ICCCSC 2026

5th International Conference on Calcined Clay for Sustainable Concrete

04 – 06 February 2026 | Cape Town, South Africa

Conference venue:

- GSB Conference Centre, Portswood Road, V&A Waterfront, Cape Town

Overview:

- Monday, 02 Feb.: **PhD course on LC3 Concrete Technology**, UCT Upper Campus
- Tuesday, 03 Feb.: **PhD course on LC3** (geology, characterization, calcination, hydration, application, properties, ecology), GSB Conference Centre
- Tuesday, 03 Feb., 17:00 – 18:30: **Welcome Function and Registration**
- Wednesday – Friday (04 – 06 Feb.), 08:30 – 17:30: **Technical Programme**
- Wednesday, 04 Feb.: **Conference Dinner**

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Day 1: Wednesday, 04 February 2026

Session 1 (08:30 - 10:00): Conference Opening / Venue A		
Welcome, Hans Beushausen & Mark Alexander		
Welcome Address, Aubrey Mainza, Dean of the Faculty and Engineering and the Built Environment, UCT		
Introduction to ICCCSC and LC3, Karen Scrivener		
Keynote presentations [*Chair: Karen Scrivener*]		
Experiences with Calcined Clay Cements in the East and South African Contexts – Key Insights and Findings; *Mark Alexander*		
From Data to Decarbonization: The Economics and Carbon Value of LC3; *Sofía Sánchez Berriel*		
Tea & coffee break (10:00 - 10:30)		
Session 2 (10:30 - 12:30)		
Venue A	**Venue B**	**Venue C**
Calcined Clay: Market Development and Industry Trends - I	**Mechanical and Durability Performance of LC3 Concrete**	**Mix Design, Rheology and Fresh Concrete Properties**
Chair: Sofía Sánchez Berriel	*Chair: Mark Alexander*	*Chair: Nicolas Rousell*
Innovative Technology for Effective CO_2 Reduction in Cement Production C/Clay – Dynamis/Loesche Calcined Clay; *Tiago Guelfi de Freitas*	Concrete With Calcined Clay: Results From Holcim and Hyundai E&C Research Collaboration; *Rémi Barbarulo*	Bio-based Admixtures for LC^3 Rheology Modification; *Renata Lorenzoni*
Pilot-Scale Calcination of Kaolinitic Clay in a Multiple Hearth Furnace: A Pathway to Viable LC3 Production; *José Fernando Martirena Hernández*	Performance of Low-Clinker Binders: from Binder Properties to Concrete Performance; *Reza Homayoonmehr*	Optimizing Superplasticizer Selection for LC3 Mixes: Correlating Fluidity and Compressive Strength of Pastes; *Ominda Nanayakkara*
Scaling up Production of Sustainable Concrete using Calcined London Clay from the HS2 Excavation Operations; *Yuvaraj Dhandapani*	Potential use of Low-grade Limestone in Limestone Calcined Clay Cement (LC^3); *Menard B. Kilumile*	Measuring the Shear Thickening of Blended Cements; *Clémentine Delattaignant*
Potential of LC3 Cement for Sustainable Construction and Accelerating Infrastructure Development in Nigeria: An Overview; *K. A. Olonade*	Combining LC^3 with Activators and Particle Packing Optimization for CEM III/A Replacement -Part A: Binder Optimisation; *Juan Manuel Etcheverry*	Redefining Workability of LC 3 Concrete: Novel Testing Methods and Optimized Mixing Protocols; *Beatrice Malchiodi*
From Traditional Craft to Modern Factory: Standardizing and Industrializing Omani Sarooj with MECC; *Abdulaziz Al Maqbali*	Combining LC^3 with Activators and Particle Packing Optimization for CEM III/A Replacement – Part B: Durability; *Laurena De Brabandere*	CO_2 Utilization in LC^3-based Concrete for Additive Manufacturing: Influence on Rheological Properties; *Silvia Reißig*
Advancing LC^3 from Research to Practice: A Commercial Pilot Case Study from India; *Lav Singh*	Suitability of Mine-rejected Low-grade Limestone in LC3 Systems; *Amitkumar Chauhan*	Fresh-State Rheology of LC^3 Incorporating Calcined Clays and Ceramic Wastes; *Lucia Ferrari*
Calcined Clays a Sustainable Alternative to Decarbonise the Cement Industry: A Case Study of Ghana's LC3 Project; *Peter Dickson*	Influence of Clinker Reduction and Calcined Clay Grade on the Strength and Carbonation Performance of LC3 Concretes; *Suhail Ahmad Baba*	Understanding Superplasticizer–Mineral Interactions: From Single Phases to Complex Blended Binders; *Franco Zunino*
Durability of LC3 Systems under Harsh Conditions: A Sulphate Exposure Study; *Nikita Majhi* [3 min.]	Mechanical and Durability Properties of Calcined Clay Based Geopolymer Mortars; *Melanie Langlois*	Fresh Properties and Sustainability Assessment of Low-Carbon LC 3 Based Rubberized Self-Compacting Concrete; *Mohamed Abdulqadir Mohamed*
Economic assessment of LC 3 adoption – A Business Case; *Neha Gupta* [3. Min]		
Lunch break (12:30 - 13:30)		

Session 3 (13:30 - 15:00)		
Venue A	**Venue B**	**Venue C**
Clay Mineralogy, Calcination, and Reactivity - I	**Performance Modelling, Testing, and Optimization of LC3 Concrete**	**Dimensional Stability of LC3 Concrete**
Chair: Shashank Bishnoi	*Chair: Mark Alexander*	*Chair: Ichebau Amadi*
Mineralogical and Thermophysical Characterization of Kaolinitic Clays from Kisonga in Kongo-Central (DRC); *Seke Vangu Max*	Enhancing the Sustainability of Limestone Calcined Clay Cement Concrete: A Unique Mix Design Approach; *Ashirbad Satapathy*	Development of Shrinkage and Creep Prediction Models for Low Carbon Cement Concrete via SCDT; *Wen-Cheng Liao*
Mineralogical Characterization and Reactivity of Selected Clays from Kongo Central (DRC) for BLC3 Low-Carbon Cement Formulations; *Kapinga Kabulwe Sharon Rose*	Machine Learning-Assisted Optimization of LC^3 Systems; *Daniel Benkeser*	Early-age Creep Reduction and Shrinkage Increase from Pozzolanic Reaction in LC3 Paste, Determined in Hourly Three-minute Creep Tests; *Sophie J. Schmid*
Activation of Natural Bentonite using Different Calcination Methods; *Paula Aguilar Guimarães*	Optimising Blending Ratios in Calcined Clay Cements; *Nina Cardinal*	Enhanced Structural Performance and Reduced Carbon Footprint through LC3 Concrete: A Flexural Creep Study; *Beatrice Malchiodi*
Assessment of the Pozzolanic Potential of a weathered mafic rock from an iron mine for Use as a Supplementary Cementitious Material; *Bruna Luiza Brito*	Toolbox for Calcined Clays: Optimizing Clay Selection and Activation with Orthogonal Quantitative Analyses; *Matteo Pernechele*	Creep in LC^3 pastes: A micromechanical modelling approach; *Amit Kumar*
Study of the Impact of Calcination on the Pozzolanic Properties of Bulungu's Illitic Green Clays (DRC) and their Potential for Integration into the Production of Eco-friendly Cements; *Seke Vangu Max*	Early-age Strength Evolution of Limestone and Calcined Clay-blended Cement Pastes: Experiments and Multiscale Modelling; *Sophie J. Schmid*	Effect of Superplasticiser on Mechanical Performance of Limestone Calcined Clay Cement Concrete; *Idris Mayowa Abdrafiu*
Effect of limestone fineness on the hydration mechanism and Reactivity of LC3 blends; *Anwesa Satapathy* [3 min.]	Calcined clays as SCM for Optimal Reduction of Portland Clinker in Cement: a Comparative Study with Volcanic Pozzolans; *Ndigui Billong*	Correlation of Elastic Modulus and Compressive Strength in LC3 Systems; *Aastha Singh* [3 min.]
Tea & coffee break (15:00 - 15:30)		
Session 4 (15:30 - 17:00)		
Venue A	**Venue B**	
Reactivity Modelling and Testing	**Durability of LC3 Concrete**	
Chair: Franco Zunino	*Chair: Alice Bakera*	
A Novel 5-min UR 2 Test for QC/QA of Commercial Calcined Clays; *Nishant Garg*	Durability of Calcined Clay Concrete under Carbonation and Freeze–Thaw exposure; *Yuvaraj Dhandapani*	
Effects of Kaolinite Structural Order and Iron Oxide Particle Size on the Reaction Kinetics of Calcined Clays; *A. T. M Marsh*	How Does Thermal Decomposition of Concrete Affect Blended Cement?; *Suyash Bhandaree*	
Rapid Assessment of Calcined Clay Reactivity for Strength Prediction in LC3 Systems; *Sandra Mujombi*	Evaluating LC 3 Cements in Nuclear Settings: A Sustainable Approach to Long-Term Stability; *Daniel A. Geddes*	
Application of Ultra-Rapid Reactivity (UR2) Test for Online Characterization of Calcined Clay Reactivity; *Sandra Mujombi*	Multiscale Modelling of Gas Permeability in calcined-clay-based ternary cementitious blends; *Berjees Qadr*	
Evaluation of Kinetic Modeling Methods for Kaolinitic Clay Dehydroxylation; *Qun Wang*	Effect of Gas Type and Electrolyte Solution on Durability Test Methods for LC3 concrete; *Vikash Kumar Singh*	
Conference Dinner, 18:00 - 22:00 | GOLD Restaurant, 15 Bennett Street, Green Point. Bus from GSB at 17:50.		

Day 2: Thursday, 05 February 2026

Session 5 (08:30 - 10:00)		
Keynote presentations [*Chair: Shashank Bishnoi*]		
Early Age Reactivity of Calcined Clays – Impact on LC3 Hydration; *Thomas Matschei*		
Shedding Light on Early-Age Hydration of Metakaolin-containing Cements Using Novel Solid-State NMR Experiments; *Franco Zunino*		
An Optimization Tool for LC3 Cements that Balances Chemical Reactivity with the Requirements for Mixing Water and Admixture; *Vanderley John*		
Tea & coffee break (10:00 - 10:30)		
Session 6 (10:30 - 12:30)		
Venue A	**Venue B**	**Venue C**
Influence of Processing on the Reactivity of Calcined Clays - I	**Hydration, Microstr. Development and Early-age Performance - I**	**Special Applications of LC3 Binders**
Chair: J. Fernando Martirena Hernández	*Chair: Franco Zunino*	*Chair: Alice Bakera*
Activation Strategies for Coal Gangue in LC^3 Systems: from processing to Performance and Sustainability; *Lei Xu*	Understanding the role of C-S-H seeding and sodium silicate on the properties of limestone calcined clay cement (LC3) derived from low-grade clays; *Xiaodi Dai*	Calcined Clay as a Sustainable Additive for Oil Well Cement Applications; *Hilal Saif Al Dhamri*
Thermal Activation and Reactivity Assessment of New Zealand Natural Pozzolans for Low Carbon Concrete Applications; *Oliver Cadrain*	Improving the Properties of LC3 by Addition of BCSA (Belitic Calcium Sulfoaluminate) Mineral Admixture; *Visa Isteri*	Mechanical Performance of Limestone–Calcined Clay Based Roller-Compacted Concrete Pavement Incorporating Recycled Concrete Aggregate; *D Sitarami Reddy*
A Comparative Study on the Early Hydration and Workability of Cements Blended with Thermally and Mechanochemically Activated Phyllosilicates; *Lea Ruckes*	The Role of Sulphate During the Hydration of Ternary Cements with Calcined Clay and Limestone; *Katja Pesch*	Investigation of Sustainable Concrete Blocks for Affordable Housing in Tanzania; *Kelvin C Luoga*
Thermally and Mechano-chemically Activated Opalinus Clay as Cement Replacement; *Adrian-Alexandru Pîrvan*	Effect of Clay Type on the Hydration and Microstructure of Limestone Calcined Clay Cement; *Mehnaz Dhar*	Synergetic Effect of Soil Chemical Composition on Performance of Limestone Calcined Clay Cement in Soil Stabilization in Kenya; *Joseph Mwiti Marangu*
Mechanical Activation of High Kaolinite Clays - Evaluation of Energy Requirements and Effects on Intrinsic and Applicative Properties of the Clays; *Barbara Benevenuti*	Impact of Early Hydration Products on the Packing Properties of Metakaolins; *L. Caneda-Martínez*	The Viability of Waste Clays as Low-carbon Binders in Sustainable Earthen Construction; *India Harding*
Thermo-Mechanochemical Activation of Low-Kaolinite Clays and Their Performance in Binary and Ternary Binders with Limestone of Varying Fineness; *Amrita Hazarika*	Early-Age Performance of LC^3 Concrete: The Impact of Clinker Content and Water-to-Binder Ratios; *Isteeda Ikbal*	Impact of High Levels of Cement Replacement by Limestone Calcined Clay Cements (LC3) on Rheology and Mechanical Properties in ECCs; *Urs Buegger*
Production of Activated Clay – the Experience of the Vicat Group; *François Avet*	Early and Long-term Performance of LC^3 Cement with C-S-H Seeding; *Xuerun Li*	Carbonation Curing of LC3 -50 Foamed Binders: Role of Curing Sequence; *Anna Jose*
	Reevaluating LC3 - based Mix Design Beyond ASTM C311: A Nomogram Approach to Determine Effective Water-to-binder Ratio; *Ankita Pareek*	Compressive Strength and Pore Structure Development in Sustainable Foam Concrete Modified with Metakaolin for Non-Structural Purposes; *Alassane Compaore*
Lunch break (12:30 - 13:30)		

Session 7 (13:30 - 15:30)		
Industry Presentations [*Chair: Hans Beushausen*]		
Do's and Dont's of Testing SCM Reactivity in an Isothermal Calorimeter; *Marc Zacharias, Calmetrix*		
Scaling Up LC3: CBMI Project Delivery Experience and Lab-to-Pilot Capabilities; *Xuwei Jiao, Sinoma CBMI Construction*		
Panel Discussion: Advancing LC3: From Research Gaps to Industrial Implementation		
Panel Members: *Karen Scrivener (EPFL, Switzerland), Alice Bakera (University of Dar es Salaam), (Kaolin Group), Hakan Gurdal (Heidelberg Materials), Wang Bin (CBMI Construction)*; Moderator: *Hans Beushausen (UCT)*		
Tea & coffee break (15:30 - 16:00)		
Session 8 (16:00 - 17:45)		
Venue A	**Venue B**	**Venue C**
Influence of Processing on Reactivity of Calcined Clays - II	**Calcined Clay: Market Development and Industry Trends - II**	**Developments in Sustainable Binder Technology**
Chair: Vanderley John	*Chair: Ichebadu Amadi*	*Chair: Thomas Matschei*
Utilization of Low-Grade Clays from Clinker Production in Limestone Calcined Clay Cement; *Ömer Faruk Kalkan*	Design of Low-carbon Cement Containing Calcined Clay Granite, Dolomitic Limestone, or Slag in the Context of Burkina Faso; *Philbert Nshimiyimana*	Influence of Rhyolite Pozzolana Content and Activation Methods on Compressive Strength of Cement; *Muhammad Danyal Sheikh*
Particle Modeling of the Influence of Process Conditions on Clay Flash Calcination; *Nicolás Carro*	Engineered UK Clays for Production of Low-carbon Cements; *Clive Mitchell*	Sustainable Cement Hydration: Impact of Glass and Resin from Wind Turbine Blade Waste; *Tao Liu*
Structure and Pozzolanic Reactivity of Kaolinite and Bentonite Co-calcined with Limestone or Na_2SO_4 from ^{27}Al and ^{29}Si NMR Studies, *Jørgen Skibsted*	Accelerating Low-Carbon Concrete Adoption in Africa: Implementation Pathways and Decarbonisation Strategies for Calcined Clay Technologies; *R. Munemo*	Decarbonizing Concrete with Biochar: Insights from Life cycle Sustainability Assessment; *Teklit Gebregiorgis Ambaye*
Impact of Colour Control on the Reactivity of Calcined Clays; *Fabien Georget*	Advancing Sustainable Concrete Solutions Calcined Clay at Bouygues Construction; *Khalil Haidar*	Upscaling the Utilization of Eco-blend Cement for Low-carbon Construction Projects in Global South; *Ademilade Olubambi*
Variation in Particle Size Distribution in Thermally Modified Kaolinitics Clays in Rotary Kilns; *José Fernando Martirena Hernández*	Unlocking the Potential of Calcined Clays in Africa: Field Experience from Ghana and the Role of Cement Additives; *Alejandro Velez*	Soil Solutions: Bioactive Clay–Mycelium Liners for Sustainable Infrastructure; *Astrid Kirsten*
Advancing LC3 with Disruptive Grinding: Performance and Environmental Insights; *Beatrice Malchiodi*	First LC3 Cement and Concrete Productions Using Low Kaolinite Grade Clays from the Xelow-gradeuilley Plant, France; *Laury Barnes-Davin*	Hybrid Low-Carbon Cements from Legacy Ash, Slag, and Waste Streams: Science, Design, and Global Case Studies; *Cyril Attwell*
	Roman Concrete 2 (RoC2) Blocks - Diagnosing the Sustainability Improvement Potential in Sub-Saharan Africa; *Raine Isaksson*	CO_2 Capture through Mineral Carbonation: a Comparative Study of Dry, Semi-Dry, and Wet Approaches for Cement-Based Materials; *Arailym Umirova*

Day 3: Friday, 06 February 2026

Session 9 (08:30 - 10:00)		
Keynote presentations [*Chair: José Fernando Martirena Hernández*]		
The Research Progress and Prospect of LC3 in China; *Cheng Yu*		
Unlocking Sustainable Construction with Low-Carbon Cement in Sub-Saharan Africa; *Joseph Mwiti Marangu*		
The influence of carbonation on the microstructure of LC3 concrete; *Shashank Bishnoi*		
Tea & coffee break (10:00 - 10:30)		
Session 10 (10:30 - 12:15)		
Venue A	**Venue B**	**Venue C**
Hydration, Microstructure Development and Early-age Performance - II	**Durability of LC3 Concrete with a Focus on Factors Influencing Reinforcement Corrosion**	**Waste Utilization and Resource Optimization**
Chair: Karen Scrivener	*Chair: Sylvia Kessler*	*Chair: Beatrice Malchiodi*
Strength and Flow Behaviour of LC^3 Cement with Hydration Control Additive; *Xuerun Li*	Impact of Admixture on Carbonation in Limestone Calcined Clay Cements; *Sebastien Dhers*	Carbon Footprint Analysis of Mining Waste Calcined Clay and LC3 Production in Brazil; *Luiza Helena Julich*
Incorporation of Carbonated Cement Paste in Portland Cement – Calcined Clay Ternary Blends Studied by ^{27}Al and ^{29}Si MAS NMR; *Jørgen Skibsted*	Towards a Testing Framework to Characterize Chloride Resistance of Concrete Based on Cement Paste-Scale Tests; *Dhanush Sahasra Bejjarapu*	Ecological-economic Evaluation Scheme for Calcined Clays from Mineral Secondary Raw Materials; *Simone E. Schulze*
A Hierarchical Hydration Pathway in Limestone Blended Cements: The Role of Alumina Source and Reactivity; *Ruochen Jiang*	Overcoming Challenges in the Implementation of Low-Carbon Concrete; *Ilyana Ahmed-Khedda*	Utilization of Construction Demolition Waste of Morocco for Use in LC3 Binders; *Abla Grace Leaticia Kouassi*
Influence of Calcined Clays on the Pore Solution of Hydrated Cement Pastes: An Experimental and Thermodynamic Modelling Investigation; *Katarina K. Schlage*	Comparative Analysis of Corrosion Cracking and Mechanical Performance in LC3 and OPC Mortars; *Talles Felix*	Hybrid Low-Carbon Cements from Legacy Ash, Slag, and Waste Streams: Science, Design, and Global Case Studies; *Cyril Attwell*
Quantification of the Microstructure of Calcined Clay-Limestone Blends by using Saturated Salt Solutions and Archimedes Principle; *Wolfgang Kunther*	Durability Design of Reinforced Concrete with Limestone Calcined Clay Experiencing Carbonation; *Umesh Hule*	Sustainable Local Production of Standardized Sand for Hydraulic Cement Testing in Developing Countries; *José Fernando Martirena Hernández*
Minimum Clinker Threshold of Low Clinker Limestone Calcined Clay Blended Cements; *Timur Mukhametkaliyev*	Effect of Carbonation on the Relationship Between Transport Properties and Pore Structure in Blended Cements; *Shashank Bishnoi*	From Inert to Essential: Catalytic Transformation of Clay Waste; *Astrid Kirsten*
Lunch break (12:15 - 13:15)		

Session 11 (13:15 - 15:30)		
Industry Presentations [*Chair: Hans Beushausen*]		
From Quarry to Quality: Getting the Best from XRF, XRD and Laser Diffraction in Cement Production; *Murielle Goubard, Malvern Panalytical*		
Pioneering LC3 technology deployment in Africa; *Mpume Mlalazi, Saint-Gobain*		
Kaolin Group		
Linking Clay constitution to Binder Performance - Findings from Innovandi Core Projects [*Chair: Thomas Matschei*]		
Overview: Innovandi Calcined Clay Core Project; *Thomas Matschei*		
Modelling Early-age Hydration: Wrong but Easy Assumptions for Industrial Applications; *Fabien Georget*		
Quality Control of Calcined Clays at an Industrial Scale using the Methylene Blue Test; *Mehnaz Dhar*		
Impact of Colour Control on the Reactivity of Calcined Clays, *Fernando Martirena*		
Tea & coffee break (15:30 - 16:00)		
Session 12 (16:00 - 17:15)		
Venue A	**Venue B**	
Clay Mineralogy, Calcination and Reactivity - II	**Development and Performance of Low-clinker Cementitious Binders**	
Chair: Franco Zunino	*Chair: Sofía Sánchez Berriel*	
Activation, Reactivity and Dissolution of 2:1 Clay Minerals; *Haoming Wu*	Less Clinker - More Questions: Durability Assessment through long-Term Experience; *Fabrizio Moro*	
Calcined Clays from Kongo Central: a Low Carbon Alternative for the Cement Industry; *Maya-Vangua Marc klesh*	Ecoefficiency of Calcined Clay Blended Cements; *Yuri Mariano Carvalho*	
Characterization and Assessment of the Industrial Potential of White Clays from the Kongo-Central Province (DRC) using XRF, XRD, FTIR, TGA/DSC, and SEM-EDS; *Seke Vangu Max*	LCA Strategies to Evaluate CE in Construction: Recent Advances and Outlook for the Cement Industry; *Teklit Gebregiorgis Ambaye*	
Thermal Behaviour and Reactivity of Selected Clays from Kongo Central (DRC) for Low-Emission Cement Applications; *Kapinga Kabulwe Sharon Rose*	Reducing Emissions and Costs: Life Cycle Analysis of Low-Carbon Cement for the Pacific, the Case of Fiji; *Akash Mishra*	
Closing, 17:15 – 17:45		