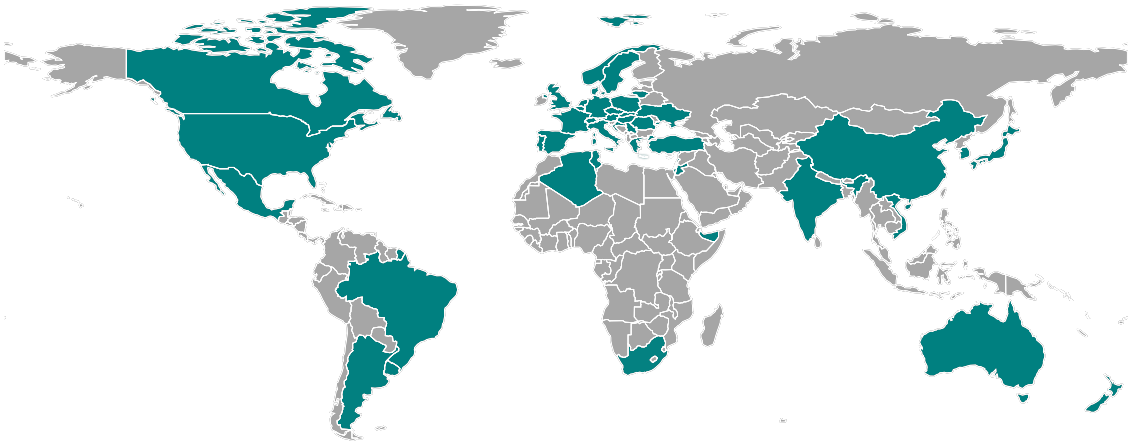
Program of

15th *fib* International PhD Symposium in Civil Engineering 2024 Budapest



Budapest University of Technology and Economics

Budapest, Hungary

28-30 August 2024

Muegyetem 3, H-1111 Budapest, Building K

Scientific Committee

György L. Balázs (HU), Chairman, BME
Sándor Sólyom (HU), Co-Chairman, BME, Steven Foster (AU), Co-Chairman, Univ. of New-South Wales

János Levendovszky (HU)
Szabolcs Rózsa (HU)
László P. Kollár (HU)
Ákos Török (HU)
János Józsa (HU)
Tamás Lovas (HU)
Sándor Ádány (HU)
Carmen Andrade (ES)
Katalin Bagi (HU)
Nemkumar Banthia (CA)
Joaquim Barros (PT)
Josée Bastien (CA)
Beatrice Belletti (IT)
Farid Benboudjema (FR)
Konrad Bergmeister (AT)
Antonio Mari Bernat (ES)
Hans Beushausen (ZA)
Agnieszka Bigaj-van Vliet(NL)
Jan Biliszczuk (PL)
Ruben Paul Borg (MT)
Billy Boshoff (ZA)
Alejandro Caldentey (ES)
Cristina Campian (RO)
Arpad Ceh (RS)
Francesca Ceroni (IT)
Chrys. Chrysostomou (CY)
Isabella Colombo (IT)
Matteo Colombo (IT)
Hugo Corres (ES)
Manfred Curbach (DE)
Yifei Cui (CN)
Judit Csanaky (HU)
László Csetényi (GB)
Avraham Dacygier (IL)
Frank Dehn (DE)
Marta Del Zoppo (IT)
Iria Lícia Olivia Doniak (BR)
Wit Derkowski (PL)
Marco di Prisco (IT)
András Dormány (HU)
Atef Daoud (TN)
Steve Denton (UK)
Carola Edvardsen (DK)
Rolf Eligehausan (DE)
Abdulkader El-Mir (LB)
Michael Fardis (GR)
György Farkas (HU)
Sándor Fehérvári (HU)
Dabin Feng (CN)
Olivér Fenyvesi (HU)
Liberto Ferrara (IT)
John P. Forth (GB)
Albert De la Fuente (ES)
Hans-Rudolf Ganz (CH)
Harald Garrecht (DE)
Fabrice Gatuingt (FR)
Ravindra Gettu (IN)
Viktor Gribniak (LT)
Maurizo Guadagnini (GB)
Michael Haist (DE)
Petr Hajek (CZ)
Viktor Hlavička (HU)
Tor-Arne M. Hamer (NO)
Max Hendriks (NL)
Dezső Hegyi (HU)
Chris Hendy (GB)
Rick Henry (NZ)
Jan Hofmann (DE)
Le Guang Hung (VN)
Eva Ollers Ibars (E)
Ivan Ignjatović (RS)
Alper Ilki (TR)
Edoardo Santos Júlio (PT)
Terje Kanstad (NO)
Akio Kasuga (JP)
Walter Kaufmann (CH)
Said Kenai (DZ)
Sylvia Kessler (DE)
Rita Kiss (HU)
Zoltán Kiss (RO)
Johann Kollegger (AT)
Katalin Kopecskó (HU)
Kálmán Koris (HU)
Renata Kotynia (PL)
Tamás Kovács (HU)
Nauzika Kovács (HU)
Imre Kovács (HU)
Flórián Kovács (HU)
Gábor Köllő (RO)
Balázs Kövesdi (HU)
Yahya Kurama (US)
Simone Labò (IT)
Laurie Lacarriere (FR)
Ingrid Lande (NO)
János Lógó (HU)
Xilin Lu (CHN)
Éva Lublóy (HU)
Karin Lundgren (SE)
Koichi Maekawa (JP)
András Mahler (HU)
Giuseppe Mancini (IT)
Marko Marinković (RS)
Steffen Marx (DE)
Bruno Massicotte (CA)
Stijn Matthys (BE)
Alberto Meda (IT)
Ildiko Merta (AT)
Fausto Minelli (IT)
Barzin Mobasher (US)
Gábor Mucsi (HU)
Aurelio Muttoni (CH)
Harald S. Müller (DE)
Antione Naaman (US)
Balázs Nagy (HU)
Tamás Nagy-György(RO)
Salem G. Nehme (HU)
Kinga Nehme (HU)
Rita Nemes (HU)
Róbert Németh (HU)
Motohiro Ohno (JP)
Tor-Ole Olsen (NO)
Zoltán Orban (HU)
Ádám Paládi-Kovács(HU)
Alessandro Palermo (US)
Daman K. Panesar (CA)
Gustavo Parra-Montesinos (US)
Peter Paulik (SK)
Marisa Pecce (IT)
Cristina Barris Pena (ES)
Giovanni Plizzari (IT)
Andrea Prota (IT)
Goran Puz (HR)
Marco Rampini (IT)
Ágoston Restás (H)
Mario E. Rodrigez (MX)
Pedro Serna Ros (ES)
Reem Sabouni (AE)
Genadijs Sahmenko (LV)
István Sajtos (HU)
Syed Yasir Salam (FR)
Marek Salamak (PL)
Samindi Samarakoon (NO)
Dirk Schlicke (AT)
Luis Segura (UY)
Larbi Sennour (US)
Takami Shimomura (JP)
Johan Silfwerband (SE)
Jongsung Sim (KR)
Simone Spagnuolo (IT)
Alfred Strauss (AT)
Fernando Stucchi (BR)
Zsombor Szabó (RO)
Zsuzsa Szalay (HU)
János Szép (HU)
Luc Taerwe (BE)
Arezki Tagnit-Hamou (CA)
Maurizio Taliano (IT)
Diego Alejandro Talledo (IT)
Jin-Guang Teng (CN)
Ishida Tetsuya (JP)
Georgia Thermou (GB)
Jean-Michel Torrenti (FR)
Lluis Torres (ES)
François Toutlemonde (FR)
Thanasis Triantafillou (GR)
Tamon Ueda (CN, JP)
Jan L. Vítek (CZ)
Robert Vollum (GBR)
István K. Völgyi (HU)
Lukas Vrablik (CZ)
Joost Walraven (NL)
Roman Wan-Wendner (BE)
Andor Windisch (HUDE)
Sherif Yehia (AE)
Giulio Zani (IT)
Raul Zerbino (AR)
Yamei Zhang (CN)
Peng Zhang (CN)
Bin Zhao (CN)
Arash Zolfagharnasab (IR)

Organizing Committee

György L. Balázs (HU), Chairman, BME

Szabolcs Szinvai (HU), Co-Chairman, András Biró (HU), Co-Chairman, Sándor Sólyom (HU), Co-Chairman, BME

David Fernández-Ordóñez (CH), Secretary General, Marie Reymond (CH), Corinne Bottollier Depois (CH), *fib* Lausanne

Zaid Ali Abdulhussein (HU)
Balázs Fürtön (HU)
Al-Askary Ali Satar Jaber (HU)
Manea Thajeel Marwah (HU)
Marcelo Melo (BR)
Yousuf Zubair (HU)
Fanni Petresevics (HU)
Dóra Szagri (HU)
Anna Szijártó (HU)
Nikola Tošič (ES)
Wisam Kamil Tuama (HU)
Ali Ahmed Omer Hassan (HU)

Participating Universities

University of New South Wales	Australia	University of Basilicata	Italy
Graz University of Technology	Austria	University of Bergamo	Italy
University of Natural Ressources and Life Sciences Vienna	Austria	University of Brescia	Italy
Technische Universität Wien	Austria	University of Rome "Tor Vergata"	Italy
Belgian Nuclear Research Centre	Belgium	University of Salerno	Italy
University of Liège	Belgium	Università degli Studi Roma Tre	Italy
Ghent University	Belgium	The University of Tokyo	Japan
Universidade de São Paulo	Brazil	Waseda University	Japan
University of Ottawa	Canada	Yokohama National University	Japan
Université de Sherbrooke	Canada	Delft University of Technology	Netherlands
Tongji University	China	University of Stavanger	Norway
Qingdao University of Technology	China	Cracow University of Technology	Poland
Brno University of Technology	Czechia	Silesian University of Technology	Poland
Czech Technical University	Czechia	University of Lisbon	Portugal
University of Pardubice	Czechia	University of Minho	Portugal
Technical University of Denmark	Denmark	University of Pretoria	Republic of South Africa
Université Paris-Saclay	France	Faculty of Civil Engineering	Serbia
Karlsruhe Institute of Technology	Germany	University of Belgrade	Serbia
University of Stuttgart	Germany	University of Novi Sad	Serbia
Technical University of Darmstadt	Germany	Slovak University of Technology in Bratislava	Slovakia
Leibniz University Hannover	Germany	Seoul National University	South Korea
Dresden University of Technology	Germany	Polytechnic University of Valencia	Spain
Technical University Munich	Germany	Universitat Politècnica de Catalunya	Spain
Technische Hochschule Mittelhessen	Germany	Universitat de les Illes Balears	Spain
Technische Hochschule Würzburg-Schweinfurt	Germany	Linnaeus University	Sweden
Technische Universität Berlin	Germany	ETH Zurich	Switzerland
University of the Bundeswehr Munich	Germany	Istanbul Technical University	Turkey
Budapest University of Technology and Economics, BME	Hungary	Istanbul University-Cerrahpasa	Turkey
Széchenyi István University	Hungary	Yildiz Technical University	Turkey
University of Miskolc	Hungary	National University «Yuri Kondratyuk Poltava Polytechnic»	Ukraine
University of Debrecen	Hungary	Imperial College London	UK
University of Pécs	Hungary	University of Leeds	UK
Indian Institute of Technology Tirupati	India	University of Southampton	UK
Technion – Israel Institute of Technology	Israel	University of Surrey	UK
Politecnico di Milano	Italy	Lyles School of Civil Engineering	USA
Politecnico di Torino	Italy		

Supported by

MTA HUNGARIAN ACADEMY OF SCIENCES

Hungarian Intellectual Property Office

MABESZ Association of Hungarian Concrete elements Manufacturers

ASSOCIATION FOR BRIDGE ENGINEERS

MAÚT 30 HUNGARIAN ROAD AND RAIL SOCIETY

CeMBeton® foundation of construction

Sponsors

Diamond

fischer

Gold

moratus A SZERKEZETÉPÍTŐ

MC BE SURE. BUILD SURE.

Silver

ATENA Reinforced Concrete Modeling

CEOS

Standard

Pont-TERV MÉRNÖKI TERVEZŐ ÉS TANÁCSADÓ ZRT.

BW s.r.o.

beton partner - a tartós kapcsolat -

meva

AVERS

Duna-Dráva Cement

15th *fib* PhD Symposium 2024 Budapest - Overview

BME, 1111 Budapest, Műegyetem rkp. 3.

	Day 0 Tuesday 27 August	Day 1 Wednesday 28 August	Day 2 Thursday 29 August	Day 3 Friday 30 August
08:00 - 08:30		Registration		
08:30 - 09:00		Opening ceremony *Group photo*	Keynote Session	Technical Session 7: 5 parallel sessions
09:00 - 09:30		Coffee break		
09:30 - 10:00		Technical Session 1: 5 parallel sessions	Technical Session 4: 5 parallel sessions	Technical Session 8: 5 parallel sessions
10:00 - 10:30				
10:30 - 11:00				
11:00 - 11:30		Lunch		
11:30 - 12:00				
12:00 - 12:30				
12:30 - 13:00	*fib*-course UHPC materials and structures	Technical Session 2: 5 parallel sessions	Technical Session 5: 5 parallel sessions	Technical Session 9: 4 parallel sessions
13:00 - 13:30				
13:30 - 14:00		Coffee break		
14:00 - 14:30				
14:30 - 15:00		Technical Session 3: 5 parallel sessions	Technical Session 6: 5 parallel sessions	Closing Ceremony Awards Announcements
15:00 - 15:30				
15:30 - 16:00				
16:00 - 16:30				
16:30 - 17:00				
17:00 - 17:30				
17:30 - 18:00				
19:00	Welcome drink		Banquet	

Day 0

Tuesday, 27 Aug 2024

fib-course on „UHPC materials and structures”

Muegyetem 3, H-1111 Budapest, Building K, 1st Floor, Room 1.03

13:00-14:00		Registration
14:00-14:20	Prof. György L. Balázs (Budapest)	Introduction to UHPC
		Discussion
14:20-14:40	Dr. David Fernandez-Ordonez (Lausanne)	Introduction to *fib*
		Discussion
14:40-15:40	Prof. Stephen Foster (Sydney)	Exploring the Future of Ultra-High Performance Concrete (UHPC) Bridge Construction: Advancements, Challenges, and its Role in Critical Infrastructure Development
		Discussion
15:40-16:00	Coffee break	
16:00-17:00	Prof. Marco di Prisco (Milano)	UHPFRC for sustainability: a high-performance material for new and existing structures
		Discussion
17:00-18:00	Dr. Akio Kasuga (Tokyo)	A challenging concrete structure for the low carbon society
		Discussion

19:00 – 21:00 Welcome drink of PhD Symposium 2024 at BME Building K

Day 1 - Wednesday, 28 Aug 2024

08:00	08:30	Registration				
08:30	09:00					
09:00	10:30	**Opening Ceremony** György L. Balázs, Prof, *fib* Honorary President, *fib* President 2011-2012, Inventor of PhD Symposia: Objectives and history of the *fib* Symposia in Civil Engineering Hassan Charaf, Prof, Rector BME: AI governance and ecosystem at the BME Balázs Kövesdi, Prof, Vice Dean of Research: Opening words by the Dear of the Faculty of Civil Engineering of BME László Kollár, Prof, Secretary General of Hungarian Academy of Sciences, Chairman of the „Vásárhelyi Pál" Doctoral School of Civil Engineering BME: Opening words Szabolcs Farkas, President, The Hungarian Intellectual Property Office: Importance of PhD research as a possible source for intellectual properties Steven Foster, Prof, University of New South-Wales, Sydney, Australia, President of *fib*, Co-Chaiman of Scientific Com.: Opening words *Group Photo*				
10:30	11:00	Coffee break				
11:00	11:30	Session 1-1 Structural analysis, modeling and design	Session 1-2 Assessment and structural health monitoring	Session 1-3 Durability of existing concrete structures and durability for future structures	Session 1-4 Innovations in concrete and concrete technology	Session 1-5 Bridges, reservoirs, dams, tunnels and road constructions
11:30	12:00					
12:00	12:30					
12:30	13:00					
13:00	13:30	Lunch				
13:30	14:00					
14:00	14:30	Session 2-1 Structural analysis, modeling and design	Session 2-2 Assessment and structural health monitoring	Session 2-3 Durability of existing concrete structures and durability for future structures	Session 2-4 Innovations in concrete and concrete technology	Session 2-5 Bridges, reservoirs, dams, tunnels and road constructions
14:30	15:00					
15:00	15:30					
15:30	16:00					
16:00	16:30	Coffee break				
16:30	17:00	Session 3-1 Structural analysis, modeling and design	Session 3-2 Innovations in metallic and non-metallic reinforcements	Session 3-3 Durability of existing concrete structures and durability for future structures	Session 3-4 Innovations in concrete and concrete technology	Session 3-5 Composites for strengthening of concrete structures
17:00	17:30					
17:30	18:00					

Day 2 - Thursday, 29 Aug 2024

08:00	08:30	Registration				
08:30	09:00					
09:00	09:30	Andreas Zitek, Alexandra Strauss-Sieberth, Teaching and Learning Center / Unit Didactic, BOKU University, Vienna: Potential influences of Artificial Intelligence on PhD procedures				
09:30	10:00	György L. Balázs, Prof, *fib* Honorary President, BME: Challenges in concrete and concrete structures				
10:00	10:30	Luc Taerwe, Prof, Editor-in-chief: The publishing process of the *fib* journal Structural Concrete				
10:30	11:00	Coffee break				
11:00	11:30	Session 4-1 Structural analysis, modeling and design	Session 4-2 Assessment and structural health monitoring	Session 4-3 Life cycle assessment and design, rest life	Session 4-4 Sustainability of materials and structural systems, including heritage concrete structures	Session 4-5 Durability of existing concrete structures and durability for future structures
11:30	12:00					
12:00	12:30					
12:30	13:00					
13:00	13:30	Lunch				
13:30	14:00					
14:00	14:30	Session 5-1 Structural analysis, modeling and design	Session 5-2 Assessment and structural health monitoring	Session 5-3 Innovations in concrete and concrete technology	Session 5-4 Sustainability of materials and structural systems, including heritage concrete structures	Session 5-5 Maintenance, retrofitting or strengthening of concrete structures
14:30	15:00					
15:00	15:30					
15:30	16:00					
16:00	16:30	Coffee break				
16:30	17:00	Session 6-1 Structural analysis, modeling and design	Session 6-2 Composites for strengthening of concrete structures	Session 6-3 Durability of existing concrete structures and durability for future structures	Session 6-4 Bridges, reservoirs, dams, tunnels and road constructions	Session 6-5 Digitalization - 3D concrete printing
17:00	17:30					
17:30	18:00					

19:00-22:00 **Symposium Banquet with cruise on the Danube**

Day 3 - Friday, 30 Aug 2024

08:00	08:30	Registration				
08:30	09:00					
09:00	09:30	Session 7-1 Structural analysis, modeling and design	Session 7-2 Innovations in metallic and non-metallic reinforcements	Session 7-3 Structural analysis, modeling and design	Session 7-4 Innovations in concrete and concrete technology	Session 7-5 Composites for strengthening of concrete structures
09:30	10:00					
10:00	10:30					
10:30	11:00	Coffee break				
11:00	11:30	Session 8-1 Structural analysis, modeling and design	Session 8-2 Assessment and structural health monitoring	Session 8-3 Structural analysis, modeling and design	Session 8-4 Buildings and shells	Session 8-5 Structural reliability and risk analysis
11:30	12:00					
12:00	12:30					
12:30	13:00					
13:00	13:30	Lunch				
13:30	14:00					
14:00	14:30	Session 9-1 Structural analysis, modeling and design	Session 9-2 Assessment and structural health monitoring	Session 9-3 Structural analysis, modeling and design	Session 9-4 Buildings and shells	
14:30	15:00					
15:00	15:30					
15:30	16:00					
16:00	16:30	Coffee break				
16:30	18:00	**CLOSING** Marcelo Melo, Univ. of São Paulo, Brazil, Member of OC: *fib* YMG - Perspectives and projects for young researchers János Levendoszky, Prof, BME, Vice-Rector for Research and Innovation: Closing words Róbert Németh, Secretary of the „Vásárhelyi Pál" Doctoral School of Civil Engineering, BME: Closing words Steven Foster, Prof. Univ. of New South Wales, Sydney, Australia, *fib* President, Co-chairman of SC: Closing words by *fib* and Wiley Máté Tóth, PhD, Head of Business Unit Structural Retrofitting, fischer group, Co-convener of *fib* TG2.9.4, Working Party "Fatigue Loading", Corporate Representative in *fib* TG2.9: Closing words by the Diamond Sponsor György L. Balázs, Prof, BME, Chairman of SC, Sándor Sólyom, PhD, BME, Co-chairman of SC: Evaluation of the Symposium and closing words Prize Giving Ceremony, Photo of the winners Giovanni Plizzari, Prof, Chairman of *fib* AAYE: Information about the *fib* Achievement Award for Young Engineers (AAYE) Marcelo Melo, Univ. of São Paulo, Brazil, Member of OC: Invitation to Conceptual Design 2025 Rio de Janeiro Konrad Bergmeister, Alfred Strauss, BOKU University, Vienna: Invitation to PhD Symp 2026 Vienna Delivery of Memorial Stone of the PhD Symposium 2026				

Day 1: Wednesday 28 August
11:00 - 13:00

Session 1-1	Topic: Structural analysis, modeling and design Chairs: Steven Foster (AU), László Kollar (HU)	Room 3 Ceremony Hall
7	Numerical prediction of the concentrated load-bearing capacity of 400 mm deep hollow core floor	Miłosz Jeziorski and Wit Derkowski
79	Numerical analysis of precast concrete beam to column connections with relocated plastic hinge	Bela Kovacs, Bogdan Heghes and Zoltan Kiss
134	Numerical modeling of two-chord concrete-filled steel tubular column under axial compression	Josip Kovač-Striko, Aleksandar Landović and Arpad Čeh
82	Reliability assessment of the robustness of reinforced concrete frame under column loss scenario	Elena Miceli, Luca Giordano, Paolo Castaldo and Giuseppe Mancini

Session 1-2	Topic: Assessment and structural health monitoring Chairs: György L. Balázs (HU), Kálmán Koris (HU), Chandan Gowda (UK)	Room 93
37	Study of the influence of bond loss on shear strength in corroded reinforced concrete structures.	Alejandro Frontera, Carlos R. Ribas, Antoni Cladera and Francesc Masdeu
62	Modelling the Shear Behaviour of Reinforced Concrete Dapped-End Connections	Sameera Hippola and Boyan Mihaylov
171	Implementation of an experimental database for new phenomenological degradation laws for corroded steel rebars	Manuel Bartoli, Fabio Di Carlo and Zila Rinaldi
39	Practical application of the "Saw-Cut" technique on prestressed concrete beams under laboratory conditions	Juan Antonio Mateu Sánchez, Juan Navarro Gregori and José Rocío Martí Vargas

Session 1-3	Topic: Durability of existing and future concrete structures Chairs: Harald Müller (DE), Salem Nehme (HU)	Room 72
6	Determination of freeze-thaw induced damage in concrete by proton nuclear magnetic resonance (1H-NMR)	Vanessa Mercedes Kind, Sophie Unbehau, Matthias Müller, Horst-Michael Ludwig and Frank Dehn
200	Role of Cellulose Nanocrystals and Their Utilization in Cement-Based Composites	Ali Satar Jaber Al-Askary and Katalin Kopecskó
49	Experimental Study on the Durability of Concrete Made with Artificial Aggregates	Dechen Wangmo, Giovanni Plizzari and Adriano Reggia
165	Mechanical and durability performance of low carbon concrete with alternative pozzolanic binders	Eliana Soldado, Hugo Costa, Ricardo Carmo and Eduardo Júlio

Session 1-4	Topic: Innovations in concrete and concrete technology Chairs: Luc Taerwe (BE), Katalin Kopecskó (HU), Nikola Tosić (ES)	Room 97
3	Performance of one-part alkali-activated materials incorporating fly ash and slag	Chenmeng Zhang, Dan V. Bompa, Suryakanta Biswal and Ying Wang
94	Cement-based metamaterial with spiral perforations incorporating vibration attenuation characteristics	Koichi Imagawa, Motohiro Ohno and Tetsuya Ishida
175	Experimental Investigation of Utilizing Silicon Manganese Slag for Low-Carbon Mortar Production	Dileepa Hettiarachchi, Samindi Samarakoon, Kjell Fosså, Kidane Gebremariam and Khalifeh Mahmoud
56	Comparison of tensile testing methods for UHPC: Conversion factors for direct and splitting tension and bending	Jan Vesecký, Jan Kubát and Lukáš Vráblík

Session 1-5	Topic: Bridges, reservoirs, dams, tunnels and road construction Chairs: Akio Kasuga (JP); János Lógó (HU)	Room 87
32	Integration of Monitoring-Based Safety Assessments of Bridges into Digital Twins	Maria Walker, Jan-Hauke Bartels, Pauline Esser and Steffen Marx
187	Design and analysis of a modular precast segmental footbridge with reinforcement and post-tensioning tendons of CFRP	Martin Rettinger, Luzia Koch, Alex Hückler and Mike Schlaich
208	Analytical and numerical investigations of the reinforcements of half-joint bridge beams.	Paolo Pizzini, Nico Di Stefano, Luca Facconi, Fausto Minelli and Giovanni Plizzari
105	Experimental investigations on the shear load-bearing behaviour of ground dry joints	Clara Schramm, Florian Fürll, Dennis Birkner and Steffen Marx

Day 1: Wednesday 28 August
14:00 - 16:00

Session 2-1	Topic: Structural analysis, modeling and design Chairs: Jan Vítek (CZ), Olivér Fenyves (HU), Marko Marinković (SR	Room 3 Cerremony Hall
9	Experimental investigation of the transition from tension to compression in reinforced concrete chords	Simon Karrer, Karel Thoma and Walter Kaufmann
34	Experimental Research of Biaxially Bended Reinforced Concrete Columns Manufactured on Granite Sifting	Olha Harkava and Andrii Pavlikov
89	Experimental investigation of combined in-plane and out-of-plane shear in non-shear reinforced concrete elements	Jens Skovgaard Larsen, Henrik Brøner Jørgensen and Søren Gustenhoff Hansen
118	Experimental results of Delft blind prediction contest on shear behaviour of continuous precast girders	Mohammed S. Ibrahim, Mauro Poliotti, Yuguang Yang and Max A.N. Hendriks

Session 2-2	Topic: Assessment and structural health monitoring Chairs: Alberto Meda (IT), Dezső Hegyi (HU), Nikola Tosić (ES)	Room 93
93	Quality control and assessment of novel concrete structures made of eco-efficient concrete	Lisa Ptacek and Alfred Strauss
100	Damage assessment of an RC arch bridge using Finite Element Analysis and proposal of bridge SHM system	Muhammad Fawad, Marek Salamak and Kálmán Koris
172	Satellite-Based Structural Monitoring for Bridges Safety Assessment and Maintenance Optimization	Teresa Celozzi, Fabio Di Carlo and Alberto Meda
191	Diagnosis and Prognosis of ISR-affected Concrete Sleepers	Rennan Medeiros, Leandro Sanchez and Antonio Carlos Dos Santos

Session 2-3	Topic: Durability of existing and future concrete structures Chairs: Bin Zhao (CN), Rita Nemes (HU)	Room 72
159	Microstructural degradation from freeze-thaw attack - spatial exposure history and effects on multiscale porosity	Markus Mahlbacher, Felix Mett, Matteo Broggi, Michael Beer and Michael Haist
19	Structural performance of chloride corroded hybrid fibre-reinforced concrete under sustained loads	Petar Bajić, Bruno Leporace-Guimil, Carmen Andrade, Nikola Tošić and Albert de la Fuente
128	Determining the chloride resistance of concrete -different rapid testing methods and their correlation	Hannah Drenkard and Christian Fischer
33	Analytical Assessment of the Bond Behaviour of pre-stressed Carbon Fiber Reinforced Polymer Strands in Concrete	María Serrano-Mesa, Eladio Alejandro Martínez-Pina, Alex Hückler Mike Schlaich

Session 2-4	Topic: Innovations in concrete and concrete technology Chairs: László Csetényi (UK), Katalin Bagi (HU)	Room 97
14	Use of fine recycled aggregate in sprayed concrete: Experimental study	Zdeněk Hlavsa and Jan L. Vítek
158	Experimental Investigation of Strength Relations in RCA Concrete	Cecilie Kristensen, Jesper Harrild Sørensen, Linh Cao Hoang, Gregor Fischer and Lars Zenke Pørlov Hansen
194	Mechanical properties of mortar partly substituting fine aggregate with biomass bottom ash from fluidized bed boilers	Anders Hedegaard Jensen, Lisbeth M. Ottosen and Carola Edvardsen
196	Performance-driven optimization of emissionlow watertight structural concrete using recycled aggregates	Thomas Pichler, Konrad Bergmeister and Klaus Voit

Session 2-5	Topic: Bridges, reservoirs, dams, tunnels and road construction Chairs: Jan Hoffmann (DE), Balazs Kövesdi (HU)	Room 87
69	Material savings potential of the LT-bridge construction method for post-tensioned bridges	Franz Untermarzoner, Michael Rath and Johann Kollegger
111	Experimental tests and numerical analysis of bridge columns reinforced with high performance fiber reinforced concrete (HPFRC)	Ivan Beltracchi, Adriano Reggia, Giovanni Metelli and Giovanni Plizzari
190	Structural behavior of corrosion-damaged existing bridges: design of the experiment	Elisa Carleschi, Adriano Reggia, Fausto Minelli and Giovanni Plizzari
214	Experimental results of sliding and welding tests in a novel construction method for steel-concrete composite bridges	Dániel Gosztola and János Szép

Day 1: Wednesday 28 August
16:30 - 18:00

Session 3-1	Topic: Structural analysis, modeling and design Chairs: Stefen Marx (DE), István Sajtos(HU)	Room 3 Ceremony Hall
12	Correlation between requirements and performance metrics for concrete floor slabs	Rebecca Ammann, Karel Thoma, Jaime Mata-Falcón and Walter Kaufmann
44	Analysis of the Effect of Hydration Heat in Massive Constructions: Experimental Measurement of the Spillway at Orlik Reservoir	Simona Potůčková, Milan Holý, David Čítek and Jiří Kolísko
184	Significance of Soil Nonlinearity in Soil Structure Interaction	Yaseen Shayah and László Kollár

Session 3-2	Topic: Innovations in metallic and non-metallic reinforcements Chairs: Simone Spagnuolo (IT), Sándor Sólyom (HU), Chandan Gowda (UK)	Room 93
28	Sensitivity assessment of the load-bearing capacity of FRP reinforced concrete columns	Lukas Bujotzek and Danièle Waldmann
130	Investigation on Basalt-Based Reinforcement with Innovative 3D-Design	Angeliki Kosta and Konrad Bergmeister
131	Experimental and numerical analysis of the shear lag effect in basalt and glass fiber reinforced polymer bars	Szabolcs Szinvai and Tamás Kovács

Session 3-3	Topic: Durability of existing and future concrete structures Chairs: Dirk Schlicke (AT), János Szép (HU)	Room 72
99	Reliability Analysis of Existing Post-tensioned Concrete Bridge Affected by Corrosion	Aleš Mezera, Milan Holý and Miroslav Sýkora
101	Experimental analysis of the seismic behavior of first floor frames of concrete buildings	Álvaro Ruiz Miguel, Luis Pallarés Rubio and Francisco Javier Pallarés Rubio
150	Sustainable use of post-demolition concrete as recycled aggregates and cement substitute: Recycling potential in Germany	Antonia Frank, Rebekka Volk and Frank Schultmann

Session 3-4	Topic: Innovations in concrete and concrete technology Chairs: Andor Windisch (DE), Tamás Lovas (HU), Nikola Tosić (ES)	Room 97
124	Comparative analysis on mechanical properties of concrete reinforced with waste fibres from end-of-life composite materials	Umar Ayaz Lone, Zhao Bin and Zhou Zucan
22	Load bearing behaviour of fastenings with effective embedment depth less than 30 mm	Michael Yamandu Eckstein and Jan Hofmann
10	Structural fuse-based segmentation for limiting disproportionate building collapse: design requirements	Maria L. Gerbaudo, José Miguel Adam Martínez and Andri Setiawan

Session 3-5	Topic: Composites for strengthening of concrete structures Chairs: Ildiko Merta (AT), Zsuzsa Szalay (HU)	Room 87
27	Properties Analysis of Electrically Cured Fiber-Reinforced Fly Ash-Slag Geopolymer Composites with Diverse Activators	Beyza Aygun, Turhan Bilir, Turgay Cosgun, Mucteba Uysal and Elif Burcu Deliktas
35	Effect of Nano-SiO2 On Electrical Cured Metakaolin-Granulated Blast Furnace Slag Based Geopolymers with fiber addition	Yusuf Gokcegoz, Mucteba Uysal and Beyza Fahriye Aygun
59	Tensile behavior of textile-reinforced mortar solutions made from natural hemp fibres.	Kevin Isaac Escobar, Juan Murcia-Delso and Eva Oller Ibars

Day 2: Thursday 29 August
11:00 - 13:00

Session 4-1	Topic: Structural analysis, modeling and design Chairs: Walter Kaufmann (CH), János Lógó (HU), Marko Marinković (SR)	Room 3 Ceremony Hall
13	A Parametric Design of Reinforced Concrete Structures	Vittoria Borghese, Silvia Santini, Camillo Nuti and Cristoforo Demartino
20	Analysis of former and new Eurocode 2 shear provisions for concrete members without transverse reinforcement	Sam Coppens, Robby Caspeele and Roman Wan-Wendner
24	Higher-order beam theories based on Carrera unified formulation for damage analysis of reinforced concrete structures	Jiahui Shen, Mário Rui Arruda and Alfonso Pagani
43	Engineering models for determining the Residual load-bearing capacity of reinforced concrete components after high dynamic loading	Vahan Zohrabyan and Thomas Braml

Session 4-2	Topic: Assessment and structural health monitoring Chairs: Daman Panesar (CA), Balázs Kövesdi (HU)	Room 93
75	Performance assessment procedures for dynamically loaded reinforced concrete-steel connections	Maximilian Granzner and Alfred Strauss
112	Behavior and modelling of as-built and retrofitted reinforced concrete beam-column joints considering transverse beams and slab	Margaritis Tonidis
119	Safety of existing bridges with a long period of good service based on the theory of reliability	Marcelo Melo, Fernando Stucchi and Camila Candido
132	A new approach to improve safety of exceptional transportation: a proof of concept (POC) in the framework of NRRP	Alessia Abbozzo, Giulio Zani and Marco di Prisco

Session 4-3	Topic: Life cycle assessment and design, rest life Chairs: Frank Dehn (DE), Balázs Nagy (HU), Nikola Tosić (ES)	Room 72
47	Circular rehabilitation methodology - sustainable construction and demolition waste management	Ana Antunes, Hugo Costa, Ricardo Carmo and Eduardo Júlio
81	Re-anchorage behaviour of ruptured tendons in bonded post-tensioned members	Liyi Pan, Ryota Kurihara, Satoshi Tsuchiya and Tetsuya Ishida
145	The effect of temperature on the static compressive strength of HPC and the consequence on fatigue resistance	Martin Markert, Hanna Schiewe and Harald Garrecht
146	Effects of different RC aggregates on the fatigue behaviour of high-strength concrete	Hanna Schiewe, Martin Markert and Harald Garrecht

Session 4-4	Topic: Sustainability of materials and structural systems, including heritage concrete structures Chairs: Jan Hoffman (DE), Éva Lublóy (HU), Dóra Szagri (HU)	Room 97
16	Recycled polypropylene fibre reinforced concrete: assessment of the mechanical properties of recycled aggregates and recovered fibres in new concrete	Guanzhi Liu, Nikola Tošić and Albert de la Fuente
87	The potential of carbonated recycled aggregates towards more sustainable concrete construction	Johannes Hron and Konrad Bergmeister
125	Applicability of fasteners in recycled aggregate concrete	Zdravka Mikulic and Konrad Bergmeister
206	Valorization of Waste Slurries: Aqueous Carbonation of Recycled Fines in Industrial Waste Water	Daniella Mehanni and Ildiko Merta

Session 4-5	Topic: Durability of existing and future concrete structures Chairs: Konrad Bergmeister (AT), Rita Kiss (HU)	Room 87
55	Numerical study on the effect of freeze-thaw damage on wet fatigue performance of reinforced concrete beams	Yanyue Qin, Kai Matsutani and Yuya Takahashi
57	Analysing corrosion of reinforced concrete elements in cracked stage under sustained loads	Muhammad Bilal, Giovanni Giacomo Bosetti, Antonio Conforti and Giovanni Plizzari
63	Tension stiffening behaviour of stainless steel reinforcing bars	Hamish Moodley, Zhanpeng Zhao and Sheida Afshan
74	Restraint-Induced Cracking in Edge-Restrained Walls: Validation of Numerical Model and Parametric Study	Karim El Khoury, Robert Vollum and Bassam Izzuddin

Day 2: Thursday 29 August
14:00 - 16:00

Session 5-1	Topic: Structural analysis, modeling and design Chairs: Marco di Prisco (IT), Árpád Ceh (SR)	Room 3 Ceremony Hall
21	Shear mechanism of Ultra-High Performance Fiber Reinforced Concrete under Shear Loading	Kefiyalew Zerfu and Fujiyama Chikako
36	Shear behaviour of UHPFRC deep beams using a two-parameter kinematic approach	Yasas Lamawansa, Eissa Fathalla and Boyan Mihaylov
18	Modeling the bond-slip effect in RC Column with Plain Reinforcement Bars	Tilong Shan, Ozgur Yurdakul and Routil Ladislav
156	Refinement of Engineering Models Through Experimental Findings on Textile-Strengthened Concrete Plates under Impact Load	Nicholas Unger, Birgit Beckmann and Manfred Curbach

Session 5-2	Topic: Assessment and structural health monitoring Chairs: Andor Windisch (DE), Peter Paulik (SL)	Room 93
137	Concrete-to-concrete interface behaviour in precast girder bridges made continuous: deficiencies and challenges	Emilia Antonia Andrade Borges, Yuguang Yang, Marco Roosen and Max Hendriks
152	Effect of temperature on the mechanical and physical properties of lining concrete in nuclear waste disposal	Shamseldin Abdo, Tri Phung, Mingzhe Tang, Robby Caspeele, Suresh Seetharam and Roman Wan-Wendner
154	An experimental investigation on shrinkage and the restraint offered by steel reinforcement	Imogen Ridley, John Forth and Nikolaos Nikitas
203	Reinforced concrete dapped-end beams' strength assessment: comparison of analytical and numerical methods	Valentina Picciano and Giuseppe Santarsiero

Session 5-3	Topic: Innovations in concrete and concrete technology Chairs: Simone Spagnuolo (IT), Éva Lublóy (HU), Anna Szijártó (HU)	Room 72
60	Fibre-reinforced sprayed concrete for use in permanent tunnel lining application	Mesfin Zenebe Gezahegn, Giuseppe Tiberti, Trabucchi Ivan and Giovanni Plizzari
85	Concept and Realisation of Direct Tensile Tests on Steel Fibre Reinforced Concrete (SFRC) with main Focus on Ease of Execution	Sören Faustmann and Oliver Fischer
170	Functionally Graded Beams: A Parametric Study and Eco-design Methodology	Salma Es-Satte, Syed Yasir Alam, Jean-Michel Torrenti and Ahmed Loukili
148	Planetary Mill to Improve Coal Gangue Properties for Geopolymer Application	Siti Natrah Binti Abd Bakil and Gábor Mucsi

Session 5-4	Topic: Sustainability of materials and structural systems, including heritage concrete structures Chairs: Ildiko Merta (AT), Balázs Nagy (HU), Nikola Tosić (ES)	Room 97
41	Investigation into the mechanical performance of concrete foundations affected by Alkali-Silica Reaction	Sylvain Langlois, Amelie Fau, Maroua Maaroufi and Farid Benboudjema
102	Pozzolanic reactivity of mechanically activated construction and demolition waste	Cornelius Ngandu, Ákos Debreczeni and Gábor Mucsi
116	The effect of metakaolin content on the fire resistance of concrete	Zubair Yousuf and Viktor Hlavička
98	Analysis and sustainable reuse of the concrete structural systems of the European network of architectural heritage of the Cold War.	Alessandra Vazzoler, Giovanni Plizzari and Olivia Longo

Session 5-5	Topic: Maintenance, retrofitting or strengthening of concrete structures Chairs: Albert De La Fuente Antequera (ES), Florian Kovács (HU)	Room 87
67	Evaluation of fibre orientation of sprayed Ultra-High Performance Fibre Reinforced Shotcrete (UHPFRSC) with an opto-analytical approach	Maximilian Kronau, Andre Strotmann, Sören Faustmann, Jörg Jungwirth and Oliver Fischer
177	A Genetic Algorithm to optimize seismic retrofit interventions on existing RC structures	Francesco Nigro and Enzo Martinelli
180	Integrated renovation of reinforced concrete buildings through cold-formed steel panels with burring holes	Michelle Gualdi, Andrea Belleri, Alessandra Marini and Atsushi Sato
228	Enhancing properties of concrete structures by using slurry infiltrated fiber concrete	Wisam Alzweehm and György L. Balázs

Day 2: Thursday 29 August
16:30 - 18:00

Session 6-1	Topic: Structural analysis, modeling and design Chairs: Zoltán Orbán (HU), Dezső Hegyi (HU), Nikola Tosić (ES)	Room 3 Ceremony Hall
95	Seismic Performance of Coupled Transfer Structures: The Effect of Stiffness in Coupling Beams	Jahyung Koo and Honggun Park
4	Concrete notch failures in timber-concrete composite deck - Incremental Upper Bound Modelling	Peter Kolt Rasmussen, Linh Cao Hoang, Jesper Harrild Sørensen and Bent Feddersen
153	An analytical method to evaluate effects of screw connectors on effective bending stiffness of Timber-Concrete Composite slabs	Laura Corti and Giovanni Muciaccia

Session 6-2	Topic: Composites for strengthening of concrete structures Chairs: Tamás Nagy-György (RO), Sándor Sólyom (HU)	Room 93
30	Prediction of ultimate debonding strain for FRP sheet bonded to concrete utilizing numerical analysis	Mitsuhiko Ozaki and Yasuhiko Sato
168	Bond behaviour of carbon textile reinforced concrete	David Sandmann and Steffen Marx
211	A new confinement configuration of conventional steel hoops with carbon fiber mesh for HSC columns	Yedidya Shachar, Rami Eid and Avraham Dancygier

Session 6-3	Topic: Durability of existing and future concrete structures Chairs: Árpád Ceh (SR), Katalin Kopecskó (HU)	Room 72
216	Assessing Shrinkage in Limestone-Enhanced Concrete	Abdelraouf Kenai, William Wilson, Luca Sorelli and Arezki Tagnit-Hamou
139	Innovative precast eco-HD-LWAC composite walls. Development of dry-connections	Ricardo Martins, Ricardo Do Carmo, Hugo Costa, Eduardo Júlio, André Furtado and Romain Sousa
121	Durability of short hemp fibre reinforced fly ash-based alkali-activated materials	Bojan Poletanovic and Ildiko Merta

Session 6-4	Topic: Bridges, reservoirs, dams, tunnels and road construction Chairs:Giovanni Plizzari (IT), Robert Németh (HU)	Room 97
52	Towards design optimization of tunnel joints – use of DIC on partially loaded fiber reinforced concrete specimens	Angel Denia, Andrea Monserrat, Xavier Torelló and Albert de la Fuente
91	Theoretical and Numerical Analysis of Shear force Distribution in Joint between Corrugated Steel Web and Concrete Top Slab	Haochu Cai, Sihao Wang and Yuqing Liu

Session 6-5	Topic: Digitalization – 3D concrete printing Chairs: Francesco Nigro (IT), Rita Nemes (HU)	Room 87
108	Characteristics of 3D Printed Concrete	Marwah Thajeel and György Balázs
189	Image-based analysis of fresh concrete open-channel-flow for obtaining rheological properties	Christian Vogel, Max Coenen, Tobias Schack and Michael Haist
223	Connections between single elements made by 3D printed concrete	Stefan Mitrovic and Ivan Ignjatovic

Day 3: Friday 30 August
09:00 - 10:30

Session 7-1	Topic: Structural analysis, modeling and design Chairs: Wit Derkowski (PL), Balázs Kövesdi (HU)	Room 79*
25	Experimental investigation of welded reinforcement grids for partial area loading	Fabian Morger and Walter Kaufmann
46	Model uncertainty for steel welded box section beams	Erzsébet Bärnkopf, Balázs Kövesdi and Balázs Somodi
222	The Influence of the Partitioning Web Plate on the Increase of the Ductility of the Steel-Concrete-Steel Structure	Roman Kubát and Petr Bílý

Session 7-2	Topic: Innovations in metallic and non-metallic reinforcements Chairs: Zsombor Szabó (RO), Marko Marinković (SR),	Room 93
40	Effects of semi-cyclic loading on reinforced concrete beams strengthened with Iron-Based Shape-Memory Alloy bars	Antoni Mir Pons, Sandra del Río-Bonnín, Carlos Ribas, Joaquín G. Ruiz-Pinilla and Antoni Cladera
61	Experimental study of Precast Segmental Bridge keyed joints using two types of post-tensioned fasteners	Rogelio Franco Segarra, José Luís Bonet Senach and Pedro Miguel Sosa
151	Recycled Aggregate Concrete reinforced with a Novel Fiber Cocktail	Makrini Macha and Konrad Bergmeister

Session 7-3	Topic: Structural analysis, modeling and design Chairs: János Szép (HU)	Room 72
65	Structural Performance Investigation Of Beams, Columns And Beam–Column Joints Using Slag-Based Concrete	Han-Se Moon, Do-Hun Kim, Kwang-Won Jo, Hyeon-Jong Hwang, Chang-Soo Kim, Jae-Hong Jeong, Chan-Kyu Park and Hong-Gun Park
123	Exploring Alkali-Silica Reaction Effects on Concrete Bond Strength: Literature Review and Novel Experimental Approach	Jesper Kierkegaard Hansen, Søren Gustenhoff Hansen and Henrik Brøner Jørgensen
144	Physicochemical characterization of synthesized Calcium-Aluminium-Silicate-Hydrate phase	An Thai Nguyen, Delphine Durce, Quoc Tri Phung and Elke Gruyaert

Session 7-4	Topic: Innovations in concrete and concrete technology Chairs:Alfred Strauss (AT), Viktor Hlavicka (HU)	Room 97
192	De-airing of fresh concrete – Unraveling the mechanisms of a very old problem	Bastian Strybny, Julian Link, Marcus Zuber, Michael Haist, Max Coenen and Tobias Schack
207	Negative Emission Pathways Through CO2 Uptake of Powders in Concrete: A Preliminary Study on Influencing Parameters	Bayram Tutkun and Ildiko Merta
212	Fuzzy Logic and Push-Out Test Innovations for Fiber-Reinforced Self-compacting Concrete Assessment	Vahid Shafaie, Oveys Ghodousian, Géza Herczeg and Majid Movahedi Rad

Session 7-5	Topic: Composites for strengthening of concrete structures Chairs: Matteo Colombo (IT), István Sajtos (HU),Chandan Gowda (UK)	Room 87
48	Experimental Investigation of Flexural Behavior of Composite Castellated Steel Beams	Ali Mansi, László Dunai and Alaa Al-Zuhairi
80	Advancements and Challenges in Composite Steel and Concrete Structures: A Focus on Adhesive Connections	Alexandre Rocha, José B. Aguiar and Isabel B. Valente
221	Improving tensile and UV resistance properties of GFRP based on enhanced multiphase structures	Yinlong Cao, Yanqun Sun, Peng Zhang, Jiuwen Bao and Yifei Cui

*Room 79 is one floor below Room 72

Day 3: Friday 30 August
11:00 - 13:00

Session 8-1	Topic: Structural analysis, modeling and design Chairs: Imre Kovacs (HU), Olivér Fenyvesi (HU)	Room 79*
42	A risk-based framework for enhancing the robustness of building structures through segmentation	Giacomo Caredda, Nirvan Makoond, Manuel Buitrago, Juan Sagaseta, Marios Chryssanthopoulos and Jose M. Adam
50	Butt joints of highly reinforced concrete columns	Johannes Glaßner and Nguyen Viet Tue
64	Effect of aspect ratio in shear-friction strength of squat wall	Jaehan Oh and Honggun Park
70	Symmetry sensibility of a snap-through problem	Márton Módis and Flórián Kovács

Session 8-2	Topic: Assessment and structural health monitoring Chairs: Stefen Marx (DE)	Room 93
162	Bridge vertical deflection evaluation using clinometers data obtained by Micro Electro-Mechanical Systems (MEMS) sensors.	Francesco Filippo Bico, Fabio Di Carlo and Alberto Meda
186	Analysis of a stock of reinforced and prestressed concrete bridges – The case of the A3 highway (Southern Italy)	Carmine Lupo and Luigi Petti
217	Inspection of bridges in the Province of Brescia, Italy: a critical discussion	Luca Longinotti, Nico Di Stefano and Fausto Minelli
174	Utilizing IoT, ML and AI to Extend the service life of RC Structures and develop Maintenance Strategy	Saeideh Faghfouri and Alfred Strauss

Session 8-3	Topic: Structural analysis, modeling and design Chairs: Jan Hoffmann (DE), János Lógó (HU)	Room 72
77	Anchoring of steel components using concrete dowels in wall-type components	Manuel Koob, Jens Minnert and Wolfgang Kurz
142	A simplified spring model for the design of fastening systems	Sebastian Geiger and Jan Hofmann
147	Use of numerical simulations for the design of fasteners – limitations and way forward	Johannes Holder, Hitesh Lakhani and Jan Hofmann
157	Investigation of the Behaviour of Demountable Shear Connectors Embedded in Concrete and Mortar	Krisztián Király, Levente Borsi, Nauzika Kovács and László Dunai

Session 8-4	Topic: Buildings and shells Chairs: Jan Vítek (CZ), Giovanni Muciaccia (IT)	Room 97
17	Experimental assessment of static and dynamic properties of a new sustainable composite floor	Ervin Halilovic and Wit Derkowski
72	Experimental study of the seismic behaviour of intermediate-story frames in buildings filled with concrete blocks	Jorge Ignacio Garces Arroyo, Francisco Javier Pallarés Rubio and Luis Pallarés Rubio
92	Experimental investigation on seismic performance of light infill masonry wall with prefabricated formwork constructed RC frames	Cheng Yin and Bin Zhao
84	Cyclic Loading Test for Reinforced Concrete Columns with 700MPa Reinforcement	Mok-In Park and Hong-Gun Park

Session 8-5	Topic: Structural reliability and risk analysis Chairs: Yifei Cui (CN), Róbert Németh (HU)	Room 87
15	Input for a rapid risk assessment methodology for existing flood-prone bridges	Zdenek Shanel, Özgür Yurdakul, Ladislav Routil and Maria Pregnolato
54	Reliability analysis of concrete crack leakage based on computational fluid dynamics	Yousang Lee and Hong-Gun Park
86	Loss Assessment Study of the Base Station Towers in Beşiktaş District of Istanbul Using HAZTURK Software	Omer Bilginer and Himmet Karaman
71	Computational determination of pressure coefficients of an anticlastic tensile membrane surface	Richárd Joao Rosa and Krisztián Hincz

*Room 79 is one floor below Room 72

Day 3: Friday 30 August
14:00 - 16:00

Session 9-1	Topic: Structural analysis, modeling and design Chairs: Matteo Colombo (IT), Tamás Kovács (HU)	Room 79*
51	Design Forces for Punching Shear Verification in Thick Raft Foundations with Special Regard to Partial Safety Factors	Yolcu Sever and Dirk Schlicke
113	Punching shear of post-tensioned steel fibre reinforced concrete elevated slabs without longitudinal reinforcement	Chiara Gaddi, Matteo Colombo and Marco di Prisco
160	Shear Resistance of Prestressed Beams: Experimental Validation and Parametric Nonlinear Analysis	Jaroslav Baran, Viktor Borzovič and Fernando Gonzalez-Vidosa
224	Robustness of prestressed concrete columns	Jonas Knitl and Konrad Bergmeister

Session 9-2	Topic: Assessment and structural health monitoring Chairs: Karim Khoury (UK), Dóra Szagri (HU)	Room 93
53	Solving Inverse Problems using Machine Learning-aided Optimization Method	Bohumil Šplíchal, David Lehký, Hana Šimonová, Barbara Kucharczyková and Katarína Lamperová
136	Digital performance and lifetime assessment of concrete structures interacting with soil, environment and climate	Benjamin Täubling-Fruleux and Alfred Strauss
229	Digital Twin-Based Health Monitoring and Damage Detection for Reinforced Concrete Bridges	Asseel Al-Hijazeen and Kálmán Koris

Session 9-3	Topic: Structural analysis, modeling and design Chairs: Giovanni Muciaccia (IT), Florián Kovács (HU)	Room 72
173	Adjustment of sensitivity factors for the assessment of reinforced concrete Portal-Frame underpass short span bridge	Midula Alam, Francis Lavergne, Silvia Ientile, André Orcesi and Franziska Schmidt
183	Switch-free Harmonic Vibrations of Multi-Degree-of-Freedom Piecewise Linear Elastic Structures	Bilal Alzubaidi
185	Design-Based Material Optimisation of Reinforced Concrete Structures	Jeff Larsen, Peter Noe Poulsen, John Forbes Olesen and Linh Cao Hoang
220	A Computer Vision Method to Measure Distribution of Crack Characteristics in Reinforced Concrete Elements	Morteza Hagh, Stephen Foster and Hamid Vali Pour

Session 9-4	Topic: Buildings and shells Chairs: David Fernandez-Ordonez (CH), Viktor Hlavicka (HU)	Room 97
106	Influence of surface characteristics on the connection of reused concrete members with detachable dry joints	Ben Stöhr and Alexander Stark
109	A Rapid Digital Pre-design Process for Functionally Graded Concrete With Mineral Void Formers	Carl Niklas Haufe, David Nigl, Benedikt Strahm and Lucio Blandini
110	Modular construction using precast concrete elements: Investigations on the erection of prestressed modular shell structures	Felix Hofmann and Alexander Stark
140	Nonlinear Modeling and Machine Learning for Interstorey Damage State Classification in 10-Story RC Frame Building	Filip Đorđević and Marko Marinković

*Room 79 is one floor below Room 72

About Budapest University of Technology and Economics – BME

In 1635, Péter Pázmány, Primate, Archbishop of Hungary, has founded the first Hungarian University of the New Age at Nagyszombat. In the late 18th century, The University moved to Buda and becomes the University of Buda. In 1782, Emperor Joseph II established the Institutum Geometricum as part of the Faculty of Liberal Arts at the University of Buda. The Institutum, the direct predecessor of the Budapest University of Technology and Economics, was the first in Europe to award engineering degrees to students of land surveying, river control, and road construction. In 2000 the official name changed to Budapest University of Technology and Economics (BME).
At present more than 110 departments and institutes operate within the structure of eight faculties. About 1100 lecturers, 400 researchers and other degree holders and numerous invited lecturers and practicing expert specialists participate in education and research at the Budapest University of Technology and Economics.

For more information visit:
https://www.bme.hu/en

Symposium venue

The symposium will take place in the historical central building of the Budapest University of Technology and Economics (BME), building K. The venue is in the close vicinity of the heart of Budapest, with an amazing view of the Danube riverbank with several types of road bridges across the river and the Pest-side of the capital. The city center can be reached in not more than 10 minutes' walk.
The outstanding building has already hosted various international engineering conferences and has been operating as the largest education center of Hungarian engineers.

Map of Budapest, Hungary *(only a part of the city is shown)*

The full address of the venue is as follows:

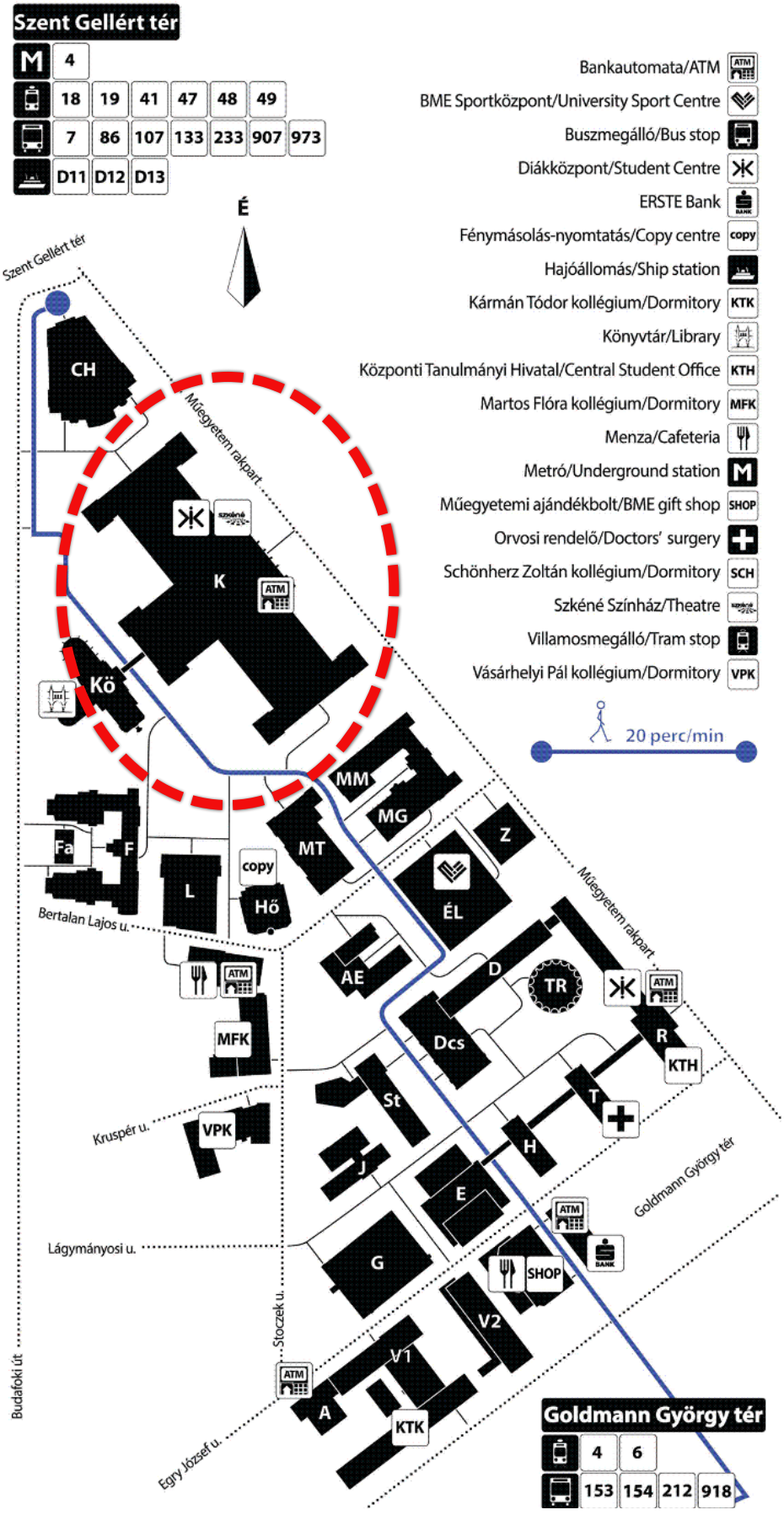
Budapest University of Technology and Economics (BME), Faculty of Civil Engineering

H-1111 Budapest, Műegyetem rkp. 3, Building K

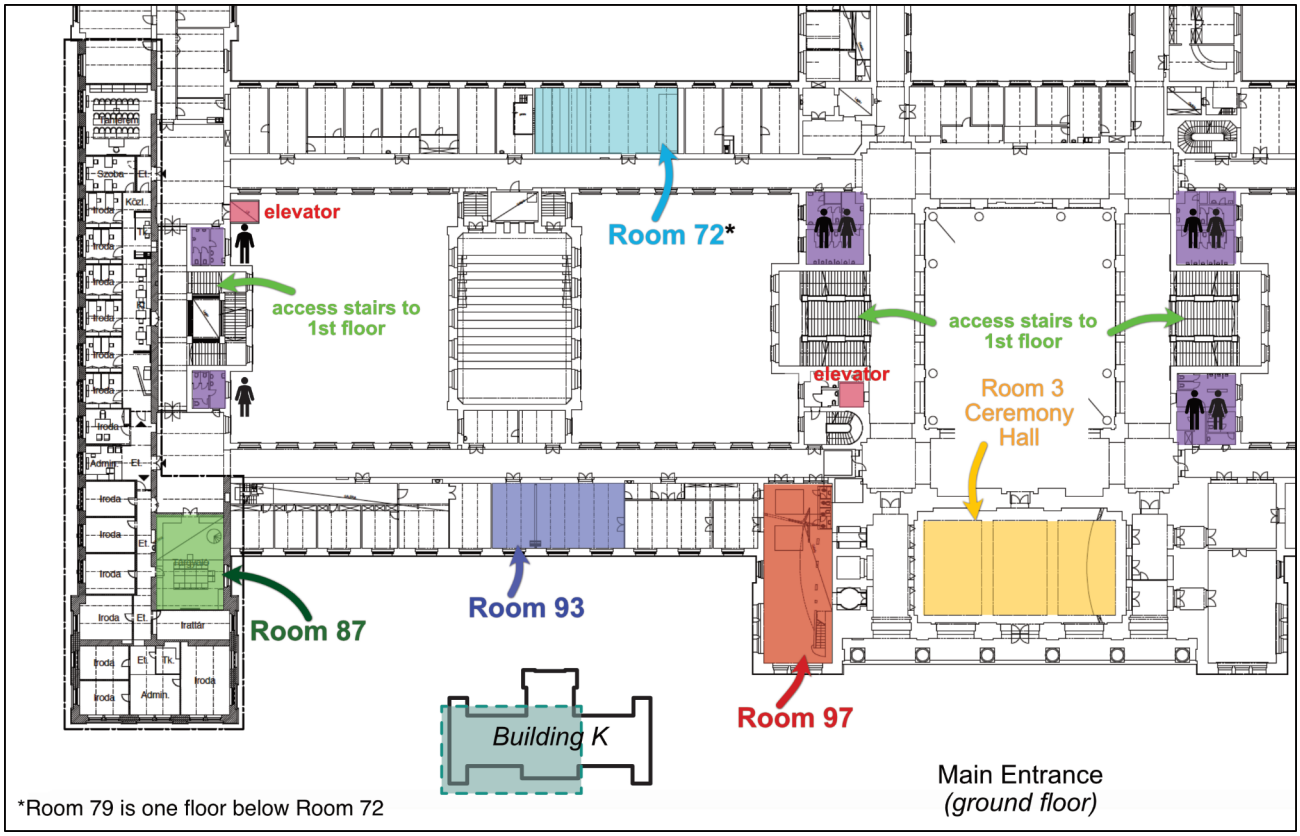
GPS Coordinates: 47.4816676334 (lat) 19.0559487888 (long)

Building K, BME

Entrance to the meeting venue, along with the closest public transport stations (Szent Gellért tér-Műegyetem)



Map of University Campus (points of interest highlighted), the symposium is held in building K, public transportation options (metros, trams, buses) and stations are shown as well



Map of 1st floor of building K *(only a part of 1st floor)*

How to get to the venue

Building K of BME is well accessible either by public transport services from the international airport and the main railway stations in downtown or by car through the motorways.

From Liszt Ferenc International Airport:

By public transport:
Take **Bus no. 200E** (frequency approx. 7-10 minutes), get off at terminal station "Kőbánya-Kispest", change to **Metro line M3** until "Kálvin tér" then to **Metro line M4** (towards "Kelenföld vasútállomás") and get off at "Szent Gellért tér-Műegyetem" station. The venue is located at 3 minutes walking distance from Szent Gellért tér- Műegyetem metro station. The approximate journey time is 1 hour. Tickets are available at the airport. Search for the ticket machine in bus station 200E. You must validate your ticket on the bus. You must buy a separate ticket for metro (validate before entering the station).

Alternatively, there is a **direct bus (100E)** from the airport to the city center (Kálvin tér and Deák tér), its departure point is next to that of bus 200E. Please note that a different type of ticket is required for this service (Airport shuttle bus single ticket, 2200 HUF). Tickets can be purchased from machines at the airport, via a mobile application, or directly on the bus using the onboard terminal, where payment by card is accepted.

By taxi: Reservations can be made in person at the Főtaxi booths located at the exits at Terminals 2A and 2B (follow the painted signs on the floor in the arrival hall). At the taxi rank in front of the stands, taxis are parked continuously waiting for passengers. All cars are equipped with a POS terminal; therefore, credit cards are also accepted. Taxis operate at a fixed tariff. A ride to the city center should typically cost around 10000 HUF (25 EUR) depending on traffic conditions.

By shuttle: Airport Shuttle minibus service operates between the airport and any location in Budapest. Special rates are available for airport-hotel travels. Tickets can be purchased at the desk on arrival in the baggage reclaim hall (follow the painted signs on the floor in the arrival hall).

From the main railway stations to the venue:
Keleti station: by metro M4, stop: „Szent Gellért tér-Műegyetem"
Nyugati station: by tram no. 4 or 6, stop: „Petőfi híd, budai hídfő"
Déli station: by tram no. 56, 56A, stop: „Szent Gellért tér"
Kelenföld station: by metro M4, stop: „Szent Gellért tér-Műegyetem".

The following public transportation lines stop near to the meeting venue.

Metro/Subway:
Metro line M4 – stop: Szent Gellért tér-Műegyetem.

Trams:
Lines 4, 6 to Petőfi híd budai hídfő (Goldmann György tér)
Lines 19, 41, 47, 48, 49, 56, 56A to Szent Gellért tér-Műegyetem

Buses:
Bus n° 7, 107, 133E to Szent Gellért tér-Műegyetem
Bus n° 153, 212A, 212B to Petőfi híd, budai hídfő (Goldmann György tér)

Useful application: BudapestGO.
https://bkk.hu/en/tickets-and-passes/budapestgo/

English site of BKK and travel options in Budapest.
https://bkk.hu/en/
https://bkk.hu/en/visiting-budapest/travel-options/

From the motorways to the venue by car:
M1 (E60, E75), M7 (E71): M1-M7 - Budaörsi út - Nagyszőlős u. - Bocskai út - Október 23. u. - Irinyi József u. - Műegyetem rakpart
M3 (E71): M3 - Hungária körút - Könyves Kálmán körút - Rákóczi híd - Pázmány Péter sétány - Műegyetem rakpart
M5 (E75): M5 - Nagykőrösi út - Gyáli út - Könyves Kálmán körút - Rákóczi híd - Pázmány Péter sétány - Műegyetem rakpart

Public parking (~200 places) in front of the venue building (subjected to charge).

Meals

Lunches and coffee breaks will be provided by the local organizer.

Welcome drink

Will be held at building K of BME.

Banquet

Boat cruise with dinner on the Danube River. View of famous Buda Castle (dating back to the beginning of 13th century), Parliament building, passing under the beautiful Budapest bridges such as Chain Bridge, Elisabeth Bridge etc.

Európa Boat during cruising

How to reach EURÓPA HAJÓ from BME

Location of EURÓPA HAJÓ:
The ship is docked at **Jégverem Street, 1011 Budapes**t

Website:
https://europahajo.hu/

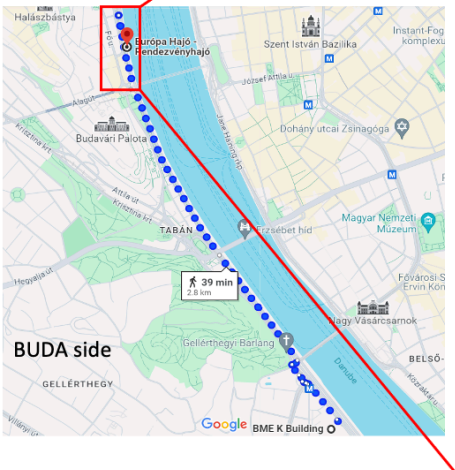
EURÓPA HAJÓ is Central Europe's largest and most equipped river event ship, with a 330 sqm panoramic terrace.

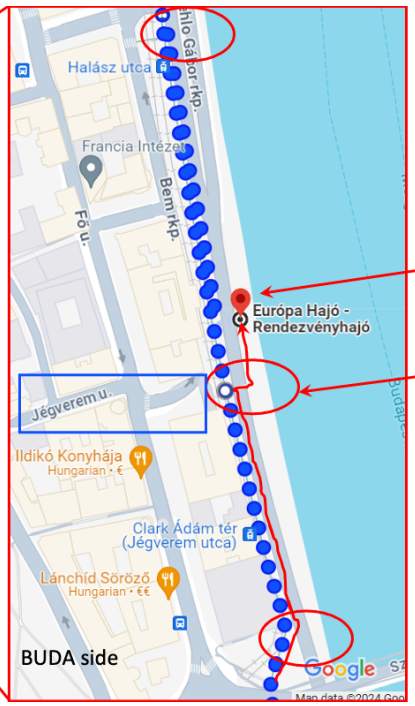
Approach on foot and by tram from BME Building K to EURÓPA HAJÓ (= EURÓPA SHIP)

Link/English
https://maps.app.goo.gl/Mqsk9CshzyAK51S88

Approach on foot from BME Building K to EURÓPA HAJÓ (= EURÓPA SHIP)

Link/English
https://maps.app.goo.gl/FxMqV6UML4Lmqnnu8





Leave here the upper quay (ramp close to the tram station of Halász street to reach the lower quay)

EURÓPA HAJÓ (venue)

The only nearby pedestrian crossing for safe crossing of the busy lower quay.
But to do so you have to leave the upper quay footpaths at the marked places and continue up the stairs or ramp to the lower quay footpath.

Leave here the upper quay (stairs after you leave the Chain Bridge)