

A week on building industry-academia collaborations on

# Technologies for Low-carbon and Lean Construction

at IC&SR Auditorium, IIT Madras, Chennai, India

January 30 – February 3, 2023 (Monday - Friday)



## About the TLC2 Week

IIT Madras, as part of the Institute of Eminence funds, has started Research Initiatives in the areas of Technologies for Low-carbon and Lean Construction (TLC2). The TLC2 group at IIT Madras focuses on developing and implementing technologies to (1) Valorize the waste materials from construction, demolition, power, steel, and agricultural industries for use in construction, (2) Enhance the durability and sustainability of concrete structures and reduce the carbon footprint of construction industry, (2) Minimize waste of materials, money, and time during the construction processes using lean principles and digital/robotic/3D printing tools, and (3) Develop policies to enable the BEST and NEXT practices in the Indian construction industry. These research initiatives are geared towards minimizing the carbon footprint of the concrete construction industry and enhancing the circular economy of the construction sector. The TLC2 Week 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. For more details on TLC2, visit <https://civil.iitm.ac.in/pcoe/tlc/>.

## Tentative schedule for the 5 days

Day 1  
Jan 30, 2023  
8:30 am – 5 pm

6<sup>th</sup> One-day workshop on Corrosion Control in Concrete Structures (C3S)

Coordinator: Prof. Radhakrishna G Pillai

Day 2  
Jan 31, 2023  
8:30 am – 5 pm

Young Researchers' Symposium (YRS) on TLC2 and Prof. Surendra P. Shah Award

Coordinators: Ms. Bipina T. V and Mr. Kaushik Bhattacharjee (PhD students)

Days 3 & 4  
Feb 1 - 2, 2023  
8:30 am – 5 pm

Two-Day TLC2 workshop

Coordinators: Prof. Radhakrishna G. Pillai and Dr. Nikhil Bugalia

Day 5  
Feb 3, 2023  
8:30 am – 5 pm

SPARC Workshop on Sustainability & Durability of Reinforced Concrete Systems

Coordinators: Dr. Piyush Chaunsali and Prof. Manu Santhanam

Workshop on Textile Reinforced Concrete (TRC)

Coordinators: Dr. Keerthana Kirupakaran and Prof. Ravindra Gettu

## Registration Fee (excluding 18% GST)

Category	C3S workshop Monday, January 30 <sup>th</sup>	Young Researchers' Symposium Tuesday, January 31 <sup>st</sup>	2-day TLC2 workshop Wednesday & Thursday, February 1 <sup>st</sup> & 2 <sup>nd</sup>	Workshop on TRC & SPARC workshop Friday, February 3 <sup>rd</sup>
Industry - Practicing engineers	Rs. 4000	Rs. 2000	Rs. 8000	Rs. 4000
Academia – Faculty, Scientists, Part-time research scholars	Rs. 2000	Rs. 1000	Rs. 4000	Rs. 2000
Academia – Students, Full-time research scholars	Rs. 1000	Rs. 1000	Rs. 2000	Rs. 1000

**Notes:** (a) Foreigners making payment from outside India will be charged the registration fee as applicable (including taxes) in INR.

(b) Upon showing a proof of valid membership, members of AMPP, NACE, or ICI can get a refund of Rs. 500/- at the end of the C3S workshop on January 30, 2023. Please note that this is applicable only for the C3S workshop on 30 January 2023.

## Deadlines

Early-bird registration with 20% discount: **January 9, 2023**

Final registration: **January 23, 2023**

For registration,  
click [here](#)



## General Contact

Mr. Murali Menon

BSB 205, Dept. of Civil Engineering, IIT Madras, Chennai

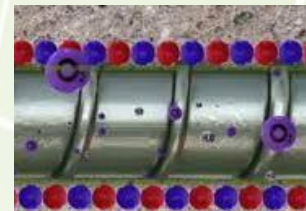
Email: [tlc2atiitm@gmail.com](mailto:tlc2atiitm@gmail.com)



Day 1  
Jan 30, 2023  
8:30 am – 5 pm

# 6<sup>th</sup> One-day workshop on Corrosion Control in Concrete Structures (C3S)

Sponsored by SPARC scheme  
@ ICSR Auditorium, IIT Madras



**About the workshop:** We are witnessing a significant boom in the construction of concrete bridges, ports, buildings, etc. Some of these concrete structures are designed for a service life of 100+ years. However, many are experiencing premature corrosion and are not able to meet the design life requirements due to chloride-attack and carbonation. Moreover, most repairs are excessively focused 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 lead to a huge economic burden. Most countries spend about ~2 % or more of GDP in addressing the corrosion issues in concrete infrastructure. If we do not take adequate measures in this regard, then we will have to face expensive repair works on the large number of concrete structures that are being built now. This workshop is formulated to educate engineers on how to design for durability or service life and combat corrosion of steel in concrete structures with a blend of both theoretical and practical aspects.

### Tentative Programme Schedule

09:00 – 09:30 am	<b>Inaugural session</b> (Refreshments from 8:30 to 8:45 am)	
09:30 – 10:00 am	Corrosion in concrete structures and challenges ahead	Prof Mark Alexander, Univ. of Cape Town, South Africa
10:00 – 10:30 am	Performance specifications for concrete structures	Prof. Manu Santhanam, IIT Madras, Chennai
10:30 – 11:00 am	<b>Tea/coffee Break</b>	
11:00 – 11:30 pm	Assessing conductivity/resistivity of concretes	Prof. Farshad Rajabipour, Pennsylvania State Univ., USA
11:30 – 12:00 pm	Corrosion testing techniques for concrete structures	Prof. Carmen Andrade, CIMNE/UPC, Spain
12:00 – 12:30 pm	Detecting corrosion in post-tensioned concrete systems	Prof. Christopher Alexander, Univ. of South Florida, USA
12:30 – 01:00 pm	Discussion	
01:00 – 02:00 pm	<b>Lunch break</b>	
02:00 – 02:30 pm	Service life design of concrete structures	Prof. David Trejo, Oregon State Univ., USA
02:30 – 03:00 pm	Effect of corrosion inhibitors on service life	Prof. Shwetha Goyal, Thapar Univ., Patiala
03:00 – 03:30 pm	Service life of prestressed concrete structures	Dr. Dyana Joseline, L&T Construction, Chennai
03:30 – 04:00 pm	<b>Tea/coffee Break</b>	
04:00 – 04:30 pm	Cathodic protection of concrete structures	Prof. Radhakrishna G. Pillai, IIT Madras, Chennai
04:30 – 05:00 pm	<b>Discussion &amp; Closure</b>	

### Coordinators:

Prof. M.S. Haji Sheik Mohammed, BSA Crescent Univ., Chennai  
Prof. Radhakrishna G. Pillai, IIT Madras, Chennai

Email: [tlc2atiitm@gmail.com](mailto:tlc2atiitm@gmail.com)

For registration, please click [here](#)



Sponsored by



# Young Researchers' Symposium on TLC<sub>2</sub> - 2023

“YRS on TLC<sub>2</sub>” @ ICSR Auditorium, IIT Madras

## About the Symposium:

This is a premium forum for young researchers to present advances and research results in the construction materials and management sector, especially related to Technologies for Low-Carbon and Lean Construction (TLC<sub>2</sub>). The symposium aims at engaging young researchers to (i) connect and interact with peers and experts working in the same domain, (ii) showcase their research and get exposed to state of the art on different aspects of construction materials and management, both theoretical and applied, and (iii) get guidance from the renowned experts working on low carbon lean construction technologies.

## Eligibility:

Participants should be senior Ph.D. students (in the final year of their thesis work) who have completed their qualifying/comprehensive exam, submitted research proposal, or recent PhD graduates who have defended their thesis in 2022.

## Details of the Event:

- Submit an abstract and a 5-minute video on the PhD thesis work by December 31, 2022.
- Best 10 symposium speakers will be selected based on the short videos and abstracts. The jury may decide to interview some candidates online before shortlisting.
- Each speaker will be given 15 minutes for the talk, followed by 15 minutes of discussion.
- A jury of international experts will evaluate the presentations and the best speaker will receive the **Prof. Surendra P. Shah Award** on Technologies for Low-Carbon and Lean Construction 2022. The awardee will be given a slot at the 2<sup>nd</sup> International Workshop on Technologies for Low-Carbon and Lean Construction to be held at IIT Madras, Chennai, during February 1 – 2, 2023.
- Travel grant of up to EUR 2000 (two thousand) could be available to selected speakers (partial support towards the actual travel expenses).

## Themes Include (But Not Restricted To...)

1. Supplementary/alternative cementitious materials - hydration, fresh, durability, hardened properties
2. Identification, processing, and valorization of waste for use in concrete construction
3. Service life and life cycle assessment, sustainability, and carbon footprint of construction industry
4. An Integrated Test-Bed for large-scale processes and visualization
5. Organizational and policy research for large-scale and accelerated construction technology

## Registration

- Pre-register as a speaker [here](#); your submission will be evaluated and intimated if shortlisted.
- If shortlisted, your fee will be waived
- If not shortlisted, you can register as an attendee by making a payment of Rs. 1000/- (link will be provided later).
- Abstract submission is not required for registering as an attendee.

## Coordinators:

Ms. Bipina T. V and Mr. Kaushik Bhattacharjee (PhD students)  
Department of Civil Engineering  
Indian Institute of Technology (IIT) Madras, Chennai, India  
Email: [btcmatiitm@gmail.com](mailto:btcmatiitm@gmail.com)



<https://event.icsr.in/phdsymposium/>

For registration, please click [here](#)



Days 3 & 4  
Feb 1 - 2, 2023  
8:30 am - 5 pm

# Two-day International Workshop on Technologies for Low-carbon and Lean Construction

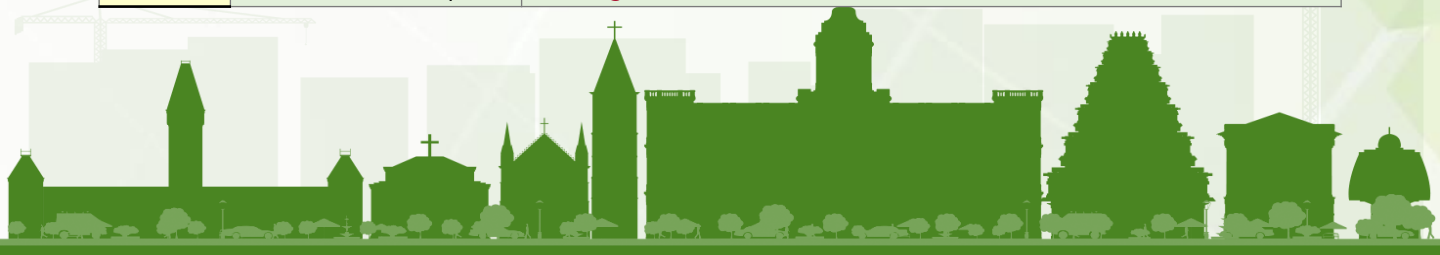
@ ICSR Auditorium, IIT Madras

## About the TLC2 workshop

Recognizing the need to enhance the 'circular economy and sustainability' of the concrete construction industry worldwide, several researchers are working on technologies for low-carbon and lean construction (TLC2). Joining this global effort, Building Technology and Construction Management (BTCM) group at IIT Madras has initiated several research projects on TLC2 and has been collaborating with various agencies in academia, government, and industry worldwide. This workshop will bring together students, faculty members, researchers, and practitioners in the two broad areas of construction materials and construction management. In this workshop, we plan to conduct the following sessions with international speakers - bringing the latest in the research and application fronts.

## Programme Schedule

Day3 (Feb 1)	08:30 - 09:00 am	Conference kit distribution and refreshments
	09:00 - 09:30 am	Inaugural function
	09:30 - 11:00 am	Session 1 - Advanced Construction Materials 1
	11:00 - 11:30 am	Tea/coffee Break and Posters
	11:30 - 01:30 pm	Session 2 - Advanced Construction Materials 2
	01:30 - 02:30 pm	Lunch break
	02:30 - 04:30 pm	Session 3 - Sustainability and carbon footprint
	04:30 - 05:00 pm	Lecture by the Prof. Surendra P Shah Awardee
	05:00 - 05:30 pm	Refreshments & Posters
Day4 (Feb 2)	08:30 - 09:00 am	Refreshments
	09:00 - 11:00 am	Session 4 - Recycling & processing of waste for concrete
	11:00 - 11:30 am	Tea/coffee Break and Posters
	11:30 - 01:30 pm	Session 5 - Construction automation
	01:30 - 02:30 pm	Lunch break
	02:30 - 04:30 pm	Session 6 - Construction policies
	04:30 - 05:00 pm	Closing and Refreshments



## Discussion leaders and Invited Speakers

### Session 1 – Advanced Construction Materials 1



**Dr. Nishant Garg**  
UIUC, USA  
Discussion Leader



**Prof. Manu Santhanam**  
IIT Madras, India



**Dr. Priyadarshini Perumal**  
Univ. of Oulu, Finland



**Dr. Aslam Kunhi Mohamed**  
ETH Zürich, Switzerland  
(joining IIT Madras)

### Session 2 – Advanced Construction Materials 2



**Prof. Carmen Andrade**  
Univ. of Catalunya, Spain  
Discussion Leader



**Prof. David Trejo**  
Oregon State Univ., USA



**Prof. Farshad Rajabipour**  
Pennstate Univ., USA



**Dr. Christopher Alexander**  
Univ. of South Florida, USA

### Session 3 – Sustainability and Carbon Footprint



**Prof. Ravindra Gettu**  
IIT Madras, India  
Discussion Leader



**Prof. Leon Black**  
Univ. of Leeds, UK



**Prof. Takafumi Noguchi**  
Univ. of Tokyo, Japan



**Dr. Prakash Nanthagopalan**  
IIT Mumbai, India

### Session 4 – Recycling & Processing of Waste for Concrete



**Prof. Mark Alexander**  
UCT, South Africa  
Discussion Leader



**Dr. Alexander S Brand**  
Virginia Tech Univ., USA



**Prof. Chi Sun Poon**  
HKP Univ., Hong Kong



**Prof. Dhaval Monani**  
Anant National Univ.,  
Ahmedabad, India

### Session 5 – Construction Automation



**Prof. Koshy Varghese**  
IIT Madras, India  
Discussion Leader



**Dr. Akio Kasuga,**  
President, fib



**Dr. Liberato Ferrara**  
Politecnico Di Milano,  
Milan, Italy



**Dr. Pang Sze Dai**  
National Univ. of  
Singapore, Singapore

### Session 6 – Construction Policies



**Prof. Satyanarayana K N**  
IIT Tirupati, India  
Discussion Leader



**Dr. K S Jayachandran**  
Indian Forest Service,  
India



**Dr. Anumita Roy Chowduri**  
Centre for Science and  
Environment, New Delhi



**Mr. Naveen Unni**  
Managing Partner  
McKinsey, India



**Prof. Ashwin Mahalingam**  
IIT Madras, India

### Coordinators:

Prof. Radhakrishna G. Pillai and Dr. Nikhil Bugalia  
Department of Civil Engineering  
IIT Madras, Chennai, India

Email: [tlc2atiitm@gmail.com](mailto:tlc2atiitm@gmail.com)

For registration, please click [here](#)



# SPARC Workshop on Sustainability & Durability of Reinforced Concrete Systems

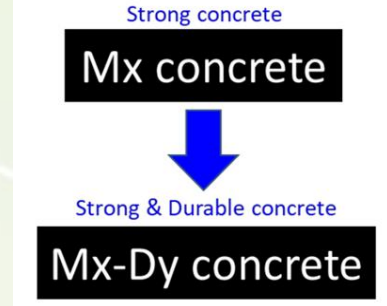
@ ICSR Auditorium, IIT Madras

## About the workshop

The Scheme for Promotion of Academic and Research Collaboration (SPARC) aims at improving 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. For more details, visit [www.sparc.iitkgp.ac.in](http://www.sparc.iitkgp.ac.in). The TLC2 group at IIT Madras has been engaged in the following three SPARC 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)

This half-day workshop will present the major insights gained from these projects. The state-of-the-art technologies to valorize various industrial by-products and recycle waste materials to make durable reinforced concrete systems will be discussed. The lectures will also discuss how to implement the use of such materials and technologies to construct durable structures (say, with a specific target service life) in emerging economies.



## Speakers



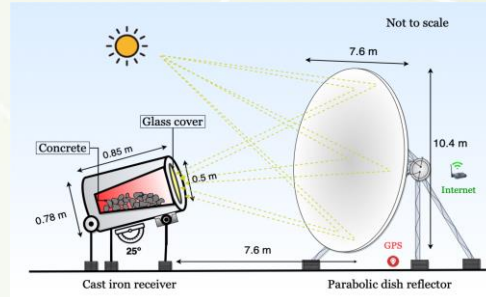
**Prof. David Trejo**  
Oregon State Univ., USA



**Prof. Mark Alexander**  
Univ. of Cape Town,  
South Africa



**Prof. Farshad Rajabipour**  
Pennstate Univ., USA



**Prof. Radhakrishna G. Pillai**  
IIT Madras, India



**Prof. Manu Santhanam**  
IIT Madras, India



**Dr. Piyush Chaunsali**  
IIT Madras, India



## Coordinators:

Dr. Piyush Chausali and Prof. Manu Santhanam  
Department of Civil Engineering  
IIT Madras, Chennai, India

**For registration, click [here](#)**

**Email: [tlc2atiitm@gmail.com](mailto:tlc2atiitm@gmail.com)**



## Workshop on Textile Reinforced Concrete (TRC)

@ ICSR Auditorium, IIT Madras

### About the workshop

The growing adoption of Textile Reinforced Concrete (TRC) technologies for suitable applications by the construction sector in India is a testimony to the multi-faceted advantages this material offers. 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. In comparison to conventional elements with steel reinforcement, thinner sections can be designed with TRC. The possibility of making components with considerably lower amount of materials, and the potential to provide long service life contributes to the sustainability aspect of TRC. This workshop is intended to familiarize the large community of users, designers, researchers, and consumers about the structural behaviour, fabrication techniques, characterization and properties as well as design and analysis of TRC. Results from major ongoing projects at IIT Madras and other institutions will be presented.

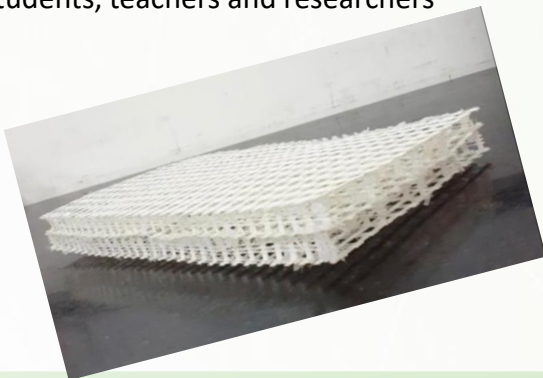
Experts will present aspects ranging from the availability of suitable textiles to characterization and design of structural elements to durability to prototype applications.

### Topics Covered

- Characteristics of glass textiles suitable for TRC
- Fundamentals of TRC design
- Mechanical characterization and design
- Modeling and analysis of TRC
- Durability assessment
- Practical applications

### Who should attend

- Practicing Engineers – Govt. & Private Sector
- Designers, consultants, contractors
- Personnel from testing labs
- Precast concrete manufacturers
- Students, teachers and researchers



Retrofitting of column with TRC - at IIT Madras



Circular sewage tank with TRC - at IIT Madras

### Coordinators:

Dr. Keerthana Kirupakaran and Prof. Ravindra Gettu  
Department of Civil Engineering  
IIT Madras, Chennai, India



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# SPONSORSHIP opportunities and benefits

<b>PLATINUM</b>	<b>5 Lakhs</b>	<b>10 delegates, exhibition space, and 5-min presentation slot</b>
<b>GOLD</b>	<b>3 Lakhs</b>	<b>5 delegates, exhibition space</b>
<b>SILVER</b>	<b>1 Lakh</b>	<b>3 delegates</b>

We have partial support from the Government of India projects and are awaiting industry sponsorship from various organisations with activities in the following areas/sectors:

- Cement
- Construction chemicals
- Steel & non-metallic reinforcement
- Construction equipment
- Structural designers
- Contractors and builders
- Construction project management
- Construction policy making

## Contacts for queries on sponsorships

Prof. Radhakrishna G. Pillai and Prof. Ravindra Gettu  
 Department of Civil Engineering  
 IIT Madras, Chennai, India



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**Email: [tlc2atiitm@gmail.com](mailto:tlc2atiitm@gmail.com)**

