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Book review

WATER IN ROAD STRUCTURES: MOVEMENT, DRAINAGE AND EFFECTS
Andrew Dawson (ed.), Springer, Guildford, 2008, ISBN 978-1-4020-8561-1, £103·00, 438 pp.

This book will be of primary interest to pavement engineers and surface water drainage specialists but is written in such a way as to make the subject of interest to civil engineers from more general backgrounds. The text is generally written in an easy-to-follow manner; however, there are a number of chapters dedicated to more specialist areas, particularly those relating to finite-element analysis, which most readers will find difficult to follow.

The book flows from one chapter to another in a concise and logical manner and thoroughly explains the theory and practice of water movement within the ground and pavement structures. It comprehensively explains the differing modes of groundwater and vapour movement through a soil and the mechanical effects that traffic has upon a pavement structure under varying moisture levels. The text also gives an intriguing insight into the ability of conventional granular materials to self drain and the mechanisms by which this is achieved.

A significant part of the text is given to the subject of pollution flux, retention and subsequent removal from the pavement by additional water flow. Consideration is also given to differing types of soil and their reactions/retention properties to various pollutants that are often found in the general highway environment. Many will find this subject particularly interesting, especially when considering the use of water-retaining pavements in areas of high pollution risk.

Knowledge and practices from other countries are collated and assessed and this gives a thorough background to problems not always associated with conditions prevalent within the UK. Indeed the time given to the freeze–thaw effects on a pavement structure should be a must read for all UK highway engineers.

The section on the practical applications of controlling water and pollution prevention provides a good contrast to the more theoretical parts of the book in which the flows of water through the microstructure of materials is explained in detail. Indeed the section on pollution mitigation provides a good insight into methods of dealing with pollution and the sensitivity of the adjacent environment to accept it.

A significant part of the text relates to the environmental issues concerning groundwater movement and the effects of waterborne pollutants arising from both the construction and operation of the road. Methods of reducing the impact that the road will have upon the general hydrology of an area are explained, together with ways of pollution treatment that often improve the environment from that existing prior to the development.

Overall the book is very well written, adequately illustrated and suitably balanced in its content, and it challenges many areas of conventional pavement drainage practice. Although some chapters are difficult to follow, especially if you are unfamiliar with some of the more specialist aspects, the text is generally very easily understood. Many transport professionals, geotechnical engineers and academic specialists would find it of value and further reading is extensively referenced for those wishing to undertake additional research into the subject.

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