عنوان مقاله:

Experimental Study on the Stability of Concrete Block Revetment for High Waves Propagating over Submerged Geotube Breakwater

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خلاصه مقاله:

Bangladesh has a coastline of ۷۱۰ km and a long sandy beach. Moderate and high waves causes erosion along the coastline. Concrete block revetment is widely used for shore protection in Bangladesh. As per Coastal Engineering Manual, concrete block revetment stability is limited to wave height of ۱.۵ m. Studies reveal that the significant wave heights are greater than ۱.۵ m in the most parts of coastline of Bangladesh. Therefore, in some places, the concrete block revetment has failed. Revetment constructed with Tetrapod, X-bloc, Core-loc etc. are recommended to use for high waves. However, those armor units are not suitable in the context of Bangladesh considering its cost, construction and placement. Moreover, any hard protection may stop the erosion and protect the shoreline, but the sandy beach may be lost. Geotube breakwater is low cost structure for dissipating wave energy to some extent. In this study, laboratory experiments have been carried out for wave height ۱.۷۶ m to ۲.۴۰ m (as prototype) with two layer protection consisting of concrete block revetment at the shore and submerged geotube breakwater at shallow water. Concrete block size has been calculated using Pilarczyk formula for prototype wave height ۱.۵ m and scaled down using surf coefficient for laboratory model. Seventeen laboratory runs have been conducted and analysis of the experimental results reveal that two layer protection is effect to protect the shore from high waves. An equation has been established to design the shore protection works along the coastline experienced by high waves.

کلمات کلیدی:

high waves, revetment, submerged breakwater, transmission coefficient, Wave breaking

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