

Accepted Manuscript

Scattering of water waves by vertical porous barriers: An analytical approach

S.R. Manam, M. Sivanesan

PII: S0165-2125(16)30085-3

DOI: <http://dx.doi.org/10.1016/j.wavemoti.2016.07.008>

Reference: WAMOT 2080

To appear in: *Wave Motion*

Received date: 21 March 2016

Revised date: 20 July 2016

Accepted date: 20 July 2016



Please cite this article as: S.R. Manam, M. Sivanesan, Scattering of water waves by vertical porous barriers: An analytical approach, *Wave Motion* (2016), <http://dx.doi.org/10.1016/j.wavemoti.2016.07.008>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Scattering of water waves by vertical porous barriers: an analytical approach

S.R. Manam*, M. Sivanesan

Department of Mathematics, Indian Institute of Technology Madras, Chennai 600036, India

Abstract

An analytical approach is proposed here to study scattering of deep water waves by a submerged or a surface piercing vertical porous barrier. It involves a connection between two wave potentials of which one is the solution of a boundary value problem associated with wave scattering by the porous barrier and the other is the solution of a complementary type problem where barrier and gap positions are interchanged and solid barrier takes the position of the porous barrier. The connection also involves an auxiliary or a connection wave potential. The potential for the solid barrier problem involves incident wave forcing while the auxiliary potential describes a solid barrier type problem that involves a non-physical forcing. The solution procedure of Ursell [1] is chosen to solve these boundary value problems explicitly in the case of normal wave incidence as it also determines necessary exact behavior of the potential at the barrier edge. The reflection coefficients are also connected and the reflection amplitudes of the normally incident wave against the vertical porous barriers are obtained analytically. Numerical results for reflection and transmission coefficients are presented.

Keywords: Potential, Reflection coefficient, porous barrier, mixed boundary value problem

*Corresponding author

Email address: manam@iitm.ac.in (S.R. Manam)

Download English Version:

<https://daneshyari.com/en/article/8256882>

Download Persian Version:

<https://daneshyari.com/article/8256882>

[Daneshyari.com](https://daneshyari.com)