Book review

ICE Themes Recycled Aggregates: Use in Concrete

RK Dhir and CQ Lye (eds). ICE Publishing, London, UK, 2019, ISBN 978-0-7277-6463-8, £125, 516 pp.

This book is one of the *ICE Themes* series for addressing the key issues and the challenges in civil engineering. The book provides a well-balanced overview of the full spectrum of research undertaken on the use of recycled aggregates as a replacement of the commonly used natural aggregates in a wide range of applications, including both structural and non-structural concretes. The book contains the work of a number of recognised international experts who are actively engaged in developing the use of recycled aggregates in concrete.

The book contains six sections, covering various aspects of recycled aggregates and their use in concrete.

The first section has two chapters, which are related to the characteristics of recycled aggregates. The second section also contains two chapters, which address the design of concrete mixes containing recycled aggregates. Section 3, containing six chapters, discusses dealing with the effect of recycled aggregates on the mechanical properties of concrete, including compressive strength, tensile and flexural strengths, static and dynamic modulus of elasticity, stress–strain relationship and shrinkage.

Section 4 deals with the durability of concrete, but concentrates exclusively on the response of recycled aggregate concrete exposed to high temperatures and, interestingly, using different methods, the evaluation of the risk of alkali–aggregate reaction arising in concrete made with recycled

aggregates containing different materials, namely masonry, concrete, demolition waste, road pavement planning, slate and plasterboard.

Section 5 comprises seven chapters, which discuss the structural performance of concrete incorporating recycled aggregates, mainly dealing with fatigue strength, shear strength, bond strength, crack width in bottle-shaped struts, deflections in composite slabs and bearing capacity of steel cubes filled with concrete, as well as the performance of ready-mixed concrete incorporating fine recycled aggregates in the fresh and hardened states, including in-situ measurements for bond, flexural and shear performance.

The last section of the book contains four chapters and addresses the environmental impacts associated with the use of recycled aggregates and provides case study examples and an overview of standards and specifications related to the production of recycled aggregates, as well as the use of recycled aggregate concrete. A comprehensive subject index is also provided at the end of the book.

All 23 chapters of the book reflect cutting-edge research and provide practical guidance to the current state on recycled aggregates and their potential use in concrete construction. With over 1200 cited references within the high-quality work presented, the book makes an excellent source of information for researchers and practitioners in the area of re-use, recycling and reconstitution of processed aggregate arising from construction, demolition and excavation waste to create sustainable concrete, and it aims at developing the appropriate use of recycled aggregates in concrete construction.

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