

# District Council of Tumby Bay

## COASTAL ADAPTATION PLANNING – FREQUENTLY ASKED QUESTIONS

### ***Why is our coastline susceptible to coastal hazards such as erosion and inundation?***

A historical review of Tumby Bay has identified that the coastal dune system was removed and levelled during early settlement (Figure 1). This area was developed for recreational purposes, with natural dunes replaced by lawn. This is an important context, as exposed coastal systems like Tumby Bay, depend upon an established dune system and an available sand reserve to provide natural protection (i.e. a buffer) from coastal erosion and storm surge. Removal of the sand reserve has increased Tumby Bay's susceptibility to coastal hazards since early settlement and necessitated the construction of protection works in the late 1990s.

### ***Why has our existing vertical seawall failed?***

Seawalls, like all structures, have a design life. That is a period in which the structure is expected to function effectively under normal conditions. The design life of a vertical seawall, such as at Tumby Bay, is typically between 20 to 30 years and depends on a range of factors, including the material used and environmental conditions, such as the wave climate. The vertical seawall, constructed in the 90's, is now well beyond its functional design life. Exposed sections of the vertical wall also indicate that the seawall is not founded deep enough to accommodate short term storm erosion and longer-term recession of the beach.

### ***Why is a vertical wall so much more expensive than a rock revetment?***

Vertical seawalls are generally more expensive to construct than rock revetments due to several factors. The main reason is that materials to construct a vertical seawall, such as reinforced concrete or steel sheet piles, are generally more expensive than a rock revetment. Material is often not available locally and needs to be imported from other locations, such as Adelaide. Additionally, vertical seawalls are typically more expensive to place, requiring specialist equipment and/or appropriate foundation preparation. For example, dewatering is often needed to properly found a reinforced concrete seawall on a beach due to the construction depths required below water level. The construction costs are often amplified in rural and remote locations, as the number of contractors who can construct vertical seawalls is limited and thus are likely to need to mobilise from further away, such as Adelaide.

### ***Will we lose access to the beach with a rock revetment wall?***

Access to the beach will still be maintained, this is an important consideration during the design of any seawall structure. Adequate access, including number of access points and access types (e.g. stairs, ramps) will need to be considered through the concept design phase in consultation with the community and key stakeholders.

### ***Won't we lose more of our beach (beach width) with the construction of a rock revetment wall, as opposed to fixing and extending the vertical seawall.***

A rock revetment is more porous than a vertical seawall and therefore dissipates more wave energy and causes less wave reflections. Although initially a rock revetment wall will take up more of the beach, over time a rock revetment will allow more sand to settle out within the beach area due to this dissipation effect. Whereas a vertical seawall is unable to dissipate wave energy, causing sand to be reflected further offshore and resulting in greater loss of beach width over time compared to a rock revetment seawall structure.

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### ***Was extending the existing sand bag wall considered?***

Yes. However, it's important to note that whilst the sand bag walls may provide better amenity, both visually and by providing a 'soft' edge for seating, they are by nature less durable than a rock revetment. Sand bag walls are also prone to damage, including accidental damage and vandalism. Given the volume of sand required to fill the bags and ongoing upkeep (compared to a rock revetment wall) the costs can be comparable in the short to medium term. In the longer term, sourcing the required volume of sand will become particularly challenging and subsequently likely to become more expensive than a rock revetment seawall.

### ***Why can't the existing dunes, as there currently existing south of the jetty, be extended north?***

Dune strengthening through nourishment, as opposed to hard protection structures, for the whole of the foreshore is absolutely a viable option in the short to medium term. However, for considering the longer-term protection of Tumby Bay (beyond 2050), securing a viable sand source (i.e. bringing sand in from another location) becomes unsustainable. Costs are estimated to be more than \$500M to maintain a beach and dune system between 2050 and 2100.

### ***Where else have rock revetment seawalls been constructed in South Australia?***

The construction of rock revetment walls to prevent the impacts of coastal erosion is a common coastal management practice locally and around the world. Some local examples include Port Lincoln, Point Turton and Moonta Bay (Yorke Peninsula), Kingston and Robe (Limestone Coast), Victor Harbor (Fleurieu Peninsula) and large sections of the metropolitan beaches of Adelaide.



Figure 1: Tumby Bay foreshore, 1938