

Geraldton Port

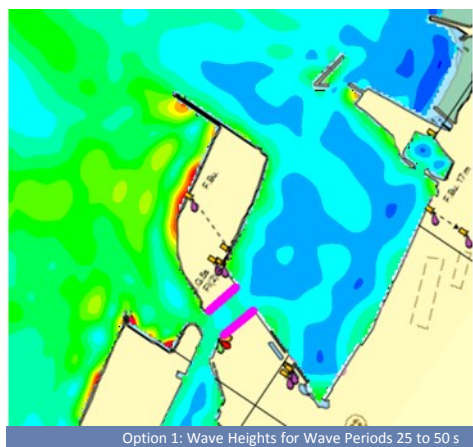
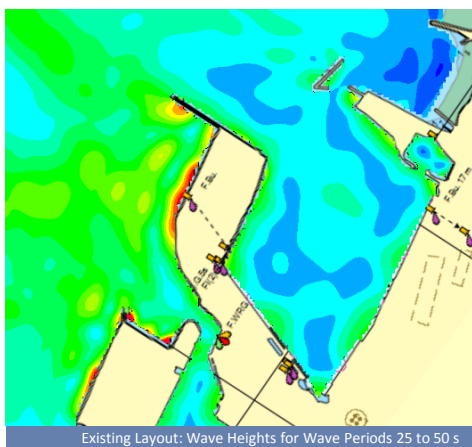
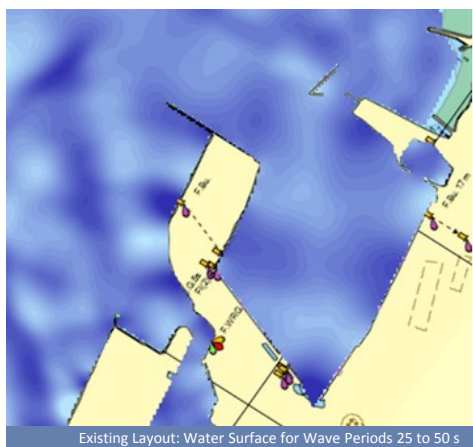
PRELIMINARY MODELLING OF WAVE RESONANCE

Investigation

PRDW have carried out preliminary modelling of the wave resonance problem at Geraldton Port to identify whether more detailed modelling could assist in alleviating the problems experienced.

Perth / Cape Town
0/A001

Geraldton
Western Australia
Australia
2012



A MIKE Boussinesq wave model of Geraldton Port was set up to investigate options to mitigate resonance problems experienced in the port. The approach was to apply a white noise spectrum at the 10 m depth contour. The wave height was set to $H_{m0} = 0.1$ m with a wave direction of 295° , corresponding to the typical swell direction at this depth. The following three ranges of wave periods were tested: 25 to 50 s, 50 to 100 s and 100 to 200 s.

Nine different modifications to the existing port layout were tested. The three most effective layouts were found to be:

Option 1: Cut a 90 m wide opening between the port and the marina to the West

Option 7: Remove the end 150 m of the eastern breakwater as well as the detached breakwater located offshore of the eastern breakwater

Option 8: Extend the main breakwater by 500 m

The results for the existing layout plus these three options were then presented as the H_{m0} inside the port for each wave period range. An example of the instantaneous water surface was also shown, since this permits wave direction and standing wave patterns to be visualised. The results indicated that the long period wave heights could be reduced by more than 30%.

