Special Issue

Advanced Construction Materials and Smart Structural Technologies for Sustainable Civil Structures

Message from the Guest Editors

This Special Issue explores the transformative role of nanotechnology in externally bonded reinforcement (EBR) and near-surface mounted (NSM) fiber-reinforced polymer (FRP) systems, emphasizing nanomaterial-modified epoxy and cement-based adhesives. Additionally, this Issue expands its focus to include nanomaterial-enhanced cementitious and concrete composites, as well as sustainable and smart FRP retrofitting systems.

This Special Issue seeks contributions that advance our understanding of nanotechnology-enhanced adhesives, cementitious composites, and FRP retrofitting systems. Topics include the development and characterization of nanomaterial dispersion techniques, interfacial bonding mechanisms in FRP–concrete systems, and the evaluation of mechanical properties, hydration processes, and failure behavior. Additionally, research on smart nanomaterials, such as self-sensing and self-healing materials, for enhancing durability and structural health monitoring (SHM) in FRP-based retrofitting is encouraged. Investigations into sustainable practices and eco-friendly alternatives in nanomaterial-enhanced FRP systems for concrete rehabilitation are also welcome.

Guest Editors

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About the Journal

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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