

The application of single layered concrete armour units in breakwater design

Recent developments in concrete armour units been strongly influenced by the lessons learnt from a series of major breakwater failures which took place in the late seventies and the early eighties. It was widely accepted that breakwater designers have been engaged in excessive extrapolation without recognizing the limits of the prevalent state of the art of breakwater design. Research on the design and construction of breakwaters has led to the development of new concepts and further examination of alternative design practices. One such alternative is the use of single layered concrete armored breakwaters. The results of detailed hydraulic model investigations (at scales of 1:20 and 1:36) relating to the hydraulic performance of rubble mound breakwaters armoured with two types of single layered concrete units are presented. The investigations were designed to obtain a complete profile of the energy dissipation characteristics of the structures for a range of incident wave conditions. The results are discussed in the context of the importance of the geometry of the armour units, the porosity and the permeability of the structures and their application in practice.