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BOOK REVIEWS

Fracture Mechanics and Structural Concrete. (Fourth Edition). Bhushan L. Karihaloo. Longman Scientific & Technical 1995; ISBN 0-582-21582X. 330 p.

Plain and reinforced concrete structures are full of microcracks. These structures are designed nowadays without considering the propagation of microcracks. Fracture mechanics explains phenomena that cannot be adequately explained by the conventional strength failure criteria. The absorbed energy determines the ductility of the structure: the greater the energy absorbed, the more ductile its response. Limit analysis does not take account tension softening. It cannot therefore give us an indication of the energy absorbing capacity of a concrete structures.

The primary aim of the book is to introduce a wide audience of present and future structural design engineers to the concepts of fracture mechanics of concrete. Those concepts are included which have reached a mature state of development and are widely accepted.

The book includes detailed overviews on linear elastic fracture mechanics (LEFM), application of LEFM to concrete, non-linear fracture theories for concrete, approximate non-linear fracture models, test methods for the determination of fracture parameters, brittleness and size effect of concrete structures, determination of the tension stiffening response of concrete, applications to plain and reinforced concrete structures as well as to high performance cementitious materials.

The book fulfils its above aims, therefore suitable for teaching purposes.

Ferenc TAMÁS
György L. BALÁZS

Reinforced and Prestressed Concrete Design - The complete process. Eugene J. O'Brien and Andrew S. Dixon. Longman Scientific & Technical Ltd., 1995. ISBN 0-582-21883-7.

The book covers all aspects of the design process of reinforced and prestressed concrete structures from initial conception of the structural alternatives through the process of analysis and on to the detailed design traditionally taught in concrete design courses.

The authors felt that presenting unrealistic examples with a view to setting clever problems in the examinations is a mistake. They decided to omit the topics often taught in structures curricula and are never used afterwards by the design engineers. On the other hand they intended to include all the materials in this book that are necessary to understand the interrelationship between conceptual design, analysis and detailed design of concrete structures.

The book is structured in three major parts: 1. Structural Loading and Qualitative Design - deals with the conceptual design stage that ends with one feasible solution which satisfies the design constraints being selected. Part 1 includes: fundamentals of qualitative design, Basic layout of concrete structures, loads and load effects. Attention is called that poor decisions in the provision for load can result in a structure that is unsafe or is too expensive to construct. 2. Preliminary Analysis and Design - presents simple calculation methods in order to acquire more

reliable estimates of structural actions and section requirements. Part 2 includes: fundamentals of structural analysis, application of structural analysis to concrete structures, preliminary sizing of members. 3. Detailed Member Design - deals with traditional design methods on bending of reinforced and prestress concrete members, shear, tension and combined axial force and bending of reinforced concrete beams and punching shear of slabs including the detailed code requirements as well.

This is one of the first books that is completely based on Eurocodes (EC1: Basis of Design and Actions in Structures and EC2: Design of Concrete Structures) which is a big advantage for those students who will start their profession when the Eurocodes will apply.

The book is didactically very well structured and visualised by excellent axonometric diagrams.

Ferenc TAMÁS
György L. BALÁZS

Properties of Concrete (Fourth Edition). A.M. Neville. Longman Scientific & Technical Ltd. 1995. ISBN 0-582-23070-5

This is the fourth (and final) edition of the excellent "Neville" on concrete. The book is suitable both for engineering studies and for practising engineers.

Very significant changes in knowledge and in practice have taken place in recent years, therefore, the fourth edition is a new book on a fundamental core. Those readers who were familiar with the earlier versions will have no difficulty in finding their way in the new book. Previous three editions were translated into 12 languages.

Concrete is one of the most commonly used structural material. This book has striven to integrate the various topics so as show their interdependence in the making and use of concrete. The ultimate purpose of the book is to facilitate better construction in concrete.

The fourth edition contains much new material on cementitious materials, some of which were not used, or were little used, in the past. Durability of concrete under various conditions of exposure, including carbonation and alkali-silica reaction, is treated fully. In particular, the behaviour of concrete under the extreme conditions existing in coastal areas of the hot parts of the world, where a great deal of construction nowadays takes place, is discussed. Other new topics are: high performance concrete, recently introduced admixtures, concrete under cryogenic conditions, and properties of the aggregate-matrix interface, to mention the main ones.

Detailed discussion is given on Portland cement, cementitious materials of other types, properties of aggregate, fresh concrete, admixtures, strength and other aspects of hardened concrete, temperature effects in concrete, shrinkage and creep of concrete, durability of concrete, effects of freezing and thawing, effects of chlorides, testing of hardened concrete, concretes with particular properties and mix design.

A considerable advantage for the international user: both SI and the Imperial units are simultaneously used in tables and figures.

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