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Shotcrete for Underground Support XIV

Proceedings

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11-17-2019

### Conference Program

Dr.-Ing. Matthias Beisler

Preedee Ngamsantikul

Dr.-Ing. Dr. h. c. Herbert Klapperich

Prof. Tarcisio Celestino

Chuchai Sujivorakul

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## *Program*

# Shotcrete for Underground Support XIV

November 17-20, 2019  
Thailand,  
Nong Nouch Garden, Pattaya

### Conference Chair

**Dr.-Ing. Matthias Beisler**  
ILF Consulting Engineers (Asia) Ltd.  
Bangkok

### Conference Co-Chairs

**Mr. Preedee Ngamsantikul**  
Thailand Underground and Tunnelling  
Group  
Bangkok

**Prof. em. Dr.-Ing. Dr. h. c. Herbert  
Klapperich**  
TU Freiberg  
Germany

**Honorary Chair**  
**Prof. Tarcisio Celestino**  
ITA president

**Guest of Honour**  
**Prof. Chuchai Sujivorakul**  
King Mongkut's Institute of Technology  
Thonburi, Thailand



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**Sattahip, Pattaya, 20250**  
**Thailand**  
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**Previous conferences in this series**

***Use of Shotcrete for Underground Structural Support***

**July 15-20, 1973**

**South Berwick, Maine**

*Conference Chair:*

J. R. Graham, Bureau of Reclamation

***Shotcrete For Underground Support II***

**October 3-8, 1977**

**Easton, Maryland**

*Conference Chair:*

J. A. Veltrop, Harza Engineering Co.

***Shotcrete For Underground Support III***

**April 16-21, 1978**

**St. Anton, Austria**

*Conference Chair:*

L.F. Piatnik, Walco Chemical Corporation

***Shotcrete For Underground Support IV***

**September 5-11, 1982**

**Paipa, Colombia**

*Conference Chairs:*

Elwyn King, P.B, Q+D

Alberto Murlando, Ingetec

***Shotcrete For Underground Support V***

**June 3-7, 1990**

**Uppsala, Sweden**

*Conference Chairs:*

John Sharp, Geo-Engineering

Elwyn King, Parsons Brinckerhoff

Tomas Franzen, Swedish Rock Research Foundation

***Shotcrete For Underground Support VI***

**May 2-6, 1993**

**Niagara-on-the-Lake, Ontario**

*Conference Chairs:*

D.F. Wood, University of Toronto

D. Morgan, Hardy BBT

***Shotcrete For Underground Support VII***

**June 11-15, 1995**

**Seefeld, Austria**

*Conference Chairs:*

H. Klapperich, DMT

R. Poettler, Kling

J. Willocq, Lafarge International

**Previous conferences in this series**

**Shotcrete For Underground Support VIII**

**April 11-15, 1999**

**Sao Paulo, Brazil**

*Conference Chairs:*

Tarcisio B. Celestino, Thermag & University of Sao Paulo, Brazil

Harvey Parker, Harvey Parker and Associates

**Shotcrete For Underground Support IX**

**November 17-21, 2002**

**Shonan Village, Japan**

*Conference Chairs:*

Koichi Ono, University of Kyoto

Rusty Morgan, AGRA Earth & Environment

**Shotcrete For Underground Support X**

**September 12-16, 2006**

**Whistler, B.C., Canada**

*Conference Chairs:*

Rusty Morgan, AMEC Earth & Environmental

Harvey Parker, Harvey Parker & Associates, Inc.

**Shotcrete For Underground Support XI**

**June 7-10, 2009**

**Davos-Platz, Switzerland**

*Conference Chairs:*

Felix Amberg, Amberg Group, Swiss Tunnelling Society

Knut F. Garshol, BASF Construction Chemicals, LLF

**Shotcrete For Underground Support XII**

**October 11-13, 2015**

**Singapore**

*Conference Chair:*

Ming Lu, Nanyang Technological University

**Shotcrete For Underground Support XIII**

**September 3 - 6, 2017**

**Irsee, Germany**

*Conference Chairs:*

Dietmar Mähner, FH Münster, Germany

Matthias Beisler, ILF Consulting Engineers, Thailand

Frank Heimbecher, FH Münster, Germany

# Sunday, November 17, 2019

12:00 – 15:00 Arrival of international delegates at Nong Nouch Garden and hotel check-in

15:00 - 15:30 Gathering at meeting point

15:30 - 16:00 Introduction to Nong Nouch Garden and walk to Theater area

16:00 – 16:30 Thai Cultural Performances at Nong Nooch Theater



16:30 – 17:00 Nong Nooch Elephant Show



17:00 - 18:30 Walk to conference area

18:30 – 19:00 Conference Check-in

19:00 – 21:30 Opening Reception, dinner, social gathering

Welcome Speeches

- **ECI Liaison**  
Herbert Klapperich  
*Prof. em. Geotechnic, TU Bergak. Freiberg, Germany*
- **Conference Chair**  
Dr. Matthias Beisler  
Managing Director ILF Consulting Engineers (Asia) Ltd.

### **Notes**

- Keynote speeches and technical presentations on Monday and Tuesday will be held at the conference center of Nong Nooch Tropical Garden
- Audiotaping, videotaping and photography of presentations are prohibited.
- The order of the keynote speeches and technical presentations may change upon the discretion of the organising committee.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
- Be sure to make any corrections to your name/contact information on the Master Participant List or confirm that the listing is correct. A corrected copy will be sent to all participants after the conference.



# Monday, November 18, 2019

<b>07:30 - 09:00</b>	<b>Breakfast (Restaurant Nong Nouch Garden)</b>
<b>08:00 – 09:00</b>	<b>Registration</b>
<b>09:00 – 09:45</b>	<b>Welcome Speeches</b>
09:00 – 09:15	<ul style="list-style-type: none"><li>▪ <b>ECI Liaison</b> <b>Herbert Klapperich</b> Prof. em. Geotechnic, TU Bergak. Freiberg, Germany</li></ul>
09:15 – 09:30	<ul style="list-style-type: none"><li>▪ <b>Honorary Conference Chair</b> <b>Prof. Tarcisio Celestino</b> Professor at the University of São Paulo, previous President of the International Tunnelling and Underground Space Association (ITA) and President of the Brazilian Tunnelling Committee</li></ul>
09:30 - 09:45	<ul style="list-style-type: none"><li>▪ <b>Guest of Honour</b> <b>Prof. Chuchai Sujivorakul</b> King Mongkut's Institute of Technology Thonburi, Thailand</li></ul>
<b>09:45 – 10:15</b>	<b>Thai Cultural Show</b>
<b>10:15 – 10:45</b>	<b>Coffee break</b>
<b>10:45 – 12:45</b>	<b>Keynote Speakers</b>
10:45 – 11:15	<ul style="list-style-type: none"><li>▪ <b>Keynote Speaker 01:</b> <b>Mr. Preedee Ngamsantikul, Dr.Auttakit Asanprakit</b> Introduction of Thailand Underground &amp; Tunnelling Group (TUTG), experiences and challenges in underground engineering in SE Asia</li></ul>
11:15 – 11:45	<ul style="list-style-type: none"><li>▪ <b>Keynote Speaker 02:</b> <b>Prof. Marc Jolin, Laval University, Canada</b> Evaluating the cracking potential of shotcrete</li></ul>
11:45 – 12:15	<ul style="list-style-type: none"><li>▪ <b>Keynote Speaker 03:</b> <b>Mr. Gottfried Braun, ILF Consulting Engineers Austria GmbH</b> Optimized shotcrete design for irregular tunnel excavation</li></ul>
12:15 - 12:45	Questions & Answers
<b>12:45 – 14:00</b>	<b>Lunch (Restaurant Nong Nouch Garden)</b>
<b>14:00 - 16:00</b>	<b>Technical Session</b>
14:00 – 14:30	<ul style="list-style-type: none"><li>▪ <b>Technical Presentation 04:</b> <b>Mr. Martin Eberli, Bekaert Maccaferri Underground Solution</b> Steelfibre for High performance shotcrete, the way to more cost efficiency</li></ul>
14:30 – 15:00	<ul style="list-style-type: none"><li>▪ <b>Technical Presentation 05:</b> <b>Mr. Philippe Doriot, SIKA</b> Waterproofing Solutions for Tunnels (traditional excavation)</li></ul>
15:00 – 15:30	<ul style="list-style-type: none"><li>▪ <b>Technical Presentation 06:</b> <b>Prof. Dr. Junsheng Yang, School of Civil Engineering, Central South Univ., China</b> Design optimization and application of bolt-shotcrete support for East Tianshan tunnel project in China</li></ul>

15:30 – 16:00	Questions & Answers
<b>16:00 – 16:30</b>	<b>Coffee break</b>
<b>16:30 – 18:00</b>	<b>Technical Session</b>
16:30 – 17:00	<ul style="list-style-type: none"> <li>▪ <b>Technical Presentation 07:</b> <b>Mr. Klaus Bonin, Wacker Chemie AG</b> Performance Improvement of Shotcrete by Polymer Binder Modification</li> </ul>
17:00 – 17:30	<ul style="list-style-type: none"> <li>▪ <b>Technical Presentation 08:</b> <b>Mr. Des Vlietstra, BarChip Inc., Japan</b> Meaningful testing of fibre reinforced shotcrete for lining designs</li> </ul>
17:30 – 18:00	Questions & Answers, closing of technical seminars day 1
<b>19:00 – 22:00</b>	<b>Nong Nouch Garden entertainment program &amp; dinner for registered delegates</b>

## Tuesday, November 19, 2019

07:00 - 08:30	Breakfast (Restaurant Nong Nooch Garden)
<p>08:30 - 10:30</p> <p>08:30 - 8:45</p> <p>08:45 – 09:15</p> <p>09:15 – 09:45</p> <p>9:45 - 10:15</p> <p>10:15 – 10:30</p>	<p><b>Technical Session</b></p> <p><b>Opening note (conference chair)</b></p> <ul style="list-style-type: none"> <li>▪ <b>Keynote Speaker 01:</b> <b>Prof. Dietmar Maehner, University of Muenster, Germany</b> Shotcrete of the outer shell and the sealing system</li> <li>▪ <b>Keynote Speaker 02:</b> <b>Prof. Marc Jolin, Laval University, Canada</b> Pumping shotcrete: past knowledge applied for modern shotcrete mix design</li> <li>▪ <b>Keynote Speaker 03:</b> <b>Dr. Matthias Beisler, ILF Consulting Engineers (Asia) Ltd.</b> Untersammelsdorf Tunnel – Challenges, Special Measures and use of Special Shotcrete for Tunneling in Lacustrine Clay</li> </ul> <p>Questions &amp; Answers</p>
10:30 – 11:00	Coffee break
<p>11:00 – 12:45</p> <p>11:00 – 11:30</p> <p>11:30 – 12:00</p> <p>12:00 – 12:30</p> <p>12:30 – 12:45</p>	<p><b>Technical Session</b></p> <ul style="list-style-type: none"> <li>▪ <b>Technical Presentation 04:</b> <b>Dr. Michael Mett, Dibit Messtechnik GmbH</b> 3D Tunnel Inspection with Photogrammetric and Hybrid Systems</li> <li>▪ <b>Technical Presentation 05:</b> <b>Prof. Dr. Junsheng Yang, Central South University, China</b> Stability Analysis and Reinforcement of the Existing Karst Cave Passing through Yujingshan Tunnel</li> <li>▪ <b>Technical Presentation 06:</b> <b>Prof. Kyong-Ku Yun, Kangwon National University, South Korea</b> Plastic Shrinkage Properties of Natural Fiber Reinforced Shotcrete</li> </ul> <p>Questions &amp; Answers</p>
12:45 - 14:00	Lunch (Restaurant Nong Nouch Garden)
<p>14:00 – 15:30</p> <p>14:00 – 14:30</p> <p>14:30 – 15:00</p>	<p><b>Technical Session:</b></p> <ul style="list-style-type: none"> <li>▪ <b>Technical Presentation 07:</b> <b>Mr. Eugen Kleen, MC Bauchemie</b> Development of a sprayable geopolymer concrete for fire protection improvement and upgrading of underground traffic structures</li> <li>▪ <b>Technical Presentation 08:</b> <b>Mr. Johannes Flotzinger, University of Regensburg, Germany</b> Investigations regarding the pumping process of wet-mix shotcrete improvement and upgrading of underground traffic structures</li> </ul>

<p>15:00 – 15:15</p> <p>15:15 – 15:30</p>	<p>Questions &amp; Answers, closing of technical seminars day 2</p> <p>Transfer to area of Shotcreting demo</p>
<p><b>15:30 - 18:00</b></p>	<p><b>Practical Shotcreting Demonstration (example)</b></p> <p>Practical Demonstrations</p> 
<p><b>19:00 - 19:30</b></p> <p><b>19:30 - 22:00</b></p>	<p><b>Reception</b></p> <p><b>Grand Gala Dinner for registered delegates</b></p>

## Wednesday, November 20, 2019

<b>07:00 - 09:00</b>	<b>Breakfast (Restaurant Nong Nooch Garden)</b>
<b>09:00 - 10:45</b>	<b>Technical Session</b>
09:00 - 09:30	<ul style="list-style-type: none"> <li>▪ <b>Technical Presentation 01:</b> <b>Mr. Stefan Eder, ILF Consulting Engineers Austria GmbH</b> Geological 3D Analyses of Tunnel Faces with Software and Hardware tools of DIBIT</li> </ul>
09:30 – 10:00	<ul style="list-style-type: none"> <li>▪ <b>Technical Presentation 02:</b> <b>Mr. Lars Vollmert, NAUE GmbH &amp; Co. KG</b> Geotechnical solutions for improved sealing and stabilization of tunnels and reservoirs</li> </ul>
10:00 – 10:30	<ul style="list-style-type: none"> <li>▪ <b>Technical Presentation 03:</b> <b>Mr. Chawalit Tanomtin, Right Tunnelling, Thailand</b> Mab Krabao Jira Double Track Tunnel Project, Saraburi Province, Thailand</li> </ul>
10:30 -10:45	Questions & Answers
<b>10:45 – 11:15</b>	<b>Coffee break</b>
<b>11:15 – 13:00</b>	<b>Technical Session</b>
11:15 – 11:45	<ul style="list-style-type: none"> <li>▪ <b>Technical Presentation 04:</b> <b>Dr. Florian Patrice Nagel, ILF Consulting Engineers (Asia) Ltd.</b> Off-grid power supply for tunneling and mining employing Renewable Energies</li> </ul>
11:45 – 12:15	<ul style="list-style-type: none"> <li>▪ <b>Technical Presentation 05:</b> <b>Dr.-Ing. Bernd Vogl, Aqua2Power AG</b> Energy Sheet Pilings - A milestone for emission free, renewable power production</li> </ul>
12:15 – 12:30	Questions & Answers, discussion & outlook Closing ceremony and end of conference
<b>12:30 - 14:00</b>	<b>Optional: Lunch (Restaurant Nong Nouch Garden)</b>

**Complimentary program:** Guided tour of Nong Nooch Garden

Optional: Boat trip Pattaya area