Book review

Practical Building Conservation: Concrete

Historic England, Ashgate, Surrey, UK, 2013, ISBN 978-0-7546-4565-8, £70.00 (hardback), 320 pp.

The original five-volume series *Practical Building Conservation: English Heritage Technical Handbook* was published in 1988. *Concrete* is one of the ten volumes in the revised and expanded series produced within the last few years.

While the inclusion of *Concrete* within the series might be seen as surprising by some, it recognises that concrete has been in use in various forms for thousands of years. Applications over the last 150 years in particular, since the early use of artificial cements, are described in the book. Its publication is timely as the conservation of a number of twentieth century-listed buildings becomes a pressing, if sometimes controversial, issue, and the advice the volume contains is, of course, of wider value for the large range of structures dating from this period. It is acknowledged that where exposed concrete has been used, the original details in many cases were not conducive to ensuring that the material weathered sympathetically; this applies to both architectural detailing such as drips and finishes and also design problems such as low cover to reinforcement and historical use of calcium chloride. One reason why twentieth-century concrete has had a bad press is the experience of weather-stained surfaces, rust staining from corroding reinforcement and areas of cracking and spalling.

The point is well made in the introduction of the book that experience in the conservation of concrete, rather than its repair, is relatively limited; given the relatively recent application of some of the treatments carried out to date, there is a shortage of documented evidence as to their effectiveness in terms of longevity and weathering. The book does include, however, an excellent series of case studies to the extent that these have been used and evaluated.

Concrete is used as a structural material and also in different non-structural applications. During the twentieth century, there were developments in both the constituent materials and the construction techniques. The chapter on the 'Development and Use of Concrete' provides a timeline through the structural use of mass concrete in buildings and structures, the early Hennebique reinforcement system and the use of pre-stressing through modern movement architecture and post-war buildings. There are further sections on the properties of concrete, its constituent materials and surface treatments.

Thus, in addition to looking at conservation aspects, this volume provides an informative and well-illustrated overview of the development of architectural styles and use of concrete in the twentieth century.

Indeed, it is only quite a long way through the book that the chapter 'Treatment and Repair' is found, followed by the case studies referred to earlier. These include examples of the use of different repair materials and techniques, reinforced concrete in a marine environment (of relevance for a number of piers, breakwaters and other historical coastal structures) and repair of finishes. Repairs using traditional and more recent proprietary materials are discussed. This is felt to be entirely appropriate given the extensive developments in the constituent materials of concrete during the timescale considered.

Like the other volumes in the series, this one is well illustrated with colour photographs. Some of these, for example those illustrating 'Modern Movement Architecture' and 'Mass Concrete' in the 19th Century, are probably of a more general interest. For this publication, however, it is those showing defects and the use of different repair techniques and the resulting surface finishes which are likely to be of the most value.

There is a short but authoritative chapter on 'Care and Maintenance' in conclusion, emphasising the vital need 'to incorporate effective regular maintenance into the conservation structure'. This serves as a useful reminder that this 'modern' material should be treated no differently in principle from more 'traditional' materials. The glossary fills 17 pages covering an extensive range of terms relating to the constituent materials, testing techniques, deterioration mechanisms and construction terminology; it alone constitutes a short and valuable guide to concrete construction.

This is a publication with a particularly wide scope, and it will be of interest and use to those involved with the conservation of concrete in both structural and non-structural applications. The explanations and illustrations of deterioration mechanisms, the treatment of defects and the impact on appearance are particularly informative. It is to be hoped that those involved in such work will both heed the advice it contains and where practicable provide feedback on the results. This is an area where experience will continue to develop.

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