Book review

DURABILITY OF MATERIALS AND STRUCTURES IN BUILDING AND CIVIL ENGINEERING

C. W. Yu and J. W. Bull, Whittles, Dunbeath, Scotland, 2006,
ISBN 978-1870325585, £95-00, 458 pp.

This book provides a review of the durability of the principal materials encountered in structures including concrete, steel, timber, masonry, aluminium and fibre-reinforced plastics. There are references to stone in the chapters on masonry, but these do not give a comprehensive treatment of the material. Durability is related to exposure and hence geographical location. The book is written with reference to British conditions and British standards. Some chapters extend the scope to other parts of the world but this is not comprehensive, for example, there is a chapter on concrete in the tropics but not one on concrete in the Middle East.

There are 16 chapters, most of which are written by different authors. The split authorship is understandable given the wide subject matter, however the chapters appear to have been written independently with little cross-referencing, resulting in a degree of repetition. For example, several chapters are primarily concerned with corrosion and the basic processes are described each time. Similarly, several chapters refer to chemical attack on Portland cement. It would be helpful to have these processes described once in slightly greater detail.

The division of materials into chapters is not always completely satisfactory. Steel is covered in two chapters, one dealing with general structural steel and the other with steel in the ground and this works well as the scope is clearly different. The two chapters on fibre-reinforced plastics, however, have a much greater overlap and this is even greater in the case of masonry, where there are four chapters but there is no clear distinction in the material covered.

While the book has a wide scope there are several omissions. The lack of reference to high alumina cement is perhaps

understandable as the structural use of this material has been banned in the UK for many years. Its inclusion would, however, be useful as it may be encountered when dealing with existing structures. The lack of reference to the thaumasite form of sulfate attack on concrete and problems with post-tensioned concrete are more surprising given the difficulties that have been encountered, particularly in highway bridges. The references to alkali-silica reaction are also rather brief given the concern it has caused. Some mention of weathering steel might have also been helpful.

Each author approaches the subject in different ways, from those providing a general overview with insufficient detail for practical application to those providing guidance appropriate for application by a practising engineer and, finally, to those more suited to a specialist. The different style of the chapters is illustrated by comparing the chapters on aluminium, the use of steel in the ground and concrete structures in the tropics. The chapter on aluminium is more suited to a general book on materials than one on durability as less than half the chapter is directly related to durability. This is interesting material but means that the durability issues receive insufficient detail; for example, anodising is highlighted as a means of protection but is covered in a single paragraph. The chapter on steel in the ground presents a clear analysis of the corrosion risks involved and gives guidance on how these may be assessed and appropriate protection provided; reference is made to codes and other documents for more complex cases. The chapter dealing with concrete in the tropics includes a review of relevant research but does not provide information that can be readily applied by the practising engineer.

It follows from the comments above that this book cannot be recommended as a comprehensive reference on the durability of construction materials but may be a useful addition to a library.

ALAN KEILLER
Centre for Window and Cladding Technology