LABORATORY STUDY ON BREAKWATER

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JANUARY 2008

ACKNOWLEDGEMENT

The researchers would really like to express their gratitude to those who have contributed and helped in completing this research, namely :

ABSTRACT

Breakwater functioned as an energy dissipater that protects the beach area from wave attacks. This research is intended to test and introduce a newly designed open type breakwater which consists of multi layer horizontal plates. The objectives of this research are to study the effectiveness of the new configuration of multi layer breakwater with respect to the wave characteristics and the breakwater dimensions, to evaluate the ability of the multi layer breakwater in dissipating energy in terms of energy loss percentage and to compare the performance of the multi layer breakwater in reflecting wave with a vertical sea wall. Nine multi layer breakwater models with different widths and a model of vertical sea wall were fabricated and tested for this research. Simulations for all models were carried out for two water depths and four regular wave periods. The data obtained from laboratory exercise were analysed using 3-point method introduced by Mansard and Funke (1980). The results were discussed into several separate sections, namely wave steepness, relative gap, relative width and energy loss. It can be concluded from the findings that transmission coefficient was independent of gap spacing but dependant on breakwater width, wave steepness and wave period. Reflection coefficient was independent of breakwater width and gap spacing but dependant on wave steepness and wave period. The multi layer breakwater was able to dissipate energy significantly and more energy was dissipated in fully submerged condition. The proposed breakwater is suitable to be used when the wave period is short. Another important finding was the multi layer breakwater was not able to reflect wave strongly as compared to vertical sea wall.

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