

HYDRAULIC PERFORMANCE OF STATICALLY STABLE BERM BREAKWATERS & GABION STRUCTURES

by

K. P. Manori Femando

A thesis submitted to University of Moratuwa for the Degree in Master of Science

> Research supervised by Professor S. S. L. Hettiarachchi

DEPARTMENT OF CIVIL ENGINEERING UNIVERSITY OF MORA TUWA MORATUWA SRI LANKA

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Abstract

The ability to predict the level of reflection, transmission and dissipation for various types of coastal structures plays an important role in the assessment of their hydraulic performance. These parameters together with the hydraulic, geotechnical and structural stability of the individual components and of the structure as a whole determine the overall performance of the structure.

This study has done a literature review and presents the results from a study of the hydraulic performances especially on wave reflection and transmission characteristics of a wide range of structures (vertical, sloping and berm) used in harbour and coastal engineering.

Hydraulic model test can provide reliable method to quantify many of the wave structure response functions for breakwaters. A detailed hydraulic model investigation (1:20) relating to the hydraulic performances of berm breakwater with berm width of 6m was done as a part of this study. It was tested in Lanka Hydraulic Institute (LHI), Katubedda, Moratuwa.

The results are compared with a model investigation done on a berm structure with the berm width of 12m at a scale of 1:20 (also tested in Lanka Hydraulic Institute in 1999) and Allsop and Channel (berm widths of 4m, 8m and 16m) test sections.

The investigations were designed to obtain a full profile of the energy dissipation characteristics of the structures tested, including the damping of waves as they propagate through the structure.

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Research supervised

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ABSTRACT

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Declaration

The work described in this thesis is a research carried out in the Department of Civil Engineering, University of Moratuwa, Sri Lanka, under the supervision of Prof. S.S.L. Hettiarachchi and Dr. S.P. Samarawickrama.

The author wishes to declare that, except for commonly understood ideas, or where specific reference has made to the work of authors, the content of thesis has his original work and include nothing, which is the outcome of work done in collaboration. The work has not been previously submitted, in part or in whole to any other university for any degree, diploma or any other qualification.

This thesis contains 174 pages.

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UOM Verified Signature

Supervisor Prof. S.S.L. Hettiarachchi Department of Civil Engineering University of Moratuwa Sri Lanka

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