Interaction of water-waves with permeable structures

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A problem of the interaction of surface waves with partly permeable and partly sub-
merged structures was considered. From a theoretical point of view, in 2-D, it was
modeled using Euler equations for ideal incompressible fluid. The motion of fluid
supposed stationary. The fluid had an uniform depth. The area of the wave motion was
an infinite strip. The boundary conditions were: no flow to the bed, to the members
of structures, the kinematic and dynamic conditions on the free surface. The radiation
conditions at large horizontal distances were also fulfilled. By linearization procedure
and by subsequent integral transformations the original problem was reduced to the
inverse problem of mathematical physics. The solution of latter problem was carried
out by the Tikhonov's regularization procedure. A number of labor experiments was
fulfilled to estimate the numerical results. The wave flume with the length 40 m, the
width 1 m, and the height 1.2 m was used. The depth of fluid was 0.6 m. The modeling
was based on the Froude number and was fulfilled on the scale 1:40. The waves gen-
erated by the beam-type wavemaker. Their lengths were from 2 m to 4.5 m and their
heights were up to 0.2 m. The comparison of experimental and numerical data shows
clearly that theoretical results describe satisfactory the physics of the problem.