



EPFL

Limestone
Calcined
Clay
Cement **LC³**

ICCCSC 2026

5th International Conference on Calcined Clay for Sustainable Concrete

04 – 06 February 2026 | Cape Town, South Africa



Conference venue:

- GSB Conference Centre, Portwood 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 ICCSC 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; <i>Mark Alexander</i>		
From Data to Decarbonization: The Economics and Carbon Value of LC3; <i>Sofía Sánchez Berriel</i>		
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
<i>Chair: Sofía Sánchez Berriel</i>	<i>Chair: Mark Alexander</i>	<i>Chair: Nicolas Rousell</i>
Innovative Technology for Effective CO ₂ Reduction in Cement Production C/Clay – Dynamis/Loesche Calcined Clay; <i>Tiago Guelfi de Freitas</i>	Concrete With Calcined Clay: Results From Holcim and Hyundai E&C Research Collaboration; <i>Rémi Barbarulo</i>	Bio-based Admixtures for LC ³ Rheology Modification; <i>Renata Lorenzoni</i>
Pilot-Scale Calcination of Kaolinitic Clay in a Multiple Hearth Furnace: A Pathway to Viable LC3 Production; <i>José Fernando Martirena Hernández</i>	Performance of Low-Clinker Binders: from Binder Properties to Concrete Performance; <i>Reza Homayoonmehr</i>	Optimizing Superplasticizer Selection for LC3 Mixes: Correlating Fluidity and Compressive Strength of Pastes; <i>Ominde Nanayakkara</i>
Scaling up Production of Sustainable Concrete using Calcined London Clay from the HS2 Excavation Operations; <i>Yuvaraj Dhandapani</i>	Potential use of Low-grade Limestone in Limestone Calcined Clay Cement (LC ³); <i>Menard B. Kilumile</i>	Measuring the Shear Thickening of Blended Cements; <i>Clémentine Delattaignant</i>
Potential of LC3 Cement for Sustainable Construction and Accelerating Infrastructure Development in Nigeria: An Overview; <i>K. A. Olonade</i>	Combining LC ³ with Activators and Particle Packing Optimization for CEM III/A Replacement -Part A: Binder Optimisation; <i>Juan Manuel Etcheverry</i>	Low-carbon LC3 concrete design: Cutting Carbon Without Compromising Strength or Durability; <i>Beatrice Malchiodi</i>
Advancing LC ³ from Research to Practice: A Commercial Pilot Case Study from India; <i>Lav Singh</i>	Combining LC ³ with Activators and Particle Packing Optimization for CEM III/A Replacement – Part B: Durability; <i>Laurena De Brabandere</i>	CO ₂ Utilization in LC ³ -based Concrete for Additive Manufacturing: Influence on Rheological Properties; <i>Silvia Reibig</i>
Calcined Clays a Sustainable Alternative to Decarbonise the Cement Industry: A Case Study of Ghana’s LC3 Project; <i>Peter Dickson</i>	Suitability of Mine-rejected Low-grade Limestone in LC3 Systems; <i>Amitkumar Chauhan</i>	Fresh-State Rheology of LC ³ Incorporating Calcined Clays and Ceramic Wastes; <i>Lucia Ferrari</i>
Economic assessment of LC3 adoption – A Business Case; <i>Neha Gupta</i>	Influence of Clinker Reduction and Calcined Clay Grade on the Strength and Carbonation Performance of LC3 Concretes; <i>Suhail Ahmad Baba</i>	Understanding Superplasticizer–Mineral Interactions: From Single Phases to Complex Blended Binders; <i>Franco Zunino</i>
	Mechanical and Durability Properties of Calcined Clay Based Geopolymer Mortars; <i>Melanie Langlois</i>	Fresh Properties and Sustainability Assessment of Low-Carbon LC 3 Based Rubberized Self-Compacting Concrete; <i>Mohamed Abdulqadir Mohamed</i>
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
<i>Chair: Shashank Bishnoi</i>	<i>Chair: Mark Alexander</i>	<i>Chair: Ichebau Amadi</i>
Mineralogical and Thermophysical Characterization of Kaolinitic Clays from Kisonga in Kongo-Central (DRC); <i>Seke Vangu Max</i>	Enhancing the Sustainability of Limestone Calcined Clay Cement Concrete: A Unique Mix Design Approach; <i>Ashirbad Satapathy</i>	Development of Shrinkage and Creep Prediction Models for Low Carbon Cement Concrete via SCDT; <i>Wen-Cheng Liao</i>
Mineralogical Characterization and Reactivity of Selected Clays from Kongo Central (DRC) for BLC3 Low-Carbon Cement Formulations; <i>Kapinga Kabulwe Sharon Rose</i>	Explainable Machine Learning for Prediction and Monitoring of LC3 Compressive Strength in Production; <i>Thorsten Kalb</i>	Early-age Creep Reduction and Shrinkage Increase from Pozzolanic Reaction in LC3 Paste, Determined in Hourly Three-minute Creep Tests; <i>Bernhard Pichler</i>
Activation of Natural Bentonite using Different Calcination Methods; <i>Paula Aguilar Guimarães</i>	Machine Learning-Assisted Optimization of LC ³ Systems; <i>Daniel Benkeser</i>	Creep in LC ³ pastes: A micromechanical modelling approach; <i>Amit Kumar</i>
Assessment of the Pozzolanic Potential of a weathered mafic rock from an iron mine for Use as a Supplementary Cementitious Material; <i>Bruna Luiza Brito</i>	Optimising Blending Ratios in Calcined Clay Cements; <i>Nina Cardinal</i>	Effect of Superplasticiser on Mechanical Performance of Limestone Calcined Clay Cement Concrete; <i>Idris Mayowa Abdrafii</i>
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; <i>Seke Vangu Max</i>	Toolbox for Calcined Clays: Optimizing Clay Selection and Activation with Orthogonal Quantitative Analyses; <i>Matteo Pernechele</i>	Correlation of Elastic Modulus and Compressive Strength in LC3 Systems; <i>Aastha Singh</i>
Effect of limestone fineness on the hydration mechanism and Reactivity of LC3 blends; <i>Anwesa Satapathy</i>	Early-age Strength Evolution of Limestone and Calcined Clay-blended Cement Pastes: Experiments and Multiscale Modelling; <i>Sophie J. Schmid</i>	
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	
<i>Chair: Franco Zunino</i>	<i>Chair: Alice Bakera</i>	
A Novel 5-min UR 2 Test for QC/QA of Commercial Calcined Clays; <i>Nishant Garg</i>	Durability of Calcined Clay Concrete under Carbonation and Freeze-Thaw exposure; <i>Yuvaraj Dhandapani</i>	
Effects of Kaolinite Structural Order and Iron Oxide Particle Size on the Reaction Kinetics of Calcined Clays; <i>A. T. M Marsh</i>	How Does Thermal Decomposition of Concrete Affect Blended Cement?; <i>Suyash Bhandaree</i>	
Rapid Assessment of Calcined Clay Reactivity for Strength Prediction in LC3 Systems; <i>Sandra Mujombi</i>	Evaluating LC3 Cements in Nuclear Settings: A Sustainable Approach to Long-Term Stability; <i>Daniel A. Geddes</i>	
Application of Ultra-Rapid Reactivity (UR2) Test for Online Characterization of Calcined Clay Reactivity; <i>Sandra Mujombi</i>	Multiscale Modelling of Gas Permeability in calcined-clay-based ternary cementitious blends; <i>Berjees Qadr</i>	
Evaluation of Kinetic Modeling Methods for Kaolinitic Clay Dehydroxylation; <i>Qun Wang</i>	Effect of Gas Type and Electrolyte Solution on Durability Test Methods for LC3 concrete; <i>Vikash Kumar Singh</i>	
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: <i>Shashank Bishnoi</i>]		
Early Age Reactivity of Calcined Clays – Impact on LC3 Hydration; <i>Thomas Matschei</i>		
Shedding Light on Early-Age Hydration of Metakaolin-containing Cements Using Novel Solid-State NMR Experiments; <i>Franco Zunino</i>		
An Optimization Tool for LC3 Cements that Balances Chemical Reactivity with the Requirements for Mixing Water and Admixture; <i>Vanderley John</i>		
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
<i>Chair: J. Fernando Martirena Hernández</i>	<i>Chair: Ruvimbo Munemo</i>	<i>Chair: Alice Bakera</i>
Activation Strategies for Coal Gangue in LC ³ Systems: from processing to Performance and Sustainability; <i>Lei Xu</i>	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; <i>Xiaodi Dai</i>	Mechanical Performance of Limestone–Calcined Clay Based Roller-Compacted Concrete Pavement Incorporating Recycled Concrete Aggregate; <i>D Sitarami Reddy</i>
Thermal Activation and Reactivity Assessment of New Zealand Natural Pozzolans for Low Carbon Concrete Applications; <i>Oliver Cadrain</i>	Improving the Properties of LC3 by Addition of BCSA (Belitic Calcium Sulfoaluminate) Mineral Admixture; <i>Eric Bescher</i>	Investigation of Sustainable Concrete Blocks for Affordable Housing in Tanzania; <i>Kelvin C Luoga</i>
A Comparative Study on the Early Hydration and Workability of Cements Blended with Thermally and Mechanochemically Activated Phyllosilicates; <i>Lea Ruckes</i>	The Role of Sulphate During the Hydration of Ternary Cements with Calcined Clay and Limestone; <i>Katja Pesch</i>	Synergetic Effect of Soil Chemical Composition on Performance of Limestone Calcined Clay Cement in Soil Stabilization in Kenya; <i>Joseph Mwiti Marangu</i>
Thermally and Mechano-chemically Activated Opalinus Clay as Cement Replacement; <i>Adrian-Alexandru Pirvan</i>	Effect of Clay Type on the Hydration and Microstructure of Limestone Calcined Clay Cement; <i>Mehnaz Dhar</i>	The Viability of Waste Clays as Low-carbon Binders in Sustainable Earthen Construction; <i>India Harding</i>
Mechanical Activation of High Kaolinite Clays - Evaluation of Energy Requirements and Effects on Intrinsic and Applicative Properties of the Clays; <i>Barbara Benevenuti</i>	Impact of Early Hydration Products on the Packing Properties of Metakaolins; <i>L. Caneda-Martínez</i>	Impact of High Levels of Cement Replacement by Limestone Calcined Clay Cements (LC3) on Rheology and Mechanical Properties in ECCs; <i>Urs Buegger</i>
Thermo-Mechanochemical Activation of Low-Kaolinite Clays and Their Performance in Binary and Ternary Binders with Limestone of Varying Fineness; <i>Amrita Hazarika</i>	Early-Age Performance of LC ³ Concrete: The Impact of Clinker Content and Water-to-Binder Ratios; <i>Isteeada Ikbal</i>	Carbonation Curing of LC3 -50 Foamed Binders: Role of Curing Sequence; <i>Anna Jose</i>
Production of Activated Clay – the Experience of the Vicat Group; <i>François Avet</i>	Early and Long-term Performance of LC ³ Cement with C-S-H Seeding; <i>Xuerun Li</i>	Compressive Strength and Pore Structure Development in Sustainable Foam Concrete Modified with Metakaolin for Non-Structural Purposes; <i>Alassane Compaore</i>
	Reevaluating LC3 - based Mix Design Beyond ASTM C311: A Nomogram Approach to Determine Effective Water-to-binder Ratio; <i>Ankita Pareek</i>	Roman Concrete 2 (RoC2) Blocks - Diagnosing the Sustainability Improvement Potential in Sub-Saharan Africa; <i>Raine Isaksson</i>
Lunch break (12:30 - 13:30)		



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Session 7 (13:30 - 15:30)		
Industry Presentations [Chair: Hans Beushausen]		
Do's and Dont's of Testing SCM Reactivity in an Isothermal Calorimeter; <i>Marc Zacharias, Calmetrix</i>		
Scaling Up LC3: CBMI Project Delivery Experience and Lab-to-Pilot Capabilities; <i>Xuwei Jiao, Sinoma CBMI Construction</i>		
Panel Discussion: Advancing LC3: From Research Gaps to Industrial Implementation		
Panel Members: <i>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)</i>		
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
<i>Chair: Vanderley John</i>	<i>Chair: Ichebadu Amadi</i>	<i>Chair: Thomas Matschei</i>
Utilization of Low-Grade Clays from Clinker Production in Limestone Calcined Clay Cement; <i>Ömer Faruk Kalkan</i>	Design of Low-carbon Cement Containing Calcined Clay Granite, Dolomitic Limestone, or Slag in the Context of Burkina Faso; <i>Philbert Nshimiyimana</i>	Influence of Rhyolite Pozzolana Content and Activation Methods on Compressive Strength of Cement; <i>Muhammad Danyal Sheikh</i>
Particle Modeling of the Influence of Process Conditions on Clay Flash Calcination; <i>Nicolás Carro</i>	Engineered UK Clays for Production of Low-carbon Cements; <i>Clive Mitchell</i>	Sustainable Cement Hydration: Impact of Glass and Resin from Wind Turbine Blade Waste; <i>Tao Liu</i>
Structure and Pozzolanic Reactivity of Kaolinite and Bentonite Co-calcined with Limestone or Na ₂ SO ₄ from ²⁷ Al and ²⁹ Si NMR Studies, <i>Jørgen Skibsted</i>	Accelerating Low-Carbon Concrete Adoption in Africa: Implementation Pathways and Decarbonisation Strategies for Calcined Clay Technologies; <i>R. Munemo</i>	Decarbonizing Concrete with Biochar: Insights from Life cycle Sustainability Assessment; <i>Teklit Gebregiorgis Ambaye</i>
Impact of Colour Control on the Reactivity of Calcined Clays; <i>Fabien Georget</i>	Advancing Sustainable Concrete Solutions Calcined Clay at Bouygues Construction; <i>Khalil Haidar</i>	Upscaling the Utilization of Eco-blend Cement for Low-carbon Construction Projects in Global South; <i>Ademilade Olubambi</i>
Variation in Particle Size Distribution in Thermally Modified Kaolinitic Clays in Rotary Kilns; <i>José Fernando Martirena Hernández</i>	Unlocking the Potential of Calcined Clays in Africa: Field Experience from Ghana and the Role of Cement Additives; <i>Alejandro Velez</i>	Soil Solutions: Bioactive Clay–Mycelium Liners for Sustainable Infrastructure; <i>Astrid Kirsten</i>
	First LC3 Cement and Concrete Productions Using Low Kaolinite Grade Clays from the Xelow-gradeuilley Plant, France; <i>Laury Barnes-Davin</i>	Hybrid Activation of Coal Rejects and Legacy Ash for Liner Construction at a South African Power Station; <i>Cyril Attwell</i>
	Dilemma between North & South - Player for the Same Purpose of Decarbonization; <i>Hakan Gurdal</i>	CO ₂ Capture through Mineral Carbonation: a Comparative Study of Dry, Semi-Dry, and Wet Approaches for Cement-Based Materials; <i>Arailym Umirova</i>

**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; <i>Cheng Yu</i>		
Unlocking Sustainable Construction with Low-Carbon Cement in Sub-Saharan Africa; <i>Joseph Mwit Marangu</i>		
The influence of carbonation on the microstructure of LC3 concrete; <i>Shashank Bishnoi</i>		
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
<i>Chair: Karen Scrivener</i>	<i>Chair: Sylvia Kessler</i>	<i>Chair: Beatrice Malchiodi</i>
Strength and Flow Behaviour of LC ³ Cement with Hydration Control Additive; <i>Xuerun Li</i>	Impact of Admixture on Carbonation in Limestone Calcined Clay Cements; <i>Sebastien Dhers</i>	Carbon Footprint Analysis of Mining Waste Calcined Clay and LC3 Production in Brazil; <i>Luiza Helena Julich</i>
Incorporation of Carbonated Cement Paste in Portland Cement – Calcined Clay Ternary Blends Studied by ²⁷ Al and ²⁹ Si MAS NMR; <i>Jørgen Skibsted</i>	Towards a Testing Framework to Characterize Chloride Resistance of Concrete Based on Cement Paste-Scale Tests; <i>Dhanush Sahasra Bejjarapu</i>	Ecological-economic Evaluation Scheme for Calcined Clays from Mineral Secondary Raw Materials; <i>Simone E. Schulze</i>
A Hierarchical Hydration Pathway in Limestone Blended Cements: The Role of Alumina Source and Reactivity; <i>Ruo Chen Jiang</i>	Overcoming Challenges in the Implementation of Low-Carbon Concrete; <i>Ilyana Ahmed-Khedda</i>	Utilization of Construction Demolition Waste of Morocco for Use in LC3 Binders; <i>Abla Grace Leaticia Kouassi</i>
Influence of Calcined Clays on the Pore Solution of Hydrated Cement Pastes: An Experimental and Thermodynamic Modelling Investigation; <i>Katarina K. Schlage</i>	Comparative Analysis of Corrosion Cracking and Mechanical Performance in LC3 and OPC Mortars; <i>Talles Felix</i>	Chemical and Physical Pathways for Brine Utilisation in Hybrid Cement Systems: Encapsulation, Chelation, and Backfill Applications; <i>Cyril Attwell</i>
Quantification of the Microstructure of Calcined Clay-Limestone Blends by using Saturated Salt Solutions and Archimedes Principle; <i>Wolfgang Kunther</i>	Durability Design of Reinforced Concrete with Limestone Calcined Clay Experiencing Carbonation; <i>Umesh Hule</i>	Sustainable Local Production of Standardized Sand for Hydraulic Cement Testing in Developing Countries; <i>José Fernando Martirena Hernández</i>
Minimum Clinker Threshold of Low Clinker Limestone Calcined Clay Blended Cements; <i>Timur Mukhametkaliyev</i>	Durability of LC3 Systems under Harsh Conditions: A Sulphate Exposure Study; <i>Nikita Majhi</i>	From Inert to Essential: Catalytic Transformation of Clay Waste; <i>Astrid Kirsten</i>
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; <i>Murielle Goubard, Malvern Panalytical</i>		
Pioneering LC3 technology deployment in Africa; <i>Mpume Mlalazi, Saint-Gobain</i>		
<i>Kaolin Group</i>		
Linking Clay constitution to Binder Performance - Findings from Innovandi Core Projects [Chair: Thomas Matschei]		
Overview: Innovandi Calcined Clay Core Project; <i>Thomas Matschei</i>		
Modelling Early-age Hydration: Wrong but Easy Assumptions for Industrial Applications; <i>Fabien Georget</i>		
Quality Control of Calcined Clays at an Industrial Scale using the Methylene Blue Test; <i>Mehnaz Dhar</i>		
Impact of Colour Control on the Reactivity of Calcined Clays, <i>Fernando Martirena</i>		
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	
<i>Chair: Franco Zunino</i>	<i>Chair: Sofía Sánchez Berriel</i>	
Activation, Reactivity and Dissolution of 2:1 Clay Minerals; <i>Haoming Wu</i>	Less Clinker - More Questions: Durability Assessment through long-Term Experience; <i>Fabrizio Moro</i>	
Calcined Clays from Kongo Central: a Low Carbon Alternative for the Cement Industry; <i>Maya-Vangua Marc klesh</i>	Ecoefficiency of Calcined Clay Blended Cements; <i>Yuri Mariano Carvalho</i>	
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; <i>Seke Vangu Max</i>	LCA Strategies to Evaluate CE in Construction: Recent Advances and Outlook for the Cement Industry; <i>Teklit Gebregiorgis Ambaye</i>	
Thermal Behaviour and Reactivity of Selected Clays from Kongo Central (DRC) for Low-Emission Cement Applications; <i>Kapinga Kabulwe Sharon Rose</i>	Reducing Emissions and Costs: Life Cycle Analysis of Low-Carbon Cement for the Pacific, the Case of Fiji; <i>Akash Mishra</i>	
Closing, 17:15 – 17:45		