



RILEM Co-sponsored Event Report

Title: Online Workshop on **Resilience of Concrete Construction**

Dates: 23rd May 2020

Venue: Zoom and YouTube

The IIT Madras Construction Materials Group organised a one-day workshop on Resilience of Concrete Construction as a part of RILEM Online Conferences & Transfer of Knowledge (ROC&TOK) Series. The workshop was co-sponsored by RILEM - Réunion Internationale des Laboratoires et Experts des Matériaux, systèmes de construction et ouvrages, and ICI - Indian Concrete Institute.

The workshop dealt with advances about improvement in the response of the construction industry to extreme global and local events, such as earthquakes, floods, hurricanes and cyclones. Adaptive resilience in construction activities was seen to be critical in strategization of upcoming projects for coping with the challenges faced due to natural calamities or changing propositions in global scenarios. Limitations of common construction materials and the need to improve the life span of constructed structures and employ alternative solutions in changing and aggressive environments were also discussed.

The workshop had 11 speakers delivering lectures on a range of themes related to resilience in construction. The workshop was attended by graduate students, researchers, practising engineers and industry experts around the world, with about 3000 registered participants. The workshop was held on Zoom and live streamed on YouTube, where it has more than 5000 views already.

Some aspects highlighted by the speakers were:

- i. Prof. Paolo Gardoni emphasized the importance of region-specific risk analysis as a critical way forward for the community to restore normalcy after extreme events. Such analyses would help plan the critical infrastructure for quick restoration after extreme events.
- ii. Prof. Ashwin Mahalingam spoke about policy gaps, and the roles and responsibilities of different actors in construction projects to make cities resilient. He shared the progress in assessing the resilience of Chennai as a case study.
- iii. Prof. Ornella Iuorio specifically presented a case study on the post-disaster infrastructure measures taken in Portoviejo and the learnings from that experience.
- iv. The importance of service life-based design of critical infrastructure in corrosive environments was emphasized by Prof. Radhakrishna G. Pillai. The alternative technologies in protecting reinforcement corrosion were also discussed.
- v. Suggestions for the use of IT-based technologies and automation were proposed by Prof. Koshy Varghese for post-disaster continuation of construction. The use of such approaches was discussed in the context of post-COVID scenarios.
- vi. Prof. Venkatesh Kodur discussed the advances in the technologies and design of concrete structures for improved fire resistance.

- vii. Prof. Barzin Mobasher explained the need for efficient structural design with new technologies, such as textile-reinforced concrete, and presented potential applications.
- viii. Prof. Liberato Ferrara presented the progress in the major international *ReSHEALience* project that aims to respond to the needs for construction industry with an application-specific design approach. The role of high performance concretes for the improved service life of concrete structures was discussed.
- ix. Designing concrete structures for ballistic damage resistance was explained by Prof. Avraham Dancygier, with results shown on damage due to projectile impact and novel design approaches.
- x. The critical aspects of resource utilization through the value chain of construction activities were discussed by Prof. Wolfram Schmidt, who emphasized the role of the circular value chain, which could improve downstream utilization of resources.
- xi. Prof. Ravindra Gettu gave insights on the impacts of cement concretes for construction in future. The relevant aspects of low carbon cement, electricity sources, fossil fuel usage and recycled aggregates were related to the sustainable utilization of resources in construction.

The discussions were led by Prof. Manu Santhanam, Prof. Juhyuk Moon, Dr. Daniela Ciancio and Prof. P.A. Muhammed Basheer. The participants interacted very actively through chats with the experts during the Q&A sessions.

Some of the lectures will be made available in the RILEM YouTube channel.

