



TLC2 NEWSLETTER

FEBRUARY 2023



TECHNOLOGIES FOR LOW-CARBON & LEAN CONSTRUCTION (TLC2) WEEK

JANUARY 30 – FEBRUARY 3, 2023

The TLC2 Week is an annual event and a premium forum which serves as a platform for an efficient Academia – Government – Industry nexus. The event brings together various stakeholders in the areas of construction materials, construction management and its interdisciplinary areas onto the same platform to build networks, share recent research findings, brainstorm on new ideas, forge collaborations etc. which is crucial to accelerate the implementation of various technologies related to construction materials and processes in modern construction and improve the 'circular economy and sustainability' of the construction industry.

THE TLC2 WEEK EVENT:

IIT Madras has established a center of excellence titled Technologies for Low Carbon and Lean Construction (TLC2). As part of the TLC2 center's activities, the 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 the new challenges in the areas of TLC2 through collaborations with relevant national and international stakeholders working on the areas mentioned above. The week-long program had the following events:

- Day 1 - Workshop on Corrosion and its control in concrete structures (C3S)
- Day 2 - Young Researchers Symposium (YRS) on TLC2
- Day 3 & 4 - TLC2 workshop (2 days)
- Day 5 - SPARC workshop on Durability and sustainability of concrete structures (morning session); & Workshop on Textile reinforced concrete (afternoon session)

JANUARY 30 | C3S WORKSHOP

India continues to witness a significant boom in the country's concrete infrastructure, particularly concrete bridges, ports, and buildings. Most of these concrete structures are designed for a service life of 100+ years. However, many of these structures are experiencing premature corrosion and cannot meet the design life requirements due to chloride attack and carbonation. Moreover, most repairs excessively focus on structural aspects and neglect durability or electrochemical aspects. This lack of focus on Durability and electrochemical aspects leads to short-lived repairs and frequent re-repairs, which in turn leads to a huge economic burden wherein most countries spend about ~2 % or more of GDP in addressing the corrosion issues in concrete infrastructure. To mitigate these issues, we must take adequate measures to avoid expensive repair works on the large number of concrete structures being built now. The C3S Workshop provided insights to engineers on how to design for durability or service life and combat steel corrosion in concrete structures with a blend of theoretical and practical aspects and some case studies. The speakers were a mix of eminent researchers from leading universities across the globe and experts from leading industries.



Eminent international speakers during on 30th Jan during the C3S Workshop

JANUARY 31 | YOUNG RESEARCHERS' SYMPOSIUM & PROF SURENDRA P SHAH AWARD



The Young Researchers' Symposium (YRS) on TLC2, co-sponsored by RILEM, was a premium forum for promoting and supporting young researchers. After rigorous scrutiny, 10 Young researchers, mainly senior Ph.D. scholars in their advanced stages of research, were invited to present their work on areas related to TLC2. Professor Surendra P Shah delivered the virtual presentation inspiring the audience on how to be a successful researcher. **Dr. Payam Sadrolodabae** was adjudged as the best young researcher for his research and recommended by the Jury for the **Prof Surendra P Shah Award**. The YRS also featured several poster presentations. Working in collaboration with IIT Madras, **Ms. Avni Vishnoi from Malba Projects** received the best poster award.

Commented [NB1]: Rohit's Award



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FEBRUARY 1 & 2 | WORKSHOP ON TECHNOLOGIES FOR LOW-CARBON & LEAN CONSTRUCTION

Recognizing the need to enhance the 'circular economy and sustainability' of the concrete construction industry worldwide and joining the global effort, the 2-day TLC2 Workshop co-sponsored by RILEM was organized focusing on thematic sessions in the following areas: (1) Advanced Construction Materials, (2) Sustainability and carbon footprint, (3) Recycling & processing of waste for concrete, (4) Construction automation, (5) Construction policies.



The workshop was inaugurated by Prof V Kamakoti, Director, IITM, who briefly spoke on the research initiatives under the Institute of Eminence (IoE) scheme and the recently announced Centers of Excellence from these initiatives. The workshop brought together students, faculty members, researchers, practitioners, and experts in the two broad areas of construction materials and construction management. The participants extensively discussed improving how buildings are designed, built, and operated. The primary focus of carbon-neutral constructions is reducing the use of cement in constructions, thereby addressing up to 8% carbon footprint of concrete infrastructure (although the carbon footprint of infrastructure is 40% of total emissions). The 'green design' movement addresses global environmental issues by driving design towards sustainability. Participants also deliberated on construction frameworks such as Lean Project Delivery (LPD), and pre-cast construction methods that can help improve each of the processes of the building delivery workflow. Overall, the necessity of a Systems Approach through a collective understanding of various aspects was well emphasized in the TLC2 workshop. The systems approach could integrate all the processes and technologies across the whole building industry, thus, providing a holistic solution instead of solving each problem separately.

The TLC2 Workshop had a mix of speakers from across the globe. The workshop had an overwhelming participation of more than 250 participants from 40+ industries (private & public), 20+ IITs/NITs and other CFTIs, Government organizations, and the student community.

25+ industries strongly supported the TLC2 Workshop; both nationally and internationally.

FEBRUARY 3 | SPARC WORKSHOP ON SUSTAINABILITY & DURABILITY OF REINFORCED CONCRETE SYSTEMS & WORKSHOP ON TEXTILE REINFORCED CONCRETE (TRC)



The Scheme for Promotion of Academic and Research Collaboration (SPARC) aims to improve the research ecosystem of India's Higher Educational Institutions by facilitating academic and research collaborations between Indian Institutions and the best institutions in the world from 28 selected nations to solve problems of national and international relevance. The half-day SPARC workshop presented the major insights gained from the following projects:

- 1) Sustainability of Novel Cementitious Binders Derived from Industrial By-Products (P758)
- 2) Towards Durability Specifications with Recycled Aggregate Concrete (P844)
- 3) Enhancing the Durability and Sustainability of Concrete Structures in Emerging Economies (P834)

WORKSHOP ON TEXTILE-REINFORCED CONCRETE

The growing adoption of Textile Reinforced Concrete (TRC) technologies for suitable applications by the construction sector in India is a testimony to this material's multi-faceted advantages. Thin-walled structural elements are upcoming applications of TRC, along with other non-structural use. TRC is a strain-hardening cementitious material with non-corrosive reinforcement, like glass and carbon. Compared to traditional elements with steel reinforcement, thinner sections can be designed with TRC. The possibility of making components with considerably lower amounts of materials and the potential to provide long service life contributes to the sustainability aspect of TRC. The TRC workshop provided insights to the large community of users, designers, researchers, and consumers on the structural behavior, fabrication techniques, characterization and properties, and design and analysis of TRC. Results from major ongoing projects at IIT Madras and other institutions were also presented.



JANUARY 31 | ROUNDTABLE ON CONSTRUCTION & DEMOLITION WASTE – CHALLENGES & OPPORTUNITIES

IIT Madras in collaboration with Habitat for Humanity's Terwilliger Centre for Innovation (TCIS) India conducted a round table conference on Effective Management of Construction & Demolition (C&D) Waste. The aim of the roundtable was to bring under one roof all the relevant stakeholders for an open discussion on identifying barriers in India with respect to the use of recycled aggregates and the ways to overcome these barriers effectively. The key topics of this conference were C&D waste value chain logistics, usage of C&D waste in construction and other sectors, and policy, incentives, and taxation. The round table was well represented from the members across the C&D value chain ranging from academia, Government, policy makers, industry, and start-ups. This roundtable aims to result in a policy note on the construction & demolition waste, which will be shared with the concerned authorities in India.



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ABOUT TLC2

The Technologies for Low-Carbon, Lean Construction (TLC2) research initiative has been established at IIT Madras with the aim of developing initiatives that reduce material and process waste in construction. In a broader context, the TLC2 initiative is focused on technologies for low carbon and lean construction, to reduce the carbon footprint brought in by the construction industry. The TLC2 initiative also actively disseminates the research being carried out on technology for low-carbon and lean construction through international conferences, webinars and workshops, both online and offline. The TLC2 initiative aims to be the primary destination nationally, if not globally, for anyone interested in developing innovative low-carbon, lean construction technologies for minimising waste throughout the construction value chain in the country and beyond.

Contact Us

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