Overtopping analysis – the state of the practice

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Abstract. A variety of revetment systems are available for erosion control during overtopping flow. Given that little information is available on the hydraulic characteristics of overtopping flow, calculating stability thresholds of protection materials can be difficult. Articulated concrete block (ACB) revetment systems used for overtopping flow conditions are the focus of this research. Safety factor calculation methods presented by Simons and Senturk (1992) and Julien (1998) have been applied to ACB systems, but have not proven to be successful at predicting stability thresholds. Both methods were derived using a moment stability analysis and were developed for sediment particles within a channel. Each method uses a significant number of assumptions including simplifications for the weight force distribution, assuming that equal moments are created by the drag force and the lift force, and assuming that the drag and lift forces are solely dependent upon the boundary shear stress. These assumptions have been evaluated for applicability to ACB systems on steep slopes. This presentation will describe each of the assumptions and their potential effect on the accuracy of calculated safety factors.

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