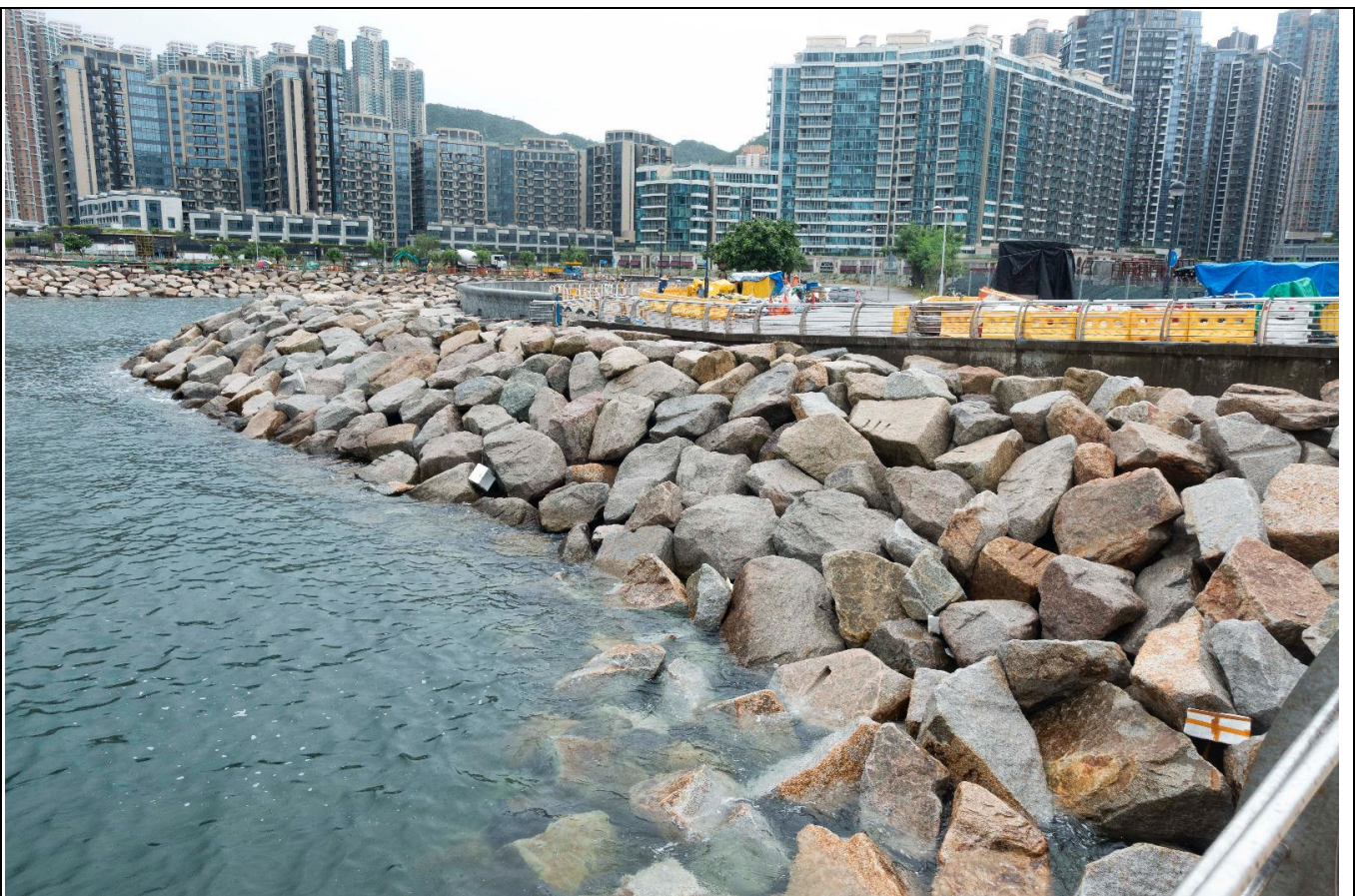




# Wave Design Aspects of Coastal Defence Structures by Prof. Jentsje W. van der Meer



**Date of Course:** 21 March 2023

## **Introduction**

In Hong Kong, technical guidelines on Design of Seawalls and Breakwaters are governed by “Port Works Design Manual Part 4”. Structural Stability mainly relies on the design of the Armour Units against wave actions. Wave Run-up is also an important consideration in the Hydraulic Performance of Seawalls and Breakwaters. This Course provides an update by an internationally renowned expert on these two aspects, Professor Jentsje W. van der Meer.

Meanwhile, technical guidelines on the Design of Main Drainage Channels are given in “Stormwater Drainage Manual”. In particular, guidance on River Bed and Bank Protection by Armour Stone makes reference to “Port Works Design Manual” with regard to wave resistance in the estuarine reach of drainage

channels.

Building & Housing Developments and essential Utilities Services such as Wastewater Treatment Plants, Municipal Waste Facilities, Seawater Intakes/Desalination Facilities/Coastal Reservoirs, Electric Power Generation Plants and Town Gas/ Petroleum Handling Facilities all lie on the coasts, which are subject to rising sea levels and worsening wave actions due to Climate Change in the 21st Century and beyond.

## **Synopsis**

### **Topic 1 Stability of Rock Armoured Slopes against Wave Attack**

The Van der Meer formula for rock slope stability was first published in 1987 and has since then been applied all over the world for design. Recent work introduced the spectral wave period into the formula and the new rewritten formula can now directly be compared to the Modified Van der Meer formula that is applicable for shallow water (Rock Manual). Further research has led to a closer look of stability in shallow water, using the relative depth as a parameter. The course will introduce the original formula, will show the best way how to come to a reliable design of the armour and will give the latest design information on stability in shallow water.

#### **Key Points**

1. Introduction of the Van der Meer formula with their parameters and the range of application.
2. The best way how to come to a reliable armour design.
3. The stability of rock slopes in shallow water.

### **Topic 2 Wave Overtopping at Coastal Defence Structures**

The EurOtop Manual on Wave Overtopping considers all types of coastal structures divided in three distinct categories: relatively smooth impermeable slopes (dikes), rubble mound slopes (breakwaters) and vertical structures. Wave overtopping often determines the crest level of a structure and the admissible or allowable wave overtopping is the first design parameter to be decided. The EurOtop considers the wave height and period at the toe of the structure as governing parameters, but may not be applicable for very shallow water. New research showed that the Goda method, taking the relative depth with the deep water wave height, is a good method for very shallow water and new formulae for vertical structures will be given. Finally, two examples of mitigation structures will be given with respect to possible sea level rise and relatively low wave heights, that do not need a lot of space and have been proposed for the Singapore area.

#### **Key Points**

1. Introduction of EurOtop
2. Allowable wave overtopping
3. Overtopping over coastal structures
4. Overtopping in very shallow water for vertical structures
5. Simple mitigation structures for sea level rise

#### **Who should attend?**

- Civil Engineers in Works Departments, responsible for Seawalls & Breakwaters, Land Drainage & Flood Control, Flood Resilience & Climate Change, Research & Development, Main Drainage Channels as well as Coastal Highways & Reservoirs
- Consultants working in Coastal & Hydraulic Engineering projects
- Contractors under the Port Works, Roads & Drainage and Waterworks Categories
- Academia with research interests in coastal and hydraulic engineering

- HK Observatory's Scientists working on Oceanography
- EPD's Project Managers , Consultants, Contractors of Municipal Waste Facilities
- Marine Department's Hydrographers
- Power Plant Operators of HK Electric; China Light & Power
- Public & Private Developers of Coastal Reclamations
- Operators of Town Gas and Petroleum Handling Facilities

### **Programme Rundown**

2:30 p.m.-2:35 p.m. Introduction of the speaker

2:35 p.m.-3:35 p.m. Topic 1: Stability of Rock Armoured Slopes against Wave Attack

3:35 p.m.-3:50 p.m. Discussion/Q&A

3:50 p.m.-4:05 p.m. Break

4:05 p.m.-5:05 p.m. Topic 2: Wave Overtopping at Coastal Defence Structures

5:05 p.m.-5:30 p.m. Discussion/Q&A

### **Speaker**



Prof. Jentsje W. van der Meer is an internationally renowned expert in appraisal, design and testing of breakwaters and coastal structures, including seawalls, levees, dikes, embankments, groynes, revetments and shingle beaches. He has worked with Delft Hydraulics (now Deltares) and Infram International, a private consultancy for infrastructure appraisal and management. For the past 15 years, he has provided consultancy advice to projects across the globe through his own firm, Van der Meer Consulting b.v. Prof. Van der Meer was a professor at IHE Delft, the world's largest international graduate water education facility, from 2014 until his retirement last year.

Prof. Jentsje W. van der Meer's work on rubble mound structures, including the Van der Meer design formula, has been included in engineering manuals all over the world. He co-authored both editions of EurOtop, the Overtopping Manual, and has published more than two hundred papers in international journals, proceedings and books. These include Design and Construction of Berm Breakwaters, co-written by Prof. Van der Meer and Sigurdur Sigurdarson. Prof. Van der Meer is also co-owner of the copyright for the hydraulic wave overtopping simulator, developed to test the strength of existing levees in the Netherlands, the US, Singapore and Vietnam under wave attack.

### **Moderator**



Ir Professor Chan Pak Keung is an Honorary Fellow of the HK Chapter of the International Association for Hydro-environment Engineering & Research, an Adjunct Professor of the University of Hong Kong and the former Professor of Practice (Infrastructure), HK Polytechnic University. Being a former Assistant Director of the Drainage Services Department, he specialises in Flood Management & Wastewater Engineering.

**Organizer****LNS Ltd****Supporting Organisation**

International Association for  
Hydro-Environment Engineering and  
Research - Hong Kong Chapter (IAHR-HK)

**Date**

21 March 2023

**Time**

2:30 p.m.-5:30 p.m.

**Venue**

Zoom platform

**Working Language**

English

**Registration**

Please send the registration form by email  
to: [event@lns.com.hk](mailto:event@lns.com.hk)

**Early bird****17 Feb 2023****Application Deadline**

3 March 2023

**Payment Methods**

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# Wave Design Aspects of Coastal Defence Structures

## by Prof. Jentsje W. van der Meer

Surname	( Mr / Ms)	
First Name		
Organization/Company		
Position		
Correspondence Address		
Date of Course	21 March 2023	
CPD	3 Hours	
A group registrations of 15, Course Fee per head (registered on or before <b>17 February 2023</b> )	HK\$2,000	
Early Bird Course Fee per head (registered on or before <b>17 February 2023</b> )	HK\$2,400	
Course Fee per head	HK\$2,600	
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