

2 Further clarification on rules triggered

2.1 Regional Coastal Plan

Rule 83 – driving on beaches (Lyllall Bay to Point Arthur). This rule is assessed in the table below:

Rule No.	Rule (as relevant)	Assessment
Rule 83 Motor vehicles, motorcycles, trailers and land yachts on beaches Discretionary (Restricted) Activity	Within the following areas: <ul style="list-style-type: none"> • the foreshore from Lyall Bay at NZMS 260 R27 599 844 to Point Arthur at NZMS 260 R27 677 872; the driving or riding or parking of any motor vehicle, motorcycle, trailer, or land yacht for any purpose is a Discretionary Activity (restricted), provided that this Rule shall not apply to: <ol style="list-style-type: none"> (1) any motor vehicle moving to or from the edge of the water for the purpose of launching a vessel, or removing a vessel from the water, and that vehicle moves across the foreshore to or from the nearest formed access by the shortest practicable route; (2) any motor vehicle or tractor used in association with surf lifesaving or rescue activities; (3) any motor vehicle used for litter removal or dog control; (4) any motor vehicle used for beach grooming or re-contouring, clearance of piped stormwater outfalls, maintenance of lawful structures, or other activities permitted by this Plan; (5) any motor vehicle or motorcycle driven by an enforcement officer when undertaking their duties; (6) any vehicles directly associated with the horse races allowed by Rule 79; or (7) for Titahi Bay, any motor vehicle, trailer or tractor owned, leased or operated by a registered boatshed owner in the Porirua City Council's Titahi Bay Boatshed Owners Register. 	As none of the exceptions apply, consent is required to drive, ride or park motor vehicles along the Eastern Bays foreshore as part of the Project.

2.2 Proposed Natural Resources Plan

2.2.1 Rule R99 and R101 – earthworks and associated discharges.

It is likely that the earthworks associated with the shared path construction will exceed 3,000m² outside of the MHWS. The exact areas of earthworks will be determined during the detailed design but until the areas have been confirmed, the applicant is taking a cautious approach and is therefore applying for a consent under this rule.

2.2.2 Rule R182 and R184 – occupation

The occupation of space in the common marine and coastal area by a structure existing before the date of 31 July 2015 which is regionally significant infrastructure or owned by a network utility operator is a permitted activity. We agree that occupation is covered by relevant rules for construction of the required structures

under the PNRP and therefore the proposed structures will comply with this rule. A consent is therefore not necessary.

2.2.3 Rule 195 – disturbance or damage inside sites of significance

The exact location of the seagrass (Schedule F5 habitat) has been identified. Based on this information and given that the seagrass will be avoided, there are no Schedule F4 habitats within the project footprint. Therefore Rule 195 can be disregarded.

2.2.4 Rule R214- reclamation

We confirm that the legal advice received by GWRC, was that reclamation does not require a separate consent under R214.

3 Visual Amenity

In considering the safety barriers, the intention was to include barriers (along with signage, markings, bus shelters) in the detailed design at which time further input will be obtained from the community given there were mixed feelings about railings and barriers during feedback at community meetings. This will also be addressed in a Landscape and Urban Design Plan, also a suggested condition of this consent.

However, given that traffic safety has been raised by the Hutt City Council peer reviewer, we are currently assessing the requirements for safety barriers and this will be outlined in a separate memo (Memorandum 4) to be forwarded to GWRC in due course.

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Relevant objective	Relevant policy	Assessment
	renewable energy generation activities in the coastal marine area and the beds of lakes and rivers.	The social, economic, cultural and environmental benefits of the Project and the renewable energy generation activities it enables have been recognised throughout the development of the Project. The Project will also build resilience into the existing infrastructure through rebuilding and maintaining the seawalls.
Objective O13 Significant mineral resources and the ongoing operation, maintenance and upgrade of regionally significant infrastructure and renewable energy generation activities in the coastal marine area and beds of rivers and lakes are protected from incompatible use and development occurring under, over, or adjacent to the infrastructure or activity.	Policy P13: Providing for regionally significant infrastructure and renewable electricity generation activities The use, development, operation, maintenance, and upgrade of regionally significant infrastructure and renewable energy generation activities are provided for.	As the use and ongoing operation of the shared pathway in this coastal marine area is regionally significant, it is considered that it will be protected from future incompatible uses and development. It will provide the first step in incremental upgrades to protect the Project and the surrounding environment from the effects of climate change and sea level rise. These future activities will be highly compatible with the ongoing use and operation of the pathway. The mitigation measures included in Appendix J will ensure that any potential adverse effects on the surrounding environment are avoided, remedied or mitigated throughout the construction period.
	Policy P14: Incompatible activities adjacent to regionally significant infrastructure, renewable electricity generation activities and significant mineral resources Regionally significant infrastructure, renewable energy generation activities and significant mineral resources shall be protected from incompatible use and development occurring under, over or adjacent to it, by locating and designing any use and development to avoid, remedy or mitigate any reverse sensitivity effects.	
Maori relationships		
Objective O14 The relationships of Māori and their culture and traditions with their ancestral lands water, sites, waahi tapu, and other taonga are recognised and provided for, including: (a) maintaining and improving opportunities for Māori customary use of the coastal marine area, rivers, lakes and their margins and natural wetlands , and (b) maintaining and improving the availability of mahinga kai species, in terms of quantity, quality and diversity, to support Māori customary harvest, and (c) providing for the relationship of mana whenua with Ngā Taonga Nui a Kiwa , and (d) protecting sites with significant mana whenua values are protected from use and development that will adversely affect their values and restoring those sites to a state where the characteristics and qualities sustain the identified values.	Policy P17: Mauri The mauri of fresh and coastal waters shall be recognised as being important to Māori and is sustained and enhanced, including by: (a) managing the individual and cumulative adverse effects of activities that may impact on mauri in the manner set out in the rest of the Plan, and (b) providing for those activities that sustain and enhance mauri , and (c) recognising and providing for the role of kaitiaki in sustaining mauri . Policy P18: Mana whenua relationships with Ngā Taonga Nui a Kiwa The relationships between mana whenua and Ngā Huangā o Ngā Taonga Nui a Kiwa identified in Schedule B (Ngā Taonga Nui a Kiwa) will be recognised and provided for by: (a) having particular regard to the values and Ngā Taonga Nui a Kiwa huanga identified in Schedule B (Ngā Taonga Nui a Kiwa) when applying for, and making decisions on resource consent applications and developing Whaitua Implementation Programmes, and (b) informing iwi authorities of relevant resource consents relating to Ngā Taonga Nui a Kiwa , and (c) recognising the relevant iwi authority/ies as an affected party under RMA s95E where activities risk having a minor or more than minor adverse effect on Ngā Huangā o Ngā Taonga Nui a Kiwa or on the significant values of a Schedule C site which is located downstream, and (d) working with mana whenua , landowners, and other interested parties as appropriate, to develop and implement restoration initiatives within Ngā Taonga Nui a Kiwa , and (e) the Wellington Regional Council and iwi authorities implementing kaupapa Māori monitoring of Ngā Taonga Nui a Kiwa .	<i>Mana Whenua relationships within the Project area</i> The post settlement governance entities that have an interest in and statutory acknowledgements from the Crown in relation to Wellington Harbour relevant to the application are the Port Nicholson Block Settlement Trust and Te Rūnanga o Ngāti Toa. The relevant statutory acknowledgements are set out in the Cultural Impact Report (Appendix H). The Wellington Tenth Trust and Te Atiawa ki te Upoko o te Ika a Maui Potiki Trust also have interests in the application. The relationships of Māori and their culture and traditions with the land, water and other taonga within the Project area have been recognised and provided for throughout the development of the Project. Mana Whenua relationships with Ngā Taonga Nui a Kiwi, particularly Te Whanganui-a-Tara (Wellington Harbour), have also been provided for throughout the consultation processes with iwi to date. <i>Kaitiakitanga – active participation in the development of the Project</i> Mana Whenua have been consulted on an ongoing basis since the initial stages of the Project's development. The consultation process has enabled prioritisation and understanding of issues of significance to Mana Whenua, such as access to the foreshore, to be translated into Project design and the development of measures to avoid, remedy or mitigate actual and potential adverse effects on mana whenua values. The Project design will provide for the exercise of kaitiakitanga by mana whenua over the Project area through the formulation of storyboards and signage along the shared path. As part of this engagement, iwi prepared a Cultural Impact Report (CIA) to support the resource consent application (Appendix H). The Cultural Impact Report documents Māori cultural values, interests and associations with the area, and the potential impacts of the Project and related activities, on these values. The Cultural Impact Report incorporates mitigation measures to ensure Maori relationships with air, land and water in this environment are recognised and provided for, and where appropriate, adverse effects on those relationships are minimised. This includes measures to sustain the mauri of coastal waters and coastal and marine ecosystems. As a result of the report's recommendations, a draft condition has also been included in Appendix R to provide protocols for the accidental discovery of artefacts, taonga and kōiwi during construction. It is also noted that a number of parties have submitted applications under the Marine and Coastal Area (Takutai Moana) Act 2011 (MACA) for customary marine title and protected customary rights over the section of the Wellington Harbour within the Project area. Notifications occurred as prescribed by MACA to seek the views of the groups that have applied for recognition of customary marine title in the area about the Project. Section 2.2 and Appendix C of Appendix I (Stakeholder Engagement and Consultation Report) sets out a record of notification undertaken under MACA. No Project specific feedback has been received from MACA applicants to date.
Objective O15 Kaitiakitanga is recognised and mana whenua actively participate in planning and decision-making in relation to the use, development and protection of natural and physical resources.	Policy P19: Māori values The cultural relationship of Māori with air, land and water shall be recognised and the adverse effects on this relationship and their values shall be minimised. Policy P20: Exercise of kaitiakitanga	

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<p>Objective O20</p> <p>The hazard risk¹ and residual hazard risk² from natural hazards and adverse effects of climate change on people, the community and infrastructure are acceptable.</p>	<p>Policy P28: Hazard mitigation measures</p> <p>Hard hazard engineering mitigation and protection methods shall be avoided except where it is necessary to protect existing development from unacceptable hazard risk, assessed using the risk-based approach and;</p> <p>(a) any adverse effects are no more than minor, or</p> <p>(b) where environmental effects are more than minor the works form part of a hazard risk management strategy³.</p>	<p>The Project will replace the existing, ad hoc seawalls and structures along the Eastern Bays with new, fit for purpose structures. If nothing is done, in the medium-term critical road and infrastructure access to and along the Eastern Bays will be lost due to coastal erosion, SLR and the resulting inundation and overtopping hazards.</p> <p>As set out in the Alternatives Assessment (Appendix G) and the Design Features Report (Appendix J), following significant investigations hard shore protection structures (sea walls and revetment) have been preferred for the Project. All other alternatives were found to be impracticable and would not provide the same level of protection from coastal hazards, including wave overtopping. Hard hazard options have therefore been assessed as necessary to protect existing development along Marine Drive from unacceptable hazard risk.</p> <p>The works form part of a broader hazard management strategy and provide the first step in incremental upgrades along the coastline to protect against the increasing level of coastal hazard exposure due to climate change. In particular, the Project will 'buy some time' for HCC to develop an iterative long-term management approach to for the Eastern Bays to adapt to climate change.</p> <p>As the potential adverse effects of these hard hazard engineering methods are likely to be more than minor, a hazard risk management strategy has been developed in support of the application.</p> <p>The Hazard Risk Management Plan (September 2019) forms part of the information supplied in Memorandum 3, Annexure 2 (dated September 2019) of the further information request in response to email dated 19 August 2019 from Greater Wellington Regional Council.</p>
	<p>Policy P29: Climate change</p> <p>Particular regard shall be given to the potential for climate change to threaten biodiversity, aquatic ecosystem health and mahinga kai, or to cause or exacerbate natural hazard events over at least the next 100 years that could adversely affect use and development including:</p> <p>(a) coastal erosion and inundation (storm surge), and</p> <p>(b) river and lake flooding and erosion, aggradation, decreased minimum flows, and</p> <p>(c) stormwater ponding and impeded drainage, and</p> <p>(d) relative sea level rise, using reliable scientific data for the Wellington Region.</p>	
Water quality		
<p>Objective O23</p> <p>The quality of groundwater, water in surface water bodies and the coastal marine area is maintained or improved.</p>		<p>Coastal water quality will be maintained to a level that is suitable for the health and vitality of coastal and marine ecosystems, contact recreation and Māori customary use. Specifically, the primary contact recreation and Māori customary use objectives in Table 3.3 as relevant to the open coast and harbours within the Project area will be met and/or enhanced by the Project.</p> <p>While there is the potential for the Project to generate localised higher than existing levels of suspended sediment concentration (SSC) during the construction stage, the reworking of beach sediments by the change to nearshore hydrodynamics will have a negligible effect on sedimentation rates or suspended sediment concentrations within each bay and the wider Wellington Harbour.</p> <p>To mitigate these effects, pouring of concrete in situ will be done in the dry and if not the contaminated water will be pumped away and treated. Details on sediment control are included in Construction Methodology in section 4.2.4 of Appendix J.</p>
<p>Objective O24</p> <p>Rivers, lakes, natural wetlands and coastal water are suitable for contact recreation and Māori customary use, including by:</p> <p>(a) maintaining water quality, or</p> <p>(b) improving water quality in:</p> <p>(ii) coastal water and sites with significant mana whenua values and Ngā Taonga Nui a Kiwi to meet, as a minimum, the primary contact recreation objectives in Table 3.3, and</p>		

¹ **Hazard risk:** A combination of the probability of a natural hazard and the consequences that would result from an event of a given magnitude. Commonly expressed by the formula: Hazard risk = hazard x vulnerability.

² **Residual hazard risk:** The **hazard risk** to a subdivision or development that remains after implementation of **hazard risk** treatment or hazard mitigation works.

³ **Hazard risk management strategy:** A coherent, integrated framework for the management of hazard **risk**, normally developed by a local authority or appropriately qualified agency, and including some or all of the following elements; hazard and hazard **risk** identification, impact assessment, potential mitigation works (costs/impacts/maintenance), assessment of environmental effects, assessment of alternate options, cost-benefit analysis, budget allocation; community engagement and implementation plan. The scale of a **hazard risk management strategy** should reflect the scale of the proposed development or activity.

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Biodiversity, aquatic ecosystem health and mahinga kai		
<p>Objective O25</p> <p>Biodiversity, aquatic ecosystem health and mahinga kai in fresh water bodies and the coastal marine area are safeguarded such that:</p> <p>(a) water quality, flows, water levels and aquatic and coastal habitats are managed to maintain biodiversity aquatic ecosystem health and mahinga kai, and</p> <p>(c) where an objective in Table 3.8 is not met the coastal marine area is improved over time to meet that objective.</p>	<p>Policy P31: Biodiversity, aquatic ecosystem health and mahinga kai</p> <p>Biodiversity, aquatic ecosystem health and mahinga kai shall be maintained or restored by managing the effects of use and development on physical, chemical and biological processes to:</p> <p><i>Water quality</i></p> <p>(b) maintain or improve water quality to meet the objectives in Table 3.8 of Objective O25, and</p> <p><i>Aquatic habitat diversity and quality</i></p> <p>(c) maintain or restore aquatic habitat diversity and quality, including the natural form of the coastal marine area, and</p> <p>(d) restore the connections between fragmented aquatic habitats, and</p> <p><i>Critical habitat for indigenous aquatic species and indigenous birds</i></p> <p>(e) maintain and restore habitats that are important to the life cycle and survival of indigenous aquatic species and the habitats of indigenous birds in the coastal marine area, and</p> <p><i>Critical life cycle periods</i></p> <p>(f) minimise adverse effects on aquatic species at times which will most affect the breeding, spawning, and dispersal or migration of those species, including timing the activity, or the adverse effects of the activity, to avoid times of the year when adverse effects may be more significant, and</p> <p><i>Riparian habitats</i></p> <p>(g) maintain or restore riparian habitats, and</p> <p><i>Pests</i></p> <p>(h) avoid the introduction, and restrict the spread, of aquatic pest plants and animals.</p>	<p>The Project, which replaces existing seawall/structures, will be managed to maintain existing hydrodynamic processes and coastal water quality. This will support and maintain existing biodiversity, aquatic ecosystem health and mahinga kai within the coastal marine area.</p> <p><i>Water quality</i></p> <p>While there is the potential for the Project to generate localised higher than existing levels of suspended sediment concentration during the construction stage, the reworking of beach sediments by the change to nearshore hydrodynamics will have a negligible effect on sedimentation rates or suspended sediment concentrations within each bay and the wider Wellington Harbour. The sedimentation rate will remain within an acceptable range as per Table 3.8, and support the life supporting capacity of the coastal waters.</p> <p><i>Aquatic habitat diversity and quality</i></p> <p>The Project will also maintain and enhance fish passage and mahinga kai along the Eastern Bays and will enable additional fish habitat along the seawalls through the use of textured surfaces.</p> <p>As explained in the Intertidal Ecology AEE (Appendix A), Freshwater Fish Passage AEE (Appendix B) and Coastal Vegetation and Avifauna Report (Appendix C), the effects of the seawalls on the:</p> <ul style="list-style-type: none"> • Intertidal benthic community = less than minor. • Resultant loss of intertidal habitat = minimal. • Intertidal ecology = minor and less than minor. • Fish passage = negligible. • Gravel beach ecosystem = less than minor. • Six at risk species. <p><i>Riparian habitats</i></p> <p>Overall effects on vegetation, taking into account mitigation measures will be less than minor for seagrass and less than minor the remaining vegetation types and gravels.</p> <p><i>Critical habitat for indigenous aquatic species and indigenous birds</i></p> <p>Overall effects on avifauna, taking into account mitigation measures are less than minor for coastal birds, and less than minor for Little Penguins. Opportunities to enhance penguin habitat by establishing local population recover sites at the Seaview Marina breakwater and the Whiorau Reserve.</p> <p>Other potential adverse effects listed in the Policy are not significant and will be satisfactorily mitigated or remedied through the measures provided in Appendix J, the draft conditions and any subsequent mitigation developed as part of detailed design</p>
<p>Objective O27</p> <p>Vegetated riparian margins are established, maintained or restored to enhance water quality, aquatic ecosystem health, mahinga kai and indigenous biodiversity in the coastal marine area.</p>	<p>(f) minimise adverse effects on aquatic species at times which will most affect the breeding, spawning, and dispersal or migration of those species, including timing the activity, or the adverse effects of the activity, to avoid times of the year when adverse effects may be more significant, and</p> <p><i>Riparian habitats</i></p> <p>(g) maintain or restore riparian habitats, and</p> <p><i>Pests</i></p> <p>(h) avoid the introduction, and restrict the spread, of aquatic pest plants and animals.</p>	<p>As detailed above, the Project will not have significant adverse effects or significant residual adverse effects on aquatic ecosystem health, biodiversity or mahinga kai.</p> <p>Where not possible to avoid, potential adverse effects of the Project on these values have been minimised, mitigated or remedied through the measures provided in the Design Features Report (Appendix J), the draft conditions (Appendix R) and any subsequent mitigation developed as part of detailed design, including through the CEMP.</p>
	<p>Policy P32: Adverse effects on biodiversity, aquatic ecosystem health and mahinga kai</p> <p>Adverse effects on biodiversity, aquatic ecosystem health and mahinga kai shall be managed by:</p> <p>(a) avoiding significant adverse effects, and</p> <p>(b) where significant adverse effects cannot be avoided, minimising them, and</p> <p>(c) where significant adverse effects cannot be avoided and/or minimised they are remedied, and</p> <p>(d) where significant residual adverse effects remain, it is appropriate to consider the use of biodiversity offsets.</p> <p>Proposals for biodiversity mitigation and biodiversity offsetting will be assessed against the principles listed in Schedules G1 (biodiversity mitigation) and G2 (biodiversity offsetting).</p>	

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<p>Objective O29</p> <p>The passage of fish and koura is maintained and the passage of indigenous fish and koura is restored.</p>	<p>Policy P34: Fish passage</p> <p>The construction or creation of new barriers to the passage of fish and koura species shall be avoided, except where this is required for the protection of indigenous fish and koura populations.</p>	<p>The Project has been designed to avoid the creation of new barriers and maintain the passage of fish and koura within the Project area. The methods by which this will be achieved are detailed in the Intertidal Ecology AEE (Appendix A) and the Freshwater Fish Passage AEE (Appendix B).</p> <p>In summary, a number of outfalls within the Project area provide for fish passage. The fish species present or likely to be present in the affected streams have exceptional climbing abilities to negotiate instream barriers; however, they cannot get beyond perched outlets with an overhang. Solutions will be site-specific as it will depend on the relative level of the outlet and seawall design at each location, and may include constructing a short concrete ramp or use of mussel spat rope. A freshwater ecologist with fish passage experience will be involved in the detailed design of these outlets.</p>
	<p>Policy P35: Restoring fish passage</p> <p>The passage of indigenous fish and koura shall be restored where this is appropriate for the management and protection of indigenous fish and koura populations.</p>	<p>Underground storm water pipes will require extensions where seawall treatments are proposed to create additional corridor width. The locations of the storm water pipes were identified as part of the topographical survey and assessed by experts. During detailed design, cross sections will be developed to accommodate the pipe extension within the seawall treatment and where necessary fish passage will be provided for.</p> <p>In addition to fish passage, nine stormwater pipes under Marine Drive in the Project area were identified as being currently accessible or used as breeding habitat by Little Penguins. Little Penguin access to inland breeding sites via stormwater pipes will be maintained through the design of appropriate pipe extensions until alternative breeding locations on the Seaview Marina breakwater and Whiorau Reserve have become established. At that stage measures will be taken to discourage penguins from entering the culverts. This will be addressed in the Little Penguin Management Plan (a condition of the consent).</p>
Sites with significant values		
<p>Objective O31</p> <p>Outstanding water bodies and their significant values are protected and restored. Where significant values relate to biodiversity, aquatic ecosystem health and mahinga kai, restoration is to a healthy functioning state as defined by Table 3.8.</p>	<p>4.6.1 Outstanding water bodies</p> <p>Policy P39: Adverse effects on outstanding water bodies</p> <p>The adverse effects of use and development on outstanding water bodies and their significant values identified in Schedule A (outstanding water bodies) shall be avoided.</p>	<p>The Project will avoid all outstanding water bodies in Schedule A.</p>
	<p>4.6.1A Managing adverse effects on aquatic ecosystems, habitats and species within the coastal marine area</p> <p>Policy 39A: Indigenous biodiversity values within the coastal marine area</p> <p>To protect the indigenous biodiversity values of aquatic ecosystems, habitats and species, use and development within the coastal marine area shall:</p> <p>(a) avoid adverse effects on:</p> <ul style="list-style-type: none"> (i) indigenous taxa listed as threatened or at risk in the NZ Threat classification system lists or as threatened by the International Union for Conservation of Nature and Natural Resources; (ii) indigenous ecosystems and vegetation types in the coastal environment that are threatened or are naturally rare; (iii) habitats of indigenous species where the species are at the limit of their natural range, or are naturally rare; (iv) areas in the coastal environment containing nationally significant examples of indigenous community types; (v) areas set aside for full or partial protection of indigenous biological diversity under other legislation. <p>(b) avoid significant adverse effects, and avoid, minimise, and/or remedy other adverse effects, of activities on the ecosystem values of estuaries...</p>	<p>The Avifauna and Vegetation AEE (Appendix C) provides a comprehensive assessment of the indigenous biodiversity values that exist within the Project area and provides for the management of effects on these values.</p> <p>A number of existing avifauna and their habitats were found within the Project area. The majority of these birds were observed in Point Howard-Sorrento Bays (79% of all birds). No coastal birds were seen during the field surveys on Marine Drive and existing concrete seawalls.</p> <p>The shared path footprint area and zone of influence provide seasonal or core habitat for one Nationally Endangered indigenous bird species (reef heron, in low and declining numbers) and one Nationally Vulnerable species (Caspian tern in low numbers). Nine At Risk species are present: fluttering shearwater (Relict); giant petrel, pied shag and variable oystercatcher (Recovering); black shag and little black shag (Naturally Uncommon); and red-billed gull, NZ little penguin and white-fronted tern (Declining). Appendix C assesses the post-mitigation level of effect on these species as low (see Table ES 1).</p> <p>The Project area has very high value for avifauna and their habitat. Although the level of potential effect of habitat loss on coastal avifauna is assessed as moderate over decades, it is noted that effects will reduce over longer time spans with increasing sea-level rise. Mitigation options for curved seawalls and revetments are proposed that would enhance their intertidal productivity and compensate to a degree for the loss of avifauna habitat. A review of site-specific choices for a 3.5 m shared path width in relation to marginal benefits of shared path use and the retention of avifauna habitat is recommended in Appendix C.</p> <p>There are parts of the shared path area that are used by little penguins for access, nesting and moulting and are of high ecological value as stated in Appendix C. Potential construction effects of curved seawall and revetment works and of works on stormwater pipes being used for nesting or access include noise, disturbance or destruction of nest, moulting or other occupational sites and blocking of penguin access. The magnitude of potential effect is assessed as high. Effects on the little penguin cannot be avoided, but can be mitigated through stormwater drains, access steps and ramps, and revetment design for little penguin access.</p>
	<p>4.6.2 Sites with significant indigenous biodiversity value</p> <p>Policy P40: Ecosystems and habitats with significant indigenous biodiversity values</p>	<p>As addressed above (and in further detail in Appendix C and John Cockrem's report dated 28 July 2018), the Project area includes significant habitats for five threatened or at risk indigenous birds (variable oystercatcher, red-billed gull, black shag, little black shag and pied shag). The habitat was mapped from along the coastline from the Point Howard wharf to the boat ramp and carpark where Marine Drive meets Marine Parade. This habitat is all</p>

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	<p>Protect and restore the following ecosystems and habitats with significant indigenous biodiversity values:</p> <p>(b) the habitats for indigenous birds identified in Schedule F2 (bird habitats), and</p> <p>(d) the ecosystems and habitat-types with significant indigenous biodiversity values in the coastal marine area identified in Schedule F4 (coastal sites) and Schedule F5 (coastal habitats).</p>	<p>within the Schedule F2 area: Wellington Harbour (Port Nicholson) foreshore. An effects management package for this habitat is set out below.</p> <p>The Project avoids all coastal sites with significant indigenous biodiversity values as listed in Schedules F4 and will also avoid all seagrass habitat identified in Schedule F5. Mitigation measures have been included in the Beach Nourishment Report (Appendix F) and the Design Features Report (Appendix J) to ensure that seagrass is protected from any potential adverse effects resulting from beach nourishment.</p>
<p>Objective O35</p> <p>Ecosystems and habitats with significant indigenous biodiversity values are protected and where appropriate restored to a healthy functioning state as defined by Table 3.8.</p>	<p>Policy P41: Managing adverse effects on ecosystems and habitats with significant indigenous biodiversity values</p> <p>In order to protect the ecosystems and habitats with significant indigenous biodiversity values identified in Policy P40, in the first instance activities that risk causing adverse effects on the values of a significant site, shall avoid these ecosystems and habitats.</p> <p>If the ecosystem or habitat cannot be avoided, (except for those ecosystems and habitats identified in Policy P40(b), (c) and (d) that are identified and managed by Policy P39A(a)), the adverse effects of activities shall be managed by:</p> <p>(a) avoiding more than minor adverse effects, and</p> <p>(b) where more than minor adverse effects cannot be avoided, minimising them, and</p> <p>(c) where more than minor adverse effects cannot be avoided and/or minimised, they are remedied, and</p> <p>(d) where residual adverse effects remain the use of biodiversity offsets may be proposed or agreed by the applicant.</p> <p>Proposals for biodiversity mitigation and biodiversity offsetting will be assessed against the principles listed in Schedules G1 (biodiversity mitigation) and G2 (biodiversity offsetting). A precautionary approach shall be used when assessing the potential for adverse effects on ecosystems and habitats with significant indigenous biodiversity values.</p> <p>Where more than minor adverse effects on ecosystems and habitats with significant indigenous biodiversity values identified in Policy P40 cannot be avoided, remedied, mitigated or redressed through biodiversity offsets, the activity is inappropriate.</p>	<p>Policy P41 considers the protection of the ecosystems and habitats with significant indigenous biodiversity values identified in Policy P40 (variable oystercatcher, red-billed gull, black shag, little black shag and pied shag).</p> <p>The Project will protect and restore these ecosystems and habitats with significant indigenous biodiversity values where possible. Where it is not possible to avoid these habitats and values, potential adverse effects have been managed by minimising more than minor effects, or remedying these potential on-site through use of the measures in the Design Features Report (Appendix J), the draft conditions (Appendix R) and any subsequent mitigation developed as part of detailed design, including through the CEMP.</p> <p>John Cockrem's report dated 28 July 2018 sets out the full effects management package for the shoreline foragers (gulls and oystercatchers) in particular. This is due to the potential for the Project to result in permanent habitat loss for these birds. Effects on the other indigenous bird habitats in Schedule F2 (black shag, little black shag and pied shag) were assessed as only being temporary in nature.</p> <p>The report finds that it is not possible to avoid significant coastal habitats for the shoreline foragers, to avoid more than minor adverse effects on these birds, or to minimise these effects. Given that the loss of foraging habitat will be a permanent effect of the Project, it is not considered to be possible to remedy this effect. It was noted that a small proportion of the lost habitat will be replaced during the Project construction due to the potential for areas of rock revetments that were previously under water to become feeding areas for shoreline foragers.</p> <p>In addition to shoreline foragers, it is also not possible to avoid, minimise or remedy more than minor adverse effects of the Project on little penguins. Potential nesting sites will be created at some of the new revetments and the timing of Project construction activities will avoid penguin breeding or moulting periods.</p> <p>In order to protect these significant indigenous biodiversity values, biodiversity offsetting is proposed by creating breeding areas for shoreline birds and little penguins on the southern breakwater wall at the Seaview marina. This biodiversity offset applies the principles set out in Schedule G2 (to both shoreline foragers and little penguins) as follows:</p> <ul style="list-style-type: none"> • Adherence to the mitigation hierarchy: The biodiversity offset will address the residual adverse effects of the activity by providing approximately 250 to 400m² of additional breeding habitat for shoreline foragers on the existing southern breakwater at the Seaview marina. • Limits to what can be offset: The biodiversity offset is considered appropriate as it will not have residual adverse effects on biodiversity and will appropriately be overseen and managed by technical experts. • Additional conservation outcomes: The biodiversity offset will create new, safe breeding habitat for shoreline foraging birds and little penguins, will also provide safe roosting opportunities, and will have positive effects on biodiversity that would not otherwise have occurred. • Landscape context: The biodiversity offset will increase the availability of safe breeding habitat for shoreline foraging birds and little penguins in the Wellington Harbour, thereby contributing to the protection of habitats of avifauna. The offset site is an existing artificial structure and the creation of breeding habitat for birds will complement the primary purpose of the breakwater which is to provide shelter for the marina. In addition, the offset is within an existing reserve where penguins currently nest. The creation of safe breeding habitat for penguins within the reserve will enhance the biological, social and cultural values of the reserve. • Long term outcomes: The breakwater is owned by the Hutt City Council (HCC) so the biodiversity offset will continue in perpetuity. Implementation of the offset by the HCC will be undertaken as a consent condition for the project. The breakwater can be used without further enlargement and therefore no consents are required to achieve this offset. • Not net biodiversity loss: The biodiversity offset will provide new breeding habitat for birds. There will be no loss of biodiversity associated with creation of the breeding area and hence there will be a net gain of biodiversity. Measurable positive effects on biodiversity will be seen when shoreline foragers start to roost and then to breed, and little penguins breed at the new site. Shoreline foraging birds and little penguins currently frequent the area, so the risk of failure in delivering the biodiversity offset is very low.
	<p>Policy P42: Protecting and restoring ecosystems and habitats with significant indigenous biodiversity values</p>	<p>As mentioned above, the Project will protect and restore ecosystems and habitats with significant indigenous biodiversity values where possible. Where it is not possible to avoid these habitats and values, potential adverse</p>

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Relevant objective	Relevant policy	Assessment
	<p>In order to protect the ecosystems and habitats with significant indigenous biodiversity values identified in Policy P40, particular regard shall be given to managing the adverse effects of use and development in surrounding areas on physical, chemical and biological processes to:</p> <p>(a) maintain ecological connections within and between these habitats, or</p> <p>(b) provide for the enhancement of ecological connectivity between fragmented habitats through biodiversity offsets, and</p> <p>(c) provide adequate buffers around ecosystems and habitats with significant indigenous biodiversity values, and</p> <p>(d) avoid cumulative adverse effects on, and the incremental loss of the values of these ecosystems and habitats.</p>	<p>effects have been managed by minimising more than minor effects, or remedying these potential on-site through use of the measures in the Design Features Report (Appendix J), the draft conditions (Appendix R) and any subsequent mitigation developed as part of detailed design, including through the CEMP. Biodiversity offsetting is also proposed to provide new breeding grounds for shoreline foragers and little penguins, which will enhance ecological connectivity and protect against the incremental loss of the values of these ecosystems and habitats.</p>
<p>Objective O34</p> <p>Significant historic heritage values are protected from inappropriate modification, use and development.</p>	<p>4.6.4 Sites with significant historic heritage value</p> <p>Policy P46: Managing adverse effects on sites with significant historic heritage value</p> <p>More than minor adverse effects on the significant historic heritage values identified in Schedule E1 (heritage structures) shall be avoided, remedied or mitigated by managing activities so that:</p> <p>(a) significant historic heritage values are not lost, damaged or destroyed</p> <p>(b) effects are of a low magnitude or scale, or effects are reversible</p> <p>(c) interconnections and linkages between sites are not significantly altered or lost</p> <p>(d) previous damage to significant historic heritage values is remedied or mitigated where relevant</p> <p>(e) previous changes that have significant historic heritage value in their own right are respected and retained</p> <p>(f) adjacent significant historic heritage values are unlikely to be adversely affected</p> <p>(g) unique or special materials and/or craftsmanship are retained</p> <p>(h) the activities do not lead to cumulative adverse effects on historic heritage.</p>	<p>The Skerrett Boatshed (1906) at Lowry/Whiorau Bay is the only site within the Project area listed as a site with historic heritage value in the pNRP (Schedule E1). All works undertaken in close proximity to the boatshed will be undertaken so as to avoid any potential adverse effects on the boatshed. The Shared Path itself has been narrowed to avoid the building and no works will be undertaken on the boatshed itself.</p> <p>It is noted that the Project avoids sites with significant mana whenua values in Schedule C. Policies P44 and P45 are therefore not relevant to the application.</p>
<p>Objective O32</p> <p>Outstanding natural features and landscapes and their values are protected from inappropriate use and development.</p>	<p>4.6.5 Natural features and landscapes</p> <p>Policy P48: Protection of natural features and landscapes</p> <p>The natural features and landscapes (including seascapes) of the coastal marine area, rivers, lakes and their margins and natural wetlands shall be protected from inappropriate use and development by:</p> <p>(b) avoiding adverse effects of activities on outstanding natural features and landscapes, and</p> <p>(c) avoiding significant adverse effects and avoiding, remedying or mitigating other adverse effects of activities on all other natural features and landscapes.</p>	<p>Hutt City Council does not currently identify outstanding natural features (ONFs), outstanding natural landscapes (ONLs), or special amenity landscapes (SALs) in its district plan.</p> <p>It is possible that either the west facing hills in East Harbour Regional Park or Wellington Harbour could be assessed as ONF or ONL, or as SAL in a revised Hutt City district plan.</p> <p>The Project will have no impact on visual linkages to the Eastern Hills and insignificant effects on visual linkages to the Wellington Harbour.</p>
Land use and Discharges to land and water		
<p>Objective O43</p> <p>The environment is protected from more than minor adverse effects of discharges from contaminated land.</p>		<p>Potential adverse effects on soil and water from land use activities associated with the construction of the Project will be minimised to the smallest extent practicable through the use of mitigation measures included in Appendix J, the draft conditions, and as further refined in the CEMP. In particular, special procedures will be put in place through detailed design to manage the contaminated soils and materials near Sunshine Bay Garage to ensure potential adverse effects on human health and the environment are avoided.</p>
<p>Objective O44</p> <p>The adverse effects on soil and water from land use activities are minimised.</p>		

Proposed Natural Resources Plan for the Wellington Region – Decisions Version (31 July 2019)		
Rule No.	Rule	Assessment
Rule R166 Seawalls outside sites of significance (Discretionary activity)	The placement of a new seawall , or the addition to or alteration or replacement of an existing seawall , and the associated use of the structure outside a site or habitat identified in Schedule C (mana whenua), Schedule F4 (coastal sites), Schedule F5 (coastal habitats) or Schedule J (geological features) in the coastal marine area including any associated: (a) occupation of space in the common marine and coastal area , and (b) disturbance of the foreshore or seabed, and (c) deposition in, on or under the foreshore or seabed, and (d) discharge of contaminants, and (e) diversion of open coastal water that is not a controlled activity under Rule R165 is a discretionary activity under Rule R166.	As seawalls will be constructed outside sites of significance, a discretionary activity must be applied for under Rule 166. Works within the footprint of the existing seawall will be a controlled activity under Rule R166. Works outside the footprint of the existing seawall and/or outside sites of significance will be a discretionary activity under Rule R166.
Heritage structures		
Rule R168 Maintenance or repair or alteration of structures identified in Schedule E1, E2 or E3 (Permitted Activity)	The maintenance or repair or alteration of a structure identified in Schedule E1 (heritage structures), Schedule E2 (wharves and boatsheds) or Schedule E3 (navigation aids) in the coastal marine area, including any associated: (a) occupation of space in the common marine and coastal area , and (b) disturbance of the foreshore or seabed, and (c) deposition in, on or under the foreshore or seabed, and (d) discharge of contaminants is a permitted activity, provided the following conditions are met: (e) for structures identified in Schedule E1 (heritage structures), Schedule E2 (wharves and boatsheds) and Schedule E3 (navigation aids), the materials used for maintenance or repair or alteration of the structure shall use the same materials, or the altered components should be of original or similar material, texture, form and design as the original it replaces, and (f) any alteration is contained within the form of the existing structure and there is no increase in length, width, height of the existing structure, and (g) the number of components altered should be substantially less than existing number of components, and (h) the alteration does not include the removal, relation, partial or total demolition of any structure, and (i) the activity shall comply with the coastal management general conditions specified above in Section 5.7.2.	Not applicable. Although the Shared Path will run alongside the Skerrett Boat House (listed in Schedule E1), the building will not be affected by the Project.
Occupation		
Rule R182 Occupations of space by regionally significant infrastructure or a structure owned by a network utility operator (Permitted Activity)	The occupation of space in the common marine and coastal area by a structure existing before the date of 31 July 2015 which is regionally significant infrastructure or owned by a network utility operator is a permitted activity.	Occupation is covered by relevant rules for construction of the required structures under the PNRP and therefore the proposed structures will comply with this rule.
Rule R184 Occupation of space (Discretionary Activity)	The occupation of space in the common marine and coastal area that is not permitted, controlled, restricted discretionary, non-complying or prohibited is a discretionary activity.	Please refer to the above comments.
General disturbance activities		
Rule R188 Minor disturbances (Permitted Activity)	The disturbance of the foreshore or seabed including any removal of sand, shingle, shell or other natural material in the coastal marine area, including any associated: (a) occupation of space in the common marine and coastal area , and (b) deposition in, on or under the foreshore or seabed, and (c) discharge of contaminants is a permitted activity, provided the following conditions are met: (d) the activity shall not be inside a site or habitat identified in or using Schedule C (mana whenua), Schedule E4 (archaeological sites), Schedule F2c (birds-coastal) or Schedule J (geological features), and (e) no more than 0.1m3 of sand, shingle, shell or other natural material shall be taken by a person in a 12 month period, and	Rule R188(i) cannot be met as an excavator will be used - motorised machine will disturb sand and shingle during construction of these structures. The activity will also be within significant habitats for indigenous birds in the coastal marine area (Schedule F2c habitat). As a result, Rule R188(d) cannot be met.

Proposed Natural Resources Plan for the Wellington Region – Decisions Version (31 July 2019)		
Rule No.	Rule	Assessment
	(f) the removed natural material shall not be used for commercial gain, and (g) the area of excavation shall be smoothed over after the completion of the activity (e.g. no holes left on the foreshore), and (h) the extent of the foreshore or seabed disturbance is limited to that required to undertake the activity, and (i) no motorised excavation machinery shall be used to disturb or remove sand, shingle, shell or other natural material.	
Motor vehicles on the foreshore		
Rule R196 Motor vehicles (Permitted Activity)	The disturbance of the foreshore from motor vehicles , other than those permitted by Rule R190, in the coastal marine area is a permitted activity, provided the following conditions are met: (a) the activity is not within the area of Tītahi Bay shown on Map 35, and (b) the activity is not within a site or habitat identified in Schedule C (mana whenua), Schedule E4 (archaeological sites), Schedule F2c (birds-coastal), Schedule F4 (coastal sites), Schedule F5 (coastal habitats) or Schedule J (geological features).	Rule R196 cannot be met as vehicles will be used within a site or habitat identified in Schedules F2c and/or F5.
Rule R198 Motor vehicles include sites of significance (Non-Complying Activity)	The disturbance of the foreshore or seabed from motor vehicles inside a site or habitat identified in Schedule C (mana whenua), Schedule E4 (archaeological sites), Schedule F2c (birds-coastal), Schedule F4 (coastal sites), Schedule F5 (coastal habitats) or Schedule J (geological features) in the coastal marine area, that is not permitted by Rule R190, Rule R196 or Rule R197 or prohibited under Rule R199, is a non-complying activity.	A consent will be required to enable the use of motor vehicles within the Schedule F2c habitat and to ensure the protection of seagrass habitat in Schedule F5.
All other destruction, damage, or disturbance or deposition		
Rule R204 Destruction, damage, disturbance or deposition outside sites of significance (Discretionary Activity)	Destruction, damage, or disturbance or deposition outside a site and habitat identified in Schedule C (mana whenua), Schedule E4 (archaeological sites), Schedule F4 (coastal sites), Schedule F5 (coastal habitats) or Schedule J (geological features) in the coastal marine area, including any associated: (a) deposition in, or under the foreshore or seabed, and (b) discharge of contaminants, and (c) diversion of open coastal water, that is not permitted, controlled, restricted discretionary, non-complying or prohibited, is a discretionary activity.	Deposition will occur outside habitats of significance within Schedule F5, as such consent for a discretionary activity will be required.
Deposition		
Rule R207 Deposition for beach renourishment (Controlled Activity)	The deposition of sand, shingle, shell or other naturally occurring coastal material for beach renourishment in, on or under the coastal marine area, including any associated: (a) disturbance of the foreshore or seabed, and (b) discharge of contaminants is a controlled activity provided the following conditions are met: (c) the deposition is for the purpose of managing beach or shoreline erosion or improving the amenity value of the foreshore, and (d) the deposition is undertaken by, or for, a local authority, and (e) the activity shall comply with the coastal management general conditions specified above in Section 5.7.2.	The deposition sand, shingle, shell or other naturally occurring coastal material for beach nourishment as part of the Project is for the purpose of improving the amenity value of the foreshore within the Project area, will be undertaken by HCC. This is assessed under R204.
Reclamation and drainage		
Rule R214 Reclamation and Drainage for regionally significant infrastructure outside of sites of significance (Discretionary Activity)	Reclamation and drainage for regionally significant infrastructure activities outside a site or habitat identified in Schedule C (mana whenua), Schedule E4 (archaeological sites), Schedule F4 (coastal sites), Schedule F5 (coastal habitats) or Schedule J (geological features) in the coastal marine area, including any associated: (a) occupation of space in the common marine and coastal area , and (b) destruction of the foreshore or seabed, and (c) disturbance of the foreshore or seabed, and (d) deposition in, on or under the foreshore or seabed, and (e) discharge of contaminants (f) diversion of open coastal water is a discretionary activity.	Reclamation and drainage for regionally significant infrastructure in the coastal marine area must be assessed as a discretionary activity under Rule R214 given that the activity occurs outside sites of significance as identified in Schedule F5 (coastal habitat).

Table 2: Scheduled area summary

Schedule	Summary
Schedule A: Outstanding Water Bodies	Schedules A1-A3 are not relevant to the Project or within the Project area.
Schedule B: Ngā Taonga Nui a Kiwa	See the assessment above in respect of Policy P18.
Schedule C: Sites with significant mana whenua values	The Project avoids all sites of significance to mana whenua listed in Schedules C1 to C5.
Schedule E: Sites with significant historic heritage values	The only Schedule E site within the Project area is Skerrett Boatshed (Schedule E1). The Project has been designed so as to avoid the boatshed.
Schedule F: Ecosystems and habitats with significant biodiversity values	<p>Schedule F2c: The Project avoids all known parts of the coastal marine area with inanga spawning listed in Schedule F1b.</p> <p>Schedule F2c: The Project is located within a significant habitat area for indigenous birds. See the assessment at Policy P40 and P41 and related effects management package.</p> <p>Schedule F4: The Project avoids all sites with significant indigenous biodiversity values in the coastal marine area listed in Schedule F4.</p> <p>Schedule F5: See full assessment below. The Project area includes seagrass and rocky reef habitats (listed in Schedule F5). These habitats will be avoided by the Project.</p>
Schedule H: Contract recreation and Māori customary use	The Project avoids all water bodies included in Schedule H.
Schedule J: Significant geological features in the coastal marine area	The Project avoids all significant geological features in the coastal marine area.

Table 4: Schedule F5 Assessment

Habitat	General descriptor	Known locations	Assessment
<i>Adamsiella</i> algal beds	<i>Adamsiella</i> beds are known to harbour a range of associated species in other areas of New Zealand but Wellington studies are lacking.	Evans Bay, Wellington Harbour (Port Nicholson) 41°18.83'S 174°48.10'E	N/A
Deep-sea woodfall	Woodfalls are reducing environments undergoing a prolonged decay process during which a diverse range of organisms comes to be associated with it. Molluscs are the principal group represented (also including chitons and gastropods), followed by crustaceans, polychaetes and echinoderms. The fauna is frequently closely related to the fauna around hydrothermal vents, cold seeps, and whale falls.	1100 m off Wairarapa coast	N/A
Giant kelp, <i>Macrocystis</i> , beds	<i>Macrocystis</i> beds are considered to sustain one of the most diverse, productive and dynamic ecosystems of the planet. Kelp beds provide three dimensional habitat space and structuring in areas of rocky reef and are critical to food chains. The beds in the Wellington region are patchily distributed and known to vary in size and position over time.	Point Howard to Hinds Point, and Worser Bay to Kau Bay, Wellington Harbour (Port Nicholson)	Not present in the Project area - refer to AEE
Inanga spawning habitat	Inanga are the adult life stage of the most abundant whitebait species <i>Galaxias maculatus</i> . It spawns gregariously on spring tide events during late summer and autumn amongst tidally influenced riparian vegetation. Preferred habitat is the moist litter-layer, on the banks of rivers and streams, inundated by the spring tide. In pastoralised areas, ungrazed pasture grasses, especially tall fescue, Yorkshire fog and creeping bent provide suitable conditions. Native plants such as flax, raupo, and native rushes in low salinity areas are also suitable.	Known locations include the tidally indated vegetation near the mouths of the Wainuiomata River, Ōtaki River, Makara Stream, Whangaimoana Stream, and Otarei Stream. See Schedule F1b for a list of rivers where inanga spawning habitat has been identified.	Not present in the Project area - refer to AEE and Appendix B.
Kelp beds	Kelp beds provide three dimensional habitat space and structuring to the environment in rocky reef habitats. Kelp beds are known to harbour high biodiversity and are critical to food chains.	Kelp beds occur on exposed rocky reefs region wide	Not present in the Project area - refer to AEE.

Habitat	General descriptor	Known locations	Assessment
Rhodolith Beds	Biota associated with rhodolith beds and other biogenic habitats are usually highly diverse. Rhodolith beds in the region have not been studied so the extent and specific biodiversity values are unknown.	The rhodolith bed within the Kāpiti Island Marine Reserve is protected, but the bed extends to the East of Kāpiti Island beyond the reserve boundaries, and potentially in other locations.	N/A
Saltmarsh	A variety of saltmarsh species (scrub, sedge, tussock, grass, reed and herb fields) grow in the upper margins of most NZ estuaries where this vegetation stabilises sediments transported by tidal flows. Saltmarshes have high biodiversity and are amongst the most productive habitats on earth. Saltmarshes are sensitive to a large range of pressures, including reclamation, margin development, flow regulation, grazing, sea level rise, wastewater contaminants and weed invasion.	Saltmarsh occurs at the margins of estuaries region wide, though the historical extent and quality of saltmarsh has been severely depleted in most estuaries.	N/A
Seagrass	Seagrass grows in soft sediments in NZ estuaries where its presence enhances estuarine biodiversity. Seagrass is highly valued ecologically for the ecosystem services it supports, such as, primary production, nutrient recycling, sediment stabilisation, and as a nursery for fish and invertebrates. Seagrass is also an important forerunner to the establishment of healthy saltmarsh on tidal flats. Though tolerant of a wide range of conditions, seagrass is vulnerable to high levels of suspended sediments and poor sediment quality.	The largest seagrass beds in the region are in Pauatahanui inlet, Te Awarua-o-Porirua Harbour. Seagrass occurs as small remnant beds in many other estuaries region wide.	Present in the Project area - refer to AEE and Appendix C
Seal Haul-outs	Seals need to come onto land to rest and breed. While they may be above mean high water springs for some of the time, they need unencumbered access to the foreshore and water. Seals are particularly sensitive to disturbance during the breeding season (mid November to mid-January), but will be disturbed by loud noises, construction activity and vehicles at all times when they are ashore.	Known seal haul outs in the region include Pariwhero/Red Rocks, Turakirae Head and Cape Palliser	N/A
Sponge garden	Sponges are sedentary, filter feeding metazoans that can encrust hard surfaces, or anchor themselves in mud, sand, or gravel. Hotspots of species diversity, density, richness, or endemism are known as sponge gardens. Sponge gardens create three-dimensional biogenic habitat for associated flora and fauna.	Pukerua Bay	N/A
Subtidal rocky reefs	Subtidal rocky reefs generally have high levels of species richness because of the large number of microhabitats. This richness is frequently augmented by biogenic 3-dimensional habitats created by reef species as well as high levels of biotic interaction.	Subtidal rocky reefs occur along the majority of coast in the Wellington region. Notable exceptions are the sandy beaches north of Paekakariki and in Palliser Bay.	Present in the Project area - refer to AEE and Appendices A & C



Annexure 2: Hazard Risk Management Strategy

Eastern Bays Shared Path Hazard Risk Management Strategy

1 Introduction

This Hazard Risk Management Strategy (HRMS) is provided in response to changes affecting Policy P28 of the Decisions Version of the Proposed Natural Resources Plan (31 July 2019) (PNRP-DV).

As a result of these changes, Greater Wellington Regional Council (GWRC) has requested that Hutt City Council (HCC) provide a hazard risk management strategy prepared in accordance with the prescribed definition in the 'Interpretation' section of the PNRP-DV in support of its application for the Eastern Bays Shared Path project (Project)¹.

Under Policy P28 a hazard risk management strategy is normally developed by a local authority. It is acknowledged that HCC are actively developing a "sustainability strategy" however, because of the current hazard risk from failing seawalls, the risk to road and community and funding timeline commitments, it means the Project cannot wait for an overall HCC strategy to be developed.

This Project-specific strategy document explains and summarises how this Project has already proactively addressed hazard risk in its key design elements and consent application. This project-specific HRMS may be superseded by the to-be-developed HCC strategy, however it follows the same principles and is expected to be consistent.

This Hazard Risk Management Strategy "repackages" information that is already part of the Eastern Bays Shared Path resource consent application, and expands in some areas by referring to existing guidance (MfE 2017), to demonstrate how the project responds and manages hazard risks.

The following technical reports from the resource consent application are referenced in this strategy:

- Coastal Processes Report (Appendix E)
- Beach Nourishment Report (Appendix F)
- Alternatives Assessment (Appendix G)
- Stakeholder Engagement and Consultation report (Appendix I)
- Design Features Report (Appendix J)
- Transport Assessment (Appendix L)
- Preliminary Design Plans (Appendix N)

2 Hazard and hazard risk identification

2.1 Hazards

The following natural hazards are identified in the Project area and are relevant to the application:

- Coastal hazards - the most significant natural hazard associated with the Project.²
- Earthquakes and seismic activity
- Non-seismic vertical land movements

¹ Policy P28: Hazard mitigation measures. Hard hazard engineering mitigation and protection methods shall be avoided except where it is necessary to protect existing development from unacceptable hazard risk, assessed using the risk-based approach, and;

(a) any adverse effects are no more than minor, or

(b) where the environmental effects are more than minor the works form part of a hazard risk management strategy.

² For the purposes of the PNRP-DV, all areas in the coastal marine area are high risk areas (also known as areas at high risk from natural hazards).

- Tsunami

These natural hazards are described below, and are detailed further in the Coastal Processes Report (Appendix E) of the resource consent application.

We note there are many other potential natural hazards which may affect the Project area (e.g. landslides, cliff collapse, extreme hot/cold, wet/dry or windy weather events, wildfire) however these hazards are unaffected by the proposal, are managed by other hazard management strategies (Greater Wellington Regional Council, Civil Defence Emergency Management), and are not addressed here.

2.1.1 Coastal Hazards including climate change

In New Zealand the 1% Annual Exceedance Probability³ hazard events are often adopted as extreme events for coastal hazard planning and design. These "extreme sea-levels" are higher-than-usual sea levels that are infrequently exceeded when high tides, storm surges and large wave combine. A recent extreme event analogous to this 1% AEP scenario is the 21 June 2013 storm where sea levels reached 1.29 m WVD-53 at Queens Wharf corresponding to 1.2% AEP and was coupled with strong southerly winds and large waves within the Wellington Harbour. This storm caused region-wide disruption, with major undermining of the Wellington to Wairarapa railway causing economic losses of \$2.4M–\$8.6M per day⁴. Marine Drive was affected by wave overtopping and requiring multiple road closures and costly clean-ups.

Coastal hazards affecting the Marine Drive route include:

- Waves along Marine Drive arise from ocean swells penetrating into the harbour and combined with strong winds whipping up waves over the local fetch within the harbour. The 1% AEP wave heights along the Shared Path are 1.29 m in the south and increasing to 1.5 m in the north.
- Storm surges in Wellington Harbour result from barometric pressure dropping combined with onshore winds causing a wave 'setup' at the coast. High sea levels which include normal tides reach elevations of 1.32 m at 1% AEP. Storm surges are often accompanied by large waves and allow waves to progress further inland on the elevated sea levels.
- Wave overtopping hazards are where waves impact the coast and 'over top' the crest. Overtopping is usually white-water splash or wind-driven spray (with rocks, sand and driftwood debris deposited onto the road and requiring road closures) but can also be a more hazardous volume of "green" (surging) water during large storm conditions which can overwhelm stormwater drains and contribute to localised inundation. Overtopping occurrences requiring road closures are estimated to occur 5-10 times per year at the present day.
- Climate change is causing sea levels to rise. By 2100, sea levels will be between around 0.3 m and 1.0 m above the 1995 level, depending on the amount of future greenhouse gas emissions. The 2017 MfE guidance provides four scenarios of sea-level rise for NZ to assess against project plans. For this Project, sea-level rise values are used to evaluate the proposed seawalls by 2070 (50-year design life), and to 'stress test' designs with sea level rise in 2120 (100-year assessment NZCPS). The stress-test refers to assessing the effects of wave overtopping hazards and storm-tide (tidal elevation + storm surge) elevation over the long term.

The main effect of climate change on the existing coastal environment of the Eastern Bays is the increase in sea level leading to an increase in coastal hazards such as the frequency of wave overtopping and extent of coastal inundation. This is because areas with small tidal range, such as Wellington, are more sensitive to sea level rise, and because Marine Drive is low-lying with edge

³ i.e. the probability of occurring each year on average. Related to Average Recurrence Interval (ARI) by 1% AEP = 100-year ARI, 2% AEP = 50-year ARI, 5% AEP = 20-year ARI, 10% AEP = 10-year ARI, 18% AEP = 5-year ARI and 1% AEP = 63% ARI.

⁴ Ministry of Transport (2013). The transport impacts of the 20 June 2013 storm: The effects of closing the Hutt Valley rail line between Petone and Wellington for multiple days A joint report by the Ministry of Transport, the NZ Transport Agency, KiwiRail and the Greater Wellington Regional Council, ISBN: 978-0-478-07259-4.

elevations typically 1.9-2.5 m WVD-53⁵ for most bays and up to 3.5 m WVD in the Windy Point area. A secondary effect of climate change is storm intensification, which will see stronger winds, larger waves and higher storm-surges with the MfE guidance recommending assessing 10% increases in each.

With only 16 cm of sea level rise, the frequency of the present day 1% AEP event in Wellington will have increased to once per year on average. Following MfE (2017) projections, this 16 cm sea level rise is expected to occur sometime between 2030 and 2040 (depending on global emissions trajectories).

As sea level rises beyond 16 cm in the subsequent decades, the existing Marine Drive coastal route will be subject to more frequent high-water and wave overtopping events like the 21 June 2013 event, leading to more regular road closures and community disruption. For example, sea level rise of 1 m will create hundreds of occurrences per year of the present-day 1% AEP extreme sea level, with all high tides in Wellington exceeding this level. Coastal inundation hazards and the effect of sea level rise are also presented in the GWRC online mapping tool⁶ and copied into Figure 2-2 for the existing seawall configuration.

Figure 2-1 shows an example of the existing seawalls at Point Howard beach along with the proposed designs after periods of sea level rise. Also superimposed is the water level reached on 21 June 2013. The Preliminary Design Plans (Appendix N) of the resource consent application include a series of nine cross sections showing the periods of sea level rise at 0.5 m and 1.0 m.

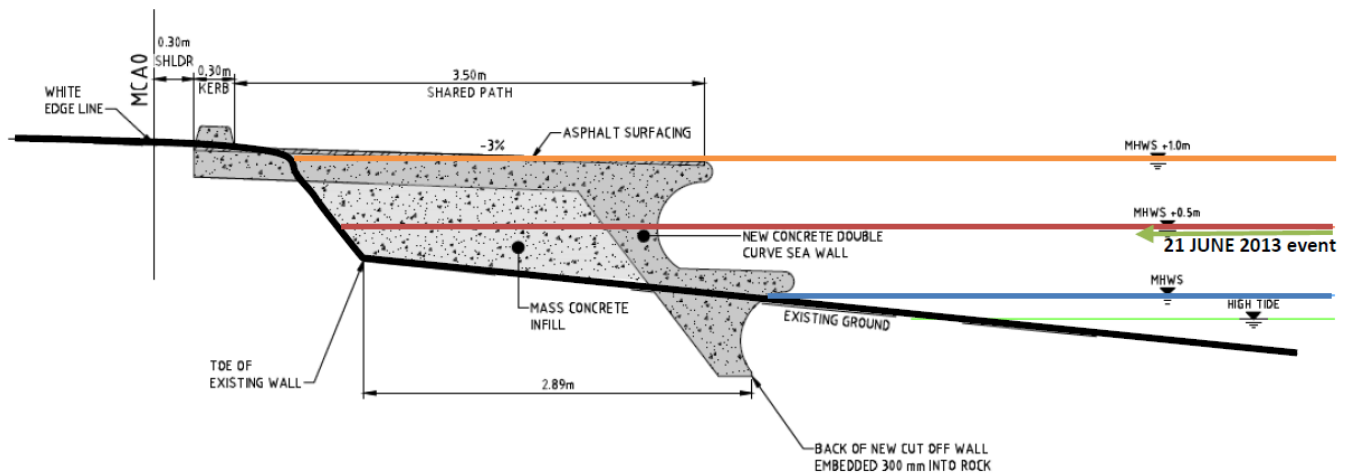


Figure 2-1 Schematic of existing seawall along with proposed seawall at Point Howard Beach showing MHWs elevation after periods of sea-level rise.

⁵ Wellington Vertical Datum 1953

⁶ <https://mapping1.gw.govt.nz/GW/SLR/>

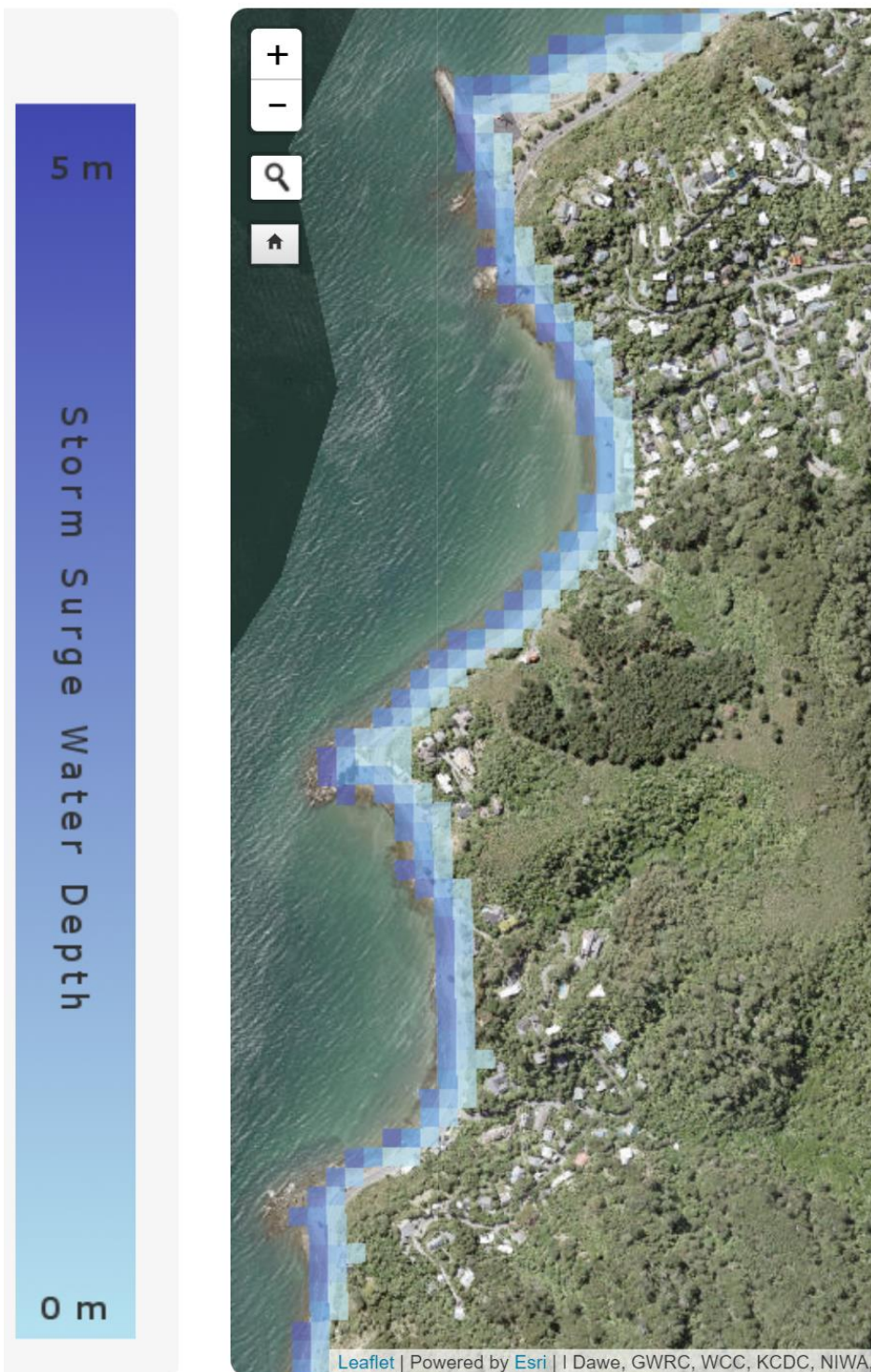


Figure 2-2 Schematic of modelled inundation depths along Marine Drive during 1% AEP storm-surge event with existing seawall after 0.5 m SLR.

Source: <https://mapping.l.gw.govt.nz/GW/SLR/>

2.1.2 Earthquakes and seismic activity

The Wellington region is located within an area of high seismicity near the boundary of the Pacific and Australian tectonic plates. Stresses in the earth's crust produced by the subduction margin have produced a number of faults, both on land and on the seafloor, around the Wellington region. Many of these faults are still active and present a significant hazard. The most prominent nearby active fault is the Wellington Fault (north-western edge of Wellington Harbour) and is the

subject of many hazard risk assessments and emergency plans which incorporate the likely impacts on the Eastern Bays area. Further, it is difficult to predict the frequency and distribution of distant deep or large earthquakes centred offshore or their effect on the Wellington Region (e.g. the 2016 Kaikōura Earthquake). Research indicates that a major Wellington Fault event may submerge much of the Eastern Bays foreshore into the Harbour waters.

The exposure of the Project to active faults, expanse of soft seabed sediments and geological history of large seismic events necessitate that the seawalls and shared path undergo careful design to maintain serviceability access following a significant seismic event. To address the potential hazard of submergence, the new seawalls should have improved foundational capacity compared to the present-day situation.

The public safety effects from earthquakes and seismic activity are best dealt with through robust emergency-management arrangements including warnings, evacuation and road closures. These activities are administered by Civil Defence Emergency Management (CDEM) and are beyond the scope of this proposal.

2.1.3 Vertical land motion

Vertical land movement (VLM), i.e. uplift or subsidence not associated with coseismic activity) is causing non-negligible subsidence in the Wellington Region⁷. The current secular (average) trend of 2.7 mm/year subsidence could result in a 0.27 m fall in land elevations if it continued over the 100-year NZCPS assessment lifetime.

This natural hazard essentially accelerates the rate of sea level rise relative to the land (i.e. a *relative sea level rise*, RSLR). The inclusion of VLM into RSLR will bring forward the timing of adaptation triggers and implementation steps under the HCC's to-be-developed climate change strategy.

2.1.4 Tsunami

Tsunami have affected the Eastern Bays coastal areas in the past and can be expected to affect it in the future. For example, in the 1855 Wairarapa earthquake water levels rose at least 1.2 m above high-water level in the Wellington Harbour. The November 2016 Kaikōura earthquake created tsunami waves (trough to crest height) of 1.6 m near the Eastbourne foreshore.

It is noted that Marine Drive and many waterfront properties are well within the tsunami hazard zones. However, the extent that the Project could be affected by tsunami is not addressed in this strategy because damaging tsunami are generally large and rarely economical for an engineering design to accommodate. In the relatively low-lying situation of Marine Drive the changes to the seawalls are minor compared to Tsunami wave size, and will have negligible effect at reducing the hazard from large tsunami waves.

The public safety effects from Tsunami are best dealt with through robust emergency-management arrangements including warnings, evacuation and road closures. These activities are administered by Civil Defence Emergency Management (CDEM) and are beyond the scope of this proposal.

2.2 Hazard risk

Hazard risk is a combination of the probability of a natural hazard and the consequences that would result from an event of a given magnitude. This is expressed by the formula:

$$\text{Hazard risk} = \text{hazard} \times \text{vulnerability}$$

⁷ Bell, R.G., Denys, P. and Hannah, J. (2018) Update on relative sea-level rise and vertical land motion: Wellington region. NIWA Client Report 2019007HN, prepared for Greater Wellington Regional Council: 36

This Project followed a risk-based approach associated with coastal hazards and sea level rise which takes account of:

- the intended purpose of a development,
- the likelihood of natural hazard events occurring
- the vulnerability and exposure of the site, use or development,
- the severity and consequences of potential hazard events and
- the costs and benefits of acting or not acting.

The hazard risk assessment is outlined in the table below. It is a present-day assessment, which demonstrates the Project as a hazard risk reduction strategy. It fulfils the requirements of a resource consent application in high-risk areas and is commensurate with the size and scale of the development.

Table 2-1: Hazard risk assessment

	Assessment
Intended purpose of a development	Construction of the shared path and protecting the resilience of the Marine Drive and underground services by upgrading the supporting seawalls.
Likelihood of natural hazard events occurring (design timeframe – lifetime of design (50-years) with consideration over 100 year NZCPS timeframe).	Following MfE (2017) projections, a 16 cm sea level rise is expected to occur sometime between 2030 and 2040 (depending on global emissions trajectories). The 1 per cent AEP event would cause substantial wave overtopping. Likelihood=high, Consequence = moderate, Impact = moderate.
Vulnerability and exposure of the site, use or development	The road is currently vulnerable to closure, and/or reduced operation, in part due to wave overtopping due to the current state of the coastal edge. The existing seawall in places has a residual life of less than 5 years, and as it has been built in an ad hoc nature over time, is vulnerable to failure and does not provide effective storm mitigation. Likelihood=high, Consequence = moderate, Impact = moderate.
Severity and consequences of potential hazard events	Storms regularly cause localised flooding in roads and property near the coast, with hazardous wave overtopping making Marine Drive unsafe for vehicles and pedestrians in several locations (notably Lowry Bay). The existing seawalls are relatively ineffective at reducing the overtopping waves hazard. Likelihood=high, Consequence = moderate, Impact = moderate.
Costs and benefits of acting or not acting	Not acting is not an acceptable option given the high investment in regionally significant infrastructure. A BCR of 1.3 has been calculated for the shared path as part of the 2017 Detailed Business Case phase.

The Project will improve the current and short-term resilience of Marine Drive. In turn, the following benefits will be experienced:

- Reduced economic costs from road closures and delays;
- Reduced clean-up costs;
- Better protection of vulnerable underground amenities;
- Increased protection against existing and future storm events; and

- Adaptability of the design of the seawall to accommodate sea level rise through increasing the height of the structure.

3 Impact assessment

The most significant impacts of natural hazards on the Eastern Bays are:

- Increased coastal inundation during storm surges;
- Increased vulnerability to coastal storm damage – road closures & debris;
- Increased coastal flooding on extreme high tides, during high wave conditions and storm surge events; and
- Impeded stormwater drainage at coastal outfalls.

The low-lying Marine Drive and urban areas within the Eastern Bays currently experience flooding and road closures during high water levels combined with waves and onshore winds. Storms regularly cause localised flooding in roads and property near the coast, with hazardous wave overtopping making Marine Drive unsafe for vehicles and pedestrians in several locations (most notably Lowry Bay). The existing seawalls are relatively ineffective at reducing the overtopping waves hazard.

Ongoing climate change will unavoidably affect the existing environment primarily through rising sea levels, which will increase the frequency and severity of coastal hazards and road closures along Marine Drive. Marine Drive provides the only road access to the Eastern Bay suburbs and is therefore a key transport route for the region. Key infrastructure services, including the main outfall sewer pipeline (MOP), are located within the road corridor. The MOP is an 18 km long pipeline that conveys secondary treated wastewater from the Seaview Wastewater Treatment Plant (which services 146,000 residents and a large number of local industries) to the outfall at Bluff Point, near Pencarrow Head. The MOP and other services are regionally significant infrastructure, and along with the road access, are important lifeline utilities for the wider community.

The road is currently vulnerable to closure, and/or reduced operation, in part due to wave overtopping due to the current state of the coastal edge. The existing seawall in places has a residual life of less than 5 years, and as it has been built in an ad hoc nature over time, is vulnerable to failure and does not provide effective storm mitigation. Over time sea levels will rise, aggravating the situation. As mentioned previously, MfE (2017) projections forecast a 16 cm sea level rise by between 2030 and 2040 (depending on global emissions trajectories). Further sea level rise will increase the frequency of all coastal inundation along the Eastern Bays, with sea level rise of 0.5 m forecast to be reached sometime between ~2070 and ~2110 and sea level rise of 1.0 m sometime after ~2115.

4 Potential mitigation works

The rebuilding (and upgrading) of existing seawalls and the construction of new seawalls for the accommodation of the Shared Path includes design elements which meet the dynamic adaptive planning principles (DAPP)⁸ of "buying some time". This initial adaptation option ("pathway") outlines the ability for some incremental upgrades, while monitoring sea level rise and extreme event impacts and their changing frequency. HCC is considering a long-term suite of planning pathways to adapt to ongoing sea level rise effects of climate change along Marine Drive and adjacent development.

⁸ The term "DAPP" is explained in the Ministry for the Environment, Coastal hazards and climate change: Guidance for local government as dynamic adaptive pathways planning. It is described as a tool that is particularly useful for making decisions at the coast, which is a dynamic environment with ever-changing risk profiles, and where there is uncertainty around the rates and magnitude of changes, especially over the long term.
<http://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/coastal-hazards-guide-final.pdf>

4.1 Design Principles

The design principles are set out in Appendix J (Design Features Report) of the resource consent application.

The consideration of the whole environment into an integrated solution is necessary for the design. The key drivers of the Shared Path project take an integrated approach and aims:

- To develop a safe and integrated walking and cycling facility to connect communities along Eastern Bays, and to provide links to other parts of the network for recreation and tourism purposes.
- To provide a basis for future opportunities for protecting the resilience of the road and underground services by upgrading the supporting seawalls.

The design of the seawall and shared path is to be multi-functional, providing a safe and continuous cycleway and walkway, and providing protection from coastal processes. This will be done by:

- Designing to reduce 'slop and splash' onto the road, ensuring that splash reduction performance (i.e. wave redirection) of new walls is better than those that they replace.
- Providing for/maintain safe pedestrian access to beaches through steps and ramps at frequent intervals.
- Providing appropriate means of access for penguins and maintaining, and where practical enhancing, fish passage.
- Placing stormwater outfalls as low as practicable on the wall and locate where they do not cause erosion at the beach, and where they can provide access for fish.

4.2 Seawalls

Vertical curved seawalls have been chosen across most of the Project length because create a reduced footprint on the foreshore compared to other non-vertical seawalls. The design of the seawall can be easily adapted to accommodate sea level rise through increasing the height of the structure and includes elements that incorporate iterative long-term management principles to address sea level rise. The present designs also have adequate structural competence to support the additional loads from raising the defences in the future. Therefore, the proposed seawalls do not preclude future adaptation options or lock-in a future approach beyond that of the present situation and Marine Drive alignment.

4.3 Revetment

Revetment structures are proposed in the rocky shore areas where it is desirable to maintain a 'non-concrete' or 'non-seawall' shoreline, or replace existing rock revetment and where additional protection is required to reduce wave hazards. Due to the dynamic nature of the coastal environment, the revetment seawalls require a double layer of competent weathered rock that is hard wearing and in sufficient quantity for the new revetments (e.g. granite or andesite).

4.4 Beach nourishment

Beach nourishment is proposed to be used as a strategy to mitigate loss of beach area available for beach amenity by nourishing the beaches with imported beach-compatible fill, with a secondary benefit of improved coastal protection.

5 Assessment of environmental effects

An assessment of effects that the Project may have on the environment has been prepared in the application in accordance with the Resource Management Act 1991 (RMA).

The preliminary design for the Project, as reflected in the application and supporting drawings and assessments by specialists, has sought to avoid or mitigate adverse effects through the alternatives assessment, development of Project design features and the proposed construction methods. The design has been through a series of iterations that were considered against the parameters of the natural environment (such as coastal processes, ecologically sensitive areas – intertidal and subtidal areas), to achieve an optimum design. Where it has not been practicable to avoid adverse effects, the measures are proposed to remedy or mitigate these adverse effects.

There are a wide range of components of the environment that could potentially be impacted in either the short term (construction phase) or long term (permanently) by the different elements of the Project. These components range from nearby coastal areas, to seabed life or sea life in the water column, to people living nearby or who use the sea area for recreation, and on those people who have particular cultural affinity and association with the area.

The resource consent application for the proposed seawall and shared path sets out a comprehensive assessment of environmental effects to comply with the requirements of the RMA.

The following effects are assessed in the application:

- Effects on Intertidal Ecology and Fish Passage
- Effects on Vegetation
- Effects on Avifauna
- Effects on Natural Character, Landscape and Visual Values
- Effects on Amenity Value and Recreation
- Effects on Coastal Processes
- Effects on Climate Change and Natural Hazards
- Effects on Culture and Heritage
- Construction Effects
- Cumulative Effects.

The positive effects include the following:

- Transport Benefits.
- Recreation Benefits, including health and wellbeing, and tourism.
- The Project provides a basis for future opportunities for protecting the resilience of the road and underground services by upgrading the supporting seawalls.

6 Assessment of Alternatives

6.1 Context

Throughout the development of the Project, alternatives and options associated with the design were investigated and recorded⁹. Given the geography and terrain in the Eastern Bays area and the lack of any other alternative transport routes, the focus has been on alignments based on Marine Drive. This is where the current and forecast future demand is focused, as well as the local access requirements and trip generators to the coastal amenities.

As part of the assessment of alternatives, a number of design options for the shared path were investigated. The options development process undertaken during the Indicative Business Case identified several factors that principally dictated the form of the Project along the Eastern Bays foreshore.

- The path location along the Marine drive route, a seaward or landward side, or combination of both.

⁹ Appendix G of the resource consent application sets out the Alternatives Assessment.

- The path width that safely accommodates pedestrians and cyclists along the route with the least amount of widening onto the coastal marine area (CMA).
- The types of seawalls and coastal protection methods that could be used to create a path.

The report in Appendix G of the resource consent application provides a summary of the various alternatives that have been considered and assessed throughout the development of the Eastern Bays Shared Path project. This includes assessments undertaken during the Indicative Business Case Phase, Detailed Business Case Phase, Community Engagement and Consenting Design.

It is noted that a key point relevant to coastal hazards and climate change is that with the Project, the crest elevation of the Marine Drive is to remain largely unchanged, due to design challenges associated with stormwater, pedestrian access, beach amenity, and resulting costs. Increasing the elevation of the road and shared path was out of scope of the project but remains a future option to maintain road access as sea level rise continues. This option has therefore not been assessed under this risk management strategy but it is acknowledged that it will have consequences on cost, driveway access, stormwater etc.

6.2 Path location

The Project has been developed on the seaward side of Marine Drive, following a detailed alternatives assessment. In summary, the key reasons for favouring a "coastal edge" option are:

- To avoid the steep hill slopes along large sections of the landward side of the road. Any widening on the landward side would require major earthworks and cuts, especially on the headlands, which would result in significant effects to the environment.
- To avoid adverse effects to properties and dwellings. Much of the landward side of Marine Drive is lined with residences and any road widening inland would bring the road closer to houses resulting in increased adverse amenity effects. It would also require considerable and complex property purchase.
- To reduce car and cycle/pedestrian conflicts. A shared path on the landward side of Marine Drive will both reduce visibility during egress and access of properties while directing people to pass across all the street and property exits onto Marine Drive. Potentially the shared path could cross from inland to coastal options at multiple locations but this would further increase traffic and cycle/pedestrian conflicts and disrupt path continuity and level of service.
- To enhance the connection to the coast and recreational benefits. Many areas currently have very poor access, especially at high tide. A coastal option enables public access to the to be enhanced. It also fits with the Great Harbour Way/Te Aranui O Pōneke which, apart from the section past the port, is designed to follow the coast.
- Ability to integrate with coastal hazard protection and climate change. A coastal location enables the efficient use of natural and physical resources by providing the shared path on an enhanced, consistent and fit-for-purpose seawall option, thereby reducing road closures due to coastal storms and increasing the resilience of Marine Drive and the underground services.
- Ability to enhance environmental outcomes through providing a modern seawall and treatment options that respond to environmental effects such as fish passage, natural character, etc.
- Ensuring that the option is affordable and provides medium to long-term benefits.

6.3 Path width

Two options for widening the road (2.5m and 3.5m path widths) were favoured through this process. Feedback through community consultation and alignment to the investment objectives also reinforced the two preferred options.

The outcome is providing a seaward side shared path of varying width between 2.5m and 3.5m width, by using the existing shoulder where possible, reallocating road space where feasible, or by

constructing a new seawall beyond the existing road pavement edge (or existing seawall edge) in order to provide additional width to create a new shared path.

6.4 Seawall options

Multiple design options were considered. Through an assessment process the options were refined and the curved seawalls (single, double and triple) were selected as the most appropriate. Placed rock revetment is also considered for certain sections requiring greater coastal protection.

A multi-criteria analysis (MCA) process was used to assess seawall design options. This process is outlined in more detail in the Alternatives Assessment (Appendix G) of the resource consent application.

6.5 Adaptability of Design

The design includes elements that incorporate iterative long term management principles to address sea level rise. The design of a curved seawall can be easily adapted to accommodate sea level rise through increasing the height of the structure. The present designs have adequate structural competence to support the additional loads from raising the defences in the future¹⁰. Therefore, the proposed seawalls do not preclude future adaptation options or lock-in a future approach beyond that of the present situation and Marine Drive alignment.

The future raising of the height would however have effects on the available path width, but that has been considered and deemed to be an acceptable compromise given that encroachment onto the beach areas is limited where possible.

7 Budget allocation

It is intended that the project will be co-funded by HCC and NZTA and staged over a number of years. HCC has a role in delivering land transport outcomes. Active modes of transport, including cycling, have a key role in ensuring sustainable growth and improving the liveability of the city. HCC is focused on providing its communities and visitors to the city with more and safer transport choices for their journeys, and enhanced wellbeing and recreational opportunities.

HCC also has a leadership role with respect to climate change and its effects on regional and local communities, as well as on infrastructure. It also needs to ensure the sustainable management of the natural and physical resources in order to meet the reasonably foreseeable needs of future generations. In addition, HCC must contribute to building community resilience in terms of managing the effects of natural hazards and its coastal margins. To this end, HCC will be developing a Climate Change and Resilience Strategy with its community. The Project will “buy” time for it to be developed, agreed and implemented.

8 Community Engagement

8.1 Bay by bay

The Eastbourne Community Survey (2014) revealed that the top two issues for residents are completion of the Eastern Bays walk/cycleway (which relies on the construction of the seawall) and climate change (and extreme weather events). Consultation specifically on a planned cycleway has been ongoing since 2016. GHD undertook consultation early in 2016 mainly with iwi and then further public engagement was undertaken by MWH/Stantec at the end of 2016. The proposal was refined during the early part of 2017 and a series of community meetings was held in August 2017 to

¹⁰ Future proofing to include threaded sockets in the front nose of the top curve where required to address sea level rise.

obtain input from the community on path widths and seawall options. The consultation process adopted a 'bay-by-bay' approach, with dedicated sessions for individual bays, focusing on the key issues faced by each bay along the corridor.

A detailed description of the community consultation process, results and feedback received is provided in Appendix I of the resource consent application.

Many of the issues raised through the feedback process were taken on board and incorporated into the preliminary design. Similarly, the vast majority of the 'bay by bay' feedback received has been included in the design.

Some of the main design features have been included in the design in response to feedback:

- Accesses have been retained where possible, and new access steps have been proposed at regular intervals to ensure that the community has convenient access to the beaches and rocky foreshore.
- The ramps will have a 1:8 gradient to improve the access to the beach.
- The Shared Path has incorporated varying widths (2.5 m and 3.5 m) so that there is a narrowing along beaches to reduce the amount of widening into the beach environment, thereby trying to retain as much foreshore as possible.
- Beach nourishment to mitigate loss of beach area available for beach amenity by nourishing the beaches with imported beach-compatible fill, with a secondary benefit of improved coastal protection.

8.2 Lowry Bay

Further engagement was undertaken with representatives from the Lowry Bay community, in particular around whether revetment was required at the northern end of the bay. The worst wave action occurs either side of the northern boat shed (chainage 1150) in Lowry Bay. The overtopping hazard at these locations is particularly damaging for a number reasons:

- the lower road elevation along this section;
- the shape of the existing seawall (an old-style curve) which is a very poor design and promotes overtopping; and
- the narrow shoulder width (<1m).

Earlier designs showed a 9 m wide revetment structure at the northern section of Lowry Bay to reduce the wave overtopping in that area (Preliminary Design Plan, Rev H). This proposal was shared with the residents fronting onto this section of Lowry Bay with mixed responses. There was limited support for revetment due to the visual effects and the perceived difficulty accessing the water over the rocks (particularly for kayaks) but others were supportive of the coastal protection that revetment offered. Following further investigations, it was found that the revetment would encroach on the subtidal areas and after concerns raised by GWRC, it was decided to remove the proposed revetment along this section to avoid encroachment on the subtidal areas whilst acknowledging that the level of protection provided wouldn't be as high without the revetment. The design plans were amended to reflect these changes (Rev J).

The proposed double and triple curved seawall in Lowry Bay will provide some protection but further bay-wide protection will need to be investigated under the HCC coastal erosion strategy in developing a Climate Change and Resilience Strategy (outside the scope of this project).

It is however recognized that it is unlikely with a project of this nature in such a constrained location to achieve unanimous support from the community. There is a clear commitment by the HCC and the Project team to maintain the high levels of engagement and community involvement through the detailed design process to ensure a high-quality outcome that responds appropriately to the community's requirements.

9 Implementation plan

The Project recognises the series of ongoing processes of managing coastal values in the face of climate change, and sea level rise and the related pressures faced by Greater Wellington Regional Council and HCC. However, the Project is not a solution to all natural hazards or the effects of sea level rise. Instead, the Project provides the first step in potentially incremental upgrades that would assist in providing protection to the road (and underground services) from the effects of natural hazards and sea level rise along this section of the coast throughout the design lifetime and beyond. As an adaptation model, the seawalls do not preclude future structural options and have been designed to enable additional protection to be added in the future if considered by the Eastern Bays community to be appropriate.

This document demonstrates that the Project in the preliminary design stage *already* contains steps consistent with a hazard risk mitigation strategy. The practical implementation steps will be further developed during the detailed design stage as consultation progresses, and as HCC continues with its Climate Change and Resilience Strategy development.

10 Summary

To enable GWRC to assess the Project against Policy P28, a Hazard Risk Management Strategy has been prepared in accordance with the prescribed definition in the 'Interpretation' section of the PNRP-DV. HCC are actively developing a "sustainability strategy" however, because of the current hazard risk from failing seawalls, the risk to road and community and funding timeline commitments, it means the Eastern Bays Shared Path project cannot wait for an overall HCC strategy to be developed. This Project-specific strategy document therefore explains and summarises how this Project has *already* proactively addressed hazard risk in its key design elements and consent application.

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Rev. No.	Date	Description	Prepared By	Checked By	Reviewed By	Approved By
1	September 2019	Final	Caroline van Halderen, Stantec	Jamie Povall, Stantec	Dr Michael Allis, NIWA	Jamie Povall, Stantec