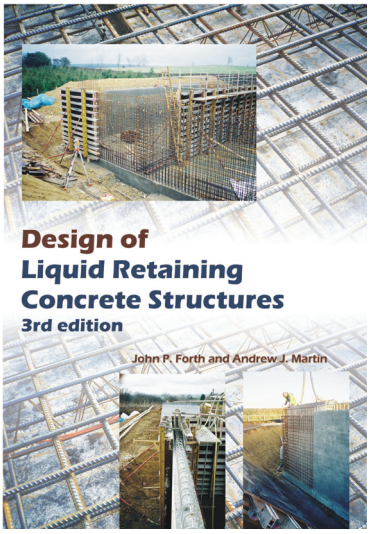
Reviews

Charles Goodchild considers this book an admirable attempt to do justice to a vast and fluid subject. While not covering every nuance, it will be of great benefit to both postgraduate students and practising engineers.

Design of Liquid Retaining Concrete Structures (3rd ed.)



Authors: John P. Forth and Andrew J. Martin
Publisher: Whittles Publishing
Price: £75.00
ISBN: 978-1-84-995052-7

This reincarnation of the classic R. D. Anchor textbook goes through the background to, and process of, designing reinforced concrete in liquid-retaining structures. Similar in content, layout, style and small page format to earlier editions, this third edition has been almost completely rewritten and updated.

It concentrates on designing to the Eurocodes. The book's synopsis promises that the contents will provide "an interpretation of the more theoretical guidance given in the suite of Eurocodes" and "an insight into some of the shortcomings of the code and potential improvements". To a large extent, those promises are fulfilled. The arguments are current, but in some instances give the impression of being opinionated.

The first chapter gives a very good introduction and outline, but is somewhat disturbed by a discussion on the need to add restraint and loading stresses. Chapter 2 covers the basis of design and materials and is generally very informative, discussing principles with the help of some well-chosen anecdotes. One or two issues are left hanging. For instance, are partial contraction joints as per BS 8007 still advocated? How do 'severe' and 'very severe' align with exposure classes in BS 8500?

Chapter 3 is full of clear explanations with informed commentary on, and discussion about, reinforced concrete design issues. An excellent section explaining calculation of crack widths due to combined bending and tension (3.6) is somewhat undermined later when the worked example illustrates the normal and pragmatic approach of undertaking separate crack width checks. The explanation of the 'shift rule' is unconventional. An extended discussion about shear is possibly misplaced and opinion dominates the discussion on deflection.

A separate chapter on the design of prestressed concrete, by Dr J. A. Purkiss, is again clear. Frustratingly though, not all the parameters are fully explained and, when the worked example of a circular tank illustrates differences between first principles and EC2, there is no comment.

Chapter 5 covers design for thermal and shrinkage stresses in restrained panels, including the principles of cracking, crack distribution and reinforcing to control crack width. It opens by explaining the history and difficulties behind these aspects of design. The text is clear and up to date with current thinking. Eurocode modifications to surface zones, critical steel ratio, maximum crack spacing (flexural and imposed strain) and edge are highlighted and discussed in detail. Slightly more could have been said about parameters such as T_1 and α_c and different opinions could be argued (such as on the background to the determination of s_{max}). There is a good explanation of joints but little advice on their use and placement. But, all in all, the text is comprehensive and lucid.

The worked example is of the same subterranean pump house used in the second edition – only this time it is to the Eurocodes. Again, the clarity is exemplary and perhaps explains why the 13 pages of calculations in the second edition have turned into 37 pages in this edition (it is not just the Eurocodes!). Readers may be interested to note that in the wall the vertical designed steel, Y16@175, has become B16@150 and horizontally, Y16@200 has become B16@150!

Unlike in the Eurocodes, testing is covered well. However, 'Vapour exclusion' is a curious title for a short chapter dealing with concrete basements, which is somewhat disappointing.

The book does not cover everything the title might suggest. It does not cover non-aqueous liquids, moment factor charts, computer methods, finite element or grillage analysis, data on T_1 (early thermal peak to ambient temperature), commercial drivers etc, so it cannot stand alone. It has also lost the reservoir example. The sprinkling of typographical errors tends to detract from the authority of the text ("cot 45 = 2.5"!).

However, it would be wrong to dwell on minor criticisms. The book is well researched, written and produced and it reads very well. Towards the end there is a statement that "... insufficient design guidance can result in a structure that is

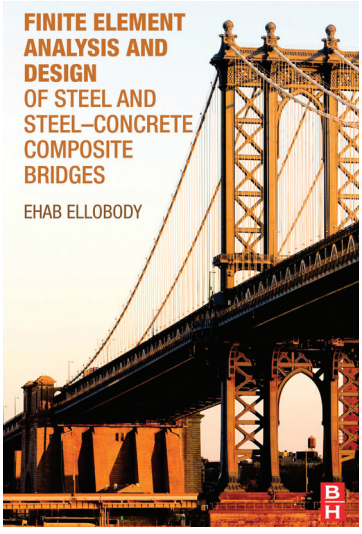
less than completely watertight". Does the book provide sufficient guidance? The answer is a qualified 'yes'.

In conclusion, this book tackles a specialist subject that few other publications do. It is a massive topic – one with many specialisations, opinions and nuances – and some issues are in a state of flux. So to steer a course through it all is to be admired and congratulated. To cover every nuance and differing opinion would be impossible and would make for far less clarity. Just like its predecessors, this edition will become a great boon to its target audience of practising civil and structural engineers and postgraduate students. It is indeed a modern-day 'Anchor'.

Charles Goodchild BSc, CEng, MCIOB, MIStructE
Charles Goodchild is Principal Structural Engineer with MPA–The Concrete Centre. Charles has worked for contractors, both in the UK and abroad, and for consultant engineers. In 1991, he joined the Reinforced Concrete Council, which was subsumed in 2003 into The Concrete Centre, which itself became part of the Mineral Products Association (MPA) in 2009. Here, he continues to promote efficiency in concrete design and construction in reinforced concrete structures by managing and writing publications, attending to codes and standards, managing software development and interest groups and giving talks and lectures. Notable among his productions are the suite of RC spreadsheets and the publications *Economic Concrete Frame Elements to Eurocode 2* and *Concise Eurocode 2*. He is currently working on the continuing implementation of EC2 in the UK.

Ali Mahdi finds this book on steel and steel-composite bridges to be a useful source of information for students – both undergraduate and postgraduate – with something for the practising structural engineer too.

Finite Element Analysis and Design of Steel and Steel-Concrete Composite Bridges



Authors: Ehab Ellobody
Publisher: Butterworth-Heinemann
Price: £95.00 (hardback); £95.00 (ebook)
ISBN: 978-0-12-417247-0

I found this book an excellent source of information for undergraduate and postgraduate students, as well as for practising structural engineers. In addition, it might prove invaluable to asset management engineers who are looking for specialist techniques to explore the true strength of steel and steel-composite structures. Particularly when assessing existing bridges, they might find it helpful to refer to the excellent computational and materials modelling techniques included in the book. I have found that using these specialist techniques helps to determine a higher latent strength of existing structures compared to what is implied in some design standards.

Some of the content of the book would be of more interest to academics (postgraduate students) than to practising engineers, but I also found the list of international experts in the fields of steel or steel-composite structures provided in the references very useful.

Like any other publication, the book has limitations. For example, when it comes to railway loadings, this reviewer could not ascertain where the book addressed track/deck interaction or rolling stock loadings, but it could be considered that these should be viewed as *ad hoc* and project-specific loadings.

Commenting on chapters 4–7 as a whole, which present the modelling and examples, we often need to verify constitutive and computational models and it would have been helpful if the author had provided a simple manual verification example.

Limitations in certain areas not withstanding, this is an excellent source of information.

Dr Ali A K Mahdi BSc, MSc, PhD, CEng, MICE
Dr Mahdi is an associate director with 27 years of experience. Over the years, he has worked on design, design management and construction of concrete, steel and steel-composite highway and railway bridges around the world, using re-measured, DBFO (design, build, finance and operate), D&B (design and build), and ECI (early contractor involvement) contracts. He completed his undergraduate and postgraduate studies in the UK and his PhD in Structural Engineering was sponsored by the UK Science and Engineering Research Council and a group of UK companies. He is a recipient of the Henry Adams Award from The Institution of Structural Engineers.