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Kong Fah Tee, PhD
Siew Choo Chin, PhD
Koorosh Gharehbaghi, PhD
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Kong Fah Tee
Siew Choo Chin
and Koorosh Gharehbaghi
Editors

Cement and Concrete

Design, Performance and Structure

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Preface

Cement and Concrete: Design, Performance, and Structure presents advances in cement and concrete research and development. In dealing with cement and concrete, this book investigates different aspects of their design, performance, and structure. The covered topics include green concrete and tomography-based concrete ageing analysis, as well as the use of natural fibres, geopolymers, and nanomaterials in concrete.

The book is intended for academics, researchers, and engineers, and will serve as an invaluable guide or reference that encourages undergraduate and postgraduate students to look beyond normal procedures when developing and constructing innovative and sustainable building materials.

This edited book is divided into the following seven chapters. In Chapter 1, the utilization of industrial waste is employed to evaluate the performance of green and self-compacting concrete. While Chapter 2 deals with infrared thermography analysis of sulfur polymer concrete exposed to accelerated ageing, in Chapter 3 various structural and environmental performances of fly ash-amended cement are evaluated and presented. The mechanical properties of concrete are carefully examined in Chapter 4 through the determination of the effect of nanomaterials on the strength properties of self-compacting concrete. To understand the current practices of geopolymer concrete, Chapter 5 deals with the pertinency of geopolymer concrete for the Australian construction industry. In Chapter 6, a novel method of improving the gradation of multi-recycled aggregate using a particle packing approach is prudently presented. Finally, in Chapter 7, bamboo fibre composites are dealt with to better understand their overall potential and challenges.