

Abstract

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Study of Environment Friendly Porous Suspended Breakwater for the Egyptian Northwestern Coast

A proposed new type of breakwater used for the Egyptian Northwestern Coast is presented and evaluated. The new model consists of double porous curtain walls fixed on two rows of vertical piles. The curtain walls consist of two sets of horizontal steel strips with equal spacing. The piles are in two rows with spacing in the two directions. The spaces between the steel strips and the piles allow for good transmission of water and sediment with a favorable dissipation of wave energy. The Northwestern coast of Egypt is an ideal location for the application of this new type of breakwater due to its sudden steep slope, wave breaking near the shore, strong rip currents and huge amount of sediment transport. A calibration has been implemented using a set of laboratory results. A parametric study has been conducted in order to introduce the best configuration of the new model. Real shore and sea data for several locations were applied and theoretical analysis has shown that the suspended breakwater leads to energy dissipation of incident wave energy and provides a quite safe surf zone for swimmers and human activity with minimum changes to the shoreline.