

Book reviews

Concrete mixes — planning and design for transporting, placing and finishing. Report 165.

C. G. T. Masterton and R. A. Wilson

CIRIA, London, 1997. 82 pp. ISBN 0 860 17470 0. ISSN 0305 408 X. £59.00

This report by C. G. T. Masterton and R. A. Wilson supersedes CIRIA Report 17 produced in 1970 on a similar topic. It describes current good practice in the UK and includes recent developments in constituent materials which enable mix designs for fresh concrete properties to be matched to modern methods of construction, transportation and placing. The steering group which guided the project consisted of 14 experts in concrete design and production from industry and one respected academic so that the recommendations are soundly based on a wealth of practical experience.

The report is divided into six sections, including an introduction and recommendations for further work. The main parts relate to 'design', 'construction planning', 'factors influencing mix design' and 'case studies'.

The section on design includes approaches to specification such as performance specifications and prescriptive approaches and makes extensive reference to BS 5328. Methods of assessing compliance are covered in some detail, and the actions to be considered in the event of non-conformity are outlined.

The importance of construction planning is detailed, including the whole process of production, transporting, placing, compaction, finishing and testing. A plea is made for the development of a test method for 'cohesiveness', which has defeated the industry for more than 100 years.

The longest chapter deals with factors influencing concrete mix design. Emphasis is given to the need to continually refine the design both in the planning pro-

cess and as the contract progresses in order to take into account changing conditions. Thus good communication between the various parties forms a part of the design process. The design is centred around the fresh state rheological properties of concrete appropriate to the construction operations. Thus importance of workability, cohesion, placing method, time and the environment are all given prominence in the design process. Some useful nomograms and tables are provided to assist the mix design and modification procedures.

The other major section includes case studies which illustrate the application of the previous chapters to a range of notional scenarios. Seven case studies are provided which cover only C30 and C40 concrete. The applications are for: an internal floor slab; early formwork striking; pumpable concrete; large-volume pours; air-entrained bridge deck; column pour in hot, dry conditions; and a water-retaining tank floor. Templates are given to ensure that all relevant parameters are included.

The reference list gives 65 publications.

To summarize, the report is a useful state of the art for general concrete construction but it does not include information on roller-compacted concrete, underwater concreting, road paving, slip-forming, microsilica concrete and sprayed concrete which could well form the basis of a separate report. Many engineers directly involved with concrete construction will nevertheless find this a valuable document.

D. J. HANNANT

RILEM report II. Interfacial transition zone in concrete

J. C. Maso (editor)

Spon, London, 1996. 178 pp. ISBN 0 419 20010 X. £55

This book of 178 pages contains nine chapters contributed by authors from several countries who were members of RILEM Technical Committee 108-ICC 'Interfaces in Cementitious Composites'.

The initial two chapters are concerned with interface microstructure, providing a good overview of the techniques that are available for characterizing the distinctive compositional and pore structural features of interfacial transition zones and reviewing current knowledge of microstructural characteristics of these important regions within concretes and cementitious composites of various kinds. There then follow three chapters devoted to mechanical properties of interfacial zones, covering experimental methods of measurement and modelling approaches. The final section of the book contains four chapters dealing with various aspects of the influence of interfacial transition zones on properties of concrete. These include a review of the

role of interfaces in relation to composite mechanical properties, an attempt to summarize the present state of knowledge of the significance of transition zone percolation on mass transport characteristics and chapters which address the effects of environmental exposure and ageing.

Overall the book succeeds in highlighting a number of the areas of current research interest where progress is being made in understanding and learning how to modify the interfacial transition zones that are now known to affect substantially properties of concrete and other cement-based materials. The field has advanced considerably in recent years and the publication of this book is therefore timely. It will be of use mainly to researchers and represents good value for money at the price of £55, given the high quality of the technical contents and standard of production.

C. L. PAGE

Alkali-aggregate reaction in concrete roads and bridges

G. West

Thomas Telford, London, 1995. 163 pp. ISBN 0 727 72069. £35

This book of 163 pages provides a detailed review of the problem of alkali-aggregate reaction in concrete roads and bridges, concentrating mainly on experiences in the UK. It is written by a geologist who was formerly Head of the Aggregates Section at the Transport Research Laboratory.

The first two chapters provide an introduction to concrete materials and to the nature of alkali-aggregate reactions, with particular reference to the alkali-silica reactivity of certain British sands and gravels. Chapters 3 and 4 describe the occurrence of the alkali-silica reaction in UK roads and bridges, drawing on the findings of a number of surveys conducted during the 1980s and comparing the observations with those reported in other countries. There then follows a brief account of structural effects of alkali-aggregate reaction and a useful review of the methods of identifying the problem, distinguishing it from other forms of damage that may be observed during bridge inspections and similar fieldwork. Chapters 7 and 8 deal with the

related issues of methods of prevention of alkali-aggregate reaction problems in new construction and with specification and testing to ensure that risks are minimized; these sections contain material that was the subject of significant research debate at the time of publication of the book but a number of aspects have subsequently been clarified. The final chapter of the book gives a brief account of management strategies for dealing with roads and bridges that are affected by alkali-aggregate reaction and mentions the possible risks of inducing such effects if certain electrochemical methods of controlling reinforcement corrosion are applied without due care to structures containing potentially reactive aggregates.

The book as a whole is well produced and will be useful primarily to engineers who require a practical guide to the problems of alkali-aggregate reactions in highway structures. It is reasonably priced at £35 (UK and Europe)/£40 (elsewhere).

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