Kāpiti Coast
DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

10 May 2021

[redacted]

[redacted]

Request for Official Information responded to under the Local Government and Official Information and Meetings Act 1987 (LGOIMA) – reference: 8235546 (OIR: 2021-243)

I refer to your information request we received on 18 April 2021 for the following:

1. ***The documents and information you have establishing that the cost of a concrete seawall will be $27 million. Who supplied that figure?***

   The estimated cost of $23,516,474 as at July 2020, was provided by Bond Construction Management Ltd. A professional Quantity Surveying and Construction Engineering consultancy. The $27 million figure provided in the Long Term Plan consultation document has been adjusted to account for future years' inflation.

   The estimate was based on the Tonkin and Taylor design drawings and schedule of quantities. The schedule of quantities is as attached. Due to the commercial nature of the estimated rates these cannot be provided, the Council may look to tender this work. On that basis I must withhold this information under section 7(2)(b)(ii) of the Act which allows for Council to withhold information in order to protect information where the making available of the information would be likely unreasonably to prejudice the commercial position of the person who supplied or who is the subject of the information.

   In the Council's view the reasons for withholding these details are not outweighed by public interest considerations in section 7(1) favouring their release.

2. ***Did you ask for an estimated price from more than one construction company?***

   The estimate from Bond was the only estimate provided to Council based on the Tonkin and Taylor design drawings and schedules.

3. ***You now say there will be a 1.2m sea level rise within 50 years. Please provide reports, documents, or internal memos that were relied on within the council in support of this change of policy.***

   The Council has used 0.45m predicted sea-level-rise, as highlighted in **attached** relevant section of the design report. This is based on Intergovernmental Panel on Climate Change (IPCC) predictions and Ministry for the Environment (MfE) guidelines as detailed in attached design report details.

4. ***As we understand it KCDC has no in-house coastal engineer. Therefore, who evaluated and recommended the rejection of the 'design and build' submissions, referred to in the earlier OIA?***

There has not been a formal Council tender process entered into for the construction of the currently proposed concrete seawall option. If you would like to submit a design and build option into the formal tender process, then that could be done as part of the next stage in the project once Council has decided on a preferred option.

If you are referring to the previous “stepped wall” option provided by yourself in 2017 then Tonkin and Taylor provided expert advice in assessing this option.

5. ***You have indicated that the 'design and build' submissions were "not designed". Please explain what "not designed" means.***

We are not aware of where this reference is taken from so not able to answer the question directly but design documentation associated with 960m of potential seawall would generally include substantive supporting information regarding elements of the design such as but not limited to:

- Geotech investigation and supporting calculations, risks and assumptions;
- Structural calculations and relevant drawings and design assumptions and parameters;
- Spatial survey data and associated details, drawings and any risks assumptions;
- Relevant sign-off from suitably qualified individuals for design and relevant elements of the design;
- Peer review documentation if required for design.

You have the right to request the Ombudsman to review this decision. Complaints can be sent by email to info@ombudsman.parliament.nz, by fax to (04) 471 2254, or by post to The Ombudsman, PO Box 10152, Wellington 6143.

Yours sincerely

Sean Mallon
Group Manager Infrastructure Services
Te Kaihautū Ratonga Pakiaka

4.1.1 Fluctuations in Sand Level

The coastal environment at Paekākāriki is highly dynamic with beach sand levels fluctuating regularly. A typical range of beach levels over the study area has been defined through an analysis of surveyed cross shore profiles over a 16 year period, between 2000 and 2016. Excursion plots (sand levels with time) have been produced for three of the profiles applicable to the study area. The typical range of beach sand levels adopted for the design are:

1. Minimum Typical Beach Level 1.3m RL
2. Maximum Typical Beach Level 2.3m RL
3. Average Beach Level 1.8m RL.

The typical beach level fluctuation does not take into account extreme scour levels that can occur during and immediately following large storm events. The maximum scour depth assessment is set out in section 4.1.4 below.

4.1.2 Wave Climate Assessment

Seawall design requires the assessment of the nearshore wave climate (wave height and sea level) for a selected storm frequency (1% AEP in this case) to consider wall performance. These are discussed in more detail in the following sections.

4.1.2.1 Climate Change Assumptions

The main climate change effect that needs to be taken into account for sea wall design, is predicted sea level rise over the design life of the seawall. In cases where near shore waves are depth limited (which is the case for Paekākāriki), higher near shore water levels allow larger waves to reach the seawall, and also result in higher wave runup levels, and overtopping flows.

The Intergovernmental Panel on Climate Change (IPCC) provides predictions for sea level rise based on a number of Climate Change scenarios. Current Ministry for the Environment (MfE) guidelines are based on IPCC's sea level rise predictions which recommend considering a sea level rise of between 0.31m and 0.45m by 2065, and 0.7m to 1.0m by 2120.

The following coastal climate change assumptions have been used in the design assessment for the replacement seawall. For further detail on how these have been implemented, please refer to sections 4.1.2.2 to 4.1.2.4 below.

- As the design life for the seawall is 50 years, we have included an allowance of 0.45m predicted sea level rise, in determining future design water levels,
  - Please note that the timber option (B1) has been designed using this sea level rise despite only being recommended for a maximum design life of 25 years.
- Depth limited design waves have been based on a design water level including sea level rise allowance as noted above.

4.1.2.2 Design off-shore sea level

The design off-shore sea level has been assessed on the basis of a joint probability analysis undertaken by NIWA in 2012 and presented in NIWA report, *'Assessing the storm surge inundation hazard for coastal margins around the Wellington Region'*.

The 1% AEP storm tide water level offshore from the proposed seawall was reported as **1.72m RL**. This storm tide water level allows for storm surge, but not near shore wave set-up. This value is similar to the water level presented in the MetOcean reports described in section 4.1.2.4.

The 50 year sea level rise prediction of **0.45m** has been adopted for the design. This results in a predicted 2067 offshore 1% AEP storm tide level of **2.17m RL**.

4.1.2.3 Design near-shore sea level

Near-shore water levels differ from the offshore levels due to wave setup as waves enter shallow water.

NIWA (2012) modelled near shore storm tide and wave setup level of RL 2.09m for Paekakariki Beach. Accordingly we have selected the following near shore extreme water levels for design purposes:

- Present day near shore design 1% AEP water level (including wave set-up) is RL 2.1m
- The 2017 estimated future near shore design 1% AEP water level (including wave set-up) is approximately RL 2.6m

To put this in context, the near shore design water level is effectively the high tide water level experienced at the seawall during a 1% AEP storm event towards the end of the 50 year design life (including current predictions for sea level rise). This doesn't include wave heights which are discussed in section 4.1.2.4.

4.1.2.4 Design wave height

Off-shore wave climate analysis along the Kāpiti Coast has been undertaken by MetOcean on behalf of KCDC. For this work, MetOcean has produced a numerical model, SWAN (Simulating Waves Nearshore), which provides a description of the wave field as it changes over time and space. The outputs from this model have been presented in MetOcean reports dated 2007, 2010 and 2012 (refer section 2.3 for further details on the report references). The 2012 MetOcean report presents the most recent off-shore wave modelling, and the off-shore results presented in this report have been used as the basis for calculating the near-shore wave conditions used in the seawall design – for a 1% AEP event, significant off-shore wave height (Hs=5.23m) and peak period (Tp=10s to 12s).

Near-shore wave height differs from the off-shore wave height in this location as a result of depth limiting effects. The models described in section 4.1.2.3 have been used to assess a near-shore significant wave height of 1.5m for present day conditions, and **1.7m** allowing for 0.45m of predicted sea level rise.

Note the value of the significant wave height is the average of the highest third of the waves in the wave climate for a given return period storm, and is one of the key wave parameters used in the design of seawalls. It is not however the highest wave in the wave climate and waves approximately 30% higher are possible in the same storm event. Therefore the largest near shore wave likely for the design wave climate is **2.3m**.

The crest level of the design wave is typically 78% of the design wave height above the design near-shore sea level (i.e. approximately 3.9 m RL, for the (2067 sea level rise) significant wave height, and 4.3m RL for the (2067 sea level rise) maximum wave height). However, there is considerable uncertainty in this wave crest level and as waves break on the seawall, the wave run up level is well in excess of the near shore wave crest level.

4.1.3 Rock Sizing

Armour and underlayer rock sizing has been undertaken in accordance with the Rock Manual (2007) which is internationally accepted as the leading design guidance for coastal rock protection. The rock has been sized for the 1% AEP storm event.