

BOOK REVIEW: URBAN DRAINAGE

by DAVID BUTLER and JOHN W. DAVIES

Mihaela PĂCESILĂ

Academy of Economic Studies. Calea Serban Voda 22-24, Bucharest, Romania
pacesilamihala@gmail.com

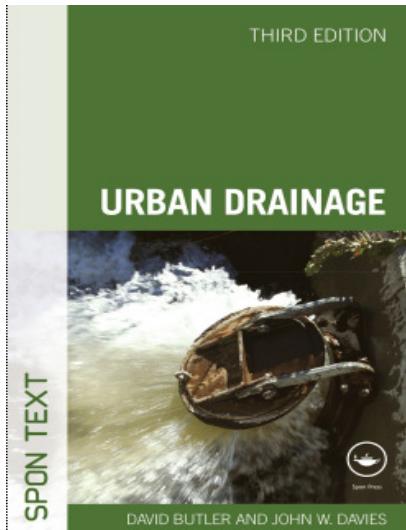
1. INTRODUCTION

In 2011, Spon Press, Taylor & Francis published the third edition of the book „Urban Drainage”, ISBN 0-203-84905-1, 978-0-415-45526-8 (pbk), 978-0-415-45525-1 (hbk), 978-0-203-84905-7 (ebk), written by David Butler and John W. Davies.

David Butler is Professor of Water Engineering at the University of Exeter, Centre for Water Systems (United Kingdom). He is also formerly professor and head of the Urban Water Research Group (UWRG) at Imperial College London.

John Davies is Professor of Civil Engineering at Coventry University, Department of the Built Environment (United Kingdom). The textbook represents a contribution to the development of the literature in the field of the drainage of rainwater and wastewater from areas of human development. The book is not only a source of documentation for anyone that seeks a better understanding of the complexities in urban drainage, but also a reference material providing property information on the potential means through which the decision makers can contribute to the development of sustainable urban drainage systems.

With its relevant subject matter of extraordinary variety and interests, with the design of new systems and the analysis and upgrading of existing infrastructure, with the environmental issues involved, the paper represents a reference pole for undergraduate and postgraduate students, lecturers and



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researchers in the civil engineering fields of water engineering, environmental engineering, public health engineering, engineering hydrology, and related non-engineering disciplines.

With all the explanation, practical tips and plenty of extensive examples given in the text in order to support and demonstrate the key issues that are presented and explained the book also becomes essential for the specialists and practitioners in the area like drainage design and drainage operation engineers in local authorities and also consulting engineers.

The book contains 625 pages and 25 chapters very rich in engineering concepts, theories and principles and provides a descriptive overview and analysis for each topic.

The first chapter „Introduction” explains the concept of urban drainage and the effects of urbanization on drainage. The authors underline the fact that the interaction between human activity and the natural water cycles makes necessary the drainage systems in urban developed areas. They also insist on the important role of urban drainage in maintaining public health.

The second chapter “Approaches to urban drainage” presents the types of urban drainage systems specifying that much of this chapter and of this book is dedicated to pipe systems which can be also combined or separate.

The third chapter “Water quality” offers information on water parameters, processes, impacts and standards. The first part highlights the basic approaches for characterising the wastewater and stormwater. The end of the chapter presents the legislation and the regulatory regime in the field. According to the Urban Waste Water Directive the member states are obliged to build water collection system in all urban areas (with 2000 or more people).

The following chapters of the present book, entitled “Wastewater”, “Rainfall” and “Stormwater”, provide information and summary data about the concepts mentioned: wastewater, rainfall and stormwater. These chapters are a highlight to better understand the following chapters because the methods, data and techniques presented will be used in subsequent chapters on design and analysis.

The seventh chapter “System components and layout” provides an overall description of the elements which are included in an urban drainage system. The chapter also focuses on the main stages in the design process that are largely described.

The eighth chapter “Hydraulics” describes the basic hydraulic principles useful for urban drainage. The aspects of hydraulics, especially those relating to special features are also presented in the ninth chapter “Hydraulic features”

The tenth chapter "Foul sewers" explains how the foul sewers are designed in order to collect wastewater, to be completely dedicated to wastewater. In the eleventh chapter "Storm sewers" the text refers to the properties and the design of systems for carrying stormwater. The chapter introduces the concept of the design storm and presents in detail the method required when designing piped storm sewers.

In the twelfth chapter "Sewer flooding" the notions of exceedance flow and flood risk in urban areas are defined and largely explained. The authors also provide a descriptive overview of the appropriate management strategies and the latest strategic approaches in the field.

The thirteenth chapter "Combined sewers and combined sewer overflows" represents a continuation of chapter 2 where the sewer systems were described. The special characteristics of combined sewers and in particular combined sewer overflows are presented here, specifying the fact that they carry both wastewater and stormwater in the same pipe.

The fourteenth chapter "Storage" presents and describes the functions of storage, the shapes, size and configurations of storage devices. The routing methods that calculates the relationship between inflow and outflow is also explained.

The fifteenth chapter "Pumped systems" describes, as the title says, the pumped systems. The first part explains how pumping systems work. Then, the overall methods and technology used for pumping are presented. The end of this chapter is dedicated to the non-gravity systems used for more general applications.

The first part of the sixteenth chapter "Structural design and construction" focuses on some physical aspects of sewer pipes and their design, especially the structural design of open-trench sewers. In the other parts of the chapter three method of construction are described: open-trench construction, tunneling, trenchless construction.

The seventeenth chapter "Sediments" deals with the origins, characteristics, problems and the effects of sediments. The authors specify that they are deposited on catchment surfaces, in gully pots and in drains and sewers. The authors also describe a design method that takes sediment clearly into account.

The eighteenth chapter "Operation, maintenance and performance" explains why the maintenance of a drainage system is needed ("to maintain the operational function of the system and to extend its working life"). Then, there are presented the sewer location and inspection methods, which are considered tools of the maintenance and the sewer cleaning techniques used for removing sediments, aiding sewer

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repair, etc. The end of the chapter points out that a considerable quantity of energy is used by the water industry.

The nineteenth chapter "Rehabilitation" highlights the need for rehabilitation and presents the sewer rehabilitation as being one of the main areas of activity of the drainage system. Another section describes the methods of repair and renovation suited to man-entry sewers and non-man-entry sewers.

The next chapters "Flow models" and "Quality models" describe the modeling drainage systems. The twentieth chapter presents the models covering hydrological and hydraulic aspects of modeling and the chapter twenty one deals with the requirements which are common to all methods of quality modeling.

The chapter twenty two "Storm water management" presents the alternatives to piped systems for storm water which were described in the eleventh chapter. The function and operation of constructed wetlands in storm water management are also considered. The authors also point out the methods for improving the quality of storm water from residential development and their benefits in relation to structural measures.

The chapter twenty three "Low-income communities" deals with the two urban drainage services: sanitation and storm drainage. They are considered very important in reducing economic loss due to flooding, especially in communities facing financial problems.

The chapter twenty four "Integrated management and control" focuses on the future direction of the management of urban drainage system. The main in-sewer transformation processes and the benefits of in-sewer water treatment are also considered.

The last chapter, twenty five entitled "Towards sustainable water management" defines the concept of sustainable development and discusses the sustainability of the existing urban drainage systems. The end of the chapter makes some speculations on urban futures and possible urban water systems.

The content of this book is relevant not only to its field of study that reflects changes in the practice and priorities of urban drainage, but also to other areas such as: environmental science, technology, policy and planning, geography and health studies. Presenting and explaining concepts such as wastewater, rainfall, stormwater, sewer flooding, flow models, quality models, sustainable urban drainage systems, the authors seek to avoid some of the problems of flooding and wastewater storage and to look for more innovative sanitation techniques and services.