BOOK REVIEW

Concrete Structure, Properties, and Materials

Reviewed by Philip D. Cady, Professor of Civil Engineering, The Pennsylvania State University, University Park, PA 16802.

REFERENCE: Metha, P. K., *Concrete Structure, Properties, and Materials*, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1986, 450 pp. + xxvi, ISBN 0-13-167115-4.

Reflective of the author's 30-year experience and international reputation in the fields of cement and concrete, this book is an excellent coverage of the state of the art. Though written primarily as a textbook for undergraduate civil engineering students, practicing civil engineers will find it to be a valuable reference source.

The book is divided into three parts. Part I deals with hardened concrete and includes discussion of internal structure, strength, dimensional stability, and durability. Part II—concrete materials—covers hydraulic cements, aggregates, admixtures, mixture proportioning, properties of fresh concrete, and quality assurance. Part III deals with specialty concretes including structural lightweight, high-strength, flowable, shrinkage compensating, fiber reinforced, polymer-containing, heavy-weight, and mass concretes. The approach taken by the author relative to the order of presentation of the topical items is innovative and very effective from both the instructional and professional points of view.

The treatment of the subject matter is very clear and well balanced. In the author's words, "Since concrete tends to behave like *living systems*, it cannot be left solely to mechanistic treatments." Faithful to this premise, he leans heavily on empirical data from laboratory and field experience to supplement theory, making extensive use of illustrations, tables, and graphs to make his points. Though the breadth and complexity of the subject areas preclude exhaustive coverage in a single volume, the author has achieved well-balanced presentations throughout, citing abundant informational sources.

This writer was particularly impressed with the chapter on durability. In the space of a mere 63 pages the author successfully covered completely and in an easily digestible fashion the many facets of this very complex subject. He used selected case histories with particular effectiveness in this chapter.

The book concludes with an interesting chapter on the future of concrete. Here the author speculates on the future volumetric needs for concrete and the practices that will result in a better product. He also compares concrete with steel in terms of satisfying the requirements of future needs.

This book will be a valuable addition to the library of the student, the practicing civil engineer, and the concrete researcher alike.