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High-Performance Building Materials and Structures: State-of-the-Art Studies

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Message from the Guest Editors

Recently, high-performance building materials have been developed and proposed for building structures, e.g., high-strength steel, stainless steel, aluminum alloys, high- or ultra-high-strength concrete, lightweight concrete, or ultra-high-performance concrete. These innovative high-performance materials have been developed and put into use in buildings, spacing structures (e.g., aluminum rooves), bridges (e.g., stainless steel bridge, aluminum bridge), TV emission towers (e.g., the Tokyo tower with high-strength steel), and offshore structures. This issue aims to incorporate these state-of-the-art research developments and engineering activities of high-performance materials and their applications in structures, bridges, tunnels, and other civil engineering constructions. The scope of this issue includes but is not limited to steel, concrete, and steel–concrete composite structures with high-performance steel, concrete, composite, and alloy materials.

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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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