Figures

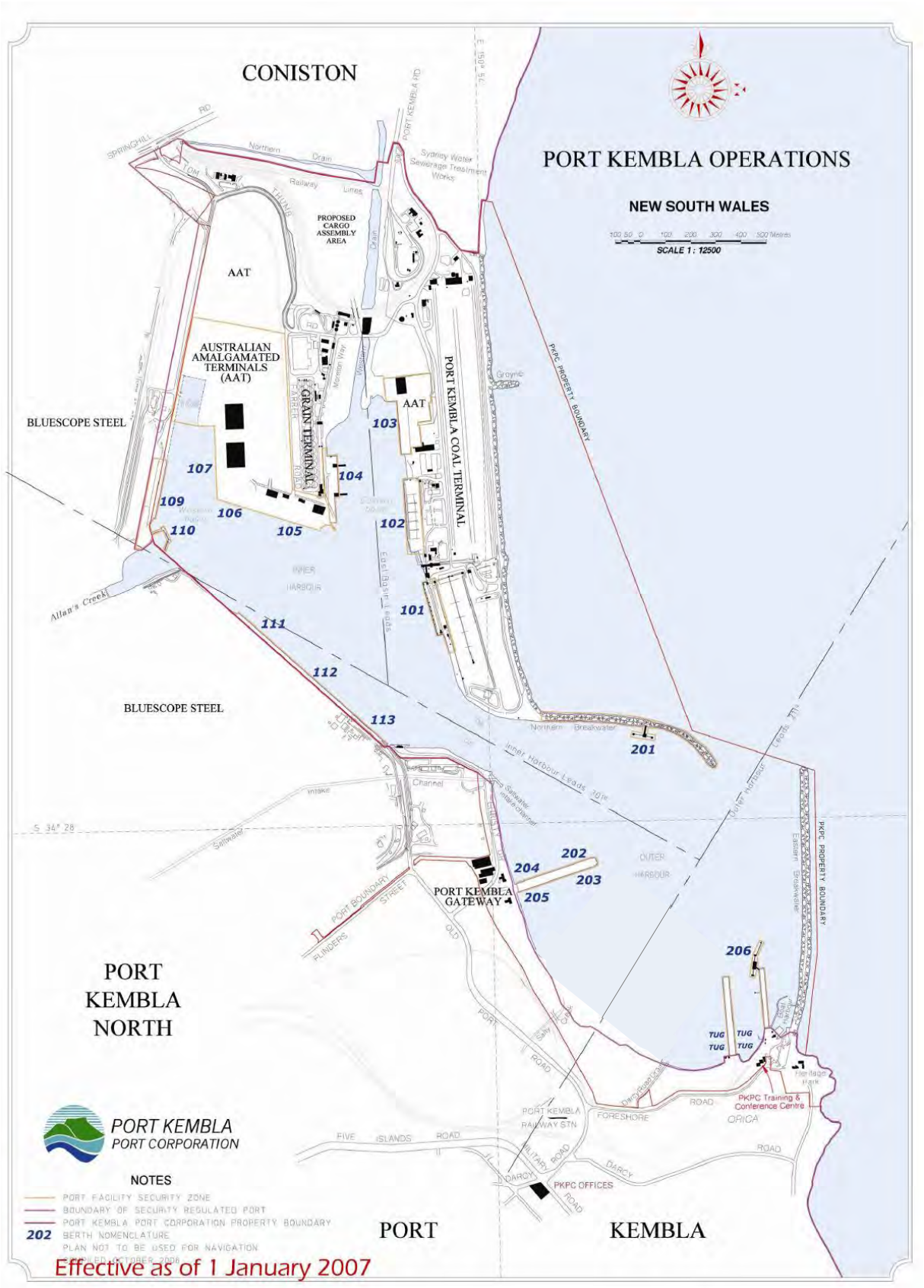

Figure 1 **Port Kembla Harbour Location Plan showing existing berths**

Figure 2 Staged development of the Port Kembla Outer Harbour assumed for modelling

Figure 3 Proposed staged development and dredging of Port Kembla Outer Harbour assumed for modelling

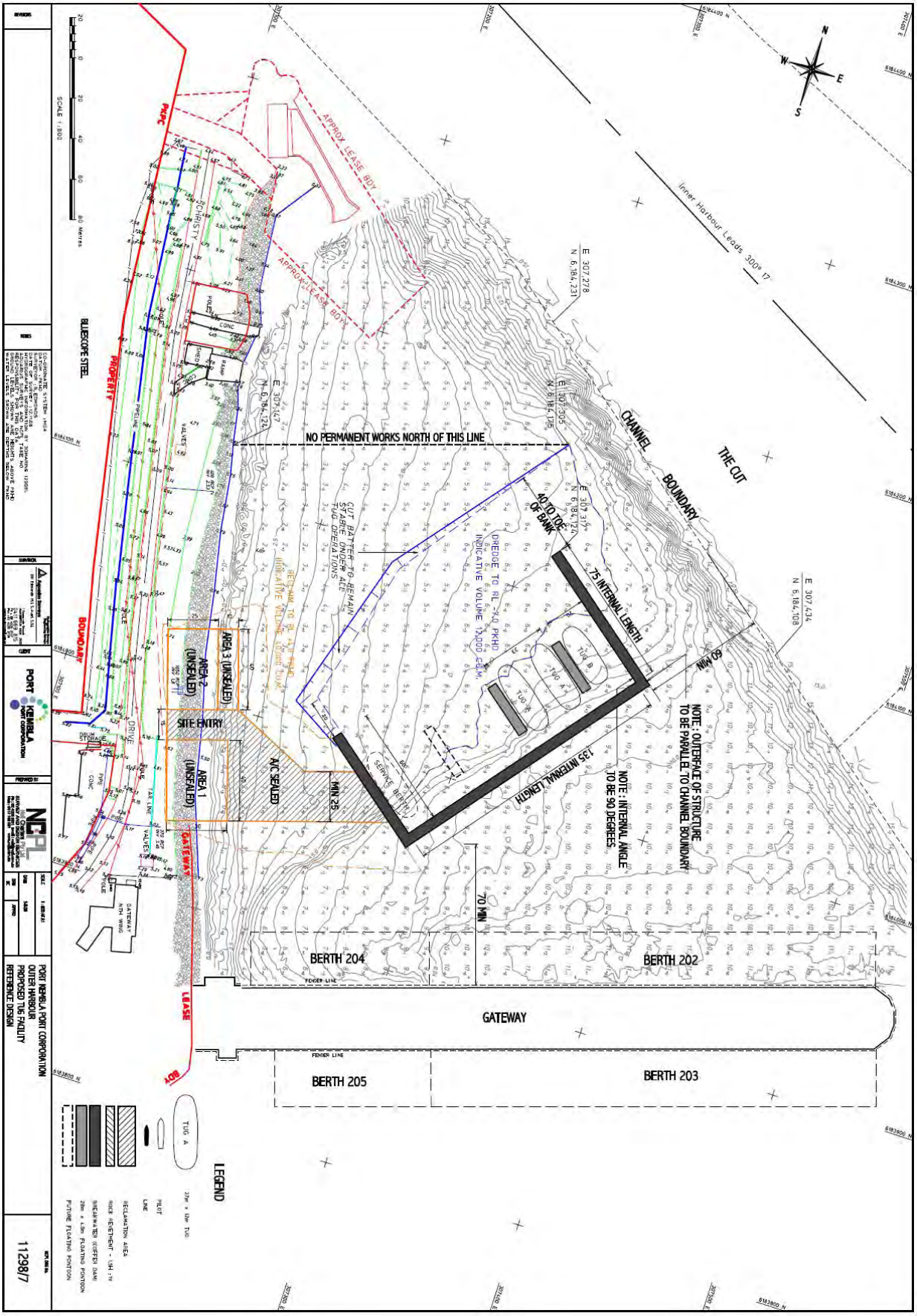

Figure 4 Reference Design for the Proposed Tug Harbour Layout

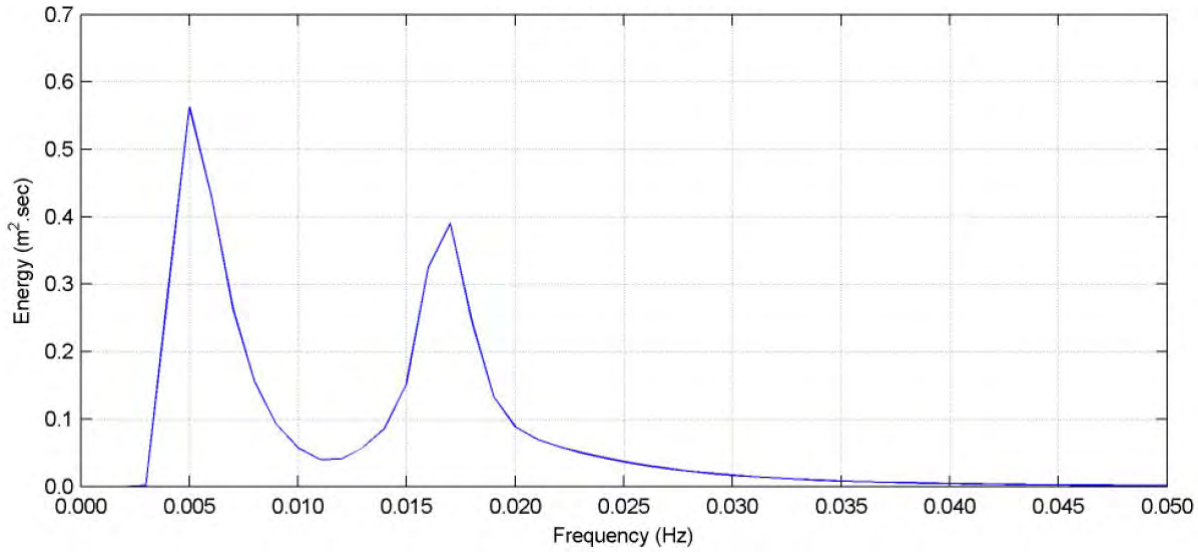

Figure 5 **Schematic long wave spectrum derived from field data obtained north of Port Kembla Outer Harbour in 20 m water depth (approximately) (CLT).**

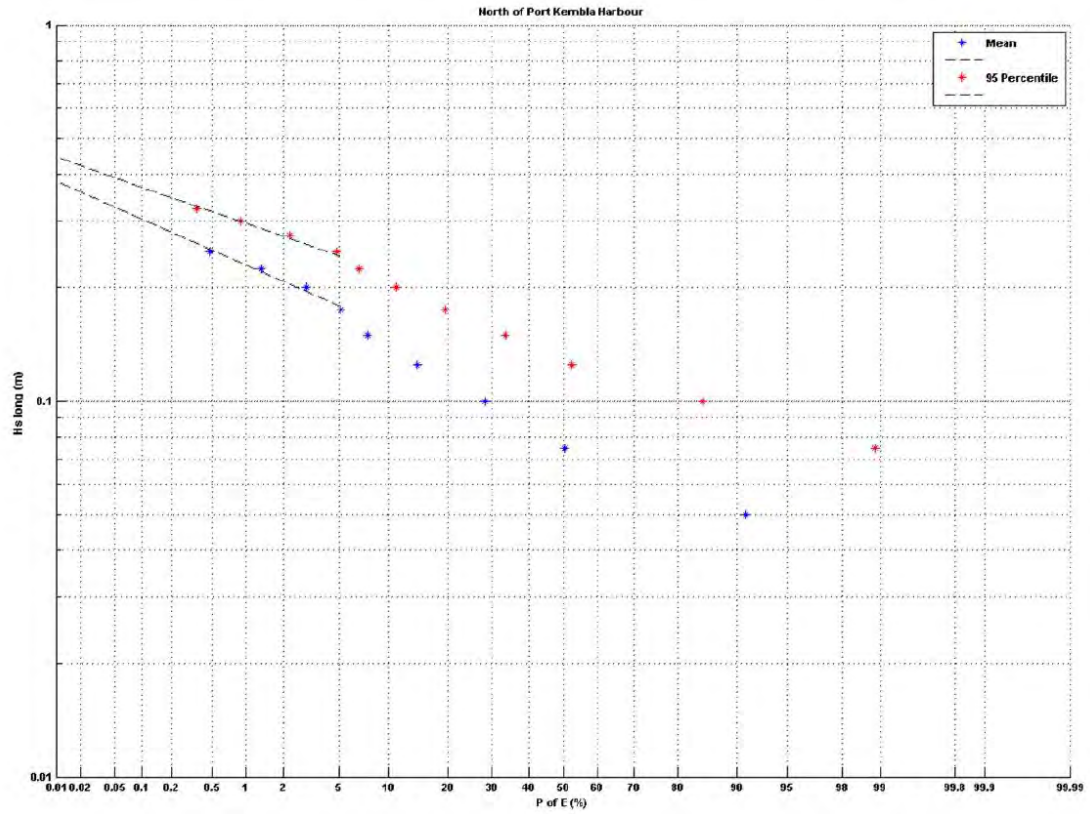

Figure 6 **Probability of Exceedance of long waves measured north of harbour entrance (CLT).**

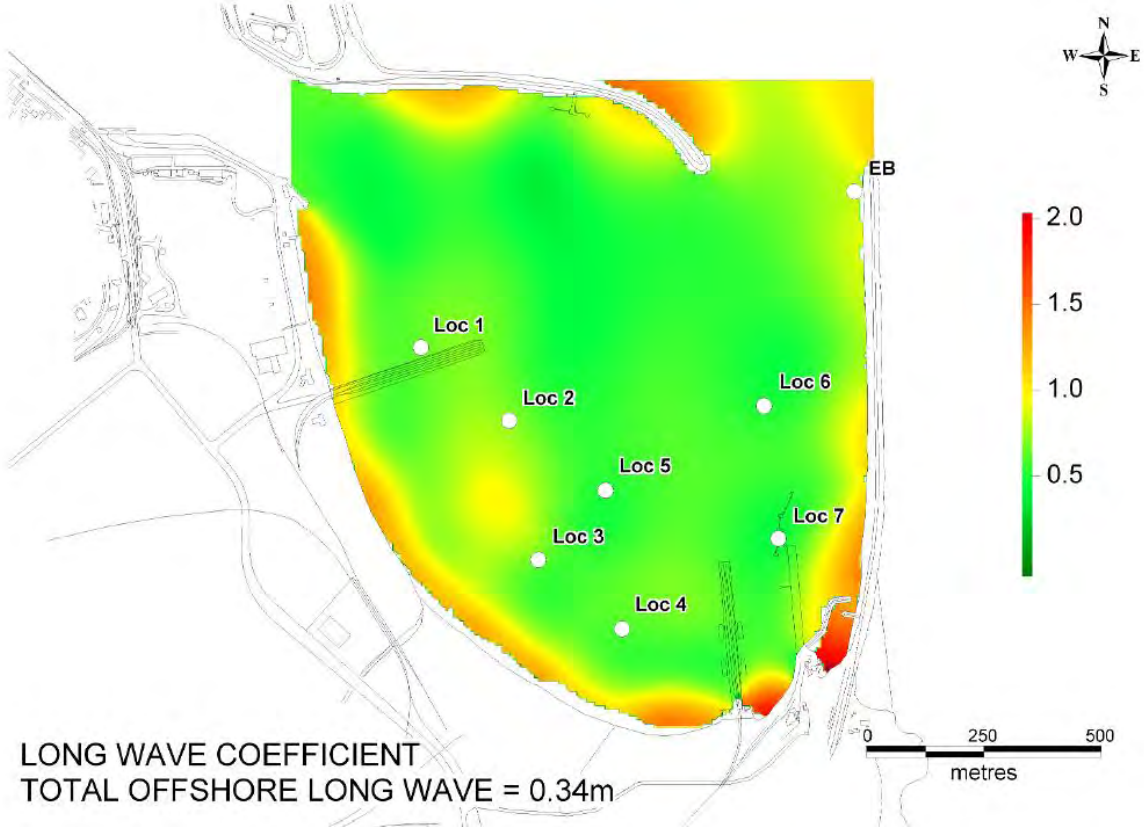

Figure 7 **Existing long wave height coefficients in Port Kembla Outer Harbour (CLT)**

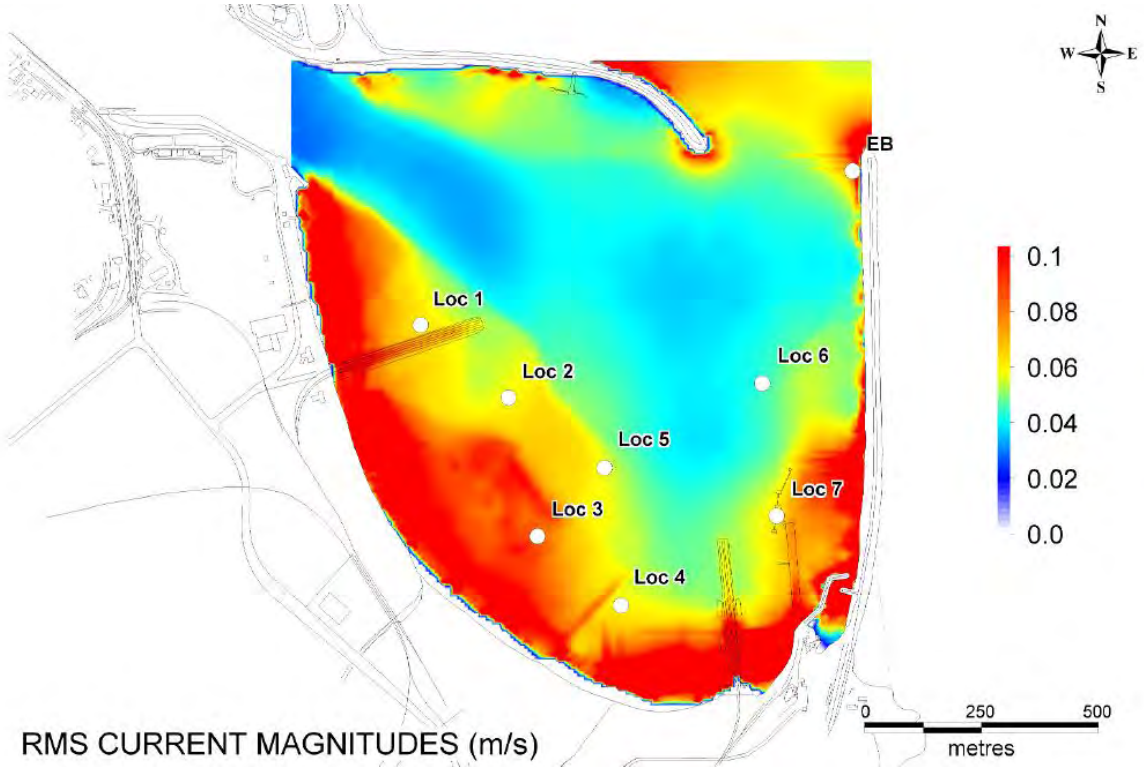

Figure 8 **Existing long wave induced current magnitudes in Port Kembla Outer Harbour (CLT)**

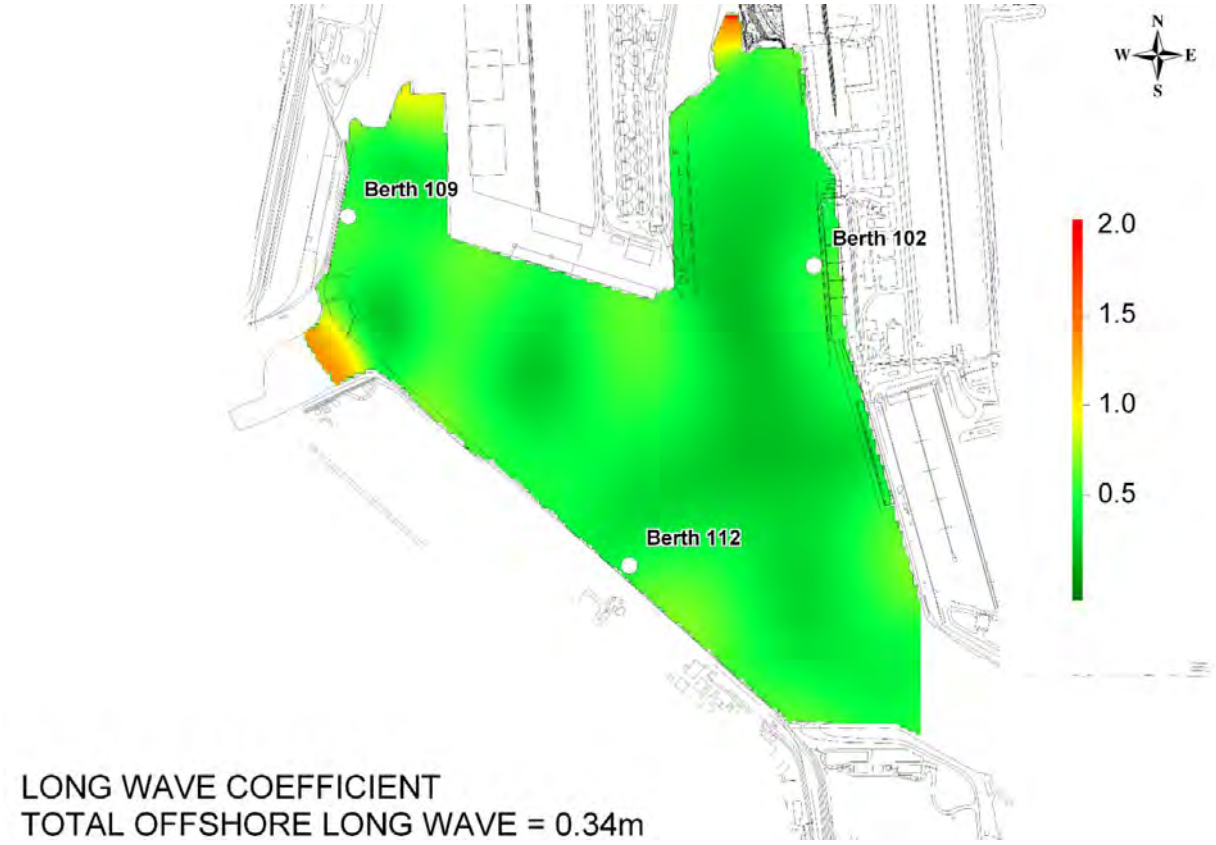

Figure 9 **Existing long wave height coefficients in Port Kembla Inner Harbour (CLT)**

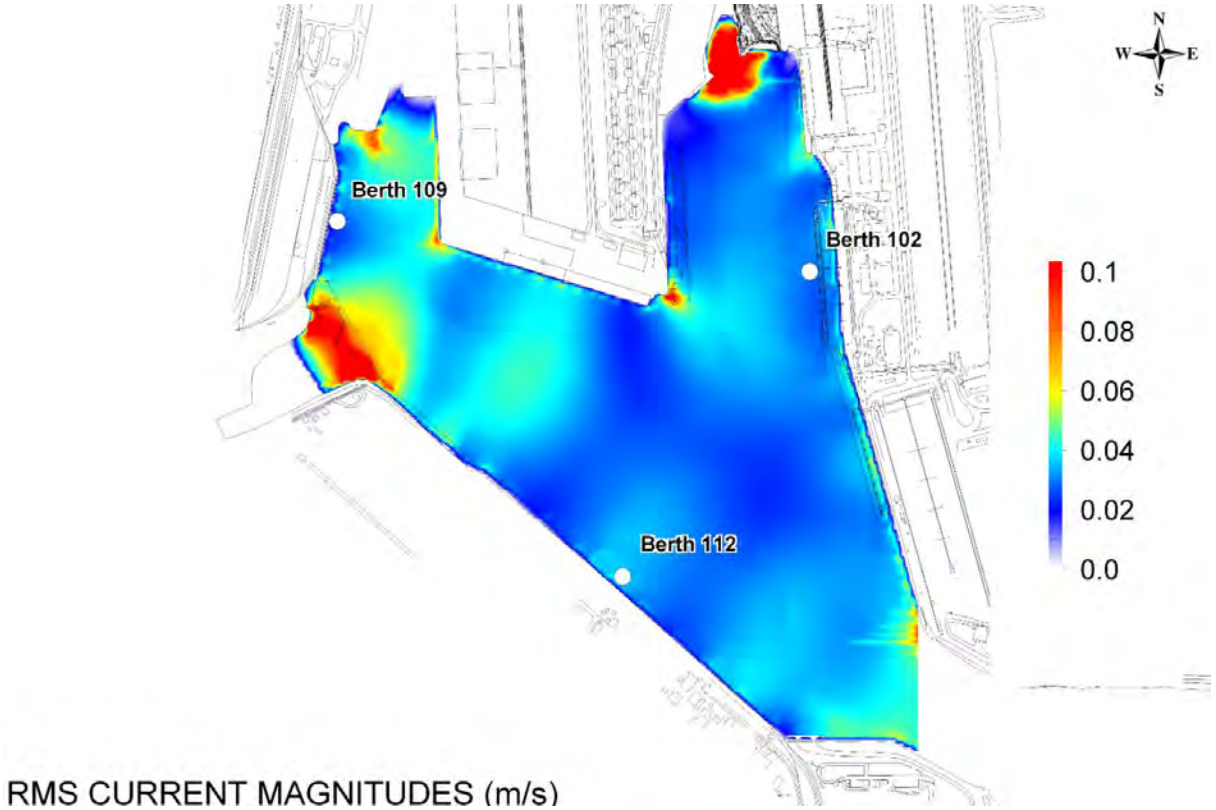

Figure 10 **Existing long wave induced current magnitudes in Port Kembla Inner Harbour (CLT)**

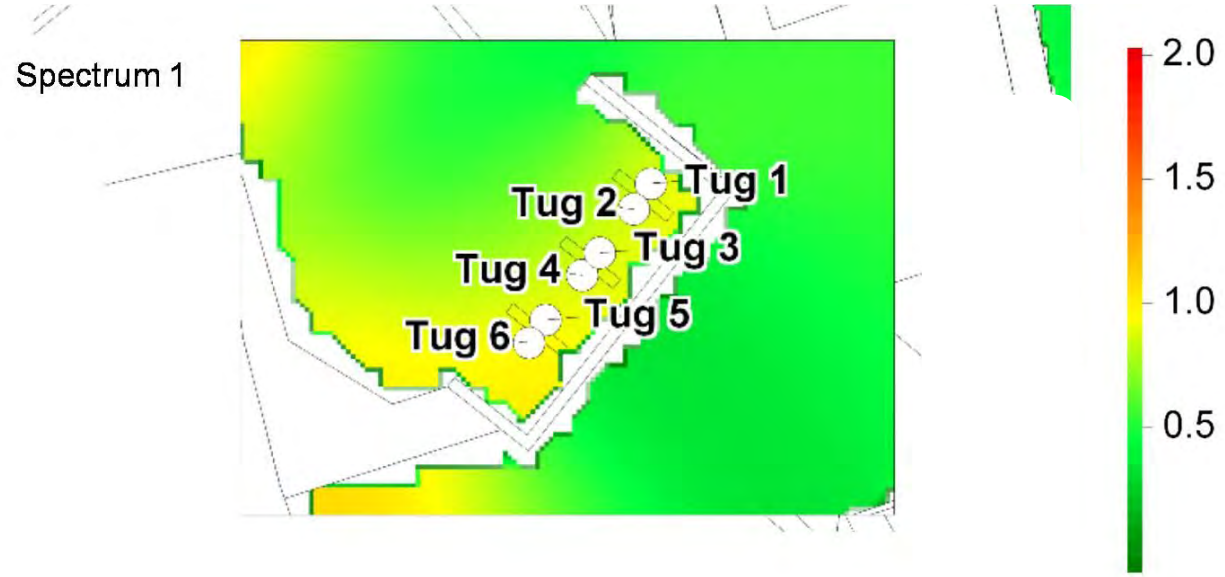

Figure 11 **Contour plots of long wave height coefficients at proposed tug harbour Spectrum 1 (CLT)**

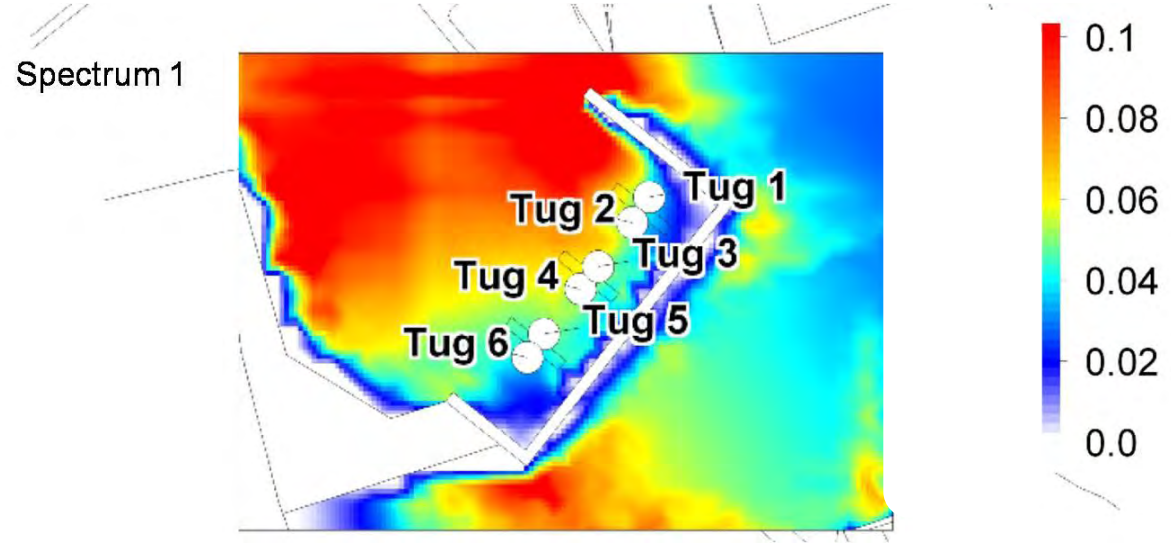

Figure 12 **Contour plots of RMS current magnitudes at purposed tug harbour Spectrum 1 (CLT)**

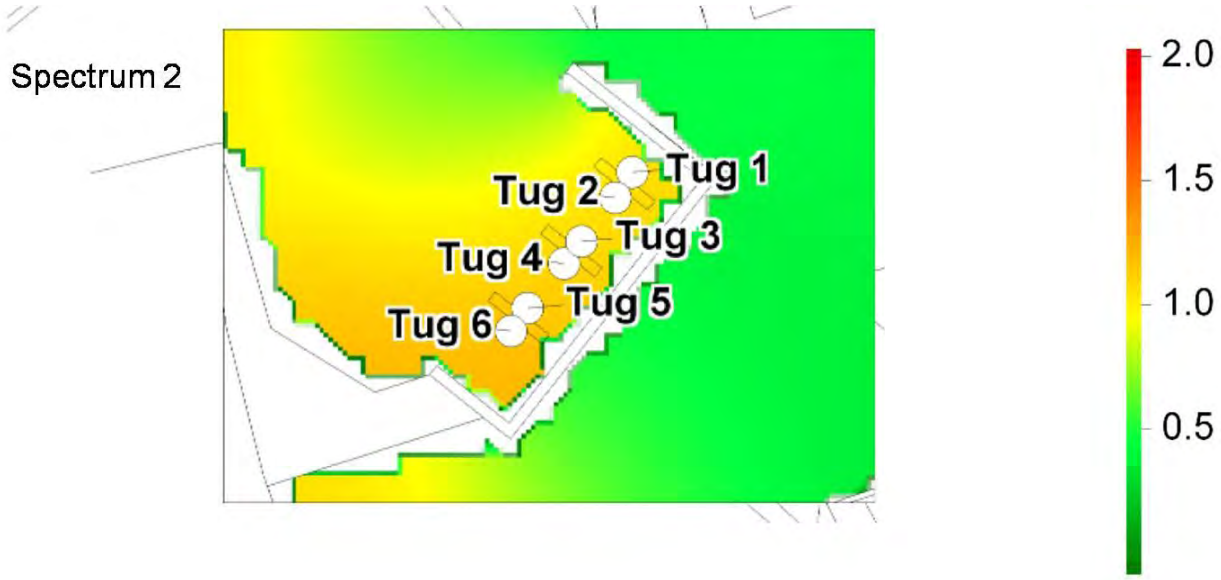

Figure 13 Contour plots of long wave height coefficients at proposed tug harbour Spectrum 2 (CLT)

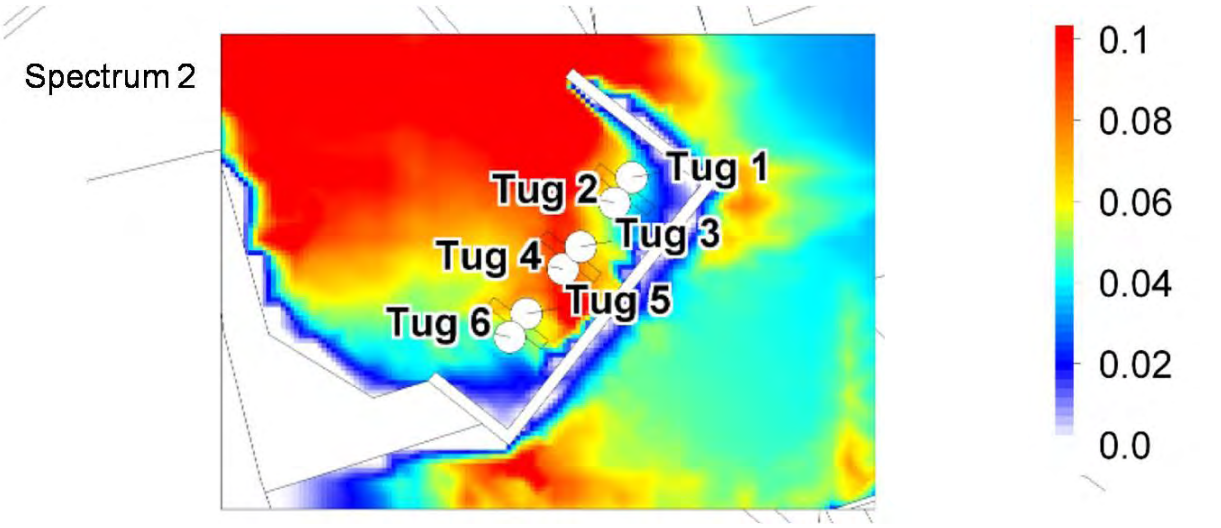

Figure 14 Contour plots of RMS current magnitudes at purposed tug harbour Spectrum 2 (CLT)

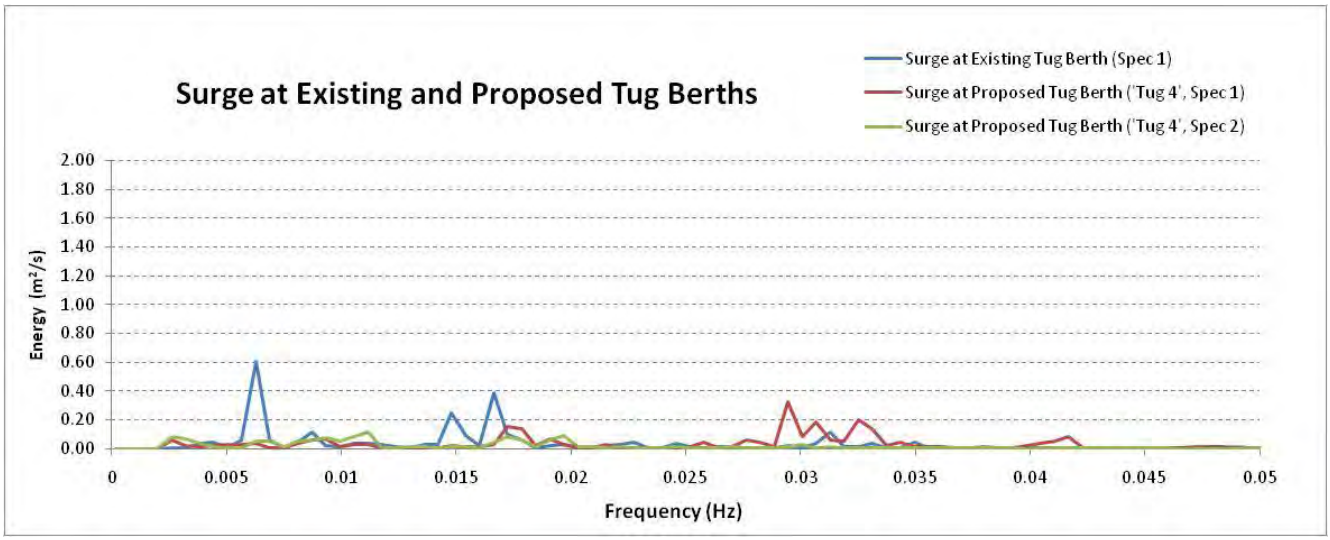

Figure 15 Surge at existing and proposed tug berths

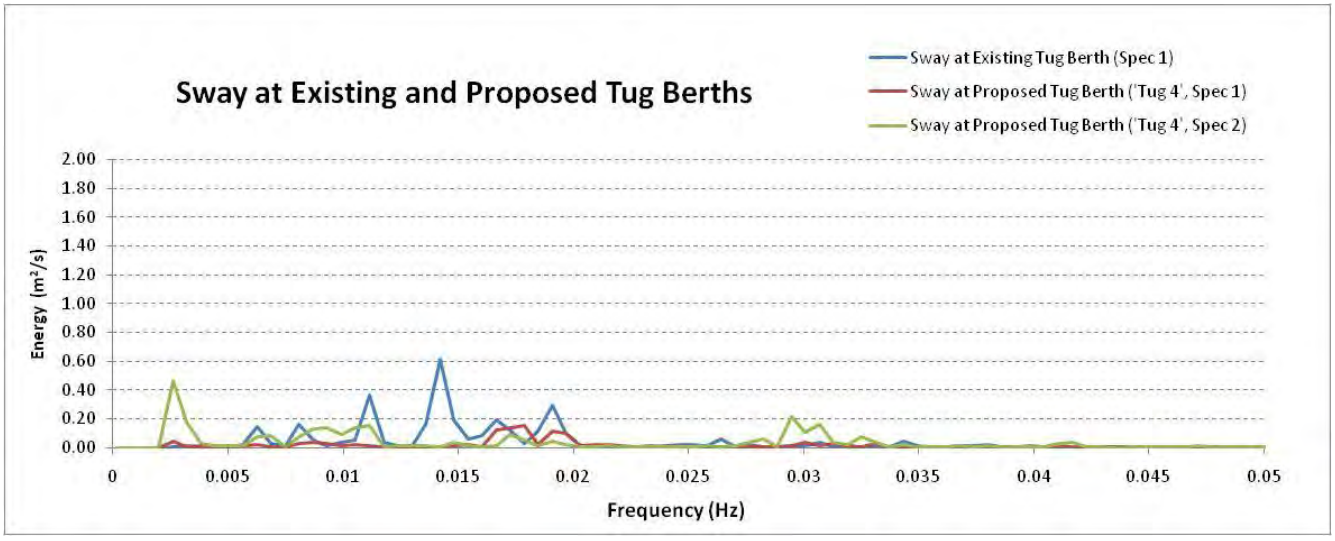

Figure 16 Sway at existing and proposed tug berths

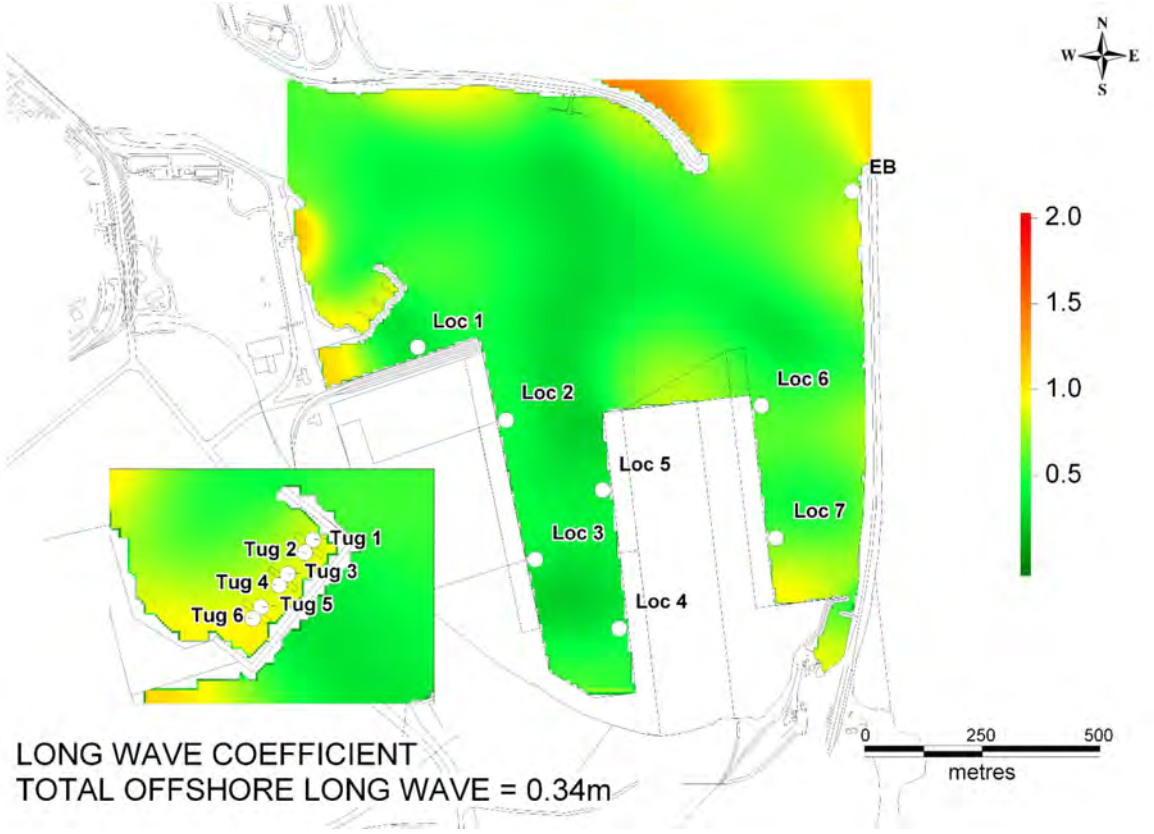

Figure 17 Contour plots of long wave height coefficients at developed Outer Harbour (Spectrum 1)

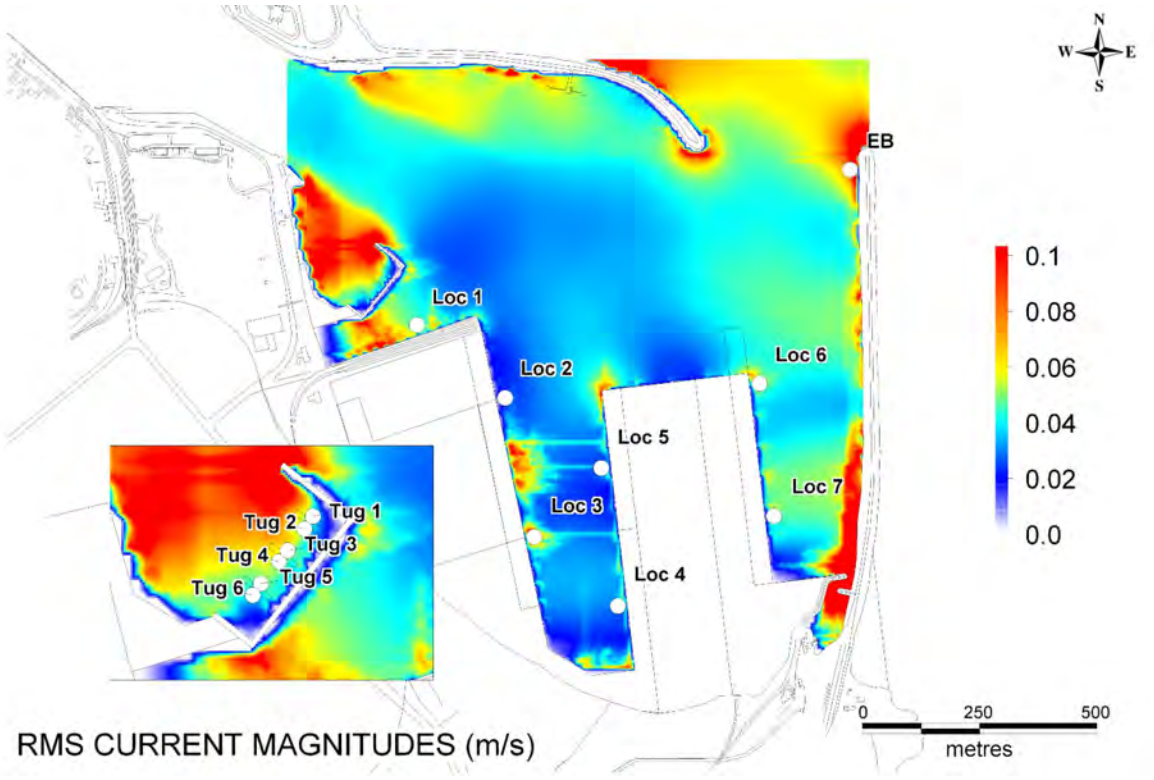

Figure 18 Contour plots of current magnitudes at developed Outer Harbour (Spectrum 1)

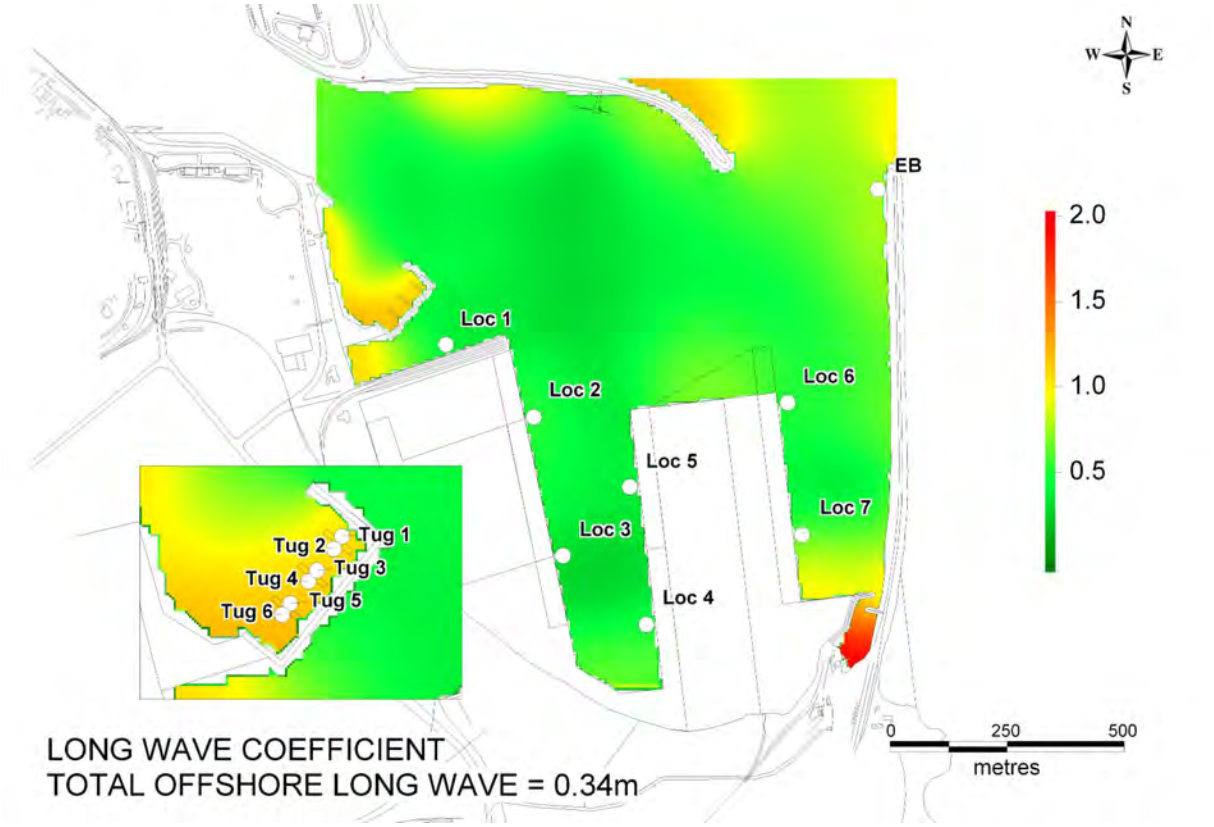

Figure 19 Contour plots of long wave height coefficients at developed Outer Harbour (Spectrum 2)

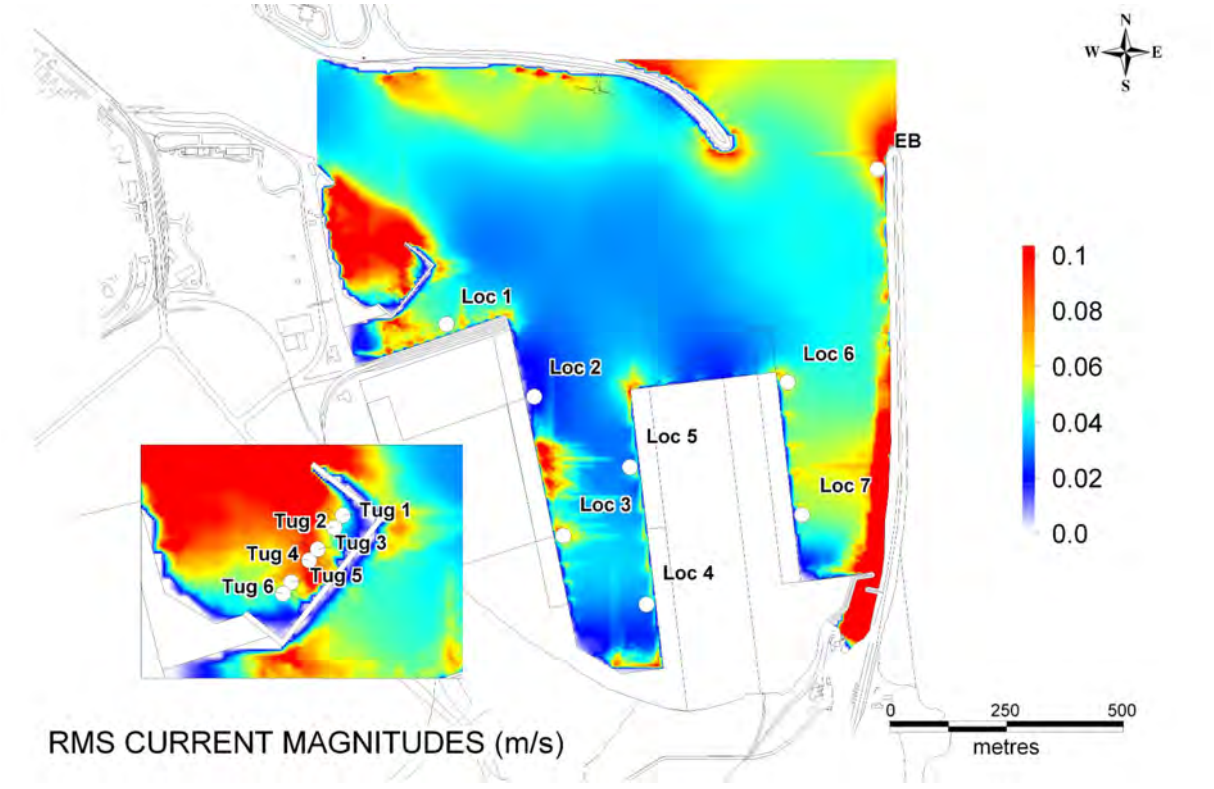

Figure 20 Contour plots of RMS current magnitudes at developed Outer Harbour (Spectrum 2)

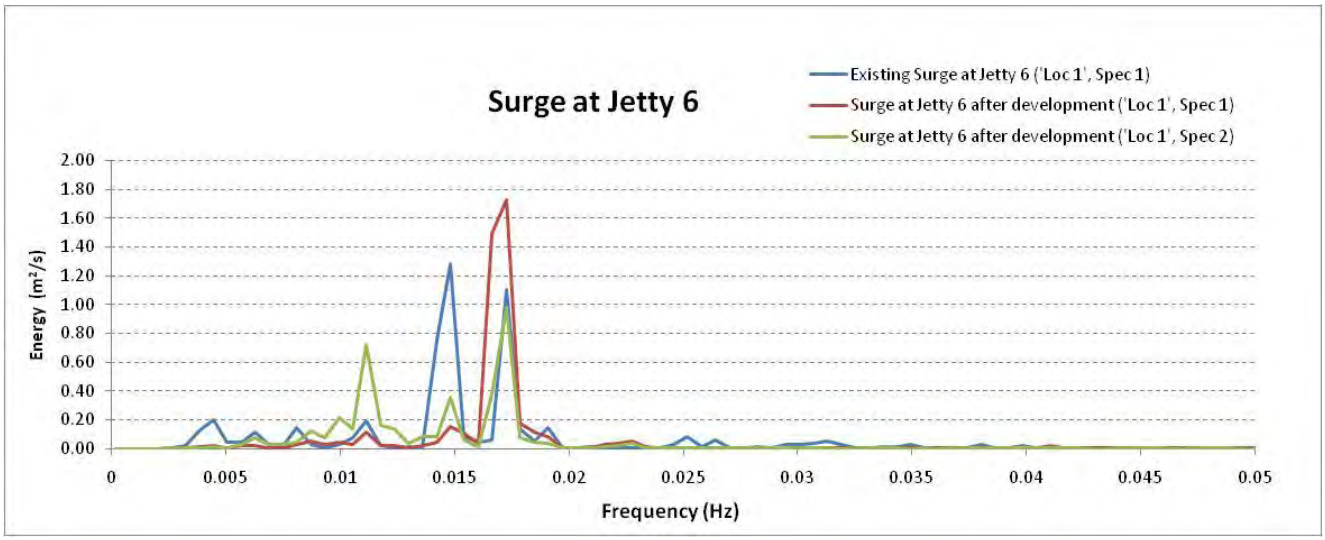

Figure 21 Surge at Jetty 6 prior to and after development

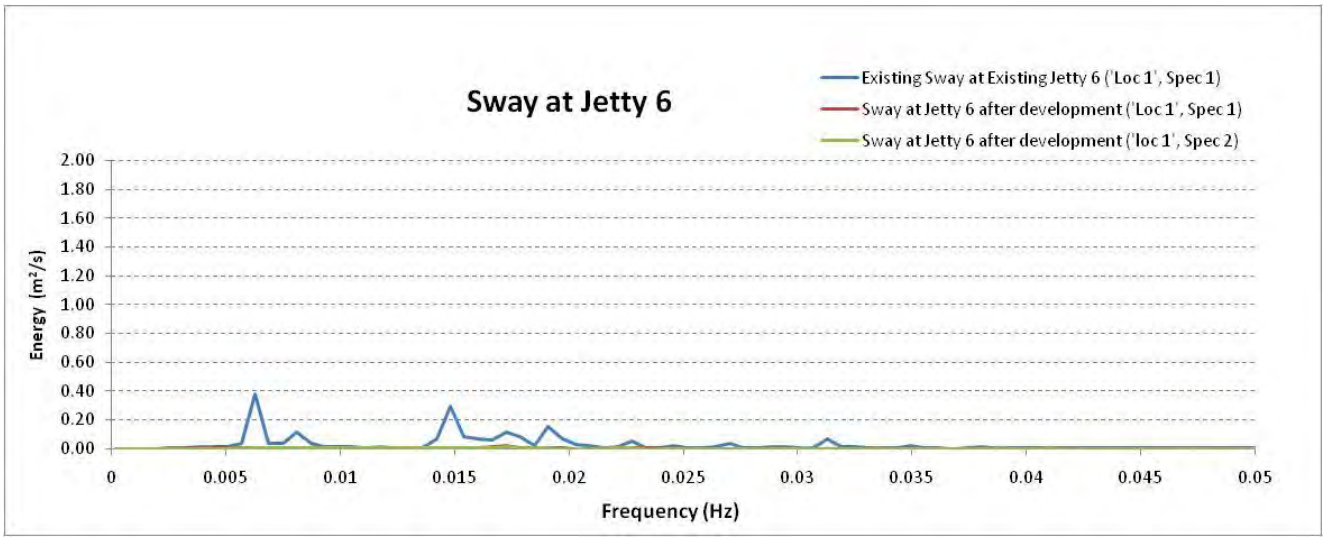

Figure 22 Sway at Jetty 6 prior to and after development

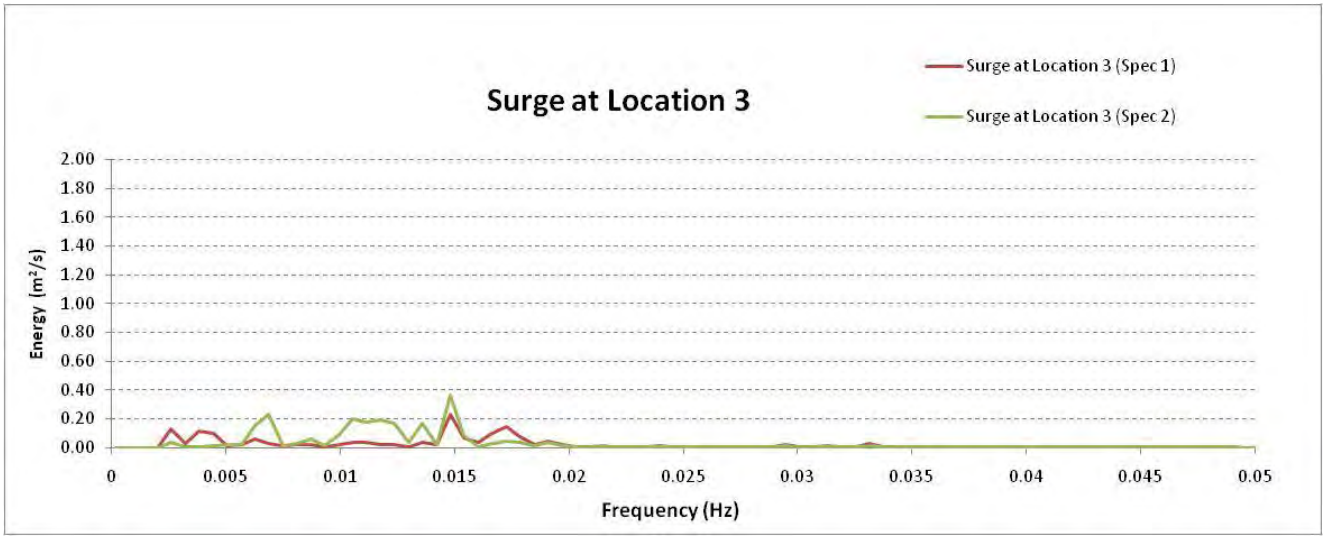

Figure 23 Surge at Location 3 prior to and after development

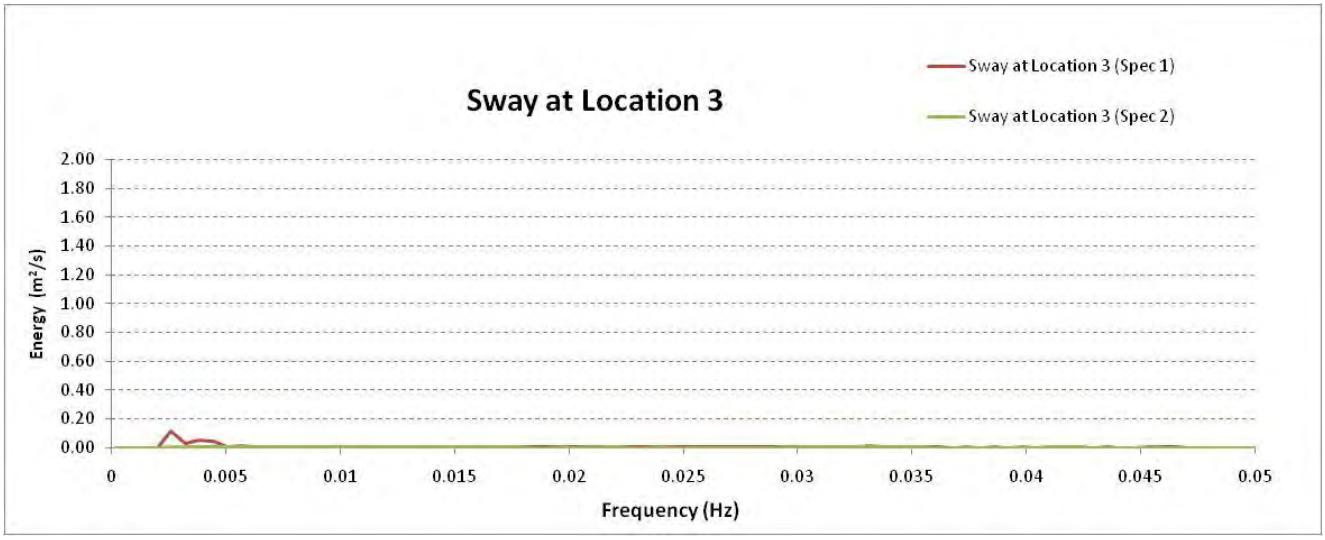

Figure 24 Sway at Location 3 prior to and after development

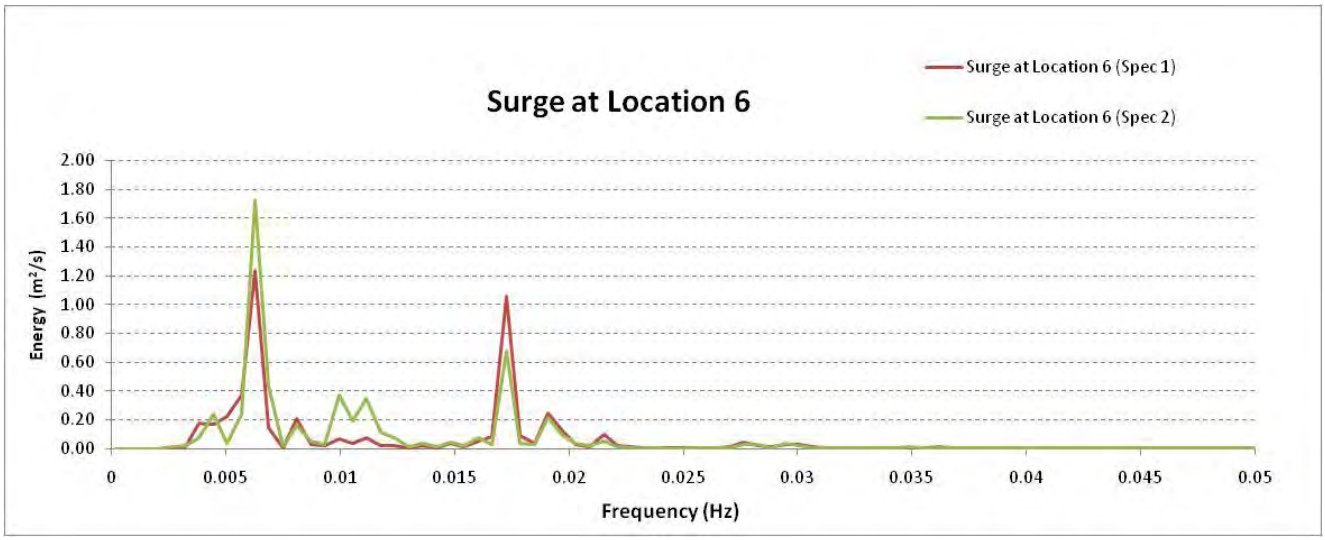

Figure 25 Surge at Location 6 prior to and after development

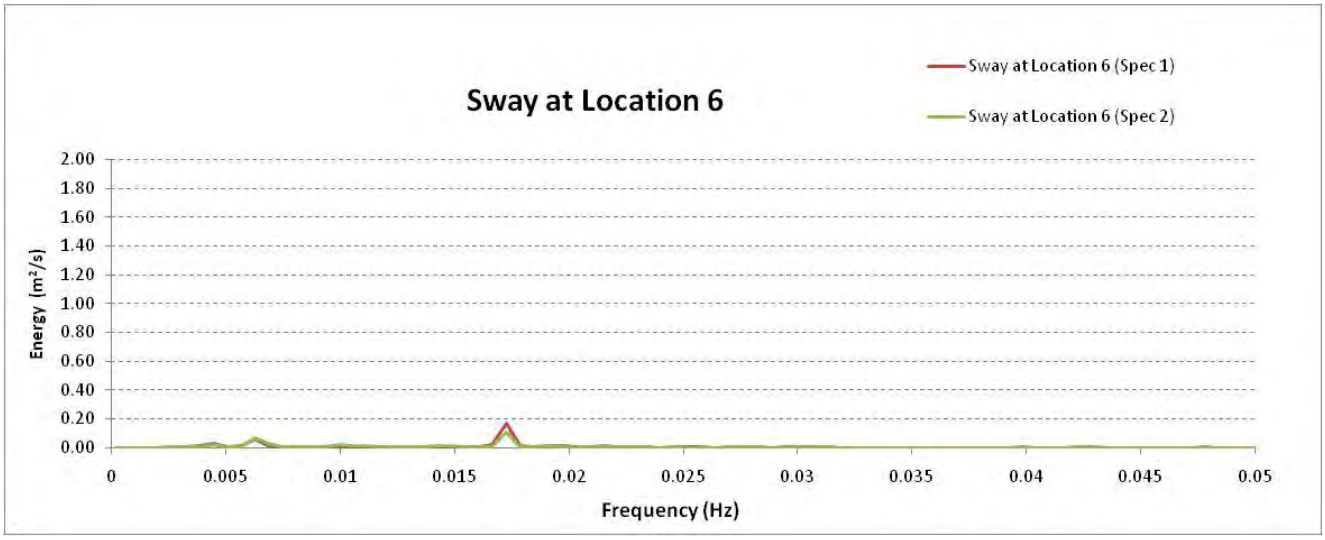

Figure 26 Sway at Location 6 prior to and after development

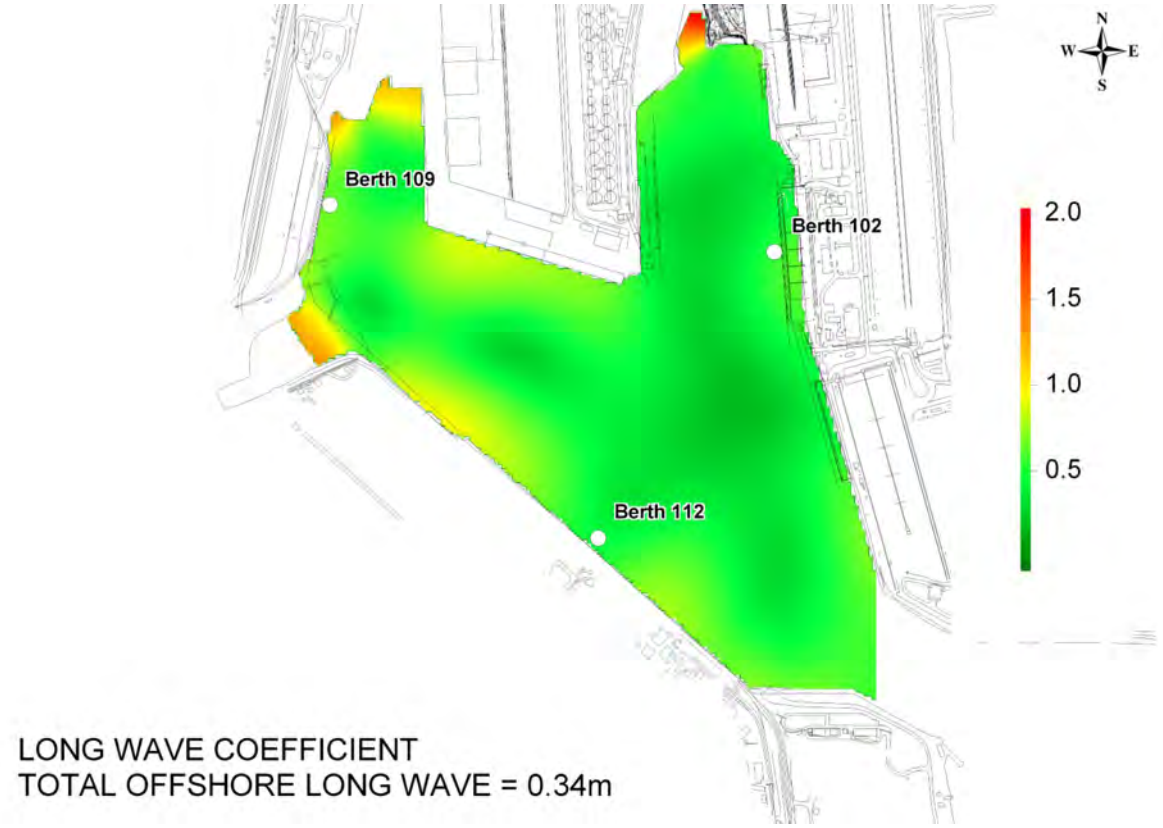

Figure 27 **Contour plots of long wave height coefficients in the Inner Harbour after development of the Outer Harbour (Spectrum 1)**

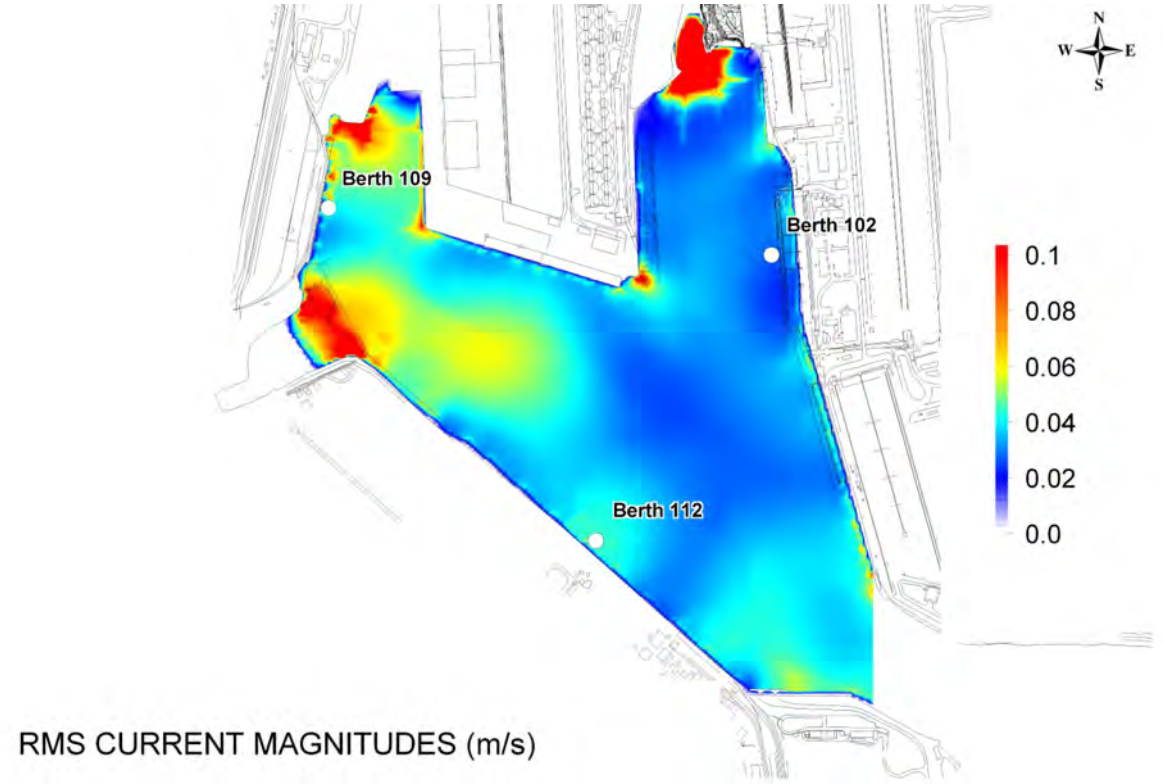

Figure 28 **Contour plots of RMS current magnitudes in the Inner Harbour after development of the Outer Harbour (Spectrum 1)**

Figure 29 Contour plots of long wave height coefficients in the Inner Harbour after development of the Outer Harbour (Spectrum 2)

Figure 30 Contour plots of RMS current magnitudes in the Inner Harbour after development of the Outer Harbour (Spectrum 2)

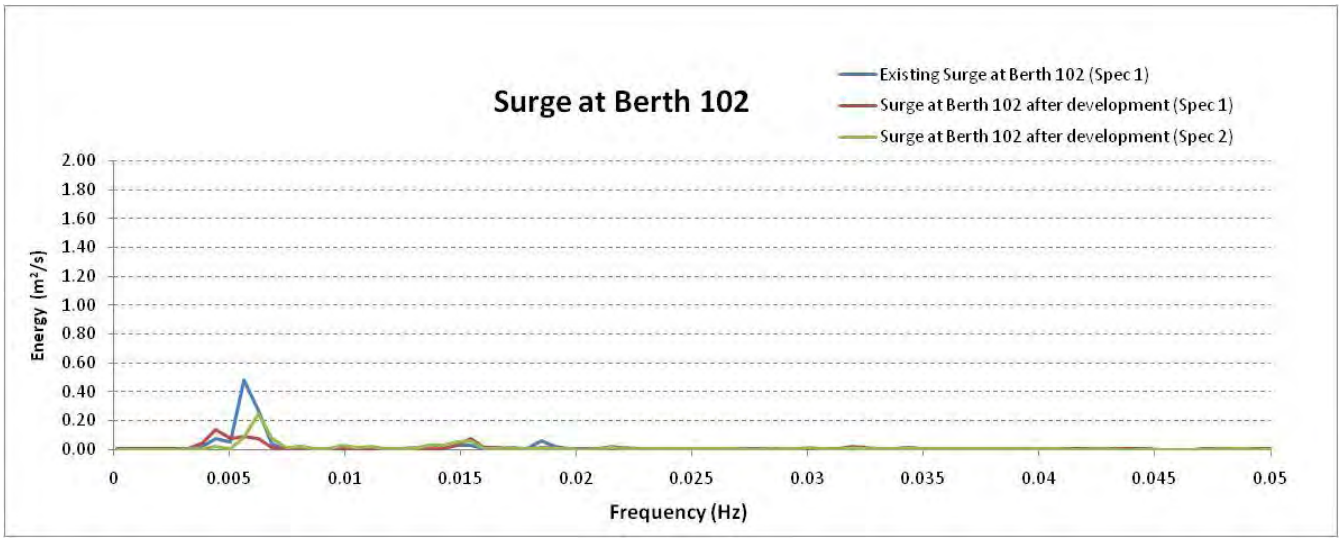

Figure 31 Surge at Berth 102 prior to and after development of the Outer Harbour

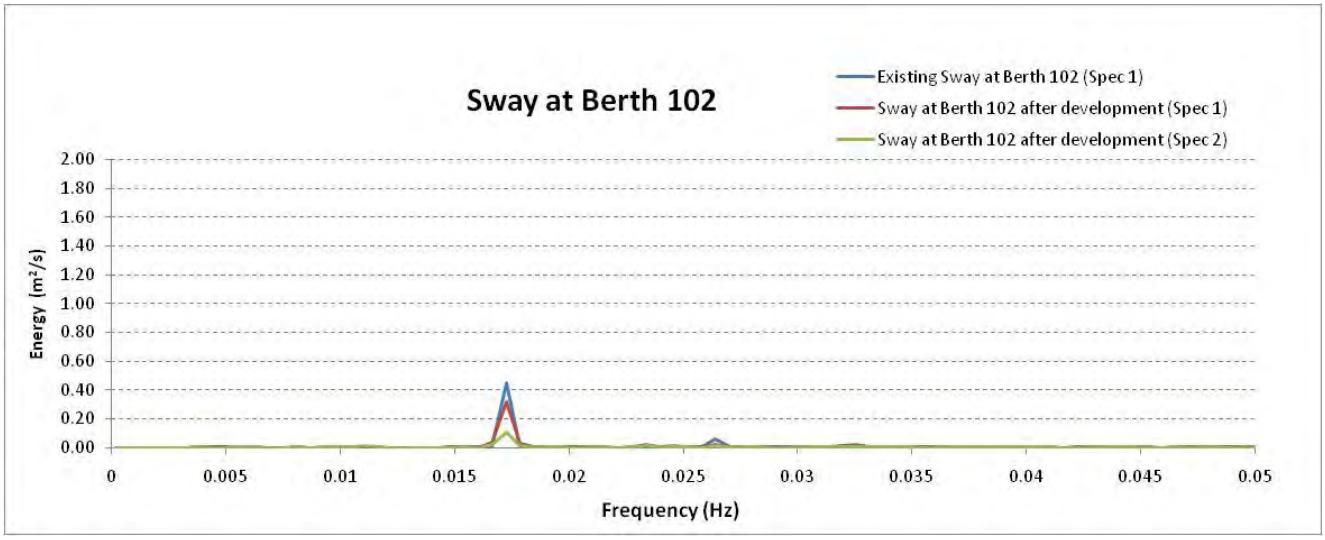

Figure 32 Sway at Berth 102 prior to and after development of the Outer Harbour

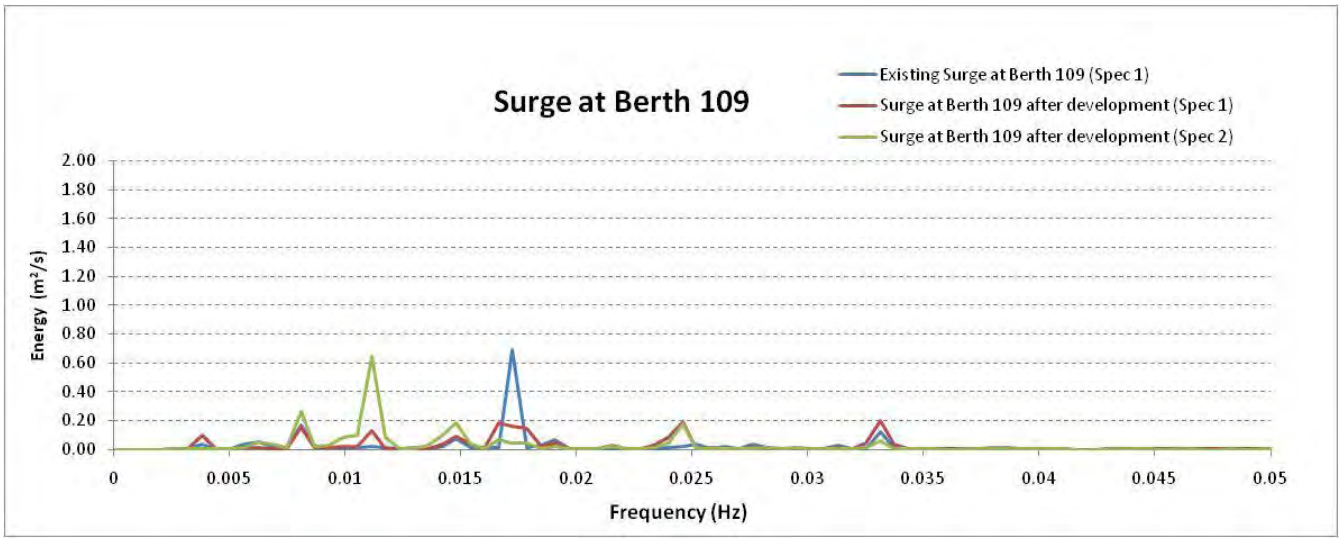

Figure 33 Surge at Berth 109 prior to and after development of the Outer Harbour

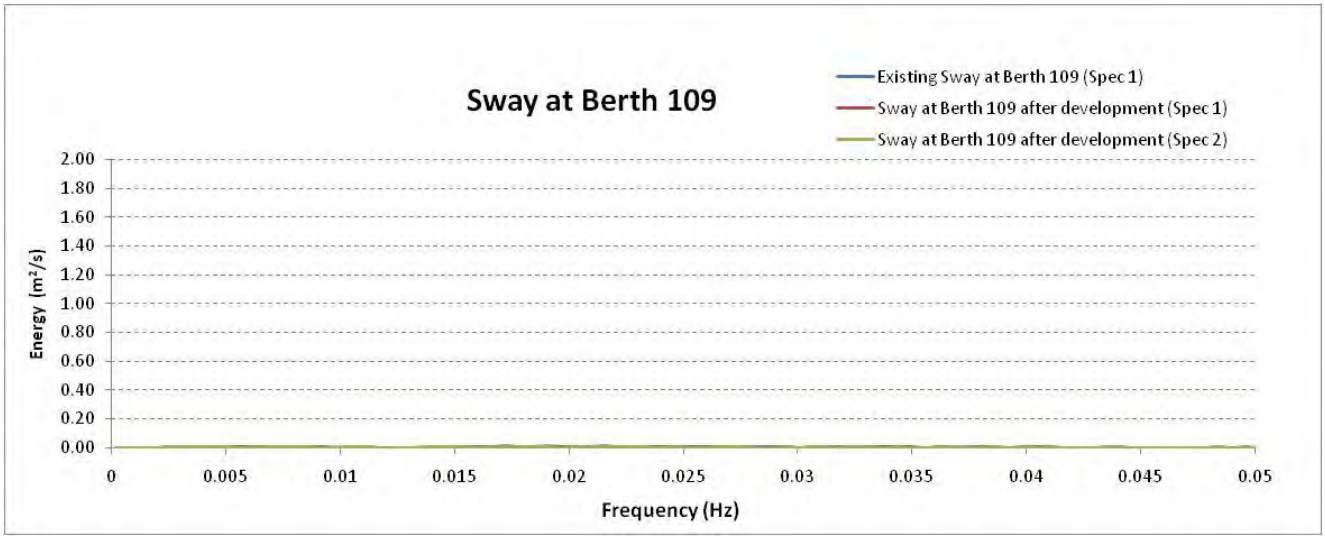

Figure 34 Sway at Berth 109 prior to and after development of the Outer Harbour

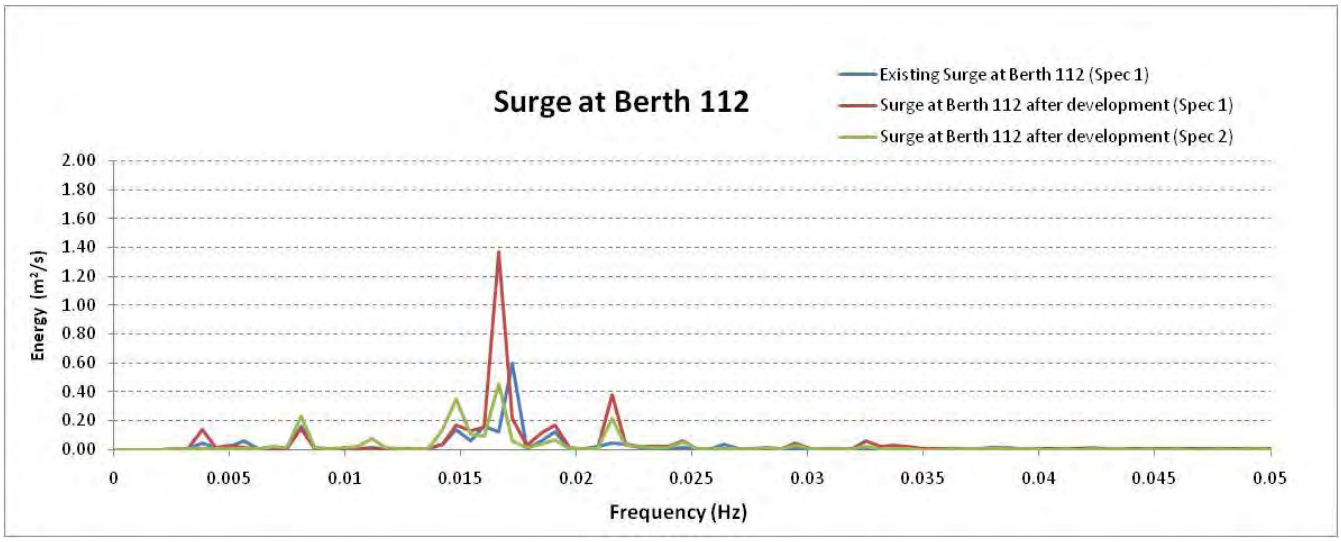

Figure 35 Surge at Berth 112 prior to and after development of the Outer Harbour

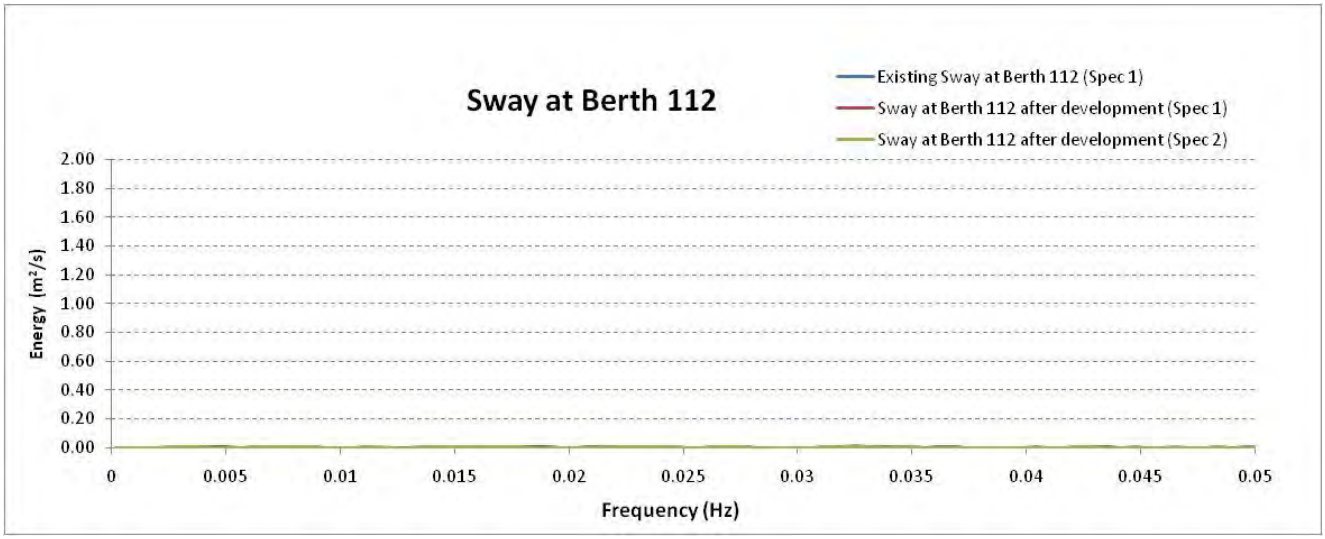

Figure 36 Sway at Berth 112 prior to and after development of the Outer Harbour

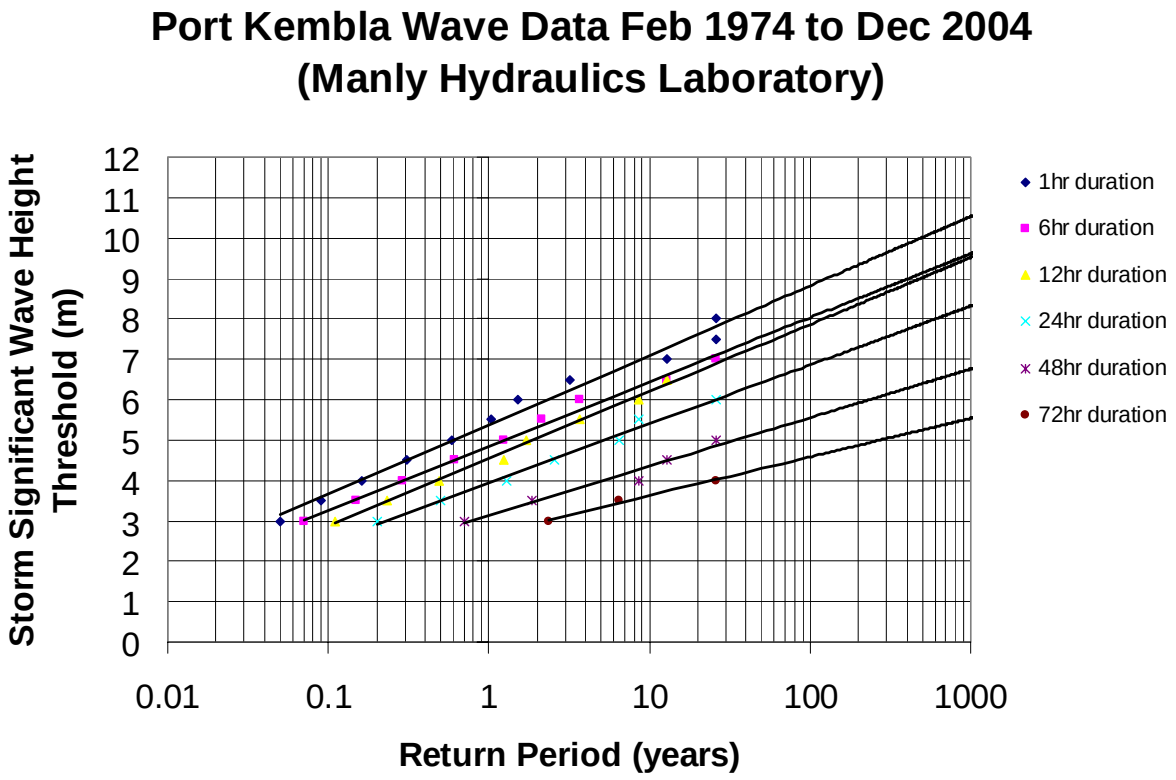

Figure 37 Port Kembla wave data February 1974 – December 2004 (Data supplied by Manly Hydraulics Laboratory)

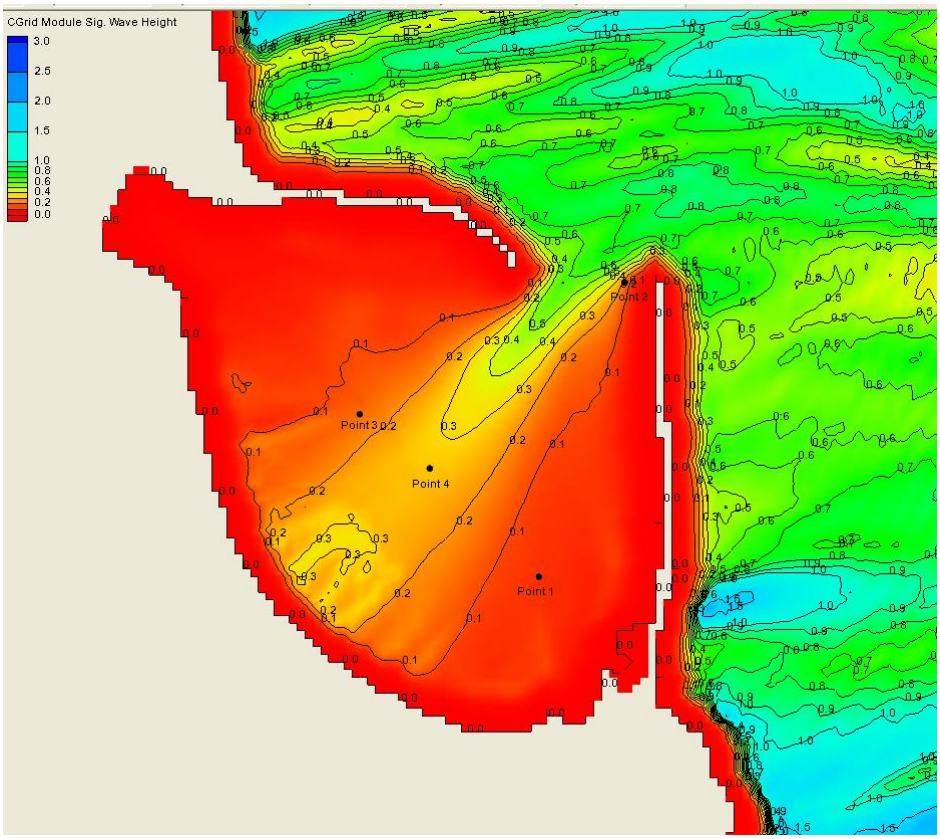

Figure 38 Swell wave penetration within the existing Port Kembla Outer Harbour (T_p = 10 s)

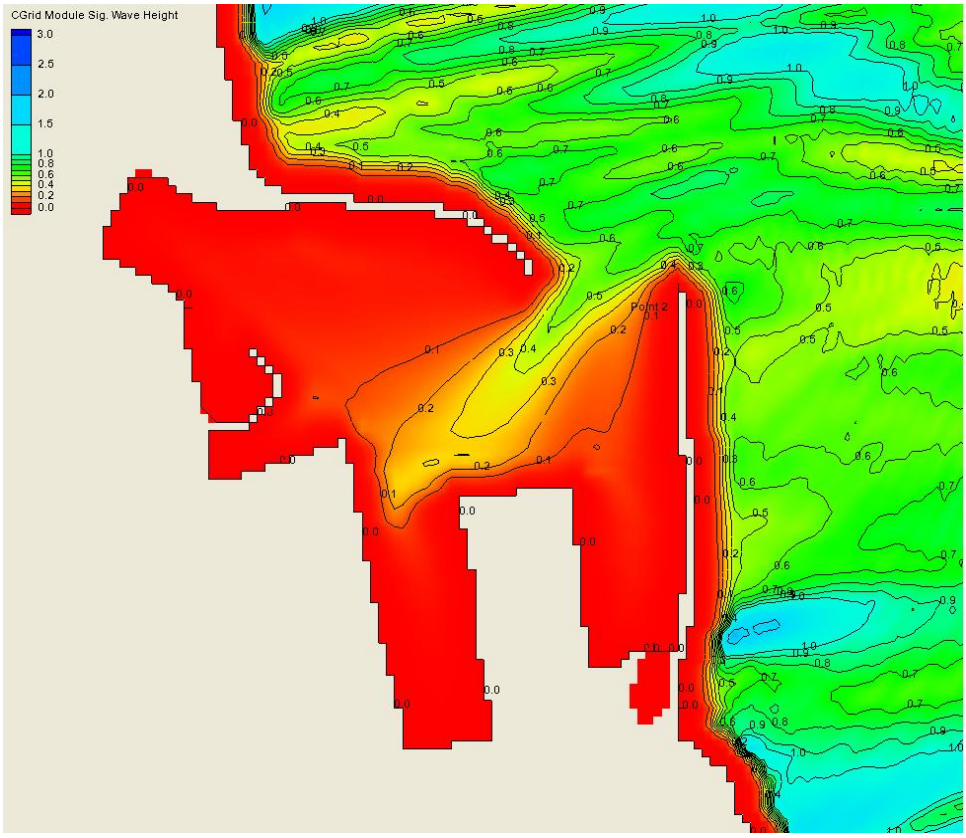

Figure 39 Swell wave penetration within Port Kembla Outer Harbour after completion of the proposed re-development (T_p = 10 s)

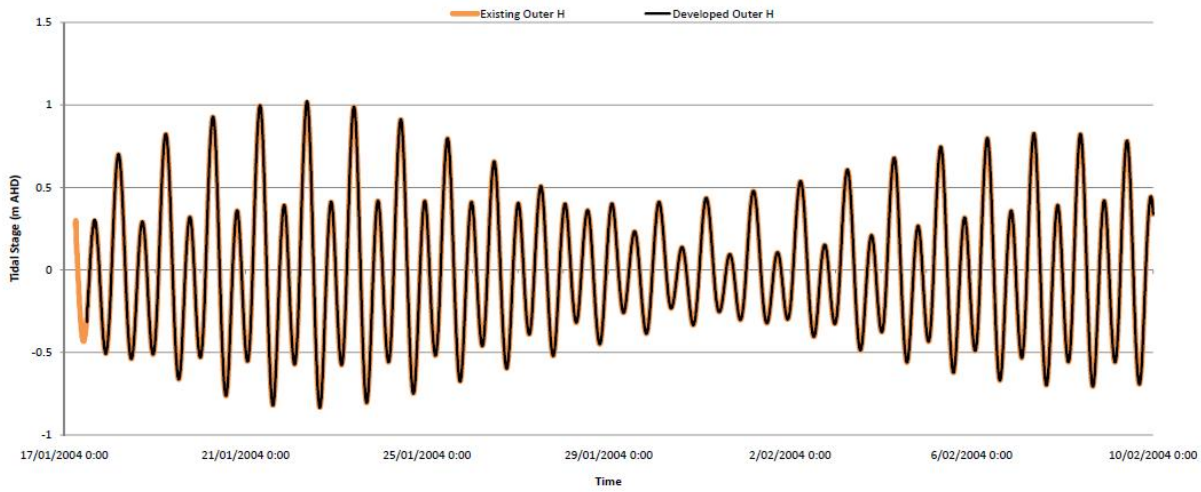

Figure 40 Typical tidal stage in the Outer Harbour for existing conditions and for the developed Outer Harbour

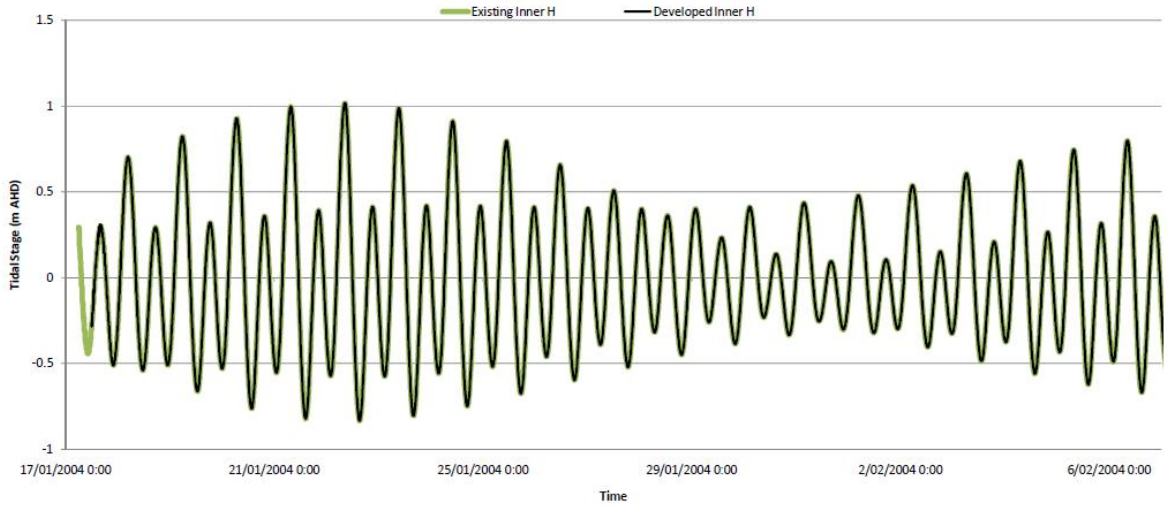

Figure 41 Typical tidal stage in the Inner Harbour for existing conditions and for the developed Outer Harbour

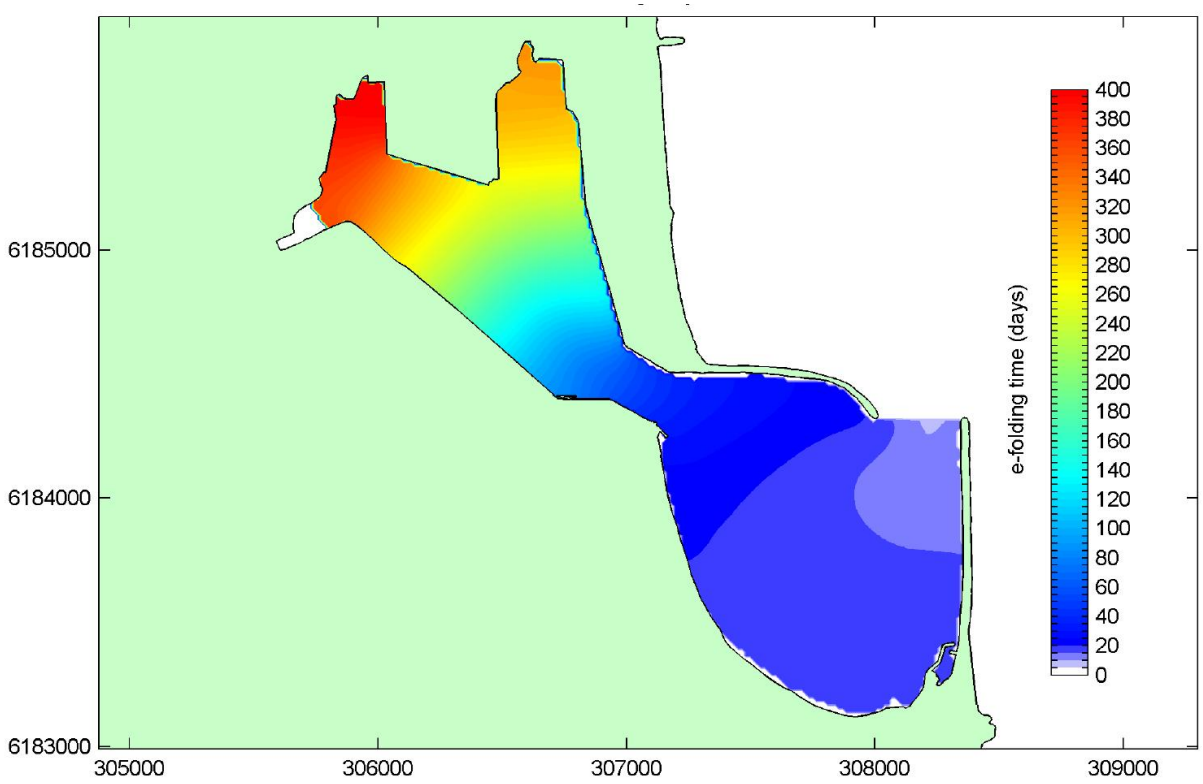

Figure 42 Tidal flushing existing conditions

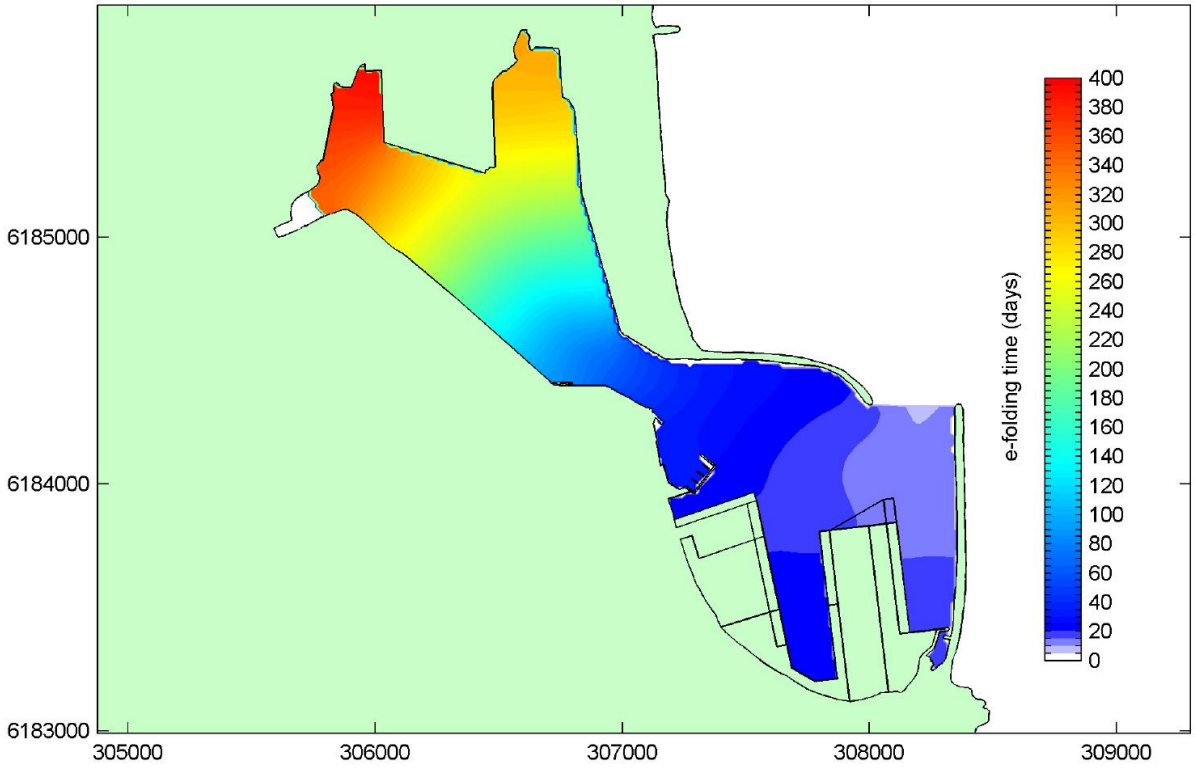

Figure 43 Tidal flushing conditions after development of Outer Harbour

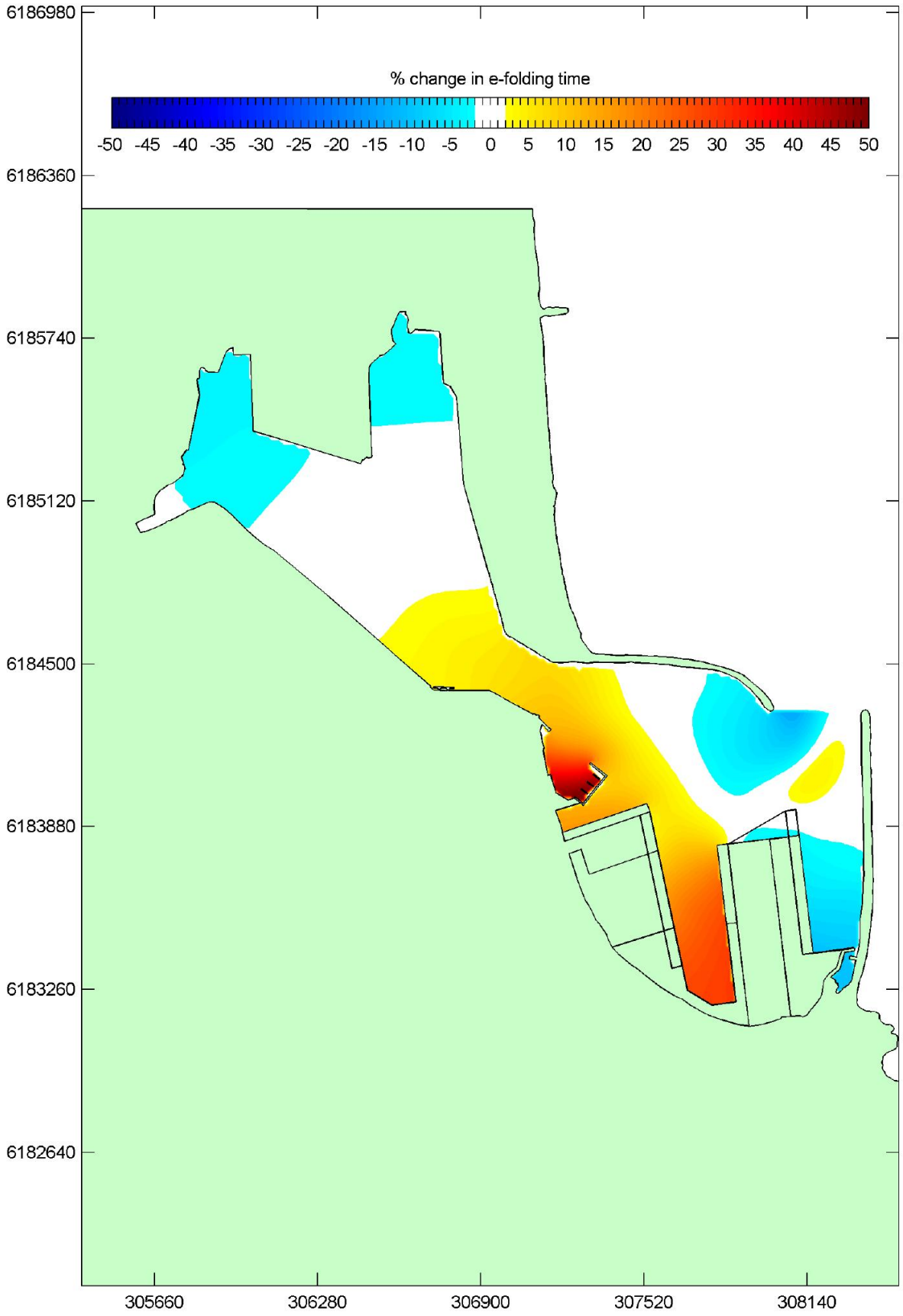

Figure 44 Change in flushing characteristics after development of the Outer Harbour

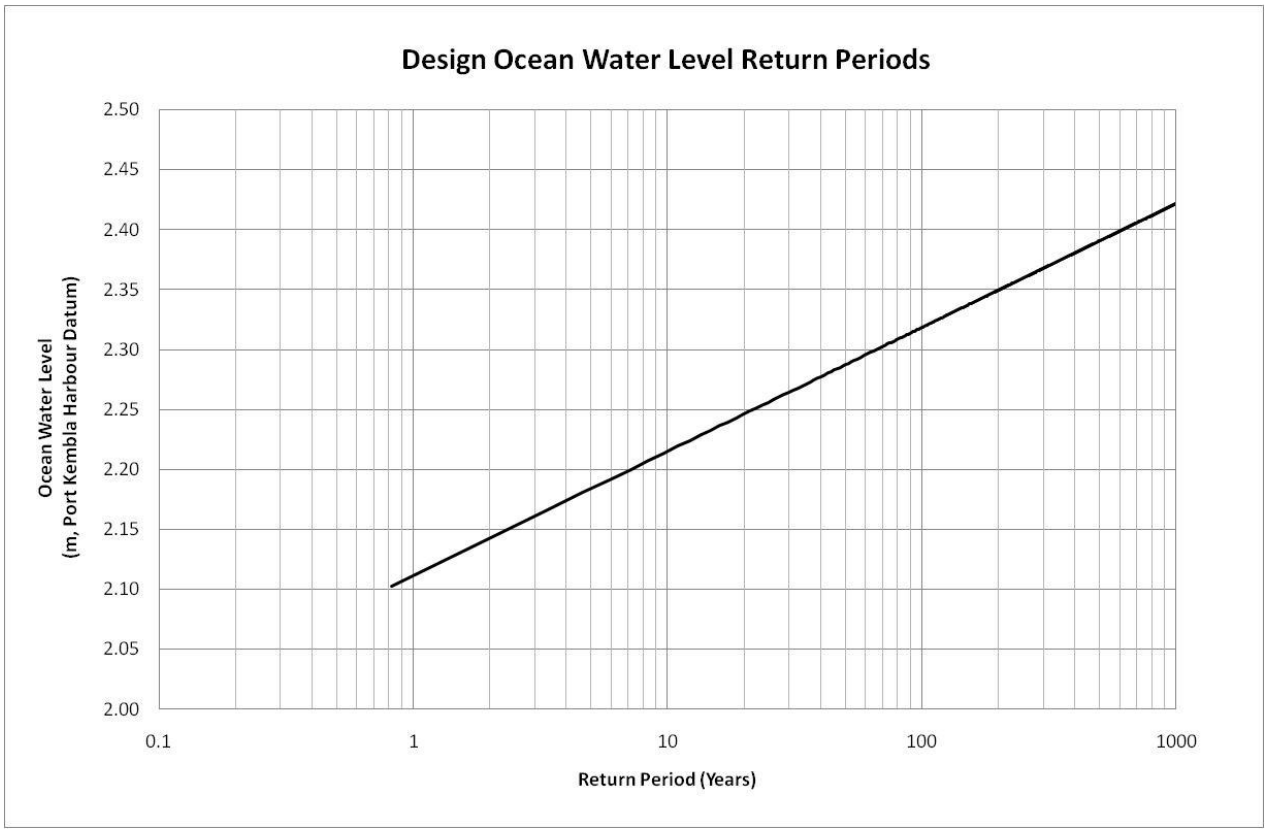

Figure 45 Sydney, NSW, extreme ocean level occurrence, converted to the Port Kembla Harbour Datum based on joint probability analysis 1914 to 1999 utilising all available data (MHL).