Special Issue

Alternative Additions in Concrete: Screening, Assessment, and Specifications for Durability

Message from the Guest Editors

Concrete is the most widely used construction material, and its demand is anticipated to grow further by 2050. Meanwhile, the concrete industry is responsible for around 8% of global CO2 emissions caused by humans and must, therefore, set out its plan for decarbonization. Replacing Portland cement with Supplementary Cementitious Materials (SCMs) is one of the most adopted methods to reduce the carbon footprint and the embodied energy of concrete, together with advanced/optimized mix-design techniques. However, different regions around the globe may face the depletion of common SCMs such as fly ash, silica fume, and blast-furnace slag in the coming years. While finding alternative materials and proportioning methods is crucial, implementing these technologies should not be done at the expense of performance. This Special Issue aims to bridge advances in materials science with engineering practices. Therefore, we encourage submissions discussing the screening of new sources of materials, long-term durability assessments, and progress in the standardization and qualification of new materials.

Guest Editors

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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.

Editor-in-Chief

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