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BOOK REVIEW

Steel Corrosion in Concrete (Fundamentals and Civil Engineering Practice) Arnon Bentur, Sidney Diamond, and Neal S. Berke. Published by E&F Spon, an imprint of Chapman & Hall, London. 1997. ISBN 0 419 22530 7. Published price: 55 GBP.

This book, Vol. 6. of the series "Modern Concrete Technology," deals with one of the most important aspects of concrete durability: the extent of damage due to steel corrosion. This is one of the major concerns facing civil engineers at the present time, both in the design of new structures and the maintenance of existing ones.

The book is subdivided into 10 main chapters; after an introduction, two short chapters describe mechanisms of steel corrosion as well as concrete structure/concrete chemistry inter-relationships. The following chapters give a deeper insight: Chapter 4 describes possible sources of steel depassivation (carbonation, chloride ingress) and the role of concrete cover in corrosion. Corrosion damage forms are analyzed in the next chapter, including damages in plain and prestressed reinforced concrete.

The following chapters deal with practice, and include corrosion measurements, both laboratory and field ones, as well as corrosion control (control of carbonation, of chlorides and special protection measures, as inhibitors, sealers, coatings). The Specifications and Design chapter incorporates American, British, and European codes, focusing on the most important point: chloride exposure. Here the European Standard (EN 206) will bring changes in design considerations. This code is in the preparation stage, being pre-standard only; the book suggests several revisions, which will be probably accepted during finalization.

Perhaps the most important aspect for practitioners, repair and rehabilitation, are dealt with in Chapter 9. This includes removal of damaged concrete, cleaning of steel, mortar and concrete repair, treatment and electrochemical protection of steel. Finally, Chapter 10, gives lifecycle cost analyses, giving not only basic principles, but also a case study on service life/cost example for a bridge deck in a de-icing salt environment.

The book, although short (only 200 pages), but concise and comprehensive, gives a good summary of most relevant problems. In the reviewer's view, its main benefit is that, although written for practitioners, it gives good references from the scientific to the engineering sides of elimination of corrosion of steel in concrete. It will be a good companion for concrete experts. A good subject index makes its use simple; cited references are up-to-date. Perhaps the only deficiency is the lack of an author index. The book can be recommended for all concrete experts who have to deal with concrete durability, where the most frequent case of non-durable performance is caused by steel corrosion.

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