Properties of concrete - book review

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BOOK REVIEWS / CRITIQUES DE LIVRES

Properties of concrete[1]

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The three previous editions of this tome were well received and lauded by the construction industry and materials research community. The fourth edition (a scholarly work of 844 pages) exemplifies excellence and is no exception. It embodies all the attributes of the earlier texts and addresses current technology in an erudite, skillful, and informative manner. It continues to serve as the primary source of information on issues relevant to concrete technology and materials innovation in the construction industry. Important advanced technologies that have significantly evolved in the 1990s, including high performance concrete, superplasticizing and super-retarding multifunctional admixtures, and supplementary cementing materials, are treated critically. New approaches to designing durable concrete are addressed in terms of these technologies.

Properties of Concrete contains 14 chapters and about 1500 references with a significant number published since 1990. A few of the highlights (from this reviewer's perspective) are briefly described as follows.

A chapter on portland cement presents a new perspective on the hydration of cement minerals and suggested modifications to the Bogue calculation for compound composition. Relevant information on the conversion process in high alumina cement and preventative measures incorporating granulated blast-furnace slag are discussed in another chapter.

Advances in rheological approaches and their practical implications and application to ultra high strength concrete are given. A comprehensive treatment of superplasticizer technobgy is provided in two chapters with special reference to high performance concrete. Novel developments in admixture technology, including the use of phosphonate-based super-retarders, are critically appraised. New research on the role of the transition zone at the paste–aggregate interface is a feature of a chapter on strength.

The chapter on elasticity, shrinkage, and creep reflects the acknowledged authority of the author on this subject and includes additional insight on the nature of creep of concrete and the influence of supplementary cementing materials. Recent contributions on the durability of concrete, in particular alkali-silica reactivity, relate to the use of lithium-based admixtures and supplementary cementing materials. Data on corrosion of steel in concrete and its mitigation through the use of blended cements are critically evaluated. The final two chapters deal with the particular properties of concrete containing supplementary cementing materials and mix design with special sections on proportioning mixes for high performance and lightweight concrete.

The scholarly presentation throughout the book is significantly enhanced by the selective use of graphics effectively chosen to illustrate the arguments presented. The listing of relevant North American and European standards is particularly useful. The detailed indices provide easy access to information. *Properties of Concrete* is a valuable resource for researchers and practicing engineers. It is highly recommended.

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[1] Fourth and final edition. By A.M. Neville. Longman Group Limited, Fourth Avenue, Harlow, Essex CM19 5AA, United Kingdom. 1995. 844 p.