IIT Madras

BTCM
Building Technology, Construction Materials & Management

Recycle and Reuse **Material Waste** + Minimize **Process Waste** → Sustainable Construction

Vision

To be the primary destination in India for all interested in developing and implementing ideas on low-carbon, lean construction technologies.

Mission

To develop India's first integrated testbed for evaluating the usage of agricultural, industrial, and construction & demolition waste in concrete for directing practices, policies, and standards for the reduction of 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 members of IIT Madras with expertise in Construction Materials, Construction Automation, Building Science and Construction Management. With 15 core faculty members and several allied faculty members from India and abroad, the CoE was set up to address the adoption of sustainable construction practices in the concrete construction industry.

As India moves ahead in terms of industrial growth and rapid development of infrastructure, the outputs from this CoE will make a significant contribution to the evolving landscape, and lowering the sustainability impact of construction processes. We invite all researchers, innovators and construction personnel to join us in this journey towards sustainable construction in the country.

Our Team

Dr. Aritra Pal

Dr. Ashwin Mahalingam

Dr. Aslam Kunhi Mohamed

Dr. Benny Raphael

Dr. Keerthana Kirupakaran

Dr. Koshy Varghese

Dr. Manu Santhanam

Dr. Murali Jagannathan

Dr. Nikhil Bugalia

Dr. Piyush Chaunsali

Dr. Radhakrishna Pillai

Dr. Ramamurthy K

Dr. Ravindra Gettu

Dr. Sivakumar Palaniappan

Dr. Surender Singh

Work Elements

Fundamental research
From the molecular scale to the macroscopic scale

Applied research
From the basic research to more applied problems on materials & management.

Process visualization and decision making
An integrated test-bed comprising of physical and virtual test bed for large-scale processes and visualization of construction materials

Organizational & Policy research
Strategies to adopt lean process

Salient achievements of CoE on TLC2

- Utilization of Waste as a Resource for the Construction Industry
- Sustainable Processing & Beneficiation of Construction & Demolition (C&D) Waste
- CO2 Mineralization of industrial waste
- Virtual Reality (VR) for Skill Development in Defect Identification
- Vision-Based Volumetric Estimation of Localized Waste from Construction and Demolition
- Development of Sorting Techniques for C&D Waste
- Computer Vision-Based Framework for Monitoring and Controlling the Quality of Concrete 3D Printing Process
- **141 Journal papers published during 2022 - 25, 81 of them 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.

Benefits of Membership

- Participation in joint R&D efforts – Feasibility stage R&D, scale-up validations, and pilot demonstrations
- Knowledge Collaboration - access to a large talent pool of researchers and entrepreneurs at IITM
- Exclusive workshops and fixed faculty time allocation for the consortium partner members

PLATINUM MEMBERS

FOSROC
constructive solutions

L&T Construction
Heavy Civil Infrastructure

UltraTech CEMENT
The Engineer's Choice
INDIA'S NO.1 CEMENT

SCHWING Stetter

asianpaints
PROJECT SALES
Paints | Waterproofing | Flooring | Repair | Admixtures

SILVER MEMBERS

SIWIN
SUDISH'S INSTITUTE OF WATERPROOFING AND INSULATION

Concrete OEM

CHIR-AYU
CHIR-AYU CONTROLS PVT. LTD.

TEAK MEMBERS

FMG

JYAMITI & SEA

SCM

Technology Development & Implementation

Textile Reinforced Concrete Precast Units

Implementation of Low Carbon Strategies for Concrete Mix Selection in the Foundation of the Ayodhya Ram Mandir

Technology Development & Implementation

Construction of G+1 3D Printed Guest House on
IIT Madras Campus

Enhancing Service Life and Reducing the Carbon Footprint of a
Coastal Highway Bridge with Slag-Based Concrete

Capacity Building, Training & Workshops

39 Ph.D. and M.S., Graduands (2021-2025)

46 Current Research Scholars

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

290+ **Participants in 3 cohorts**

- 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 the country, with 38 participants from 10 countries across 3 editions

TLC2 Initiative

Research Data & Reports (RDR) is a free, open-access journal supported by CoE on TLC2.

We invite submissions:

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

Future Plans

TLC2 Experience Centre in IIT Madras Discovery Campus, Thaiyur, Chennai

A pilot-scale solar beneficiation plant for the production of RCA, and a demonstrator for alternative calcination technologies for cement manufacture, as well as capture and utilization of the CO_2 produced, under a new DST grant for Carbon Capture and Utilization in the Cement Sector, will be set up at TLC2EC.

https://tlc2.iitm.ac.in/

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