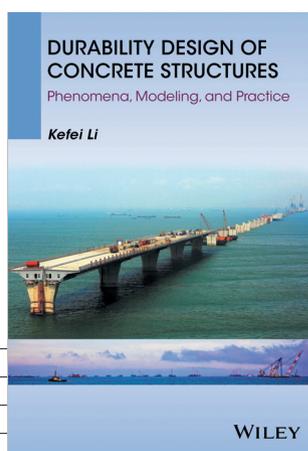


# Review

 This book provides good coverage of durability design of concrete structures and valuable information for the understanding of deterioration processes, concludes Long-yuan Li. It will serve as a useful reference work for both students and practising engineers.

## Durability Design of Concrete Structures – Phenomena, Modeling, and Practice

**Author:** Kefei Li  
**Publisher:** John Wiley & Sons  
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Concrete structures are often required to function in a wide range of aggressive environments for long periods of service. The durability of concrete structures remains a complex and difficult issue to design and manage, due to too many uncertainties involved in materials, structures, and environments where the materials and structures are exposed. While research into concrete durability continues, knowledge of material properties, significance of exposure, deterioration processes and implications of workmanship has developed significantly over the last two decades. This has led to the development of new durability design practices, including durability modelling methods and new methods of construction.

In *Durability Design of Concrete Structures*, Kefei Li attempts to treat the subject matter by addressing simultaneously the material and structural disciplines in civil engineering. The book follows a basic logic line from concrete materials to structural design, and the content is accordingly divided into three parts. Part one is dedicated to the deterioration of concrete materials under different environmental actions, including concrete carbonation

### "THE BOOK FOLLOWS A BASIC LOGIC LINE FROM CONCRETE MATERIALS TO STRUCTURAL DESIGN"

(Chapter 1), chloride attack (Chapter 2), freeze–thaw damage (Chapter 3), calcium leaching (Chapter 4), and salt crystallisation (Chapter 5). In each of these chapters, the problem is addressed by first describing the phenomena, then explaining the mechanism, followed by model development and then their application for design considerations.

Part two, which contains a single chapter (Chapter 6), discusses the subject of concrete deterioration in a structural context, including the effect of mechanical loading, the impact of cracks, and the multi-field problems for the analysis of thermal and moisture transport. In the last section of this chapter, the moisture-transport mechanism under drying–wetting cycles is described in detail and its impact on the durability of concrete structures is also discussed.

Part three (Chapters 7–10) focuses on

the topics of durability design of concrete structures. Chapter 7 describes the concept and corresponding framework for durability design of concrete structures. In Chapter 8, basic material properties related to the durability of concrete structures, and their characterisations and indicators for durability design, are discussed. Chapter 9 shows the application of the durability design approaches in two practical projects in China and also further discusses the concept related to long-service-life design in the context of lifecycle engineering, referring to design uncertainty, quality control, and durability redesign options. The final chapter (Chapter 10) discusses the codes and standards for durability design, which include GB/T 50476 (China), ACI 318 (USA), the JSCE code (Japan) and the Eurocode.

Overall, the book provides good coverage of the topic and valuable information for the understanding of deterioration processes of concrete structures. The book can serve as a reference for civil and structural engineering students, as well as practising engineers who work in the field of civil and construction engineering and are involved in the design, execution and management of concrete structures.



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