Special Issue

Performance Analysis of Cross-Laminated Timber (CLT) Constructions Under Current and Future Climates

Message from the Guest Editors

Climate change and net-zero GHG emission goals brought new challenges to the construction industry which require more climate-resilient and low-carbon building designs and constructions. Cross-laminated timber (CLT) constructions attracted increasing attention, as CLT has much lower embodied carbon than other building materials, such as concrete or steel. With the widespread adoption of performance-based building codes and standards, in many countries, performance analysis became mandatory to support building designs, and this has no exception for CLT building design. The research topics of this Special Issue will cover (1) the characterization of CLT material properties, including, but not limited to, hygrothermal, mechanical and biochemical properties; (2) performance analysis of CLT building envelope systems, such as the durability, thermal performance, fire, acoustics and structural performance; (3) performance analysis of whole buildings built with CLT, including thermal comfort, energy efficiency and life cycle carbon/cost analysis; and (4) the impact of climate change and climate resilience on CLT buildings under future and extreme climatic conditions.

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Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

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