5th International Conference on Sustainable Construction Materials and Technologies (SCMT5)

Kingston University London, UK | 14 – 17 July 2019

CONFERENCE PROGRAMME

subject to change *
PREFACE

Welcome to Kingston, London and SCMT5

On behalf of the SCMT5 committees and supporting institutions. It gives us great pleasure and is an honour to welcome you to Kingston University_London.

The SCMT5 scientific program features the latest research and development in different construction materials with emphasis on durability and testing, sustainability, and constituent materials. Over the next three days, nearly 200 papers, from 38 countries will be presented. These papers have been carefully selected and peer-reviewed to meet the strict standards of the SCMT conference series.

The conference honours Professors Christian Grosse (Germany), Tim Ibell (UK) and Chris Cheeseman (UK) for their many years of intellectual and professional contributions to the field of construction materials and technologies. Whilst Dr Antonin Fabbri will be representing RILEM 274- TCE: Testing and Characterisation of earth-based building materials and elements work in this field. These will give be keynote presentations in the plenary sessions and invited colleagues will give papers in six special sessions in their honour.

The awards committee for the conference has selected papers to be considered for publication in special editions of the ASCE journal of Materials in Civil Engineering and the ICE Construction Materials journal. The awarded papers will be announced in the conference banquet.

We express our sincerer thanks to the conference presenters, honourees, organisers of the honouree sessions, members of the international, scientific, award and local committees, and numerous reviewers for their contributions, support, advice and assistance.

Professor Eshmaiel Ganjian

Professor Peter Claisse

Professor Mukesh Limbachiya

SCMT5 Organising committee
## Committees

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<td>Antonio Telesca</td>
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<td>Pietro Lura</td>
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<td>Syed Faiz Ahmad</td>
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Professor Christian U. Grosse studied Geophysics at the University of Karlsruhe and earned his Ph.D. in 1996 in Civil Engineering at the University of Stuttgart. This was followed by his Habilitation in 2005 and the “Venia Legendi” in Materials Testing at the same place. In 2005/2006 he spent a year as a visiting research scholar at the University of California in Berkeley, USA. He was University lecturer at the University of Stuttgart and finally Director at the Material Testing Institute MPA before he became Professor and Chair of Non-destructive Testing at the Technical University of Munich in 2010. This position is a joint appointment in two departments: Civil and Mechanical Engineering. He is member of the board of directors of the Center for Building Materials (cbm) and since 2015 part-time working for the company WTM Engineers GmbH in Munich where he is scientific director of the “Diagnostics” division.

Prof. Grosse has published 47 monographs, books and book chapters, 85 papers in peer-reviewed scientific journals and conference proceedings, 256 papers in refereed conference proceedings, has 4 patents, and has written numerous research reports and other publications. He also is a member of many national and international technical committees and organizations specializing in NDT. His research interests include the application and development of non-destructive testing (ultrasound, acoustic emission, impact-echo, vibration analysis, radar, infrared thermography, computed-tomography) for both individual inspections and continuous long-term structural health monitoring. Applications in Civil Engineering includes mortar, steel-reinforced and pre-stressed concrete construction as well as quality control of fresh concrete. In the field of Mechanical Engineering he works with automotive and aeronautical companies as well as academic institutions on topics related to quality control of lightweight construction, in particular glass-, carbon-fiber reinforced polymers and hybrid materials as well as, more recently, on quality control of metal parts from additive manufacturing. Another research focus is on conventional and wind turbines, particular on the detection of deterioration and the determination of the residual service life. He works with engineering geologists and geophysicists on measurement techniques to reveal fracture mechanisms in stone, and with biomedical engineers (orthopedics) evaluating the fracture of bones. Another main topic is the application of non-destructive testing techniques in the field of archaeology, forensic archaeology (together with the State Bureau of Investigation and police departments) and the investigation of objects of our cultural heritage (with museums).
Tim Ibell graduated with a BSc(Eng)(Civil) degree from the University of Cape Town in 1988, and then with a PhD in Structural Engineering from the University of Cambridge in 1992. He then spent two years in industry before completing postdoctoral research back at the University of Cambridge. He joined the Department of Architecture & Civil Engineering at the University of Bath in 1997. In 2002, Tim spent a year in the United States on a Fulbright Distinguished Scholar Award.

He was promoted to Professor in 2003 and held the role of Head of Department from 2005 to 2008, and again from 2010 to 2013. Tim was Associate Dean (Graduate Studies) in the Faculty of Engineering and Design from 2008 to 2013, followed by Associate Dean (Research) from 2013 to 2017. After a year at Cambridge as the Sir Kirby Laing Professor of Civil Engineering, he returned to Bath in 2018. He is presently Associate Dean (Learning and Teaching) for Engineering and Design. He will sit on the REF2021 sub-panel for Engineering, and he is Chair-Elect of the Joint Board of Moderators which accredits civil engineering degrees across the UK. Tim was President of the Institution of Structural Engineers in 2015, and he is a Fellow of the Royal Academy of Engineering.

Tim's research interests include the use of FRP to reinforce or strengthen concrete structures, the use of fabric to form innovative concrete structures, and the efficient use of structural materials in buildings. He and his team have received six best journal-paper awards, including three each from the Institution of Structural Engineers and Institution of Civil Engineers.
Christopher Cheeseman is Professor of Materials Resources Engineering in the Department of Civil and Environmental Engineering at Imperial College London. He is Head of the Materials Section and the Director of the newly formed Centre for Infrastructure Materials at Imperial. This has been funded by EPSRC and UKCRIC and provides a unique facility specifically dedicated to fundamental and applied research focused on infrastructure materials.

Chris originally trained as a materials scientist, originally studying at Warwick University and then at the University of Oxford where his PhD research was on high temperature properties of ceramics. Following a period working in industry as the Technical Manager of a manufacturing company he joined Imperial in 1990 where he has remained to this day.

As a materials scientist, based in the Environmental Engineering Section of a leading Civil and Environmental Engineering Department Chris has had a unique opportunity to be involved in a wide range of materials related research associated with waste management, resource efficiency, industrial symbiosis, the circular economy, low carbon materials and increasingly in greenhouse gas removal technologies. He has been closely involved in the Environmental Engineering MSc course as Course Director and he is currently leading the development of a new MSc course on Advanced Materials for Sustainable Infrastructure. He has supervised over 120 MSc and PhD projects to completion and has published over 220 papers in international journals and conference proceedings.

Innovation has formed an important driver for much of his research and this has led to involvement in a number of spin-out companies including Novacem, who developed novel low-carbon MgO cements, Aeropowder, who are developing beneficial reuse applications for waste feathers, and Permea, a new spin-out developing non-clogging permeable pavements.
Réalisation de l’Union Internationale des Laboratoires et Experts des Matériaux, systèmes de construction et ouvrages (RILEM)

The International Union of Laboratories and Experts in Construction Materials, Systems and Structures

274-TCE: Testing and characterisation of earth-based building materials and elements

Chair: Professor Jean-Claude MOREL

Co-chair: Dr Antonin FABBRI

The activity started in 2016, ending in 2021

Earth-based building materials have the potential to reduce the carbon footprint of buildings but are currently only a niche market. The promotion of those techniques requires producing guidelines, that are currently not available, for engineers, architects and practitioners.

Actually, earth is a non-standard construction material. It is characterised by significant complexities in behaviour and large variabilities in intrinsic parameters because earth is basically a soil locally variable. Logically, experimentally obtained values of performance parameters from several earthen construction projects are usually quite scattered. That is why the ability of a soil to be used as a building material should be determined by its performances specific to the intended use and not restrained to its composition.

The aims of the 274-TCE are to define dedicated testing procedures for unstabilized earth in the form of rammed earth, cob, compressed earth blocks, etc. and to encourage the transfer of TC’s findings to practitioners through the publication of guidelines and the organisation of the dedicated workshop.

The first objective is to define the minimal number of laboratory tests needed to provide an accurate assessment of the mechanical, thermal and hygroscopic performances of the material through existing and newly developed experimental tests. The second objective is to validate the accuracy of the tests by comparing laboratory and on-site data. The used earth samples will come from existing construction sites that will be properly instrumented.
Sunday 14th July 2019

To be held at Kingston University’s Penrhyn Road campus, KT1 2EE

18:00 - 21:00  Registration
Main reception, Penrhyn Road campus

18:00 - 21:00  Welcome Reception
The Picton Room Restaurant (onsite)

Monday 15th July 2019

08:30 - 10:00  Registration
Rose Theatre, Kingston upon Thames, KT1 1HL

10:00 - 11:40  Opening Plenary Session
Rose Theatre, Kingston upon Thames, KT1 1HL

Chair: Professor M Limbachiya, Conference Chairman and Co-Organiser

Welcome and Opening Addresses

- Professor Peter Claisse, SCMT5 Conference Co-Organiser
- Dr David Mackintosh, Pro-Vice Chancellor and Executive Dean, Faculty of Science, Engineering & Computing, Kingston University

Keynote Addresses

- Monitoring of Inspection Techniques Supporting a Digital Twin Concept in Civil Engineering
  Professor Christian Grosse, Technical University of Munich, Germany
- Enough is Enough! Concrete waste is building design
  Professor Tim Ibell, University of Bath, UK

12:00 - 13:30  Lunch Reception
The Guildhall, Kingston upon Thames, KT1 1EU

14:00 - 15:30  5 x Parallel Technical Sessions
Kingston University Penrhyn Road campus

Session 1

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<th>HONOUREE FOR PROFESSOR GROSSE</th>
<th>PAPER TITLE &amp; AUTHORS</th>
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| IDSCMT5167                    | Material characterization via contact-free detection of surface waves using an optical microphone
  Wolfgang Rohringer, Ryan Sommerhuber, Lukas Csaszar, Nils Panzer, Sebastian Wald, Balthasar Fischer, Harald Garrecht, Friedrich Grüner, Jürgen Frick |
| IDSCMT5127                    | Insight into the application of computed tomography to building materials research
  Christine Hadlich, Andrea Osburg, Franziska Vogt |
| IDSCMT5134                    | Reactivity of modified iron silicate slag as sustainable alternative binder
  Pithchai Pandian Sivakumar, Elke Gruyaert, Nele De Belie, Stijn Matthys |
| IDSCMT5155                    | Next Generation Building Diagnostics – Corrosion Detection
  Ralf W. Arndt |
| IDSCMT5182                    | Non-destructive Inspection and Monitoring of Fractures in Concrete with Self-Healing Properties
  Fabian Malm, Fabian Diewald, Katja Pinkert |
### Session 2  
**CONCRETE STRUCTURE AND CONSTRUCTION**  
**CHAIR: ESSIE GANJIAN**  
**ROOM: JG0002**

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| IDSCMT5170 | Flexural characteristics of reinforced concrete beams containing lightweight aggregate in the tensile zone  
Jamal Khatib, Ali Jahami, Ossama Baalbaki |
| IDSCMT5002 | Applicable Use of Lightweight Foam Concrete Composite Sandwich Panels as a Flooring System  
Hisham Alabduljobbar, Rayed Alyousef, Y. H. Mugahed Amran |
| IDSCMT5046 | Shear strengthening of thick concrete slabs accounting for loading during strengthening  
Frédéric Bédard, Mathieu Fiset, Josée Bastien, Denis Mitchell |
| IDSCMT5003 | Effects on Flexural Strength of Concrete Beams using Waste Polythene Bags as Partial Fine Aggregate Replacement  
Richie. I. Umasabor |
| IDSCMT5145 | UT Inspection Practice for Anchor Bolts to Assure Structure Reliability  
Ali Abdullah Al-Shehry |

### Session 3  
**CONCRETE DURABILITY AND TESTING**  
**CHAIR: JUAN MARRIAGA**  
**ROOM: JG0003**

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| IDSCMT5023 | Sulfate Resistance of Portland Cement Mortars: A Comparison of Nano and Micro Silica  
Nader Ghafouri, Iani Batilov, P. E. and Meysam Najimi |
| IDSCMT5052 | Improving the sulfate attack resistance of portland-limestone cement through sulfate optimization: a calorimetry-based approach  
Md Manjur A Elahi and Christopher R. Shearer |
| IDSCMT5069 | Sulfate Resistance of Sustainable Geopolymer Mortars  
Yurdakul Aygörmez, Orhan Canpolat, Mukhallad M Al-Mashhadani, Mucteba Uysal, and Furkan Sahin |
| IDSCMT5110 | Sulphate attack in slag-blended cementitious materials hydrated with sodium sulphate  
Li Chuang, Tomohiro Kajio, Eiji Owaki, Yuka Morinaga, Yogarajah Elakeswaran, and Toyoharu Nawa |

### Session 4  
**SUSTAINABILITY OF BUILDINGS/ CONSTRUCTION**  
**CHAIR: TIM IBELL**  
**ROOM: JG2008**

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| IDSCMT5133 | Sustainability of Construction Materials and Buildings: An overview  
B. V. Venkatarama Reddy |
| IDSCMT5171 | New set up for tensile test performed on thin bamboo  
Silvia Greco, Luisa Molari |
| IDSCMT5039 | A Sustainable Process for Mass Customization in the Wood working Industry  
Stehling, Miguel Pereira and Ruschel, Regina Coeli |
| IDSCMT5176 | Performance Evaluation of Industrial By-Products as Sustainable Practice against Exploitation of Virgin Materials  
U. Johnson Alengaram |

### Session 5  
**CONCRETE CONSTITUENTS / MATERIALS**  
**CHAIR: MARK TYRER**  
**ROOM: JG1008**

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| IDSCMT5185 | Experimental Investigation on the Behaviour of Recycled Aggregate Concrete  
Robert Kovacs, Rabee Shamass, Vireen Limbachiya, Mahmoud Datoo |
| IDSCMT5012 | The Use of Steel Fibers to enhance the Performance of Concrete made with Recycled Aggregate  
Nancy Kachouh, Hilal El-Hassan, and Tamer El Maaddawy |
| IDSCMT5015 | Recycling of Concrete Made with Brick Aggregate: An Extended Study |

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| IDSCMT5166 | A Practical Approach to Fabric-Formed Concrete  
Kaloyana Kostova, Tim Ibell, Antony Darby, and Mark Evernden  |
| IDSCMT5140 | Impact of sustainable building design on occupant experience: a human centered approach  
Antony Darby, Sukumar Natarajan, David Coley, Dan Maskell, Ian Walker, James Brownjohn  |
| IDSCMT5188 | Conflicts in Design for Strengthening of Concrete Structures using Fibre-reinforced Polymer Composites  
Kunal D Kansara and Tim J Ibell  |

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| IDSCMT5055 | Finite Element Analysis of RC Beams Subjected to Non-Uniform Corrosion of Steel Bars  
R. K. Biswas, M. Iwanami, N. Chijiwa, and K. Uno  |
| IDSCMT5152 | Characterizing the performance of transversely confined multi-culm bamboo to steel connections  
Nischal P. N. Pradhan, Elias G. Dimitrakopoulos, Themelina S. Paraskeva  |
| IDSCMT5104 | Push-out experimental evaluation of pultruded FRP-concrete composites  
Offiong Etim, Alfred Kofi Gand, Messaoud Saidani, Okon Etad Ekpo and Pam Fom  |
| IDSCMT5147 | Quality Control Methodology for Composite FRP Rebars  
Leire Echeverria, Alvaro Ruiz Emparanza, Antonio Nanni, Francisco De Caso y Basalo  |

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| IDSCMT5111 | Comparison of industrial and natural pozzolans for ASR mitigation  
Nader Ghafoori, Arash Kian, Ariful Hasnat and Stanley Tat  |
| IDSCMT5130 | The Influence of Properties as Admixture for Concrete on The Preservation State of The Modified Fly Ash Cake by The Floatation Method  
Kento Onomoto, Koji Takasu, Hidehiro Koyamada, Hiroki Suyama  |
| IDSCMT5151 | Improved Durability of Concrete Using Supplementary Cementitious Materials  
Banti A. Gedam, Suvir Singh, Akhil Upadhyay, N. M. Bhandari  |
| IDSCMT5178 | Properties of concrete incorporating metakaolin, flyash and recycled concrete aggregates  
Shailja Bawa, M. Singh  |
| IDSCMT5125 | Corrosion Performance of Seawater Concrete with Fly Ash under Impressed Current  
Cheryl Lyne C. Roxas, Bernardo A. Lejano and Jason Maximino C. Ongpeng  |

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A Proposed Performance Based Approach for Life Cycle Assessment of Reinforced Blended Cement Concrete
Hisham Hafez, Wai Ming Cheung, Brabha Nagaratnam and Rawaz Kurda

Environmental assessment in the building materials industry: How are the results of Life-Cycle-Assessment (LCA) for concrete influenced by technology and regulations?
Ronny Meglin and Susanne Kytzia

Antifragile Windows - How to improve the sustainability of the building sector through the description of the technical elements
Emilio Antoniol, Maria Antonia Barucco

IDSCMT5135
IDSCMT5108
IDSCMT5043

Tuesday 16th July 2019

07:30 - 08:30 Speakers’ Breakfast Penrhyn Road campus
09:00 - 10:30 4 x Parallel Technical Sessions Penrhyn Road campus

Session 1 HOUNOUREE SESSION FOR PROFESSOR C GROSSE (PART 2) CHAIR: RUDI KRAUS ROOM: JG0001

Inert material with binding rim by reactive milling
Frank Schmidt-Döhl, Gabriel Glück and David Schulenberg

Ultralight mineral foams for sustainable insulation applications
Albrecht Gilka-Bötzw, Sha Yang, Eduardus A.B. Koenders

Characterization of fresh cementitious media through wave dispersion
Sokratis Iliopoulos, Dimitrios G. Aggelis

Sensitivity of the various parameters in the prediction of the voids ratio of mixes with fine and coarse particles according to Dewar’s model
S.Q. Liu, P. Minne, J. Li, E. Gruyaert

Air-coupled Impact-Echo Scanner: Fast and Contactless Non-destructive Testing of Concrete Pavements
Robin Groschup and Rudolph N. Kraus

Session 2 CONCRETE CONSTITUENTS / MATERIALS CHAIR: NADER GHAFOORI ROOM: JG0002

Sustainable use of supplementary cementitious materials from agricultural wastes – A Review

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<td>IDSCMT5183</td>
<td>Characterization of Sewage Sludge Ash as affected by different Incineration Temperature and Time</td>
<td>Siham AlShanti, Amr S. El-Dieb, Munjed A. Maraqa</td>
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<td>Feasibility Study on Production of Fiber Cement Board Using Mortar Reinforced by Fiberglass Net and Polypolyrene Fibres</td>
<td>Ali Younesian, Mahmoud Nili, Alirea Azarioon</td>
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<td>IDSCMT5177</td>
<td>Formulation of hydraulic cement from Nigeria seashell and staple crop husk powders</td>
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<td>IDSCMT5148</td>
<td>Durability of Mechanical Properties of GFRP Rebars Exposed to Seawater</td>
<td>Alvaro Ruiz Emparanza, Francisco De Caso Y Basalo, Raphael Kampmann, Pedro Rodrigues de Castro Jalles, Antonio Nanni</td>
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<td>IDSCMT5001</td>
<td>Durability index of dry sludge incorporated concrete when used as sand replacement</td>
<td>B.D Ikotun, R.P Mathye, G.C Fanourakis</td>
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<td>IDSCMT5073</td>
<td>Use of Oil Palm Broom Fibres for Eco-friendly Concrete</td>
<td>Emmanuel Owoichochei Momoh, Adelaja Israel Osofere</td>
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<td>IDSCMT5077</td>
<td>Brick Fine Aggregate and Ladle Furnace slag as Alternative to Natural River Sand</td>
<td>Tarek U. Mohammed, Md. Mahafizul Hassan, Md Nafiru Rahman, Shibly Mostafiz Apurbo</td>
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<td>IDSCMT5090</td>
<td>Compatibilization of natural fibers as reinforcement of polymeric matrices</td>
<td>P. Luna, J. Lizarazo-Marriaga, A. Mariño</td>
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<td>IDSCMT5085</td>
<td>Effect of degree of refining on flexural response of fibre cement boards reinforced with Guadua Angustifolia KUNTH bamboo</td>
<td>Luz Adriana Sánchez Echeverri, Jorge Alberto Medina Perilla, Germán Quintana, Jorge Hernán Sánchez Toro, Eshmaiel Ganjian</td>
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10:30 - 11:00  Mid-morning tea & coffee  Penrhyn Road campus
11:00 - 12:30 5 x Parallel Technical Sessions  Penrhyn Road campus
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<td>IDSCMT5157</td>
<td>ALLUVIUM: Earthen construction in future urban area Julia Tourtelot, Loren Masson, Myriam Duc, Jeanne-Sylvine Guedon, Laurent Brochard, Matthieu Vandamme, Robert Le Roy, Erwan Hamard, Chloé Fourdrin, Thomas Barré, Jean-Didier Mertz, Ann Bourgès, Emmanuel Keita</td>
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<td>IDSCMT5165</td>
<td>Sustainable bio-based earth mortar with self-healing capacity Abbie Romano, Hazha Mohammed, Veronica Torres, Ana Bras</td>
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<td>IDSCMT5179</td>
<td>Effect on quick firing on the hygro-mechanical behaviour of earth bricks Celine Perlot, Domenico Gallipoli, Agostino Walter Bruno</td>
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<td>IDSCMT5159</td>
<td>Cement stabilization effect on mechanical and hygric properties of compacted earth Noha Al Haiffar, Antonin Fabbri, Fionn McGregor, Horacio Colina</td>
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<td>IDSCMT5112</td>
<td>Properties of Ultra-High-Performance Concrete Ariful Hasnat, Arash Kian, Nader Ghafouri</td>
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<td>IDSCMT5117</td>
<td>Effect of Recycled Concrete Aggregate on the Shear behavior of Reinforced Concrete Panels Huan Zhang, Katie Kuder, Dawn Lehman, Paolo Calvi, and Charles Roeder</td>
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<td>IDSCMT5138</td>
<td>Ultra high performance fiber reinforced concrete as strengthening material Spyridon A. Paschalidis</td>
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<td>IDSCMT5154</td>
<td>Effect of Longitudinal Reinforcement Ratio on the Shear Behaviour of RC Beams made with Recycled Aggregates Nariman Khalil and Roger Makhoul</td>
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<td>IDSCMT5024</td>
<td>The Sorption and Porosity of GGBS-PFA Ternary Blended Cement Concrete Cheah Chee Ban and Chow Wee Kang</td>
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<td>IDSCMT5025</td>
<td>Long-term carbonation performance of the concrete covered with the elastic paint with heat deterioration Masashi SUGIYAMA</td>
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<td>IDSCMT5029</td>
<td>Biogenic treatment improves the durability of steel slag amended mortar structures M. Sudhakara Reddy, Prabhdeep Kaur, Sumit Joshi, Omkar A Shinde</td>
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<td>IDSCMT5036</td>
<td>Durability of Oil well Cement in CO2-rich Environments Mohammadreza Bagheri, Seyed M. Shariatipour, Eshmaiel Ganjian</td>
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<td>IDSCMT5061</td>
<td>The Effects of Formwork Types and Curing Period on the Concrete Surface Quality Akari Shibuya, Shinya Kitagawa and Takeshi Iyoda</td>
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<td>IDSCMT5008</td>
<td>Building Information Modelling (BIM): An Evaluation of BIM Application on Achieving Sustainable Design Dunya Abdulazeez G. Aldhafer</td>
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<td>IDSCMT5021</td>
<td>Long-term monitoring of an earth masonry shell house in Johannesburg, South Africa: Thermal performance</td>
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### Session 5: CONCRETE CONSTITUENTS / MATERIALS

**Chair:** Jamal Khatib  
**Room:** JG2007

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| IDSCMT5071   | Fly Ash Based Geopolymer Composites Partially Replaced with Silica Fume: An Experimental Investigation  
*Orhan Canpolat, Mukhallad M. Al-mashhadani, Yurdakul Aygörmez, and Musteba Uysal, Furkan Sahin* |
| IDSCMT5102   | Effect of partial Portland cement replacement on properties of fly ash based geopolymer concrete  
*Lateef N. Assi, Rafał Anay, Vafa Soltangharaei, Paul Ziehl* |
| IDSCMT5132   | Effect of the nature of chemical activator on the compressive strength of calcined clay geopolymer mortar  
*A. S. Bature, M. Khorami, E. Ganjian and M. Tyrer* |
| IDSCMT5116   | Synthesis and characterization of belite calcium sulfoaluminate cements produced by oxyfuel combustion residues  
*A. Telesca, M. Marroccoli, N. Ibris, T. R., Naik, C. Lupiáñez, L. I. Diez, L. M. Romeo, and F. Montagnaro* |

**12:30 - 14:00** Lunch/Exhibition  
Penrhyn Road campus

**14:00 - 15:30** 5 x Parallel Technical Sessions  
Penrhyn Road campus

### Session 1: CONCRETE CONSTITUENTS / MATERIALS

**Chair:** Nader Ghafoori  
**Room:** JG0001

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| IDSCMT5099   | Selected properties of concrete containing Municipal Solid Waste Incineration Bottom Ash (MSWI-BA)  
*Meheddene Machaka, Jamal Khatib, Adel Elkordi, Hassan Ghanem, Oussama Baalbaki* |
| IDSCMT5100   | Optimisation of secondary waste gypsum for mechanical stability in road (base) and foundation  
*Kande Bure Bai Kamara, Eshmaiel Ganjian, and Morteza Khorami* |
| IDSCMT5101   | Preliminary studies of sustainable concrete incorporating ceramic hybrid binders  
*Amir Al Arab, Bilal Hamad, Ghassan Chehab* |
| IDSCMT5107   | Consideration on Appearance Limitations of Fly Ash Blended within Concrete  
*Yosuke Mitani, Koji Takasu, Hidehiro Koyama, Hiroki Suyama* |
| IDSCMT5114   | Recycling of Single-Stream Waste Glass in Flowable Fill  
*Pranshoo Solanki, Thomas Bierma, and Guang Jin* |

### Session 2: CONCRETE STRUCTURE AND CONSTRUCTION

**Chair:** Pranshoo Solanki  
**Room:** JG0002

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| IDSCMT5013   | Design Method for Renewal from Reinforced Concrete Slab to Precast Prestressed Concrete Slab  
*Hideaki Sakai* |
| IDSCMT5030   | A Method for Assessing the Cross-Sectional Stiffness of Buried Reinforced-Concrete Pipe  
*M. Hyodo, K. Ooyama, M. Ishii, T. Hatanaka, and H. Ogata* |
Session 3  **CONCRETE DURABILITY AND TESTING**  CHAIR: KATJA PINKERT  ROOM: JG0003

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<td>Evaluation of Salt Resistance of Concrete Combined with Chloride-Ion Immobilizer and Expansive additive</td>
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<td>IDSCMT5062</td>
<td>Development and verification of neutralization depth and chloride ion penetration depth measurement method using fibrescope</td>
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<td>Shunsei Tanaka, Yuka Sakai</td>
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<td>Assessment of the Effectiveness of Butler-Volmer Equation to Predict Corrosion Rate in Cathodically Protected Structures</td>
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<td>Arpit Goyal, Homayoon Sadeghi Pouya, Eshmaiel Ganjian</td>
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<td>Reinforced alkali-activated concrete with induced corrosion</td>
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<td>IDSCMT5068</td>
<td>Influence of interfacial transition zone at aggregate surface caused by bleeding on permeability</td>
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Session 4  **SUSTAINABILITY OF BUILDINGS/ CONSTRUCTION**  CHAIR: CHRIS CHEESEMAN  ROOM: JG2008

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<td>Ethiopian Vernacular Bamboo Architecture and its Potentials for Adaptation in Modern Urban Housing: A case study</td>
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<td>IDSCMT5033</td>
<td>Innovative Nanoparticle-Based Admixture for Sustainable Construction Materials and Technologies</td>
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<td>Van Bui, Chris Eagon, Steve Schaef &amp; Paul Seiler</td>
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<td>IDSCMT5097</td>
<td>The use of electric arc furnace slag in bituminous pavements</td>
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<td>Marta Skaf, Juan Manuel Manso, José Antonio Chica, Amaia Santamaría, Emiliano Pasquini and Vanesa Ortega-López</td>
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<td>IDSCMT5169</td>
<td>Construction practices for first ever wheat straw reinforced concrete pavement for light traffic</td>
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<td>Muhammad Usman Farooqi, Majid Ali</td>
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<td>IDSCMT5120</td>
<td>Preparation for green high performance steam-cured concrete</td>
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Session 5  **CONCRETE CONSTITUENTS / MATERIALS**  CHAIR: MARK TYRER  ROOM: JG2007

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<td>IDSCMT5113</td>
<td>Study on Creep Properties of the Concrete Combined with Recycled Aggregate and Fly Ash</td>
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<td>Shunsuke Hayashi, Koji Takasu, Hidehiro Koyamada, Hiroki Suyama</td>
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<td>IDSCMT5119</td>
<td>Mechanical behavior of natural fiber textile reinforced mortar sheets</td>
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<td>P. Luna, J. Lizarazo-Marriaga, L. Luna, J. Ortiz, D. Mayorga</td>
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Fly ashes from fluidized bed combustion of peat and wood as a cement replacement material

Jouni Rissanen, Katja Ohenoja, Mirco Marcellini and Mirja Illikainen

A study on influence of physical properties of crushed sand with adjusted particle size distribution for fluidity of mortar

Daijiro Tokunaga, Koji Takasu, Hidehiro Koyamada, Hiroki Suyama

Ladle furnace slag as cement replacement in mortar mixes

Amaia Santamaria, Vanesa Ortega-Lopez, Marta Skafč, Veronica García, Juan J. Gaitero, Jose T. San-Jose, Javier J. González

15:30 - 16:00 Mid-afternoon tea & coffee Penrhyn Road campus

16:00 - 17:30 5 x Parallel Technical Sessions Penrhyn Road campus

Session 1 CONCRETE CONSTITUENTS / MATERIALS CHAIR: PRANSHOO SOLANKI ROOM: JG0001

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<td>IDSCMT5037</td>
<td>Characterization of Enhanced Pozzolanic Biomass Ash Eman H. Elbuaiishi and P.S. Mangat</td>
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<td>IDSCMT5060</td>
<td>Pozzolanic activity of flint powder Lennart Osterhus, Florian Ditz, Frank Schmidt-Döhi</td>
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<td>IDSCMT5128</td>
<td>A Study on Wet Classification Method of Fly Ash and Physical Property of Classified Fly Ash Ayano Endo, Koji Takasu, Hidehiro Koyamada and Hiroki Suyama</td>
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<td>IDSCMT5174</td>
<td>Study of optimum compressive strength of palm kernel shell - quarry dust aggregates concrete Damilola Oyejobi, Alao A Jimoh and Kehinde Abdulsalam Eeleu</td>
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Session 2 CONCRETE STRUCTURE AND CONSTRUCTION CHAIR: JAMAL KHATIB ROOM: JG0002

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<td>IDSCMT5180</td>
<td>Electrical resistivity used for liquid imbibition monitoring in cement-based materials: comparison between experience and simulation Mohamed Abdou Ibro, Jérôme Verdier, Sandrine Geoffroy, Hugo Cagnon</td>
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<td>IDSCMT5181</td>
<td>Textile-reinforced mortar external strengthening of corroded reinforced concrete beams Charles K.S. Moy and Silas Oluwadahunsi</td>
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<td>IDSCMT5156</td>
<td>Effect of water and alkali content on setting time of cement pastes with electric arc furnace dust (EAFD) Margareth da Silva Magalhães, Flora Faleschini, Carlo Pellegrino, Katya Brunelli</td>
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<td>IDSCMT5153</td>
<td>An Evaluation on Anti-corrosion Performance of Galvanized (Zinc-coated) Rebar in Concrete by Galvanostatic Technique Hongbok-Choe, Manabu Kanematsu and Yuhei Nishio</td>
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<td>IDSCMT5018</td>
<td>Estimation on Deterioration Process Model of Concrete Structure received Chloride induced Damage with considering Repeated Repairing Manabu Matsushima, Hiroyuki Nakagawa</td>
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Session 3 CONCRETE DURABILITY AND TESTING CHAIR: KATJA PINKERT ROOM: JG0003

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<td>IDSCMT5032</td>
<td>Pull-out Resistance of Post-installed Anchors with Cracks Repaired by Epoxy Resin Noritaka Morohashi</td>
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Session 4  SUSTAINABILITY OF BUILDINGS/ CONSTRUCTION  CHAIR: NADER GHAFOORI  ROOM: JG2008

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| IDSCMT5186  | Exploring Challenges of Adopting Sustainability Assessment: Methods in UAE - Perspectives of Project Professionals  
Amna I. Shibieka, Tasneem B. Abdel Raheem, Batoul Y. Hittini |
| IDSCMT5091  | Technical-financial viability of the sustainable guidelines implementation related to water & energy for schools  
Amanda Francielle do Nascimento, Maria Julia Pereira, Rúbia Bernadete Pereira dos Santos |
| IDSCMT5086  | Sustainability Patterns and Tradeoffs through a Graphical Sustainability Index  
Rita Awwad and Karim El Khoury |
| IDSCMT5044  | Improving the Recycling Rate of the Construction Industry  

Session 5  CONCRETE CONSTITUENTS / MATERIALS  CHAIR: VENKAT REDDY  ROOM: JG2007

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| IDSCMT5004  | Evaluation of Rice Husk Ash Blended Concrete using Response Surface Methodology  
Richie. I. Umasabor and Henry C. Odunze |
| IDSCMT5005  | Utilisation of wood ash for environmentally friendly concrete production  
Sevket Can Bostanci |
| IDSCMT5006  | Laboratory Study to Evaluate the Effect of Waste Toner on Dynamic Creep of Asphalt Concrete Mixtures  
Taisir S. Khedaywi |
| IDSCMT5010  | Tailor- Made Blended Cement for Sustainable Concrete in Ghana  
Mark Bediako, Eric Opoku Amankwah, John Solomon Ankrah |
| IDSCMT5016  | Multiple Blend supplementary cementitious materials (Recovered Mineral Components), benefit sustainability through innovative concrete design  
Eckart R. Bühler & Robert C. Lewis |

19:30 – 23:00  CONFERENCE BANQUET  Raven’s Ait Island, Kingston upon Thames KT6 4HN

Wednesday 17th July 2019

07:30 - 08:30  Speakers’ Breakfast  Penrhyn Road campus

09:00 - 10:30  3 x Parallel Technical Sessions  Penrhyn Road campus
### Session 1
#### HONOUREE RILEM
**Chair:** Essie Ganjian  
**Room:** JG0001

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| IDSCMT5158   | Influence of compacted earth topography on water droplet damping  
*T.Mauffré, F.McGregor, E.Contraires, A.Fabbri* |
| IDSCMT5164   | Gypsum and lime stabilised earth-rice husk composite  
*Ana Bras, Ana Antunes, Paulina Faria* |
| IDSCMT5163   | Bio-fibre earth composite mortar: a structural and hygrothermal assessment  
*Abbie Romano, Ana Bras, Sotirios Grammatikos, Andy Shaw and Mike Riley* |

### Session 2
#### CONCRETE CONSTITUENTS / MATERIALS
**Chair:** Jean-Claude Morel  
**Room:** JG0002

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| IDSCMT5105   | Pozzolanic reactions in ultra-high performance concrete containing silica fume and fly ash  
*Padmaja Krishnan, Min-Hong Zhang and J Y Richard Liew* |
| IDSCMT5106   | The effect of seeding of synthesized C-S-H with different C/S on early hydration reaction of alite  
*Yumetoki Abe, Yuka Morinaga, Yogarajah Elakneswaran, Toyoharu Nawa* |
| IDSCMT5050   | Nano-modified Cementitious Composites with high volume Supplementary Cementitious Materials  
Incorporating Basalt Fiber Pellets  
*A.Azzam, M.T. Bassuoni, and A. Shalaby* |
| IDSCMT5139   | Effects on strength of concrete from incremental rubber aggregate replacement by volume  
*Istvan Pocklington, Hsein Kew* |

### Session 3
#### SUSTAINABILITY OF BUILDINGS/ CONSTRUCTION
**Chair:** Chris CheeseMAN  
**Room:** JG0003

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| IDSCMT5081   | Tyres an Environmentally Sustainable Resource  
*Tedge Sagoo, Chris Sawden and Noel Peart* |
| IDSCMT5142   | Smart Biofacades; An Innovative Living Construction Technology  
*F. Fadli, S. Zaina, P. Bahrami* |
| IDSCMT5143   | More sustainable constructions using Limestone Calcined Clay Cement (LC3)  
*Karen Scrivener, François Avet, Franco Zunino, Julien Ston* |
| IDSCMT5136   | Sustainable Construction Materials Based On Recycled Asbestos Cement Wastes  
*I. Farina, F.Fraternali, N. Singh, R.Cioffi, F. Colangelo* |
| IDSCMT5137   | Clay-Burnt Coarse Aggregate: Production and Utilization in Concrete  
*Tarek U. Mohammed, Aziz H. Mahmood, Syed S. Ahmed, and Mosabbir Pasha* |

### Session 1
#### HONOUREE SESSION FOR PROFESSOR CHRIS CHEESEMAN
**Chair:** Alan Maries  
**Room:** JG0001

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| IDSCMT5123   | The influence of Ca source on the preparation of geopolymer using circulating fluidized bed fly ash  
*Xiu-chen Qiao* |
### Session 2: Concrete Structure and Construction  
**Chair:** Sunny Nwaubani  
**Room:** JG0002

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| IDSCMT5026    | Experimental and Analytical Studies on Cracking due to Corrosion in Reinforced Concrete Slab  
Hiroyuki Nakagawa, Hiroki Yamaguchi, Manabu Matsushima |
| IDSCMT5057    | Study on Various Factors Related to Evaluation of Thermal Cracking Probability of Mass Concrete Structures  
Ryoichi Ashizawa, Toshiaki Mizobuchi, and Hiroki Izumi |
| IDSCMT5149    | Effect of natural fibrous plaster on lateral resistance of mortarless interlocking wall  
Furqan Qamar, Terrence Thomas and Majid Ali |
| IDSCMT5056    | Effects of Drying Shrinkage of Concrete on Shear Behavior of Reinforced Concrete Beams without Shear Reinforcement  
Hikotsugu Hyodo, Ryoichi Sato, Kenji Kawai and Ken-ichiro Nakarai |

### Session 3: Concrete Durability and Testing  
**Chair:** Robert Lewis  
**Room:** JG0003

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| IDSCMT5067    | Investigation of carbonation rate coefficient in mortars with blast furnace slag high content  
Junya Nakamura, Takeshi Iyoda, Seishi Goto |
| IDSCMT5072    | Investigation of mechanism on progress for strength and air permeability of concrete using c-s-h hardening accelerator  
Takeshi IYODA, Tomomi SUGIYAMA |
| IDSCMT5079    | Rehabilitation of Transportation Infrastructure in West Virginia with FRP Wraps  
Wael Zatar and Hai Nguyen |
| IDSCMT5118    | Influence of CaCO3 whiskers, steel fibers and basalt fibers hybridization on flexural toughness of concrete  
Mehran Khan, Mingli Cao, Majid Ali |
| IDSCMT5115    | Chloride Migration Coefficient and Resistivity of Concrete Containing Supplementary Cementitious Materials  
Eisuke Nakamura, Kensuke Mito, Masahiro Suzuki, and Hirohisa Koga |

### Session 4: Sustainability of Buildings/Construction  
**Chair:** Peter Claisse  
**Room:** JG2008

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| IDSCMT5070    | Using Different Types of Aggregates Including Waste Concrete in the Production of Geopolymer Mortars  
Furkan Sahin, Mucteba Uysal, Orhan Canpolat, Mukhallad M. Al-Mashhadani and Yurdakul Aygörmez |
| IDSCMT5074    | Metabolism of metals from co-processing of Energy from Waste Air Pollution Control residue in cement kilns  
Marchand, L., Van Ewijk, S., Stegemann, J. A. |
| IDSCMT5076    | Demonstration of using low carbon precast concrete products for an energy efficient built environment  
T. E. McGrath, J. Kwasny, T.A. Aiken, S. Cox, M. Soutsos, J.F. Chen, J. Mariotti, W. Sha, R. Correia |
Investigations into the high temperature behaviour of unstabilised rammed earth
Christopher Beckett, Kyriacos Kazamias and Angus Law

Performance Evaluation of Industrial By-Products as Sustainable Practice against Exploitation of Virgin Materials
U. Johnson Alengaram

12:30 - 14:00   Lunch/Exhibition   Penrhyyn Road campus
14:00 - 15:30   Closing Plenary Session   Penrhyyn Road campus

Chair: Professor E Ganjian

Keynote Addresses
• Title to be confirmed
  Professor Chris Cheeseman, Imperial College London
• The Performance testing of earthen materials: Challenges and Future Developments
  Dr Antonin Fabbri, University of Lyon-France and Professor Jean-Claude Morel, Coventry University- UK

Closing Remarks by Professor M Limbachiya

Conference Ends
Supporting Organisations

Exhibitor

Ferroglobre
Advancing Materials Innovation