

Abstract

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Numerical study of combined overflow and wave overtopping over a smooth impermeable seawall

A numerical wave flume is used to investigate the discharge characteristics of combined overflow and wave overtopping of impermeable seawalls. The numerical procedure computes solutions to the Reynolds-averaged Navier-Stokes equations and includes the generation of an irregular train of waves, the simulation of wave breaking and interaction with a sloping, impermeable wall. The numerical model is first tested against published experimental observations, approximate analytical solutions and empirical design formulae for the cases of pure overflow and pure overtopping. A sequence of numerical experiments simulating combined overflow and overtopping are described. The results are used to determine empirical discharge formulae, of the form used in current practice.