

## Building Drainage Systems Fit for the 21st Century: Innovation and Advancement through Research

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### Message from the Guest Editor

Dear Colleagues,

Modern building drainage or sanitary plumbing systems have proved to be successful in reducing the burden of disease on populations by introducing design principles based on our understanding of unsteady fluid flow in partially filled pipework. These methods arguably stem from the explosion of interest in urban sanitation in the 19th Century and early 20th Century. Many recent design codes have been based on the seminal work of Hunter in the 1940s, which introduces a probabilistic approach to the loading design of above-ground systems. With a few exceptions, this has been the case since the mid 20th Century. At the same time, the world has experienced rapid growth with respect to population and a shift to urban living with an attendant increase in the construction of tall buildings and the challenge of providing sanitation for all as espoused in the UN Sustainable Development Goals. This Special Issue seeks to gather the most recent innovations and research on building drainage and sanitation systems and attempts to produce a coherent anthology of techniques and approaches that describe systems fit for the purposes of the 21<sup>st</sup> Century.

Prof. Dr. Michael Gormley



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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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