

MODELLING THE HYDRODYNAMIC FORCES ON GEOBAG REVETMENTS USING CES

A. Akter¹, G. Pender¹, G. Wright¹ & M. Crapper²

¹ *School of the Built Environment, Heriot-Watt University, Edinburgh, UK*

² *School of Engineering and Electronics, The University of Edinburgh, Edinburgh, UK*
email: aa462@hw.ac.uk

ABSTRACT

Sand filled geotextile bag (“geobag”) revetments are commonly used for riverbank protection schemes in Bangladesh and other countries around the world. The method is effective; however the failure modes are not well understood. To address this, the hydrodynamic forces associated with bag failure need to be better understood. The research reported here addresses this through: (a) Physical modelling using 1:10 scale model geobag revetment, and (b) Conveyance Estimation System (CES) modelling, to estimate hydraulic forces on a geobag revetment. In the physical modelling, the velocities associated with the failure of geobag revetments have been measured. The comparison between the experimental data and the CES data indicates that the CES model can predict model velocities with reasonably accuracy. This validated CES model can then be used to estimate shear stress. In next stage not reported here, the CES predicted velocities will be used to prepare the mapped velocity field for the Discrete Element Model (DEM) setup. It is envisaged, the validated DEM model will provide more details on failure modes, and hence will be used as the basis for the development of a practical design guide for the use of geobags as riverbank protection structures.