



HYDRAULIC STRUCTURES

THIRD EDITION

P. Novak, A. Moffat, C Nalluri and R. Narayanan

**Also available as a printed book
see title verso for ISBN details**

Hydraulic Structures

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Third Edition

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Spon Press

Taylor & Francis Group

LONDON AND NEW YORK

First published 2001 by Spon Press
11 New Fetter Lane, London EC4P 4EE
Simultaneously published in the USA and Canada
by Spon Press
29 West 35th Street, New York, NY 10001

This edition published in the Taylor & Francis e-Library, 2004.

Spon Press is an imprint of the Taylor & Francis Group

© 1990, 1996, 2001 P. Novak, A.I.B. Moffat, C. Nalluri and R. Narayanan

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British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data

Hydraulic structures/P. Novak ... [et al.].— 3rd ed.
p. cm.

Includes bibliographical references and indexes.

1. Hydraulic structures. I. Novák, Pavel.

TC180 .H95 2001

627—dc21

00-052637

ISBN 0-203-24651-9 Master e-book ISBN

ISBN 0-203-22833-2 (Adobe eReader Format)

ISBN 0-415-25071-4 (pbk)

ISBN 0-415-25070-6 (hbk)

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Preface

The main aim of the book, i.e. to provide a text for final year undergraduate and for postgraduate students, remains the same as for the previous two editions; we also hope that researchers, designers and operators of the many types of structures covered in the book will continue to find the text of interest and a stimulating, up-to-date reference source.

It is now almost six years since the manuscript of the second edition was completed and this new edition gave us the opportunity to correct the few remaining errors and to update the text and references throughout. At the same time, as a reaction to some important developments in the field, certain parts of the text have been rewritten, enlarged or reorganized. Readers of the second edition may wish to note the following *major* changes:

- Chapter 1.* The environmental and social issues associated with major reservoir projects are addressed in greater depth.
- Chapter 2.* New section on small embankments and flood banks and expanded discussion of seismicity and seismic analysis.
- Chapter 4.* Enlarged text on design flood selection and reservoir flood standards, aeration on spillways and in free flowing tunnels; extended treatment of stepped spillways.
- Chapter 6.* A new section on tidal barrage and surge protection gates and enlarged text on forces acting on gates; a new worked example.
- Chapter 7.* Enhanced text on reservoir hazard analysis and dam break floods.
- Chapter 9.* New paragraph on pressure distribution under piled foundation floors of weirs with a new worked example.
- Chapter 14.* This chapter – Coastal and offshore engineering in previous edition – has been divided into:
Chapter 14 ‘Waves and offshore engineering’ and

Chapter 15 'Coastal engineering'

Consequently the whole material has been reorganized. The treatment of forces on cylindrical bodies in waves and currents has been significantly extended in Chapter 14. Chapter 15 now includes an extended treatment of wave overtopping and stability of breakwaters as well as a brief discussion of coastal management.

Chapter 16 (formerly ch. 15). Extended discussion of computational modelling of hydraulic structures.

P. Novak, A.I.B. Moffat, C. Nalluri and R. Narayanan
Newcastle upon Tyne, August 2000

Preface to the second edition

The main aim of the book, i.e. to provide a text for final year undergraduate and for postgraduate students, remains the same as for the first edition; equally we hope that researchers, designers and operators of the many types of hydraulic structures covered in the book will find the text of interest and a useful reference source.

We took the opportunity of a new edition to correct all (known) errors and thoroughly to update the text and references throughout. At the same time as a response to received comments and reviews as well as a reaction to some new developments in the field, certain parts of the text were rewritten or enlarged. Readers of the first edition may wish to note the following major changes.

- Chapter 1.* Extended text on site assessment for dams.
- Chapter 2.* Expanded treatment of geotechnical aspects, e.g. a new paragraph (2.8.3) on performance indices for earthfill cores, and a new brief section (2.10) on geosynthetics.
- Chapter 3.* Extended coverage of RCC dams with a new paragraph (3.7.3) dealing with developments in RCC construction.
- Chapter 4.* Enlarged text dealing with design flood estimation, reservoir sedimentation, interference waves and aeration on spillways and a new paragraph (4.7.6) on stepped spillways.
- Chapter 5.* Enlarged section on scour below spillways.
- Chapter 6.* A new paragraph (6.2.8) on overspill fusegates.
- Chapter 7.* Enlarged text on reservoir downstream hazard assessment.
- Chapter 8.* Enlarged text on multistage channels, geotextiles, Crump weir computation and a new section (8.6) on river flood routing.
- Chapter 9.* Extended text on fish passes and a new paragraph (9.1.6) on the effect of the operation of barrages on river water quality.

- Chapter 10.* Enlarged text on canal inlets and scour at bridges and below culvert outlets.
- Chapter 13.* A new short section (13.7) on benching.
- Chapter 14.* Change of title (from Coastal engineering) to Coastal and offshore engineering incorporating a substantial new section (14.7) on sea outfalls and the treatment of wave forces on pipelines in the shoaling region.
- Chapter 15.* Change of title (from Scale models in hydraulic engineering) to Models in hydraulic engineering to include in the general discussion of hydraulic models (15.1.1) a typology of mathematical models; also included a short paragraph (15.2.4) on modelling of seismic response.

The authors would like to thank the reviewers for their constructive comments and the publisher for providing the opportunity for this second edition.

P. Novak, A.I.B. Moffat, C. Nalluri and R. Narayanan
Newcastle upon Tyne, December 1994