Adhami Pender Architects

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217a BEACH ROAD, DENHAMS BEACH
Retaining / Sea Wall

The original requirement was to provide slope stability to the 25 m high escarpment overlooking Denhams Beach. Included in the clients design requirements were 2 platforms at the base of the escarpment created by 2 retaining walls. I decided to modify the lower retaining wall to provide some resistance to storm surge, thus turning it into a sea wall as well. The client decided to use a Vertiblock wall system – a stone filled, precast concrete hollow block (see attached details). I decided to concrete reinforce it, and stabilise it by linking the top to the footing of the adjacent wall. See original structural drawings attached. The slope stability and retaining walls have been built to my design.

The Council now require it to formally certified as a Sea Wall to design loads determined by UNSW Water Research Laboratory. See attached document.

The UNSW guide lists a range to design horizontal pressures depending on the wave action and sea level increases due to climate change, for the current year, 2025, and for year 2075, and for 100 and 500 year ARI (annual recurrent incident). The max design horizontal pressure for 2025 / 500 ARI is 55.6 Kpa, and 113.6 Kpa for 2075 / 500 ARI.

The upper and lower walls are capable of withstanding 60 KPa based solely on the resistance provided by passive earth pressure of loose sand. This would satisfy the 2025 / 500 ARI. The lower seawall / retaining wall may experience local damage at the 2075 100 year and 500 year ARI events, but the wall as a whole should remain intact. Failure of this wall does not pose a safety risk or risk to other nearby structures

The lower sea wall could be strengthened by casting a 200 mm slab on top of the platform above the lower sea wall and anchored into the existing concrete reinforce parts of the lower wall and into the footing of the upper wall. This would confine the soil behind the wall and result in resisting pressures in excess of 150 KPa. It would also eliminate the loss of soil from behind the wall. This would then satisfy the 2075 / 500 ARI requirement.

Both walls should be inspected after major storm events to check for and rectify any damage.

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