Prediction of scour depth near a caisson breakwater using ANN models

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1- INTRODUCTION

Caisson breakwater is a rigid vertical structure that transmits most of the impinging wave force to its foundation. The caisson breakwater is susceptible to foundation damage and local scouring in front of its foundation [13]. Hence, prediction of local scouring near a caisson breakwater is an important issue in coastal and harbor engineering.

The incident waves impinge on and reflect from the caisson breakwater at nearshore area that produces a series of standing waves in front of the caisson breakwater. Standing waves have significant influence on the scouring in front of caisson breakwaters. Carter et al. [4] studied the effect of standing waves on formation of parallel pattern of scour/deposition in sand bars. They also mentioned that standing waves develop a field of steady streaming system of recirculating cells in front of vertical breakwater and indicated that the recirculating cells of the steady streaming system consist of top and bottom cells as illustrated in Fig.1. The bottom cells of steady streaming system are attributed to the formation of bottom boundary layer near the seabed [13].
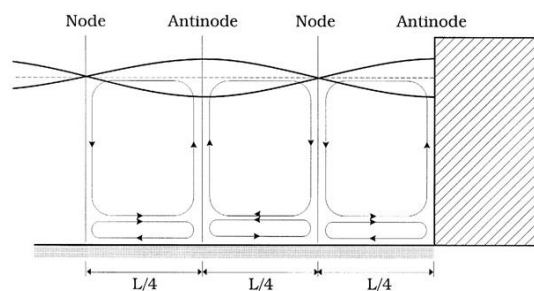

***Fig. 1) Steady streaming in front of vertical
breakwater, Sumer and Fredsoe [13]***