

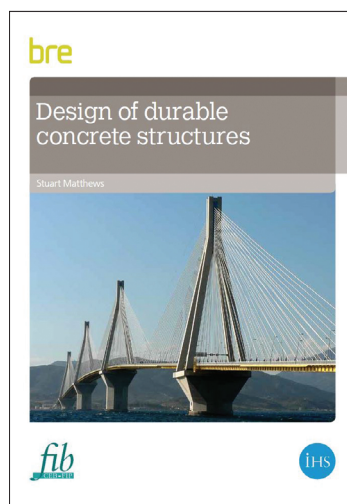
# Review



**Chris Shaw** finds this to be a well-presented and useful book, but one that is let down by a series of omissions which he would like to see addressed in the next edition.

## Design of durable concrete structures

**Author:** Stuart Matthews  
**Publisher:** IHS BRE Press  
**Price:** £95.00  
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Concrete is the most widely used structural material around the world, and will continue to be. Most of the concrete used is reinforced concrete and durability is an essential requirement. This book looks at most of the different factors involved in achieving durability, and the text layout is good, as are the photos and figures.

The author draws heavily on *fib* documents, and other published work, and draws attention to the advances in analysis and design which have not been matched by improvements in the knowledge and skills of the construction operatives. Structures are still being built to the lowest initial cost, without regard to their lifetime cost, particularly their durability. The author covers most of the issues involved in the selection of the durability factors, but there is no mention of the political influences or personal preferences of designers, both of which can have a significant influence on the choice of the final design.

It is good to see the "Common Law of Business" reproduced on page 26, as this is all too often overlooked when selecting the successful tender for the work. The inclusion of the "soft" factors (page 8 etc.) is also welcome, as these have a significant effect on the quality of the finished structure, and more attention needs to be paid to them.

The author rightly makes many mentions throughout the book of the problems resulting from the failure to achieve the specified cover to the reinforcement in ordinary steel-reinforced concrete, but fails to make any mention of BS 7973 or the very relevant papers published as part of the Proceedings of the 6th, 7th, and 8th International Conferences on Concrete. This is a serious omission because, as Sections 1.3 and 1.4 explain, the problem of misplaced reinforcement is the single biggest cause of durability problems in ordinary steel-reinforced concrete. There is only one short section (13.10) on this subject, and this has an error in it with regard to the plastic spacer text. The concreting sub-plan (page 372), and reinforcement plan (page 375) are good ideas, but need to specifically include the spacer and chair requirements.

The author makes reference to "negative cover" (page 21), but unlike for other terms in the book, makes no acknowledgement of the originator of the term.

On page 129, three of the four "C"s of concrete are mentioned. It would have been very helpful if the four "C"s of concrete had been included and explained, as they are all equally fundamental to achieving durable concrete structures.

The section that starts on page 278 deals

with the use of galvanised reinforcement in some detail. However, there is no mention made of the need to passivate the galvanised reinforcement before it is fixed and the concrete poured. This has been known about for many decades, so it should have been included.

There is a section that deals with corrosion of reinforcement in some detail, but it is disappointing that it does not mention longitudinal cracking of corroded steel reinforcing bars, which can greatly reduce the strength of the structure.

Other terms such as "minimum cover" and "mesh" were discontinued a long time ago and should not have been included in the text, especially "minimum cover", which has resulted in so many of the problems that continue to be seen, even on new structures.

It would have been useful to include a section on flexible detailing as this can overcome many of the problems associated with poor durability due to misplaced and corroding steel reinforcement. Similarly, a section on the use of hybrid reinforcement would have been useful.

This is a potentially useful book, especially with regard to the concrete itself, but users need to be aware of the omissions and errors, which need addressing in the next edition.

### Chris Shaw

Chris Shaw is a consultant chartered civil and structural engineer, with several decades of experience in achieving durable concrete, especially reinforced concrete. He is known worldwide for his expertise in developing sustainable reinforced concrete designs, and has written and contributed to many articles and publications on achieving durable reinforced concrete.