ICCRRR 2012 and RILEM Week 2012
International Conference on Concrete Repair, Rehabilitation and Retrofitting
Cape Town, South Africa, 02-05 September 2012

Draft Programme and List of Papers
**Sunday, 02 September**  
**UCT Graduate School of Business, V&A Waterfront**

<table>
<thead>
<tr>
<th>SUNDAY 02 SEP</th>
<th>ICCRRR</th>
<th>RILEM Week</th>
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<tr>
<td></td>
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<td>GSB 1</td>
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<tr>
<td>09:00 - 12:00</td>
<td>MAC</td>
<td>TAC</td>
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<td>12:00 - 13:00</td>
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<td>13:00 - 16:00</td>
<td>MAC</td>
<td>TAC</td>
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<tr>
<td>16:00 - 18:00</td>
<td>ICCRRR &amp; RILEM Week Opening Function and Registration</td>
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**The Graduate School of Business at the V&A Waterfront**
### MONDAY 03 SEP

**ICCRRR**

<table>
<thead>
<tr>
<th></th>
<th>LT 1</th>
<th>LT 2</th>
<th>LT 3</th>
<th>LT 4</th>
<th>LT 5</th>
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<tbody>
<tr>
<td>Room</td>
<td>Boardroom 1</td>
<td>Boardroom 2</td>
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</table>

#### Session 1

- **Registration**
- **Opening**
- **Keynotes 1, 2**

<table>
<thead>
<tr>
<th>Tea break</th>
<th>10:00 - 10:30</th>
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</table>

#### Session 2

- **10:30 - 12:15**
  - 6 presentations
  - 6 presentations
  - 6 presentations
  - 6 presentations
  - 6 presentations
  - EAC (10:15 - 12:15)

<table>
<thead>
<tr>
<th>TC meetings TC211-PAE</th>
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<tr>
<th>Lunch</th>
<th>12:15 - 13:15</th>
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#### Session 3

- **13:15 - 14:15**
  - Keynotes 3, 4

#### Session 4

- **14:20 - 15:30**
  - 4 presentations
  - 4 presentations
  - 4 presentations
  - 4 presentations
  - 4 presentations

<table>
<thead>
<tr>
<th>Bureau I 13:00-15:30</th>
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<tr>
<th>TC meetings TC 230 PSC</th>
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<tr>
<th>Tea break</th>
<th>15:30 - 16:00</th>
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#### Session 5

- **16:00 - 17:30**
  - 5 presentations
  - 5 presentations
  - 5 presentations
  - 5 presentations
  - 5 presentations

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<tr>
<th>Development Meeting 16:00-17:30</th>
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**Lunch and tea sponsored by Sika**
### Conference Schedule

**Tuesday, 04 September**

**UCT Upper Campus, Kramer-Economics Complex, Rondebosch**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activities</th>
<th>ICCRRR</th>
<th>RILEM Week</th>
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<tbody>
<tr>
<td>7:30 - 17:00</td>
<td>Registration</td>
<td>LT 1</td>
<td>Boardroom 1</td>
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<tr>
<td>Session 6</td>
<td>08:30 - 09:30</td>
<td>Keynotes 5, 6</td>
<td>LT 2</td>
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<tr>
<td>09:35 - 10:30</td>
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<td>3 presentations</td>
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<td>10:30 - 11:00</td>
<td>Tea break</td>
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<tr>
<td>11:00 - 12:30</td>
<td>5 presentations</td>
<td>Boardroom 1</td>
<td>LT 1</td>
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<tr>
<td>11:00 - 12:30</td>
<td>5 presentations</td>
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<td>5 presentations</td>
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<tr>
<td>12:30 - 13:30</td>
<td>Lunch</td>
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<td>TC meetings TC MMB</td>
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<tr>
<td>13:30 - 14:30</td>
<td>Keynotes 7, 8</td>
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<td>Bureau II</td>
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<tr>
<td>14:35 - 15:30</td>
<td>3 presentations</td>
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<td>TC meetings TC SCM</td>
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<td>14:35 - 15:30</td>
<td>3 presentations</td>
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<td>TC ISC</td>
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<td>15:30 - 16:00</td>
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<tr>
<td>19:00</td>
<td>Conference Dinner</td>
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**Lunch and tea sponsored by Sika**
**Wednesday, 05 September**  
**UCT Upper Campus, Kramer-Economics Complex, Rondebosch**

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<thead>
<tr>
<th>WEDNESDAY 05 SEP</th>
<th>ICCRRR</th>
<th>RILEM Week</th>
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<tr>
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<td>LT 1</td>
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<tr>
<td>Registration</td>
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<tr>
<td>Session 12</td>
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<td>08:30 - 10:00</td>
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<tr>
<td>Keynotes 9, 10, 11</td>
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<tr>
<td>Tea break</td>
<td>10:00 - 10:30</td>
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<td>Session 13</td>
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<td>10:30 - 12:30</td>
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<tr>
<td>RILEM Technical Day Presentations</td>
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<tr>
<td>207-INR (Breysse), 233-FPC (Billberg), 234-DUC (Pellegrino), 235-CTC (Tang), JCSS (J.D. Soerensen)</td>
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<tr>
<td>Lunch</td>
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<tr>
<td>Session 14</td>
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<td>5 presentations</td>
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<tr>
<td>Tea break</td>
<td>15:00 - 15:30</td>
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<tr>
<td>Session 15</td>
<td>15:30 - 17:00</td>
<td>5 presentations</td>
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<tr>
<td>Brief closing session - ICCRRR &amp; RILEM Week. Drinks.</td>
<td>17:00-18:00</td>
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<tr>
<td>RILEM Banquet</td>
<td>19:30</td>
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*Lunch and tea sponsored by*
03 September – 05 September

ICCRRR2012 - List of Exhibitors

a.b.e. Construction Chemicals
AfriSam
BASF Construction Chemicals
Chryso Southern Africa
Fibwrap South Africa
Freyssenet
Mapei SA
Penetron
PPC
Proceq
Red Dog Scientific Services
RILEM
StonCor Africa
TAL X-Calibur
Thursday, 06 September  
UCT Upper Campus, Seminar Room, Department of Chemical Engineering

One-day Workshop  
Non-Destructive Testing of Concrete Structures

Programme and Timetable

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>07:30 - 08:00</td>
<td>Registration</td>
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</table>
| 08:00 - 09:30 | Introduction to non-destructive testing in Civil Engineering;  
Philosophies and test methods                           |
| 09:30 - 10:00 | Teak break                                                              |
| 10:00 - 11:30 | Classical NDT methods: Concrete strength and rebound hammer;  
Concrete cover and location of rebars; Potential mapping           |
| 11:30 - 12:00 | Ultrasonic test methods                                                  |
| 12:00 - 13:00 | Lunch break                                                              |
| 13:00 - 13:30 | Impact-echo                                                              |
| 13:30 - 14:00 | Radar methods                                                            |
| 14:00 - 14:30 | Dynamic testing                                                          |
| 14:30 - 15:00 | Tea break                                                                 |
| 15:00 - 17:00 | Laboratory demonstrations                                                |
| 17:00       | Discussions and closure                                                  |

The following NDT techniques will be included:

- Concrete Resistivity (Wenner Probe) to assess potential corrosion rates of steel reinforcement
- Half-cell potentials to assess the probability of reinforcement corrosion
- Corrosion rate measurements
- Evaluation of cover depths to the reinforcement
- Rebound Hammer to estimate in-situ concrete strength
- Acoustic methods (ultrasonic echo, impact echo, ultrasound methods) to locate voids and objects  
  (reinforcement bars, ducts) and to assess member thickness
- Radar methods (location of objects in concrete members, measurement of moisture profiles, evaluation  
  of the thickness of the wearing course on bridges)

Dynamic testing of structural members to assess the load-bearing characteristics
ICCRRRR2012 – List of Papers

**Keynote papers**

Assessing the remaining service life of existing concrete bridges  
*J.C. Walraven*

The transformation of the existing building stock: A precondition for a sustainable future  
*P. Richner*

The Concrete repair industry, actions for improvements  
*P.H. Emmons*

Where does rehabilitation fit into the South African dam safety picture?  
*C. Oosthuizen*

A life in non-destructive testing!  
*M.G. Grantham*

Non-destructive testing and continuous monitoring: Modern tools for performance assessment and life time prognosis of structures  
*C.U. Grosse*

Operational modal analysis for testing and continuous monitoring of bridges and special structures  
*A. Cunha, E. Caetano, F. Magalhães*

From the instantaneous corrosion rate to a representative value  
*C. Andrade*

Novel cement-based composites for strengthening and repair of concrete structures  
*V. Mechtcherine*

Rehabilitation and strengthening of concrete structures using ultra-high performance fibre reinforced concrete  
*E. Brühwiler*

Textile-based composites versus FRP as strengthening and seismic retrofitting materials of concrete and masonry structures  
*T.C. Triantafillou*
Theme 1: Concrete durability aspects

Innovative materials and influences of material composition

Curing Technologies, Strength and Durability Performance
R. Wasserman, A. Bentur

The effect of binder type on chloride threshold values for reinforced concrete
M.C. Alonso, M. Sanchez

Durability properties of high performance metakaolin concrete in different curing conditions
M. Skazlić, A. Baricevic, M. Perić

Quantification of anhydrous GGBFS particles in cement pastes subjected to organic acids: comparison of selective dissolution and image analysis methods
J. Duchesne & O. Oueslati

Performance evaluation of limestone mortars for elevated temperature application in nuclear industry
K.M. Haneefa, M. Santhanam

Optimization of fly ash based geo-polymer concrete
A. Arjun

Durability studies on Glass Fiber Reinforced High performance Concrete With Fly Ash as Admixture
H.S. Rao, V.G. Ghorpade

Strength and sulphate resistance of rice husk ash concrete
D.B. Raijiwala

Improvement of repairing mortars in cold environments using coal bottom ash
C. Argiz, E. Menéndez

TIO2TRC – New features of TRC by titanium dioxide modifications
W. Brameshuber, C. Neunzig

The use of superabsorbent polymers as a crack sealing and crack healing mechanism in cementitious materials
D. Snoeck, K. Van Tittelboom, N. De Belie

Effect of matrix permeability on durability of structural grade Geopolymer and conventional concretes
K. Sagoe-Crentsil, S. Yan, T. Brown

Polymers in concrete repairing according to EN 1504
L. Czarnecki, P. Łukowski

Durability properties of inorganic polymer concrete using fly ash and slag
J.R. Mackechnie, A.C.N. Scott
Aminobenzoate modified hydrotalcites as a novel smart additive of reinforced concrete for anticorrosion applications
Z. Yang, H. Fischer, R. Polder

Mix design, mechanical properties and impact resistance of UHPFRCCs
D. Nicolaides, A. Kanellopoulos, M. Petrou, M. Soutsos

Durability of lightweight self-consolidating concrete in massive structures
M. Kaszynska

Influence of different recycled aggregate types on strength and abrasion resistance properties of concrete
S.O. Ekolu, L.N Makama, W.P Shuluuka

Innovative low cost fibre-reinforced concrete. Part I: Mechanical and durability properties
D. Bjegovic, A. Baricevic, S. Lakusic

Innovative low cost fibre-reinforced concrete. Part II: Fracture toughness and impact strength
J. Krolo, D. Bjegović, D. Damjanović, I. Duvnjak, A. Baričević

The effect of cement type on the performance of mortars modified by superabsorbent polymers
A.J. Klemm, K. Sikora

Effect of super-absorbent polymer on simplification of curing and prevention of micro-cracking of concrete at early age
K. Ichimiya, H.-W. Reinhardt, A. Assmann

The influence of the particle size of superabsorbent polymer on internal curing of high performance concrete
H. Huang, N. van Tuan, G. Ye

Porous network concrete: novel concept of healable concrete structures
S. Sangadji, E. Schlangen, A. Milenkovic

An experimental methodology to assess the self-healing capacity of cementitious composites with “aero-crystallizing” additives
L. Ferrara, V. Krelani, I. Pessina, P. Bamonte, E. Gastaldo Brac

Study of the effectiveness of different types of surface protection materials applied in concrete structures
K. da Silva Almeida, M.Q. Oliveira, V. Pereira, E.B. Monteiro

Influence of cement content and environmental humidity on cement-asphalt composites performance
A. Garcia, P. Lura, M.N. Partl

Engineered Cementitious Composite as a Cover Concrete Against Chloride Ingress
Y. Lin, L. Wotherspoon, J.M. Ingham, A. Scott, D. Lawley
Fire resistance performance of concretes exposed to high temperatures
*D. Pasla*

Fire-protection coating of reinforced concrete lining in Lefortovsky Tunnel
*V.R. Falikman, A.A. Shilin*

Influence of hydrophobicity and oleophobicity on cleaning graffiti on concrete panels and natural stones
*K. Malaga, U. Mueller*

**Service life modelling and prediction of durability**

Developing of new method for evaluation of chloride permeability in concretes
*A.A. Ramezanianpour, A.R. Pilvar, M. Mahdikhani, F. Moodi, R. Pilvar*

Measuring Permeability of Cementitious Materials
*Q. Tri Phung, G. De Schutter, N. Maes, D. Jacques, G. Ye*

The pore structure and water permeability of cement paste blended with fly ash in a long period up to one year
*Z. Yu & G. Ye*

Measurement of the air permeability of concrete “in situ”: status quo
*R. Torrent, L. Ebensperger*

Evaluation of carbonation progress of existing concrete structure based on air permeability of concrete cover – A case study in Japan
*K. Imamoto, A. Tanaka*

Lattice Boltzmann simulation of permeability of cement-based materials
*M. Zhang, G. Ye*

Morphological nature of diffusion in cement paste
*N. Ukrainczyk, E.A.B. Koenders, K. van Breugel*

Modeling of moisture diffusion in concrete in 3D
*J. Skramlik, M. Novotny, K. Suhajda*

DC and AC measurements of the chloride diffusion coefficient through concrete
*H. Mercado, S. Lorente, X. Bourbon*

Factors affecting AgNO3 colorimetric method for measurement of chloride migration in cement-based materials
*C. Shi, X. An, Q. Li, F. He, C. Chen*

Cement mortars with fly ash and slag. Study of their microstructure and resistance to salt ingress in different environmental conditions
*M.A. Climent, J.M. Ortega, I. Sánchez*
Capillary suction and chloride migration in fire exposed concrete with PP-fibre
J. Albrektsson, R. Jansson

Effect of chlorides on moisture content and sorption isotherms
M. Leivo, H. Kuosa, E. Holt, E. Vesikari, R.M. Ferreira

Accelerated evaluation of corrosion inhibition by means of the integral corrosion test
C. Andrade, N. Rebolledo

Ageing process of cementitious materials: Ion transport and diffusion coefficient
A. Babaahmadi, L. Tang, Z. Abbas

The interaction of deterioration caused by chloride ingress and carbonation in mortars exposed to cyclic wetting and drying
J. Backus, D. McPolin, B. Kuen

Influence of carbonation on the chloride concentration in the pore solution of concrete
X. Wan, T. Zhao, F.H. Wittmann

Modified wedge splitting test (MWST) – a simple tool for durability investigations of reinforcement corrosion in cracked concrete
B. Šavija, E. Schlangen, J. Pacheco, R.B. Polder

Effect of concrete and binder composition on cracking sensitivity
K. Kovler, S. Zhutovsky, A. Bentur

Towards incorporating the influence of cracks in the durability index testing approach
J. Kanjee, H. Beushausen, M.G. Alexander, M. Otieno

A model for the prediction of plastic shrinkage cracking in concrete
W.P. Boshoff, R. Combrinck, J. Maritz

Durability design of reinforced concrete structures submitted to carbonation by using an probabilistic modelling
M. Thiéry, V. Baroghel-Bouny, A. Orcesi

Mix design optimisation - The influence of binder content on mechanical and durability properties of concrete
M. Angelucci, H. Beushausen, M.G. Alexander

Durability and Service Life of Reinforced Concrete Structures under Combined Mechanical and Environmental Actions
F. Wittmann

Control of concrete cover depth of reinforced concrete structures for durability
G. Nganga, M.G. Alexander, H. Beushausen

Essential parameters for strength-based service life modeling of reinforced concrete structures – A review
J.O. Ikotun, S.E. Ekolu
A virtual lab for multi-scale modeling of cementitious materials
*E.A.B. Koenders, E. Dado, D.B.F. Carvalho*

Model verification, refinement, and testing on independent 10-year carbonation field data
*S.O. Ekolu*

Treatment of a stochastic service life prediction model to an evaluation of a distressed two-story RC building
*S.O. Ekolu, M. Allan*

Methodology for including the age effect of concrete with SCMs in results from accelerated testing
*E. Gruyaert, N. De Belie*

Lattice model implementation on alkali silica reaction gel expansion in a reacted concrete medium
*C. Anaç, E. Schlangen, O. Çopuroğlu*

A concrete performance assessment tool for structures with alkali silica reaction
*C. Anaç, O. Çopuroğlu, E. Schlangen*

Relation between mass flow in cement-based composite materials and durability, investigated by means of neutron Imaging
*F. Wittmann*

**Modelling and prevention of reinforcement corrosion**

Assessment of some parameters of corrosion initiation prediction of reinforced concrete in Persian Gulf region
*A.A. Ramezanianpour, E. Jahangiri, F. Moodi*

Possibilities and restrictions for the use of stainless steel reinforcement
*U. Nuernberger*

Service life extension of concrete structures by increasing chloride threshold using stainless steel reinforcements
*H. Mahmoud, M.C. Alonso, M. Sanchez*

Working life of cathodic protection systems for concrete structures – Analysis of field data
*R.B. Polder, G. Leegwater, D. Worm, W. Courage*

Assessment of critical chloride content in reinforced concrete by Energy Dispersive Spectrometry (EDS) revisited
*J. Pacheco, O. Çopuroğlu, B. Šavija, E. Schlangen, R.B. Polder*

Testing of the chloride threshold values for reinforced concrete structures
*H.E. Sørensen, S.L. Poulsen, E.P. Nielsen*

Protection of Steel in Concrete Using Galvanic and Hybrid Electrochemical Treatments
*G.K. Glass, S. Holme*
Mechanical behaviour of basalt fibre-reinforced plastics and their durability in an alkaline environment
*S. Müller, M. Butler, V. Mechtcherine*

Towards correlating natural and accelerated chloride-induced corrosion in cracked RC – preliminary results
*M. Otieno, H. Beushausen, M.G. Alexander*

Improving Concrete Durability through the use of Corrosion Inhibitors
*I.N. Robertson*

**Theme 2: Condition assessment of concrete structures**

**Degradation assessment and service life aspects**

Conservation of Concrete Structures in fib Model Code 2010
*S. L. Matthews, T. Ueda, A. Bigaj van Vliet*

Non-destructive building diagnosis in the monitoring and inspection of existing building structures
*A. Walther, A. Hasenstab*

Concrete deterioration in mining structures
*A. Masarira, T.L. Bopape*

Case Studies of Concrete Deterioration in Reinforced Concrete Chimneys
*M. Santhanam*

An investigation into failures and problems of industrial floors on the ground – with an emphasis on case studies
*R.S. Walls, S.E. Ekolu*

Concrete damage in underground constructions
*F. Mittermayr, D. Klammer, D. Höllen, M. Dietzel, C. Kurta, A. Leis, M.E. Böttcher*

Managing risk for concrete repair to multi-storey buildings
*P. Storey, J.A. Wium*

Condition assessment and repair strategy for seawater intake structure in Saudi Arabia
*M.K. Rahman, M. Ibrahim, S.M. Shaahid, M. Barry, M. Alkami, M.R. Taha*

Corrosion damage of concrete structures in ammonium nitrate-based environments
*I. Pepenar*

Condition assessment and repair of antenna towers concrete foundations
*I. B. Pecur, N. Stirmer, B. Milovanovic*
Repair and restoration of “Dalle de Verre” concrete windows
M. Ünal, H.-C. Kühne

Residual structural performance of a 26-year-old corroded reinforced concrete beam
W. Zhu, R. Francois

Experimental and numerical study on the residual strength of deteriorated pre-stressed concrete bridge due to chloride attack
Y. Tanaka, T. Shimomura, T. Yamaguchi

Method to evaluate the residual strength in concrete elements exposed to fire using physico-chemical and micro-structural parameters
E. Menéndez, L. Vega, C. Andrade

Rehabilitation of a large arch dam: Importance of dam safety surveillance
L. Hattingh, C. Oosthuizen

Multiple arch dam: Challenges with the rehabilitation of one of the thin, unreinforced, double curvature arches of the Stompdrift Dam
J.L. Schoeman, C. Oosthuizen

Lombardi slenderness coefficient as one of the criteria for the preliminary evaluation of proposed rehabilitation works at Kouga dam
C. Oosthuizen, C. Mahlabela

Observations from the calibration of an arch dam model using ambient modal properties
R. Makha, P. Moyo

Modal parameter estimation from ambient vibration measurements of a dam using stochastic subspace identification methods
P. Bukenya, P. Moyo, C. Oosthuizen

Macroscopic ice lens growth: Observations on Swedish concrete dams
M. Rosenqvist, K. Fridh, M. Hassanzadeh

**NDE/NDT and measurement techniques**

Strength monitoring of concrete structures by using non destructive testing
C. Sashidhar, N.V. Ramana, D.P. Kumar

Main challenges of non destructive evaluation of on-site concrete strength
D. Breysse

Test method to determine durability of concrete under combined environmental actions and mechanical load
L. Wang, Y. Yao, Z. Wang, P. Huang
Structure testing with Ultrasonic-Echo and Impulse Radar Technique
C. Sodeikat

Influences on layer thickness measurement of concrete coatings by mobile NMR on steel-reinforced concrete constructions
J. Orlowsky, M. Raupach

Shape factors of four point resistivity method in presence of rebars
A.J. Garzon, C. Andrade, N. Rebolledo, J. Fullea, J. Sanchez, E. Menéndez

Statistical analysis of electrical resistivity as a tool for estimating cement type of 12-year-old concrete specimens
J. Pacheco, O. Morales-Nápoles, J. Sanchez, E. Menéndez

Measurement and visualisation of the actual concrete resistivity in consideration of conductive layers and reinforcement bars
K. Reichling, M. Raupach

Practical operation of data-logging covermeters and the interpretation of results
J.F. Fletcher, C.I. Woolhouse

Modern damage detection by using static assessment methods for efficient rehabilitation
F. Scherbaum, J. Mahowald, D. Waldmann, S. Maas, A. Zübes

Strengthening of reinforced concrete slabs built around the year 1910
S. Gmainer, J. Kollegger

Analysis of the strain transfer mechanism between a truly distributed optical fibre sensor and the surrounding medium

Investigation of the crack opening and damage monitoring of textile reinforced cementitious composites using digital image
E. Tsangouri, D. van Hemelrijk

A non-destructive test method for the performance of hydrophobic treatments
U. Antons, J. Orlowsky, M. Raupach

Examination of the hydration of cementitious binders with Fly Ash and Blast Furnace Slag using in-situ XRD
A. Vollpracht, W. Brameshuber

Passive infrared thermography as a diagnostic tool in civil engineering structural material health monitoring
M. Scott, H. Luttig, M. Strydom, M. Gonelli, D. Kruger, R.G.D Rankine, T. Broodryk

Active thermography as a quality assurance for structural engineering
F. Schaudienst, F.U. Vogdt, M. Walsdorf-Maul
Infrared thermography applications for the quality control of concrete elements strengthened with FRP
G. Concu, B. de Nicolo, C. Piga, N. Trulli

Structural reliability targets for assessment of ageing infrastructure
M. Kabani, P. Moyo, M.G. Alexander

Impact of mobile cranes on short span bridges
V. Gaya, P. Moyo

Materials and structural assessments

Lessons from the Big Dig
D. W. Fowler

Differing results from inspection and load rating of Sikanni Chief Bridge
P. Phillips, R. El-Hacha

A new life for the ultra low strength concrete, Brisbane City Hall structure
A.N. van Grieken

Testing, maintenance and reinforcement of the Pietrastretta RA 05 motorway viaduct
A. Contin, E. Viviani, M. Viviani

Residual structural performance of RC bridge deteriorated with reinforcement corrosion
T. Shimomura, Y. Tanaka, T. Yamaguchi

Residual shear capacity of continuous reinforced concrete beams
Y. Yang, J.A. den Uijl, J.C. Walraven

Shear assessment of solid slab bridges
E.O.L. Lantsoght, C. van der Veen, J.C. Walraven

Upgrading of bridges across rivers to resist ship impact
R. Wensauer M. Keuser

Through-life management of LPS dwelling blocks, including their structural assessment for accidental loads and actions
S.L. Matthews, B. Reeves

Condition assessment and repair of concrete tunnel lining after fire
K. Mavar, E. Marušić
Theme 3: Concrete repair, rehabilitation and retrofitting

**Repair methods, materials and techniques**

Random thoughts on concrete repair specifications’ ills and treatment prescriptions  
*R.M. Snover, A.M. Vaysburd, B. Bissonnette, D. Burke*

Concrete repair as an engineering task: an approximate solution to an exact problem  
*A.M. Vaysburd, P.H. Emmons, B. Bissonnette*

Concrete repair materials, polymers and green chemistry – how far synergistic are they?  
*A.K. Chatterjee*

Performance and service life of repairs of concrete structures in The Netherlands  
*J.H.M. Visser, Q.F. van Zon*

Development of repair mortars for the restoration of natural stone in cultural heritage  
*P. Ramge, H.-C. Kühne*

Maintenance of aged concrete structures of the Hong Kong Housing Authority  
*H.W. Pang, B. Au, K.C. Lau*

Sustainability-focused maintenance strategy for the Public Rental Housing Estates in Hong Kong  
*S.T. Chan, H.W. Pang, B. Au*

The effect of pulse current on energy saving during electrochemical chloride extraction (ECE) in concrete  
*T.R. Sun, M.R. Geiker, L.M. Ottosen*

Modern repair technique for an ancient temple  
*R. Anupadma, M.S. Mathews, G.A. Rao, T. Satyamurthy*

Repair of deteriorated concrete containing recycled aggregates  
*A. Badr, L. McGivern*

Physico-chemical properties and durability of polymer modified repair materials  
*I.L. Tchetgnia-Ngassam, F. Lespinasse, S. Marceau*

Polymer-modified self-compacting concrete (PSCC) for concrete repair  
*K. A. Bode, A. Dimmig-Osburg*

Effect of weathering on polymer modified cement mortars used for the repair and waterproofing of concrete  
*A. Krishnan, P.S. Nair, R. Gettu*

Case history of polymer-modified cementitious membrane used to protect new and repair concrete  
*Z. Nieuwoudt*
Use of starch modified concrete as a repair material
A. A. Akindahunsi, H. C. Uzoegbo, S. E. Lyuke

Mitigation of ASR affected concrete in Boston, MA, USA: a case study
A. F. Bentivegna, T. Drimalas, J. H. Ideker

Shrinkage cracking of steel fibre-reinforced and rubberized cement-based mortars
T.-H. Nguyen, A. Toumi, A. Turatsinze

Development of a liquid bio-based repair system for aged concrete structures
V. Wiktor, A. Thijssen, H. M. Jonkers

Development of bio-based mortar system for concrete repair
M. G. Sierra-Beltran, H. M. Jonkers

Full scale application of bacteria-based self-healing concrete for repair purposes
H. M. Jonkers, R. Mors

Evaluation of crack patterns in SHCC with respect to water permeability and capillary suction
C. Wagner, A. Dollase, V. Slowik

Cathodic protection of concrete structures with thermally sprayed sacrificial zinc anodes – critical parameters for the protective ability of the sprayed-on anode
B. Sederholm, A. Selander, J. Trägårth

Sustainable repair of concrete members of seaside apartment buildings endangered by steel rebar corrosion
W. Schwarz, F. Müllner, A. van den Hondel

Galvanic corrosion protection of steel in concrete with a zinc mesh anode embedded into a solid electrolyte (EZA): Operational data and service time expectations
W. Schwarz, F. Müllner, A. van den Hondel

The use of discrete sacrificial anodes in reducing corrosion rate in chloride contaminated reinforced concrete
P. A. Arito, H. Beushausen, M. G. Alexander, M. Otieno

**Bonded concrete overlays and patch repairs**

Concrete overlays for pavement rehabilitation
P. C. Taylor, D. Harrington

Optimizing the steel fibre and mesh combinations used in repairing existing pavements with Ultra Thin Continuously Reinforced Concrete Pavements (UTCRCP)
E. P. Kearsley, H. F. Mostert
Effect of repair materials on durability indexes of concrete
P. Parbhoo, H. Lyimo, S.O. Ekolu

Concrete Heritage: Tentative guidelines for the ‘Patch Restoration Method’
J. Valença, C. Almeida, E.S. Júlio

Fatigue crack propagation for bi-material interfaces
S. Ray, J. M.C. Kishen

Mechanical properties of old concrete - UHPFC interface
B. Tayeh, B.H. Abu Bakar, M.A.M. Johari

Bond characteristics of substrate concrete and repair materials
M.I. Khan, T.H. Almusallam

Investigations on the performance of concrete repair mortars in composite specimen tests
P. Ramge, H.-C. Kühne

Topography evaluation methods for concrete substrates: parametric study
L. Courard, A. Garbacz, B. Bissonnette

Modeling water absorption of the concrete substrate in concrete repairs
M. Luković, B. Šavija, G. Ye, J. Zhou

Textile reinforced sprayed mortar for the repair of hydraulic engineering structures
J. Orlowsky, M. Raupach

Shrinkage stress damage effect in concrete patch repair
M.A. Shazali, M.K. Rahman, M.H. Baluch

Performance of engineered cementitious composite for concrete repairs subjected to differential shrinkage
J. Zhou, G. Ye, T. Sui

Cracking characteristics of cement mortars subjected to restrained shrinkage
M. Chilwesa, H. Beushausen

Structural repairs and strengthening

Retrofitting of Bridge B421 over the Olifants River after flood damage
W. Findlay, F. Kromhout

Strengthening of traffic barriers on bridges along the Kaaimans Pass
B.P. Durow, G.A. Visser, E.J. Kruger

Assessment and strengthening of R/C hospital building
O.M.A. Daoud
Repair and dynamic-based condition assessment of impact damage to a freeway overpass bridge near Mossel Bay, South Africa
A.A. Newmark, P. Moyo, E.J. Kruger

Upgrading of three historic arch bridges over the Orange River near Keimoes, South Africa
A.A. Newmark, E.J. Smuts, E.J. Kruger, E. Lourens

Analysis and retrofitting design of a single-span R.C. bridge
B. de Nicolo, D. Meloni, A. Cabboi

Verification of bridge repair assisted by numerical simulation
V. Cervenka, J. Cervenka

Repairing preloaded square columns by ferro-cement jackets made of non-structural WWMs
S.M. Mourad, M.J. Shannag

Experimental results of RC columns strengthened with fibre reinforced cementitious mortars
P. Colajanni, F. de Domenico, N. Maugeri, A. Recupero, N. Spinella, G. Mantegazza

The enhancement of performance on road tunnel lining by epoxy injection and carbon fiber reinforcement

Strengthening of R/C beams using Ultra High Performance Concrete
E. Fehling, M. Alkhoury

Experimental investigation on the effectiveness of patch repair on the flexural behaviour of corroded post-tensioned beams
M. Shekarchi, F. Ghasmzadeh, S. Sajedi, S.A. Razavizadeh, M.J. Mohebbi

Numerical investigation on the effectiveness of patch repair on the flexural behaviour of corroded post-tensioned beams
S. Sajedi, F. Ghasemzadeh, S.A. Razavizadeh, M. Shekarchi, A. Manafpour

Flexure retrofitting of ribbed one-way reinforced concrete slabs through external reinforcing bars
F. Minelli, G.A. Plizzari

Analysis of structural rehabilitation of historical masonry with reinforced concrete
N.G. Maldonado, P.E. Martín, I.A. Maldonado

Dual function carbon fibre strengthening and cathodic protection anode for reinforced concrete structures
C.V. Nguyen, P.S. Mangat, P. Lambert, F.J. O’Flaherty, G. Jones

Repairing and retrofitting pre-stressed concrete water tanks in the San Francisco Bay Area
K.C. Kuebitz, T. Bloomer.

Post-installed bars under low installation temperatures
C. Mahrenholtz, R. Eligehausen, W. Fuchs, J. Hofmann
Application of post-installed anchors for seismic retrofit of RC beam-column joints: Design and validation
G. Genesio, R. Eligehausen, A. Sharma, S. Pampanin

Retrofitting techniques and FRP systems

Anchoring FRP laminates for the seismic strengthening of RC columns
R. Sadone, M. Quiertant, E. Ferrier, S. Chataigner, J. Mercier

Confinement of short concrete columns subjected to eccentric loading with CFRP wraps
A-R. Khan, S. Fareed

Corner beam-column joints retrofitting with HPFRC jacketing
C. Beschi, P. Riva, A. Meda

Cracking behaviour of RC members strengthened with CFRP strips
W. Ibrahim, J. Hegger, A. Sherif

Shear strengthening of RC hollow box bridge columns using FRP and RC jacketing
M. Fischinger, T. Isaković

Flexural performance of repaired reinforced concrete beam containing DFRCC materials
S.F.U. Ahmed

Retrofitting bridges to accommodate single point interchanges on the Gauteng Freeways Improvement Project
R. Nel, S.S. Kramer, R.G. Miller

Investigation of shear bonding behaviour between base concrete and polymer-modified mortar with CFRP grid
J. Zhang, K. Ohno, K. Uji, A. Ueno, Y. Ogawa

The influence of externally bonded longitudinal TRC reinforcement on the crack pattern of a concrete beam
S. Verbruggen, J. Wastiels, T. Tysmans, O. Remy, S. Michez

Retrofitting of structural concrete after damage caused by impact or explosion
M. Keuser, R. Lenner, M. Fuchs

Debonding of external CFRP plates from RC structures caused by cyclic loading effects
A.J. Badenhorst, G.P.A.G. van Zijl

An improved damage model to predict the failure process in FRP/concrete assemblies
K. Benzarti, G. Ruoci, P. Argoul, F. Freddi

Mechanical fastening of multi-directional CFRP laminates in concrete
P. Desnerck, L. Vasseur, H. Van Hoecke
TRM and UHPFRC: retrofitting solutions for structural element
A. Magri, M. Colombo, M. di Prisco

Analytical study on behaviour of external shear wall and Internal shear wall as lateral load resisting systems for retrofitting a ten storey building frame
S.V. Venkatesh, H. Sharada Bai, S.P. Divya, S.V. Venkatesh, H. Sharada Bai, S.P. Divya

Retrofit of a reinforced concrete building with lead rubber bearing in Iran
M.J. Golzar, Y.Y. Nia

Theme 4: Developments in materials technology, assessment and processing

Influence of intensive vacuum mixing on the compressive strength of cementitious materials
J. Dils, G. De Schutter, V. Boel

Underwater concreting by using two-stage concrete - case study
H.S. Abdelgader, A.S. El-Baden

Robustness improvement of fresh concrete and mortar performance for challenging casting environments with focus on sub-Saharan Africa
W. Schmidt, N.S. Msinjili, H.-C. Kühne, M.V.A. Florea, G. S. Kumaran, P. Nibasumba

Technical-economical consequences of the use of controlled permeable formwork
R. Torrent, A. Griesser, F. Moro, F. Jacobs

An Investigation on effect of aggregate grading on fresh properties of self-consolidating mortar
N.A. Libre, A. Pourzarabi, A. M. Etemadrezaei, M. Shekarchi

Strength of recycled aggregate concrete for structural uses
S. Chandra Paul, G.P.A.G. van Zijl

Concrete containing steel slag aggregate: performance after high temperature exposure
I. Netinger, M. Jeličić Rukavina, D. Bjegović, A. Mladenović

Completely recyclable concrete: how does the cement paste behave during reclinkering?
M. De Schepper, R. Snellings, N. De Belie, K. De Buysser, I. Van Driessche

Influence of particle packing on the strength of ecological concrete
S.A.A.M. Fennis, J.C. Walraven, J.A. den Uijl

Development of geo-polymer based ductile fibre reinforced cementitious composites (DFRCC)
S. F. U. Ahmed, M. Hossain, Y.Y. Lu

Load-deformation behaviour of hybrid elements of PCC and CC under flexural stress
A. Flohr, A. Dimmig-Osburg
Fatigue behaviour of self-compacting concrete
S. Korte, V. Boel, W. de Corte, G. de Schutter

Velocity profile of self compacting concrete and traditional concrete flowing in a half open pipe
G. de Schutter, Kadri

Deformation of concrete subject to freeze-thaw cycles and chloride attack
Z. Wang, Y. Yao, L. Wang, Y. Cao

Thermal expansion of high-performance cement paste and mortar at early age
M. Wyrzykowski, P. Lura

Development of new lime binder for building bio-aggregate materials
T.M. Ding, C. Magniont, M. Coutand, G. Escadeillas

‘Buffer’ effects of natural zeolites in blended cements
R. Snellings

Evaluation of steel fibre distribution in a concrete matrix
S. A. Yehia

Contribution to study of the self-healing effect activated by crystalline catalysts in concrete structures when subjected to continuous exposure to water
E.M. Takagi, M.G. Lima.

Strength behaviour of clay-cement concrete and quality implications for low-cost construction materials
F. Solomon, S.Ekolu

Characterisation and description of the structure of metakaolin by total scattering, density functional theory, and X-ray spectroscopy
C.E. White, J.L. Provis, D.P. Riley, T. Proffen, L.M. Perander, J.S.J. van Deventer

The comparison between the cracking behaviour of bending and tension for strain hardening cement-based composites (SHCC)
P.D. Nieuwoudt, W.P. Boshoff

Influence of temperature on the hydration of blended cements
B. Lothenbach, G. Le Saout

Thermodynamic modeling of sulphate interaction
B. Lothenbach, W. Kunther, A.E. Idiart

An ongoing investigation on modeling the strength properties of water-entrained cement-based materials
L.P. Esteves
Theme 5: Concrete technology and structural design

Concrete knowledge improvement in sub-Saharan Africa

Evaluation of concrete quality in Libya
M.S. Alazhari, M.M. Al Shebani

Who will be making high performance concrete?
M. Khrapko

The role of the structural engineer in the design of low embodied energy concrete-frame buildings
R. Muigai, M.G. Alexander, P. Moyo

Synthetic climate modeling for estimating the impact of global warming on construction materials
D. Breysse, M. Chaplain, A. Marache

Resistance factors for shear capacity of ordinary and lightweight R/C beams
A.S. Nowak, A.M. Rakoczy

Global safety factor for slender reinforced concrete structures
D.L. Allaix, V.I. Carbone, G. Mancini

Time-dependent analysis of segmentally constructed cantilever bridge comparing two different creep model
G.F. Giaccu, D. Solinas, G.P. Gamberini