Special Issue

Research on Rate-Dependent Mechanical Properties of Ultra-High Strength Concrete

Message from the Guest Editors

Because of the ultra-high strength, excellent ductility and good durability, Ultra-high Performance Concrete (UHPC) is considered as the promising structure material for building vulnerable to dynamic loadings, i.e., earthquake, explosion and crushing, etc.. It has been widely acknowledged that the damage and failure of concrete structure can be attributed to the propagation and cumulation of cracking. From a multiscale point of view, the cracking of UHPC containing aggregates can be assigned to the fracture of aggregate, ITZ, and paste matrix. So, understanding the rate-dependent mechanical properties of UHPC from a multisacle perspective is of vital importance to the design and safety assurance of structure exposed to dynamic loading.

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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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