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
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!
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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
- CORPORATE SPONSORS
- 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
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
WITH THE PATRONAGE
Welcome to WTC 2019

PLATINUM SPONSOR

Ghella

S SILVER SPONSOR

HITACHI

Inspire the Next

MAPEI

GOLD SPONSOR

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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, lubricants
- 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
BUILD THE FUTURE, FUELLING THE PRESENT

Hitachi Rail STS
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
> PALACONCRESSI
> 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

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

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

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Saturday 04 May</td>
<td>08.00-09.00</td>
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EXHIBITION HOURS
Exhibition Hall Opening Hours:

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<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>
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</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.

The congress backpack is a quality gift for you from the Institutional Sponsor and the Platinum sponsors of the Congress.

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.
GENERAL INFORMATION

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.

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

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.

PRESS CONTACTS
Italian press and media partners:
WTC 2019 PRESS OFFICE:
PPAN
Mrs. Federica Ruggeri
federica.ruggeri@ppan.it; wtc2019@ppan.it
+39 06 87751723 | +39 388 576 2810

International press:
ITA-AITES PRESS OFFICE
Mrs. Diane Loth
d.loth@giesbert-mandin.fr
+ 33 6 47 27 74 29

Broadcast list: +39 388 5762810

SLIDE CENTER
All Speakers and Podium presenters should submit their presentation in advance to the technicians for checking the spelling and features, in order to ensure the quality of their presentation(s) including fonts, bullets, outlines, animations, etc.
The computers in the Slide Centre are configured with the same hardware and software as those in the presentation rooms. All presenters are asked to submit their final version on the day before their scheduled presentation.
An exception is made for the Offsite Sessions at Palazzo Serra di Cassano: podium presenters are allowed to submit their final version either on the day before at the Slide Centre in Palacongressi or on the same day of their scheduled presentation time at Palazzo Serra di Cassano but at least 15 minutes in advance.

Location: Palacongressi, ground floor

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 refunded.

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.

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):

MEETING POINT 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>
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<tbody>
<tr>
<td>A</td>
<td>LUNGOMARE</td>
<td>17H45</td>
<td>07H30</td>
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<td></td>
<td>Via N. Sauro</td>
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<tr>
<td>B</td>
<td>PIZZA MUNICIPIO</td>
<td>17H45</td>
<td>07H30</td>
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<td>Via Medina</td>
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<tr>
<td>C</td>
<td>METROPARK</td>
<td>17H45</td>
<td>07H30</td>
<td>07H30</td>
<td>07H30</td>
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<tr>
<td></td>
<td>Garibaldi Station</td>
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<table>
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<th>HOTELS</th>
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<th>MAY 5</th>
<th>MAY 6</th>
<th>MAY 7</th>
<th>MAY 8</th>
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<tbody>
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<td>Best Western Suites</td>
<td>Front entrance</td>
<td>18H00</td>
<td>07H45</td>
<td>07H45</td>
<td>07H45</td>
</tr>
<tr>
<td>&amp; Residence Hotel</td>
<td>of the hotel</td>
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<tr>
<td>American Hotel</td>
<td>Front entrance</td>
<td>18H05</td>
<td>07H50</td>
<td>07H50</td>
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<tr>
<td>Montespin Park Hotel</td>
<td>of the hotel</td>
<td>18H20</td>
<td>08H00</td>
<td>08H00</td>
<td>08H00</td>
</tr>
<tr>
<td>Hotel Nuvo</td>
<td>Front entrance</td>
<td>18H30</td>
<td>08H10</td>
<td>08H10</td>
<td>08H10</td>
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<td></td>
<td>of the hotel</td>
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<tr>
<td>Best Western JFK</td>
<td>Front entrance</td>
<td>18H10</td>
<td>07H45</td>
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<td>Hotel Serius</td>
<td>Front entrance</td>
<td>18H20</td>
<td>07H55</td>
<td>07H55</td>
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<tr>
<td>Hotel Cristina</td>
<td>Front entrance</td>
<td>18H30</td>
<td>08H05</td>
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<td>Palazzo Salgar</td>
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<td>Grand Hotel Parker's</td>
<td>Front entrance</td>
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CONGRESS VENUE ❯ MEETING POINT A B C

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<th>MEETING POINT</th>
<th>Pick up Location</th>
<th>MAY 5</th>
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<td>Mostra d’Oltremare/</td>
<td>21H30</td>
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<td>Piazzale Tecchio</td>
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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:

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<tr>
<th>FROM CONGRESS VENUE ➤ TO SEIANO GROTTO</th>
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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:

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<thead>
<tr>
<th>FROM CONGRESS VENUE ➤ TO BOURBON TUNNEL</th>
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<th>FROM BOURBON TUNNEL ➤ TO THE CONGRESS VENUE AND MEETING POINT</th>
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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

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<tr>
<th>Date</th>
<th>Event Location</th>
<th>Timetable and pick up Location</th>
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<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>
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Timetable and Return pick up Location

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<th>Date</th>
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<td>MAY 8</td>
<td>Railway National Museum of Pietrarsa to Meeting point</td>
<td>23H00 Hotel Esedra and hotels listed on p. 35 (return transfer by bus)</td>
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Provided by

WTC 2022 Candidates Dinner

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<tr>
<th>Date</th>
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<tr>
<td>MAY 7</td>
<td>Belvedere Carafa</td>
<td>19H30 Meeting point Hotel Esedra and hotels listed on p. 35</td>
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Timetable and Return pick up Location

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<tr>
<td>MAY 7</td>
<td>Belvedere Carafa to Meeting point</td>
<td>22H00 Hotel Esedra and hotels listed on p. 35</td>
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PLEASE NOTE: For more details on social event, please see p. 63

Technical Visits

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

BUSITALIA
GRUPPO FERROVIE DELLO STATO ITALIANE

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PRIVACY POLICY
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. Please consult this website for further details.

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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Stand 32-33
May 3-9 2019
Contact: tunnels@arcelormittal.com
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<th>MAY 2019</th>
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| AFTERNOON|      |              |            |            | ITA WG Meetings | ITA WG Meetings | ITA WG Meetings |
|         |      |              |            |            | Special AAA Off-site Event | Special AAA Off-site Event | Special AAA Off-site Event |
|         |      |              |            |            | ITA WG Meetings | ITA WG Meetings | ITA WG Meetings |
| Coffee   |      |              |            |            | Coffee Break   | Coffee Break   | Coffee Break   |
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| Lunch    |      |              |            |            | Lunch         | Lunch          | Lunch          |

| EVENING  |      |              |            |            | WTC2019 Special Event & ITA Tech Dinner | Gala Dinner | Closing Ceremony |
|          |      |              |            |            | Gala Dinner  | Gala Dinner    | Gala Dinner    |
|          |      |              |            |            | ITA General Assembly | ITA General Assembly | ITA General Assembly |
|          |      |              |            |            | ITA General Assembly | ITA General Assembly | ITA General Assembly |
|          |      |              |            |            | ITA General Assembly | ITA General Assembly | ITA General Assembly |
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|          |      |              |            |            | ITA General Assembly | ITA General Assembly | ITA General Assembly |

For more details see pp. 62-64
For more details see pp. 60-61
For more details see pp. 58-60
For more details see pp. 54-55
For more details see pp. 52-53
For more details see pp. 50-51
For more details see pp. 48-49
**PALACONGRESSI**

**FIRST FLOOR**

- Sicilia 2
- Sicilia 1
- Sardegna
- Press Area
- Slide Center

**GROUND FLOOR**

- Europa
- EGADI 2
- EGADI 3
- EGADI 1
- Stromboli
- Eolie
- Procida
- Panarea
- Capri
- Ischia

**TEATRO MEDITERRANEO**

**FIRST FLOOR**

- Auditorium
- ITALIA Room

**GROUND FLOOR**

- A - B - C - D - E - F - G - H

**ITALIA ROOM**

**EXHIBITION AREA 1**

**EXHIBITION AREA 2**

**EXHIBITION AREA 3**

**TENTS 1-4**

**MEETING ROOMS**

**PRESS AREA**

**SICILIA 2**

**SICILIA 1**

**SARDEGNA**

**CORSICA**

**ITALIA ROOM**

**TEATRO MEDITERRANEO**

**GLOBAL IDEAS AND SOLUTIONS FOR WORLDWIDE INFRASTRUCTURE PROJECTS**

**ITALIA ROOM**

**45th ITA - AITES General Assembly and World Tunnel Congress**

**Italferr**, the engineering company of Ferrovie dello Stato Italiane Group, is a leading provider of design, site supervision and project management services for infrastructure projects, on the Italian and International markets.

From planning and design to commissioning, we have the know-how - based on more than 30 years’ experience – to offer our clients the best integrated technology solutions, with a low environmental impact.
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Steel fibre tunnel applications

**3D Dramix®**
- USED IN
  - NorthConnex
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**4D Dramix®**
- USED IN
  - Expolink in Dubai
  - Folo Line Norway

**5D Dramix®**
- SUCCESSFULLY 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

Because we are tunnelling
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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.

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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.
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+39 02 3671 44 18
lomazzo@piniswiss.com

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

**17.00-17.30**

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

17.05 Speech by elected ITA President

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

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

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

17.25 Closing speech and invitation to Gala Dinner
   WTC 2019 Organizing Committee
SOLUTION FOR ALL TYPES 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

COMING SOON

**UNDERGROUND MACHINERY RANGE**

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ITA-AITES PROGRAM & ITACET TRAINING COURSES

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

The San Carlo Theatre is the most ancient in Europe, built in 1737 and wanted by King Charles of Bourbon to provide the capital of his kingdom of a great work culture: an amazing scenery where to experience a typical Italian atmosphere.

No transfer service will be provided

Dress code: Business formal

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.
• 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)
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

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ENGINEERING EXPERIENCE SINCE 1955

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.
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.

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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

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!

ITA Young Members

ym@societaitalianagallerie.it
itaaym@ita-aites.or
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 Balext 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
TECHNICAL SESSION PROGRAM

• TECHNICAL SESSIONS OVERVIEW
• DETAILED TECHNICAL SESSIONS PROGRAM
• SPECIAL AAA OFF-SITE EVENTS
### MONDAY, MAY 6th

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<tr>
<td>10.00-12.00</td>
<td>Grounding of the Exhibition &amp; Coffee Break</td>
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<td>13.00-14.00</td>
<td>Lunch</td>
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### TUESDAY, MAY 7th

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<td>Opening Ceremony &amp; Keynote Lecture</td>
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<td>12:00-13:00</td>
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### WEDNESDAY, MAY 8th

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<td>14.00-15.20</td>
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<td>15.20-17.40</td>
<td>Lunch</td>
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### SPECIAL AAA OFF-SITE EVENT

15.00-17.30 AAA & ITACUS Session: *Archaeology, Architecture and Art in Underground Construction/Strategic Use of Underground Space for Resilient Cities*
Coffee Break

BOURBON TUNNEL VISIT

Lunch

Coffee Break

OPENING CEREMONY

Enabling underground transport construction Guatemala City, Central America

OPENING CEREMONY & KEY NOTE LECTURE

10.30-11.00

13.00-14.00

PUBLIC COMMUNICATION: URBAN TUNNELS IN UNDERGROUND CONSTRUCTIONS

CONVENTIONAL TUNNELLING AND ARTIFICIAL GROUND FREEZING

D. Ludovici (Italy), L. Patrolecco (Italy)

A Record of Constructing a Ramp Section

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

14.00-14.20

N. Matsukawa, S. Ikezoe, Y. Kono, E. Pimentel & G. Anagnostou

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

14.20-14.40

M. Virano, L. Beatrice, G. Dati & G. Avataneo

Designer and P&CM during the construction phase

14.40-15.00

M. Barla, A. Insana & F. Zacco

J.A. Sopko

Design of ground freezing for cross passages

15.00-15.20

G.L. Menchini & S. Piscitelli

J. Classen, P. Hoppe & J. Seegers

N. Antonias

SAFETY IN URBAN TUNNELS IN UNDERGROUND CONSTRUCTIONS

SAFETY DURING CONSTRUCTION

B. Bitetti, F. Valdemarin, C. Leguet, M. Masci, A. Ansell

European research results on resource efficient tunnelling to blasting and vibration in hard rock

15.20-15.40

D. Ludovici (Italy), A. Barra Caracciolo (Italy)

Construction Methods, Monitoring and Follow-Up of Brenner Base Tunnel & Isarco River Underpass Section:
Practical guidelines for shotcrete work close to TBM Tunnelling Beneath an Operating Metro Station in Bucharest

15.40-16.00

G. Martire & A. Stematiu

G. Martire & A. Stematiu

Practically oriented: Excavation, shotcreting and ground freezing in Stockholm bypass: environmental sustainability in the excavation of the Lovön rock tunnels

16.00-16.20

Environmental reclamation for the Gotthard Base Tunnel

Environmental risk assessment of conditioned soil: Effects of construction and demolition of a TBM excavated tunnel inside existing diaphragm walls

16.20-16.40

M. Secondulfo & F. Cichello

M. Secondulfo & F. Cichello

B. Stille, F. Johansson, F. Ríos Bayona, Y. Sawamura, K. Konishi, K. Kishida & M. Kimura

H.A. Yazici, M.B. Okkerman & C. Budak

Environmental risk assessment of conditioned soil: Effects of construction and demolition of a TBM excavated tunnel inside existing diaphragm walls

16.40-17.00

M.A.A.P. Silva, F.L. Gonçalves, A.A. Ferreira & H.C. Rocha

P. Lanfranchi, E. Catelli & T. Bühler

Y. Sawamura, K. Konishi, K. Kishida & M. Kimura

H.A. Yazici, M.B. Okkerman & C. Budak

Environmental risk assessment of conditioned soil: Effects of construction and demolition of a TBM excavated tunnel inside existing diaphragm walls

17.00-17.20

S. Padulosi, F. Martelli, A. Sciotti, D.F. Putzu, S. Cavagnet, A. Giammarino, L. Mancinelli & C. Crémer

S. Cavagnet, A. Giammarino, L. Mancinelli & C. Crémer

J. de la Rúa, E. Pimentel, G. Martire & C. Budak

Environmental risk assessment of conditioned soil: Effects of construction and demolition of a TBM excavated tunnel inside existing diaphragm walls

17.20-17.40

M. Filippone & G. Mininni

B. Stille, F. Johansson, F. Ríos Bayona

A. Barrel & C. Salot

Environmental reclamation for the Gotthard Base Tunnel

Environmental risk assessment of conditioned soil: Effects of construction and demolition of a TBM excavated tunnel inside existing diaphragm walls

17.40-18.00
## OPEN SESSION 1 - Coffee Break

The second Gotthard tunnel tube.

**Speakers:**
- M. Pescara (Italy), J. Pascoal Jr. (Brazil)
- M. Neuenschwander (Switzerland), P. Torta (Italy)
- G. Vollmann (Germany), L. Carrarini (Italy)
- C. di Prisco (Italy), E. Taylor (Australia)

**Location:**
- Duomo Metro station, Line 1, Naples

**Date:**
- MONDAY, MAY 6TH

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## COMMITTEES REPORTS

**Time:** 08.30-10.15

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## OPEN SESSION 2 - ON TUNNELS A RESILIENT LINK

**Time:** 10.15-13.00

### 10.45-13.00

- **CONSTRUCTION & FINANCIAL ASPECTS**
- **MECHANIZED TUNNELLING**
- **TUNNEL REFURBISHMENT**

**Talks and Lectures:**
- Risk allocation in the FIDIC Forms of Contract
- Numerical back-analysis of the Fréjus road tunnel
- Refitting strategies for Italian historical railway tunnels in the Rainbow Suite & expert group meeting results
- North East Boundary Tunnel: Applied Lessons learned
- Contractual Time for Completion Adjustment in the underground structures, complex challenges and Operational safety from first responders perspectives for a cost-effective tunnel maintenance

**Time:** 14.20-15.00

### 14.40-15.00

- **SAFETY IN UNDERGROUND CONSTRUCTION**
- **INNOVATION IN UNDERGROUND TRANSPORTATION FACILITIES**
- **LONG AND DEEP TUNNELS**
- **GROUND ENGINEERING, MATERIALS AND EQUIPMENT**

**Talks and Lectures:**
- Tunnels widening and renewal using precast lining:
- The Montcenis base tunnel: how to turn project of the TBM tunnel for the Athens Metro Line 3, The role of the Engineer in the Emerald book
- The claims, dispute avoidance and dispute resolution procedure in the new FIDIC Emerald Book
- Design of the support medium for slurry pressure balance (SPB) shield tunnelling
- Embedded barriers as a mitigation measure

**Time:** 15.20-15.40

### 15.40-17.00

- **SAFETY IN UNDERGROUND CONSTRUCTION**
- **INNOVATION IN UNDERGROUND TRANSPORTATION FACILITIES**
- **LONG AND DEEP TUNNELS**
- **GROUND ENGINEERING, MATERIALS AND EQUIPMENT**

**Talks and Lectures:**
- Ventilation of tunnels and cross-passages
- Ground movement problems in EPB tunneling by the “Federica” TBM of a geological accident
- Innovative method for the construction in Saint-Martin-la-Porte construction site
- Reducing the monotonous design in the worlds deepest and longest sub-sea road tunnel: Transposition into national law of the new EU public procurement directives and the impact on subsurface construction contracts - the Portuguese case

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## OFF-SITE SESSION

**ARCHAEOLOGY, ARCHITECTURE AND ART IN UNDERGROUND CONSTRUCTION/STRATEGIC USE OF UNDERGROUND SPACE FOR RESILIENT CITIES**

**Venue:**
- PALAZZO SERRA DI CASSANO

**Time:**
- 14.45-15.20

- 16.00-16.20

- 16.20-17.30

- 17.30-18.00

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**Location:**
- Naples

**Date:**
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<th>Session</th>
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<td>09.30-09.50</td>
<td>Soil abrasion and penetration test for the evaluation of soft ground TBMs’ excavation performance and cutter life of the pilot tunnel of the Seikan Tunnel, Japan</td>
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<td>09.30-09.50</td>
<td>Geochemical and geotechnical key-factors for tunnel design of the new Naples-Bari High-Speed railway line in Southern Italy</td>
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<td>09.50-10.10</td>
<td>Investigation on the geotechnical properties of a chemically treated sandy soil in the Salamonde II underground hydroelectric complex</td>
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<td>10.10-10.30</td>
<td>Countermeasure of jammed TBM in rock tunnel excavation: Hard Rock TBM: Example of the Brenner Base Tunnel - challenges of gripper TBM application</td>
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<td>10.30-10.50</td>
<td>Adapting tunnel construction: Experimental determination and plausibility proof of the longitudinal displacement in EPB-TBM tunneling</td>
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<td>10.30-11.10</td>
<td>Keynote lecture: Dr. G. Vassilakopoulou, P. Foufas, G. Anagnostou, D. Rizos and G. Vassilakopoulou: &quot;Influence of consistency index on soil conditioning in EPB-TBM tunneling&quot;</td>
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<tr>
<td>11.10-11.30</td>
<td>SOIL CONDITIONING FOR LONG AND DEEP TUNNELS: KNOWLEDGE AND REQUIREMENTS FOR PROJECT IMPLEMENTATION</td>
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<td>11.30-12.40</td>
<td>Groundscape stories: Metro Thessaloniki - intersecting microtunnels to support Key construction technology of Long Metro Subsea Tunnel</td>
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<td>12.40-13.00</td>
<td>Tilt sliding test to assess the behaviour of conditioned soil of low porosity rocks and implications for tunnelling</td>
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<td>14:00-14:20</td>
<td>Coffee Break</td>
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<td>14:20-14:40</td>
<td><strong>Innovation in Underground Engineering, Materials and Equipment</strong></td>
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<td>14:40-14:50</td>
<td><strong>Geological and Geotechnical Knowledge and Requirements</strong></td>
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<td>14:50-15:10</td>
<td><strong>Panel Session</strong></td>
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<td>16:40-17:00</td>
<td><strong>Panel Discussion</strong></td>
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**Panel Session**

Panelists: A. Moro (Italy), A. Grillo (Italy), A. Moro (Italy), A. Micheli (Italy), A. Andreacchio (Italy), S. Pelizza (Italy)

**Panel Discussion**

Moderators: L. Cedrone (Italy), A. Andreacchio (Italy), S. Pelizza (Italy)
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 architects 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!
"A passion for design, innovation, quality and service"

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 and 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)
**TECHNICAL VISITS**

**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”!

**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 Colosseum.

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!*

- **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.

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

OPERATOR TRAINING SIMULATOR
LEARN ANYWHERE, ANYTIME

We build a better connected world
We make cities more livable
We create better life for people

MAY 6th – 9th
Naples Italy
No.08 Outdoor Area
Delivering the Support You Need

Reliable Ground Support

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

Visit us at
Booth 64-65

www.dsiunderground.com
SOCIAL EVENTS

• SOCIAL HIGHLIGHTS
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!

ço 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.

ço 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
PIETRARSA 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 ço 20.00
Dinner ço 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!
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*
Arché 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](http://www.arche.it)
WHEN PARTNERSHIP AND PERFORMANCE GO HAND IN HAND
THAT’S BUILDING TRUST

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
**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)**

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**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)**

---

**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)**

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**CAPRI & ANACAPRI**  
**MAY 7, 2019**

Experience La Dolce Vita of Capri island on a full-day tour departing from Naples. 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)**
All you need for a complete tunneling cycle!

United. Inspired.

**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)

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**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)

---

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.
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
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