting points will be provided (for more details see p. 37)

Welcome Cocktail  20.00
Dinner  20.45
Dress code: Business formal

Do not miss the grand finale of the WTC 2019 and enjoy a stunning view of the Gulf of Naples!

€ 150,00 (VAT included)
Maximum capacity 750 seats
Check at the registration desk if tickets are still available and book your seat!

Offered by
salini impregilo
www.rocksoil.com
Global infrastructure needs are growing.
Complex ground conditions must be managed.
Technical demands on tunnels are increasing.

We see through complexity to create solutions.

We thrive on challenges
Arché was established by Fr Giuseppe Bettoni in 1991 in Milan, in response to the childhood HIV crisis. Today, people are facing different difficulties, and Arché has changed and evolved accordingly: it now takes care of mothers and children in situations of social distress or personal vulnerability, protecting and supporting them in their journey towards autonomy in their social condition, housing and working life. Arché has projects in Milan, Rome and San Benedetto del Tronto, Italy.

La Corte di Quarto
From social housing to homing
Archè wants to create an apartment block of 14 homes reserved for mother-and-child semi-autonomy projects in the Milan area, sharing experiences of cultural integration and social inclusion involving vulnerable families and welcoming local families.

For more information visit www.arche.it
The building owner expects timely completion of a project in high quality, also in consideration of local conditions. We provide you with system solutions that meet these demands and ensure you competent service and punctual delivery of high quality products.

You have clear demands regarding economical rock support and durable lining system, the concept of the waterproofing system and of the sustainability of products and solutions used. Sika provides quality products to meet your requirements, including those for unforeseen circumstances.
ACCOMPANYING PERSONS PROGRAM

• TOURS
ACCOMPANYING PERSONS PROGRAM
MAY 7, 2019

Enjoy the panoramic sea views of the Amalfi coast, a stunning driving route from Naples to Amalfi. Explore the colorful Positano and experience the Limoncello making process during a full-day excursion. Departure from Naples port (300 m from Municipio metro station) at h 08.15.

€ 150,00 (VAT included)

Experience La Dolce Vita of Capri island on a full-day tour departing from Naples.

CAPRI & ANACAPRI
MAY 7, 2019

Enjoy the panoramic sea views of the Amalfi coast, a stunning driving route from Naples to Amalfi. Explore the colorful Positano and experience the Limoncello making process during a full-day excursion. Departure from Naples port (300 m from Municipio metro station) at h 08.15.

Check at the registration desk if tickets are still available and make your reservation!

€ 200,00 (VAT included)

NAPLES CITY TOUR
MAY 5-6-7-8, 2019

Discover the Naples’ highlights with an expert local guide. During the tour you will admire some of the most impressive monuments of the city. The first part of the tour will take you on a comfortable coach up to Capo Posillipo to admire the entire gulf of Naples. The second part consists in a pleasant walk through the historical centre. Admire the Duomo, S. Gennaro Chapel, Spaccanapoli and the ancient Cloister of Santa Chiara where the tour ends. Departure from Naples port (300 m from Municipio metro station) at h 09.00.

Check at the registration desk if tickets are still available and make your reservation!

€ 60,00 (VAT included)

MATERA
MAY 4-5, 2019

Visit the enchanting Matera, UNESCO World Heritage Site and European Capital of Culture 2019. You will experience the authentic hospitality and typical flavors of Southern Italy. The cost of the tour includes 1 night accommodation, transfer from/to Naples on a private bus, an English speaking guide and a Welcome dinner. Departure from Naples port (300 m from Municipio metro station) at h 13.00.

Check at the registration desk if tickets are still available and make your reservation!

€ 500,00 (VAT included)

AMALFI COAST & LIMONCELLO CLASS
MAY 5, 2019

Enjoy the panoramic sea views of the Amalfi coast, a stunning driving route from Naples to Amalfi. Explore the colorful Positano and experience the Limoncello making process during a full-day excursion. Departure from Naples port (300 m from Municipio metro station) at h 08.15.

Check at the registration desk if tickets are still available and make your reservation!

€ 150,00 (VAT included)
ACCOMPANYING PERSONS PROGRAM

United. Inspired.

No matter what your challenge is
A small tunnel or a large tunnel, a hydroelectric plant or a subway line, a utility tunnel for heating pipes or for any other purpose. We are specialists in underground tunnels! And we have all the equipment you need for a complete tunneling cycle.

Come to booth no 123 and talk to us about tunnels.

POMPEII TOUR
MAY 8, 2019

Hop aboard a comfortable private bus for a fully-guided tour of the archaeological site of Pompeii. Discover this incredible archaeological site on a half-day excursion. Departure from Naples port (300 m from Municipio metro station) at h 8.30.

Check at the registration desk if tickets are still available and make your reservation!

€ 100,00 (VAT included)

CASERTA ROYAL PALACE & PARK
MAY 9, 2019

Discover the enchanting Royal Palace of Caserta and its beautiful park. Traditional lunch in a Restaurant is included. Departure from the Naples port (300 mt from Municipio metro station) at h 09.00.

Check at the registration desk if tickets are still available and make your reservation!

€ 150,00 (VAT included)
Contractors:
Acciona Infraestructuras
Ghella ANS

Follo Line, Norway

A THOUSAND TONNES OF INGENUITY

Four Double Shield TBMs running in parallel, rock strengths of up to 268 MPa, and managing potential water pressures of up to 12 bar – Follo Line is undoubtedly a technical and logistical top-class project. Smart engineering, unshakeable willpower and mutual trust between all partners are necessary to make Norway’s biggest infrastructure project a success.

herrenknecht.com/hardrock/
EXHIBITION

• EXHIBITORS LIST
• EXHIBITION TIMETABLE
• EXHIBITION MAP
# EXHIBITORS LIST

Listing as of April 10, 2019, for complete details on exhibiting companies please download the WTC2019 App

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