

Application of Shore Protective Structures in Optimum Land Using of Defense Sites Located in Coastal Cities

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Abstract : Awareness of effective land using issues in coastal area including protection of natural ecosystems and coastal environment due to the increasing of human life along the coast is of great importance. There are numerous valuable structures and heritages which are located in defence sites and waterfront area. Marine structures such as groins, sea walls and detached breakwaters are constructed in coast to improve the coast stability against bed erosion due to changing wave and climate pattern. Marine mechanisms and interaction with the shore protection structures need to be intensively studied. Groins are one of the most prominent structures that are used in shore protection to create a safe environment for coastal area by maintaining the land against progressive coastal erosion. The main structural function of a groin is to control the long shore current and littoral sediment transport. This structure can be submerged and provide the necessary beach protection without negative environmental impact. However, for submerged structures adopted for beach protection, the shoreline response to these structures is not well understood at present. Nowadays, modelling and computer simulation are used to assess beach morphology in the vicinity of marine structures to reduce their environmental impact. The objective of this study is to predict the beach morphology in the vicinity of submerged groins and comparison with non-submerged groins with focus on a part of the coast located in Dahane sar Sefidrood, Guilan province, Iran where serious coast erosion has occurred recently. The simulations were obtained using a one-line model which can be used as a first approximation of shoreline prediction in the vicinity of groins. The results of the proposed model are compared with field measurements to determine the shape of the coast. Finally, the results of the present study show that using submerged groins can have a good efficiency to control the beach erosion without causing severe environmental impact to the coast. The important outcome from this study can be employed in optimum designing of defence sites in the coastal cities to improve their efficiency in terms of re-using the heritage lands.

Keywords : submerged structures, groin, shore protective structures, coastal cities

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