

Attachment 2: Summary of relevant technical matters contained within the Assessment of Environmental Effects

The resource consent application for the proposed erosion protection structure is supported by a detailed technical assessment of the effects of the proposed seawall on coastal processes. A summary of technical matters relevant to the consideration of Council approval is given below.

Storm effects

The seawall has been designed with 1.8m freeboard above current 1% AEP storm tide levels and includes engineered design elements to reduce the risk of large scale erosion of dune sands behind the proposed wall. Foundation undermining is proposed to be prevented by excavating the wall 500mm into underlying harder base material. This allows for the entire loss of the existing beach in front of the structure (approximately 1.5m deep at the time of application), and lowering of 500mm of the underlying material, before the seawall is at risk of undermining.

End erosion

End erosion can occur as a result of wave or current differentials created by a hard protection structure transferring energy to unprotected portions of the dune or beach. The application report has provided a detailed assessment of the potential effects of end erosion associated with the proposed structure that take into account the detailed analysis of the wave environment, historic extreme water levels, sediment transport mechanisms and the existing foreshore environment. The application report sets out that the wall as proposed to be located on an alignment that is directly perpendicular to the dominant angle of wave attack and accordingly there is low risk of deflection of swash and wave energy along the wall. Incoming energy will tend to be deflected directly back out to sea given the shore normal incident angle. The applicant also proposes to bed the northern end of the wall 4m into the dune face at an angle of 90° into the backing. This will provide futureproofing for the end portion of the wall against future retreat of the coastline. This embedment can be increased as the coastline continues to retreat and imposing requirements of that nature though conditions of consent would be within the ambit of the consent authority.

Sea level rise

The application report provides an assessment of the proposal taking into account a sea level scenario based on the RCP 8.5 emissions scenario (i.e. the worst case scenario) in accordance with MfE Guidelines¹. Based on the RCP 8.5 emissions scenarios, those guidelines indicate a

¹ Ministry for the Environment (2017). *Preparing for coastal change: A summary of coastal hazards and climate change guidance for local government.*

sea-level rise of 300-400mm over the next 35 years and a sea level rise of 1m within the next 100 years. The applicant has sought a term of 35 years for the coastal permit authorising the occupation of the structure within the common marine and coastal area. A 35 year assessment period is therefore appropriate.

The application report demonstrates that, for current predictions of sea-level rise over the 35 year consent term, the structure remains resilient to the extreme water level events, including wave setup. It should be noted that the report also demonstrates that the structure will be unaffected by 1% AEP storm tides up to the 1m sea level rise scenario.