



Recycle and Reuse
Material Waste



Minimize
Process Waste



Sustainable
Construction



Vision

To be India's primary destination for developing and implementing ideas on low-carbon, lean construction technologies.



Mission

To establish India's first integrated testbed for evaluating the use of agricultural, industrial, and construction & demolition (C&D) waste in concrete. The goal is to guide practices, policies, and standards that reduce product and process waste.

About the Centre

The **Centre of Excellence (CoE) on Technologies for Low-Carbon and Lean Construction (TLC2)** at IIT Madras brings together faculty experts in construction materials, automation, building science, and management. With 15 core faculty members and several allied collaborators from India and abroad, the CoE promotes sustainable practices in the concrete construction industry.

As India advances in industrial growth and infrastructure development, TLC2's outputs will significantly lower the environmental impact of construction processes. We invite researchers, innovators, and construction professionals to join us in this journey toward sustainable construction across the country.

Work Elements

● Fundamental Research

From molecular to macroscopic scale.

● Applied research

Addressing practical problems in materials and management.

● Process Visualization & Decision-Making

Integrated physical and virtual testbeds for large-scale processes and material visualization.

● Organizational & Policy Research

Strategies for adopting lean processes.

Salient Achievements

- Utilization of waste as a resource for the construction industry.
- Sustainable processing and beneficiation of C&D waste.
- CO₂ mineralization of industrial waste.
- Virtual Reality (VR) for skill development in defect identification.
- Vision-based volumetric estimation of localized C&D waste.
- Development of sorting techniques for C&D waste.
- Computer vision framework for monitoring and controlling concrete 3D printing quality.
- 141 journal papers published (2022–2025), including 81 in Q1 international journals, with a combined FWCI of 1.08

TLC2 Consortium

Pioneering Partnership: India's First-Ever Industry-Academia Collaboration Set to Transform the Construction Sector

TLC2 industry consortium aim at fostering collaboration, innovation, and implementation of advanced and sustainable technologies in the construction sector. By partnering with industry leaders, we strive to create a dynamic environment where ideas can flourish and practical solutions can be developed, ultimately benefiting the entire sector and contributing to a more sustainable world.

Consortium Benefits

- Joint R&D efforts: feasibility studies, scale-up validations, and pilot demonstrations.
- Access to IITM's large talent pool of researchers and entrepreneurs.
- Exclusive workshops and dedicated faculty time for consortium partners.
- A dynamic environment fostering collaboration, innovation, and sustainable technology adoption.

Technology Development & Implementation



Textile-reinforced concrete precast units.



Low-carbon concrete mix strategies for the foundations of the Ayodhya Ram Mandir.

Technology Development & Implementation



Construction of a G+1 3D-printed guest house at IIT Madras.



Slag-based concrete for extending service life and reducing the carbon footprint of a coastal highway bridge.

PLATINUM MEMBERS



constructive solutions



L&T Construction
Heavy Civil Infrastructure

NEMETSCHEK
GROUP



SCHWING
Stetter



SILVER MEMBERS



SIWIN
SUDISH'S INSTITUTE OF
WATERPROOFING AND INSULATION



Concrete OEM



CHIR-AYU CONTROLS PVT. LTD.

TEAK MEMBERS



JYAMITI & SEA



Capacity Building, Training & Workshops

39 Ph.D. and 46 M.S. graduands (2021–2025).



Online Certification Program on Construction Technology and Management (CTAM) for aspiring engineers, construction technologists, and managers

290+

participants across three cohorts of the Online Certification Program on Construction Technology & Management (CTAM).

- Annual TLC2 Week events (2022 – 2025), with 30+ speakers from 14+ countries, attracting more than 600 participants overall.
- Young Researchers' Symposium – first of its kind in India, with 38 participants from 10 countries across three editions.

TLC2 Initiative

Research Data & Reports (RDR) – A free, open-access journal supported by TLC2,

Publishing:

- Brief papers on datasets
- Technical reports
- Journal papers
- Review papers



Future Plans



- TLC2 Experience Centre at IIT Madras Discovery Campus, Thaipur, Chennai.
- Pilot-scale solar beneficiation plant for recycled concrete aggregates (RCA).
- Demonstrators for alternative calcination technologies in cement manufacturing.
- Carbon capture and utilization projects under a new DST grant

Our Team



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