Book review

Reinforced Concrete Beams, Columns and Frames: Mechanics and Design

C. Casandjian, N. Challamel, C. Lanos and J. Hellesland. Wiley, Hoboken, NJ, USA, 2013, ISBN 978-1-84821-482-8 (print), 978-1-11863-951-1 (online), doi 10.1002/9781118639511, US\$145.00, 320 pp.

This book is aimed at masters-level students, engineers, researchers and teachers of reinforced concrete design. The authors are very distinguished and have considerable expertise in the fields of structural mechanics as well as the teaching of reinforced concrete design in the French educational system. The book gives a very theoretical treatment of the flexural design of reinforced concrete beams, columns and frames in which the emphasis is firmly placed on mathematical exactitude rather than practical application. The emphasis on theory is the main strength of the book, which will be of most interest to mathematically inclined engineers. A minor quibble is that the index is very limited in scope and as such is of little use. The authors' treatment of flexural design is very different from that commonly encountered in text books on reinforced concrete design, and as such fills a gap in the literature. There is some discussion on the influence of the concrete and reinforcement material properties on the flexural response, but it is more mathematical than design oriented in nature. The book includes a useful section on bending curvature at the ultimate limit state and plastic hinge development, but surprisingly makes no detailed reference to the influence of tension stiffening or bond slip on hinge rotation. The emphasis on the mechanics of hinge development is, however, valuable.

The book's focus on mathematical exactness rather than actual behaviour or practical design would seem to reflect the different educational philosophies of the UK and France. As a broad generalisation, engineering education in the UK is more applied and specialised than in France, where more emphasis is placed on mathematical rigour. Consequently, I suspect that the book's approach will be considered over-theoretical for masters-level students by most if not all teachers of reinforced concrete design in UK universities. The mathematical exactness of the book is its strength, but a downside is that the range of topics covered is rather limited. For example, there is no discussion on the flexural design of cross-sections with multiple layers of reinforcement or asymmetrical geometry, which are commonly encountered in practice. This is perhaps a consequence of the emphasis on mathematical precision rather than practical design. In practice, numerical rather than analytical methods are needed for the flexural design of reinforced concrete sections with multiple layers of reinforcement such as columns and shear walls. More surprisingly, the book makes no mention of design for shear, which is of fundamental importance for the design of reinforced concrete members. To summarise, this is a valuable book for engineers wishing to gain an in-depth knowledge of the mechanics of idealised reinforced concrete sections. However, it may be of less interest to practising engineers involved in the design of complex structures in which a more pragmatic approach is frequently required.

Robert Vollum