

# Transmittal

То	:	Kapiti Coast District Council
Attention	:	
Ву	:	e-mail
From	:	
Date	:	22 December 2020
Re	:	Paekakariki Beach Seawall Rehabilitation

#### Corinne

#### Indicative Design Section for Budget Estimates

As discussed, we have reviewed the probable format of a new seawall to replace the existing aged units along the Paekakariki Beach frontage (with particular reference to the northern section of Beach Road)

To set the basic form we've looked at several sites along the sea frontage, where there is a mixture of conventional timber-pole walls, and wall supported with rock revetment,

An indicative section of timber pole wall is to be found opposite No. 118 here the wall is 1.5 metres high, supported by (nominal) 200mm diameter posts at 1.5 metre centres. The top of the visible guide rail is 1.2 metre below the top of the wall.



Samcon Limited Paekakariki Hill Road RD 1 Porirua walkaz@xtra.co.nz Fixtures indicate the wall is 'anchored / braced" and except for expected weathering, generally remains intact.

Site record photographs from recent repair works indicate that (for at last some portion of the wall), anchorage is achieved by way of connection to rails driven behind the wall. This is an inefficient form of anchorage as it derives its strength in bending, but in this instance probably required in consequence of minimal clearance between the wall and the road embankment behind it. In places the road embankment is close enough to apply a surcharge to the wall itself.



Inspections along adjacent sections of wall identified areas of wall height up to 2metres and a localized section at 2.3 metres (associated with turbulence around structures or rock piles).

In determining the format of future walls the following factors should be recognized:-

- Relatively steep beach profiles approaching the wall (giving potential for rapid change in wall height and/or reduction in lateral support).
- Recent degradation of the beach at the south of Beach Road where walls historically 1.5-metres in height are currently 2.5-metres.
- Predicted higher water levels in consequence of climate warming will make saturation of the supporting base soils a more common feature.
- The proximity of the road embankment will require anchorage of similar format to that above, or alternatively the use of screw anchor supports.
- The staged nature of the road development combined with previous attempts to protect the coastal frontage may present unpredictable ground conditions

We have formatted a draft design for the purposes of pricing based on the above factors and the following further considerations :-

- Timber pole wall of same basic format as adopted for current works by the Raumati Boat Ramp.
- For the purposes of ensuring construction is viable, limitation of pole length to 6-metres x 225mm diameter (with spacing adjustable to meet design expectations.
- Top of wall as per existing.
- Assume supporting base material comprise clean sands fully saturated.
- Backfill quality adequate to transmit wave loading to road embankment (i.e. the wall is designed to support earth pressure from backfill and reasonable surcharge loads, but not provide free-standing support again wave impact loading.
- Anchorage to detail shown as currently used but with point of support lowered to provide horizontal link between wall and deadman pile. In the following details we have shown rail irons vertical members to minimize potential conflict with buried debris however formal design might also consider vertical timber posts, or horizontal screw anchors.
- Assumes all load resistance is provided by posts and anchors while the vertical timber lagging will provide some support while wall heights are low, their contribution decreases as wall heights become more significant.
- A factor-of-safety against rotational failure FS = > 1.5 for wall height up to 2.5 metres and FS = > 1.0 (maximum height before theoretical collapse) for wall height up to 3.0 metres.

Currently walls of average height up to 1.5 metres do not have safety rails along the top edge, and we have continued that approach for these details. However, once heights consistently over 1.5 metres occur, the need for safety rails should be reconsidered.

Proposed details are provided overleaf.

To assist in budget consideration a schedule of quantities per lineal metre of wall is also attached.

Kind regards,







### KAPITI COAST DISTRICT COUNCIL

# PAEKAKARIKI BEACH RETAINING WALL UPGRADE

SCHEDULE OF QUANTITIES

# *Materials per lineal metre of Replacement Wall - For Budgetary Purposes Only*

Note

### No Allowance made for Overheads, preliminary and general Dependant on size and scope of work packages

#### Timber Post Wall

1	Allow to remove and dispose of existing walls and associated debris	1	LM
2	Excavate and Dispose and/or Stockpile material to provide working space	6	СМ
3	Supply and Drive / Jet 225mm diam H6 x 6- metre posts	0.83	No.
4	Supply and install <u><i>TWIN</i></u> guide-rails in three levels along the wall and around the stairwell (Price per lineal metre for a pair of guide rails)	3	LM
5	Supply and fix 500mm long M16 316 stainless steel rods complete with 50mm S/S washers and nuts to secure guiderails to posts (Detail A1 and B).	2.5	No.
6	Supply and install 50 x 200mm close spaced H6 timber lagging inclusive of earthworks and remediation where required.	4	SM
7	Supply and fit 250mm M16 Stainless Steel 316 Hex Bolts complete with 50mm S/S washers and nuts for interim connection through guides and lagging between posts (Detail A2).	5	Complete unit
	Anchorage		
8	6m x 90# Rail deadman	0.83	No.
9	150 x 100 H6 Timber Brace (min 2.7 m)	0.83	No.

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10	BOWMAC BS 155 Bracket CW Lateral Bolts	0.83	No.
11	Supply and install 200 SED H6 deadman post horizontally behind wall (Detail C)	1	LM
12	Supply all stainless steel fittings to bolt brace to cross-member (Detail C)	0.83	No.
	Back-Filling		
13	Bidim A33 or similar	3	SM
14	Supply and place / replace GAP 100 / Crushed concrete aggregate compacted to 98% Standard Proctor	5.5	СМ
15	Supply and place 200mm depth of 4% cement stabilized M4 basecourse as surface to walking track width of 2.5 metres over backfill	0.5	СМ
	Subtotal		
19	<b>Contingency Fund</b> (For additional works as instructed by the Engineer)	Subtotal	15%
	TOTAL VALUE OF WORKS PER LM	(EX GST)	