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Water in Road Structures

Movement, Drainage & Effects

Water in and beneath a road pavement has a major impact on the road's performance and its survivability. This book provides a state-of-the-art on the topic of water in pavement, including coverage of the basic theory, where the water comes from, how it may (or may not) be drained, the effect of temperature on the movement, how movements may be modelled numerically, and the impact that water content has on pavement material and subgrade behaviour. It includes sections on instrumentation and monitoring and it deals not only with the water condition, but also with water quality. With increased concerns that road construction may introduce contaminants into the environment, the book also addresses the leaching action of pavement water as well as the opportunities for the pavement to sorb contaminants from pavement run-off. It draws on information from a wide variety of sources, particularly in Europe and the US, both published and unpublished, having been edited by a team of both practising engineers and researchers.

Contents: Preface.- 1. Introduction.- 2. Water flow theory in saturated and unsaturated pavement material.- 3. Measurement techniques for water flow.- 4. Heat transfer in soils.- 5. Water in the pavement surfacing.- 6. Sources and fate of water contaminants in roads.- 7. Contaminant sampling and analysis.- 8. Water influence on bearing capacity and pavement performance: field observations.- 9. Water influence on mechanical behaviour of pavements: constitutive modelling.- 10. Water influence on mechanical behaviour of pavements: experimental investigation.- 11. Modelling coupled mechanics, moisture and heat in pavement structure.- 12. Pollution mitigation.- 13. Control of pavement water and pollution prevention.- Annex A Seasonal variation in pavement design and analysis - some national examples.- Annex B Terminology used for standard pavement and associated drainage items.- Annex C Glossary of words and abbreviations.- Annex D List of symbols.- Annex E List of contributors.- Index.

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