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Research on Building Materials for Structural Characterization and Applications

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Message from the Guest Editors

Around ten billion metric tons of concrete using largely ordinary Portland cement (OPC) are manufactured worldwide annually. For each ton of used OPC, approximately one ton of CO_2 is produced. CO_2 emissions are related to the energy consumption of raw materials and external heat used during production.Current production rates of OPC factories are responsible for 7% of the total CO_2 emissions worldwide.Reduction of the carbon footprint and energy consumptions due to manufacturing of Portland cement is a burning need these days. The unexpected amount of cement and CO_2 emissions have elevated global awareness and prompted scientists to develop alternative sustainable concrete, which ensures the eco-friendly construction industry for future generations. It is essential to study on the characterization and application of new building materials for a greener environment and sustainable construction of building structures in the escalating demand of infrastructure development globally. This Special Issue is dedicated to current research on experimental, theoretical, computational and relevant research works on building materials in the design and construction of engineering structures.

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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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