

VDI

## International VDI Conference 2018

# Tunnel Construction

Meet & Greet  
with Conference  
Chair Dr. Martin  
Herrenknecht

December 4-5, 2018, Amsterdam, The Netherlands

- Building Information Modeling - How to plan international Tunnel Projects
- Tunnel Construction under Challenging Conditions - Inncity Projects
- New Technologies and Innovations on the Tunnel Construction Site
- New & Rare Excavation Techniques
- Tunnel Maintenance & Safety

+ Interactive Sessions

+ Workshops

+ Parallel Conference: Smart Construction Equipment

Meet international Experts from:



An event organized by VDI Wissensforum GmbH  
[www.vdi-international.com/07K0901018](http://www.vdi-international.com/07K0901018)



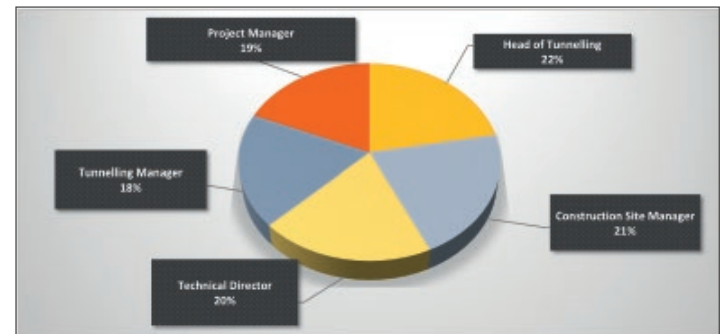


## About us



The Association of German Engineers (VDI) is one of the largest technical-scientific associations in Europe. Throughout the years, the VDI has successfully expanded its activities nationally and internationally to foster and impart knowledge about technology-related issues. As a financially independent, politically unaffiliated and non-profit organization the VDI is recognized as the key representative of engineers both within the profession and in public.

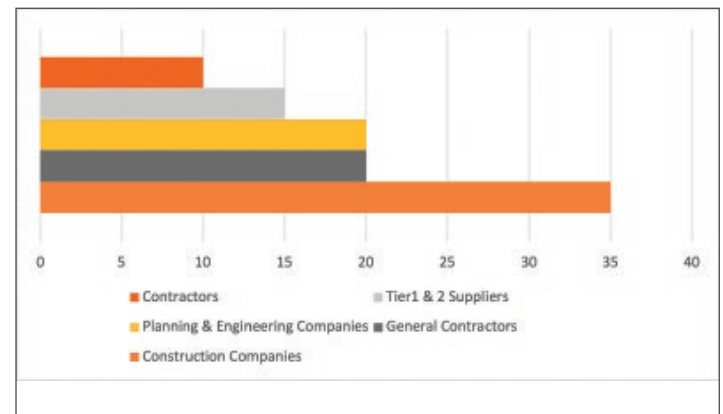
## Expected Participants according to Functions



## Reasons to attend

- Meet** international experts from the tunnelling industry
- Discuss** the latest innovations on the tunnel construction site
- Hear** about international tunnel projects from a 'lessons learned' perspective
- Learn** about the challenges the international tunnelling industry is facing
- Benefit** from our interactive World Cafés & the parallel conference on Smart Construction Equipment
- Network** with your peers during the breaks and the evening reception
- Prepare** for the Digital Transformation on the tunnel construction site

## Expected Participants according to Industries



08:30 Registration & welcome coffee

### 10:00 Chair's welcome & opening address

Conference chair: **Dr.-Ing. E.H. Martin Herrenknecht**, Chairman of the Board of Management, Herrenknecht AG, Germany

## I. Planning a Tunnel Project

### 10:15 The Amsterdam Metro - Planning and Building the new North/South Line

- The importance of communication
- Integrating and implementing the planned system
- How do the surroundings react to the construction work? – Lessons learned

**Dr. Hoite Detmar**, Managing Director Project North/South Line, Metro & Tram Amsterdam, The Netherlands

### 10:45 BIM for Hard Rock Tunnelling – A Practical Example from Scandinavia

- Geotechnical Data Delivery – the BIM approach
- Design of the new Stockholm Metro Yellow Line
- Lessons learned when integrating data into 3D models

**Miriam Cegrell**, Project Manager, WSP, Sweden

### 11:15 Planning and Construction of Abu Dhabi Deep Gravity Sewerage System (STEP) – A Case Study

- Operational Challenges – 2005 onwards
- Optioneering and Master Planning
- Tender strategy and awards
- Construction Management & Lessons learned

**Alan Thomson**, Former Managing Director of ADSSC, United Arab Emirates

## II. Innovation & Digitalisation on the Tunnel Construction Site

### 11:45 State & Future of Tunnel Monitoring and Tunnel Data Management

- Tunnel information systems and Building Information Modelling
- Tunnel monitoring by drones and robots
- VR/MR/AR tunnel applications

**Dr. Klaus Chmelina**, Area Manager R&D, Geodata Ziviltechnikergesellschaft m.b.H., Austria

12:15  Lunch

### 13:45 Data Management in TBM Tunnelling - From Table Lists to Big Data

- SWOT analysis of Big Data in tunnelling
- Economic data captured from various data sources
- Co-operations with other software systems like BIM
- Example of Analysis

**Frank Stahl**, Technical Director Tunnelsoft, Babendererde Engineers, Germany

### 14:15 The Crossrail Project – Innovation & Technology used in a Tunnel Environment

- The use of AR to help the engineering function during the construction of the Crossrail Liverpool Street Project
- Constructing the platforms underground using DfMA (Design for Manufacturing and Assembly)
- Using AR to help the engineering function during construction
- Working with AUV technologies underground for scanning and process reporting

**Ravitheran Kugananthan**, Project Engineer, Laing O'Rourke, UK

### 14:45 World Cafés

World Cafés

### Logistic Management of deep Tunnels with long and multiple Drives

**Michele Janutolo Barlet**, PHD., Project Manager, BG Ingénieurs Conseils, France  
**CDE and BIM in tunnel construction** **Jules van der Weide**, Managing Director, think project! BeNeLux, The Netherlands

16:15  Networking & coffee break

### 16:45 A new Generation of Fiber - Innovative FRC Design based on Model Code 2010 for Underground Application

- Fibre reinforced concrete – Innovative design (inner lining, shaft, CIP)
- Precast tunnel segments – Higher impact resistance and durability advantages
- Cracking control during construction phases

**Benoit De Rivaz**, CivEng, Global Technical Manager, Bekaert Maccaferri Underground Solution, Belgium

## III. Tunnelling Methods

### 17:15 Mechanized Cross-Passages under High Pressure – the Tuen Mun Chek Lap Kok Experience

- Design concept and site implementation
- Using mechanized excavation on cross-passages in soft ground
- The challenge of high water pressure

**Thibaut Lockhart**, M.Sc., M.Eng., Engineering Manager, Bouygues Travaux Publics, France; co-authors: Estelle Cagnat, M.Eng, Methods Manager of TMCLK project, Morgan Oleron, M.Eng, Construction Manager (CPs of TMCLK project), both: Dragages HK, China

17:45 Summary of the first conference day



### Get Together in the name of Saint Barbara

At the end of the first conference day we kindly invite you to use the relaxed and informal atmosphere for in-depth conversations with other participants and speakers.

### III. Tunnelling Methods

#### 09:00 New Developments of TBM : Variable Density

- History of multi-modes TBM
- Evolution and main principles of Variable Density TBM
- Project references and lessons learned

**Frédéric Battistoni**, Mechanical Engineer, Project Manager, Herrenknecht AG, Germany

#### 09:30 The Follo Line - Different Excavations Methods for one Project

- Consideration of geological conditions and decision-making for the excavation methods for the different parts of the 20km tunnel
- Experiences with excavation by Drill and Split in the northern part of the tunnel
- Lessons Learned from operating four TBMs from one single access point
- Interface with other sensitive infrastructure and tailor-made machines for hard-rock excavation

**Anne Kathrine Kalager**, Project Manager Follo Line, Bane Nor, Norway

#### 10:00 Microtunnelling - Status & Outreach of Technology

- Current status of technology and achievements
- Comparison with other methods
- Lessons Learned; working and drilling under a riverbed and launching seal replacements under water

**Juan Hoyo Rodriguez**, Microtunnelling Construction Manager, BESSAC, France

10:30 ☕ Networking & Coffee break

### IV. Inner-City Projects & Urban Tunnelling

#### 11:00 The Role of Monitoring and Modelling to control the EPB Operation in Settlement Sensitive Areas

- Analytical and numerical tools for settlement prediction
- Calibration procedures of the models
- TBM operational factors
- Building structural factors & case histories

**Davor Simic**, Ph.D. Civil Engineer, Head of Geotechnical Area, Ferrovial- Agroman, Spain

#### 11:30 Metro Doha Green Line - Experiences from Execution of a large Urban Tunnelling Project under Challenging Conditions

- Design and build contract
- Large scale urban tunneling
- Logistics for serving 6 TBM's at the same time

**Dipl. Ing. Hans Köhler**, Director of Tunneling Department, PORR Bau GmbH, Austria

#### 12:00 Project Eiganes - Building a Highway Junction under the City of Stavanger/Norway

- Tackling the challenges of excavation
- Noise and vibration control
- Drill and Blast near existing structures

**Dipl.-Ing. Jens Classen**, Managing Director, Implenia Construction GmbH, Germany

12:30 🍴 Lunch

#### 13:30 Brussels Metro North: Design and Technical Challenges

- An overview of Brussels Metro North Project
- Design concept: comparison of different tunneling layouts
- Technical challenges: TBM recommendation, settlement analysis & interfaces tunnel/station

**Dipl. Ing. Jordi Illa**, Project Manager, Amberg Engineering, Switzerland, co-authors: Dipl. Ing. EPFL Laurence Delplace, Deputy Program Manager Brussels Metro North, Amberg Engineering AG, Switzerland and Dipl. Ing. Catherine Fabry, Project Manager, Sweco, Belgium

### V. Safety and Tunnel Maintenance

#### 14:00 Compliance with actual Safety Regulations - a Heavy Task for Retrofitting and Maintaining Tunnels

- Situation of the building stock in Europe
- Safety regulations and compliance
- Concepts and measures for retrofitting

**Dr.-Ing. Goetz Vollmann**, Assistant Professor, Institute for Tunneling and Construction Management, Ruhr University Bochum, Germany

#### 14:30 Emergency Planning & Management for Road Tunnels

- The importance of tunnel safety
- The emergency response plan as a key to collaboration
- Being a partner in incident command - The tunnel operator

**Han Admiraal**, CivEng, Managing Director, Enprodes Management Consultancy BV, the Netherlands

15:00 Conference chair's closing remarks

15:15 End of conference

# Integrated Road Tunnel Safety Management

---

**Han Admiraal, Managing Director, Construction & Development, Enprodes Management Consultancy BV, The Netherlands**

Workshop Chair: Han Admiraal, Managing Director, Construction & Development, Enprodes Management Consultancy BV, The Netherlands

---

## Date and Venue:

December 03, 2018

Radisson Blu Hotel Amsterdam Airport

Time: 10:00 - 16:00

---

## CONTENT

This workshop will look at and explore the need for an integrated approach to road tunnel safety based on the EU Directive. Road tunnel safety goes further than installing the right equipment in a tunnel. It requires an integrated approach in that it needs to be part of the organizational culture. It also requires working together with third parties, namely the emergency and rescue services. In order to do so there must be knowledge and appreciation about how these services operate. In the workshop all aspects of an integrated approach will be discussed. This starts with the basic concept and how to demonstrate the road tunnel safety case throughout the tunnel's lifetime. Standards and guidelines will be discussed, and we will ask how to approach non-generic cases. Ensuring that procedures and operating system work together will be discussed, as will the testing during commissioning of the tunnel. Emergency management and response and how to prepare for this is an essential part of the integrated approach. We will look at what this means and practice with the scenario analysis as a common ground approach. The workshop is of interest to anyone who has to deal with road tunnel safety in an official capacity. Whether working for a tunnel operating authority, administrative authority or the emergency and rescue services.

## Agenda

- Organising for Road Tunnel Safety
- Standards and Guidelines
- Operational Control and Testing
- Emergency Response in Road Tunnels
- Hands-on: Scenario analysis
- Summary: Keep your tunnel safe

# The Autonomous Construction Site of the Future

---

**Prof. Dr. Karsten Berns, Computer Science Department, TU Kaiserslautern, Germany**

Workshop Chair: Prof. Dr. Karsten Berns, Computer Science Department, TU Kaiserslautern, Germany

---

## Date and Venue:

December 06, 2018

Radisson Blu Hotel Amsterdam Airport

Time: 10:00 - 16:00

---

## CONTENT

This workshop provides an overview on smart construction equipment and the autonomous construction site of the future. It will be shown, what prototype systems exists and due to real applications, what their drawbacks are. Based on best practice examples from areas like autonomous construction machines, inspection systems for construction and autonomous production a better understanding of the state of research and development will be given. The main part of the workshop consists of breakout sessions in which important topics like perception and scene understanding, safety of smart construction machines as well as control and interaction concepts will be elaborated. Participants should actively contribute during the breakouts. Based on cases studies of their development projects, different problem areas should be discussed in detail. All breakouts are started by a short presentation followed by an intensive discussions of the participants.

The workshop will end with a summary of the main findings and outlook into the future.

## Introduction

- Overview of smart construction equipment
- Autonomous construction machines
- Inspection systems for construction
- Autonomous production

## Breakout Sessions – Planned topics include:

- Perception and scene understanding
- Safety of smart construction machines
- Control and interaction

## Discussion and conclusion

- Main findings of the workshop day
- Outlook into the future

Parallel 2nd International VDI Conference 2018

## Smart Construction Equipment

---

December 4-5, 2018

Amsterdam, The Netherlands

The construction site is getting smarter and this leads to new challenges for all parties involved. The 2nd VDI Smart Construction Equipment conference will discuss these challenges to the construction industry in the face of increasing digitalization, automation, the rise of big data and other current technological developments. In a series of informative discussions, presentations and networking sessions, you'll have the opportunity to engage with international experts in the field. Get an overview of the potential changes in the market and see how you can position yourself and your company to take advantage of these changes in the best possible way.

**Renowned speakers will present their results on the following topics:**

- The Future of Digital Construction
- What is new: Telematics, Communication & Data Management
- On-Site Safety of Smart Construction Sites
- Off-Site Construction & 3D Printing
- Automation of the Construction Site
- Visualisation & Drones in Construction
- 

<https://www.vdi-international.com/01K09016018>



## Exhibition / Sponsoring

If you want to meet with and reach out to the first-rate experts attending this VDI conference and to powerfully present your products and services to the well-informed community of conference participants, please contact:

### Lukas Floherschütz

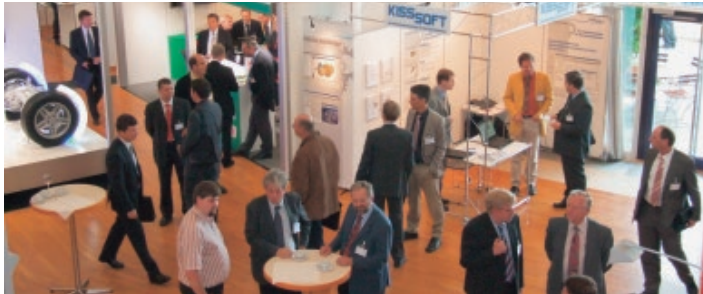
Project Consultant

Exhibitions & Sponsoring

Phone: +49 211 6214-916

Fax: +49 211 6214-97916

Email: floherschuetz@vdi.de



## Become a speaker

Become a speaker at our international VDI Construction & Off-Highway Conferences. Make yourself known in the industry and discuss best practice examples with other international experts. We are looking for speakers on: BIM, Connected Off-Highway Machines as well as Bridge Construction.

Please submit your topic to:

Maria Baumeister

Product Manager

International Business

Phone: +49 211 6214 - 284

Email: Baumeister@vdi.de

## Terms and Conditions

**Registrations:** Registrations for conference attendance must be made in writing. Confirmation of your registration and the associated invoice will be mailed to you. Please do not pay your conference attendance fee until you have received our invoice and its invoice number to be stated for transfer. Dutch VAT directives apply. Please state your VAT-ID with your registration.

### Conference venue

Radisson Blu Hotel Amsterdam Airport

Boeing Avenue 2

1119PB Schiphol-Rijk, The Netherlands

Phone: +31 20 655 3131

Email: Reservations.Amsterdam.Airport@Radissonblu.com



You will find more hotels

close to the venue at

[www.vdi-wissensforum.de/hrs](http://www.vdi-wissensforum.de/hrs)

**Hotel room reservation:** A limited number of rooms has been reserved for the benefit of the conference participants at the Radisson Blu Hotel Amsterdam Airport. Please refer to "VDI Conference". For more hotels: [www.vdi-wissensforum.de/hrs](http://www.vdi-wissensforum.de/hrs)

**VDI Wissensforum service package:** The conference package includes the conference documents (online), beverages during breaks, lunch and the get-together on December 4, 2018.

**Conference attendance conditions and terms:** By way of your registration you accept the conference attendance conditions and terms of VDI Wissensforum GmbH as binding. Any cancellation of your registration must be made in writing. We will charge you only an administrative fee of € 50.00 plus Dutch VAT if you cancel your registration earlier than 14 days ahead of the conference date.

Any cancellation that reaches us after this deadline will entail the conference attendance fee as stated in our invoice to be charged in full. The date of the post office stamp of your written cancellation will be the decisive criterion. In that case, we will gladly mail you the conference documents on request. Subject to agreement, you may name a substitute participant. Individual parts and sections of conferences and seminars cannot be booked. You will be informed without delay if an event has to be cancelled for unforeseeable reasons. In that instance, you will be entitled only to a refund of your conference attendance fee if already paid. We reserve the right to exchange speakers and/or change the program sequence in exceptional cases. In any case, the liability of VDI Wissensforum GmbH is restricted exclusively to the conference attendance fee.

**Data protection:** VDI Wissensforum GmbH captures and processes the address data of conference participants for their own corporate advertising purposes, enabling renowned companies and institutes to reach out to participants by way of information and offers within their own marketing activities. We have outsourced in part the technical implementation of data processing to external service providers. If you do not want to receive any information and offers in the future, you may contradict the use of your personal data by us or any third parties for advertising purposes. In that case, kindly notify us of your contradiction by using the email [wissensforum@vdi.de](mailto:wissensforum@vdi.de) or any other of the contact options mentioned.

# Registration

International VDI Conference 2018

# Tunnel Construction



**Register online!**

[www.vdi-international.com/07K0901018](http://www.vdi-international.com/07K0901018)



VDI Wissensforum GmbH  
P.O. Box 10 11 39  
40002 Düsseldorf, Germany  
Phone: +49 211 6214-201  
Fax: +49 211 6214-154  
Email: [wissensforum@vdi.de](mailto:wissensforum@vdi.de)  
[www.vdi-international.com/07K0901018](http://www.vdi-international.com/07K0901018)

VDI Wissensforum GmbH | VDI-Platz 1 | 40468 Düsseldorf | Germany

Participants  
are eligible to  
attend the parallel  
conference free of  
extra charge

Yes, I will participate as follows:

**Participation Fee + VAT**

**VDI Conference 04.-05.12.2018**  
(07K0901018) € 1690

and/or

**Workshop 03.12.2018**  
(075T901001) € 950

and/or

**Workshop 06.12.2018**  
(015T928001) € 950

and/or

**Package Price** (Please tick the boxes)  
 (Conference + 1 Workshop) € 2370

I am interested in sponsoring and/or exhibition

Participation Fee VDI-Members\* Save 50 € for each Conference Day.

\* For the price category 2, please state your VDI membership number

VDI membership no. Title

First Name

Last Name (Family Name)

Company/Institute VAT-ID

Department

Street

ZIP Code, City, Country

Phone Fax

Email

Please state your invoice address if this differs from the address given

**Participants with an invoice address outside of Austria, Germany and Switzerland are kindly requested to pay by credit card:**

Visa  Mastercard  American Express

Card holder

Cardno.

Valid until (MM/YYYY)

Security Code

Date × Your Signature