

PROGRAMME OVERVIEW

Sunday, 02 October 2022

17:00 – 18:30: Welcome Reception and Registration

Monday, 03 October 2022

08:00: Registration desk opens

09:00: Conference Opening and first Keynote Address

10:30 - 17:00: Conference parallel sessions and Trade Exhibition

17:30 - 19:00: Harbour Cruise

Tuesday, 04 October 2022

09:00 - 10:30: Keynote Addresses

10:30 - 17:00: Conference parallel sessions and Trade Exhibition

18:30 - 22:00: Conference Dinner

Wednesday, 05 October 2022

09:00 - 10:30: Keynote Addresses

10:30 - 16:00: Conference parallel sessions and Trade Exhibition

16:00 - 17:00: Closing Function



Venue: The University of Cape Town, Graduate
School of Business, V&A Waterfront



V&A Waterfront

EXHIBITORS



SIKA SOUTH AFRICA
<https://zaf.sika.com/>



Mapei South Africa
<https://www.mapei.com/za>



Xypex
<https://www.xypex.com/south-africa>



a.b.e.
<https://www.abe.co.za/>



PROCEQ
<https://www.screeningeagle.com/>



SANIKA
<http://sanika.co.za/>



KRYTON
<http://sanika.co.za/categories/products-services/kryton>



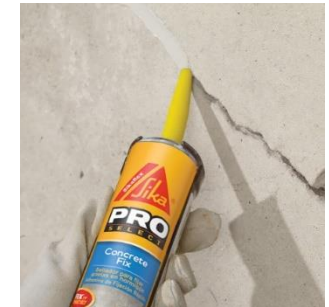
EUCLID CHEMICAL
<https://www.euclidchemical.co.za/>



StonCor
<https://www.stoncor.co.za/>

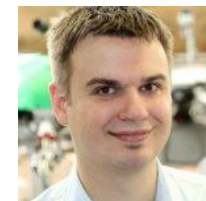


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KEYNOTE PRESENTATIONS

Concrete durability – past present, and future: in the context of confronting climate change	Prof. Karen Scrivener	EPFL	Switzerland
Damage management of concrete elements by crack mitigation and self-healing strategies	Prof. Nele De Belie	Ghent University	Belgium
Understanding concrete biodeterioration mechanisms and resistance in sewer environments: recent progress and scientific and technical challenges	Prof. Alexandra Bertron	INSA Toulouse	France
Advances in predicting reinforcement corrosion damage on concrete structures	Prof. Mike Otieno	University of Witwatersrand	South Africa
Measuring, understanding, and forecasting reinforcing steel corrosion in concrete	Prof. Ueli Angst	ETH Zurich	Switzerland
Cathodic protection of concrete structures – developments, research and applications	Prof. Rob Polder	RPCP	Netherlands
Sustainability limit states of deteriorating concrete infrastructure	Prof. Mette Geiker	NTNU	Norway
Robotic technologies for challenges in maintenance of concrete structures	Dr. Arne Roennau	FZI Forschungszentrum Informatik	Germany



SPECIAL SESSION: ALKALI-AGGREGATE REACTION MITIGATION (RILEM TC 300-ARM)

The main objectives of the [RILEM Technical Committee on Alkali-aggregate reaction mitigation](#) are to;

- Report on current strategies to mitigate alkali-aggregate reaction (AAR) induced development in affected concrete infrastructure.
- Describe and evaluate alternative/non-traditional materials and techniques to mitigate AAR-induced development in new and affected aging structures.
- Appraise the behaviour and efficiency of alternative/non-traditional materials and techniques to mitigate AAR-induced development in new and affected aging structures through accelerated test procedures in the laboratory.

The technical committee will host a special session at the conference, during which the following papers will be presented.

Actions to mitigate ASR in affected concrete structures	Luís Oliveira Santos	National Laboratory for Civil Engineering (LNEC)	Portugal
Non-traditional alkali-silica reaction mitigation products in new and affected concrete	Medhat H. Shehata	Ryerson University	Canada
Test procedures and strategies to evaluate non-traditional mitigation products in concrete	L. F. M. Sanchez; D. J. De Souza	University of Ottawa	Canada
Mitigation of the alkali-aggregate reaction	E. Menéndez; A. Santos Silva	Institute Eduardo Torroja of Construction Science; National Laboratory of Civil Engineering (LNEC)	Spain; Portugal

THEME 1: CONCRETE DURABILITY ASPECTS

Concrete durability: innovative materials and influences of material composition

Fatigue behaviour of steel and synthetic fibre reinforced concrete pavements	N.P. Makara; R. Combrinck; H. Fataar	Stellenbosch University	South Africa
Durability of concrete with belite-gehlenite clinker as fine aggregate	Arato Kobayashi; Hiromi Fujiwara; Masanori Maruoka; Mizuki Owada; Kensuke Hayashi	Utsunomiya University; D.C corporation; Taiheiyo cement corporation	Japan
Experimental study on the effect of low carbon type concrete on sulfuric acid resistance	Shintaro Tanaka; Hiromi Fujiwara; Masanori Maruoka; Hiyori Ishiduka; Tao Wang	Utsunomiya University; Penta Ocean Constructions CO.,Ltd.	Japan
Fly ash geopolymer concrete durability to sulphate, acid and peat attack	Yulin Patrisia; David W. Law; Chamila Gunasekara; Arie Wardhono	RMIT University; Universitas Negeri Surabaya	Australia; Indonesia
Mechanical properties and self-sensing ability of amorphous metallic fiber reinforced concrete	Théophile Bouillard; Anaclet Turatsinze; Jean-Paul Balayssac; Ahmed Toumi; Olivier Helson	LMDC, Université de Toulouse, INSA; ANDRA	France
Structural performance of aged reinforced autoclaved aerated concrete (RAAC) roof panels	C.I. Goodier; S. Cavalaro; M. R. Azadi Kakavand	Loughborough University	United Kingdom
Factors influencing the electrical properties of ettringite binders	Atolo Tuinukuafe; Jeremy Smith; Lamiya Noor; Jason H. Ideker; O. Burkan Isgor	Oregon State University	USA
Effect of styrene-acrylic latex polymer on the dimensional and mechanical stability of ettringite accelerated binders composed of CAC-PC-CŞ	Lamiya Noor; Jason H. Ideker	Oregon State University	USA
Assessing the pozzolanic potential of recycled masonry clay brick used as fine material in concrete	Janina P Kanjee; Ivan Ndlovu; Nwabisa Nelani; Yunus Ballim	University of the Witwatersrand	South Africa

Assessing the mechanical and durability properties of concrete using recycled masonry clay rubble bricks as coarse aggregates	Janina P Kanjee; Thoba Sikhakhane; Omphile Tejane	University of the Witwatersrand	South Africa
The influence of different modifying polymers on the mechanical properties of cement concrete within a defined service temperature range	Alexander Flohr; Andrea Osburg	Bauhaus-Universität Weimar	Germany
Influence of restraint service stresses on ASR-induced expansion in concrete structures – a critical review of literature and overview of ongoing study	Dikeledi Maboea; Mike Otieno	University of Witwatersrand	South Africa
Effects of high and vary temperatures on blast furnace slag concretes	Marcin Zyzak; Hans Hedlund; John L Provis; Andrzej Cwirzen	Luleå University of Technology	Sweden
The role of supplementary cementitious materials in the prevention of the alkali-silica reaction in concrete	Grant Prinsloo; Mohammad S. Pourbehi	Cape Peninsula University of Technology	South Africa
Effectiveness of concrete curing compounds in extreme climate conditions	Zelda Spijkerman; William P Boshoff	University of Pretoria	South Africa
Experimental investigation of curing conditions on the property of concrete partially replaced with fly ash in mcc	Olukayode O S Ojo; Zelda Spijkerman; William P Boshoff; Martha S Smit	University of Pretoria	South Africa
Controlling capillary pressure in concrete to prevent plastic shrinkage cracking	RC Deysel; WP Boshoff; MS Smit	University of Pretoria	South Africa
Application of mining tailing sand in concrete mixtures – a review	J. O. Ikotun; R. A. Adeyeye; M. Otieno	Durban University of Technology	South Africa
The effect of cement reduction on the mechanical and durability properties of concrete	Ram Kiran; Diana Londono Zuluaga; Marijana Serdar; Karen Scrivener	University of Zagreb; École Polytechnique Fédérale de Lausanne	Croatia; Switzerland
Properties of desert dune fines-slag blended geopolymer mortar designed using Taguchi method	Abdulkader El-Mir; Hilal El-Hassan	United Arab Emirates University	United Arab Emirates

Influence of alkali content and silica modulus on the carbonation kinetics of alkali-activated slag concrete	Olivera Bukvić; Marijana Serdar	University of Zagreb	Croatia
Chemical interactions between hydrated cement pastes and aggressive compounds (acetic acid and ammonium)	M. Giroudon; C. Roosz; M. Peyre-Lavigne; L. Lacarrière; A. Bertron	LMDC	France
Characterization of stability of synthetic calcium silicates hydrates in chemically aggressive conditions	C. Roosz, M. Giroudon, L. Lacarrière, A. Bertron	LMDC	France
Enhancing the resistance of alkali-activated cement mortars against biogenic acid attack by incorporation of incineration sewage sludge ash	Hafiz Asad Ali; Lu Jianxin; Sun Keke; Chi Sun Poon	The Hong Kong Polytechnic University	Hong Kong
Effects of sodium oxide content on the durability of alkali-activated mortar utilizing Botswana copper mine tailings and fly ash	A. V. J. Sannoh; G. Malumbela; V. S. Gilayeneh	Botswana International University of Science and Technology; University of Witwatersrand	Botswana; South Africa
Application of strain hardening cementitious composite (SHCC) in reinforced concrete cover zone for crack width control	Shan He; Mladena Luković; Erik Schlangen	Delft University of Technology	Netherlands
High performance reactive magnesium cement incorporating with hollow natural fiber	Bo Wu; Jishen Qiu	Hong Kong University of Science and Technology	Hong Kong
Flexural strength of fibre reinforced concrete in relation to the angle of magnetically orientated fibres	Kristýna Carrera; Karel Künzel; Václav Papež; Radoslav Sovják; Přemysl Kheml	Czech Technical University in Prague	Czech republic
Dilution effect of corn cob ash as a partial replacement for cement in concrete	Oluwadamilola A. Fadele; Mike Otieno	University of Witwatersrand	South Africa

Service life modelling and prediction of durability

Probabilistic service life design of reinforced concrete structures via free web application	Ueli Angst; Christian Linden; Marc Zintel	ETH Zurich; Steeltec AG	Switzerland
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Microcrack formation of ultra-high performance shotcrete (UHPS)	Toni Pollner; Christoph Dauberschmidt; Andrea Kustermann	Munich University of Applied Sciences	Germany
Durability aspects of cracked RC-structure exposed to chlorides reinforced with rebars 1.4003	Christoph Dauberschmidt; Andreas Fraundorfer	University of Applied Sciences Munich	Germany
The effect of SAP on cracking susceptibility of alkali activated mortars containing GGBS and copper slag	S. MacLennan; A.J. Klemm	Glasgow Caledonian University	United Kingdom
Performance based approach to assess the spalling resistance of concrete under freeze-thaw attack	P.A. Muhammed Basheer; Adrian E. Long; Sreejith V. Nanukuttan; Kai Yang	University of Leeds; Queen's University Belfast; Chongqing University	United Kingdom; China
Modelling the cracking of fresh concrete	R Combrinck; DM Meyer; W. P. Boshoff	Stellenbosch University	South Africa
The tensile deformation and capillary pressure build up in fresh concrete	R Combrinck; DM Meyer	Stellenbosch University	South Africa
The influence of temperature on the cracking of plastic concrete.	R Combrinck; J. van Zyl; DM Meyer	Stellenbosch University	South Africa
Salt frost scaling of concrete – new insights regarding the damage mechanism	Matthias Müller; Horst-Michael Ludwig	Bauhaus-University Weimar	Germany
Impact of slag on carbonation rate of concrete based on calcium aluminate cement	A.-D. Bašić; M. Serdar; G. Walenta	University of Zagreb; Calucem GmbH	Croatia; Germany
Mortar resistivity as a parameter for monitoring steel corrosion in alkali-activated materials	Antonino Runci; Marijana Serdar	University of Zagreb	Croatia
Influence of the fly ash and slag on the combined effect of alkali-silica reaction and corrosion of steel in RC structures.	Williams Dunu; Mike Otieno	University of Witwatersrand	South Africa

A critical evaluation of the use of crack width requirements in the durability design of marine reinforced concrete structures	Nicholas Elias	University of Cape Town	South Africa
Modelling and prevention of reinforcement corrosion			
Experimental and numerical analysis of corroded steel reinforcing plain bars	Francesco Pugliese; Luigi Di Sarno	University of Liverpool; University of Sannio	UK; Italy
Artificial intelligence: future of infrastructure performance prediction?	A. Michel; V. Marcos-Meson	Technical University of Denmark; COWI A/S	Denmark
Reinforcement corrosion of circular concrete columns under sustained load	Samer Jabbour; Beatriz Martín-Pérez; Michelle Liu	Halsall Associates Limited; University of Ottawa	Canada
Updating the prediction of chloride-induced corrosion in RC structures by considering cracks detected by a CNN	Patrick Pfändler; Thilo Schmid; Ueli Angst	ETH Zurich	Switzerland
Corrosion-induced cover cracking in structural rubberised concrete	Jerisa Padayachee; Mike Otieno	University of the Witwatersrand	South Africa
Stability of Fe^{2+} in cementitious media	Shishir Mundra; Dominik Kunz; Jan Tits; Erich Wieland; Ueli M. Angst	ETH Zurich; Paul Scherrer Institute	Switzerland
Toward a digital twin of the steel-concrete interface for numerical corrosion studies	T. Schmid; Z. Zhang; N. Ruffray; M. Griffa; O.B. Isgor; U. Angst	ETH Zurich; EMPA; Oregon State University,	Switzerland; USA
Corrosion-induced concrete cracking - a poromechanical, multiscale approach	Mohit Pundir; David Kammer; Ueli Angst	ETH, Zurich	Switzerland
Thermodynamic and kinetic considerations of corrosion product formation in cementitious media	F.E. Furcusa; B. Lothenbach; O.B. Isgor; S. Mundraa; Z. Zhanga; U.M. Angst	ETH Zürich; EMPA; Oregon State University	Switzerland; USA

Testing the bromide penetration resistance of concrete: substitution of NaCl by NaBr in rapid chloride/bromide migration test (RCM/RBM)	Christoph Langer; Gesa Kapteina	HafenCity University	Germany
Influence of alternative binders on the passivation of steel in mortar	Rebecca Achenbach; Michael Raupach	Institute of Building Materials Research	Germany
Sustainable reinforced concrete for chloride exposures	Sylvia Keßler; Julia Wünsch; Daniel Cassiani	Helmut-Schmidt-University / University of the Federal Armed Forces Hamburg	Germany
Effect of load-induced crack widths on the corrosion process of reinforced concrete members exposed to chloride environment	Lucas Hess; Raoul François; Laurent Boutillon; Lionel Linger; Valérie L'Hostis	LMDC, Université de Toulouse, INSA; VINCI constructions; Den-Service d'Etude du Comportement des Radionucléides (SECR)	France
Moisture sorption behaviour of concrete mixtures containing chlorides and the resulting electrolytic resistivity in relation to the estimated corrosion risk	Andreas Fraundorfer; Thomas Heilmayer; Christoph Dauberschmidt; Christoph Gehlen	University for Applied Sciences Munich; Technical University of Munich,	Germany
Corrosion rate in carbonation induced corrosion of reinforced concrete according to cement type	Thi-Thu Trang Nguyen; Raoul François; Tru Ngoc Vu; Myriam Carcasses	LMDC, Université de Toulouse, INSA; National University of Civil Engineering, Hanoi	France; Vietnam
Chloride threshold of prestressed steel in various cementitious binders	Dyana Joseline; Radhakrishna G. Pillai	Indian Institute of Technology Madras	India
Galvanic corrosion of prestressed strands in re-grouted, post tensioned concrete systems	Karthikeyan Manickam; Radhakrishna G. Pillai	Indian Institute of Technology Madras	India
Chloride profiles with a peak – why and what are the consequences for predictions?	Lars-Olof Nilsson	Moistenginst AB & University of Lund	Sweden
A numerical modelling framework to predict the effects of self healing on chloride penetration in ultra high performance concrete (UHPC)	Antonio Cibelli; Hamza Ahmed; Giovanni di Luzio; Liberato Ferrara	Politecnico di Milano	Italy

THEME 2: CONDITION ASSESSMENT OF CONCRETE STRUCTURES

Degradation and condition assessment

Inspection and diagnosis of water storage systems in Oman.	Michael Grantham; Rob Polder	Sandberg LLP; RPCP	UK; Netherlands
Testing methods for concrete-to-concrete interfaces as pathways for corrosive attack	Jan P. Höffgen; Matthias Mohs; Viktória Malárics-Pfaff; Frank Dehn	Karlsruhe Institute of Technology; Federal Waterways Engineering and Research Institute	Germany
The comprehensive assessment and rehabilitation of a 65-year-old Malaysia's parliament house building complex	Mohd Firdaus bin Mohd; Emmy Sherina binti Ismail Hashim	Public Work Department	Malaysia
Corrosion monitoring of reinforced concrete structures – actual research results and new guidelines	Andreas Fraundorfer; Christoph Dauberschmidt	University of Applied Sciences Munich	Germany
Assessment of cantilevered concrete balconies by means of practically oriented evaluation tools	Bart Craeye; Lydia Wittocx; Peter Minne; Robby Caspeele	University of Antwerp; Odisee University College; SGS Belgium; KU Leuven; Ghent University	Belgium
Condition assessment of concrete prestressed slab after 60 years in service	Dana Tawil; Leah Kristufek; Beatriz Martin-Perez; Leandro Sanchez; Martin Noël	University of Ottawa	Canada
Confederation bridge concrete ice shield monitoring and maintenance	Donald J. McGinn	Confederation Bridge	Canada
Microscopic assessment of ASR-affected columns after 20 years in service	Hesham Ahmed; Andisheh Zahedi; Leandro Sanchez	University of Ottawa, Ottawa	Canada
Preliminary evaluation of pier cap from an ASR affected bridge in Montreal, Canada	Leah Kristufek; Andisheh Zahedi; Dana Tawil; Leandro Sanchez; Beatriz Martin-Perez; Martin Noël	University of Ottawa, Ottawa	Canada

Evaluation of corrosion damage in reinforced concrete structures in terms of the rebar's residual cross-section	Victor S. Gilayeneh; Sunday O. Nwaubani	University of Witwatersrand	South Africa
Deterioration analysis of sewer concrete subjected to biogenic acid corrosion using QEMSCAN	Alice T Bakera; Mark G Alexander; Hans Beushausen	University of Cape Town	South Africa
Case study: concrete testing for accurate assessment and maintenance of concrete structures	Kerusha Ayer; Andries van der Merwe; Kevin Volmink	Naidu Consulting	South Africa

Non-destructive measurement and assessment techniques

An artificial intelligence approach to detection and assessment of concrete cracks based on visual inspection photographs	Mufaro Gomera; Yunus Ballim	University of Witwatersrand	South Africa
Imaging of results in NDT-CE: strength and limitations in the use of radar vs. Ultrasonic echo	Alexander Taffe	HTW – University of Applied Sciences Berlin	Germany
Recent advances in (ultra)sonic active and passive monitoring of reinforced and prestressed concrete structures	Ernst Niederleithinger; Niklas Epple; Chun-Man Liao	Bundesanstalt für Materialforschung und -prüfung (BAM, Federal Institute for Materials Research and Testing)	Germany
Comparison of different non-destructive techniques to assesses the electrical property of cement-based systems	Mahima Shrivastavaa; Harish Kizhakkumodom Venkatanarayananb	Indian Institute of Technology Kanpur	India
Preserving the value of heritage buildings through NDT processes	Andrei Walther; Andreas Hasenstab	Kiwa GmbH; Ingenieurbüro Dr. Hasenstab	Germany
Approach to the development of a model to quantify the quality of tendon localization in concrete using ultrasound	Stefan Küttenbaum; Stefan Maack; Alexander Taffe	Bundesanstalt für Materialforschung und -prüfung (BAM); HTW Berlin – University of Applied Sciences	Germany

Practicable procedure for the precise measurement of geometrical tendon positions in concrete with ultrasonic echo	Stefan Maack; Stefan Küttenbaum; Ernst Niederleithinger	Bundesanstalt für Materialforschung und -prüfung (BAM)	Germany
Determination of surface properties of treated cement pastes by acoustic methods and scratch test	Libor Topolář; Lukáš Kalina; Dalibor Kocáb; Petr Hrubý; Petr Bílý; Josef Fládr	Brno University of Technology; Czech Technical University in Prague	Czech Republic
A comparison of ultrasonic pulse velocity determination using traditional pitch-catch methods and pulse echo methods	David Corbett; Nicolas Budyn	Screening Eagle Technologies	Switzerland
Cover concrete quality evaluation utilizing the water intentional spraying test: a novel approach	May Huu Nguyen; Kenichiro Nakarai; Sohei Nishio	Hiroshima University; Railway Technical Research Institute	Japan
A framework for non-destructive assessment and monitoring of 3d printed steel fibre reinforced concrete (SFRC) tunnel segments	Andrea Marcucci; Stefano Guanzioli; Francesco Muscolino; Alberto Negrini; Roberto Felicetti; Liberato Ferrara	Politecnico di Milano; Hinfra	Italy
Laser-induced breakdown spectroscopy - a tool for imaging the chemical composition of concrete	G. Wilsch; T. Völker; T. Klewe; S. Kruschwitz	Bundesanstalt für Materialforschung und -prüfung (BAM)	Germany

THEME 3: CONCRETE REPAIR, REHABILITATION AND RETROFITTING

Repair methods, materials, and techniques

Emergency rehabilitation of Selby interchange on m2, in Johannesburg, South Africa	Johnnie Strydom; Jared da Silva; Odilon Kongolo	WSP Africa; Stefanutti Stocks Civils	South Africa
Use of fibres in improving the mechanical properties of a multifunctional cement for structural repair purposes	Chinedu A. Ajoku; Anaclet Turatsinze; Ariane Abou-Chakra	LMDC, Université de Toulouse, INSA; Federal University of Technology Owerri	France; Nigeria

Characterization and comparison of different formulations of textile reinforced cement composites. Application to the protection and reinforcement of an highway bridge slab	Patrice HAMELIN; Zyed MESTICOU; Amir SI-LARBI	I2C; LTDS laboratory	France
Effect of fiber content on properties of non-proprietary UHPC for prestressed girder repair	Dip Banik; Mujtaba Ahmadi; Jeffery S. Volz; Royce W. Floyd	University of Oklahoma	USA
Crack control for repair and strengthening of reinforced concrete structures by using the multi-cracking behaviour of ultra-high performance fibre reinforced shotcrete (UHPRSC)	Andre Strotmann; Jörg Jungwirth	University of Applied Sciences Munich	Germany
Application of RFID corrosion environment sensing system to repair work and results of 10-year study	Akira ERIGUCHI; Hiromi FUJIWARA; Yukitoshi ISAKA	Taiheiyo Cement Corporation; Utsunomiya University	Japan
How European standard EN 1504 for products and systems for concrete protection and repair is changing the repair and rehabilitation of concrete structures in Malaysia	Emmy Sherina Ismail Hashim	Public Work Department	Malaysia
Surface repair of concrete and reinforced concrete structures with carbon textile reinforced concrete (CTRC)	Cynthia Morales Cruz; Michael Raupach	RWTH Aachen University	Germany
Autogenous self-healing of carbon textile reinforced concrete (CTRC) repair layers exposed to cyclic movements	Cynthia Morales Cruz; Michael Raupach	RWTH Aachen University	Germany
Sustainable concrete repair & protection products - impact on renovation works	Michel Donadio; Katherine Agapitos; Wayne Smithers	Sika	Switzerland; South Africa
Product data templates of repair products for building information modeling (BIM)	Norbert Schröter	Deutsche Bauchemie e.V.	Germany
Efficiency of side-near-surface-mounted technique for flexurally strengthened RC beams comprising glass fiber reinforced plastic composite	Md. Akter Hosen; Fadi Althoey; Mohd Zamin Jumaat	Dhofar University; Najran University; University of Malaya	Saudi Arabia; Malaysia
A long-term study on the effect of a hydrophobic treatment on the moisture balance and durability of a reinforced concrete structure in a road tunnel	M. Brem; M. Büchler; J. Lohner	SGK Swiss Society for Corrosion Protection; Sika Services AG	Switzerland

Quantitative assessment of compatibility in concrete repair systems	A. Garbacz; B. Bissonnette; L. Courard; F. Modjabi-Sangnier; W. Jackiewicz-Rek; A.M. Vaysburd	Warsaw University of Technology; Université Laval; Liège University; SNC-Lavalin; Vaycon Consulting	Poland; Canada; Belgium; USA
Concrete substrate moisture requirements for durable concrete repairs	B. Bissonnette; L. Courard; A. Garbacz; A.M. Vaysburd; K. von Fay	Liège University; Université Laval; Warsaw University of Technology; Vaycon Consulting; US Bureau of Reclamation	Canada; Belgium; Poland; USA
Re-using existing prefabricated prestressed concrete girders	Rob Vergoossen; Gert-Jan van Eck; Danny Jilissen	Royal HaskoningDHV	The Netherlands
Bridge deck microstructure modification for durability with post-set applied colloidal silica	A. Brent Rollins; Benjamin Byard; George Harrison	Spray-Lock Concrete Protection; Tennessee Valley Authority; SGS	USA
Performance of polyurethane coating on concrete exposed to a frozen marine environment for 10 years	H. Zhu; Z. Fan; J. Xiong; J. Zeng; H. Yang	CCCC Forth Harbor Engineering Institute Co., Ltd.	China
Rehabilitation of a hydraulic structure with different strain-hardening cement-based composites	Steffen Müller; Viktor Mechtcherine	Technische Universität Dresden	Germany
Investigating the effects of anti-corrosive coatings on the bond between corrosion-damaged rebar and concrete repair materials	Moola Muhammad Ameen; Nicholas Jarratt; Hans Beushausen	University of Cape Town	South Africa

Concrete patch repairs and bonded overlays

Durability of repair mortars with water treatment plant sludge and sugarcane bagasse ash sand: carbonation, chloride penetration and corrosion probability	Thiago A. Hemkemeier; Fernando C.R. Almeida; Almir Sales; Agnieszka J. Klemm	Federal University of São Carlos; Federal University of Minas Gerais; Glasgow Caledonian University	Brazil; Scotland
Thin bonded overlays with carbon reinforcement for concrete pavements	Julia Neumann; Rolf Breitenbücher	Ruhr University Bochum	Germany
Rehabilitation and repair of concrete overlays	Dan King; Peter Taylor	Iowa State University	USA

UHPC overlay as sustainable solution to preserve old concrete structures	Ankit Kothari; Magdalena Rajczakowska; Andrzej Cwirzen	Luleå University of Technology	Sweden
Structural repairs and strengthening			
Actual achievements and future challenges of UHPFRC for structural rehabilitation of bridges	Adriano Reggia; Ivan Trabucchi; Bruno G. Leporace; Alessandro Morbi; Giovanni A. Plizzari;	University of Brescia; Italcementi S.p.A.	Italy
Shear strengthening of concrete t-beams with lateral layers of UHPC	Tongxu Liu; Jean-Phillippe Charron	Polytechnique Montreal	Canada
Numerical modeling of deep beams strengthened in shear with fabric-reinforced matrix composites	Nour Khir Allah; Tamer El-Maaddawy; Hilal El-Hassan	United Arab Emirates University	United Arab Emirates
Partial reconstruction and lengthening of a continuous post-tensioned concrete bridge deck: case study of emergency rehabilitation of the seaward road bridge after partial collapse	Peter Fenton; Jitesh Harripershad; Luke Reid	eThekweni Municipality	South Africa
Structural behaviour of reinforced concrete beams strengthened with ultra-high performance fiber-reinforced concrete (UHPFRC) in shear	Yitao Huang; Erik Schlangen; Mladena Lukovic	Delft University of Technology	Netherlands
History, diagnosis and repair of the corniche Kennedy in Marseille - France	Loriana Pace; Renaud Leconte; Tancrede De Folleville	Setec	France
Modelling of dapped-end connections strengthened with external FRP sheets	Boyan Mihaylov; Chathura Rajapakse	University of Liege; Universiteit Hasselt	Belgium
Rehabilitation of Brakkloof reservoir	B. Jarratt; O. Davis	JG Afrika	South Africa
Restoration of the new Pensacola Bay bridge	Brett Pielstick; Glenn Peterson; Aaron Chastain	Eisman & Russo	USA

Retrofitting of reinforced concrete chimney	Agnimithra Lingampeta; Sowjanya Vani	Aditya Institute of Technology and Management	India
Strengthening using carbon fibre reinforced polymer sheet and glass fibre reinforced polymer sheet	Aditya Punia; Amitesh Kumar Pandey; Sanjay Kumar Sharma	National Institute of Technical Teachers Training and Research	India
CFCM for strengthening potentials	György L. Balázs; Sandor Solyom	BME	Hungary
Study on the application of inorganic resin-based micro FRP bars in strengthening marine concrete structures	Shuai YANG; Ling-wang SU; Zong-quan YING; Mei-mei LIU	CCCC Fourth Harbor Engineering Institute Co., Ltd	China
Experimental testing on the structural capacity of coupling beams with non-anchored longitudinal bars.	Daniel Torrealva; Joel Arzapalo	Pontifical Catholic University of Peru	Peru
Performance of high-strength strain-hardening cement-based composites (HS-SHCC) under cyclic loading conditions	Dominik Junger; Viktor Mechtcherine	Technische Universität Dresden	Germany
Flexural behaviour of RC beams strengthened using hybrid combination of CFRP laminates and UHPC overlay	Balla Taraka Malleswara Rao; Rahul Reddy Morthala; S. Suriya Prakash	IIT Hyderabad	India
Strain-hardening limestone calcined clay cement-based (shlc3) sprayed composites for strengthening concrete elements against impact loadings	Cesare Signorini; Mirza A.B. Beigh; Marko Butler; Viktor Mechtcherine	Technische Universität Dresden	Germany
Different orientation of shear wall in a reinforced concrete structure to control drift and deflection	Chowdhury Zubayer Bin Zahid; Shahariar Alam; Azmain Fahik; Minhaz Imran Khan; Tarek Uddin Mohammed	Islamic University of Technology	Bangladesh

Service life extension: methods and materials

The durability and restoration performance of cement-based coatings for drinking water reservoirs	C. Paglia; A. Jornet	University of Applied Sciences of Southern Switzerland	Switzerland
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Extending the service life of existing concrete structures to last beyond 100 years	David Whitmore	Vector Corrosion Technologies Ltd	Canada
Numerical study of galvanic anode systems used for patch repair of reinforced concrete structures	Christian Helm; Michael Raupach	RWTH Aachen University	Germany
Current distribution and throwing power of galvanic cathodic protection with discrete anodes in reinforced concrete beam or column elements	Bjorn Van Belleghem; Mathias Maes; Tim Soetens	SANACON	Belgium
A rapid test to screen the functionality of galvanic anodes for cathodic protection of reinforced concrete.	Ryan Cobbs; Chris Akins Mott MacDonald; Rene Brueckner; Arpit Goyal	Mott MacDonald	United Kingdom
Design of ICCP system for a post-tensioned reinforced concrete structure damaged by chloride-induced corrosion and considering previous set of patch repairs	Stéphane Laurens; David Garcia; Elie Sassine; Simon Deharo; Erick Ringot; Arnaud Dubosc; Stéphane Panin; Raoul François	LMDC, Université de Toulouse, INSA; CORROHM; LR Vision; Corten Ingénierie; R3S	France
Long-term performance parameters influencing the service life of galvanic anodes in reinforced concrete systems	Karthikeyan Manickam; Ananya Ajayan; Deepak K. Kamde; Radhakrishna G. Pillai	Indian Institute of Technology Madras	India
Performance assessment of galvanic anode cathodic protection systems in reinforced concrete structures	Naveen Krishnan; Keerthi V.T.; Radhakrishna G. Pillai	Indian Institute of Technology Madras	India
The environmental impact of service life-extending repair for corrosion damaged reinforced concrete balconies: a case study in a coastal context	Neel Renne; Bart Craeye; Matthias Buyle; Amaryllis Audenaert	University of Antwerp; Odisee University College; Flemish Institute for Technological Research	Belgium
Practical service life assessment and rehabilitation strategy development for hyperbolic shell natural draft cooling towers	M. B. Gries; J. S. Lawler; E. I. Wagner; K. A. Michols; A. Dennis; K. Kgatele; M. Pretorius	Wiss, Janney, Elstner Associates, Inc.; Sasol South Africa Limited	USA; South Africa

THEME 4: DEVELOPMENTS IN CONCRETE TECHNOLOGY, ASSESSMENT AND PROCESSING

Design of smart cementitious composites based on multi-walled carbon nanotubes (MWCNTS) using probe ultrasonicator for dispersion	Shaban Shahzad; Ahmed Toumi; Jean Paul Balayssac; Anaclet Turatsinze	LMDC, Université de Toulouse, INSA	France
Quantified point clouds and enriched BIM-models for the digitalized maintenance planning	Hendrik Morgenstern; Michael Raupach	RWTH Aachen University	Germany
Textile reinforced concrete for free-form concrete elements: influence of the stitch type of textile reinforcements on the drapability for manufacturing double-curved concrete elements	Shantanu Bhat; Matthias Kalthoff; Patrick Schroeder; Thomas Gries; Thomas Matschei	RWTH Aachen University	Germany
Study on fundamental properties of the spraying ultra high strength fiber reinforced concrete cured at normal temperature	Kotaro Yoshikawa; Hiromi Fujiwara; Masanori Maruoka; Katsuhiko Yamada; Junon Yoshikawa	Utsunomiya University	Japan
The investigations on properties of self-healing concrete with crystalline admixture and recycled concrete waste	Fallon Clare Manhanga; Žymantas Rudžionis; Ernestas Ivanauskas; Augonis Algirdas	Kaunas University of Technology	Lithuania
Deep learning and data analytics for asphalt concrete pavement distress survey automation	Weidong Wu; Joseph Owino; Ignatius Fomunung; Mbakisya Onyango; Akintoye Oloko	University of Tennessee at Chattanooga	USA
Deviation correction rehabilitation of turnout ballastless track structure based on high-polymer chemical desorption	Liu Jing; Dai Zonglin; Lu Mancheng; Li Ying; Hong jian; Zheng Xinguo	China Academy of Railway Sciences; China Railway Shanghai Bureau Group Co., Ltd.	China
A novel approach for the consolidation of sand by MICP single treatment	Brigitte Nagy; Kim Brunner; Savannah Baptist; Andrea Kustermann	University of Applied Sciences Munich	Germany
Towards sustainable building materials through lithium silicate densifiers	Lukáš Kalina; Vlastimil Bílek Jr.; František Šoukal; Petr Bílý; Josef Fládr	Brno University of Technology	Czech Republic
Real-time hybrid simulation of reinforced concrete structures	Karim Kazemi Bidokhti	Simpson Gumpertz & Heger Inc.	USA

Numerical and experimental analysis of the mechanical behaviour of linings in quasi-rectangular shield tunnels	Weixi Zhang; Wouter De Corte; Xian Liu; Luc R. Taerwe	Ghent University; Tongji University	Belgium; China
The effect of super-plasticizer and ultra-sonic process on the carbon nanotube dispersion in combination with nano silica in cement composites to enhance its mechanical properties	M. S. El-Feky; Passant Youssef; Mohamed I. Serag	National Research Centre; German University in Cairo; Cairo University	Egypt
Textile reinforcement method for 3d printed concrete	JJ Janse van Rensburg; Riaan Combrinck; John Babafemi	Stellenbosch University	South Africa
The potential use of early age properties of concrete to determine setting time	Derek Mostert; Elsabe Kearsley	University of Pretoria	South Africa
Using soil water content sensors to measure water availability in fresh concrete	M.S. Smit; W.P. Boshoff	University of Pretoria	South Africa
Investigation of the bonding behaviour of basalt reinforcement in concrete	Andrea Kustermann; Benjamin Wolf; Milena Klose; Johanna de Reese; Christoph Dauberschmidt	University of Applied Sciences Munich	Germany
Investigation on the influence of fine recycled sands on the setting behaviour of cement when used as supplementary cementitious material (SCM)	Benjamin Wolf; Johannes Paule; Andrea Kustermann	University of Applied Sciences Munich	Germany
Feasibility of using clays from southeast European deposits in limestone calcined clay cements	Matea Flegar; Marijana Serdar; Diana Londono-Zuluaga; Karen Scrivener	University of Zagreb; École Polytechnique Fédérale de Lausanne	Croatia; Switzerland
Analysis of operational energy cost of typical residential building (in Guwahati located in north-eastern India) with foam concrete as walling material	Chandrashekhar D. Wagh; Indu Siva Ranjani Gandhi; Vishal Shrivastava	Indian Institute of Technology Guwahati	India
Case study: implementation of photoluminescent polymer concrete elements on bridge and infrastructure projects	Kevin Volmink; Josiah Padayachee; Nalini Nulliah	Naidu Consulting	South Africa