BOOK REVIEWS

Soil Stabilisation: Principles and Practices

This is a book directed principally to practicing engineers and, as the authors state, in particular to local government engineers in Australia. It is also very suitable as a reference text or collateral reading for undergraduate and graduate level students in civil engineering, engineering geology and soils in whatever country they might reside or practice. The results of some twenty-five years of research and development have been appraised and organized in such a way that the authors are able to state the principles of soil stabilization succinctly and to evaluate the advantages and limitations of the most useful current applications.

Emphasis is placed on providing a comprehensive guide to good engineering practice with the aim of providing sufficient detail to enable the practitioner to make immediate application. In this, the authors succeed reasonably well; there are many criteria and specifications for mechanical stabilizations, much less for cement and bitumen but very few for other types. As a source of information on the various methods of soil stabilization, the book is somewhat less valuable, although a clear, concise discussion of the underlying theory and mechanism(s) is given for nearly all.

Considerable attention is given to the machinery, materials and methods by which the various approaches to soil stabilization are implemented in practice. Generous use of photographs and diagrams aid in making this aspect very clear to the reader. In the case of stabilization by mechanical means, by cement, lime and bitumen and by electro-osmosis, quite detailed instructions are given. Much effort has been expended in sorting, compiling and organizing information on relevant material properties, formulae for mixes, design criteria, performance criteria, testing, etc., for each of the leading methods recommended. CGS units are used throughout but in most cases English units are also given. The authors have been skillful and discriminating in their use of graphs and tables to present generalized relationships illustrating essential principles and the quantitative relationships and data required for immediate application.

The book is systematically and effectively organized. The text is decisively set forth and is remarkably free of grammatical and typographical errors. There are, however, some minor defects. The well known fact that a highly permeable layer such as a sand lens, when confined by less permeable strata, can act as an impermeable barrier is related as a paradox but it is somewhat poorly illustrated and readers unfamiliar with this phenomenon will find it difficult to grasp from what is given. The treatment of the important concept of strength loss due to repeated loading by compaction equipment as well as by traffic is so inadequate that many readers will miss it completely. The effect of compaction on the swelling of clays is not clearly illustrated and unconventional symbols are employed in chemical formulae. Also, the reaction mechanism for lime stabilization is over-simplified. Considering the audience to whom the book is mainly addressed, these are perhaps minor faults. In any case, they are outweighed by the wealth of well organized practical information that is presented.

The book contains extensive listings of reference material. At first glance the coverage seems adequate; however, we are aware of at least one major gap involving the extensive work accomplished by the U.S.A. Army Corps of Engineers over a period of about 30 years in the fields of soil compaction, of soil stabilization with various additives and of dust control. There are no references at all to the primary sources and only a few to secondary or tertiary sources. In several instances, especially in the area of soil compaction, inclusion of these materials would have greatly increased the effectiveness of the presentation. The absence of a discussion of the very promising developments on the concept of membrane encapsulated soil layers (MESC) is also regrettable. This oversight probably is due to the fact that the really significant developments were taking place at the time the book was going to press (the most recent citations are from 1972).

The authors call attention to the lack of a good test for durability of stabilized soils. A sensible balance between simple field tests and more elaborate laboratory tests is advocated. How-ever, the need for a well designed testing program for every application is stressed repeatedly. Standards for quality control are provided and many useful tables, procedures and references are included in the appendices. Because the data, illustrations and discussions involve Australian applications almost exclusively, this book will be of most value to professional engineers, government inspectors and engineers and students in that country. There is, however, much of value to their counterparts in other countries.—D. R. Freitag and DuWayne M. Anderson, US Army Cold Regions Research and Engineering Laboratory, Hanover, N.H.

Irrigation, Drainage and Salinity

This book is the result of an international effort to synthesize modern scientific knowledge of irrigation and drainage principles and practices in relation to the salinity of arid lands. There were 68 contributors to the book and an additional 66 specialists were consulted concerning it. Contributors represented many different countries to truly provide a book of international perspective. The stated purposes of the book are: "(a) to provide a summary of modern scientific concepts in a form convenient for use by administrators, engineers, agronomists, hydro-technicians, soil scientists and other specialists dealing with irrigation and drainage methods and practices in relation to salinity and alkalinity of arid lands; (b) to review procedures for forecasting water requirements of crops and the irrigation and drainage impacts under various climatic conditions, giving particular attention to the prevention of salinity and alkalinity; (c) to discuss irrigation and drainage systems and management problems in relation to salinity and alkalinity; and (d) to assemble data required by the specialists concerned in the design and operation of irrigation and drainage works in the arid zone."

The approach used to prepare the publication was unique. Professor V. A. Kouta, USSR, Professor R. M. Hagan, USA, and Dr. C. van den Berg, The Netherlands, were appointed jointly by FAO and UNESCO as editors. A detailed outline was prepared and numerous specialists were requested by the editors to submit manuscripts as a basis for drafting particular chapters. These materials became working documents which were circulated among other specialists for review and comment. Then the chapters were each edited by one or more of the three editors with some assistance from others for some chapters. Such an approach assures broad coverage of the subject matter, but it allows the bias of the editors and consultants to alter the intended messages of contributing authors.

The book is printed on 8 by 12 inch paper in relatively fine print resulting in a large book containing much information. Numerous illustrations, tables, and formulae are utilized throughout the book to present valuable information. The book is comprehensive, covering most of the technology available on irrigation, drainage, and salinity up to 1965. Unfortunately, the most recent reference cited was published in 1968, and only a few references published after 1965 are cited. There have been recent papers published that would alter or add to the information on some subjects covered by several chapters in this book. This does not detract from the value of the book as an important reference, but it does indicate that certain sections of a book published in 1973 are current only up to 1965 to 1968.

The book contains numerous different writing styles and the emphasis shifts often because there were many contributors from many nations. As a result, the chapters and chapter sections are more readily comprehended by a particular reader than are others because of style and emphasis.

The book begins with a general chapter on irrigation, drainage and reclamation. The social and economic aspects of water resources development and associated irrigation and drainage projects are summarized and a brief review of the irrigation development in the world is presented. A fairly comprehensive