Book review

Concrete structures: repair, waterproofing and protection

Philip H. Perkins

Published by Applied Science Publishers Ltd, London, 1976. Type-set, illustrated, hard-back. 238 × 148 mm. pp. x, 302. ISBN 0 85334 697 6. Price: £16.00.

No matter where he may be working and no matter how good the office library, every engineer likes to build up his own private library. This book would be a useful reference for anyone concerned with design and construction or repair and maintenance of building or engineering works.

The author is an authority on the use of concrete with many years of experience in working for the Cement and Concrete Association. He has previously written a book on *Swimming pools*, as well as various advisory publications for the C & C A.

The present book covers a very wide subject in a comprehensive way and yet good paragraph numbering and indexing have helped to create a sense of order. It might have been better, however, if the paragraphs on the deterioration in concrete caused by 'calcium chloride in the mix' and the 'effects of fire' had been included in Chapter 2, "Factors controlling the deterioration of concrete, steel etc." rather than in Chapter 3, which is in any case the longest in the book.

The first chapter quite logically concerns itself with materials of all sorts which might be involved: cements, aggregates and admixtures, jointing materials and all the latest products of the chemical industry, i.e. epoxide and polyester resins, and latex emulsions.

Chapter 2 makes the interesting point that, although no material is free from deterioration, some pozzolanic concretes have lasted 2000 years. In this chapter, factors involved in the deterioration of concrete are extensively covered, including cavitation in water channels and the attack on reinforcement,

embedded in concrete made from sea water, due to the presence of excess chlorides.

The main part of the book consists of chapters on the repair of concrete building structures (80 pages), the repair of water-retaining and water-excluding structures and protection against chemical attack. Architects will be interested in the sub-section on the repair of external tiling, mosaic and slip bricks, which in fact gives useful advice on design so that the problem of repair should not arise. While discussing water-retaining and -excluding structures, the author describes acceptance testing of reservoirs and the tracing of leaks which are known to exist. The problem of sealing leaks from the side remote from the water source—much more difficult than sealing from the water side—is discussed. The sealing and repair of sewers and tunnels is a subject of some importance. Examples of problems and methods used to overcome them are given.

The subject of Chapter 6 is the protection of concrete structures against chemical attack. Problems discussed include the effect upon piles and foundations of aggressive subsoils; the attack on sewers from two-stage bacterial action, and protection from aggressive flue gases.

Marine structures which are also subject to chemical attack are dealt with separately. Attack is particularly severe in places such as the Red Sea where high temperatures combine with a highly saline sea. Repairs under water or in the tidal zone which tax the ingenuity of the engineer are described.

It may seem a pity to carp at such a well thought out

book but, in the opinion of this reviewer, the 29 pages of Appendixes 1, 2 and 3 could have been dispensed with. They list standards and codes from thirteen countries together with useful addresses from seven countries. Purchasers might well have preferred to forgo this information for the sake of a small saving in the purchase price. Appendix 4 gives useful information on non-destructive testing, core testing and load

testing. Appendix 5 outlines the Rapid Analysis Machine which has been developed by the Cement and Concrete Association for the analysis of the cement content of fresh concrete.

The book is well bound and clearly printed on good quality paper. It includes an alphabetical index and is illustrated by a number of photographs and sketches.

ROY GALBRAITH

Earthquake resistant design

A manual for engineers and architects

D. J. Dowrick

Published by John Wiley & Sons, London, New York, Sydney and Toronto, 1977. Type-set, illustrated, hard-back. 238 × 158 mm. pp. 374. ISBN 0 471 99433 2. Price: £12.50, US \$25.00.

We regret that the sterling price of the above book was printed in our last issue as £2.50. This should have read £12.50. The book is still strongly recommended.