WAVE MODELLING ASSESSMENT

PROPOSED DEVELOPMENT OF THE GRANGER BAY PRECINCT AND LAND RECLAMATION AT THE V&A WATERFRONT

BACKGROUND

PRDW Consulting Port and Coastal Engineers conducted a **Wave and Hydrodynamic Modelling Study** to quantify changes in wave dynamics**.** WML Coast's independent Impact Assessment was based on PRDW's modelling results, which were deemed acceptable for the purposes of the EIA.

A three-dimensional hydrodynamic model (MIKE 3 Flow Flexible Mesh) was used to **simulate currents, water levels and seawater temperature** under summer/autumn and winter/spring conditions. The model incorporated tidal forcing, wind stress and density-driven circulation and was calibrated against available measured data. The model was applied to simulate wave transformation processes and calculate wave-induced bed shear stresses.

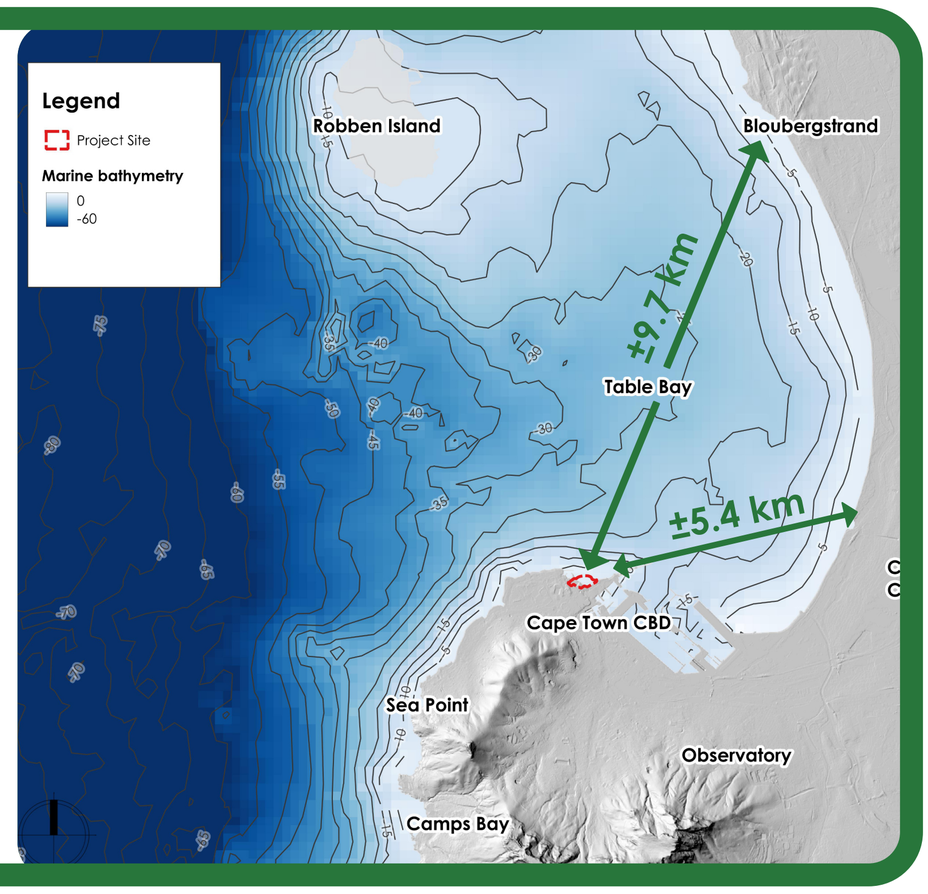
Three representative storm scenarios were modelled:
(1) a 1-month return period storm in **summer**;
(2) a 1-month return period storm in **winter**;
(3) a **1-year** return period storm.

Bed shear stresses were compared to a critical threshold of **0.2 N/m²** - above which resuspension of fine particulate matter can be expected - to assess the potential for l**ong-term mud accumulation**.

LONGSHORE SEDIMENT TRANSPORT

The coastline around the development area is rocky with limited longshore sediment transport. No changes in the sediment transport regime are anticipated due to the proposed revetment and breakwaters, except for potential accumulation of finer sediments within the proposed new bay.

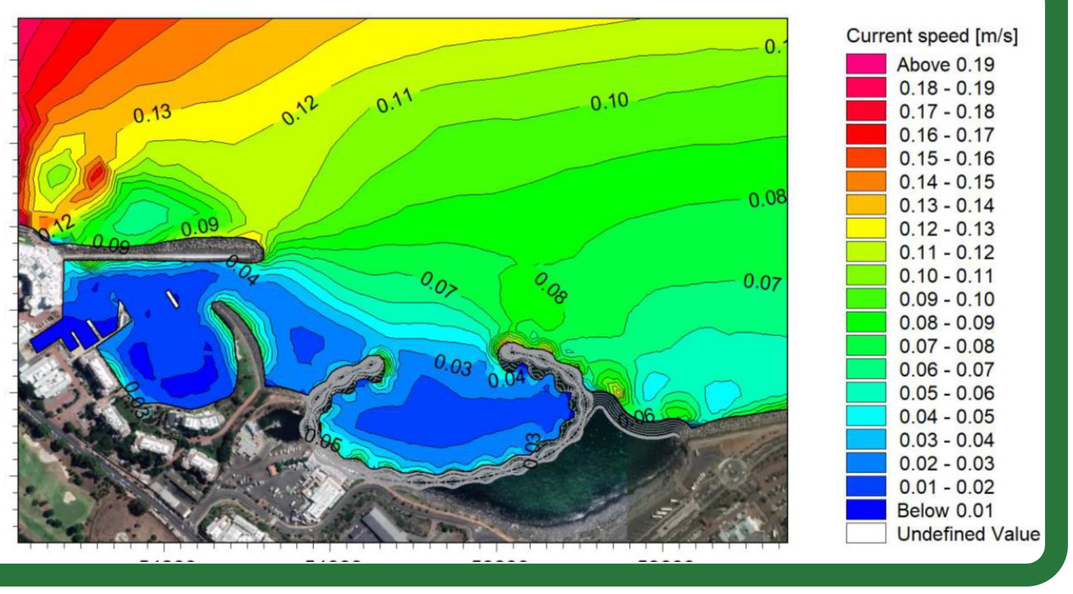
The only impacts of significance relate to the changes in the wave regime, as separately assessed.



CURRENT SPEED AND DIRECTION

The proposed development will reduce maximum current speeds in the area of the new bay to approximately 0.02 m/s, from baseline conditions of 0.06 m/s (summer) and 0.04 m/s (winter) under baseline conditions.

Current speeds within the development will remain slightly higher than those inside the existing Waterclub Marina (approximately 0.01 m/s).



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