A STUDY OF BANK SLOPE BEHAVIOR AND EROSION PROTECTION THROUGH NATURAL GEOTEXTILE AND GEOCELL

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Abstract

Bank erosion problem occurs in many areas causing the damages to the resident and properties, hence geotextiles and geocells which normally use for strengthening the soil layer on the road is then introduced to protect the erosion that occurs in the bank slope area. Today, people are turning their attention to more environmentally friendly materials due to the impacts of global warming situation. This situation occurs from the large amount of plastic and microplastic being exposed into the environment. In order to reduce the use of plastic, alternative material should be introduced. According to the research, water hyacinths present in large amounts all around the world causing an obstruction to the source of transportation and drainage system. Therefore, this study aims to find the possibility of using water hyacinth which is abundant in many areas as the alternative resource for geotextile and geocell. The experiment was conducted in the large-sized open-channel flume, with the bank slope ratio of 2:1 which protected by geotextile and geocell on its surface. Different materials of geotextile and geocell were tested. The deformation of the slope from the erosion under different Reynolds number and time was observed and collected in order to see the erosion protection efficiency of each types of material. After the bank slope protection materials was installed, the results show that the erosion protection efficiency of geotextile and geocell for both using water hyacinth fiber and plastic give a remarkably result comparing with the slope without protection. Therefore, water hyacinth fiber can be used as an alternative material which helps in reducing of its large amount and eco-friendly material.

Keywords: *Bank protection, Geocell, Geotextile, Water hyacinth*