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Liaison Opening Slides

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ECI SUS XIV 2019

International Conference on Shotcrete for
Underground Support

November 17 - 20, 2019

Thailand

Nong Nouch Garden, Pattaya





Engineering Conferences International, New York

= conference director =
Barbar Hickernell

Tressa D'Ottavio
Herbert Klapperich (liaison)

ECI - a not for profit-foundation
founded 1962 by major US-scientific organizations

ECI - SUS 2019



ECI Conference serie SUS

= Shotcrete for Underground Support =

SUS I	1973	South Berwick, Maine
SUS II	1977	Easton, Maryland
SUS III	1978	St. Anton, Austria
SUS IV	1982	Paipa, Columbia
SUS V	1990	Uppsala, Sweden John Sharp
SUS VI	1993	Niagara-on-the-lake, Ontario, Canada D. F. Wood, R. Morgan
SUS VII	1995	Telfs, Austria H. Klapperich, R. Pöttler, J. Willocq
SUS VIII	1999	Campos do Jordao, Brazil Tarcisio B. Celestino, Harvey Parker



ECI Conference serie SUS

= Shotcrete for Underground Support =

SUS IX	2002	Kyoto, Japan Koichi Ono, Rusty Morgan
SUS X	2006	Whistler, B. C., Canada Rusty Morgan, Harvey Parker
SUS XI	2009	Davos, Switzerland Felix Amberg, Knut F. Garshol
SUS XII	2015	Singapore Ming Lu, Oscar Sigl, Guojum Li
SUS XIII	2017	Kloster Irsee, Germany Dietmar Mähner, Matthias Beisler, Frank Heimbecher
SUS XIV	2019	Nong Nouch Garden, Thailand Matthias Beisler, Preedee Ngansantikul







**Wet Shotcreting System
Top-Shot**



SHOTCRETE

dry mix

- * in caverns
- * in tunnelling
 - in rock
 - in soil
- * on surface
 - deep excavation
 - slope surface

wet mix

research

&

application

significant developments
in shotcrete technology

- * material science
- * design
- * new additives & admixtures
- * fibers
- * equipment



... innovations ...

continuously under development

from deep tunnels

- like crossing the alps -

to downtown underground lines

- low overburden -

NATM - ...

- ...

- ...

SEM - Sequential Excavation Method

single-shelled shotcrete lining

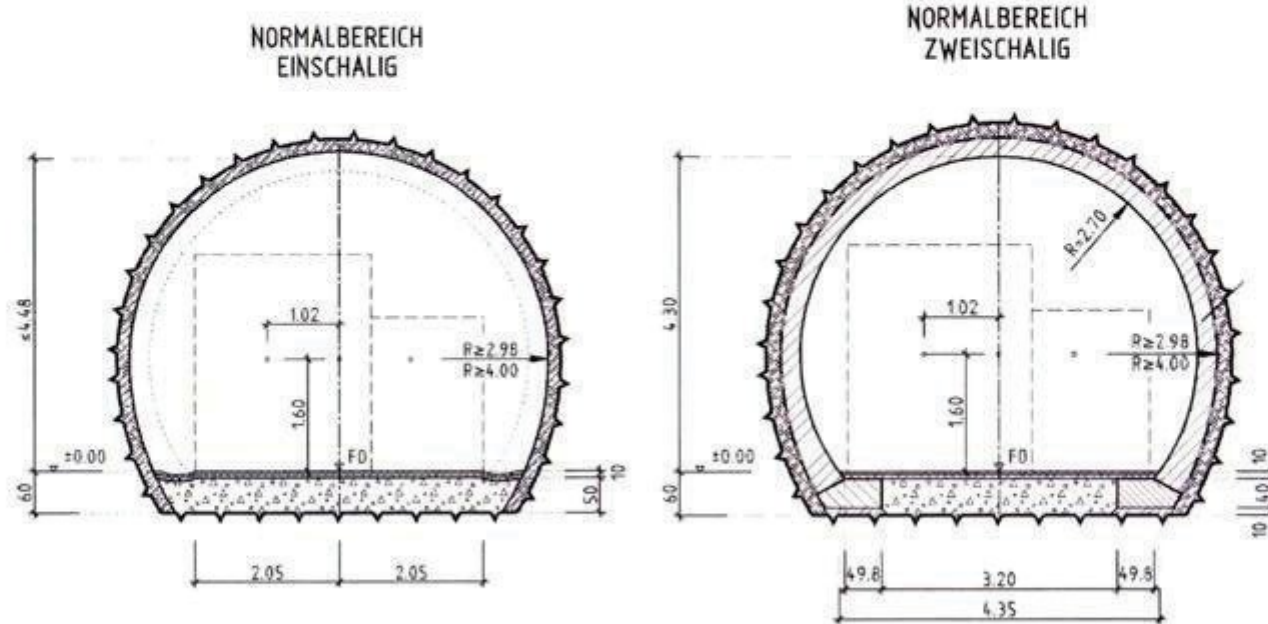
= as permanent lining =



Case History

single

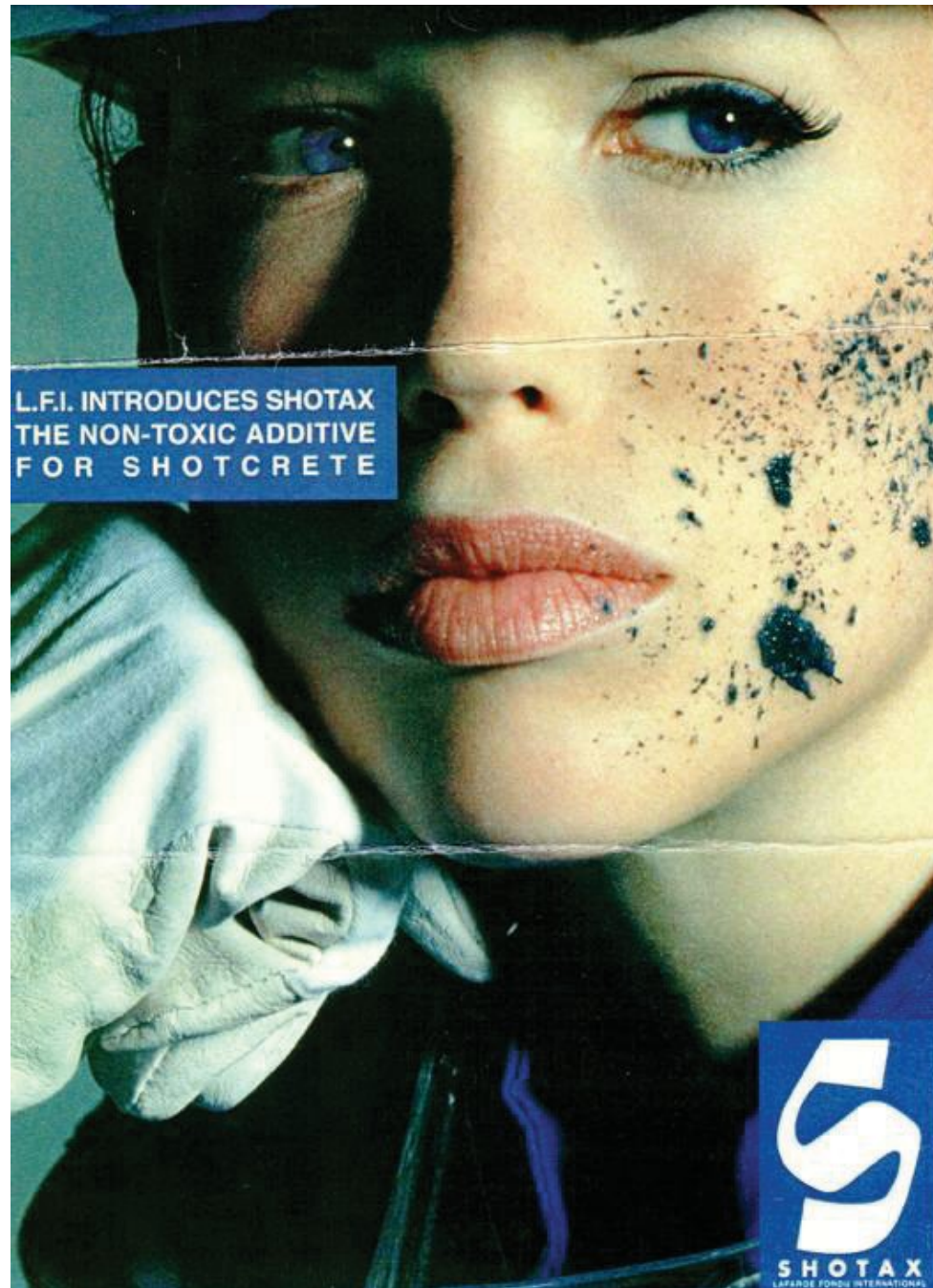
2 shells



Shotcrete VIII

12

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L.F.I. INTRODUCES SHOTAX
THE NON-TOXIC ADDITIVE
FOR SHOTCRETE



SHOTCRETE

key topics:

- ❖ DEVELOPMENTS
- ❖ METHODS
- ❖ DESIGN
- ❖ APPLICATION
 - rehabilitation
 - old tunnels
 - TBM
 - projects
 - best practice
 - failures



"special session" energy (Wednesday)

- ❖ Renewable Energies
 - Photovoltaic
 - Geothermal energy
 - energy-sheetpiles-walls
 - hybrid-systems
 - electricity
 - cooling/heating

energy is always exiting





Welcome & enjoy SUS XIV
Pataya 2019.



Herbert Klapperich
ECI – SUS 14 – 2019