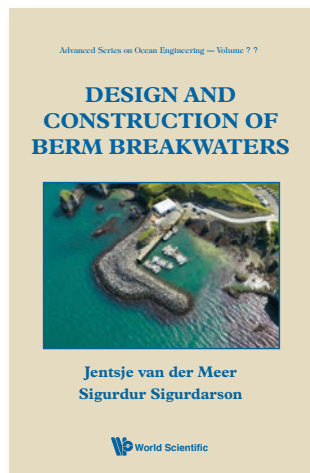


# BOOKS / PERIODICALS REVIEWED



## DESIGN AND CONSTRUCTION OF BERM BREAKWATERS

BY JENTSJE VAN DER MEER AND SIGURDUR SIGURDARSON

Published by World Scientific. 2017. Volume 40. 329 pp. 159 mm x 235 mm. In English. Illustrated in full colour. \$138. ISBN 978-981-4749-60-2

Although the modern design of berm breakwaters began thirty years ago, a design methodology for the structures had not been formalised. Dr Jentsje van der Meer and Sigurdur Sigurdarson fuse their 40 years of

collective experience to co-author *Design and Construction of Berm Breakwaters*. The book introduces a design framework for berm breakwater structures with knowledge accrued from the authors' contributions to over thirty berm breakwaters all over the world.

In this 40<sup>th</sup> volume of the Advanced Series on Ocean Engineering, the scientific experience of Dr Jentsje van der Meer (Van der Meer Consulting BV and UNESCO-IHE of the Netherlands) is united with the practical experience of Sigurdur Sigurdarson (IceBreak Consulting Engineers of Iceland) to formulate a framework to design and construct berm breakwaters. While written for practical designers, the publication is validated with scientific background for hydraulic modellers and researchers.

In the recent past, designs were mass armoured berms reshaped into statically stable S-shaped slopes. At first, this form was adopted in Iceland, but gradually developed through the use of more stable structures. Through the inclusion of available rock sizes – with grades outside of small rock (core) and large rock (berm) – a more stable and only partly reshaped structure emerged, becoming known as the Icelandic-type berm breakwater.

Geometrical designs of the berm breakwater cross-section are explained and include berm reshaping and wave overtopping, quarry and project management, blasting and sorting techniques, designs for various wave conditions and available rock classes, and case studies of already constructed berm breakwaters. The book's contents include:

- History of Modern Berm Breakwaters
- Classification and Types of Berm Breakwaters
- Predicting Stability and Reshaping
- Functional Behaviour: Wave Overtopping, Reflection and Transmission
- Geometrical Design of the Cross-section
- Armourstone and Quarrying
- Construction
- Geometrical Design into Practice, Examples
- Constructed Examples

A classification of berm breakwaters is introduced with three classes to

describe the behaviour of these berms: hardly reshaping (HR), partly reshaping (PR), and fully reshaping (FR). The first two can be described as statically stable (description mainly by damage and some recession) while the fully reshaping berm breakwater is potentially unstable directly after construction, but the reshaped profile is statically stable. The classification gives stability numbers, damage and recession for each type of berm breakwater.

For predicting the recession of each type of berm breakwater, a new method is described. The stability number  $H_s/\Delta D_{n_{50}}$  is used as its basis and the influence of wave period has been proven to be hardly at all or non-existent. Geometrical aspects such as lower slope, berm level and toe depth on influence of recession are described. The functional behaviour of berm breakwaters – including wave overtopping, reflection and transmission – is treated with current design formulae.

The results of research have led to the description of the behaviour of berm breakwaters and practical approaches to their design and construction. This work comes together in Chapter 8 which offers practical design guidance on how to design a berm breakwater for various design wave conditions and available rock classes. The final chapter recounts existing examples of berm breakwaters and the results since their original construction.

### For further information see:

<http://www.worldscientific.com/worldscibooks/10.1142/9936>

## ONLINE AND INTERACTIVE: FACTS ABOUT BUILDING WITH NATURE

Building with Nature (BwN) is a design philosophy which uses natural processes (ecosystem services) to realise structures and create benefits for both society and nature. The issue discusses BwN's concept, step-by-step approach and principles as applied to coastal zone management projects.

BwN concepts are typical multipurpose designs which combine a project's socio-economic purposes with an optimised performance on the ecological system for a holistic approach. When based on the BwN approach, marine infrastructure development can be carried out adaptively, in line with natural dynamics systematically seeking win-win solutions. This leads not only to cost-effectiveness and flexibility, but also to a net environmental gain.

The *Facts About* series is an initiative by the International Association of Dredging Companies (IADC) to distribute up-to-date information on various maritime construction and dredging subjects.

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