



BITCM
Building Technology, Construction
Materials and Management



CENTRE OF EXCELLENCE ON TECHNOLOGIES FOR LOW-CARBON AND LEAN CONSTRUCTION (TLC2)

Providing academic leadership in the areas of Building Science, Construction Materials, and Construction Management

Vision



To be the primary destination globally in developing and implementing ideas on low-carbon, lean construction technologies for minimizing waste throughout the construction value chain in the country and beyond.

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 waste reduction in Indian Construction Industry.

About the Centre

The Centre of Excellence on Technologies for Low-Carbon and Lean Construction (TLC2) was established with a view towards addressing issues that would lead to the true adoption of the concepts of circular economy in construction with minimal impact on global climate change.

Challenge before Us

- Zero-Carbon & Zero-Waste in Construction by 2070.
- Reducing embodied CO₂ emission.



Embodied Carbon

Operational Carbon

»»» OUR FOCUS «««

Recycle and Reuse
Material Waste



Minimize
Process Waste



Sustainable
Construction

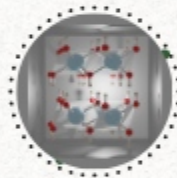


Developing technology and enhancing adoption will boost Circular economy

WORK ELEMENTS

BASIC RESEARCH

Fundamental research from the molecular scale to the macroscopic scale



APPLIED RESEARCH

Leading to technology development in construction industry

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

»»» CAPACITY BUILDING & TRAINING M.S, M.TECH and PhD STUDENTS

- PhD, MS, M.Tech and Dual Degree scholars have graduated with theses in the area of TLC2.
- PhD scholars including Prime Ministers Research Fellows, Post-docs, and MS scholars are pursuing research on the TLC2 theme.
- Certification courses are being conducted for industry personnel.

LOCAL IMPACT & GLOBAL RELEVANCE «««

The most important focus of the TLC2 is to develop collaboration with leading national and international researchers and organizations working in the areas of construction materials and management. Strong coordination among Academic, Industrial, Governmental, NGOs, and MSMEs promotes translational research.

State-of-the-Art Laboratory Facilities

- Mechanical Performance of Civil Engineering Materials (MPCEM)
- Micro Analytical Characterization of Cement and Engineering Materials (MACCEM)
- Durability and Corrosion Studies
- AR / VR Laboratory



Competencies

Innovation is the key to TLC2's success in meeting its mission and vision. New cross-cutting technologies are being developed to support the construction industry. This includes strengthened capacity in recycled aggregate beneficiation technology using concentrated solar energy, development of a robotic arm for intelligent segregation of waste, and Automated construction



Translational and Transformational Research

Technology Implementation on structures with national importance and heritage values.



Low-carbon roller compacted concrete foundation with 1000-year design life, Ayodhya.

Low-carbon concrete and cathodic protection for enhancing the service life of reinforced concrete sunshades in Rashtrapati Bhawan, New Delhi.



India's first 3D printed house (IITM-TVASTA initiative)

Core Research Areas

- Development of low-carbon cement.
- Processing and characterization of C&D, industrial, and biomass wastes.
- 3D printed and precast concrete using low-carbon materials.
- Corrosion control, durability enhancement, and service life estimation/extension.
- Life cycle assessment of low-carbon concrete systems.
- Mechanics of composite construction materials.
- AI-enabled test-bed for automated processing and assessment of waste materials.
- Virtual test beds for organizational learning and dynamic strategy simulation.
- Lean and sustainable construction practices.
- Technology enabled C & D waste quantification and management strategy.

Start-Ups being Mentored



STRU-FO-CON

WHY TLC2?

The TLC2 initiative is trying to bring ideas from various scientific fields in construction materials and management with shared qualities and characteristics under a single platform with the participation of the global research community working in these areas. The TLC2 research team has unique expertise in the areas of building science, construction materials, construction technology, and management, and the BTCM group's track record with international leadership in diverse areas is set to guide and lead such initiatives.

Plans for the future

TLC2 Experience Centre (TLC2EC) at IITM discovery campus, Thaiyur, Chennai

To set up a world-class facility that complements and enhances the capabilities of the existing ones in the region, and becomes a world leader in developing innovative, sustainable, and cost-effective solutions for the construction industry.

- Implement state-of-the-art research in pilot-scale applications
- Facilitate evaluation of alternative materials and construction strategies through 'physical' and 'virtual' test beds
- Train human resources to practice TLC2 ideas
- Provide consulting services on sustainability-related aspects to the construction industry
- Strengthen academia-industry relationship
- Engage with policymakers to influence the codes of practice

Our Team



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