

This article was downloaded by: [UCL Service Central des Bibliothèques]

On: 15 December 2011, At: 01:15

Publisher: Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Journal of Hydraulic Research

Publication details, including instructions for authors and subscription information:
<http://www.tandfonline.com/loi/tjhr20>

Wastewater hydraulics

Sandra Soares-Frazão^a

^a Institute of Mechanics, Materials and Civil Engineering, Université catholique de Louvain, Louvain-la-Neuve, Belgium

Available online: 06 Oct 2011

To cite this article: Sandra Soares-Frazão (2011): Wastewater hydraulics, Journal of Hydraulic Research, 49:6, 842-843

To link to this article: <http://dx.doi.org/10.1080/00221686.2011.614723>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Book review

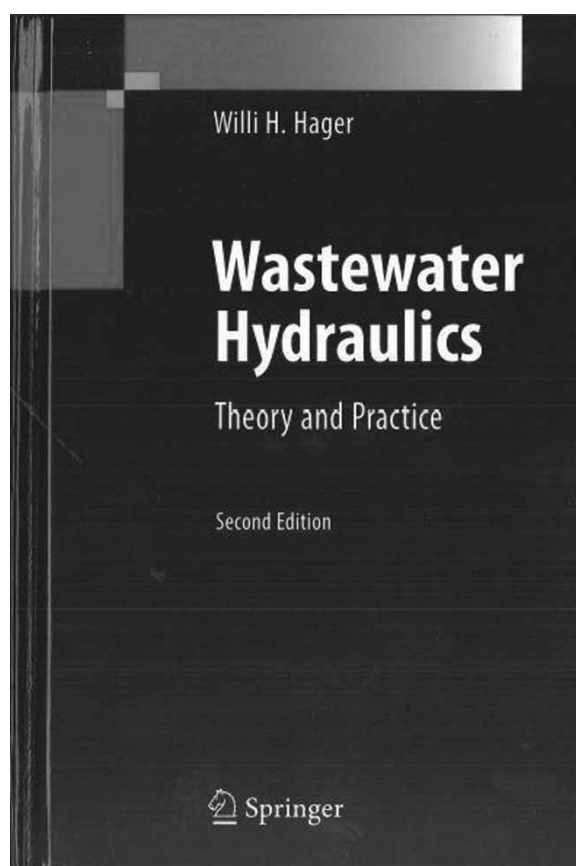
Wastewater hydraulics

By WILLI H. HAGER, *Heidelberg, Germany, Springer, ISBN 978-3-642-11382-6, 652 pages, price around €99,95, 2010*

The title “Wastewater hydraulics” is clear. This book is not just a book about wastewater in general: the reader will learn nothing about polluted water, clogging and settling of solid matter, biological processes or wastewater treatment, but he will find wide information on hydraulics related to urban drainage. As was already pointed out by the author in the preface to the first edition “... because sewage is similar to water from the hydraulic point of view, wastewater does not really vary from common engineering hydraulics”.

Accordingly, this is an excellent book of general hydraulics, but with applications and examples focused on wastewater elements. It is a true engineering book, based on the simple but smart idea that sewers are nothing else than channels of fixed and mainly limited dimensions. So, sewer flows are representative of all the main types of flows that a hydraulic engineer will have to face in his daily practice. Thanks to the fixed and limited dimensions of sewers, it was possible for the author to reproduce realistic scale models of many particular situations in the lab. Numerous photos taken from such scale models considerably enrich the book by providing convincing examples related to the associated theory.

Sewers also have the advantage to offer such a wide range of hydraulic problems that they provide applications and examples to all aspects, even the most complex, of the basic hydraulic theory. Hydraulic jumps or backwater curve calculations, in-depth analysis of sub- and supercritical flows under various geometrical conditions, detailed considerations on critical flows, or distributed in- and outflows along the sewer are only some examples of the topics covered by the book. This in-depth analysis of physical problems is a true added value of the book. Contrary to many other textbooks on general fluid mechanics, this book offers from the beginning an engineering approach, which is certainly associated with the background of the author, who started working as a wastewater engineer before turning into a university professor with a strong interest in experimental work and



methods. Throughout the book, there is a strong concern about both the physics of the described phenomena and the engineering application of the results. There is no doubt that this close link between fundamental theory and practice was the key reason for the success of the first edition. This is also the reason why this second edition is really welcomed.

In addition, the design of sewer systems is more than ever a task of paramount importance for hydraulic engineers. In developed countries, new challenges are posed by the global climate

change: how many sewers appear to be under-designed if new types and intensities of rainfalls are to be considered? In developing countries, water distribution and drainage schemes are key challenges to improve the daily life conditions, especially in large cities with a rapidly growing number of inhabitants.

The second edition, somewhat longer than the previous, covers basic hydraulic principles, including uniform flow, critical flow, hydraulic jumps and backwater curves, but also more specific aspects related to sewers. These include throttling devices, overfalls and manholes together with discharge measurement devices, side weirs, side channels and bottom openings. For each specific device, the different possible flow profiles are presented and illustrated by means of laboratory experiments and real-life examples. It must be outlined that all illustrations are of very good quality and particularly clear. A special care was taken by the author to present clear photographs of the flow in black and white colour: for example, all pictures taken from laboratory experiments show a good contrast and appropriate lighting to ensure a proper identification of the water free-surface and of the flow direction. The same care was taken in the design of the numerous definition sketches: all legends are clear and legible; the variables are well defined on the sketches with the same notations as in the main text to allow for an unambiguous identification. For example, in the chapter devoted to mobile discharge measurement, the principles of the mobile Venturi flume are explained, by comparison with classical fixed devices, then the different possible shapes of both the flume and the

constriction device are presented and for each case, detailed sketches and clear photographs of the flow are provided. The different discharge relations are detailed and the influence of the most relevant parameters is presented. Finally, practical engineering aspects are discussed, such as the fixation of the device, the need for optimized design or the presence of solid matter in the flow.

Furthermore, besides the clear theory and illustrations, numerous examples of practical calculations are provided, with detailed explanations on how to perform the calculations. These examples are highlighted in light grey colour throughout the book, allowing for a quick identification when looking for a specific application in the corresponding chapter.

As a conclusion, this book can certainly be considered as a reference text book, not only in wastewater hydraulics, but more generally in open-channel flow. It can be used for teaching graduate students as the approach is very comprehensive. Actually, any hydraulic engineer, being researcher or practitioner, will take advantage to have it at hand, for rapid look-up or in-depth thinking.

Sandra Soares-Frazão

Institute of Mechanics, Materials and Civil Engineering,
Université catholique de Louvain,

Louvain-la-Neuve, Belgium

Email: sandra.soares-frazao@uclouvain.be

© 2011 Sandra Soares-Frazão