



Indian Institute of Technology Madras Technologies for Low-Carbon and Lean Construction

NEWSLETTER

December 2023



TLC2 Workshop 2023 at IIT Madras



Prof. Raul Zerbino



Dr. Ravindra Gettu and Dr. Nikhil Bugalia in UK



TLC2 Team in ICCC 2023 in Bangkok



Prof. Ravindra Gettu with Profs. Banthia and Salman Dashtaki, RILEM week 2023



Prof. Piyush Chaunsali with Prof. Sulapha Peethamparan



Students with Professors on TLC2 Day 2023



ISARC 2023 Organizing Team at IIT Madras Research Park



TLC2 Team in RILEM Week 2023 in Canada

HIGHLIGHTS 2023

Wishing all our readers a happy, healthy and productive new year. We are happy to share highlights of our progress in 2023, including our publications, the accomplishments of our students and faculty, the partnerships we are nurturing with our international collaborators and events/conferences organized in 2023.

JOURNAL PUBLICATIONS ON TLC2 THEMES IN 2023

Criticality of binder aggregate interaction for buildability of 3D printed concrete containing limestone calcined clay, S Bhattacharjee, Smrati Jain and M Santhanam, Cement and Concrete Composites, 136

<https://doi.org/10.1016/j.cemconcomp.2022.104853>

Developing 3D printable and buildable limestone calcined clay-based cement composites with higher aggregate content, S Bhattacharjee, S Jain, M Santhanam, Construction and Building Materials 376, 131058

<https://doi.org/10.1016/j.conbuildmat.2023.131058>

Experimental evaluation of the durability of glass Textile-Reinforced Concrete, S Paul, R Gettu, DN Arnepalli, R Samanthula, Construction and Building Materials 406, 133390

[doi:10.1016/j.conbuildmat.2023.133390](https://doi.org/10.1016/j.conbuildmat.2023.133390)

Limestone-Calcined Clay (LC2) as a supplementary cementitious material for concrete

AS Basavaraj, H Muni, Y Dhandapani, R Gettu, M Santhanam

RILEM Technical Letters 8, 12-22

<https://doi.org/10.21809/rilemtechlett.2023.172>

Calcium Sulfoaluminate Cement Manufacturing in India- Prospects and Prognosis of Environmental Impacts. A Sharma, AS Basavaraj, P Chaunsali, R Gettu, ACI Materials Journal 120

Effect of gypsum addition on acid resistance of ye'elimite rich calcium sulfoaluminate cement, Damion, T. and Chaunsali, P., 2024. Cement and Concrete Composites, 145, p.105335

<https://doi.org/10.1016/j.cemconcomp.2023.105335>

Biogenic acid resistance of calcium sulfoaluminate cement: Revelations from a field study, T Damion, P Chaunsali, Cement and Concrete Composites 145, 105324

<https://doi.org/10.1016/j.cemconcomp.2023.105324>

Assessing the effect of different compaction mechanisms on the internal structure of roller compacted concrete, Selvam, M., Kalyan, N. S. S. P., Kandasami, R. K., & Singh, S. (2023), Construction and Building Materials, 365, 130072. DOI:

<https://doi.org/10.1016/j.conbuildmat.2022.130072>

Optimization of Slurry Impregnation Technique for Upcycling Carbonated Recycled Concrete Aggregates for Paving Concrete Applications, Kosuri, M., Singh, S., & Bhardwaj, B. B. (2023), Journal of Materials in Civil Engineering, 35(5), 04023053. DOI:

[https://doi.org/10.1061/\(ASCE\)MT.1943-5533.0004712](https://doi.org/10.1061/(ASCE)MT.1943-5533.0004712)

Comparative investigation of laboratory and field compaction techniques for designing roller compacted concrete pavements (RCCP), Selvam, M., & Singh, S. (2023), International Journal of Pavement Engineering, 24(1), 2177850. DOI:

<https://doi.org/10.1080/10298436.2023.2177850>

Enhancing the Performance of Roller-Compacted Concrete Pavement by Synergetic Improvement of Packing Density, Lubrication, and Moisture State of Recycled Concrete Aggregate, Selvam, M., Singh, S., & Anjana, A. G. (2023), Transportation Research Record, 03611981221149427.

<https://doi.org/10.1177/03611981221149427>

Experimental investigation on thermal performance of an actively cooled light shelf, Archana P. Ambadi, Benny Raphael, Solar Energy, Vol 263 2023.

<https://doi.org/10.1016/j.solener.2023.111932>

Comparative Analysis of Jointed Plain Concrete Pavement and Roller-Compacted Concrete Pavement, Selvam, M., Kumar, M. N., & Singh, S. (2023).

Transportation Research Record, 03611981231188722. DOI:

<https://doi.org/10.1177/03611981231188722>

Special Issue on a vision for corrosion-resistant and resilient reinforced concrete systems: An introduction, D Trejo, R Pillai

Sustainable and Resilient Infrastructure 8 (2), 143-144

<https://doi.org/10.1080/23789689.2023.2192557>

High-performance cementitious grouts for post-tensioned concrete systems-Performance specifications and prototype testing, MK Mohan, S Manohar, RG Pillai, M Santhanam, R Gettu

Construction and Building Materials 368, 130345

<https://doi.org/10.1016/j.conbuildmat.2023.130345>

Automatic classification of construction safety reports using semi-supervised YAKE-Guided LDA approach, Hrishikesh Gadekar, Nikhil Bugalia (2023), *Advanced Engineering Informatics, Volume 56*,

<https://doi.org/10.1016/j.aei.2023.101929>.

Relevance of deep sequence models for recognizing automated construction activities: a case study on a low-rise construction system, Harichandran, A., Raphael, B., & Mukherjee, A. (2023), Journal of Information Technology in Construction, Vol. 28, pg. 458-481

[DOI: 10.36680/j.itcon.2023.023](https://doi.org/10.36680/j.itcon.2023.023)

A review of concrete 3D printed structural members, Benny Raphael, Shanmugaraj Senthilnathan, Abhishek Patel and Saqib Bhat January 2023, Frontiers in Built Environment.

<https://doi.org/10.3389/fbuil.2022.1034020>

Evaluation of the failure planes in concrete containing reclaimed asphalt pavement (RAP) aggregates, Bhardwaj, B. B., & Singh, S. (2024). Cement and Concrete Composites, 145, 105334.

<https://doi.org/10.1016/j.cemconcomp.2023.105334>



AWARDS & RECOGNITIONS



Team KAIZEN comprising of five M.Tech students from BTCM department – **Devansh Shah, Dhairya Chavda, Bhairavi Sankhe, Krunal Kshatriya, and Kumar Adarsh** has bagged 1st position in the Hackathon event organized by Indian Lean Construction Excellence-2023. Marking ILCE's inaugural Hackathon, the event aimed to ignite creativity and problem-solving skills among participants, leveraging data-driven technologies to devise innovative solutions for challenges in the built environment and contributing positively to society. **Team KAIZEN** conveyed their heartfelt thanks to **Dr. Koshy Varghese** for his continuous guidance and to the entire BTCM Department for their steadfast support.



PhD student Sreelakshmi Srinivasan received the best paper award for her presentation on "Service Life of Prestressed Steel in Slag-Based Cementitious System" on theme Durability aspects of structures in International Conference on Condition Assessment, Rehabilitation & Retrofitting of Structures (CARRS 2023) organized by Indian Institute of Technology Hyderabad. Sreelakshmi is receiving award from **Prof. K.V.L. Subramaniam** during the conference.

Prof. Sivakumar

Palaniappan received the Sustainability Champion Award from the School of Sustainability of IIT Madras on October 26, 2023 for his contributions in the field of Sustainable Construction. He represented IIT Madras at the IGBC Performance Challenge 2023 event during November 23-25, 2023 and received the Excellence Award under the category Educational Campus.



Prof. Ravindra Gettu, the Immediate Past President and Fellow of RILEM, received the lifetime achievement award for his outstanding contribution in various areas of concrete research such as fracture mechanics of concrete and rock, nonlinear behaviour of cement-based materials, high strength, fibre reinforced and self-compacting concretes, sustainability and the effective use of chemical admixtures in the 77th RILEM Week (2023) in Vancouver, Canada.

Dr. Selvam M. received best PhD thesis award in the field of Concrete by the Indian Concrete Institute (ICI) for the year 2023.

Someen Khute received ICI-UltraTech Outstanding Master Thesis Award 2023 in the field of Concrete Technology.

EVENTS, CONFERENCE & WORKSHOP

The 2nd International Workshop on Technologies for Low-Carbon and Lean Construction (TLC2) Week was organized from January 30 to February 3, 2023, at IIT Madras. The TLC2 Week witnessed the enthusiastic participation of more than 400 participants from Industry, Academia, Government and the student community. The event aimed to disseminate the recent findings and identify new challenges in the areas of TLC2 through collaborations with relevant national and international stakeholders. Workshops on Corrosion in Concrete Structures, Durability and sustainability of concrete structures and Textile reinforced concrete were organized as part of the TLC2 workshop.



Day 1: Workshop on Corrosion and its control in concrete structures (C3S)

Day 2: Young Researchers Symposium (YRS) on TLC2
10 Young PhD scholars presented their research work related to TLC2 themes

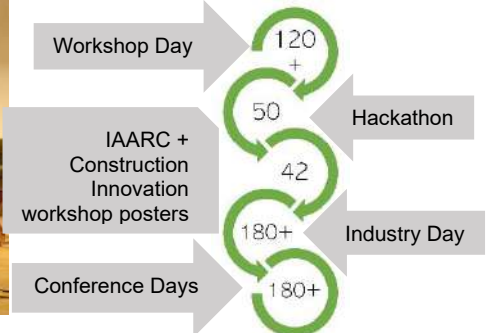
Day 3 & 4: TLC2 Workshop
Six sessions on Advanced Construction Materials, Sustainability and carbon footprint, Recycling & processing of waste for concrete, Construction automation, Construction policies

Day 5: SPARC workshop on Durability and sustainability of concrete structures & Workshop on Textile reinforced concrete

IIT Madras in association with IAARC and CoE on TLC2 hosted **40th International Symposium on Automation and Robotics in Construction (ISARC 2023)** from July 3rd to 7th, 2023



Demographics of Attendees



ISARC 2023 focuses on the theme of sustainability through automation, emphasizing the greening of the construction industry through technology option. During the 3-day ISARC conference, 130 research papers were presented from over 30 countries covering a wide range of themes.

INTERNATIONAL COLLABORATION



Prof. Sulapha Peethamparan is an accomplished researcher and renowned professor in the Department of Civil and Environmental Engineering, Clarkson University, USA. She came back to her alma mater IIT Madras under the Nehru-Fulbright fellowship and joins TLC2 project as a collaborator. Prof. Sulapha Peethamparan was visiting faculty at CoE on TLC2 during July 2023 - Jan 2024



Prof. Raul Zerbino, Professor in the Department of Civil Engineering, La Plata National University, Argentina and our esteemed collaborator in TLC2 project, very famous among PhD students and professors for his energetic, friendly and supportive nature. He was visiting faculty at CoE on TLC2 during 2022-2023.

Dr. Ravindra Gettu and Dr. Nikhil Bugalia

visited research groups in UK. They delivered talks introducing the ongoing research work at TLC2 in Imperial College of London, University College London, Brunel University, and Cambridge University, between 7 - 13 November, 2023.

Dr. Nikhil Bugalia, was selected as the Key Technology Partnership Fellow with University of Technology Sydney and was hosted by Professor Quang Ha for 2 weeks exploring the research opportunities in TLC2 and allied areas.



Dr. Keerthana Kirupakaran was a visiting assistant professor in the University of Brescia, Italy, hosted by Prof. Giovanni Plizzari to work on the research topic "Fracture behaviour of tunnel segments under thrust jack forces". She also visited RWTH, Aachen University and ETH Zurich, met research scholars and professors working in TLC2 areas.

WEBINAR

The IRIS 2.0 webinar series on CoE on TLC2 was conducted on 31st October by IIT Madras to highlight the ongoing research by the Centre of Excellence on Technologies on Low-Carbon and Lean Construction (TLC2).

Prof. Miroslaw Skibniewski, Professor of Construction Engineering and Project Management in the Department of Civil and Environmental Engineering at the University of Maryland, moderated the webinar. The webinar was conducted by Prof. Nikhil Bugalia. Prof. Radhakrishna Pillai, Prof. Koshy Varghese and Prof. Manu Santhanam presented the updates and opportunities on sustainability and circular economy in the built environment on behalf of the centre. The full webinar is available in YouTube: [Click here](#) to watch.



UPCOMING EVENT

The 3rd TLC2 Workshop on Technologies for Low-Carbon and Lean Construction will take place at IIT Madras from 28th to 31st January, 2024. TLC2 workshop is an annual event aimed at disseminating the recent findings and identifying the new challenges in the areas of TLC2 through collaborations with relevant national and international stakeholders working on TLC2 areas.

3rd International Workshop on Technologies for Low-carbon and Lean Construction (TLC2)

Registration Fee (excluding 18% GST)

Category	Young Researchers' Symposium Sunday, January 28 th	2-Day TLC2 workshop Monday & Tuesday, January 29 th – 30 th	1-Day Workshop on Realizing Sustainability – Role of Contract and Law in Indian Construction Wednesday, January 31 st
Industry - Practicing engineers	Rs. 2000	Rs. 8000	Rs. 4000
Academia – Faculty, Scientists, Part-time research scholars	Rs. 1000	Rs. 4000	Rs. 2000
Academia – Students, Full-time research scholars	Rs. 1000	Rs. 2000	Rs. 1000

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Register soon