ICCRRR2018

The fifth International Conference on Concrete Repair, Rehabilitation and Retrofitting (ICCRRR 2018) will be held in Cape Town, South Africa, from 19-21 November 2018. The Conference is the latest in a sequence of ICCRRR International Conferences (Cape Town 2005, 2008 and 2012, Leipzig 2015). The organization is a collaborative venture of the University of Cape Town in South Africa and the Karlsruhe Institute of Technology (KIT) in Germany.

ICCRRR 2018 has received excellent support by researchers and practitioners from around the world, with authors being drawn from numerous research and industrial organisations. The programme is grouped under five main themes:

(i.) Concrete durability aspects
(ii.) Condition assessment of concrete structures
(iii.) Reinforcement corrosion modelling and prevention
(iv.) Concrete repair, rehabilitation and retrofitting
(v.) Concrete technology and materials processing

Only original contributions were considered for inclusion in the conference programme and all papers submitted were subjected to a full process of peer review.

ICCRRR 2018 Programme

SUNDAY 18th November 2018, 17:00 – 19:00: Registration and Welcome Function, GSB (V&A Waterfront)			
Session	**MONDAY 19th NOVEMBER 2018**		
1 (8:30 -10:00)	**Conference Opening & KEYNOTE LECTURES** (Venue A)		
Tea Break (10:00 – 10:30)			
2 (10:30 - 12:15)	**Condition assessment and NDT** (Venue A)	**Concrete deteriorating mechanisms and prediction of durability** (Venue B)	**Repair materials and systems** (Venue C)
Lunch (12:15 -13:15)			
3 (13:15 - 14:15)	**KEYNOTE LECTURES** (Venue A)		
4 (14:20 - 15:30)	**Condition assessment and NDT** (Venue A)	**Bio-deterioration of concrete** (Venue B)	**Repair materials and systems** (Venue C)
Tea break (15:30 – 16:00)			
5 (16:00 - 17:30)	**Condition assessment and NDT** (Venue A)	**Concrete deteriorating & prediction of durability** (Venue B)	**Structural repair materials and systems** (Venue C)
Session	**TUESDAY 20th NOVEMBER 2018**		
6 (8:30 - 10:00)	**KEYNOTE LECTURES** (Venue A)		
Tea break (10:00 – 10:30)			
7 (10:30 - 12:15)	**Reinforcement corrosion: mechanisms, prediction and modelling** (Venue A)	**Concrete deteriorating mechanisms and prediction of durability** (Venue B)	**Structural repair materials and systems** (Venue C)
Lunch (12:15 -13:15)			
8 (13:15 - 14:45)	**Reinforcement corrosion: mechanisms, prediction and modelling** (Venue A)	**Concrete deteriorating mechanisms and prediction of durability** (Venue B)	**Structural repair materials and systems** (Venue C)
Tea break (14:45 – 15:15)			
9 (15:15 - 16:45)	**Case studies: repair and strengthening** (Venue A)	**Bonded concrete overlays** (Venue B)	**Concrete materials technology** (Venue C)
Conference dinner 18:30 for 19:00			
Session	**WEDNESDAY 21st NOVEMBER 2018**		
10 (8:30 – 10:00)	**KEYNOTE LECTURES** (Venue A)		
Tea break (10:00 – 10:30)			
11 (10:30 -12:15)	**Case studies: repair and strengthening** (Venue A)	**Repair materials and systems** (Venue B)	**Concrete materials technology** (Venue C)
Lunch (12:15 -13:15)			
12 (13:15 - 14:45)	**Reinforcement corrosion prevention and cathodic protection** (Venue A)	**Alkali Silica Reaction** (Venue B)	**Concrete materials technology** (Venue C)
Tea break (14:45 – 15:15)			
13 (15:15 - 16:45)	**Rebar corrosion prevention and cathodic protection** (Venue A)	**Alkali Silica Reaction** (Venue B)	
Closing 16:45 - 17:30			

Monday 19th November 2018

Session 1 (8:30 -10:00) (Venue A)

Conference Opening *Hans Beushausen, Mark Alexander, Pilate Moyo and Frank Dehn*

KEYNOTE & INVITED LECTURES

Forensic engineering - fib MC 2020 and existing structures *Stuart Matthews and Giuseppe Mancini*

What bridge heritage are we leaving? *Edwin Kruger*

Multiple performance goals in bridge management systems – overview of COST TU 1406 results *Irina Stipanovic*

Tea Break (10:30 – 11:00)

Session 2 (11:00 – 12:45)

Condition assessment and NDT (Venue A)	**Concrete deteriorating mechanisms and prediction of durability B** (Venue B)	**Repair materials and systems** (Venue C)
Reliability assessment of existing bridge constructions based on results of non-destructive testing *Stefan Küttenbaum, Alexander Taffe, Thomas Braml and Stefan Maack*	**Optimizing the Acid Resistance of Concrete with Granulated Blast-Furnace Slag** *Rolf Breitenbücher, Jan Bäcker, Sebastian Kunz, Andreas Ehrenberg, and Christian Gerten*	**Design and development of concretes for special rehabilitation tasks** *Alexander Flohr and Andrea Osburg*
Demolition of Old Oak Bridge B4113: condition of a 54-year old prestressed concrete bridge *Wandie Kramer, William Martin and Harry Viljoen*	**A new test for combined Ca-leaching and sulphate resistance of cementitious materials** *Florian R. Steindl, Andre Baldermann, Isabel Galan, Marlene Sakoparnig, Martin Dietzel and Florian Mittermayr*	**Design Considerations and Innovative Approach for Restoration of Historic Landmarks in Old Montreal** *Richard Morin, Ghfran Al Chami, Richard Gagné and Benoit Bissonnette*
New Ashton Arch - functional assessment of direct and indirect construction costs and evaluation of service life with respect to flooding risk *Philip Ronné, Abe Newmark, Gesina du Toit and Heinrich van Wijk*	**Sulfate Resistance of Rice Husk Ash Concrete** *John Kamau, Ash Ahmed and Killian Ngong*	**Intrinsic modification of repair mortars made with EVA and CaO, impacts at the earlier age** *Inès L. Tchetgnia Ngassam, Wolfram Schmidt, Hans Beushausen and Hans-Carsten Kühne*
Suggestions for improved reinforced concrete half-joint bridge inspection in England *Pieter Desnerck, Pierfrancesco Valerio, Janet M Lees and Neil Loudon*	**Assessing the influence of self-healing capacity of lime-based mortars on brick-mortar interface strength in masonry units** *Cristina De Nardi, Antonella Cecchi and Liberato Ferrara*	**Using GLP as Partial Replacement in Cement Mortars** *Ahmed El-Tair, Passant Youssef and Amr El-Nemr*
Investigations on the detectability of water intruding into bridge deck sealings by electrical resistivity *Carla Driessen and Michael Raupach*	**Performance of concrete with and without crystalline admixtures under repeated cracking/healing cycles** *Liberato Ferrara, Estefania Cuenca, Antonio Tejedor and Enricomaria Gastaldo Brac*	**Workability and mechanical properties of ultrafine cement based grout for structural rehabilitation: A parametric study on the partial replacement with SCMs** *Md Shamsuddoha, Götz Hüsken, Wolfram Schmidt, Hans-Carsten Kühne and Matthias Baeßler*
Validation of artificial defects for Non-destructive testing measurements on a reference structure *Maack Stefan, Villalobos Salvador and Scott David*	**Development of an improved cracking method to reduce the variability in testing the healing efficiency of self-healing mortar containing encapsulated polymers** *Tim Van Mullem, Kim Van Tittelboom, Elke Gruyaert, Robby Caspeele and Nele De Belie*	**Non-destructive testing of concrete treated with penetrating surface sealant using a Karsten-tube** *Sunday O. Nwaubani*

Lunch (12:45 -13:45)

Session 3 (13:45 -14:45) (Venue A)

KEYNOTE LECTURES

Modelling of chloride ingress in concrete based on benchmarking field results *E.A.B. Koenders*

Condition assessment: from the good choice of methods to reliable results that meet the customer demand *Alexander Taffe*

Session 4 (14:50 – 16:00)		
Condition assessment and NDT (Venue A)	**Bio-deterioration of concrete** (Venue B)	**Repair materials and systems** (Venue C)
Detection of near-surface reinforcement in concrete components with ultrasound *Sarah Vonk and Alexander Taffe* **Corrosion on prestressing wires due to segregation of the injection mortar – Detection of injection defects with Ultrasonic-Echo Technique** *Christian Sodeikat, Klaus Mayer and Philipp Obermeier* **Alternative methodology for linear polarization resistance assessment of reinforced concrete structure** *Gabriel Samson, Fabrice Deby, Jean-Luc Garciaz and Jean-Louis Perrin* **A practical methodology to assess corrosion in concrete sewer pipes** *Shima Taheri, Martin Ams, Heriberto Bustamante, Steve Barclay, Louisa Vorreiter, Michael Withford and Simon Martin Clark*	**Biodeterioration mechanisms and kinetics of SCM and aluminate based cements and AAM in the liquid phase of an anaerobic digestion** *Marie Giroudon, Matthieu Peyre Lavigne, Cédric Patapy and Alexandra Bertron (Invited Speaker)* **Evaluation of the resistance of CAC and BFSC mortars to biodegradation: laboratory test approach** *Amr Aboulela, Matthieu Peyre-Lavigne, Cédric Patapy and Alexandra Bertron* **Microbial induced acid corrosion from a field perspective - Advances in process understanding and construction material development** *Cyrill Grengg, Florian Mittermayr, Neven Ukrainczyk, Eddie Koenders, Günther Koraimann, Sabine Kienesberger and Martin Dietzel* **Optical pH imaging of concrete exposed to chemically corrosive environments** *Cyrill Grengg, Bernhard Mueller, Florian Mittermayr, Torsten Mayr, Sergey Borisov and Martin Dietzel*	**UHPFRC for concrete repair** *Alexandrine Maltais, Nikola Petrov, Michel Thibault, Benoit Bissonnette* **Rehabilitation of marine concrete structure with under-water hydro demolition and sprayed concrete** *Kyong-Ku YUN, Kyeo-Re KIM, Seung-Yeon HAN, Yong-Gon KIM and Soo-Ahn KWONI* **Characterization tools for shrinkage-compensating repair materials** *Benoît Bissonnette, Samy-Joseph Essalik, Charles Lamothe, Marc Jolin, Luc Courard, Richard Gagné and Richard Morin* **Use of polypropylene fiber and silica fume modified concrete as a repair material** *Jing Liu, Xinhua Wen, Wen Liu, Xinguo Zheng and Chao Guo*
Tea break (16:00 – 16:30)		
Session 5 (16:30 – 18:00)		
Condition assessment and NDT (Venue A)	**Concrete deteriorating mechanisms and prediction of durability** (Venue B)	**Structural repair materials and systems** (Venue C)
Condition assessment of reinforced concrete beams – Comparing digital image analysis with optic fibre Bragg gratings *Elsabe Kearsley and SW Jacobsz* **Health monitoring and repair of a concrete shell roof structure** *Pazhanivel K, Arunachalam S and Meenakshisundaram S* **The MFL technique - Basic application for PT cable break detection in concrete structures** *Andrei Walther, Martin Wilcke, Klaus Szielasko and Sargon Youssef* **Assessment of the in situ compressive and tensile strength of existing massive hydraulic structures** *Frank Spörel* **Client/consultant partnership in 70-year old concrete evaluation** *Avanti C. Shroff*	**Concrete quality on-site vs separately manufactured specimens** *Frank Jacobs* **Effects of concrete quality and natural Johannesburg environment on concrete carbonation rate** *Jacob Olumuyiwa Ikotun* **Changes of microstructure and diffusivity in blended cement pastes exposed to natural carbonation** *Wioletta Soja, Hamed Maraghechi, Fabien Georget and Karen Scrivener* **Interest of using a model combining carbonation/chloride ingress and depassivation to better anticipate the rehabilitation of concrete structures** *Lucie Schmitt, Jonathan Mai-Nhu, Frédéric Duprat, Thomas De Larrard and Patrick Rougeau*	**Rehabilitation of a vehicle impact damaged concrete bridge girder with GFRP rebars** *Nur Yazdani and Maria Montero* **Retrofit and Renovation of Concrete Bridges with Fibre Reinforced Polymer (FRP): The Third Alternative** *Gerrit Visser, Kees Van Ijselmuijden, Ernst Klamer and Gideon Van Zijl* **Axial stress-strain behaviour of pre-damaged square concrete column repaired with FRP jackets** *Pengda Li, Yingwu Zhou, Ningxu Han and Feng Xing* **Durability of concrete with CFRP wrapping** *Qian-Qian Yu, Xiang Li and Xiang-Lin Gu*

Tuesday 20th November 2018

Session 6 (8:30 – 10:00) (Venue A)		
KEYNOTE LECTURES		
Cathodic protection of steel in concrete – experience and overview of 30 years application *Rob Polder and Willy Peelen* **FRP Strengthening of structures – bridging gaps in research and industry - 25-years' experience creating innovation** *Björn Täljsten* **Fibre Reinforced Concrete for repairing and strengthening RC structures: some recent advancements** *Giovanni A. Plizzari*		
Tea break (10:00 – 10:30)		
Session 7 (10:30 -12:15)		
Reinforcement corrosion: mechanisms, prediction and modelling (Venue A)	**Concrete deteriorating mechanisms and prediction of durability** (Venue B)	**Structural repair materials and systems** (Venue C)
Towards understanding corrosion initiation in concrete – Influence of local electrochemical properties of reinforcing steel *Lucas Michel and Ueli Angst* **Towards understanding corrosion initiation in concrete – influence of local concrete properties in the steel-concrete interfacial zone** *Carolina Boschmann Käthler, Ueli Angst and Bernhard Elsener* **A new approach to determine the chloride threshold initiating corrosion: preliminary results** *Chantal Chalhoub, Raoul François and Myriam Carcassés* **Corrosion of steel in concrete due to one and two dimensional chloride ingress** *Ze Gyang Zakka and Mike Otieno* **Macrocell corrosion between crossed steel rebars embedded in concrete under chloride environments** *Xianglin Gu, Zheng Dong and Zhihao Jin* **Corrosion behaviour of rebars 1.4003 in cracks of RC structures containing chlorides** *Christoph Dauberschmidt and Andreas Fraundorfer*	**Perpendicular-to-crack chloride ingress in cracked and autonomously healed concrete** *Bjorn Van Belleghem, Philip Van den Heede, Kim Van Tittelboom and Nele De Belie* **Deterioration model of RC beams under marine atmospheric environment** *Hongyuan Guo, Guobing Li and Xianglin Gu* **Assessment of the effect of nanosilica on the mechanical performance and durability of cementitious materials** *Gerlinde Lefever, Dimitrios G. Aggelis, Nele De Belie, Didier Snoeck and Danny Van Hemelrijck* **Investigation on the transport properties of chlorides in concrete (I) Identification of ITZ** *TIAN Ye, JIN Xianyu and JIN Nanguo* **Investigation on the transport properties of chlorides in concrete (II) Numerical simulation** *TIAN Ye, JIN Xianyu and JIN Nanguo*	**A study on the numerical modelling of UHPFRC-strengthened members** *Renaud Franssen, Serhan Guner, Luc Courar and Boyan Mihaylov* **Behavior of RC beams strengthened in shear with ultra-high performance fiber reinforced concrete (UHPFRC)** *Mohammed A. Sakr, Ayman A. Sleemah, Tarek M. Khalifa and Walid N. Mansour* **A study on the numerical modelling of UHPFRC-strengthened members** *Adel Younis and Usama Ebead* **Characterization and application of FRCM as a strengthening material for shear-critical RC beams** *Adel Younis and Usama Ebead* **Use of Strain-Hardening Cement-Based Composites (SHCC) for Retrofitting** *Steffen Müller and Viktor Mechtcherine*
Lunch (12:15 -13:15)		

Session 8 (13:15 – 14:45)		
Reinforcement corrosion: mechanisms, prediction and modelling (Venue A)	**Concrete deteriorating mechanisms and prediction of durability** (Venue B)	**Structural repair materials and systems** (Venue C)
Monitoring DIAMOND device for corrosion state evaluation of reinforced concrete structures *Gabriel Samson, Fabrice Deby, Jean-Luc Garciaz and Jean-Louis Perrin* **Probability Distribution of Cross-sectional radius of Corroded Steel Bars in Concrete and its application** *LI Chongkai, ZHANG Weiping and GU Xianglin* **Correlation between surface crack width and steel corrosion in reinforced concrete** *Michele Win Tai Mak, Pieter Desnerck and Janet M. Lees* **Effect of the degree of corrosion on bond performance of Cement Polymer Composite (CPC) Coated steel rebars** *Deepak K. Kamde and Radhakrishna G. Pillai* **Role of crack width on the service life of concrete structures** *Joost Walraven*	**Outcomes of the round robin tests of RILEM TC 247-DTA on the durability of alkali-activated concrete** *John L. Provis and Frank Winnefeld (Invited Speakers 30 mins)* **Leaching, carbonation and chloride ingress in reinforced alkali-activated fly ash mortars** *Gregor J. G. Gluth, Petr Hlaváček, Steffi Reinemann, Gino Ebell and Jürgen Mietz* **Pore structure of mortars containing limestone powder and natural pozzolan assessed through mercury intrusion porosimetry and dynamic vapour sorption** *Natalia Alderete, Yury Villagrán, Arn Mignon, Didier Snoeck and Nele De Belie* **Sasol ash as partial replacement of Portland cement – effect on selected durability properties of concrete** *Dikeledi Maboea and Mike Otieno*	**Seismic Retrofitting of a Bridge Pier with Ultra High-Performance Fibre Reinforced Concrete** *Reggia Adriano, Alessandro Morbi and Giovanni A. Plizzari* **Basalt reinforced concrete structures for retrofitting concrete surfaces** *Benjamin Wolf, Andrea Kustermann, Christian Schuler and Christoph Dauberschmidt and Ömer Bucak* **Acoustic monitoring of a prestressed concrete beam reinforced by adhesively bonded composite** *Sylvain Chataigner, Laurent Gaillet, Yannick Falaise, Jean-François David, Richard Michel, Christophe Aubagnac, Adrien Houel, Didier Germain and Jean-Philippe Maherault* **Concrete columns confined with different composite materials** *Jacopo Donnini and Valeria Corinaldesi*
Tea break (14:45 – 15:15)		
Session 9 (15:15 – 16:45)		
Case studies: repair and strengthening (Venue A)	**Bonded concrete overlays** (Venue B)	**Concrete materials technology** (Venue C)
Case Study of Concrete Repairs on Jetty in Port Nolloth, Northern Cape *Malan Schrecker Duan Viljoen and Pierre van der Spuy* **The widening of structures over the Orange river on national route 12 section 9 near Hopetown, the Northern Cape** *Tiago Massingue and Chris Lourens* **The Rehabilitation of Structures on the National Route 10 Section 12 between Upington Km 0.0 and Nakop Km134.17** *Tiago Massingue and Bennie Zietsman* **Strengthening of a railway arch bridge from 1854** *Ole Viggo Andersen* **Sanika Waterproofing Specialists and Kryton rejuvenate a mine ventilation shaft** *Daniela Warne*	**Design and Construction of Ultra-Thin Continuously Reinforced Concrete (UTCRC) on N1 near Hugenote Tunnell** *Steph Bredenhann, Johan van Heerden, Pieter Strauss and Phillip Joubert* **Development of safe construction temperature ranges to avoid blow-ups in Ultra-Thin Concrete Pavements** *Johannes Mentz and Anton Hartman* **Guidelines for concrete surface preparation: 10 years research and experience** *Luc Courard, Benoît Bissonnette, Andrzej Garbacz, Alex M. Vaysburd and Kurt F. von Fay* **Bond behaviour of thin concrete overlays for maintenance of concrete pavements** *Rolf Breitenbücher, Christoph Schulte-Schrepping and Sebastian Kunz* **Performance of Concrete Overlays in Iowa** *Peter Taylor, Jerod Gross, Dan King, Yu-An Chen and Halil Ceylan*	**On the effect of the physical structure of cement on shrinkage of cementitious materials** *Hossein Karimi, Qingliang Yu and H.J.H Brouwers* **Partial replacement of conventional fine aggregate with crumb tyre rubber in structural concrete – effect of particle size on compressive strength and time dependent** *Kudzai Mushunje, Mike Otieno and Yunus Ballim* **A review of Waste Tyre Rubber as an Alternative Concrete Consituent Material** *Kudzai Mushunje, Mike Otieno and Yunus Ballim* **Influence of superabsorbent polymer on the splitting tensile strength and fracture energy of high-performance concrete** *Babatunde James Olawuyi and William Peter Boshoff* **Design and characterization of self-sensing steel fiber reinforced concrete** *Teuku Ferdiansyah, Anaclet Turatsinze and Jean-Paul Balayssac*
Conference dinner 19:00: GOLD Restaurant, Green Point (Cape Town)		

Wednesday 21st November 2018

<table>
<tr><td colspan="3">Session 10 (09:00 – 10:00) (Venue A)</td></tr>
<tr><td colspan="3">KEYNOTE LECTURES</td></tr>
<tr><td colspan="3">Modern cement technology for improved durability of concrete structures Karen Scrivener
Sustainable, durable concrete – are specifications always fit for purpose – a case study Michael G. Grantham
Polymer-Concrete Composites for the concrete repairing Lech Czarnecki</td></tr>
<tr><td colspan="3">Tea break (10:00 – 10:30)</td></tr>
<tr><td colspan="3">Session 11 (10:30 -12:15)</td></tr>
<tr><td>Case studies: repair and strengthening (Venue A)</td><td>Repair materials and systems (Venue B)</td><td>Concrete materials technology (Venue C)</td></tr>
<tr><td>Rehabilitation of the Komati River Bridge B1604
Johnnie Strydom, Etienne du Plessis and Lourens Pieters
A case study of the retrofitting of the Great Fish River Bridge
Nerave Moodley, Graham Moore and David Wylie
Olifants River Bridge Widening
Andrew Rowan and Les Thomson
Strengthening, rehabilitation and widening of the existing arch bridge on national route 7 over the Olifants River, South Africa
Pierre van der Spuy and Hennie Niehaus
Structural Repair to Conserve Langkawi's Main Tourist Attraction: Practical Approach
Maziah Mohammad and Ros Asmah Zahari</td><td>The effect of hydrophobic treatment on concrete durability characteristics
Haris Sohawon and Hans Beushausen
The influence of concrete substrate moisture condition on the tensile pull-off strength of protective coating
Sean Kay and Hans Beushausen
Investigation in Remediation of Wind Turbine Generator (WTG) Foundations with Epoxy Resin
Kay A. Bode
Durability of flax / bio-based epoxy composites intended for structural strengthening
Karim Benzarti, Robert Chlela, Wendlamita Zombré, Marc Quiertant and Laurence Curtil
Polymer Injection Rehabilitation Technology for Lifting Differential Settlement of Turnout Ballastless Track
Jing Liu, Zhiyuan Zhang, Xinhua Wen, Xinguo Zheng and Jiahai Zhang
Underwater Abrasion Resistance of Cementitious Acrylic Coating on Repaired Surface of Concrete Dam and Stilling Basin
Jakob Šušteršič, Andrej Kryžanowski, Aleš Brodnik and Andrej Zajc</td><td>Steel fibre-reinforced concrete: multi-scale characterisation towards numerical modelling
Stephan Zeranka and Gideon van Zijl
A new testing method for textile reinforced concrete under impact load
Marcus Hering and Manfred Curbach
Properties of Western Cape Concretes with Metakaolin
Alice T. Bakera and Mark G. Alexander
Study on Characteristics of Tensile Strength of Concrete Considering Temperature Dependence in Mass Concrete Structures
Hiroki Izumi, Juniti Arai and Toshiaki Mizobuchi</td></tr>
<tr><td colspan="3">Lunch (12:15 -13:15)</td></tr>
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Session 12 (13:15 – 14:45)		
Reinforcement corrosion prevention and cathodic protection (Venue A)	**Alkali Silica Reaction** (Venue B)	**Concrete materials technology** (Venue C)
Towards arresting reinforced concrete corrosion - a review *Christian Christodoulou, Chris Goodier and Gareth Glass* **Service life extension of state highway 16 bridges – New Zealand's first hybrid corrosion protection application** *Christian Christodoulou, Ryan Cobbs, Paul Corbett and Mike Elliot* **Long-Term Performance of Hybrid Anodes for Cathodic Protection of Reinforced Concrete** *Wayne Dodds, Christian Christodoulou and Chris Ian Goodier* **Galvanic Cathodic Protection of Corroded Reinforced Concrete Structures** *David Whitmore* ***Impregnation Technique Provides Corrosion Protection to Grouted Post-Tensioning Tendons*** *David Whitmore and Ivan Lasa*	**Three decades of international RILEM activities to combat deleterious Alkali-Silica Reactions (ASR) in concrete** *Børge Johannes Wigum and Jan Lindgård (Invited Speakers 30 mins)* **Outdoor exposure site testing for preventing Alkali Aggregate Reactivity in concrete – a review.** *Benoit Fournier, Jan Lindgård, Børge J. Wigumand and Ingmar Borchers* **Living with AAR: An Engineer's Perspective** *Jonathan G M Wood* **Determining alkali leaching during accelerated ASR performance testing and in field exposed cubes using cold water extraction (CWE) and µXRF** *Jan Lindgård, Tone Østnor, Benoit Fournier, Øyvind Lindgård, Tobias Danner, Gilles Plusquellec and Klaartje De Weerdt*	**Measured temperature effects during the construction of a prestressed precast concrete bridge beam** *Frank Küsel, Elsabe Kearsley, Liam J. Butler, Sarah A. Skorpen and M.Z.E.B. Elshafie* **Concrete hydration temperatures for the design of crack-width reinforcement in concrete water-retaining structures – design values versus in-situ values.** *Matteo Angelucci* **Tensile strength of carbon rovings impregnated with different materials under anodic polarization** *Amir Asgharzadeh and Michael Raupach* **Pullout simulation of post installed chemically bonded anchors in UHPFRC** *Fabien Delhomme and Michael Brun*
Tea break (14:45 – 15:15)		
Session 13 (15:15 – 16:45)		
Reinforcement corrosion prevention and cathodic protection (Venue A)	**Alkali Silica Reaction** (Venue B)	
A 5 year track record on a galvanic CP system applied on a light weight concrete bridge with prestressed steel – *A.J. van den Hondel, Joost Gulikers, Roberto Giorgini, Anthony van den Hondel* **Maintenance and repair of steel reinforced concrete structures by galvanic corrosion protection – field experiences over 10 years** *Wolfgang Schwarz, Alexander Pichlhöfer, Anthony van den Hondel, Hernani Esteves* **Cathodic protection of concrete with conductive coating anodes: 25 years of experience with projects and monitoring results** *Anthony van den Hondel and Hans van den Hondel* **Performance assessment of sacrificial anodes for cathodic protection of reinforced concrete structures** *Deepak K. Kamde and Radhakrishna G. Pillai* **Corrosion protection of embedded steel bars in concrete** *L., Pistolesi and C., Zaffaroni*	**Field Evaluation of Concrete using Hawaiian Aggregates for Alkali Silica Reaction** *Ian Robertson and Lin Shen* **Incidence of alkali release in concrete dam. Evaluation of alkalis releasable by feldspars** *E. Menéndez, R. García-Rovés and B. Aldea* **Modelling of Alkali Silica Reaction in concrete structures for rehabilitation intervention** *Mohammad S. Pourbehi, G.P.A.G. van Zijl and J.A.v.B. Strasheim* **Effects of alkali-silica reaction on a hydropower structure after 50 years of ongoing deterioration** *Rene Brueckner, Noah Ndugga and Tony C. Meri* **Effectiveness of Silane to Mitigate Alkali-Silica Reaction in a Historical Bridge** *Anton Schindler, Darren Johnson, Robert Warnock and Robert Barnes*	
Closing 16:45 - 17:30		

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