

İTÜ



TÜRKİYE
DEPREM
VAKE

fib
CEB•FIP
Turkey

fib Symposium
CEB•FIP

2023 ISTANBUL
5 - 7 JUNE

Istanbul Technical University

building for
the future:
durable
sustainable
resilient



PROGRAMME

fibsymposium2023.org



PROGRAMME

5 June 2023 – Monday

08:00: Registration Opening

OPENING SESSION

MAIN HALL

09:00-09:05 Opening and Welcome Speeches
Alper Ilki

09:05-09:10 Welcome Speech
ITU Rector: Ismail Koyuncu

09:10-09:25 fib President's address
Stephen Foster

09:25-09:30 fib Fellows 2023
Stephen Foster

09:30-09:35 fib Medal recipients 2023
Stephen Foster

09:35-09:40 fib Honorary Members 2023
Stephen Foster

09:40-09:45 Presentation on the honoured engineers (Dr. Ersin Arioğlu & Prof. Dr. Nahit Kumbasar)
Alper Ilki

09:45-09:55 AAYE presentation
Giovanni Plizzari

Presenting AAYE Awaerdee in Design and Construction Category on behalf of Dr. Ersin Arioğlu Award (Yapı Merkezi)
(Presenting the Award: Ülkü Arioğlu)

Presenting AAYE Awaerdee in Research Category on behalf of Peikko Group Corporation
(Presenting the Award: Jan Bujnak)

09:55-10:05 Awardees' presentation (Design and Construction Category)

10:05-10:15 Awardees' presentation (Research Category)

10:15-10:30 Music Concert (**Piano: Ceyda Piralı & Vocal: Selmin Artemiz**)

KEYNOTE LECTURES

Session Chair: Stephen Foster

MAIN HALL

10:30-11:00 "The Beauty of Simplicity and Recyclability"
Keynote Lecture - Konrad Bergmeister

11:00-11:30 "Achieving Massive CO2 Reductions in The Cement and Concrete Sector"
Keynote Lecture - Karen Scrivener

11:30-11:45 Coffee Break



PROGRAMME

1B01: Special Session- February 6th, 2023 Kahramanmaraş Earthquakes (Organizer: Alper İlki)

MAIN HALL

Session Chairs: Mustafa Erdik, Koichi Kusunoki

- 11:45-12:00 Field observations from February 2023 Kahramanmaraş and Hatay earthquakes and structural design suggestions for reduction of future losses
1656 - Alper İlki
- 12:00-12:15 February 6, 2023 Earthquakes in Türkiye
1660 - Mustafa Erdik
- 12:15-12:30 3Preliminary report on the field reconnaissance due to the 2023 Turkey-Syria Earthquake
1657 - Koichi Kusunoki
- 12:30-12:45 Ground Motions from the February 6th, 2023 Kahramanmaraş Earthquakes Viewed from the Structural Engineering Perspective
Ufuk Yazgan
- 12:45-13:00 Loss Assessment in Pre-, Co- and Post-Seismic Phases: Kahramanmaraş Earthquake and Istanbul Cases
1661 - Ufuk Hancılar
- 13:00-13:15 Performance of Pipelines during the February 6, 2023 Kahramanmaraş Earthquakes
1658 - Selçuk Toprak

1B02: Durable structures -corrosion effect

HALL 1

Session Chairs: Zila Rinaldi, Çağlar Göksu Akkaya

- 11:45-12:00 **1404** - Estimated Time to Failure of Reinforced Concrete Members Due to Corrosion
Goli Nosson Olatomide Fayomi
- 12:00-12:15 **1405** - Effect of cement type on the concrete resistance to chloride penetration over time
Federica Lollini, Nicoletta Russo, Matteo Gastaldia
- 12:15-12:30 **1074** - Influence of Seawater Curing on Reinforced Concrete Located in XS2 Environment
Gonzalo Pazó, Víctor Lanza, Pilar Alaejos, Ana Lope
- 12:30-12:45 **1284** - Structural behaviour of Gerber half-joints subjected to steel corrosion
Zila Rinaldi, Di Carlo F, Molaioni F
- 12:45-13:00 **1304** - Experimental tests on RC hollow columns with steel reinforcement corrosion
Francesco Fabbrocino, Gian Piero Lignola, Andrea Prota, Edoardo Cosenza Gaetano Manfredi
- 13:00-13:15 **1378** - Austenitic and Lean Duplex Stainless Steel Rebars in Concrete Under Simultaneous Load and Marine Corrosion Effect: A Service Lifetime Study
Estibaliz Briz Blanco, M. V. Biezma, I. Calderon, J.M.Romera, A. Santamaría



PROGRAMME

1B03: Fiber reinforced polymer reinforcements

HALL 2

Session Chairs: Vicki Brown, Tom Molkens

- 11:45-12:00 **1271** - Analysis of Concrete Deep Beams Reinforced with Fibre-Reinforced Polymer Bars through Indeterminate Strut and Tie Method
Shuqing Liu, Maria Anna Polak
- 12:00-12:15 **1370** - Resilient properties of a GFRP-embedded reinforced concrete slab
Tom Molkens, Kathleen Lauwens
- 12:15-12:30 **1589** - Bond Strength of Basalt FRP Bars with Different Surface Treatments to Plain and Fiber Reinforced Concrete
Abathar Al-Hamrani, Wael Alnahhal
- 12:30-12:45 **1069** - Multi-physics modelling of moisture diffusion in the FRP-concrete adhesive joints
Yilin Wang, Roman Wan-Wendner, Antonio Cibelli, Jan Vorel, Philipp Siedlaczek, Giovanni Di Luzio, Jan Belis
- 12:45-13:00 **1105** – Comparison of Steel and GFRP Reinforcement in the Analysis and Design of a Mid-rise Building
Mahrukh Midrar, Vicki Brown
- 13:00-13:15 **1308** - Numerical Investigation on the Efficacy of CFRP Jackets for Retrofit of Reinforced Concrete Columns with Sparse Stirrups
Asad-ur-Rehman Khan, Marina L. Moretti, and Shamsoon Fareed

1B04: Concrete structures-fire exposure

HALL 3

Session Chairs: Matteo Colombo, Ömer Tuğrul Turan

- 11:45-12:00 **1356** - Fire resistance of sustainable mortar with plastic waste aggregates
Matteo Colombo, Agnese Scalbi, K Grigoriadis, Caverzan Alessio and Paolo Negro
- 12:00-12:15 **1375** - Novel blast and fire resistant composite materials: design and preliminary results
Demetris Nicolaidis, Ioanna Giannopoulou, Ponsian Mwobeki Robert, Thomaida Polydorou, Demetris Demetriou, Ourania Tsioulou, Andreas Lampropoulos, Michael F. Petrou
- 12:15-12:30 **1041** - Seismic performance evaluation of reinforced concrete columns during fire exposure
Yu Jiang, Qingjun Chen
- 12:30-12:45 **1527** - Fire performance of concrete structures with glass fibre reinforced polymer rebars: experimental tests, numerical analysis and design
Inês C. Rosa, João P. Firmo, João R. Correia, Mário R. T. Arruda and António P. C. Duarte
- 12:45-13:00 **1183** - Precast concrete industrial portal frames subjected to simulated fires
Bruno Dal Lago, Andrea Nicora, Paride Tucci and Antonino Panico
- 13:00-13:15 **1060** - Dual steel-carbon confinement of HSC columns considering fire resistance
Avraham N. Dancygier, Avraham N. Dancygier, Rami Eid



PROGRAMME

1B05: Concrete materials

HALL 4

Session Chairs: Minehiro Nishiyama, Hakan Nuri Atahan

- 11:45-12:00 **1357** - Effects of temperature and NaCl concentration on the adsorption of C-S-H gel in cement paste: a multi-fidelity molecular dynamics simulation
Jie Cao, Chao Wang, Tongfang Wang, Jaime Gonzalez-Libreros, Yongming Tu, Gabriel Sas, Lennart Elfgren
- 12:00-12:15 **1202** - Numerical study of the ITZ volume fraction in concrete
Ahmed Naija, Karim Miled
- 12:15-12:30 **1113** - Prediction of Chloride Ingress Profiles in Concrete by Machine Learning
Simon Fjendbo
- 12:30-12:45 **1584** - Sensitivity Analysis of the Thermal Properties in Early Age Modeling of Mass Concrete
Farzad Danaei, Yılmaz Akkaya
- 12:45-13:00 **1212** - Effect of fibre tensile strength, aspect ratio and volume fraction on rheological and mechanical properties of high-strength self-compacting concrete
Sivakumar Kulasegaram, Abdullah Alshahrani
- 13:00-13:15 **1528** - Effect of Elevated Temperatures on Mechanical Properties of Fly-Ash-based Geopolymer Concrete
Chiharu Ota, Minehiro Nishiyama, Chiharu Ota, Atsushi Shibayama,
- 13:15-13:30 **1200** - Adaptation of the infrastructure to climate change – research needs
Johan Silfwerbrand

1B06: Structural performance-bridges

HALL 5

Session Chairs: Pinar Okumuş, Glenn Washer

- 11:45-12:00 **1049** - Thermal Loads and Moments in Reinforced Concrete Integral Bridges
Sarah Skorpen, Elsabe Kearsley
- 12:00-12:15 **1064** - Comparative Assessment of RC and CFST Columns in Rigid-Frame Bridges Subjected to Horizontal and Vertical Ground Motions
Javad Hashemi, Ali Al-Attaqchi and Riadh Al-Mahaidi
- 12:15-12:30 **1110** - Experimental and numerical assessment of historical steel-concrete composite bridge decks without mechanical connectors
Mauro Poliotti, Yuguang Yang and Ane de Boer
- 12:30-12:45 **1395** - Post-Tensioning Force Measurement Using Optical Fiber Sensor-Embedded Strand for Prestressed Concrete Structures
Pinar Okumus, Christopher Williams, Manan Khatri, and Reggie Holt
- 12:45-13:00 **1059** - A Non-proprietary Ultra High-Performance Concrete for Longitudinal Field-Cast Connection between Precast Bridge Decks
Ali Shokrgozar, Arya Ebrahimpour, and Mustafa Mashal
- 13:00-13:15 **1645** - Bridge Maintenance Prioritization: A Structural Reliability-Based Approach
Mattia Francesco Bado, Francesca Poli, Francesca Brighenti, and Daniele
- 13:15-14:30 Lunch Break**



PROGRAMME

1C01: Fiber/textile reinforcement

MAIN HALL

Session Chairs: **Thanasis Triantafillou, Marco di Prisco**

- 14:30-14:50 **1237 - Invited-Theme Lecturer** : “Innovative Retrofitting of RC Structures using Textile Reinforced Alkali-activated or Cement-based Mortar Overlays: Application in Short Columns “
Thanasis Triantafillou, Lazar Azdejkovic
- 14:50-15:05 **1053** - Cyclic Tests on Masonry-infilled RC frames Retrofitted with Textile-Reinforced Mortars Combined with Thermal Insulation
Christis Z. Chrysostomou, Renos Votsis, Nicholas Kyriakides, Christiana A. Filippou , Rogiros Illampas5 and Stathis Bousias
- 15:05-15:20 **1474** - Damage evaluation of Textile Reinforced Concrete (TRC) subjected to high-velocity impact load
Georgia Thermou, Mohamed Esaker Luis Neves
- 15:20-15:35 **1441** - Pull-out Tests on AR-glass Fabrics Embedded in Plain and Fibre-Reinforced Cementitious Mortars
Marco Carlo Rampini, Giulio Zani, Matteo Colombo and Marco di Prisco
- 15:35-15:50 **1081** - Bending load-bearing behaviour of concrete components reinforced with impregnated flax fibre textiles
Tânia Feiri, Katrin Zecherle Marcus Ricker, Jan Binde
- 15:50-16:05 **1568** - Influence of bond conditions on the confinement effectiveness of FRCM composites
Klajdi Toska, Flora Faleschini and Mariano A. Zanini
- 16:05-16:20 **1581** - Drapability of AR-Glass Textile Reinforcements to Evaluate Suitability for Applications in Free-Form Precasted Concrete Panels
Shantanu Bhat, Shantanu Bhat, Thomas Gries

1C02: 3D printed concrete

HALL 1

Session Chairs: **Nilüfer Özyurt Zihnioğlu, Emre Örtemiz**

- 14:30-14:50 **1663 - Invited-Theme Lecturer** : “Digital Transformation in the Construction Sector; Building Construction and Urban Furnitures Production With 3D Printer Technology”
Emre Örtemiz
- 14:50-15:05 **1089** - Experimental Study on the Directional Dependency of 3D Printed Concrete in the Elastic Range
Lien Saelens, Roman Wan-Wendner, Robby Caspeepele and Kim Van Tittelboom
- 15:05-15:20 **1240** - 3D Concrete Printing – From mechanical properties to structural analysis
Christiane Richter, Christiane Richter
- 15:20-15:35 **1238** - Bond between layers of cementitious mortars developed for 3D printing
Augusto Soares, Ana Rodrigues, Hugo Costa, Ricardo Carmo, Florindo Gaspar and Eduardo Júlio
- 15:35-15:50 **1239** - 3D printing cement-based materials using 100% of recycled aggregates
Nico Obermeier, Felix Wiese, Andrea Kustermann] and Thorsten Stengel



PROGRAMME

- 15:50-16:05 **1484** - Through Textile to Reinforced 3D Concrete Printing
Gözdem Dittel, Steffen Dringenberg, and Thomas Gries
- 16:05-16:20 **1582** - Implementation of continuous textile fibers in 3D printable cementitious composite
Ata Nikravan, Olcay Gurabi Aydogan1, Gozdem Dittel, Martin Scheurer, Shantanu Bhat, Nilufer Ozyurt, and Thomas Gries

1C03: Precast concrete components

HALL 2

Session Chairs: **Akio Kasuga, Ashraf Ashour**

- 14:30-14:50 **1610** - Invited-Theme Lecturer : “Demountable reinforced concrete structures - a way forward to minimize energy and waste in construction industry”
Ashraf Ashour
- 14:50-15:05 **1199** - Bolted column shoe connections - Sustainable and smart solution for precast structures
Jaakko Yrjölä, Jorma Kinnunen
- 15:05-15:20 **1030** - Development of Precast Concrete Members with Non-contact Lap Spliced Longitudinal Bars Encased in Grouted Corrugated Ducts
Hiroto Takatsu, Hassane Ousalem
- 15:20-15:35 **1628** - Automated Recognition and Measurement Based on 3D Point Cloud for Precast Concrete Components Connection
Jiangpeng Shu, Xiaowu Zhang, Wenkai Xiao, Yu Jiang, Zehao Zhuo, He Zhang, Yiqiang Xiang
- 15:35-15:50 **1588** - Investigation on The Behavior of Interior Frame Joint using Simplified Bolt Connections
Jie Lei
- 15:50-16:05 **1577** - Development of Temporary Joint Structure for Width-Dividing Construction of Slab Replacement Work
Yusuke Nagai, Toshimichi Ichinomiya and Hiroyuki Yamanaka
- 16:05-16:20 **1406** - Equivalent linear and nonlinear numerical simulation of precast moment-resisting concrete frame with bolt-connected joints
Jie Yi, Di Wu and Bin Zhao

1C04: Outstanding structures-bridges

HALL 3

Session Chairs: **Altok Kurşun, Wit Derkowski**

- 14:30-14:50 **1572** - Invited-Theme Lecturer : “Cable Supported Bridges in Türkiye”
Altok Kurşun
- 14:50-15:05 **1432** - Concrete Bridge Engineering Institute (CBEI)
Gregory Hunsicker, Dr. Oguzhan Bayrak, Dr. Thanu Drimalas, Dr. Anca Ferche, Dr. Kevin Folliard,
- 15:05-15:20 **1236** - Design Innovation of the Liu-Heng Highway Bridge
Lei Li, Changjiang Wang, Zhisheng Li, Haiming Dong, Rengui Wang
- 15:20-15:35 **1195** - Lane-by-Lane Replacement of Floor Slabs on the Expressway at the Otani Bridge
Tomoaki Kawabata, Yoshitada Kirino , Nariaki Tsunoda , Akio Shiji



PROGRAMME

- 15:35-15:50 **1174** - Understanding The Construction Stage Analysis of Kozlupınar Bridge
Esra Namlı, Şefika Caculi
- 15:50-16:05 **1150** - The 1915 Çanakkale Bridge – Design and Detailing of Corbels with High Concentrated Loads
Uffe G. Ravn, Joao Costa and Thomas Löhning
- 16:05-16:20 **1018** - UHPFRC Repair of Charilaos Trikoupis Bridge M3 Pier base in the tidal & splash zone.
Philip Corbett, Cussigh François, De Wiljes Guillaume, Stathopoulos Vlamis Aris and Corbett Philip

1C05: Special Session - Recent Advances in Nonlinear Modeling of Concrete Elements and Structures (Organizer: Serhan Güner) Session Chairs: Serhan Güner, Laura Lowes

- 14:30-14:50 **1412** - Calibration and validation of OpenSees model for reinforced concrete walls using NHERI SimCenter and DesignSafe resources
Laura Lowes, Joshua Stokley
- 14:50-15:05 **1205** - Multi-Platform Hybrid Simulation Method for Reinforced Concrete Structures
Oh-Sung Kwon, Jamin Park, Junyan Xiao, Evan Bentz
- 15:05-15:20 **1207** - Lessons learned from blind simulations of three reinforced concrete structural components
Vahid Sadeghian, Mohammad Naderi, Amir Reza Tabkhi
- 15:20-15:35 **1241** - Using low-cost nonlinear FEA to estimate the punching shear response of RC slabs under non-uniform connection region stresses
Trevor D. Hrynyk, Reza Abolhelm
- 15:35-15:50 **1327** - Machine-learning-based beam-column joint model for global analysis of frames
Serhan Guner, Nirmala Suwal
- 15:50-16:05 **1247** - Nonlinear Response History Analysis for Performance-Based Seismic Design in the U.S.
Insung Kim
- 16:05-16:20 **1242** - Seismic performance analysis of concrete core-wall building systems
Marios Mavros, Ioannis Koutromanos

1C06: Special Session - Design Strategies Carbon Reinforced Concrete Structures (Organizer: Steffen Marx) Session Chairs: Chudoba Rostislav, Steffen Marx

- 14:30-14:50 **1591** - Concepts and strategies for devising carbon reinforced structures
Steffen Marx, Beckmann, B, Viviane Adam2 and and Rostislav Chudoba and Josef Heggerand Manfred Curbach.
- 14:50-15:05 **1634** - Developing chemical prestressing for carbon reinforced concrete structures
Dhahir, M., Mohammed K., Tobias Neef, Danny Friese, Birgit Beckmann, Chokri Cherif, Thomas Matschei, Viktor Mechtcherine, Steffen Marx
- 15:05-15:20 **1629** - Experimental and numerical investigation on the buckling behavior of slender TRC structures
Giese, J., Homam Spartali, Birgit Beckmann, Frank Schladitz, Rostislav Chudoba



PROGRAMME

- 15:20-15:35 **1592** - CO2 curing for extruded textile reinforced concrete components - requirements and potentials
Cynthia Morales Cruz, Holger Nebel and Cynthia Morales Cruz and Laura Schmidt and Alexandra Weniger and Jana Gerta Backes and Marzia Traverso and Michael Raupach and Thomas Matschei
- 15:35-15:50 **1593** - Alkali-activated binder – requirements for extrusion and 3d-printing of carbon reinforced concrete
Cynthia Morales Cruz, Kruppa, H., Matthias Kalthoff, Tobias Neef, Silvia Reißig, Victor Mechtcherine, Michael Raupach, Thomas Matschei and Anya Vollpacht
- 15:50-16:05 **1600** - Photogrammetric image sequence analysis for deformation measurement and crack detection applied to a shear test of a carbon-reinforced concrete member
Liebold, F., Sarah Bergmann, Sven Bosbach, Viviane Adam, Steffen Marx, Martin Claßen, Josef Hegger, Hans-Gerd Maas
- 16:05-16:20 **1631** - Numerical simulations of the mechanical behavior of plant tissues as an inspiration for carbon reinforced concrete structures
Macek, D, Annabell Rjosk, Stephan Ritzert, Thea Lautenschläger, Christoph Neinhuis, Stefanie Reese

16:20-16:35 Coffee Break

1D01: Analysis and modelling of structural elements Session Chairs: Konrad Bergmeister, Almıla Uzel

MAIN HALL

- 16:35-16:50 **1196** - Numerical study on the shear capacity of PC crane beams in uncertain prestressing tendons anchorage conditions
Wit Derkowski, Rafał Walczak
- 16:50-17:05 **1503** - Dynamic Characterization of a Real-Scale Prestressed Concrete Beam Tested Until Failure
Pablo Leonel Sierra, Mauro Poliotti, Yuguang Yang, Xavier Martinez García and Rolando Chacón
- 17:05-17:20 **1504** - Critical Section for Shear Strength of Prestressed Concrete Transfer Beams
Almıla Uzel
- 17:20-17:35 **1008** - Determination of Prestressing Using Crack Reopening Method
Jakub Kralovanec, Martin Moravcik, Petra Bujnakova, Frantisek Bahleda and Jozef Prokop
- 17:35-17:50 **1141** - Laboratory testing and SHM of a prestressed concrete beam under accelerated artificial corrosion and sustained loads
Dario La Mazza, Paola Darò, M. Longo, G. Mancini, M. Brambilla, P. Chiariotti, A. Cigada, F. Di Carlo and A. Meda
- 17:50-18:05 **1222** - Numerical analysis of a prestressed non-reinforced ultra-thin concrete shell
Bárbara Gomes, Eduardo Cavaco, Paulo Fernandes, Eduardo Júlio and Maria Elizabeth Tavares
- 18:05-18:20 **1364** - Finite element modeling of shear failure in prestressed girders with a continuous cast-in-situ deck slab
Ricky Tai, Arthur T. Slobbe and Marco A. Roosen



PROGRAMME

1D02: Structural performance of concrete members Session Chairs: Rendy Thamrin, Iman Hajirasouliha

HALL 1

- 16:35-16:50 **1544** - Shear Capacity of Hollow Reinforced Concrete Members without Stirrups Strengthened with CFRP Sheets
Rendy Thamrin, Zaidir, Sabril Haris, Sri Hartati Dewi and Febi Putri Yastari
- 16:50-17:05 **1131** - Punching shear behavior of flat slab systems – Experimental investigation using isolated specimens with load-dependent boundary conditions
Matthias Kalus, Jan Ungermann, and Josef Hegger
- 17:05-17:20 **1136** - Evaluation of stress transfer mechanisms in RC beams without shear reinforcement using an automated crack detection scheme
Fahad Seemab, Maximilian Schmidt, Martin Classen, Rostislav Chudoba
- 17:20-17:35 **1182** - Finite Element Analysis of Hollow Core Floor Subjected to Point Load
Miłosz Jeziorski, Wit Derkowski
- 17:35-17:50 **1411** - Punching shear capacity related to load level of the corner columns
Michał Goldyn, Tadeusz Urban
- 17:50-18:05 **1625** - Assessment of the reliability level of the shear design provisions for members without shear reinforcement
Joan Hee Roldsgaard, Frederik Autrup, John Dalsgaard Sørensen and Alan O'Connor
- 18:05-18:20 **1039** - Impact of Distributed Loading and Intermediate Supports on Flexural Shear Behavior of Slab Segments Without Shear Reinforcement
Annkathrin Sinning, Viviane Adam, Martin Classen and Josef Hegger

1D03: Sustainable materials Session Chairs: Hakan Nuri Atahan, Cansu Çolak

HALL 2

- 16:35-16:50 **1082** - Immediate CO2 savings through optimised design approaches: A case-study of reinforced concrete flat slabs
Tânia Feiri, Sebastian Kuhn and Marcus Ricker
- 16:50-17:05 **1099** - An Investigation into Durability Aspects of Geopolymer Concretes Based Fully on Construction and Demolition Waste
Gurkan Yildirim, Emircan Ozcelikci, Musab Alhawat, Ashraf Ashour and Mustafa Sahmaran
- 17:05-17:20 **1280** - Carbon Absorption and Carbon Absorption Enhancement of Recycled Concrete Aggregate Masses
Tommi Kekkonen, Jussi Mattila, Kalle Raunio, Tandr  Oey
- 17:20-17:35 **1232** - Development of Aerated Concrete Brick with Chemical Additives from Electric Arc Furnace Slag Waste
Baycan Karabağ, Çetin BAĞLAN, Okan AYDIN, Oguz ISIK, Sinan ARAS
- 17:35-17:50 **1374** - Design of Sustainable High-Ductile Engineered Cementitious Composites with Limestone Calcined Clay Cement
Hocine Siad, Shahin Zokaei, Mohamed Lachemi, Obaid Mahmoodi, Mustafa Sahmaran



PROGRAMME

17:50-18:05 **1576** - Optimizing the Self-Healing Efficiency of Bacterial Concrete through Impregnation of Bacteria into Lightweight Aggregate in a Simulated Hot Subtropical Climate
Momen R. Mousa,

18:05-18:20 **1662** - More Performance, More Sustainable system for concrete refurbishment
Zeno Dan

1D04: Structural monitoring-bridges

HALL 3

Session Chairs: Cem Yenidoğan, Monica Longo

16:35-16:50 **1379** - Analytical modelling of the inelastic structural response of RC bridge piers under train impact
Minu Lee, Martin Bimschas and Walter Kaufmann

16:50-17:05 **1143** - Continuous MEMS SHM systems to support RC bridges retrofitting interventions through an ongoing diagnosis
M. Longo, D. La Mazza, M. Longo1, F. Basone, P. Chiariotti, A. Cigada and G. Mancini

17:05-17:20 **1626** - Computer Vision-Based Railway Viaduct Component Inspection Using Multi-Task Multi-Scale Deep Neural Network
Jiangpeng Shu, Han Yang, Gaoyang Liu, Xiaowu Zhang, Wenkai Xiao, Zehao Zhuo, He Zhang, Yiqiang Xiang

17:20-17:35 **1106** - Enabling Digital Transformation in Bridge Structure Damage Level Assessment Based on Decline in Natural Frequency Using Ambient Vibration Records
Khuyen Trong Hoang, Tsukasa Mizutani, Manabu Kawashima and Hiroyuki Uchibori

17:35-17:50 **1305** - Safety management of short span bridges based on early detection method for performance change
Hitoshi ITO, Toshiaki Mizobuchi

17:50-18:05 **1540** - Data validation of strain-based monitoring systems in low temperature conditions, case study: The Kalix bridge
Angélica Agredo, Adrian Ulfberg, Jaime Gonzalez-Libreros, Lennart Elfgren and Gabriel Sas

18:05-18:20 **1144** - Full-scale experimental testing on a reinforced bridge RC beam: experimental and SHM results
Monica Longo, Paola Darò, D. La Mazza, E. Tetta, G. Lastrico, I. Alovisi, G. Mancini, E. Miceli, D. Gino, G. Amendola, L. Giordano, P. Castaldo, M. Mariscotti, M. Garozzo, M. Deiana, B. Magri

1D05: Special Session - Recent Advances in Nonlinear Modeling of Concrete Elements and Structures (Organizer: Serhan Güner)

HALL 4

Session Chairs: Serhan Güner, Laura Lowes

16:35-16:50 **1211** - Shear strength of UHPC elements
Anca Ferche, Amjad Diab

16:50-17:05 **1245** - Finite elements analyses for the prediction of strength of shear-critical beams reinforced with UHPFRC
Fausto Minelli, Nico Di Stefano, Luca Facconi, Giovanni Plizzari



PROGRAMME

- 17:05-17:20 **1224** - Modelling of reinforced concrete columns with GFRP rebars
Robert K. Dowell, Francesca Ferretti, Claudio Mazzotti
- 17:20-17:35 **1345** - Crack-based modelling of FRP-reinforced deep beams without transverse reinforcement
Boyan Mihaylov, Alexandru Trandafir
- 17:35-17:50 **1206** - Punching verification of edge columns assisted by numerical simulation and field testing
Alexander Kagermanov, Julian Pernstich
- 17:50-18:05 **1269** - Finite Element Analysis of Hardened Properties of 3D-Printed Concrete
Zahra Miri Maria Anna Polak, and Hassan Baaj
- 18:05-18:20 **1203** - Assessing different modeling approaches for a four-story reinforced concrete building
Adolfo Matamoros, Hamid Khodadadi Koodiani, Insung kim, Ariel Creagh, Tarbin Basnet, Wassim Ghannoum

**1D06: Special Session - Design Strategies Carbon Reinforced
Concrete Structures (Organizer: Steffen Marx)
Session Chairs: Steffan Marx, Chudoba Rostislav**

HALL 5

- 16:35-16:50 **1594** - Computational modeling and experimental investigation of a single-fiber-pull-out test with a bio-inspired carbon fiber-matrix interphase
Verena Klempt, Elio Marquis1, Toni Utech, Christina Scheffler and Stefan Loehnert
- 16:50-17:05 **1633** - A comparison of multiscale methods for the modelling of carbon-reinforced concrete structures
Mester, L., Verena Klempt, Franz Wagner, Silke Scheerer, Simon Klarmann, Iurii Vakaliuk, Manfred Curbach, Hans-Gerd Maas, Stefan Löhner, Sven Klinkel
- 17:05-17:20 **1596** - Utilizing Textiles as Lost Formwork for the Additive Manufacturing of Concrete
Neef, T., Gözdem Dittel, Martin Scheurer, Thomas Gries and Viktor Mechtcherine
- 17:20-17:35 **1597** - Extrusion of carbon reinforced concrete with mineral impregnation of the carbon fibres
Neef, T., Matthias Kalthoff, Steffen Müller, Jana Gerta Backes, Michael Raupach, Thomas Matschei and Marzia Traverso, Viktor Mechtcherine
- 17:35-17:50 **1598** - Modeling of Growth of Plants for Biologically Inspired Conception of Carbon Fiber Reinforced Concrete
Kaliske, M., Jakob Platen, Bennett Pauls, Annabell Rjosk, Thea Lautenschläger, Christoph Neinhuis,
- 17:50-18:05 **1599** - Evaluation of Properties of Impregnated Reinforcement Textiles Cured within Concrete for Applications in Concrete Extrusion
Gözdem Dittel, Scheurer, M., Matthias Kalthoff, Michael Raupach, Thomas Matschei, Thomas Gries
- 18:05-18:20 **1638** - Triply periodic minimal surfaces -a novel design approach for lightweight CFR concrete structures
Wiesenhütter, S., Tom Goertzen, Iurii Vakaliuk, Manfred Curbach, Silke Scheerer, Alice C. Niemeyer, Jörg Rainer Noennig

18:20-18:50 Celebration of the 25th Anniversary of the fib



PROGRAMME

6 June 2023 – Tuesday

KEYNOTE LECTURES

MAIN HALL

Session Chair: Gyorgy L. Balazs

- 9:00-9:30 **Keynote Lecture - Brahim Benmokrane** : “Recent Canadian Developments Related to FRP Reinforcement for Sustainable and Resilient Concrete Structures, Design Codes, and Field Applications”
- 9:30-10:00 **Keynote Lecture - Nilüfer Özyurt Zihnioğlu** : “Cement-Based Materials Tailored for a Sustainable Future”
- 10:00-10:15 Coffee Break**

2A01: Special Session - Prestressing of FRP for concrete structures (Organizer: Renata Kotynia)

MAIN HALL

Session Chairs: Renata Kotynia, Abdeldjelil Belarbi

- 10:15-10:30 **1548** - Prestressing of FRP for new concrete structures
Renata Kotynia, Katarzyna Zdanowicz
- 10:30-10:45 **1488** - PC Girder-to-RC Deck Connection: Interface Shear Transfer with GFRP Reinforcement
Antonio Nanni, Abdeldjelil Belarbi and Camilo Vega
- 10:45-11:00 **1487** - Pioneering strengthening of concrete bridge girders with pretensioned CFRP laminates in Poland
Renata Kotynia, Michal Staškiewicz, Julien Michels Christoph Czaderski, Masoud Motavalli
- 11:00-11:15 **1287** - Application of shape memory alloy and CFRP strips for active flexural strengthening of RC beams
Janusz Rogowski, Renata Kotynia
- 11:15-11:30 **1490** - Experimental study on the performance of fibre reinforced polymer pretensioned concrete beams
Eva Oller, Galo Ortiz, Antonio Marí

2A02: Special Session - Seismic Strengthening of Reinforced Concrete Structures with Composite Materials (Organizer: Ciro Del Vecchio)

HALL 1

Session Chairs: Georgia Thermou, Marco Di Ludovico

- 10:15-10:30 **1413** - FRP seismic strengthening of infilled RC frames
Marco Di Ludovico, Ciro Del Vecchio, Alberto Balsamo, and Andrea Prota
- 10:30-10:45 **1473** - SRG vs SRP jacketing in shear strengthening of reinforced concrete beams
Georgia Thermou, Xiangsheng Liu
- 10:45-11:00 **1301** - Numerical Modeling of CFRP Repaired Beam Failed in Shear
Özgür Yurdakul, Onur Tunaboyu, Ladislav Routil and Özgür Avşar



PROGRAMME

- 11:00-11:15 **1351** - Theoretical Study on the Bond Behaviour of Mechanically Anchored EBR FRP
Cristina Barris, Mehdi Aghabagloo, Marta Baena, Laura Carreras and Lluís Torres
- 11:15-11:30 **1477** - CFRP Jacketing of Reinforced Concrete Columns – A DriftBased Design Approach
Murat Saatçioğlu
- 11:30-11:45 **1555** - The Influence of Shear Crack Angle on FRP Wall Strengthening
Tomislav Kišiček, Tvrtko Renić, Ivan Hafner and Luka Lulić

2A03: Special Session - ACI-fib Joint Session on Design of Concrete Structures with Internal FRP Reinforcement Recent Developments (Organizer: Antonio Nanni)
Session Chairs: Antonio Nanni, Maurizio Guadagnini

HALL 2

- 10:15-10:30 **1532** - Introduction to the Special Session
Antonio Nanni
- 10:30-10:45 **1146** - The New ACI Code 440.11-22
Vicki Brown, Will Gold, and Carol Shield
- 10:45-11:00 **1535** - Comparing Global Codes for FRP Reinforced Concrete
William Gold
- 11:00-11:15 **1533** - Introduction to New Recommendation for Design and Construction of Concrete Structures Using FRP in Japan
Hiroshi Mutsuyoshi, Makoto Murata
- 11:15-11:30 **1510** - Model Code Approach to the ULS Design of FRP Reinforced Concrete Elements
Maurizio Guadagnini, Lluís Torres, Cristina Barris, Stijn Matthys, Eva Oller and Niki Trochoutsou

2A04: Special Session - The use of fibre reinforcement for more durable, sustainable and resilient built environment (Organizer: Joaquim Barros)
Session Chairs: Joaquim Barros, Nilüfer Özyurt Zihnioğlu

HALL 3

- 10:15-10:30 **1303** - Evaluation method for bending beam tests of fibre reinforced concrete
Péter K. Juhász,
- 10:30-10:45 **1475** - The use of recycled steel fibres in precast structures
Alessandro P. Fantilli
- 10:45-11:00 **1299** - Synthetic fibre reinforcement in concrete structures – applications and design
Peter Schaul, Péter Károly Juhász
- 11:00-11:15 **1353** - Size-effect on stable multiple cracking of UHPFRC structural elements in bending
Jaime Planas, Beatriz Sanz, and José M. Sancho
- 11:15-11:30 **1639** - Flexural behaviour of continuous shallow beams reinforced with steel fibres and conventional steel bars
Joaquim Barros, Marcilio M. A. Filho, Ali Ziaeinia, Hamidreza Salehian



PROGRAMME

11:30-11:45 **1640** - Design methodology for industrial pavements supported on piles and using fibres and conventional reinforcement – a case study
Joaquim Barros

2A05: Recycled concrete

HALL 4

Session Chairs: Marta Roig-Flores, Göktuğ Ünal

10:15-10:30 **1216** - Performance Improvement of Recycled Coarse Aggregate Concrete Using a Shrinkage-Reducing Agent
Sachie Sato, Tanano

10:30-10:45 **1401** - Effect of Mechanically Treated and Internally Cured Recycled Concrete Aggregates on Recycled Aggregate Concrete
Konstantina Oikonomopoulou, Pericles Savvas, Thomaida Polydorou, Demetris Demetriou, Demetris Nicolaidis and Michael F. Petrou

10:45-11:00 **1140** - Fracture and Shear Behaviours of Recycled Aggregate Concrete
Kolluru V. L. Subramaniam, Sourav Chakraborty

11:00-11:15 **1344** - Development of concrete with 100% recycled aggregate for use in structural engineering with exposure classes XC3 and XF1
Peter Wild, Kustermann Andrea, Stengel Thorsten,

11:15-11:30 **1393** - Effects of high temperatures on concrete with recycled aggregates from ceramic stoneware waste
Marta Roig-Flores, Vicente Albero, Lucía Reig, Ana Piquer, Ángel M. Pitarch, David Hernández-Figueirido

11:30-11:45 **1560** - Flexural Capacity of Sustainable RC beams Manufactured with Treated Wastewater, RCA, and Fly Ash
Abdelrahman Abushanab, Wael Alnahhal

2A06: Performance of fiber reinforced concrete/composite

HALL 5

Session Chairs: Enzo Martinelli, Ünal Anil Doğan

10:15-10:30 **1561** - Experimental and Analytical Study of Cracking Localization in R/SFRC Beams and its Effect on the Flexural Ductility
Yuri S. Karinski, Yuri S. Karinski, Yossef Gebreyesus

10:30-10:45 **1604** - In-situ load testing of a FRC slab-on-piles
Cosmin Popescu, Björn Täljsten

10:45-11:00 **1249** - Modelling Of Steel Fibre Reinforced Concrete Ribbed Slab Panel Using Finite Element Analysis
Ruqayyah Ismail, Ahmad Amirul Abdul Aziz Hazrina Ahmad Fariz Aswan Ahmad Zakwan, Norlizan Wahid Goh Lyn Dee

11:00-11:15 **1497** - Use and application of Fiber Reinforced Concrete at industrial scale: the case study of precast electric cabins
Enzo Martinelli, Marco Pepe, Bianca M. Mennini, Silvio Di Cesare, Bernie Baietti, Carmine Lima



PROGRAMME

- 11:15-11:30 **1420** - Strengthening of reinforced concrete beams with Ultra-high performance fiber-reinforced concrete in shear
Yitao Huang, Erik Schlangen and Mladena Luković
- 11:30-11:45 **1562** - Ultra High-Performance Fiber-Reinforced Cementitious Composites for thin double-curved façade shells
Liberato Ferrara, Massimiliano Cremonesi, Lorenzo Pirone, Giuseppe Chiarandà, Sandro Moro and Francesco Lo Monte

11:45-12:00 Coffee Break

2B01: Special Session - Prestressing of FRP for concrete structures (Organizer: Renata Kotynia)

MAIN HALL

Session Chairs: Renata Kotynia, Abdeldjelil Belarbi

- 12:00-12:15 **1491** - Experimental bond performance of fibre reinforced polymer prestressed concrete elements
Eva Oller, Galo Ortiz, Nuno Várzea Prazeres, Juan Murcia-Delso and Antonio Marí
- 12:15-12:30 **1556** - Shear Design of Prestressed Concrete Girders using FRP as Auxiliary Reinforcement
Abdeldjelil Belarbi, Ayman Okeil and Antonio Nanni
- 12:30-12:45 **1554** - Relaxation in Prestressed BFRP Tendons
Eythór Rafn Thórhallsson, Jónas Thor Snæbjörnsson, Andri Gunnarsson and Thorunn Vala Jónasdóttir
- 12:45-13:00 **1546** - Short and Long-Term performance of precast HPC sheet-piles prestressed with GFRP bars
Simone Spagnuolo, Zila Rinaldi
- 13:00-13:15 **1559** - Prestressing with FRP for bridges – Potentials in various concretes: NWC and LWC
Balázs György, Gábor Kardos, Gábor Dubrovsky, Antal Bedics, János Szabó, Tamás Novoszáth, and Sándor Sólyom

2B02: Special Session - Seismic Strengthening of Reinforced Concrete Structures with Composite Materials (Organizer: Ciro Del Vecchio)

HALL 1

Session Chairs: Georgia Thermou, Marco Di Ludovico

- 12:00-12:15 **1355** - Development of fragility curves for RC columns retrofitted with FRP jackets
Juan Murcia-Delso, Eva Oller, Oscar Minor García,
- 12:15-12:30 **1332** - Effectiveness of CFRP Repair on Shear-Damaged Substandard Captive Columns
Özgür Avşar, Özgür Yurdakul, Onur Tunaboyu
- 12:30-12:45 **1455** - GA-based optimisation for seismic retrofit of RC structures by combining FRP jackets and steel bracings
Enzo Martinelli, Francesco Nigro
- 12:45-13:00 **1509** - Effect of FRP Strengthening Intervention on the Seismic Fragility of Substandard RC Buildings
Iman Hajirasouliha, Soheil Khoshkholghi, Zuhail Ozdemir, Kypros Pilakoutas
- 13:00-13:15 **1494** - Strengthening of existing structures with UHPFRC: Concrete-to-UHPFRC interfaces
Andreas Lampropoulos, Ourania Tsioulou, Demetris Nicolaidis, and Michael F. Petrou



PROGRAMME

2B03: Special Session - ACI-fib Joint Session on Design of Concrete Structures with Internal FRP Reinforcement Recent Developments (Organizer: Antonio Nanni)
Session Chairs: Antonio Nanni, Maurizio Guadagnini

HALL 2

- 12:00-12:15 **1512** - Model Code Approach to the SLS Design of FRP Reinforced Concrete Elements
Cristina Barris, Luis Torres Llinas, Maurizio Guadagnini, Stijn Matthys, Eva Olle and Marta Baena
- 12:15-12:30 **1536** - Presentation of the French AFGC document: "Recommendations for the use of FRP (Fiber Reinforced Polymer) rebars for reinforced concrete structures"
Sylvain Chataigner
- 12:30-12:45 **1538** - Towards new Italian guidelines for the design of concrete structures reinforced with FRP bars
Luigi Ascione
- 12:45-13:00 **1531** - ACI 318 Structural Concrete Building Code – An Explanation of Other ACI Dependent Codes
Randall Poston (designer)
- 13:00-13:15 **1537** - Behavior Of Concrete Slabs Reinforced with Glass Fiber Reinforced Polymer Bars Under Restrained Shrinkage
Bryan Barragan (manufacturer), Antonio Mudadu, Giuseppe Tiberti, and Giovanni Plizzari
- 13:15-13:30 **1530** - Contractor's Perspective on FRP Market Opportunities and Challenges
Jihad Sakr (contractor)

2B04: Special Session - The use of fibre reinforcement for more durable, sustainable and resilient built environment (Organizer: Joaquim Barros)
Session Chairs: Joaquim Barros

HALL 3

- 12:00-12:15 **1641** - LDPM validation of CFRC beams toward massive applications in the building industry
Erez Gal, Bar Geva, Rami Eid, Ofri Rasty, Alva Peled, Erez Gal
- 12:15-12:30 **1407** - Model for the Compressive Behaviour of Steel-Fibre Reinforced Concrete in New Eurocode 2, Annex L
Gonzalo Ruiz, Ángel De La Rosa, Elisa Poveda, Riccardo Zanon, Markus Schäfe and Sébastien Wolf
- 12:30-12:45 **1352** - A New Model to Assess the Flexural Strength of Steel-Fiber Reinforced Concrete Sections
Ángel De la Rosa, Gonzalo Ruiz and Jacinto R. Carmona
- 12:45-13:00 **1384** - Experimental investigations of SFRLC and implications for design
Ali Abbas, Hasan Hasanain Al-Naimi
- 13:00-13:15 **1526** - A fracture mechanics approach to the design of fibre-reinforced and hybrid-reinforced concrete beams
Federico Accornero, Alessio RUBINO, and Alberto CARPINTERI
- 13:15-13:30 **1635** - Precast Bridge Deck for Railway Using HPFRC and UHPFRC
Rui Valente, Mário Pimentel, Carlos Sousa, José Rui Pinto
- Gunther Meschk, Günther Meschke, Gerrit Neu, Vladislav Gudžulić, Janis Reinold and Koussay Daadouch*



PROGRAMME

2B05: Structural performance-seismic response

HALL 4

Session Chairs: Roberta Apostolska, Erkan Akpınar

- 12:00-12:15 **1277** - Shaking table test of a 1/4-scale self-centering precast reinforced concrete frame
Yang Li, Xilin Lu
- 12:15-12:30 **1130** - Multi hazard risk assessment of basic services and transport infrastructure in RN Macedonia, Greece and Albania cross-border region – CRISIS project
Roberta Apostolska, Vlatko Sheshov, Radmila Salic, Marija Vitanova Julijana Bojadzieva, Kemal Edip, Marta Stojmanovska, Aleksandra Bogdanovic, Barbara Borzi, Elisa Zuccolo, Francesca Bozzoni, Antonella Di Meo Dimitrios Ptilakis, Evi Riga, Stavroula Fotopoulou, Christos Petridis, Stevko Stefanoski, Neritan Shkodrani, Markel Baballëku
- 12:30-12:45 **1198** - Large-Scale Tests on RC Purpose-Built Buildings for Improving Robustness
Jose Adam, Manuel Buitrago, Nirvan Makoond Eduardo J. Mezquida-Alcaraz
- 12:45-13:00 **1519** - Influence of surface topography on seismic response of existing buildings
Yavuz Deniz, Zeynep Tuna Deger, Wenyang Zhang and Ertugrul Taciroglu
- 13:00-13:15 **1188** - Metallic Dissipaters Made of Conventional and Advanced Materials for Seismic Protection of Structures
Mustafa Mashal, Mahesh Acharya, Jared Cantrell and Saksham Raj Maharjan
- 13:15-13:30 **1282** - Shaking Table Test of a Single-Tube Structure with Peripheral Suspended Floor Systems
Wenjun Gao, Xiaofang Wen, Bin Zhao,, Xilin Lu
- 13:30-13:45 **1078** - Development of a Deep Learning-Based Anomaly Detection System for Structures
Mehboob Rasul, Manabu Kawashima¹ and Khuyen Trong Hoang

2B06: Performance of fiber reinforced concrete/composite

HALL 5

Session Chairs: Michael F. Petrou, Savaş Erdem

- 12:00-12:15 **1083** - Numerical Simulation of Casting Process of Fiber Reinforced Self-Compacting Concrete (SCC)
Guomin Ji, Mohammad Abedi, Chen Lin
- 12:15-12:30 **1492** - Strain Hardening Cementitious Composite (SHCC) in reinforced concrete cover zone for crack width control
Shan He, Mladena Luković, Erik Schlangen
- 12:30-12:45 **1403** - Optimising Ultra-High-Performance Fiber-Reinforced Concrete for Impact Resistance
Michael F. Petrou, Demetris Demetriou, Thomaida Polydorou, Konstantina Oikonomopoulou, Pericles Savva, Ioanna Giannopoulou, Ponsian M. Robert, Ourania Tsiolou, Andreas Lampropoulos, Demetris Nicolaidis
- 12:45-13:00 **1452** - Hemp Fiber Reinforced Lightweight Concrete (HRLWC) with Supplementary Cementitious Materials (SCM)
Havva Merve Tuncer, Zehra Canan Girgin
- 13:00-13:15 **1021** - The Mechanical Effects of Recycled Steel Fiber on Concrete
Cansu Colak, Ozkan Sengul



PROGRAMME

- 13:15-13:30 **1061** - Applicability of Proposed Steel Fiber Model based on 3D RBSM to Simulate the Mechanical Behavior of Steel Fiber Reinforced Concrete
Atik Sarraz, Hikaru Nakamura and Taito Miura
- 13:30-13:45 **1092** - Influence of loading boundary conditions on the strain distribution and stress-strain response in the concrete uniaxial compression test
Tamon Ueda, Saeid Mehrpay, Xinyu Hu, Zhao Wang, Liangliang Wei,
- 13:30-14:30 Lunch Break / Presentation of YMG Competition Winner**

2C01: Performance and design of structural walls Session Chairs: John W. Wallace, Kutay Orakçal

MAIN HALL

- 14:30-14:50 **1563** - Invited-Theme Lecturer : "Structural Walls: New Modeling Parameters for Seismic Evaluation"
John W. Wallace, Saman A. Abdullah
- 14:50-15:05 **1275** - High-performance seismic systems using reinforced concrete wall-column with response control system
Yutaka Kimura, Junji Toyama, Yuji Isshiki and Tsutomu Komuro
- 15:05-15:20 **1338** - Numerical Simulation and Seismic Performance Assessment of Tall Buildings using Grille-Type Steel Plate Composite Shear Walls
Hao Wu, Hao Wu, Qiao Yu, and Lingzhi Li
- 15:20-15:35 **1111** - Crack kinematics during the transition from shear to sliding or crushing failure in seismically loaded squat reinforced concrete shear walls
Diego Pizarro, Milan Kovarbasic and Bozidar Stojadinovic
- 15:35-15:50 **1465** - Design of Seismic Isolated Building with Staggered Precast Concrete Wall
Toru Tai, Kosaku Mitsuhashi, Nobuyuki Odajima, Junichi Wada, and Yasunori Mizushima
- 15:50-16:05 **1340** - GLRC_HEGIS global nonlinear cyclic model for reinforced concrete walls and slabs
Miquel Huguet, Michele Massarella, Olivier Lherminier, Silvano Erlicher, Panagiotis Kotronis, François Voltaire
- 16:05-16:20 **1015** - An Energy Dissipative Double Beam Coupling Beam Equipped with Low Damage Seismic Technology
Kathryn Hogarth, Jared Cantrell, and Mustafa Mashal

2C02: Sustainable and durable concrete Session Chairs: Zeynep Başaran Bundur

HALL 1

- 14:30-14:50 **1632** - Invited-Theme Lecturer : "Development of a QA/QC methodology for the construction of critical infrastructure projects designed based on service life considerations"
Yilmaz Akkaya, Mehmet Ali Taşdemir
- 14:50-15:05 **1127** - Durability of concrete: assessing the performance achieved in the laboratory and on the construction site
David Ov, Juan Mauricio Lozano Valcarcel, Thomas Kränkel, Christoph Gehlen and Rolf Breitenbücher



PROGRAMME

- 15:05-15:20 **1279** - Thames Tideway East Section – Use of a Decisional Carbon Footprint Tool for Determining Concrete Mixes
Pierre-Edouard Denis, Diego Pizarro, Milan Kovarbasic and Bozidar Stojadinovic
- 15:20-15:35 **1371** - Towards a conscious and far-sighted construction market through the use of sustainability indexes
Daide di Summa, Esteban Camacho, Liberato Ferrara and Nele De Belie
- 15:35-15:50 **1334** - 25 years working with green steel slag concrete
Amaia Santamaria, Victor Revilla-Cuesta, Jesús Setien, Iñigo Vegas and Javier Jesus González
- 15:50-16:05 **1192** - Analysis of extensive durability test data for validating 120-year design life of the Thames Tideway Tunnel
Pierre-Edouard Denis, Alexandre Chaizemartin, Ian GIBB, Aneeta Mary Joseph and Lionel Linger

2C03: Sustainable structures

HALL 2

Session Chairs: **Agnieszka Bigaj-van Vliet, Costas Georgopoulos**

- 14:30-14:50 **1229 - Invited-Theme Lecturer** : “fib MC2020 - A sustainability-driven performance-based approach to design, execution and life-cycle management of concrete structures
Agnieszka Bigaj-van Vliet, Gerrie Dieteren and Stuart Matthews
- 14:50-15:05 **1095** - A normative performance concept, based on fib model code, for durability design regarding chloride-induced corrosion
Amir Rahimi
- 15:05-15:20 **1177** - Sustainable concrete infrastructures rehabilitation: comparing interventions with multi-criteria decision analysis
Camillo Nuti, Vittoria Borghese, Carlotta Pia Contiguglia, Bruno Briseghella, Davide Lavorato, Silvia Santini
- 15:20-15:35 **1154** - Assessment of Environmental Burden of Natural Disasters by Estimating CO2 -emissions by Performing Fine-grained End-to-end Simulations of Disasters and Economy
Amit Gill, Maddegedara Lalith, Manabu Kawashima, and Akio Kasuga
- 15:35-15:50 **1091** - Evolution of Structural Design of Concrete Framed Buildings for Net Zero in the UK
Costas Georgopoulos,
- 15:50-16:05 **1469** - Embodied carbon over the life cycle of reinforcing steels: Carbon emissions associated with Modules A1-A3 Product stage and A4-A5 Construction stage
Ladin Camci, Lee Brankley, Ayhan Tugrul, Bahadır Karadayi, David Knight
- 16:05-16:20 **1573** - Towards reinforced concrete structures with near-zero impact: new reinforcement solutions and concretes
Adriano Reggia, Riccardo Chinosi, Pietro Lattarulo, and Giovanni Plizzari



PROGRAMME

2C04: Interface/bond behavior

HALL 3

Session Chairs: Elizabeth Vintzileou, Norbert Randl

- 14:30-14:50 **1068 - Invited-Theme Lecturer** : “Transfer of forces within repaired/strengthened RC elements”
Elizabeth Vintzileou,
- 14:50-15:05 **1369** - A novel methodology to determine the composite action of concrete cast at different times
Jules Smits, Ann Van Gysel, Stijn François, Tom Molkens
- 15:05-15:20 **1419** - Effect of Coarse Aggregate Concentration on the Mechanical Properties and Bond-Slip Behavior between the Low Strength Concrete and Plain Rebar
Sidar Nihat Bicakci, Osama Abokaf, Hasan Nuri Turkmenoglu, Servan Baran and Hakan Nuri Atahan
- 15:20-15:35 **1190** - Influence of rib geometry on the bond strength of reinforcing steel in coils
Froese Johannes, Oliver Fischer
- 15:35-15:50 **1009** - Interfaces Between Reinforced Concrete Jackets and Columns
Erato Oikonomopoulou, Vasiliki Palieraki, Elizabeth Vintzileou, Giovacchino Genesio
- 15:50-16:05 **1138** - Seismic Design of Anchorages Using Post-Installed Reinforcing Bars
Sara Cattaneo, Giovacchino Genesio and Roberto Piccinin
- 16:05-16:20 **1480** - Notched Beam Test for SHCC-Concrete Interface
Shozab Mustafa, Othman Harras and Mladena Luković

2C05: Structural performance and design

HALL 4

Session Chairs: Özgür Avşar

- 14:30-14:50 **1442** - Seismic Performance of Two Precast Column Concepts for ABC
Simon Bourget, Corentin Long, Bruno Massicotte
- 14:50-15:05 **1286** - Numerical-experimental assessment of the SLS for traffic safety in skewed High-Speed railway bridges
Maria D. Martinez-Rodrigo, Juan Carlos Sánchez Quesada, Emma Moliner, Pedro Galvín, Antonio Romero
- 15:05-15:20 **1209** - Numerical and Analytical evaluation of load distribution patterns on ballasted concrete railway bridges
Chao Wang, Jaime Gonzalez-Libreros, Alex Eriksson, Anita Ullrich, , Johan Johansson, Ola Enoksson, Johannes Quist, and Gabriel Sas
- 15:20-15:35 **1172** - Lessons Learned From Past Earthquakes for Horizontally Curved Bridges
Esra Namli, Turgut Öztürk
- 15:35-15:50 **1460** - Diagnostics and Verifying of Railway Bridge Made of Prestressed Precast Box Girders
Peter Koteš, Martin Vavruš, František Bahleda, Jozef Prokop, and Ondrej Křídla
- 16:05-16:20 **1359** - RC beam-column joints as membrane elements: an application of MCFT
Angelo Marchisella, Angelo Marchisella



PROGRAMME

2C06: Structural analysis and monitoring

HALL 5

Session Chairs: Tamon Ueda, Jan Cervenka

- 14:50-15:05 **1047** - Application of Unmanned Aerial Vehicle (UAV) Technology on Damage Inspection of Reinforced Concrete Structures
Tamon Ueda , Jiehui Wang
- 14:50-15:05 **1088** - Digital Twins for Reinforced Concrete Structures
Jan Cervenka, Libor Jendele, Radomir Pukl , Jiri Rymes
- 15:05-15:20 **1217** - Structural damage condition of buildings with a sparse number of sensors using Machine learning: Case Study
Edisson Alberto Moscoso Alcantara, Taiki Saito
- 15:20-15:35 **1266** - Concrete beam screening through DIC images
Ricardo Perera, Consuelo Huerta, Lluís Torres, Marta Baena, Cristina Barris
- 15:35-15:50 **1502** - Indirect Müller-Breslau Principle for Construction of Influence Lines and Application to Structural Health Monitoring Algorithm
Turgay Tahtacı, Engin Orakdöğen, Burcu Güneş
- 15:50-16:05 **1024** - Seismic damage assessment for RC buildings from SHM data
Marta Del Zoppo, Alessandro Lubrano Lobianco and Marco Di Ludovico
- 16:20-16:35 Coffee Break**

2D01: Strengthening interventions

MAIN HALL

Session Chairs: Jan L. Vitek, Alessandra Aprile

- 16:35-16:50 **1040** - Experimental study on non-ductile reinforced concrete columns strengthened with latticed steel jacketing
Sergio M. Alcocer, Jorfran Alcaraz-Vázquez, José E. Andrade, Aracely Gomez-Diaz, Vanessa Y. González, Sara Palma, Carlos F. Vargas-Altamirano, Juan José Gómez, Osvaldo Contreras-Reyes
- 16:50-17:05 **1153** - Repair of reinforced concrete column hinges by polyurethane jacketing
Arkadiusz Kwiecień, Filip Manojlovski, Zoran Rakicevic, , Aleksandra Bogdanovic, Antonio Shoklarovski, Angela Poposka
- 17:05-17:20 **1158** - UHPC in existing structures
Jan L. Vitek, Lukáš Boháček, Robert Coufal and Lukáš Vráblík
- 17:20-17:35 **1201** - “Non-iterative hysteretic bracings design procedure for retrofitting of RC frames”
Raihan Rahmat Rabi, Giorgio Monti, and Marco Vailati
- 17:35-17:50 **1227** - Seismic Retrofit of a Precast RC School Building with external BRBs in Northern Italy
Alessandra Aprile, Matteo Zerbin, Cristian Dalmonte, Andrea Sereni, Marcello Zoli and Angela Ugatti
- 17:50-18:05 **1233** - Detailing Technique to Enhance Resistance of RC Structures against Progressive Collapse
Peiman Ghaderi, Eduardo Cvaco, Valter Lucio , and Eduardo Julio
- 18:05-18:20 **1508** - Flexural Strengthening of RC Beams with Multi-Layer Steel Reinforced Grout Systems
Iman Hajirasouliha



PROGRAMME

2D02: Structural behavior and analysis

HALL 1

Session Chairs: Giuseppe Mancini, Cem YENİDOĞAN

- 16:35-16:50 **1295** - Fatigue Behavior of Shear-Critical Deep Beams with Light Web Reinforcement
Eissa Fathalla, Boyan Mihaylov
- 16:50-17:05 **1328** - Cyclic Shear Test of Reinforced Rubberised Concrete Columns
Ernesto Hernandez, Alessandro Palermo, Gabriele Chiaro and Allan Scott
- 17:05-17:20 **1365** - Experimental Investigation of Size Effect in Shear Critical Reinforced Concrete Pile Caps
Jesper Harrild Sørensen, Linh Cao Hoang, and Uffe Graaskov Ravn
- 17:20-17:35 **1414** - Numerical modelling of innovative deconstructable shallow beams made of recycled aggregate concrete and shape memory steel reinforcement
Giulio Zani, Marco Pepe, Marco Carlo Rampini, Julien Michels and Enzo Martinelli
- 17:35-17:50 **1029** - A Novel Friction Damper for Seismic Retrofit of Precast RC Structures with Poor Connections
Eleonora Grossi, Alessandra Aprile, Matteo Zerbin
- 17:50-18:05 **1054** - Enhancing the shear performance of reinforced concrete beams
Michele Win Tai Mak, Janet M. Lees
- 18:05-18:20 **1489** - Structural behaviour of slender geopolymer concrete beams without stirrups
Jiandong Lu, Yuguang Yang, Herbert van der Ham, and Danny Fu

2D03: Sustainable and durable concrete

HALL 2

Session Chairs: Özkan Şengül, Zeynep Başaran Bundur

- 16:35-16:50 **1012** - Floured CaCO₃ as Supplementary Cementitious Material in Defined Performance Concrete
Pavel Sirotn, Vyacheslav Falikman, Pavel Smirnov.
- 16:50-17:05 **1114** - Effect of grouting on the resistance of Portland and blast furnace slag cement paste against chemical attack by aggressive carbon dioxide
Falk Wagemann, Frank Schmidt-Döhl and Amir Rahimi
- 17:05-17:20 **1118** - Investigation of the influence of recycled concrete powder (RCP) on the setting behavior of cement when used as supplementary cementitious material (SCM)
Benjamin Wolf, Benedikt Zoels, Andrea Kustermann
- 17:20-17:35 **1119** - Decarbonising Precast Concrete Manufacturing: Implementation of Low-Carbon Concretes
Ana Pavlović, Glen Rust and Harry Edwards
- 17:35-17:50 **1383** - The influence of SCMs, fibres and superplasticizer on the chloride diffusion coefficient of eco-UHPC
Ana Rodrigues, Hugo Costa, Ricardo Carmo, and Eduardo Júlio
- 17:50-18:05 **1415** - A review on the use of SCMs and alternative by-products in eco-efficient concrete
Eliana Soldado, Hugo Costa, Ricardo do Carmo and Eduardo Júlio
- 18:05-18:20 **1427** - Application and texture of ground RC as supplementary cementitious material
Ludwig Hertwig, Wladislaw Polienko, Constanze Reuter and Klaus Holschemacher



PROGRAMME

2D04: Anchorages in structures

HALL 3

Session Chairs: Elizabeth Vintzileou, Norbert Randl

- 16:35-16:50 **1228** - Experimental Study of Concrete Breakout Strength for Headed Reinforcement Bars Embedded in Roof Exterior Beam-Column Joints
Hadia Mohsuni, Tomoya Matsui
- 16:50-17:05 **1268** - Anchors to Masonry in Seismic Conditions: Cracked vs. Uncracked Locations
Elizabeth Vintzileou
- 17:05-17:20 **1159** - Experimental behaviour of fastener strengthened full scale T-wall under out-of plane loading
Manuela Scamardo, Sara Cattaneo, Crespi P, Vafa Navid; Welz, Georg
- 17:20-17:35 **1101** - Numerical investigations on the influence of different parameters on the behavior of headed reinforcement
Zahi Nehme El Hayek, Margaritis Tonidis and Akanshu Sharma
- 17:35-17:50 **1134** - Numerical Investigation of Closely Spaced Anchor Groups under different Geometric and Loading Conditions
Fasih ur Rehman, Margaritis Tonidis, Boglárka Bokor and Akanshu Sharma.
- 17:50-18:05 **1585** - Bond Performance Evaluation of Deformed Rebars in Ultra-High Performance Concrete (UHPC)
Xinyu Hu
- 18:05-18:20 **1020** - Nonlinear spring modelling approach for concrete edge breakout failure of shear loaded anchorages
Boglarka Bokor, Akanshu Sharma and Jan Hofmann

2D05: Structural analysis and modelling

HALL 4

Session Chairs: Wouter De Corte, Pinar Okumuş

- 16:35-16:50 **1175** - Application of the computed tomography in structural engineering
Szymon Grzesiak, Matthias Pahn, René Basters and Christoph de Sousa
- 16:50-17:05 **1213** - Assessment of influential parameters in topology optimization of thermo-mechanically loaded concrete structures
Wouter De Corte, Ticho Ooms, Ruben Van Coile
- 17:05-17:20 **1226** - Exploring Kani's Valley of Shear Failure
Evan Bentz
- 17:20-17:35 **1390** - Predicting Shear, Stiffness and Stirrups Strain Histories in Reinforced Concrete Beams using Machine Learning
Pinar Okumus, Rodrigo Castillo, Negar Elhami-Khorasani and Varun Chandola
- 17:35-17:50 **1439** - 'Permissible' Shell Finite Element Modelling Applications for Estimating the Response of Reinforced Concrete Structures
Trevor Hrynyk, Amirali Bahnamiri



PROGRAMME

- 17:50-18:05 **1627** - A Multi-channel Input Framework for Structure Displacement Response Prediction using Convolutional Neural Network
Jiangpeng Shu, Jun Li, Xiaowu Zhang, Wenkai Xiao, Zehao Zhuo, He Zhang, Yiqiang Xiang,
- 18:05-18:20 **1038** - Solving the inverse problem of the Shelter Object reinforced concrete structures thermal expansion
Iurii Kaliukh, Yuriy Slyusarenko, Volodymyr Tytarenko, Nina Kosheleva, Iegor Kostochka, Vladyslav Shekhovtsov, Ihor Yakovenko, Oleg Fesenko, Viktoriia Vapnichna, Sergii Iskov

2D06: FRP reinforcements

HALL 5

Session Chairs: Cem Demir

- 16:35-16:50 **1214** - Development of basalt fibre reinforced polymer (BFRP) rebar infused with geopolymer binder
Mahbube Subhani, Sukanta Kumer Shill, Estela Garcez, Russel Varley3 and Jerry Gan
- 16:50-17:05 **1520** - Experimental and Numerical Investigations of BFRP Reinforced Normal and High Strength Concrete Beams
Mesfer M. AlZahrani, Omar M. Mostafa, Muhammad Kalimur Rahman, and Syed K. Najmuddin
- 17:05-17:20 **1322** - Cyclic Response of Concrete Bridge Piers Reinforced with Steel or GFRP Bars
Cain Stratford, Alessandro Palermo
- 17:20-17:35 **1319** - Creep Rupture Strength of GFRP Bars in Alkaline Concrete Environment under Elevated Temperature
Khaled Mohamed, Ahmed Hassanein and Brahim Benmokrane.
- 17:35-17:50 **1400** - Finite Element Modelling of GFRP Dowel Bars Embedded in Slabs on Ground Resting on Simulated Soil Subbase
Muhammad Kalimur Rahman, Mohammed Fasil and Mesfer M. Al-Zahrani
- 17:50-18:05 **1637** - Experimental and Analytical Investigation on Elastic Properties of Pultruded GFRP
Hadi Abbaszadeh, Yusuke Mochida, Alessandro Fascetti
- 18:05-18:20 **1482** - Behaviour of RC Columns Strengthened with Partial Carbon Fibre Reinforced Polymer (CFRP) Confinement
Ruqayyah Ismail, Norehan Othman, Hazrina Ahmad, Fariz Aswan Ahmad Zakwan, Goh Lyn Dee, Norlizan Wahid
- 20:00-23:00 GALA DINNER**



PROGRAMME

7 June 2023 – Wednesday

KEYNOTE LECTURES

MAIN HALL

Session Chair: Akio Kasuga

- 9:00-9:30 **Keynote Lecture - Ömer Güzel** : “1915 Çanakkale Bridge – Dream to Reality”
- 9:30-10:00 **Keynote Lecture - Xiangyu Wang** : “BIM and AI for Modular Buildings: Best Practice and Lessons Learned”
- 10:00-10:15 Coffee Break**

3A01: Performance and design of structural walls

MAIN HALL

Session Chairs: John W. Wallace, Radhouane Masmoudi

- 10:15-10:30 **1564** - Seismic Shear Design of RC Structural Walls
John W. Wallace, Matias Rojas-Leon, Saman A. Abdullah and Kristijan Kolozvari
- 10:30-10:45 **1376** - Experimental campaign for the ductility assessment for reinforced concrete walls and slabs of nuclear power plants
Miquel Huguet, Philippe Bisch, Elias Bou-Said, Silvano Erlicher, Etienne Gallitre, Pierre-Yves Mertz, Alexis Courtois, Philippe Merle and Rémi Meuzard
- 10:45-11:00 **1607** - Assessment of Shear Strength of Reinforced Concrete Walls: Is an Upper Limit appropriate?
Marina Moretti,
- 11:00-11:15 **1410** - Shaking table test study on the influence of construction procedure for modular precast composite shear wall structures
Di Wu, Jie Yi and Bin Zhao
- 11:15-11:30 **1162** - Curvature ductility of FRPRC walls
Tvrtko Renić, Tomislav Kišiček and Ivan Hafner
- 11:30-11:45 **1545** - A simple, closed-form method for determining the super-elevation of tall reinforced concrete buildings
David Ruggiero, Paola Costanza Miglietta, Benoit Boulanger and Tibor Kokai

3A02: Reinforcing steel in concrete

HALL 1

Session Chairs: Akanshu Sharma, Sara Cattaneo

- 10:15-10:30 **1409** - Bond strength of hot-dip galvanized and stainless-steel reinforcing bars after fire
Vicente Albero, Marta Roig-Flores, David Hernández-Figueirido, Ana Piquer
- 10:30-10:45 **1123** - Experimental tests on concrete wall-steel beam connections
Marie Claire Pascua, Rick Henry Charlotte Toma and Charles Clifton
- 10:45-11:00 **1129** - Bond strength of lightweight aggregate concrete to the plain seven-wire non-pretensioned steel strand
Andrzej Seruga, Rafał Szydłowski



PROGRAMME

- 11:00-11:15 **1084** - Experimental Study on Connection Between Precast Concrete Barrier and Existing Bridge Deck by Loop Steel Bars and Post-Installed Anchor
QuangThinh Nguyen, Takeshi Maki, Hiroshi Mutsuyoshi, Yosuke Ishihara
- 11:15-11:30 **1373** - Enhancing bond performance by functional grading of concrete
Philipp Preinstorfer, Janet M. Lees
- 11:30-11:45 **1435** - Methodology for Risk-Based Assessment of Post-Tensioning Tendons During Design
Glenn Washer, Reggie Holt

3A03: Sustainable and durable concrete Session Chairs: **Marta Skaf, Massoud Sofi**

HALL 2

- 10:15-10:30 **1017** - Evaluation of combustion effect on biomass bottom ash from a fluidised bed power plant – sand substitution on mortar application
Schlupp Florian, Page Jonathan, Djelal Chafika, Libessart Laurent
- 10:30-10:45 **1076** - The Impact of Additives and Curing Conditions on the Mechanical Strength and Microstructural Development of MgO Based Systems
Khalilullah Taj, Büşra Aktürk, and Serhan Ulukaya
- 10:45-11:00 **1254** - Performance of fibre-reinforced sustainable concretes manufactured with aggregate and binder from steelmaking slag
Vanesa Ortega-López, Javier Manso-Morato, Aratz García-Llona, Amaia Santamaría, Ana B. Espinosa, Roberto Serrano and Flora Faleschini
- 11:00-11:15 **1647** - Use of Glass Waste in Concrete: An Australian Update
Massoud Sofi, M. Zhang, Rupasingha A.M., Ekanayake, Lumantarna, Mendis,
- 11:15-11:30 **1260** - Design optimization of Self-Compacting Concrete with residues for different scenarios
Marta Skaf, Víctor Revilla-Cuesta, José-Tomás San-José, Víctor López-Ausín and Juan M. Manso

3A04: Structural performance and seismic response Session Chair: **Hasan Özkaynak**

HALL 3

- 10:15-10:30 **1259** - Evaluation of the mechanical properties and response control effects of low-cost scrap tire pads by tire type, shape factor and surface pressure
Mingyang Wang, Guangtai Zhang
- 10:30-10:45 **1204** - Probolistic evaluation of modeling parameters for reinforced concrete moment frame building
Hamid Khodadadi Koodiani, Anil Suwal, R103 Adolfo Matamoros, Andrés Lepage
- 10:45-11:00 **1579** - Comparison of pushover and incremental dynamic analysis for failure mode of base-isolated buildings in extreme events
Necmettin Güneş
- 11:00-11:15 **1500** - Developments in Seismic Safety of RC Building Stock of Istanbul According to the Years and Seismic Design Codes
Hasan Hüseyin Aydoğdu, Alper Ilki



PROGRAMME

11:15-11:30 **1644** - Locating field hospitals based on seismic vulnerability of the building stock in Izmir Bayrakli
Gulsah Olgun, Ozgur Ozcelik

11:30-11:45 **1197** - A Framework for Improving Building Robustness Through Segmentation
Manuel Buitrago, Nirvan Makoondand Jose M. Adam

3A05: Construction management and construction techniques Session Chairs: Xiangyu Wang, Esin Ergen Pehlevan

HALL 4

10:15-10:30 **1468** - Digitalisation of reinforcing steel supply chain in construction
Ladin Camci, Lee Brankley, Ayhan Tugrul and Andrew Woolnough

10:30-10:45 **1360** - Identification of Consultant and Employer Risks in Traditional Design and BIM Projects
Deniz Arda Uğur, Deniz Artan

10:45-11:00 **1348** - Possible Impacts of Smart Contracts on Construction Claim Management
Vedat Nalioğlu, Hazal Tokdemir, Deniz Artan

11:00-11:15 **1349** - A Conceptual Model for Adopting Organizational Memory in the Construction Firms
Bartu Kologlu, Deniz Artan

11:15-11:30 **1093** - Robotic Concrete Drilling – First Test Results
Maximilian Ortner, Benjamin Kromoser

3A06: Precast and prestressed concrete

HALL 5

Session Chairs: Javad Hashemi, Tuba Gürbüz Büyükkayıkçı

10:15-10:30 **1498** - New Connection Between Precast Abutment Wall and CIP Foundation Suitable for Accelerated Bridge Construction
Olafur S. Haraldsson, Bjarni Bessason, Ching-Yi Tsai

10:30-10:45 **1517** - New modular construction method for the erection of multi-span concrete bridges
Franz Untermaier, Michael Rath, and Johann Kollegger

10:45-11:00 **1290** - Towards Crack-based Assessment of Dapped-End Connections
Boyan Mihaylov, Chathura Rajapakse and Hervé Degée

11:00-11:15 **1166** - The first construction with reinforced concrete structure in Romania
George Croitoru

11:15-11:30 **1493** - Measurement of restraint moment effect on lab specimens with precast girders made continuous
Mohammed Ibrahim, Mauro Poliotti, Yuguang Yang and Max A.N. Hendriks

11:30-11:45 **1267** - Conformity Assessment Model for the Installation and monitoring of Post-Tensioning Systems in Concrete Structures for Nuclear Projects
Ian Davis, Lee Brankley, Ayhan Tugrul, Lyn Morgan and Ladin Camci,

11:45-12:00 **Coffee Break**



PROGRAMME

3B01: FRP Composites in concrete structures

MAIN HALL

Session Chairs: Riadh Al-Mahaidi, Guan Lin

- 12:00-12:20 **1165 - Invited-Theme Lecturer** : “Enhancement of the Efficiency of CFRP Composites in Strengthening Flat and Curved Soffit RC Members”
Riadh Al-Mahaidi, Khattab Al-Ghrery, Bahaa Al-Atta, Robin Kalfat and Alaa Al-Mosawe
- 12:20-12:35 **1542** - State of the art and pilot experimental program in bending moment redistribution in RC beams and slabs reinforced with FRP bars
Konrad Szczepański, Renata Kotynia
- 12:35-12:50 **1529** - Bio-based carbon fibre reinforced polymer laminates for strengthening of concrete structures: material characterization, bond to concrete and structural tests
João P. Firmo, Marina Santos, João R. Correia, Mário Garrido, Mateus Hofmann, Ana Lopez, João Tonnies, João C. Bordado, Filipe Dourado and Inês C. Rosa
- 12:50-13:05 **1575** - Concrete Filled FRP Tubular Columns Containing Recycled Concrete Lumps: Current Research and Future Work
Guan Lin, Junjie Zhang
- 13:05-13:20 **1223** - Analyzing environmental effects on the mechanical performance of composite reinforcement systems
Viktor Gribnjak, Haji Akbar Sultani, Arvydas Rimkus, Aleksandr Sokolov
- 13:20-13:35 **1541** - Strengthening of a Structural Beam with Carbon Fiber Material Applied with Polymeric Resin
Tuluhan Ergin, Burak Erdal, Tuğhan Delibaş

3B02: Composite materials in concrete structures

HALL 1

Session Chairs: Farid Abed, Marco Di Ludovico

- 12:00-12:20 **1230** - Invited-Theme Lecturer : “Towards earthquake risk reduction solutions: applications of composite materials and future challenges”
Marco Di Ludovico
- 12:20-12:35 **1372** - Damage Mode Identification of CFRP-Strengthened Beams Based on Acoustic Emission Technique
Yubao Zhou, Tanbo Pan, Yonglai Zheng, Zhuorui Wu, and Yujue Zhou
- 12:35-12:50 **1387** - Strengthening Damaged Concrete Columns with Fibre Reinforced Polymers: A Review
Hussein Al-tameemi, Medine Ispir, Alper Ilki
- 12:50-13:05 **1313** - Numerical Simulation of the Behavior of the Adhesive Joint between FRP and Concrete
Todor Zhelyazov, Eythor Thorhallsson
- 13:05-13:20 **1033** - Flexural Performance of UHSC Beams Reinforced with BFRP Bars
Farid Abed, Yazan Alhoubi, and Zin Mahaini



PROGRAMME

3B03: Structural performance and seismic response

HALL 2

Session Chairs: Alessandro Palermo, Ufuk Yazgan

- 12:00-12:20 **1624 - Invited-Theme Lecturer** : “Seismic Resilient and Sustainable solutions: from research experiments to practical implementations”
Alessandro Palermo
- 12:20-12:35 **1570** - Performance-Based Numerical Analysis at Various Hazard Earthquake Levels for the Retrofitting of Reinforced Concrete Frames with Reinforced Concrete Infill Walls
Elpida Georgiou, Nicholas Kyriakides, and Christis Z. Chrysostomou
- 12:35-12:50 **1523** - Effect of Conventional Retrofitting Methods on the Seismic Fragility of Substandard RC Buildings: A Cost-Benefit Analysis
Goktug Unal, Mehmet Akif Altinok, Cem Demir, Ufuk Yazgan, Alper Ilki
- 12:50-13:05 **1100** - Performance Assessment of Grouted Cable Bolt System Under Simulated Rock Strata Movements Using Multi-Axis Testing
Hossein Masoumi, Sriskanthan Srisangeerthan, Javad Hashem
- 13:05-13:20 **1428** - Influence of Seismic Design Decisions on the Life Cycle Environmental Impact of an RC Building
Mehmet Oruç, Ufuk Yazgan
- 13:20-13:35 **1234** - Experimental Evaluation of the RC Frame Demands Because of its Interaction with Infill Walls
Alex Brodsky, Yuval Elbo
- 13:35-13:50** **1246- Quasi-Static Cyclic Testing of Pier-Pile connection with Replaceable Bars**
Sabina Piras, Alessandro Palermo

3B04: Structural design, codes®ulations

HALL 3

Session Chairs: Bing Li, Ladin Camci

- 12:00-12:20 **1467** - Invited-Theme Lecturer : “Re-Evaluation of Reinforced Concrete Design Code Provisions in Adopting High-Strength Reinforcement”
Bing Li
- 12:20-12:35 **1046** - Experimental investigation of the bond between new steel bars B600B and high-strength concrete in a pull-out test-report and analysis of the results
Magda Kijania-Kontak, Andrzej Winnicki
- 12:35-12:50 **1265** - Conformity Assessment Model for the Constructional Steel Products
Ladin Camci, Lee Brankley, Ayhan Tugrul
- 12:50-13:05 **1261** - Validation of Shear Design Regulations for Prestressed Members with Shear reinforcement in Revised Eurocode 2
Brian Brongers, Gerrie Dieteren
- 13:05-13:20 **1079** - The role of probability-based safety analysis: The perspective of structural product manufacturers
Tânia Feiri, Jan Philip Schulze-Ardey Marcus Ricker and Josef Hegger



PROGRAMME

3B05: Construction management and construction techniques Deniz Artan İlter, Onur Behzat Tokdemir

HALL 4

- 12:00-12:20 **1558** - Analysis of Digital Twins in the construction industry: current trends and applications
Vanessa Saback, Cosmin Popescu, Thomas Blanksvärd, Björn Täljsten
- 12:20-12:35 **1045** - Digital twins as the next step in the design and management of bridge structures
Kamil Korus, Marek Salamak, Jan Winkler
- 12:35-12:50 **1107** - Investigation of Effectiveness of Common Data Environments (CDEs) Utilized in Metro Projects
İlknur Akgüneş Ahmed, Esin Ergen Pehlevan
- 12:50-13:05 **1350** - Adopting Digital Twin and Internet of Things in the Construction Industry: A SWOT analysis
Vedat Nalioğlu, Hazal Tokdemir and Deniz Artan
- 13:05-13:20 **1032** - Automated production process for structure-optimised concrete elements
Peter Gappmaier, Tolga Celik and Onur B. Tokdemir
- 13:20-13:35 **1019** - A System Development Strategy of a Digital Construction for Building Frames
Bjorn Ter Haar, Jacques Kruger, and Gideon van Zijl

3B06: Concrete and innovative materials Session Chairs: Torrenti Jean Michel, Pinar İnci

HALL 5

- 12:00-12:20 **1048** - Dependence of Basic Creep on the Relative Humidity
Torrenti Jean Michel, Nedjar Boumediene and Aili Abudushalamu
- 12:20-12:35 **1080** - Creep Response of Rubberised One-part Alkali-activated Concrete
Mohamed Elzeadani, Dan V. Bompá, and Ahmed Y. Elghazouli
- 12:35-12:50 **1326** - Compressive Strength of Foam Concrete with Coal Mining Waste
Esegbushotae Foghi, Thanh Vo and Mohammad Rezania
- 12:50-13:05 **1193** - Thames Tideway Tunnel – Thermal assessment and on-site thermal monitoring
Pierre-Edouard Denis, Alexandre CHAIZEMARTIN, Hugo CHAPIN, Ian GIBB and Lionel LINGER
- 13:05-13:20 **1342** - Behaviour of Reinforced Recycled Aggregate Concrete Beams Subjected to Torsional Loading
Asad-ur-Rehman Khan, Shamsoon Fareed, Fatima Khalid
- 13:20-13:35 **1298** - Analytical estimation of the creep behaviour of basalt FRP bars below the creep rupture limit
Ana Pavlović, Ted Donchev and Diana Petkova
- 13:35-14:30 Lunch Break**



PROGRAMME

3C01: Composite materials in structural engineering

MAIN HALL

Session Chairs: Murat Saatçioğlu, Tomislav Kišiček

- 14:30-14:50 **1478** - Invited-Theme Lecturer : "FRP Retrofit of Concrete and Masonry Buildings Against Extreme Loads"-Earthquakes and Bomb Blasts
Murat Saatçioğlu,
- 14:50-15:05 **1086** - Efficiency Assessment of CFRP Flexural Strengthening of Low Performance Concrete Elements
Haneen Rayan, Haneen Rayan1, Rami Eid and Ffib
- 15:05-15:20 **1433** - Predicting the out-of-plane flexural capacity of a TRM-strengthened unreinforced masonry (URM) wall
Hamza Tahat, Idris Bedirhanoglu,
- 15:20-15:35 **1463** - New technologies for the seismic protection of stone masonry in earthquake-prone regions
Gianmarco de Felice, Stefano De Santis, Domenico Liberatore, Ivan Roselli, MariaLuigia Sangirardi, Omar AlShawa, Luigi Sorrentino
- 15:35-15:50 **1026** - Thin-walled slab elements made of FRP-reinforced HPC and UHPC: Development, Experimental Investigation and LCA
Mathias Hammerl, Sara Reichenbach and Benjamin Kromoser
- 15:50-16:05 **1434** - Finite element modeling of masonry wall retrofitted with combination of TRM and thermal insulation
Hamza Tahat, Idris Bedirhanoglu

3C02: Precast concrete and reusable components

HALL 1

Session Chairs: Henrik B. Jørgensen, Larbi Sennour

- 14:30-14:50 **1643** - Invited-Theme Lecturer : "Seismic Design Consideration for Total Precast Structures in Seismic Zones"
Larbi Sennour
- 14:50-15:05 **1587** - Dynamic Time-history Analysis of Eleven-story Two-bay Precast Concrete Frame with UHPC-based Connections
Yanghui Li, Weichen Xue
- 15:05-15:20 **1128** - Design of pre-cast two-column bents using strut-and-tie models and nonlinear finite element analysis
Lucas Carvalho, Mário Pimentel, António Arêde, Nelson Vila Pouca, Pedro Degaldo and José Rui Pinto
- 15:20-15:35 **1062** - Precast Flat Plate Analysis by Kinematic Method
Olha Harkava, Andrii Pavlikov, Dmytro Danych, Muhammad Ghazali Abdulsalam Dabo
- 15:35-15:50 **1464** - Experimental investigation of Connections for Reuse of Hollow Core Slabs
Henrik B. Jørgensen, Ida Keinicke Jensen and Julie Gaumitz Storm
- 15:50-16:05 **1121** - Reusability Assessment of Obsolete Reinforced Concrete Structural Components
Julie Devènes, Maléna Bastien-Masse, Célia Küpfer1 and Corentin Fivet



PROGRAMME

16:05-16:20 **1210** - Renovation with Height Increasing of Standardized Residential Building of the 1960s Made of Precast Concrete
Vladyslav Shekhovtsov, Igor Shekhovtsov, Oleg Fesenko, Viktor Malakhov, Olexiy Bondarenko, Iurii Kaliukh

3C03: Special Session : WP1.3 – Integral Bridges: Design, Modelling and Applications (Organizer: Alessandro Palermo) Session Chairs: Alessandro Palermo, Jessica Sandberg

HALL 2

14:30-14:50 **1612** - Analytic Approach to Soil-structure interaction behind integral bridge abutments based on UK design requirements
Jessica Sandberg, Michael Wiechecki, Indrasenan Thusyanthan, Paul Nowak

14:50-15:05 **1613** - Structural modelling of K^* earth pressures for fully integral frame abutments based on soil, foundation, and abutment stiffnesses
Reza Mirehsan, Jessica Sandberg

15:05-15:20 **1614** - Simplified cracking analysis of piers of integral structures. Experimental and theoretical study
Alejandro Pérez Caldentey

15:20-15:35 **1615** - New Zealand practice for the analysis and design of Integral Bridges
Moustafa Al-Ani, John Wood, Alexei Murashev, Alessandro Palermo, Kaveh Andisheh, Darren Goodall

15:35-15:50 **1616** - Techniques for incorporating soil-structure interaction effects in the analysis and design of integral bridges for static and dynamic loading
Moustafa Al-Ani, Tony Stuart

15:50-16:05 **1617** - Temperature and displacement variations of monitored integral bridges
Anssi Laaksonen

16:05-16:20 **1618** - Investigation of low-cycle fatigue in integral bridge steel h-piles due to thermal-induced cyclic displacements via experimental testing and numerical simulation
Memduh Karalar, Murat Diclel

3C04: Sustainable concrete Session Chairs: Liberato Ferrara, Federica Lollini

HALL 3

14:30-14:50 **1156** - Recycled Ultra High Performance Concrete (UHPC) as a Way to Reduce the Cement Demand in New UHPC
Liberato Ferrara, Ruben P. Borg, Estefania Cuenca, May El-Sayed and Christabelle Vassallo

14:50-15:05 **1270** - Determining Mechanical and Permeability Properties of Fly Ash and Nano-Silica Containing Mixtures Using Taguchi Design Method
Mahsa Farshbaf Maherian, Sidar Nihat Bicakci, Servan Baran and Hakan Nuri Atahan

15:05-15:20 **1070** - Micromechanical modeling of the nonlinear behavior of lightweight concrete with various expanded polystyrene contents
Slim Kammoun, Abdelmonem Masmoudi² and Ali Ellouze and Bilel Miled



PROGRAMME

- 15:20-15:35 **1391** - The challenge of replacing natural aggregate with artificial aggregate for structural concrete
Federica Lollini, Nicoletta Russo
- 15:35-15:50 **1543** - Superabsorbent polymers as an additive introducing hydrophobic agents into cement matrix
Dalia Bednarska, Marcin Koniorczyk
- 15:50-16:05 **1358** - The effect of Municipal Solid Incineration Fly Ash on Mechanical Properties of Mortar
İsmail Altındağ, U. Anil Dogan
- 16:05-16:20 **1426** - Scatter of coal fly ash properties and effect of particle size and shape on fresh and hardened mortar performance
Kai Tandon, Thorsten Stengel

3C05: Mechanical characteristics of concrete

HALL 4

Session Chairs: Mehmet Ali Taşdemir, Ünal Anıl Doğan

- 14:30-14:50 **1098** - Effect of loading sequence in compressive fatigue of concrete: experimental and theoretical evidence
Abdulgader Baktheer, Josef Hegger, and Rostislav Chudoba
- 14:50-15:05 **1120** - Experimental and Numerical Characterization of High-Strength Concrete under Monotonic and Fatigue Mode II Loading with Active Control of Lateral Compression
Henrik Becks, Mario Aguilar Josef Hegger, Rostislav Chudoba and Martin Classen
- 15:05-15:20 **1171** - Self-Healing Behaviour of Ultra-High-Performance Concrete under Constant Load
Mohammad Alameri, Mohamed Mohamed Sadakkathulla, Abdul Hamid Sheikh, and Mohamed Elchalakani
- 15:20-15:35 **1185** - Acoustic emission characteristics of microbe cement under uniaxial compression
Liquan Xie, Yifan Ji, Tanbo Pan
- 15:35-15:50 **1396** - Validation of an experimental methodology for measuring concrete fracture energy in existing structures
Silvia Sarmiento, Jaime González-Libreros, Lennart Elfgren, Erik Andersson, Mats Petersson, and Gabriel Sas
- 15:50-16:05 **1310** - Behavior of EAF concrete under cyclic axial loading
Daniel Trento, Faleschini, Vanesa Ortega-López

3C06: Structural performance and analysis

HALL 5

Session Chairs: Hasan Özkaykank, Sadık Can Girgin

- 14:30-14:50 **1075** - Numerical Investigation on Influence of Vertical Shear Leg Stirrups to Shear Failure Behavior in Wide Beams using 3D-RBSM
Muhammad Abdullah, Hikaru Nakamura and Taito Miura
- 14:50-15:05 **1586** - Research on the influence of haunch on the hysteretic performance of hybrid multi-purpose utility tunnel
Shengyang Chen, Tianbo Hu



PROGRAMME

- 15:05-15:20 **1037** - Development of a Simplified Strategy for Topology Optimisation of Reinforced Concrete Beams Using Regular Geometric Shapes
Ilyad Ahmed, Sara Reichenbach, and Benjamin Kromoser
- 15:20-15:35 **1044** - Assessment of the Bending Behaviour of RC Beams Under Impact Loads with DIC
Gonzalo S.D. Ulzurrun, Carlos Zanuy
- 15:35-15:50 **1160** - Using ground penetrating radars to detect cold joints in reinforced concrete structures
Andrey Lapshinov, Evgeny Zerkal, Alexey Kalashnikov
- 15:50-16:05 **1470** - Shear transfer mechanisms in RC beams: shear drops monitoring with coupled acoustic emission and image correlation
Syed Yasir Alam, Ahmed Belbachir, Mohammed Matallah, Ahmed Loukili
- 16:05-16:20 **1522** - Monitoring the evolution of concrete strains using vibrating wire strain gauges
Wolfgang Bachofner, Johann Kollegger
- 16:20-16:35 Coffee Break**

3D01: Structural performance and analysis Session Chairs: Radhouane Masmoudi

MAIN HALL

- 16:35-16:50 **1116** - Analysis of prestressing in notched concrete beams
Juan A. Mateu-Sánchez, I. Bauset-Tortonda, E. Giménez-Carbó, M.C. Castro-Bugallo, P. Serna, J.R. Martí-Vargas, and J. Navarro-Gregori
- 16:50-17:05 **1569** - Freeze/Thaw Cycling Effects on Concrete-Filled-FRP Tubes with Valorized FRP Materials from Decommissioned Wind Turbine Blades
Radhouane Masmoudi, Dmitry Baturkin, Arezki Tagnit-Hamou, Luc Mas-sicotte
- 17:05-17:20 **1025** - Non-Linear Analysis of RC and PRC Structures Towards a Maximum Exploitation of the Plastic Reserves of the Materials
Mattia Mairone, Marco Givonetti, Rebecca Asso, Luis A. Bohorquez Grateron, Davide Masera and Giuseppe C. Marano
- 17:20-17:35 **1609** - Self-monitoring of a lightweight pedestrian bridge deck under monotonic loading using multiwall carbon nanotubes
Efstratios Badogiannis, Konstantinos Tsivolas, Konstantinos Christidis, George Papantonopoulos, Paweł Studziński, Juliusz Żach, Maria Taxiarchou
- 17:35-17:50 **1525** - Load transfer in tunnel segments with butt-jointed reinforcement
Marion Decker, Clemens Proksch-Weilguni and Johann Kollegger
- 17:50-18:05 **1549** - Externally applied iron based shape memory strips as shear reinforcement for concrete I-sections
Muhammad Arslan Yaqub, Christoph Czaderski, Stijn Matthys



PROGRAMME

3D02: Concrete and composite materials

HALL 1

Session Chairs: Hiroshi Mutsuyoshi, Oğuz Cem Çelik

- 16:35-16:50 **1135** - Experimental Investigation of Basalt/Fibre Textile Reinforced Concrete Under Uniaxial Tensile Force
Giorgio Mattarollo, Norbert Randl and Margherita Pauletta
- 16:50-17:05 **1333** - Bond enhancement of carbon textile reinforcement by nano-silica deposition
Sung-gul Hong, Hyun-soo Youm
- 17:05-17:20 **1187** - An Experimental Investigation on Mechanical Properties and Microstructures of Mortar Incorporated with Recycled Fibre-Reinforced Polymer (rFRP) Composite Waste
Yunyun Tao, S. Ali Hadigheh
- 17:20-17:35 **1085** - Experimental research on new sustainable geopolymer concretes reinforced and not reinforced with natural fibres
Alberto Viskovic, Michał Łach, Łukasz Hojdys, Piotr Krajewski, Arkadiusz Kwiecien
- 17:35-17:50 **1381** - Smart Material Design of Textile-Reinforced Composites for Thin-section Structures
Esat Selim Kocaman, Can Gürer Yücel, Onur Öztürk, Olcay Aydoğan, Selen Akın, Nilüfer Özyurt

3D03: Special Session : WP1.3 – Integral Bridges: Design, Modelling and Applications (Organizer: Alessandro Palermo)

HALL 2

Session Chairs: Alessandro Palermo, Jessica Sandberg

- 16:35-16:50 **1619** - Design Detailing To Avoid Flange Buckling and Alleviate Associated Fatigue Damage in Integral Bridge H-Piles under Cyclic Thermal Displacements
Memduh Karalar, Murat Dicleli
- 16:50-17:05 **1620** - Estimation of pile top displacements in integral abutment bridges
Habib Tabatabai, Hassan Magbool, Bryn M. Glennon, David A.B. Ramirez
- 17:05-17:20 **1621** - Numerical analyses of the flexural behaviour of ultra-high performance concrete link slab for jointless bridges
Bruno Briseghella, Hao Wu, Qiao Yu, and Lingzhi Li
- 17:20-17:35 **1622** - Numerical analysis of semi-integral abutment - flat approach slab - soil interaction
Bruno Briseghella
- 17:35-17:50 **1016** - Experimental investigations on the load-bearing behavior of monolithically connected bridge piers
Max Herbers, Steffen Marx



PROGRAMME

3D04: Structural performance and analysis

HALL 3

Session Chairs: Ahmet Anıl DİNDAR, Houssam Toutanji

- 16:35-16:50 **1285** - Numerical Analysis of High-Speed Train Induced Aerodynamic Load on Noise Barrier Considering Wind Effect
Dongyun Liu, Chao Wang, Jaime Gonzalez-Libreros, Ola Enoksson, Tommy Hojsten, Yongming Tu, Lennart Elfgren and Gabriel Sas
- 16:50-17:05 **1023** - Skewness Effect on Analysis of Transverse and In-plane Loading Acting on Skew Bridges
Essam Ayoub, Youakim Maher, Hany Karim
- 17:05-17:20 **1603** - Validation of the Locati Method in Evaluating the Fatigue Limit of RC Beams
Houssam Toutanji, Tamer Eljufout
- 17:20-17:35 **1124** - Performance Improvement of an RC Moment Resisting Frame by a Novel Lead Extrusion Damper: A Numerical Investigation
Furkan Çalim, Cihan Soydan Ahmet Güllü, and Ercan Yüksel
- 17:35-17:50 **1336** - Numerical study on the temperature field of a high geothermal tunnel with PCM modified supporting structure
Yong Yuan, Qiling Wang, Hui Wang

3D05: Timber composites and steel connections

HALL 4

Session Chairs: Pinar Inci, Klaudia Śliwa-Wieczorek

- 16:35-16:50 **1031** - Usability and Suitability of Different Small-Scale Test Setups to Accurately Assess the Shear Strength of The Glue Line in Adhesive Bonded Timber-Concrete-Composite Elements
Florian Brosch, Benjamin Kromoser
- 16:50-17:05 **1072** - Predicting the Load-Carrying Capacity of Timber-Concrete Notch Connections
Sepideh Mirshekar, Vahid Sadeghian
- 17:05-17:20 **1152** - Shear stiffness and capacity of PolyUrethane Flexible Joint in timber-concrete composites
Klaudia Śliwa-Wieczorek, Wit Derkowski, Eva Binder, Arkadiusz Kwiecień, Bogusław Zajęc, Ervin Halilovic and Seid Lotinac
- 17:20-17:35 **1243** - Effect of Wood/Binder Ratio, Slag/Binder Ratio, and Alkaline Dosage on the Compressive Strength of Wood-Geopolymer Composites
Firesenay Zerabruk Gigar, Amar Khennane, Jong-Ieng Liow and Biruk Hailu Tekle
- 17:35-17:50 **1296** - Nonlinear Behavior of Bolted Extended End-Plate Beam to Column Connections Subject to Cyclic Loading
Selin Yardımcı, Cüneyt Vatansever



PROGRAMME

3D06: Presentations of blind contest winners Session Chairs: Yuguang Yang

HALL 5

- 16:35-16:50 Assessment of the shear behaviour of continuous precast concrete girder bridges in the Netherlands and the blind prediction contest
Yuguang Yang
- 16:50-17:05 Test setup and results of the selected experiments for the contest
Yuguang Yang
- 17:05-17:20 Overview of submissions and announcement of the winner.
Niels Kostense
- 17:20-17:35 Presentations of nominated participants.
Invited Speakers
- 18:05-18:10 Coffee Break**

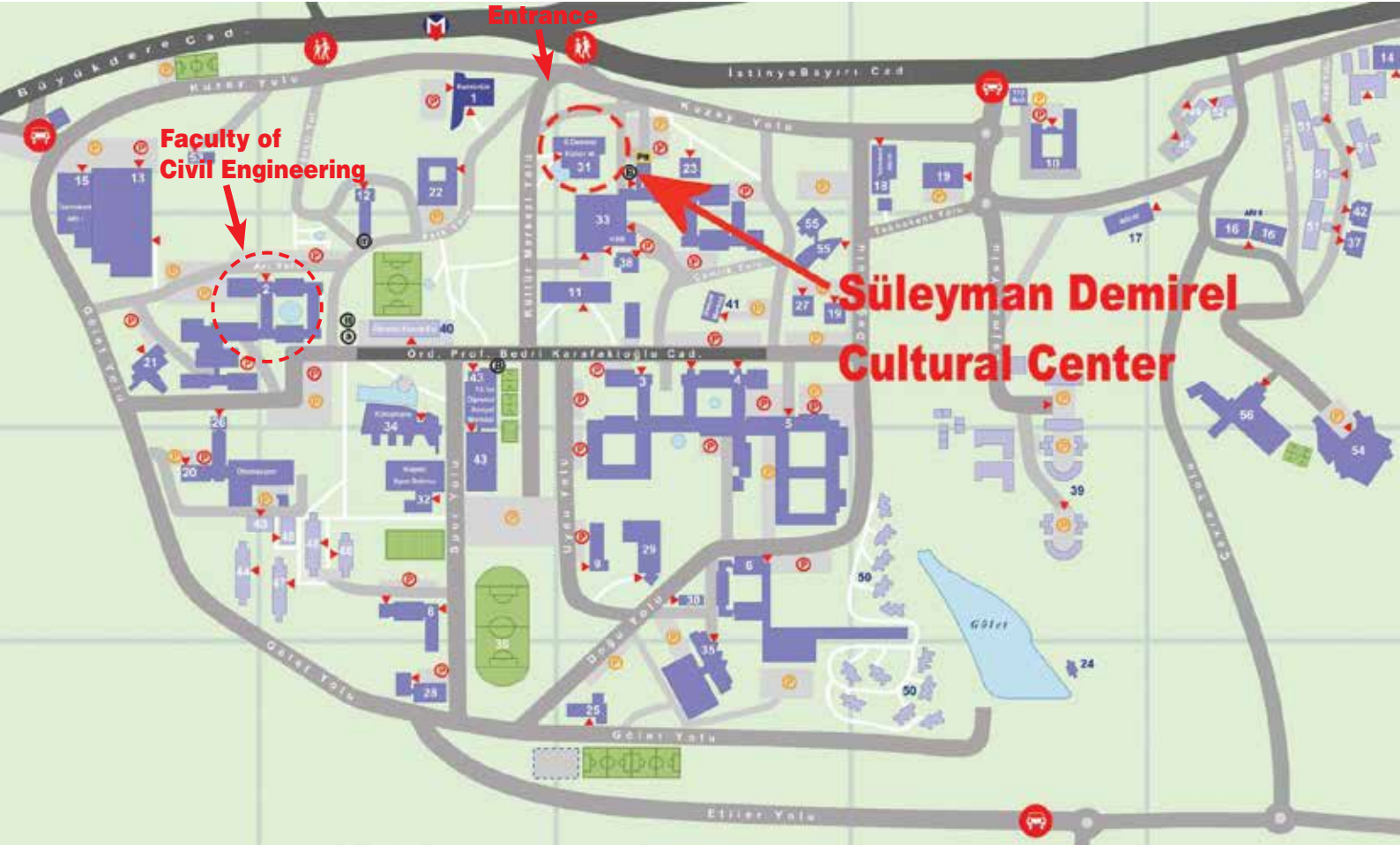
CLOSING CEREMONY

MAIN HALL

- 18:10-18:20 Presentation of *fib* President
- 18:20-18:30 Presentation of Co-chair of the Symposium
- 18:30-18:40 Presentation of next *fib* event



İTÜ CAMPUS MAP



CONGRESS CENTER HALL PLAN

MAIN HALL	SDKM 1 ST FLOOR
HALL 1	SDKM 2 ND FLOOR
HALL 2	SDKM 1 ST FLOOR
HALL 3	SDKM 1 ST FLOOR
HALL 4	FACULTY OF CIVIL ENGINEERING 1 ST floor
HALL 5	FACULTY OF CIVIL ENGINEERING 1 ST floor
EXHIBITION AREA	SDKM GROUND FLOOR & 1 ST FLOOR

fib Symposium

CEB•FIP

2023 ISTANBUL 5-7 JUNE

Istanbul Technical University

Special Thanks to *Our Sponsors*

GOLD SPONSORS



SILVER SPONSORS



BRONZE SPONSORS



fib Symposium 2023 - Istanbul is funded by TÜBİTAK 2223-C programme.