Appendix H: Sharyn Westlake expert review comments

Anna McLellan

From: Sharyn Westlake
Sent: Wednesday, May 8, 2019 12:58 PM
To: Shannon Watson
Subject: RE: WGN190301 Eastern Bays Shared Path notified consent for expert review

Hi Shannon

I have had a look through the reports below, as appearing to be the most relevant for 'stormwater' issues:

- Eastern Bays Shared Path: Assessment of Environmental Effects of Beach Nourishment and Intertidal & Subtidal Beach Areas
- Eastern Bays Shared Path Project: Consent Level Beach Nourishment Design and Effects Assessment
- Eastern Bays Shared Path Project: Freshwater Fish Passage Requirements

From a 'stormwater' viewpoint there is not much to comment on. I note that the recommendations for beach nourishment avoiding stormwater outlets are inconsistent and the Freshwater Fish Passage Requirements Report states 20m, which is apparently from the "Beach Nourishment Design and Effects Assessment". However the latter report recommends "the initial placement area will be selected to avoid stormwater outlets (no closer than 10m)…". With this, I would suggest 10m avoidance zone would be appropriate.

Aside from the above, recommendations to avoid blocking generally seem sensible and I agree with them. For example the reccommendations:

"During construction there is the potential for blocking of the stormwater. The potential risk of additional blocking is limited by

- Selecting sand/gravel gradings that match or are coarser than the in situ sediment which encourages onshore movement of sediment, rather than offshore
- Avoiding the initial placement from being within 10 m of an existing stormwater outlet.
- Only placing relatively small volumes of imported material, matched to the existing foot print loss
- Only depositing as much sediment on the bench as can be transferred along the placement area in the day of placement
- Placing imported beach sediment along the entire designated placement area rather than in one discrete location.

During the construction period the existing outfalls should be inspected and kept clear of gravels and sand.

The beach nourishment volumes proposed are to replace the existing beach area lost as a result of the shared path occupation on the upper beach. As there is no net increase in existing beach area it is anticipated over the longer term that there should be no net change to the existing processes of sediment transport along the beach areas." (from Eastern Bays Shared Path Project: Consent Level Beach Nourishment Design and Effects Assessment, Prepared by Tonkin & Taylor Ltd. March 2019)

I'm happy to discuss further if you would like.

Kind regards
Sharyn

Sharyn Westlake | Senior Engineer, Investigations, Strategy and Planning | Flood Protection Department
GREATER WELLINGTON REGIONAL COUNCIL
Te Pane Matua Taiao

Shed 39, 2 Fryatt Quay, Pipitea, Wellington 6011 | PO Box 11646, Manners St, Wellington 6142
T: 04 830 4046 Mob: 021 731 130 | www.gw.govt.nz

From: Shannon Watson <Shannon.Watson@gw.govt.nz>
Sent: Tuesday, 23 April 2019 4:14 PM
To: Megan Oliver <Megan.Oliver@gw.govt.nz>; Evan Harrison <Evan.Harrison@gw.govt.nz>; Iain Dawe <Iain.Dawe@gw.govt.nz>; Sharyn Westlake <Sharyn.Westlake@gw.govt.nz>; Roger Uys <Roger.Uys@gw.govt.nz>
Subject: WGN190301 Eastern Bays Shared Path notified consent for expert review
Importance: High

Hi all,

As you may be aware, the Eastern Bays Shared Path consent has now been formally lodged.

This email serves as a request for review of the relevant documentation which applies to your area of expertise and provides some context as to who else is involved with the Project for ease of communication where there may be cross-over into numerous fields/disciplines.

The assessment of environmental effects and supporting technical reports, alternatives assessments and design plans (including design reports) can be found in the link at the bottom of this email; or through Ourspace here: http://ourspace.gw.govt.nz/ws/WGN190301/ntproc/Forms/gBySubactivity.aspx. I will update this email once landscape and recreation/social effects experts have been confirmed (hopefully tomorrow).

Experts involved in assessment of the consent

- Intertidal ecology and seagrass – Dr Megan Oliver, megan.oliver@gw.govt.nz
- Terrestrial ecology (vegetation and avifauna) – Dr Roger Uys, roger.uys@gw.govt.nz
- Coastal processes and beach re-nourishment – Dr Iain Dawe, iain.dawe@gw.govt.nz
- Flood protection and stormwater culvert and outlet structures - Sharyn Westlake, sharyn.westlake@gw.govt.nz
- Freshwater ecology and fish passage – Dr Evan Harrison, evan.harrison@gw.govt.nz (away until 6th May - T.B.C)
- Landscape and visual effects – T.B.C
- Recreation and social effects – T.B.C

Format of review comments

Please provide any review comments by way of **review memo –** the WBS code for this work is 335/190301/01.

1. Where you agree with the assessment/conclusions drawn by the applicants experts on a relevant matter, concluding statements confirming you agree/are comfortable with the assessment are all that are required.

2. If you disagree with elements of an assessment, an assessment in its entirety, or require further information to complete your assessment please outline clearly in your review memo:

- why you disagree with the expert assessment and/or the conclusions drawn by the expert
- what further information you require and the format in which you would like this further information to be provided
- any conditions of consent or suggestions which could further manage, remedy, or mitigate an actual or potential environmental effect
- any other comments or concerns which you may have that you feel are relevant to consideration of the proposal

I am more than happy to discuss or review memo's (in DRAFT form) prior to these being finalised if you would find that useful.

Timeframe

It would greatly appreciated if I could get all review comments back by **Friday 10 May 2019 (12 working days).** Please let me know as soon as possible if you are unable to meet this timeframe**.** I will send a reminder email on Monday 6 May.

Application portal login information

FTP link: https://tmpsftp.stantec.com
Login name: s0428151523
Password: 5189740
Expiry Date: 5/12/2019

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Shed 39, 2 Fryatt Quay
Pipitea, Wellington 6011
PO Box 11646
Manners Street
Wellington 6142
T 04 384 5708
F 04 385 6960
www.gw.govt.nz

IN CONFIDENCE
By email

3 March 2020

File Ref:

Shannon Watson
GHD
Level 2, Grant Thornton House
215 Lambton Quay
Wellington 6011

Dear Shannon,

This letter is in response to your email dated 21 January 2020 requesting a formal response to matters arising from submissions to the Eastern Bays Shared Pathway consent application.

In particular you have asked me to comment on:

- The suitability of the seawall design to:
    - resist scour at the base/toe;
    - allow for further adaptation in future (i.e. add-ons and building up), and requirements for such adaptation to be successful;
    - be successfully upgraded in future.
- Whether raising of the road level is likely to be required.

The points I have responded to specifically are contained within submissions from the following parties, and are additional to the responses by Dr Iain Dawe:

1.	Submitter No. 63	John Arnold Butt
2.	Submitter No. 159	Te Aranui O Pōneke, The Great Harbour Way Trust
3.	Submitter No. 168	Richmond Esmond Atkinson
4.	Submitter No. 177	Judith Lawrence
5.	Submitter No. 190	Gertrud (Trudi) Bruhlmann

My responses are set out in response to the points listed above and include a summary of the main points raised in the submissions that I comment directly on.

1. Suitability of the seawall design

1.1 Submission points summary

A submitter expressed concern about erosion occurring beneath the wall and at the base or toe of the revetment.

Submitters also believe that sea level rise may render the path useless in the long-term, and that the sea wall infrastructure should be adaptable for sea incursions and southerly storms to be moderated/rebuffed in the future.

1.2 Response

1.2.1 Erosion beneath the wall

Appropriate design of the proposed seawalls are important for structural stability, durability and also performance. Any erosion beneath the proposed seawalls, if not designed for or able to be remedied in a timely manner through the Hutt City Council maintenance programme, could lead to failure of the protection works and also the shared path which the walls support.

In assessing foundation depths for the proposed seawalls, investigations were carried out to evaluate the likely excavations required for the proposed seawalls to be structurally sound and also to allow for coastal processes to occur without these processes compromising the walls' stability and strength. The outcomes of the seawall embedment investigations are given in the NIWA Coastal Physical Processes Report, page 29-30 (Appendix E of the Assessment of Environmental Effects), which states: "Whilst excavations will generally be shallow (<1 m, see Figure 2-7) for the majority of the Project, in some beach locations the site investigations (Stantec 2017) have indicated seawall foundations may need to extend down up to 5 m below current beach level in order to reach material of acceptable bearing capacity, whilst ensuring the design is not compromised (undermined) by the long-term effects of coastal erosion or short-term scour during prolonged storms. These areas of deep excavation include Sorrento Bay (50 m), Lowry Bay (585 m), York Bay (450 m), Mahina Bay (220 m), Sunshine Bay (250 m). These deeper foundations will utilise traditional deep foundation techniques such as reinforced concrete cut-off walls, sheet-piling, or bored or driven reinforced concrete piles as required, depending on depth and loading on the foundation. Details will be provided in the CEMP for the specific sections of seawall."

Final embedment depths for the proposed seawall will be part of the detailed design for the project and will be determined at this stage. I would also expect that structural design of the seawalls would be finalised as part of the detailed design, and that the final seawall design would be peer reviewed by an appropriately qualified and experienced engineer.

Timely monitoring and maintenance of the seawalls is required, and these would be part of Hutt City Councils asset management plans following practical completion and handover of the works.

1.2.2 Erosion at the toe of the revetment

The toe of a revetment is a special type of transition from the revetment slope to the nearly horizontal beach. The primary function of the revetment toe is to support the revetment. When the friction holding the revetment toe in place becomes too little, either to a drop in the water level, waves to erosion of the beach material, the toe has to deliver the resisting force to prevent lateral spread and collapse of the revetment. If the founding substrate for the revetment toe is sufficiently hard and not able to be eroded (i.e. rock/dense gravel) then minimal keying in of the revetment toe is required, although I would expect some keying in of the toe for revetment stability and to withstand lateral forces.

The NIWA Coastal Physical Processes Report, page 27 (Appendix E of the Assessment of Environmental Effects) states "No excavation is anticipated for placement of the rock layers of revetment (outside of the toe) due to rock/gravel substrate." As the final revetment design will be part of the detailed design for the project, I would expect this premise to be confirmed, and also that the revetment design would be peer reviewed by and appropriately qualified and experienced engineer. Also, as above, monitoring and maintenance of the revetment will be required as part of Hutt City Councils asset management programme.

1.2.3 Adaptability of the proposed seawalls and revetments

The overall design of the current project has been decided to satisfy the requirement under the RMA to consider the effects of climate change over a period of at least 100 years as stipulated in the NZCPS-2010 (Policy 24) (NIWA Coastal Physical Processes Report, (Appendix E of the Assessment of Environmental Effects)). The seawalls have been structurally designed to be able to be raised in the future. Where a revetment structure is proposed, the carriageway and path facility will be supported by a reinforced concrete cantilever wall which will be designed as a standalone element and so these too may be raised in the future. The rock revetment profile can also be raised, and further beach nourishment can also be carried out as sea levels rise, however these works would encroach further into the CMA, with consequent potential effects, including on the seagrass meadows. These would need to be evaluated as part of the consenting process for any future works.

2. Future raising of the road level

2.1 Submission points summary

A submitter raised the point that HCC will almost certainly have to raise the road level via infill behind a seawall add on. They believes the wider path will require more infill and that this will allow for additional carriageway width on the landward side of the road.

A submitter also notes that shared path will be flooded more frequently and might not be usable in 35 years.

2.2 Response

The project is an interim response to the current conditions of road closure and the requirement for a shared path along the route. It will provide protection from storm events for Marine Drive and other infrastructure along the road corridor. With sea level rise, the level of protection to the road will reduce. If the seawall is raised without raising the level of the road behind it, there will be some limited protection from wave action and debris provided by the seawall, however flooding of the road is highly likely from elevated sea water levels during storms and from stormwater flooding.

HCC will be developing a Climate Change and Resilience Strategy with the community, and future levels of service and access requirements would be expected to be part of this strategy. This project will not preclude any outcomes of the strategy and will "buy" time for it to be developed, agreed and implemented.

3. Suggested conditions

3.1 Monitoring

The proposal states that "Monitoring of the beach nourishment should be carried out every 6 months for a period of 2 years with a report completed after the 2 year period to assess the changes and make recommendations on the requirement for ongoing monitoring, or if the monitoring could cease."

Performance of the beaches is likely to be a reflection of the storminess, weather, waves and tidal conditions the storms occurred over. Monitoring should include connection with these elements and also their return period, to evaluate whether it has been sufficiently 'tested' over the duration of the monitoring. The NIWA Coastal Physical Processes report suggests that the monitoring period should be 5 years, and I concur that a monitoring period of 5 years should be enough time to allow the new seawalls and beach nourishments to obtain a new equilibrium with the wave and current climate in each bay. My suggested monitoring is:

- 6 monthly for 5 years at the end of summer and the end of winter
- Following storms of greater than 5 year return period.

Consent conditions should allow something to be done with the monitoring results i.e. 'topping up' of the beach nourishment and maintenance/topping up of the revetments if design conditions are exceeded during the monitoring period and this is deemed to be required by the experienced coastal scientist/engineer.

Longer term monitoring of the effectiveness of the whole project, including the performance of the revetments and the impacts of sea level rise and climate change, would be part of standard asset management processes within Hutt City Council.

3.2 Reclamation

The proposal states that "All imported fill/rock material to be used in the reclamations, revetments and associated toe aprons and wave/tide bunds shall be in accordance with the Ministry for the Environment 'cleanfill' definition, as detailed in Publication ME418 'A Guide to the Management of Cleanfills, 2002' or subsequent updates."

This MfE cleanfill definition is that the material "will typically be from construction and demolition activities, and will generally comprise soil, rock, concrete, bricks and similar inert material." Construction and demolition materials are clearly unsuitable for placement on the beaches and the condition should be modified to restrict suitable materials to natural sand, gravel or rock.

3.3 Peer review

Final design of the seawalls, revetments and structural works should include peer review by a suitably qualified and experienced engineer.

I am happy to discuss further.

Kind regards

Sharyn Westlake
Senior Engineer, Strategy and Advisory Specialist
Flood Protection Department

DD: (04) 830-4046
Sharyn.westlake@gw.govt.nz

Copy: Jo Frances