Greenhithe Bridge Watermain Duplication and Causeway

Technical Report I – Landscape and Visual Assessment

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Watercare
An Auckland Council Organisation

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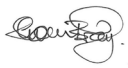
6	Final	30/06/2015	Final			
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TABLE OF CONTENTS

EXECUTIVE SUMMARY

This technical report provides specialist input into the Assessment of Effects on the Environment report prepared by AECOM and Jacobs New Zealand in support of the resource consent application for the Greenhithe Bridge Watermain Duplication (GBWD) and Causeway project. In summary, the project will provide a new watermain, sections of three new wastewater mains, and widening of the existing State Highway 18 (SH18) Causeway approaching the Greenhithe Bridge to accommodate these new pipelines. The project will be implemented by Watercare Services Limited (Watercare) as the organisation responsible for the provision of potable water and wastewater services in Auckland.

An existing watermain, North Harbour No.1 (NH1) is located within the Greenhithe Bridge and provides the primary water supply to northern parts of the North Shore and Rodney District. The proposed new watermain will provide a second water supply pipeline across the Greenhithe Bridge.

The purpose of this report is to provide an assessment of the likely visual effects (both beneficial and adverse) which may result from the duplication project and in particular the potential effects of the widened SH18 Causeway. And, if necessary, to identify suitable measures to mitigate, remedy or avoid these effects. An outline of the effects ratings and definitions used within this assessment are attached as Appendix 1. Much of the proposed works will be located on the north-western coastal side of the Causeway. Opportunities for mitigating any landscape and visual effects have been identified throughout this report, and are then summarised as a series of recommendations towards the end of the report. An indicative landscape plan has also been prepared (by Boffa Miskell) to demonstrate how these recommendations may be able to be manifested on the ground. It is anticipated that the final plan will be confirmed through the resource consent process, consultation with various stakeholders, and through the detailed design process.

The assessment of landscape and visual effects report has been based on information provided by the GBWD Project Team. Details of the proposed works are included in the full Assessment of Environmental Effects documents, including reports and drawings. The indicative landscape concept design is preliminary in nature and by necessity must be flexible so as not to limit future design and construction opportunities. As such, the design can be expected to be developed and refined further during future stages of design development. It sets out the key design principles/concepts to mitigate any potential adverse effects of the proposed works.

In summary, the subject site is identified as a man-made landform located within a highly modified environment. A limited number of public and private viewing locations are identified from which the proposed works will be seen. Based on the assessment of the existing environment and the extent of views likely to be experienced, the proposed works will result in a visible change to the existing landscape character and amenity values of the area.

Notwithstanding the overall public benefit of the delivery of essential water and waste water infrastructure, the potential adverse landscape and visually effects can be mitigated through the implementation of works as demonstrated in the Indicative Landscape Concept Plan (Appendix 3). If carried out in accordance with this Plan, the proposed mitigation can provide an opportunity for enhanced open space and better integration of the new causeway extension within the surrounding

landscape. In balance, it is considered that any potential adverse visual effects will be mitigated through delivery of the landscape plan.

1 INTRODUCTION

Boffa Miskell Limited has been commissioned by Watercare to assess the potential landscape and visual amenity effects related to the construction, operation and maintenance of the proposed GBWD and Causeway project.

The GBWD and Causeway project involves construction, operation and maintenance of a new watermain and the construction of portions of three new wastewater mains. In summary, the physical features of the project include:

- Widening and extension of the existing SH18 causeway on the western side of the Greenhithe Bridge in order to install new pipes for the GBWD and NI;
- Installation of the new watermain within the widened causeway and attachment of the watermain across Greenhithe Bridge, including associated landward connections at the western and eastern ends;
- Installation of three NI wastewater pipe within the widened causeway;
- End use of the reclaimed area following installation of the new watermain and NI wastewater pipes, including operations and maintenance access for the water and wastewater pipes and provision of open space for passive recreation.

Construction of the GBWD and Causeway project is currently planned to begin in 2016. The proposed water and wastewater infrastructure is required in order to maintain water and wastewater service levels and to provide for future growth. The new Watermain will eventually form part of Watercare's future North Harbour 2 Watermain project. The proposed widening of the motorway causeway will also incorporate wastewater pipelines and associated facilities which form part of Watercare's proposed Northern Interceptor project. Separate technical reports have or will be prepared for the future North Harbour 2 Watermain project and for the balance of the Northern Interceptor project.

The proposed GBWD and Causeway project requires various resource consents under the Resource Management Act 1991 ("RMA"). This technical report (I) provides specialist landscape input for the *Greenhithe Bridge Watermain Duplication and Causeway – Assessment of Effects on the Environment* report prepared by AECOM and Jacobs New Zealand Limited which supports the resource consent application. The works described in the Assessment of Environmental Effects and assessments described in other technical reports, have been considered in the technical assessment presented in this report.

Also set out in the AEE, the development of the project has involved consultation with a wide range of parties. In respect of the proposed mitigation put forward in this report to address landscape and visual amenity effects, consultation will continue through the design development and construction phases of the project and will be important for successful project delivery.

The purpose of this report is to provide an assessment of the likely landscape and visual amenity effects which may result from the proposed works, and to identify suitable measures to mitigate, remedy or

avoid these effects. This assessment has been undertaken with reference to the Quality Planning Landscape Guidance Note (Boffa Miskell Limited)[1] and its signposts to examples of best practice; this includes the recently published UK guidelines for landscape and visual impact assessment[2]. An outline of the effects ratings and definitions are provided in Appendix 1.

This report provides the following:

- A brief overview of the proposed works
- A description of the environmental baseline and context for the particular receiving environment(s) potentially affected by the project;
- A brief outline of the statutory framework relevant to Landscape and Visual Assessment;
- Description of specific aspects of the project in relation to the subject area being investigated;
- Description of the investigations undertaken to assess landscape and visual effects;
- An assessment of the actual or potential effects on the environment;
- Recommended mitigation measures.

2 THE PROPOSED WORKS

2.1 Proposed Engineering Works

A layout plan showing the alignment of the new proposed Watermain is included in Drawing 2010674.001 Rev 1 in Volume 3 of the AEE. The works assessed in this report are the construction, operation and maintenance of:

- The proposed Watermain from Station Street in Hobsonville, which will run under the motorway to the coastal edge. This will involve open trenching from Station Street to the motorway, and trenchless construction under the motorway;
- The proposed causeway, which will be accessed from Squadron Drive at the western end of the causeway;
- The proposed causeway widening within the CMA that will run parallel to SH18 for a distance of approximately 860m. The top of the causeway will be approximately 15m wide at an RL of 5 – 5.5m (the same as the existing causeway) and the causeway embankment (rip rap revetment) will reach a height of approximately 2.5m above the existing sea bed level;
- A portion of the causeway will extend seaward approximately halfway along the length of the overall project. This portion, entitled the 'construction platform area' will be approximately 150m long by 35m wide, and the same height as the balance of the proposed causeway. The construction platform area will enable construction of the harbour sections of the future NI pipelines;

[1] http://www.qualityplanning.org.nz/index.php/planning-tools/land/landscape
[2] Guidelines for Landscape and Visual Impact Assessment ("GLVIA") 3rd Edition (2013)

- The causeway will extend at the eastern end for 75m beyond the existing termination point for a width of approximately 18m. At this point, the proposed Watermain will transition upwards to connect to the underside of the Greenhithe Bridge; and
- On the eastern end of the bridge, the new Watermain will transition into the road reserve on the northern side of SH18 and continue east for approximately 32m where the pipe will reconnect to the existing NH1. This eastern abutment will sit above ground, supported on piles and a reinforced concrete slab.

A typical cross-section of the causeway widening is shown in Figure 1 below.

The overall area of land increase will be approximately 16,800m² along the top of the causeway. The base footprint covers 24,800m².

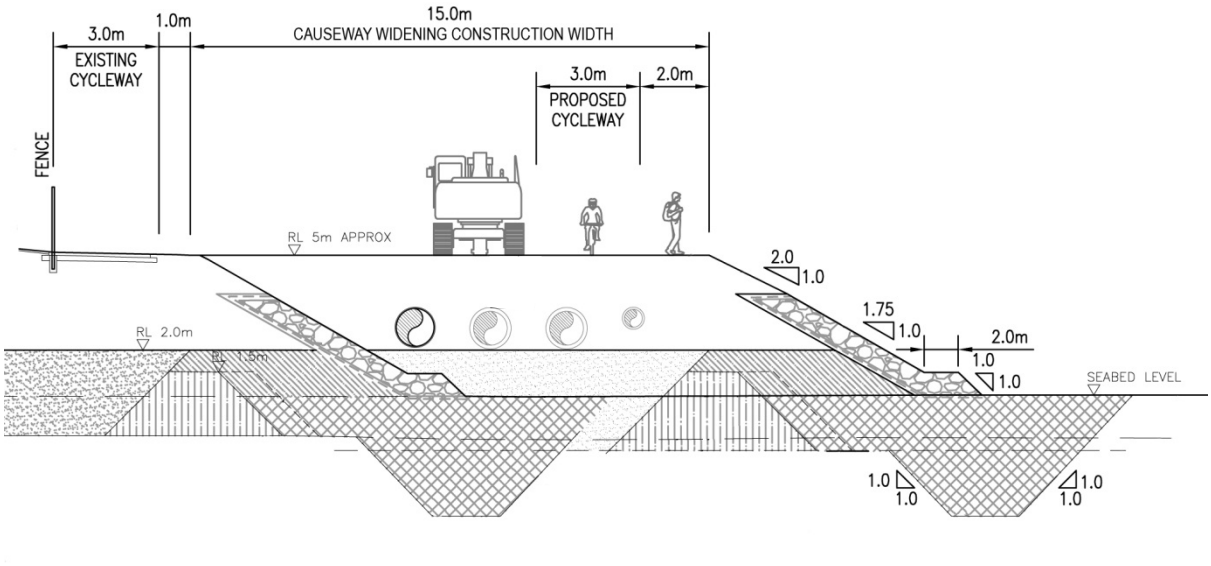

Figure 1: Causeway widening - typical cross section

Construction activities include the removal of the existing causeway, removal of existing vegetation, service relocations, and establishment of construction yards, site access areas, traffic management, earthworks, and site reinstatement. The primary access point will be from Squadron Drive. The proposed construction works, methodology and key drawings are described in detail in the AEE. The works described in the AEE and in volume three of the AEE are assessed in this report.

The completed works will be predominantly underground. A small range of permanent structures will remain at or above ground level. These will primarily consist of line and scour valves, manhole access lids located at ground level, control cabinets and communication antennae. The key above ground structures will include:

- The portion of watermain pipe that will transition onto the underside of the Greenhithe Bridge structure;
- The eastern abutment of the Greenhithe Bridge where the Watermain will be supported on piles and reinforced concrete slab.

Once constructed, the causeway will be used on an on-going basis to access, operate and maintain the GBWD and NI water and wastewater assets.

3 METHODOLOGY AND ASSESSMENT

The methodology adopted by Boffa Miskell for this assessment of landscape and visual effects has comprised the following steps and tasks:

- Site familiarisation;
- Review of documents, plans and other material;
- Site assessment;
- Analysis and evaluation of effects;
- Development of landscape concept design; and
- Internal peer review.

This assessment of landscape and visual effects report has been based on a review of a number of documents which have been prepared for the concept design of the GBWD and Causeway. Utilising these, the following assessment has been undertaken in line with the Quality Planning Landscape Guidance:

- Location and Landscape Context – a discussion which outlines where the site is, the surrounding land-uses and access;
- Statutory Context – a discussion of the relevant plans and their influence on the extent of assessment undertaken for landscape and visual effects;
- Landscape Effects – which describes both the effects on the landscape (i.e. landform, vegetation, watercourses), including the landscape character of the coastal environment;
- Extent of Visibility and Viewing Audience – which describes the area from which the proposed works will be visible from and the different types of viewing audiences.
- Visual Effects – which describes the visual amenity effects.

4 LOCATION AND LANDSCAPE CONTEXT

4.1 Surrounding Location and Context

The existing Causeway (the subject site) is situated on the north western edge of SH18, with access from Squadron Drive to the east and Tauhinu Road to the west. It is located on the fringe of the upper catchment of the Upper Waitemata Harbour; a tidal, low-energy body of water comprised of a number of bays and inlets (including Te Okoriki inlet which adjoins the site) and framed by steep, vegetated topography. The area of Harbour surrounding the site is bound by Greenhithe in the north-east, Herald Island to the north (800m across the harbour) and Hobsonville Point to the south-east.

The subject site is part of a wider coastal residential setting that is typical of the northern Auckland region. The combination of the coast and residential areas has resulted in a high level of coastal landscape amenity and recreation activities in and around the harbour, in particular boating and cycling activities. As a developed area, the existing environment is defined by SH18 and associated roading infrastructure such as the Greenhithe Bridge and the associated noise barrier.

SH18 is a four lane motorway linking West and North Auckland. The motorway extends over the Greenhithe Bridge which is a significant and obvious infrastructure element within the immediate landscape. The noise barrier runs for a length of approximately 295 metres, commencing at the Squadron Drive on-ramp. The wall, approximately 3.5m high, is located on the edge of the causeway (Figure 5) with the cycleway located on the motorway side and the rip rap revetment and stormwater outflow gully located on the coastal side. The motorway aspect of the noise wall is bright orange (part of the overall SH18 urban design strategy by NZTA) whereas the coastal aspect is natural wood with the supporting posts/frame visible from Herald Island and Whenuapai.

Both Herald Island and Greenhithe are established suburbs comprised mainly of low density residential development with significant tracts of mature vegetation along the coastline. Both suburbs feature residential development that is located along the coast and orientated toward the harbour along elevated terrain. Consequently most dwellings are typically set back from the water's edge but overlook the harbour below.

The Greenhithe coastline that faces the site is comprised of established mature native and exotic bush. A narrow public path meanders along the edge between private lots and the shoreline (Figure 1). Herald Island has no continual walkway along the coastal edge but a small number of narrow accessways connect with the harbour from Ferry Parade. A local wharf is located at the eastern-most end of the island.

Further west is Whenuapai – a low density, semi-rural residential area based around the Whenuapai airbase. Whenuapai is approximately 1.6km from the subject site.

Hobsonville Point to the south-east is also predominantly residential but comprised of much denser residential development and a greater mixture of non-residential activities such as schools, commercial, marine industry and recreational land uses. These include the Hobsonville ferry terminal, some 670m around the headland from the eastern end of the site. As a residential area undergoing significant change, the overall landscape and setting is less mature than that of Greenhithe and Herald Island. The original western coastline of Hobsonville sits south-east of SH18 (Figure 1 and 9). This former coastal

edge is elevated by a steep cliff face and a thick band of mature vegetation provides a dense visual buffer between Hobsonville and SH18 below.

The motorway and adjoining causeway severs connection between Hobsonville and the north-western harbour and the only access from Hobsonville to the harbour and the cycleway is obtained from Squadron Drive. It is noted that the 'Hobsonville Point Coastal Linear Park' is proposed for Hobsonville Point. The park will encircle the entire suburb, including the aforementioned section of original coastline. At certain points the linear park will come close to the site, particularly at the Greenhithe Bridge. Design of this park is currently underway and is scheduled for completion by the end of 2015.

Increasing residential growth is also planned for the small headland located on the western side of the site, across from Hobsonville. This area is comprised of a large-lot residential site (Lot 1 DP 475066) and the Summerset Retirement Village: Monterey Park which is currently under construction. The headland is half in pastoral land with a small section of tall mature trees at the base of the gully, adjoining the site. The form of the headland is somewhat modified with the northern coastline featuring a battered, grassed slope. Existing access to and from the headland is from Squadron Drive only.

An existing esplanade reserve extends around the base of the residential lot/20 Squadron Drive and it is possible that a future esplanade reserve will continue along the coastal edge of the retirement development. This may result in a future pedestrian/cycling path extending along these esplanade reserves that could then connect to the subject site.

4.2 Subject site

The subject site area comprises the tidal edge of the Upper Harbour and the existing causeway that adjoins SH18. The existing causeway is comprised of a rip rap revetment (with a base footprint approximately 16m wide) with a vegetated strip and pedestrian/cycle path along the top (approximately 4m wide in total). The top of the causeway is relatively flat, with an approximate RL of 5m. The existing rip rap is relatively intact with a mixture of native plants and weed species growing along the top of the crest. Along the top of the causeway for its complete length, is a 1m wide strip of coastal planting along the crest and 3m wide asphalt pedestrian/cycle path.

The pedestrian/cycle path is a popular recreation amenity (Figures 7, 8 & 9) as it forms part of a broader cycling network within Upper Harbour. The cycleway begins at Squadron Drive in the south (which connects to Duke Park and Hobsonville) and continues along the Greenhithe Bridge and into neighbouring Greenhithe to the north-east. The cycleway is separated from the motorway by a 2m high wire fence which terminates at the base of the Greenhithe Bridge.

The vegetation along the top of the causeway is a mixture of planted and self-sown vegetation, including a series of approximately 10 year old pohutukawa set at semi-regular intervals along the crest of the causeway and a mixture of low-height native and exotic coastal plants. At the base of the toe and at the northern end, the causeway tapers out beneath the Greenhithe Bridge towards the deeper channel. The harbour transitions from sandstone reefs along the middle section and then to an upper tidal area of mangroves and small patch of shell bank at the western end (Figure 7). Fishing activities occur at the north-eastern end of the causeway. The overall form of the causeway is compact and relatively discrete in scale and visual appearance.

4.3 Summary

In summary, the site is located within a highly modified environment that comprises a mixture of residential development, dominant road infrastructure and natural coastal landscape. The higher quality landscape attributes are located on the coastal edges facing the subject site where the coastline is natural and there is contiguous mature vegetation along the coastal edge and beyond. Conversely, the landscape attributes of the subject site are low due to the presence of SH18 and the level of change that is currently underway in neighbouring Hobsonville and off Squadron Drive. As a result, the overall landscape character is a mixture of highly modified land-based activities set within a natural coastal environment.

5 STATUTORY CONTEXT

The site is located in the Coastal Marine Area ('CMA'). The resource consent applications for the GBWD and Causeway are a non-complying activity. The relevant objectives and policies can be found in Appendix 2.

- New Zealand Coastal Policy Statement 2010
- Auckland Council Regional Plan: Coastal 2004 (ACRP:C)
- Auckland Council District Plan: Waitakere Section 2003 (ACDP:WS)
- Auckland Council District Plan: North Shore Section 2002 (ACDP:NS)
- Proposed Auckland Unitary Plan (PAUP)

Both the operative District Plan and the proposed Unitary Plan identify and zone the site as a coastal zone with policies aimed at enabling necessary works within the CMA that avoid adverse effects and protect natural character and landscape values, and providing public open spaces that enhance the public's relationship with the coast.

6 LANDSCAPE ASSESSMENT

The potential landscape effects resulting from the Watermain duplication and causeway will be:

- Bulk and form effects as a result of the new landform reclamation extending into the harbour;
- The addition of visible above-ground structures; and
- Removal of existing vegetation.

The effects generated by these changes will have the potential to be mitigated by various landscape mechanisms set out in the Indicative Landscape Concept Plan (ILCP) (Appendix 3) and the IBMCP (Appendix 3). The ILCP has been prepared in conjunction with the other technical experts, in particular ecologists at Tonkin & Taylor.

The ILCP sets out the following proposed mitigation:

- Providing for public access to the edge of the causeway so that there remains a connection with the harbour edge;

- A 3.0m wide maintenance access-way (that can be used by cyclists and pedestrians) constructed in concrete across the site. The access-way should include connections to the existing cycleway in a manner that allows these to be 'closed' should maintenance works be undertaken (protection of public safety). Ideally the surface of the access-way would be consistent with the Austroad standards for shared pedestrian and cycleways.

- Retention of the existing cycleway so that public access can always be provided along the causeway irrespective of any construction or maintenance works being undertaken.

- Aligning the access-way across the construction platform area in a manner that helps to reduce its prominence as an extension into the harbour.

- Implementation of the Indicative Bird Mitigation Concept Plan including shell bank.

- Consideration of other opportunities (beyond planting of trees) to lessen the angular appearance of the construction platform area, including the introduction of the shell bank for coastal birds on the construction platform area and location of wooden bird roosts.

- Planting (and landscape design) opportunities that:

    - Enhances the connection of the site with the surrounding landforms – in particular with the vegetated escarpment surrounding Hobsonville;

    - Respects views of the harbour from the motorway;

    - Enhances the connection to the coastal landscape;

    - Balances the need for open, grassed areas such to assist with reducing the perceived scale and bulk of the causeway;

    - Tree planting (including relocation of the existing pohutukawa trees, if possible) along the top of the Causeway to break up its linear form and reduce the overall angular nature of the construction platform area. It is understood that the location of trees will need to be considered in conjunction with the underground infrastructure so that they will not impact on future works.

    - Coastal shrub planting across the site in a manner that provides for views of the harbour from the motorway, but also reinforces the connection of vegetation to the wider landscape. It is understood that in some places the shrub planting may need to be 'sacrificial' – so that it can be removed and replaced when major maintenance works are necessary.

    - Locating and shaping the bio-filters such that they are considered an extension of a planting bed, and using the same mulch material on the plant beds that is used on the filters.

    - Planting of the eastern bank of Lot 1 DP 475066

In addition, at the detailed design stage it is recommended that the following matters be considered:

- Consideration of opportunities to lessen the prominence of the rock rip-rap.
- Consideration of opportunities to provide screening around the eastern end of the proposed works where the Watermain connects to the bridge.
- Use of public art or sculpture to reference historical or cultural elements of the site and/or harbour.
- Installation of seats in locations where the view can be appreciated.
- Installation of bunding or mounds (up to 1.5m in height) along central sections of the causeway to provide visual buffers between the potential reserve and motorway, and add additional interest and potentially frame views from the motorway.
- The use of a natural screen around the transition area, such as a wire-trellis with climbers, rather than more structural forms (such as fencing or walls).
- Use of different coastal-appropriate materials to provide interest, reinforce the coastal setting and the wider environmental context.

The extent to which these mitigation elements are incorporated will be subject to the resource consent process, consultation with key stakeholders (in particular Auckland Council Parks), and necessary infrastructure requirements that emerge during the detailed design process.

6.1 Landscape bulk and form

The addition of 2.5ha of land will result in changes to the bulk and form of the existing causeway and occupy a portion of the upper harbour. It will extend the width of the existing causeway along an already modified coastal environment with a similar engineered landform, which will be of a similar height and of a generally similar form to the existing causeway (rip-rap embankment with a flat surface along the top of the embankment). The overall linear shape of the proposed works is similar to the existing causeway and it is considered that overall it will have a low effect on the perceived landscape attributes that exist within and directly around the subject site. However this is not to preclude the consideration of opportunities to break up the lineal form of the rip-rap shape, particularly around the defined top edge of the proposed landform, to enhance its appearance.

The proposed ‘construction platform area’ that extends beyond the causeway, is less consistent with the overall lineal form, and will reinforce the engineered character of this part of the site. The shape of the construction platform area does not reference any local natural landforms, and therefore will be readily perceived as engineered infrastructure. Although, technically, the whole proposed works (and indeed the existing causeway) are also engineered forms, it is considered that the size, angular shape and positioning of the construction platform area (in the middle of the causeway) will exacerbate the adverse effect on natural character. It is therefore considered that if no mitigation is undertaken, the landscape character effect created by this part of the causeway proposed works will be high. If mitigation measures are undertaken (such as the addition of the shell bank (ecological mitigation) and strategic planting of vegetation) the overall effect will reduce to moderate.

6.2 Infrastructure structures

The proposed works involve the permanent location of some above-ground infrastructure elements that have the potential to generate adverse landscape effects. Some smaller structures will be required along the top of the causeway such as maintenance access points (to be covered with pit covers), man holes and bio-filters on the construction platform area (to be covered with bark or similar).

The most visible above-ground infrastructure element will be the part of the watermain that attaches to the underside of the Greenhithe Bridge structure ('pipe transition structure') at the eastern end of the causeway. The portion of watermain structure attached to the bridge will have a relatively consistent appearance with the structural elements of the bridge. Infrastructure of this nature is not uncommon along bridges (particularly on major arterial routes) and given the existing infrastructural landscape created by the causeway and bridge, it is considered that the small section of pipe and support will have a very low effect on the landscape qualities or character of the existing environment.

The transition area of the watermain pipe between the causeway and bridge will be visible. The transition will require it to deviate from a parallel, horizontal alignment along the bridge to an angle that descends into the causeway. In achieving this, it will be necessary to increase the area of exposed rock rip-rap under and around the end of the bridge. The pipe is likely to be screened (with a design to be confirmed at detail designed stage) to discourage vandalism, but with space provided for maintenance access that will include a large concrete pad for turning vehicles. Assessed together, the combination of these elements will visually amplify the mass of engineering forms in this location and will be inconsistent with the simpler horizontal forms of the causeway and bridge. As a result, it is considered that the adverse landscape character effects under and around the bridge will be moderate provided an appropriate screening design is achieved.

The location of the bio-filters is not prescribed by the engineering infrastructure, and the filters can be made to various shapes that reference natural or designed forms. Although they cannot be planted, they can be covered in a mulch material that matches the material used within planted areas of the site. Therefore it is considered that the bio-filters will have a negligible landscape effect, particularly when combined with mitigation planting (as outlined in section 9 below).

The other proposed structures elsewhere on the causeway (such as pit covers) will be limited to specific and generally discrete locations. When viewed in the context of the overall landscape, these structures will not be dominant features of the landscape. As such, when considered in isolation, these features will have negligible adverse landscape effects. However, as outlined above, they will contribute to an enhanced perception of the engineered form of the construction platform area.

6.3 Removal of existing vegetation

The proposed works will involve works in areas of existing vegetation and as a result much of the existing vegetation will be removed. Of particular note is the removal of vegetation along the top of the causeway and the area of mature, predominantly exotic trees in the private property adjacent to SH18 road reserve in the west.

The existing vegetation along the causeway includes native and exotic plant species including a mix of self-seeded and planted Pohutukawa (Metrosideros excelsa), Muehlenbeckia shrubs (Muehlenbeckia astonii), Harakeke (Phormium sp.) and various weed species such as brush wattle (Paraserianthes lophantha) and pampas grass (Cortaderia selloana). All will be removed but where possible the healthy,

well-formed species Pohutukawa will be re-planted along the top of the proposed causeway. The landscape amenity provided by the existing low height vegetation and trees along the causeway is low. The trees are not mature and while they offer some wind buffering and aesthetic appeal, the context in which they are located is harsh and unkempt alongside the motorway. The removal of vegetation can be easily and effectively offset by extending the area of landscaped surface, in addition to relocating existing vegetation (where possible) and planting new (or replanting existing) existing pohutukawa trees, low-height coastal vegetation species and areas of grass. It is noted, however, that some mitigation planting may need to be 'sacrificial' so that it can be removed and replanted when site works are required.

The existing group of mature trees located on Lot 1 DP 475066 may be removed as a result of pipe excavation and to enable the construction of a vehicle turning circle (refer to Technical Report E, Arboriculture Assessment). These trees form a visually significant stand of vegetation in the west. Removal of some or all of these trees will create a change in landscape amenity but effects from this can be mitigated via replacement planting with suitable species following the completion of earthworks.

Overall, it is considered that the removal of existing vegetation will result in a moderate level of adverse effects on the landscape. However, these effects can be successfully mitigated through a replacement planting programme in the respective areas (as outlined in Appendix 3).

6.4 Summary

In summary, it is considered that the form and appearance of the landscape will noticeably change as a result of the proposed works.

In relation to the overall bulk and form, it is considered that the landscape effects will be moderate to high. In particular, the construction platform area will exacerbate the adverse effect of the bulk and form on the natural landscape character. It is therefore considered that if no mitigation is undertaken, the overall bulk and form of the proposal will have a high effect on the landscape character.

In relation to the infrastructure structures, these features will have negligible adverse landscape effects. In respect of the removal of vegetation, the potential adverse effects will be moderate.

In order to mitigate the effects generated by the above, an Indicative Landscape Concept Plan and Indicative Bird Mitigation Concept Plan (Appendix 3) have been prepared and can be further refined through the detailed design process. With these plans implemented the overall potential adverse effects on the landscape will be reduced to moderate.

7 VISUAL CONTEXT AND VIEWING AUDIENCE

An analysis of the visual context of the site and the existing causeway has been undertaken to understand the likely viewing audiences (i.e. the types of viewers and in what context) of the proposed works. This involved site visits on the 5th and the 28th November 2014, which included walking along the existing causeway and the surrounding streets and public walkways as well as driving the surrounding roads, including SH18. Site photographs were taken from several public vantage points – the location of site photography is shown in Figure 1 of Appendix 2.

Based on the site assessment of the existing environment, the extent of visibility will be confined to particular edges of the Harbour. The existing causeway is difficult to sight from many of the surrounding locations due to its close alignment with the adjoining SH18. The low, flat massing of the existing causeway means that viewers elevated above the site or located in close proximity are the only audience able to view the site clearly. All other views from far location points are partially obscured by trees, undulating topography and the coastal environment of the recessed bays and inlets. Based on this, the viewing audiences consist of the following main groups:

- Motorists, pedestrians and cyclists using SH 18;
- Residents in parts of coastal Greenhithe, Herald Island and Whenuapai properties that face the site;
- Residents at Lot 1 DP 475066 on Squadron Drive;
- Park users along the pedestrian walkway of the Greenhithe coastline and the Herald Island coastline;
- Water-craft users.

7.1 Motorists, pedestrians and cyclists using SH 18

The existing causeway is visible to varying degrees from SH18 itself - when driving in both the southbound and northbound lanes. The speed limit for vehicles is 100km per hour and all views are transient. When travelling east along the motorway, the elongated curve of SH18 further draws the view away from the periphery and focuses the driver on the view ahead, in particular the sweeping incline of the Bridge. The extent and quality of the view of the existing pedestrian/cycle path is not overly noticeable given the width of the path.

It is also acknowledged that driver safety (eyes on the road) is more paramount than outward views. However, passengers in cars and in particular vehicles that are elevated (such as buses, trucks or particular models of cars), will likely be looking towards the harbour and therefore the causeway in the foreground.

For cyclists and walkers using the existing cycle path along the existing causeway on SH18, the extent and quality of view of the causeway is highly noticeable. Unlike vehicles moving at speed, cyclists and particularly pedestrians will be highly cognisant of the views and experience of using the causeway.

7.2 Residents in coastal Greenhithe, Herald Island and Whenuapai properties that face the site

From Greenhithe and Herald Island the causeway would be visible from the elevated sites that directly overlook the harbour. While exact views from these privately owned locations will vary, the view from Figure 3 (Appendix 2) is considered to be a representative example. The views of the site from Greenhithe are truncated due to the acute angle of the viewing point to the site. From Herald Island, views would be more straight-on. The visibility of the site will be impacted by the tide, whereby at high tide, only the top metre of causeway will be visible.

A cluster of residential dwellings along Kauri Road in Whenuapai are in a direct line of sight of the proposed works. Balancing the extent of proposed works with the 1.6km distance and low coastal edge locations, it is unlikely that the views obtained from the area will significantly or adversely change.

The causeway is not currently visible from any public viewing points in Hobsonville Point. Whether it will be seen from the future Hobsonville Point Coastal Linear Park is unclear at this stage given the lack of detail available (to the public) at the current time.

7.3 Residents at Lot 1 DP 475066 on Squadron Drive

Lot 1 DP475066 is on a hill and overlooks the harbour below. The subject site can be clearly viewed from the yard of this property when walking along the upper fenced edge of the driveway, although the view is occasionally obstructed by the tall mature trees in the foreground (which may be removed as a result of earthworks). The single dwelling is set back on top of the hill and away from the harbour edge. From the house, the subject site is not visible.

7.4 Park users along the pedestrian walkway of the Greenhithe and Herald Island coastlines

The public access walkways along the coastlines of Greenhithe and Herald Island are small, local walkways and beach access points (Figure 1 of Appendix 2). They are not formal, established parks and the frequency of use would be low based on their size, local catchment and amenity. Nonetheless, views of the site can be seen from these points as they are representative of some of the views experienced from public locations. Visual simulations have been prepared from these points. Views from these public areas would be transitory.

7.5 Water-craft users

Additional viewing audiences would also include those who use the harbour, on a regular or infrequent basis. The view seen from on the water would include a greater extent of a low view but would not be an overview of the entire proposed causeway. The visible extent of the site would depend on tide levels (see figure 4 of Appendix 2); at low tide the full extent of rip rap revetment atop the sandstone reef would be visible, whereas at high tide the top few metres of rip rap would be visible. Views from water craft users would be transitory.

7.6 Summary

In summary, the low lying, flat form of the reclamation in relation to its surroundings and extended position from the existing causeway means that despite the overall scale and length, only a relatively limited number of people within surrounding neighbourhoods are likely to have views towards the proposed works. These are typically long views of the site and likely to include: some coastal edge properties west of Tauhinu Road, Greenhithe, coastal edge properties to the south of Ferry Parade, Herald Island and Lot 1 DP 475066 on Squadron Drive. Close views of the site will be experienced in a transient manner on an intermittent basis by motorists, pedestrians and cyclist using SH18 and water craft users in the Harbour.

8 VISUAL EFFECTS ASSESSMENT

Visual effects are produced by changes to views and the visual amenity experienced by people. The change in relation to this proposed works would derive from the introduction of new elements into views, potentially impacting on existing sightlines and detracting from the existing features and overall character. However, it is important to note that visibility of a proposed works do not necessarily constitute an adverse visual effect.

Viewpoint photographs (refer to Figures 1, 2 and 5 in Appendix 2) have been taken to illustrate the views in which the proposed works will likely be seen from a public setting, and visual simulations have been prepared which demonstrate the likely change from two key representative viewing locations:

1. Remu Reserve, Greenhithe looking south-west; and

2. A public reserve accessed between 37 and 39 Ferry Parade, Herald Island.

In addition, a number of other areas in the vicinity were visited in the preparation of this assessment.

It is noted that the construction works and time frames for the proposed works are temporary. In this context, we consider the visual effects will be adverse but temporary and therefore not covered in the following assessment. The permanent aspects of the proposed works are assessed below.

8.1 Viewpoint 1

Viewpoint 1 from Greenhithe is taken from a narrow coastal walkway. The viewpoint is accessed via an unsealed vehicle path at the end of a narrow road called Remu Road. The proposal site is 520m from the viewing location. The likely view of the causeway is shown in the visual simulation as being the northern profile of the causeway, including the extended rip-rap wall around and underneath the bridge, and the eastern face of the construction platform area. The increased area of causeway will be more visible than the existing form (particularly with the introduction of a shell bank along a portion of the causeway crest), thereby increasing the visual prominence of the new landform within the environment. This effect will be magnified from locations more elevated than the viewpoint location (such as from Koki Road as shown in the photograph in Figure 3 of Appendix 2).

At low tide, the effect will be greater, particularly the prominence of the rip-rap due to the increased bulk (some of which is under water at high tide), as evident in the visual simulation. Although the construction platform area shape is not clearly evident in the photo-simulation, it is considered that once constructed the angular nature of this part of the proposal will be more legible than can be depicted in an image, and will draw the attention of the viewer. In addition, the small area of ‘natural’ beach will be lost, resulting in a reduction in the visibility of more natural elements in the immediate vicinity of the proposed works.

Overall, it is considered that the proposed works will increase the prominence of the causeway structure in the view, notably extending it into the harbour and widening the middle-ground elements of the view. The increased surface on top of the causeway will notably change the visual elements within the view and will result in a moderate level of adverse effect. However, if the area is planted in accordance with the proposed Indicative Landscape Concept Plan to match the surrounding coastal vegetation, the adverse visual effects from Viewpoint 1 will be reduced to low.

8.2 Viewpoint 2

Viewpoint 2 from Herald Island is also taken from a public path, with the proposed site being approximately 900m from the viewing location. The likely view of the causeway is shown in the visual simulation as a 'square on' profile of the causeway, and as such its whole length is seen.

From this relatively low location, it will be difficult to visually distinguish the construction platform area, and ultimately difficult to perceive that the causeway has been widened. The extension of the rip-rap underneath the bridge is also located relatively low on the water, and will not distract the viewer from the architectural shape of the bridge or visibly narrow the waterflow under the bridge.

However, from private, more elevated viewpoint locations, both the construction platform area and rip-rap around the bridge to the east, will become more prominent, as will the extent of area on the top of the causeway. In particular, the appearance of the surface will have a notable impact on the layers within the composition of the view that are currently dominated by the water in the harbour and the background vegetation around Hobsonville Point. Visually, the surface has potential to enhance the visual prominence of the widened causeway in the view.

As assessed in 8.1 above, the angular nature of the construction platform area is also likely to be affected by the surface treatment, and is likely to be a prominent visual element of the proposed works. This could be mitigated through the Indicative Landscape Concept Plan and Indicative Bird Mitigation Concept Plan, specifically, the strategic location of larger tree species in a detailed design process.

It is concluded that from this location the adverse visual effect will be low. However, from more elevated private locations on Herald Island that have a similar view towards the proposed works, the adverse visual effects will be low to moderate.

8.3 Other Views

As identified above road users along SH18 will have views of the causeway. The management of such views is a social outcome sought by NZTA[3], and therefore although arguably traffic safety is of greater importance, the impact of the proposed works on views experienced by passing motorists is an important consideration. The increased width of the causeway is likely to limit the visual connection people travelling along the motorway have with the harbour. This will be further reinforced by the removal of the existing coastal vegetation. However, it is considered that in both cases the effects can be mitigated through the careful arrangement of replacement planting such that it frames views and reinforces the coastal character. Views of the harbour will continue to be experienced from the bridge crossing.

Lot 1 DP 475066 at the western end of the proposed works will have views along the length of the causeway, and residents will be able to easily identify the angular shape of the construction platform area. This property will also experience a reduction in visual amenity as a result of the removal of trees to create the site access. However, there is a significant opportunity for the effects associated with the proposed works to be positively mitigated, such that replacement vegetation could be selected that reduces the prominence of the motorway.

Regular water-craft users will experience visual effects to differing degrees, depending on the location in which they are travelling. For the most part, views from the water will be similar to the views depicted

[3] New Zealand Transport Agency. (2013). 'Bridging the Gap – NZTA Urban Design Guidelines'. Wellington, New Zealand.

in viewpoints 1 and 2, although the angular shape of the construction platform area will be more readily perceived as the site is travelled around.

8.4 Summary

The potential visual effects of the project will result from views of additional land area and form, plus a potential reduction in the view of the harbour from the motorway. A greater extent of the rip-rap wall will be visible, particularly around the base of the bridge, and the angular shape of the construction platform area is likely to be evident from more elevated locations or from water users travelling around the site. The removal of the trees (including those at the western end) will change the view and expose a greater portion of the existing noise barrier. Views obtained from Greenhithe and Herald Island will vary depending on the setback of residential dwellings and the extent of intervening coastal vegetation.

However, in considering all views from the surrounding locality in the context of the required infrastructure components, it is considered that the increased physical appearance and angular formation of the causeway surface will have the most influence on the overall visual effect of the proposed works. Without mitigation, it is considered that the causeway would have increased prominence in the view, resulting in low to moderate visual effects. However, with mitigation (as per the Indicative Landscape Concept Plan), it will be possible to increase the connection between the causeway and the surrounding vegetation around the north-eastern edge of Hobsonville, whilst also screening the motorway from some locations, and therefore will reduce the overall visual effect of the proposed works to low.

9 RECOMMENDATIONS

The level of landscape and visual effects ranges from low to moderate. The Indicative Landscape Concept Plan proposes a series of mitigation opportunities (set out on page 11) that, if undertaken, will significantly mitigate the potential adverse landscape and visual effects. In addition it is clear that the completed causeway extension will provide opportunities for public recreation.

10 SUMMARY AND CONCLUSION

In summary, Watercare is proposing to expand the water and wastewater infrastructure along the Greenhithe Bridge Watermain Duplication and Causeway in order to maintain water and wastewater service levels and to provide for future growth. The design of the proposed works will generate a new landform through the extension of the causeway in order to accommodate various pipelines.

Within this landscape and visual assessment, the existing location and landscape context has been assessed as a highly modified environment that is comprised of residential development and dominant road infrastructure, set alongside a natural coastal landscape.

Despite the modified environmental context, the proposed works have been assessed as generating moderate to high adverse landscape effects primarily as a result of the overall scale and form, in

particular the construction platform area which is inconsistent with the underlying lineal form and will exacerbate the manufactured nature of the landform.

In terms of landscape effects, it is considered that the bulk, form and appearance of the proposed landscape, the increased visibility of particular infrastructure elements and the removal of vegetation will potentially generate a high level of adverse effect on the landscape character. However, mitigation has been proposed by way of the designs recommended in the Indicative Landscape Concept Plan and Indicative Bird Mitigation Concept Plan. When these are implemented (and further refined through the detailed design process) the overall potential adverse effects on the landscape can be mitigated and effects will be reduced to moderate.

In terms of visual effects, a number of public and private viewing locations have been identified. From these locations, the form of the proposed causeway, the extension of the rip-rap under the bridge, and the increased surface area will all contribute to the affect the composition of the view. These are likely to result in moderate adverse visual effects from Herald Island and Greenhithe properties that have a view towards the causeway. However, as with the landscape effects, implementation of the Indicative Landscape Concept Plan and Indicative Bird Mitigation Concept Plan (and further refined through the detailed design process) will reduce the overall adverse visual effects to low.

In summary, the variety of mitigation opportunities set out in the Indicative Landscape Concept Plan and Indicative Bird Mitigation Concept Plan will reduce the potential adverse landscape and visual effects. It is considered that if the mitigation is implemented, the overall adverse landscape and visual effects will reduce to a moderate level and in time the coastal edge will be enhanced.

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APPENDIX 1: EFFECTS RATING AND DEFINITIONS

Guidelines for Landscape and Visual Impact Assessment ("GLVIA") 3rd Edition (2013)

Landscape and Visual Amenity Effects – Rating System	
Effects Rating and Definitions *Note: Ratings may be positive (e.g. high level of enhancement) or negative (e.g. high adverse effect).*	
Adverse Effects Rating	Use and Definition
Negligible	The development/activity would have an undetectable on the receiving environment.
Very Low	Use The development/activity would: Have a very low effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or Have a very low effect on the perceived amenity derived from it. *Oxford English Dictionary Definition* *Very: adverb- **1.** In a high degree. **2.** With superlative or own without qualification: the very best quality.* *Low: adjective- **1.** Below average in amount, extent, or intensity. **2.** Lacking importance, prestige, or quality; inferior.*
Low	Use The development/activity would: Have low level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or Have low level of effect on the perceived amenity derived from it. *Oxford English Dictionary Definition* *Low: adjective- **1.** Below average in amount, extent, or intensity. **2.** Lacking importance, prestige, or quality; inferior.*
Moderate	Use The development/activity would: Have a moderate level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or Have a moderate level of effect on the perceived amenity derived from it. *Oxford English Dictionary Definition* *Moderate: adjective- average in amount, intensity, or degree*
High	Use The development/activity would: Have a high level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or Have a high level of effect on the perceived amenity derived from it. *Oxford English Dictionary Definition* *High: adjective- **1.** Extending above the normal level. **2.** Great in amount, value, size, or intensity. **3.** Great in rank or status.*
Very High	Use The development/activity would: Significantly change the characteristics or key attributes of the receiving environment and /or the visual context within which it is seen; and/or Have a significant effect on the perceived amenity derived from it.

	Oxford English Dictionary Definition *Very: adverb-* ***1.*** *In a high degree.* ***2.*** *With superlative or own without qualification: the very best quality.* *High: adjective-* ***1.*** *Extending above the normal level.* ***2.*** *Great in amount, value, size, or intensity.* ***3.*** *Great in rank or status.*

For the purposes of consideration under the Resource Management Act, it is considered that these ratings would translate as follows:

- Negligible or Very Low = Less than Minor
- Low = Minor
- Moderate to Very High = More than Minor

APPENDIX 2: STATUTORY ASSESSMENT: RELAVENT OBJECTIVES AND POLICIES.

Various landscape and visual assessment related objectives and policies are found throughout the following statutory documents. In summary, the following are considered most relevant to this Landscape and Visual Assessment.

10.1 New Zealand Coastal Policy Statement 2010

OBJECTIVES

Objective 2: To preserve the natural character of the coastal environment and protect natural features and landscape values through:

- *recognising the characteristics and qualities that contribute to natural character, natural features and landscape values and their location and distribution;*
- *identifying those areas where various forms of subdivision, use, and development would be inappropriate and protecting them from such activities; and*
- *encouraging restoration of the coastal environment.*

Objective 4: To maintain and enhance the public open space qualities and recreation opportunities of the coastal environment by:

- *recognising that the coastal marine area is an extensive area of public space for the public to use and enjoy;*
- *maintaining and enhancing public walking access to and along the coastal marine area without charge, and where there are exceptional reasons that mean this is not practicable providing alternative linking access close to the coastal marine area; and*
- *recognising the potential for coastal processes, including those likely to be affected by climate change, to restrict access to the coastal environment and the need to ensure that public access is maintained even when the coastal marine area advances inland*

Objective 7: To ensure that management of the coastal environment recognises and provides for New Zealand's international obligations regarding the coastal environment, including the coastal marine area.

10.2 Auckland Council Regional Plan: Coastal 2004 (ACRP:C)

CHAPTER 10 GENERAL

10.3 OBJECTIVES

10.3.1 To provide for appropriate subdivision, use and development in the coastal marine area, and to protect the coastal marine area from inappropriate subdivision, use and development.

10.3.2 To ensure that efficient use is made of the coastal marine area.

10.3.3 To maintain where appropriate, the open space nature of the coastal environment.

10.4 POLICIES

10.4.1 Subdivision, use and development which maintains or enhances public use and enjoyment of the coastal marine area shall be encouraged except where it is appropriate to restrict the public, having considered the provisions of Chapter 7: Public Access.

10.4.2 Recreation is a significant and important use of the coastal marine area, and any proposal for subdivision, use and development shall have regard to the desirability of maintaining or enhancing recreational use of the coastal marine area while avoiding, remedying or mitigating adverse effects on existing activities

10.4.3 Subdivision, use and development of the coastal marine area shall be considered more appropriate where the environment has already been highly modified by human activities, or located in areas where development already exists, unless:

a) location elsewhere in the coastal marine area of the Auckland Region would better avoid, remedy, or mitigate significant adverse effects of that subdivision, use and development; or

b) an application brought by Tangata Whenua better provides for the special relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.

10.4.4 The positive environmental effects and benefits arising from any proposal for subdivision, use and development shall be taken into account when assessing the overall effects of a proposal.

10.4.5 Any proposal for subdivision, use and development shall be located, designed, constructed or placed to: a complement as far as practicable the character of the environment in which it is located; and b avoid as far as practicable, remedy or mitigate adverse effects on ecological and physical processes beyond those which are already occurring in the immediate and surrounding area, including any area above Mean High Water Springs; and c where practicable, be consistent with relevant resource management strategies of adjoining territorial authorities.

…

10.4.10 Occupation of the coastal marine area (in terms of section 12 (2) of the RMA) shall be considered inappropriate unless:

a) Occupation is reasonably necessary for the proper functioning of the activity; and

b) Adverse effects arising from space proposed to be occupied can be avoided where practicable, remedied or mitigated, having regard to the loss of public access to and along the coastal marine area.

CHAPTER 13 RECLAMATION AND DRAINAGE

13.3 OBJECTIVES

13.3.1 To avoid inappropriate reclamation or drainage of the coastal environment.

13.3.2 To ensure that where reclamation or drainage of the coastal environment is considered appropriate, the adverse environmental effects on the coastal environment are avoided, remedied, or mitigated.

13.4 POLICIES

13.4.1 Reclamation and drainage in the coastal marine area shall generally be considered inappropriate, … [and]…

d) the reclamation or drainage will have either positive or minor adverse effects including effects on natural character, visual and other amenity, ecology, Maori values, heritage values, water quality and coastal processes, or any adverse effects can be remedied or mitigated to an acceptable level by methods such as appropriate design and location of buildings, landscaping, planting, or other forms of environmental benefits in accordance with Chapter 38: Obtaining Environmental Benefits; and

e) the finished appearance of the reclaimed or drained area, including its size, shape and the materials used, is as far as practicable compatible with the environment in which it is located; and

13.4.3 The relevant provisions of Part III: Values Chapters 3 to 9 shall be considered in the assessment of any proposal to reclaim or drain the coastal marine area.

13.4.4 Reclamation and drainage should be carried out in such a way as to maintain or enhance public access to and along the coastal marine area (except where the area is already in private title).

10.3 Auckland Council District Plan: Waitakere Section 2003 (ACDP:WS)

OBJECTIVES

Objective 7 To preserve and enhance the natural character of the City's coastal environment and lakes, rivers and wetlands and their margins, including preserving the action on the land of those processes which form that natural character.

POLICIES

Policy 7.1 Settlement should be:

• located away from the City's coastal edges and riparian margins;

• urban development should be avoided in outstanding coastal areas

• located away from all coastal dunelands, wetlands, estuaries and potential coastal hazard areas, including land susceptible to flooding or potentially affected by predicted sea level rise.

Limited settlement may occur in the Titirangi-Laingholm area which is inside the Metropolitan Urban Limit, where such settlement does not cause adverse impacts on outstanding coastal areas, outstanding natural landscapes and riparian margins. Generally, such areas shall be avoided and protected from future development. Wherever possible, encouragement will be given to the entire subdivision of a site to be considered at one time only. This will provide most certainty regarding the effects of subdivision. However, where subdivision is to be proposed in stages, it will be important to show in concept how the balance of the site can be subdivided in accordance with district plan policy and provisions. Until such time as a further plan change confirms any replacement for the current policy and rule framework for management of the area, development that is dependent on a coastal location or ancillary to the marine industry or ferry activities may occur on and adjacent to the existing modified coastal margin at the eastern end of the former Hobsonville Airbase (within the Landing Special Area) provided that development does not adversely impact on the natural landscape qualities of the Hobsonville Peninsula and the land/water interface.

Policy 7.3 Activities should avoid modification to the natural interface between coastal waters, wetlands, lakes, or rivers and the surrounding land, or any further exacerbation of any effects resulting from existing modifications to the interface between coastal waters, wetlands, lakes and rivers and surrounding land. In particular, subdivisions should be designed to ensure that any structures, impermeable surfaces or earthworks do not adversely affect the natural character of this interface. Remedial work on that interface may occur, where human life or property associated with existing settlement may be adversely affected. Structure Plans should give particular regard to the natural character of waterways and their margins and the natural character of the coast. The design of a structure plan subdivision should not adversely effect natural character. Identification of infestations of environmentally damaging plants to be removed and areas for revegetation, restoration and protection which will serve to avoid, remedy, or mitigate the effects of development on natural character should be identified. Appropriate works to achieve revegetation, restoration and protection will form part of the requirements of the structure plan subdivision process. Appropriate works to achieve revegetation and the restoration and protection of native vegetation form a particular part of the subdivision rules and assessment criteria for that part of the Titirangi-Laingholm area which is within the Metropolitan urban Limit.

Policy 7.7 Where adverse effects on the natural character of coastal or freshwater areas cannot be avoided, there may be a requirement to remedy or mitigate these adverse effects.

10.4 Auckland Council District Plan: North Shore Section 2002 (ACDP:NS)

8.3 NATURAL ENVIRONMENT: OBJECTIVES AND POLICIES

8.3.1 COASTAL CONSERVATION

OBJECTIVES

To protect the natural character, public access, cultural heritage values, ecology and landforms of the coastal environment.

POLICIES

1. *By defining the Coastal Conservation Area.*

2. *By applying a building set back or foreshore yard as a buffer between the coastline and development to the extent necessary to:*

    - *protect the natural character of the coastal environment, including its soft green edge, the physical landform, natural features, vegetation and ecological systems*
    - *protect the water quality of the coastal environment and the habitats that it sustains*
    - *provide for the operation of naturally occurring processes*
    - *keep open the existing and foreseeable opportunities for future esplanade reserves and strips*
    - *maintain and enhance landscape and amenity values*
    - *protect the value the coastline has to tangata whenua*
    - *reduce potential hazards resulting from natural processes and subsequent changes in landform*
    - *manage the cumulative effects of the activities of property owners in the coastal environment.*

10.5 Proposed Auckland Unitary Plan (PAUP)

Under the Proposed Auckland Unitary Plan ('PAUP') the site is within the General Coastal Marine zone and adjoins the Coastal Transition Zone, Road Zone and a number of overlays including Special Ecological Areas, Coastal Inundation and Stormwater Management Areas. Coastal reclamation is a discretionary activity under the PAUP.

CHAPTER B: REGIONAL POLICY STATEMENT - KUPU KAUPAPA Ā-ROHE

7 SUSTAINABLY MANAGING OUR COASTAL ENVIRONMENT - TOITŪ TE TAIWHENUA

7.1 SUBDIVISION, USE AND DEVELOPMENT IN THE COASTAL ENVIRONMENT

OBJECTIVES

1. *Subdivision, use and development in the coastal environment is located in appropriate areas, taking into account the range of uses and values of the coastal environment.*
2. *The natural and physical resources of the coastal environment are used efficiently and activities that depend on the use of the natural and physical resources of the coastal environment are provided for in appropriate locations. Conflict between activities is minimised, and rights to occupy parts of the CMA are limited to activities that have a functional need to be located below MHWS.*

POLICIES

1. *Determine the appropriateness of subdivision, use and development in the coastal environment having regard, in addition to the objectives and policies in this section, to the regional policy statement objectives and policies in the historic heritage, natural character, landscape and natural features, biodiversity and Mana Whenua sections.*

    …

4. *Maintain the value of the coast as an open space area with free public access by limiting use, occupation and development in the CMA to activities that:*

    a. have a functional need to be located below MHWS

    b. are for public benefit, including infrastructure that cannot be reasonably or practicably be located outside the CMA, including existing uses

    c. enable the cultural or traditional use of the CMA by Mana Whenua.

7.2 PUBLIC ACCESS AND OPEN SPACE IN THE COASTAL ENVIRONMENT

OBJECTIVES

1. *Public access to and along the CMA is maintained and enhanced in a manner that is sensitive to the use and values of an area.*
2. *The open space, recreation and amenity values of the coastal environment are maintained or enhanced, including through the provision of public facilities in appropriate locations.*

POLICIES

1. *Subdivision, use and development in the coastal environment must where practicable:*
   a. be designed and located to minimise impacts on public use and access of the CMA
   b. be set back from the CMA to protect public open space values and access
   c. take into account the likely impact of coastal processes and climate change, and be set back sufficiently to not compromise the ability of future generations' to have access along the coast
   d. maintain, or where possible, enhance public access to the CMA, including through the provision of esplanade reserves and strips.

2. *Facilitate the provision of public access, particularly walking access, to and along the coast through:*
   a. acquiring esplanade reserves or strips on subdivision, and linking reserves, access strips and open space areas

3. *Provide for a range of open space and recreational use of the coast by:*
   a. enabling a diverse range of recreational uses while managing uses to avoid conflicts and safety issues
   b. identifying and providing areas for particular recreational use where this ensures the most efficient use of space, and supports the provision of land-based facilities for those uses
   c. enabling the provision of facilities in appropriate locations to enhance public access and amenity values.

5. *Public access to, and along, the CMA, particularly walking access, will only be restricted where it is necessary to:*
   a. protect public health and safety
   b. provide for defence, port or airport purposes
   c. protect identified significant historic heritage or natural heritage values
   d. protect dunes, estuaries and other sensitive natural areas or habitats
   e. protect scheduled sites and places of significance to Mana Whenua
   f. have a level of security necessary to carry out an activity or function that has been established or provided for
   g. provide for exclusive use of an area to carry out an activity granted an occupation consent under s. 12 of the RMA.

CHAPTER D: ZONE OBJECTIVES AND POLICIES

5 COASTAL ZONES

5.1 GENERAL COASTAL MARINE ZONE

5.1.1 DRAINAGE, RECLAMATION AND DECLAMATION

OBJECTIVES

2. *The natural character, ecological values and natural coastal processes of the CMA are not adversely affected by inappropriate reclamation, drainage or declamation.*
3. *Public access, amenity and Mana Whenua values are not adversely affected by inappropriate reclamation, drainage or declamation.*

POLICIES

3. *Require proposals for reclamation to mitigate effects through the form and design of reclamation as far as practicable, taking into account:*

a. the shape of the reclamation, and the extent to which the materials used are visually compatible with the adjoining coast
b. the ability to avoid consequential changes to coastal processes, including erosion and accretion.

5. *Maintain and where possible enhance public access to and along the CMA to the extent practicable in providing for reclamation, declamation and drainage, having regard to:*
a. the purpose and proposed use of the area
b. whether a restriction on public access is necessary for public health, safety or operational reasons
c. the ability to remedy or mitigate any loss of public access.

6. *Require an esplanade reserve or strip to be included on reclaimed or drained areas of the CMA, unless a restriction on public access is appropriate.*

9. *Provide for the declamation of reclaimed land where it would:*
a. restore the natural character and resources of the CMA, or
b. provide for better public access or greater open water space, or
c. provide for the efficient operation of nationally and regionally significant infrastructure.

5.1.8 VEGETATION: PLANTING IN THE CMA

OBJECTIVE

1. *The distinct natural variations in native plant species that occur between different areas, and biodiversity in the CMA, are maintained.*

POLICIES

1. *Avoid the introduction and use of exotic plant species into the CMA unless the adverse effects are understood and can be avoided or mitigated.*

2. *Avoid the planting, transplanting or introduction of all species of spartina (cord grass) in the CMA.*

3. *Promote the use of native plants sourced from the same ecological district for planting in the CMA unless:*
a. this is not possible
b. any adverse effects, including cumulative effects, on local native plants can be avoided or mitigated.

4. *Promote planting in the CMA to:*
a. enhance existing natural character and communities of native plants by using native plants that are consistent with the local native plants species and common to the location
b. avoid changes to natural coastal processes, unless the planting is for the purpose of mitigating a coastal hazard.

APPENDIX 3: VISUAL SIMULATIONS AND SITE PHOTOS

Boffa Miskell
www.boffamiskell.co.nz

N

Not to scale

GREENHITHE BRIDGE WATERMAIN DUPLICATION & CAUSEWAY

Figure 1: Viewpoint Location Maps

| Date: 30 June 2015 | Revision: 1 |

Plan prepared for Watercare by Boffa Miskell Limited

Project Manager: **Shannon.Bray@boffamiskell.co.nz** | *Drawn:* JPa | *Checked:* SBy

Figure 2A: Existing view from viewpoint 1, looking south from Remu Reserve pedestrian walkway, Greenhithe

Figure 2B: Proposed view from viewpoint 1, looking south from Remu Reserve pedestrian walkway, Greenhithe

GREENHITHE BRIDGE WATERMAIN DUPLICATION & CAUSEWAY

Figure 2: VIEWPOINT 1 -Public reserve. Accessed at the end of Remu Road, Greenhithe

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Figure 3: The top of Koki Road, Greenhithe

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Figure 4: Representative view taken from a kayak in the main channel of the harbour, looking south

Figure 5A: **Existing view from viewpoint 2,** Looking south-east from a public reserve, accessed adjacent to 37 Ferry Parade, Herald Island

Figure 5B: **Proposed view from viewpoint 2,** Looking south-east from a public reserve, accessed adjacent to 37 Ferry Parade, Herald Island

GREENHITHE BRIDGE WATERMAIN DUPLICATION & CAUSEWAY

Figures 5A and B: Viewpoint 2 - Public reserve, accessed adjacent to 37 Ferry Parade, Herald Island.

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Figure 6: Looking north behind the existing noisewall and above existing stormwater outfall

Figure 7: Looking north-east from the top of the driveway at 20 Squadron Drive.

Figure 8: Looking south-west along Causeway

Figure 9: Looking north-east along Causeway

NORTH HARBOUR 2 / GREENHITHE WATERMAIN DUPLICATION & CAUSEWAY

Figures 6 - 9: Site photos

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Figure 10: Looking west. Hobsonville Point on left.

Figure 11: Looking north-east along Greenhithe Bridge

Figure 12: Typical view of rip rap and vegetation at low tide.

Figure 13: Looking beneath Greenhithe Bridge from the northern end of the Causeway.

APPENDIX 4: INDICATIVE LANDSCAPE CONCEPT PLAN

KEY

1. Opportunity for potential future connection with Hobsonville Coastal Linear Park (by others).
2. Concrete termination point with enough room for a single flatbed truck to turn around (a 3-point turn is acceptable).
3. Screening for pipe transition to bridge
4. Basalt rocks 'pulled' over riprap crest in sections along causeway to soften edge.
5. Area for wooden pillars for bird roosting.
6. 3m wide maintenance access path.
7. Existing 3m wide pedestrian/cycle path.
8. Potential location for future public art sculpture (by others).
9. Viewing area towards Herald Island and Greenhithe. Hoggin surface. Seating.
10. Low earth bunds (1000 - 1500mm high).
11. Grassed open area.
12. Rip-rap rock revetement.
13. Area of 'sacrificial' planting able to be removed (and replaced) to enable construction of future phases of the Northern Interceptor. Species and location to be determined.
14. 1m wide planting to extend over the crest of the length of causeway.
15. Existing NZTA noisewall
16. Existing road and primary site access
17. Fill area (shown hatched) to raise ground level and adjoin the esplanade of the neighbouring lot for potential future coastal path.
18. Potential future connection to pedestrian/cycle path along neighbouring esplanade reserves.
19. Trees to be removed for construction access (shown in dotted line). Reinstated with grass or planting following completion.
20. Raised shell bank.
21. Low stature vegetation or substrate (planted with *Phormium cookianum* or similar species)
22. Protective wire fence (600-900mm high) for dog exclusion.

LEGEND

- Potential location of biofilters, located between shell bank and low planting.
- NI pipeline phase 1 infrastructure (beneath ground)
- Indicative location of pipe transition structure to Greenhithe Bridge (above ground).
- Associated Infrastructure (beneath ground)
- Approximate project scope extent at western end (eastern extent not shown on plan).
- Sections of mass planting comprised of low height and low maintenance vegetation. Species and location to be determined.
- Pohutukawa Trees. Final locations to be determined.

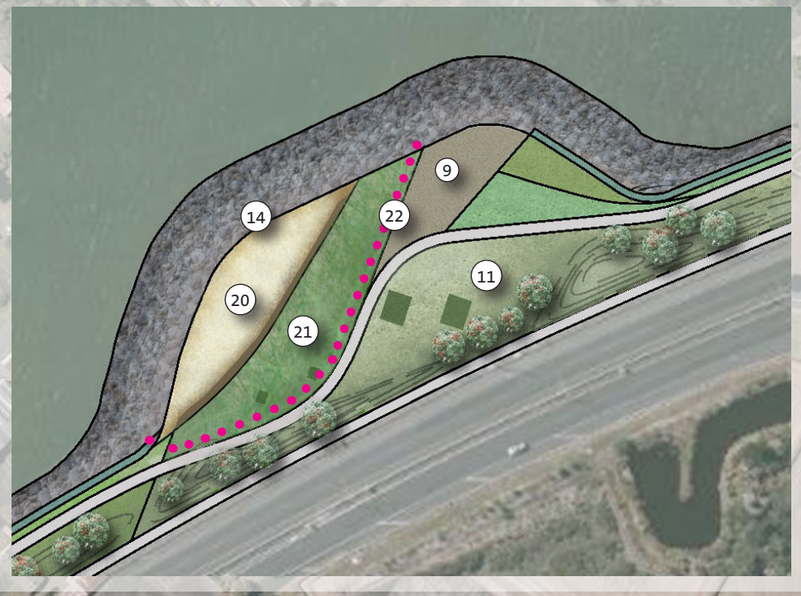
Upper Harbour

State Highway 18

Te Okariki Inlet

Hobsonville Point

CONSTRUCTION PLATFORM AREA (not to scale)



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Data Sources: Design Based on Watercare and URS Engineering drawings NH2x149a_NI_Reclamation_Layout_RevB_500scale.dwg.Model, received: 10.03.2015

GREENHITHE BRIDGE WATERMAIN DUPLICATION & CAUSEWAY RECLAMATION

Indicative Landscape Concept Plan

| Date: 30 June 2015 | Revision: _ 2 |

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APPENDIX 5: INDICATIVE BIRD MITIGATION CONCEPT PLAN

Upper Harbour

LEGEND / EXPLANATION

SHOREBIRD HABITAT / STORMWATER SWALE AREA

This area is designed to provide roosting habitat for shorebirds and simultaneously provide stormwater treatment through swales.

1. Raised shell bank – roosting habitat which may be used by oystercatcher, dotterels and seasonal migrants such as godwits. May also be a suitable breeding site for oystercatcher and dotterels. Indicative only.
2. Substrate yet to be determined. Options include biofiltration bark, shell or low stature ground cover such as sand coprosma (*Coprosma acerosa*) or swampweed (*Selliera radicans*), which is already present in the intertidal area of the footprint.
3. Dog proof fencing (600 - 900mm high wire fence)

PEST CONTROL

4. Pest control (Bait Stations)
5. Pest Control (Traps)

DOC 200 traps and bait stations to be alternating at 25 m intervals around the roost site and seaward site of causeway. Traps provide increased protection to the shell bank area. Bait stations at 50 m intervals around the mangrove/salt marsh SEA on southern side of causeway and salt marsh area at western end of causeway.

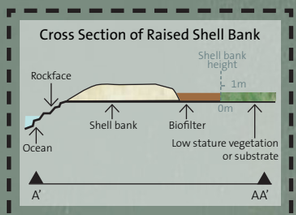
WOODEN PILLAR STRUCTURES

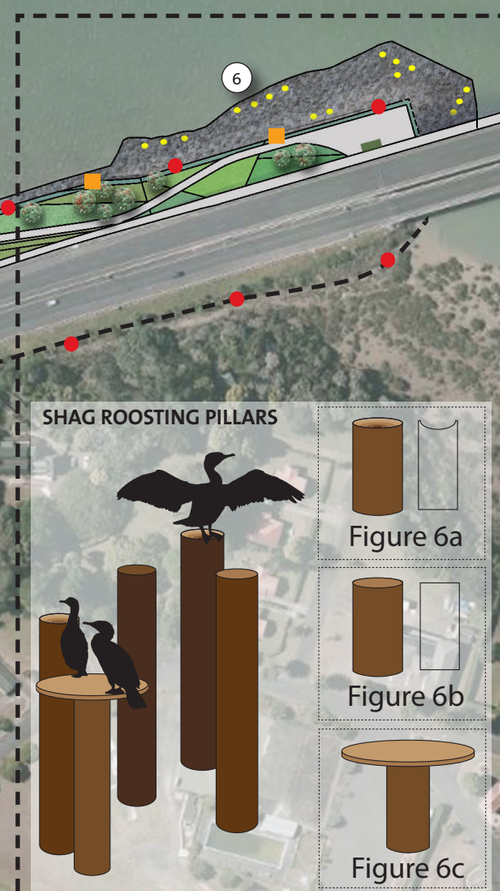
6. Wooden pillar structures – for roosting of gulls and shags and potentially white fronted terns. Generates a wharf/ marine tone to landscaping. Located away from the shell bank and wetland to minimise predation and harassment from dominant species such as black backed gulls. Suggested size approximately 2 -3 m in height and 0.3 m diameter.

Each cluster of pillars should have a different surface on the top which may be preferential to different species. The concept (Figure 6a) has no modified top, intended to replicate piers at a wharf. By creating a hollow dish shape (Figure 6b), white-fronted terns may use the structure for nesting. An enlarged surface area may promote for groups of birds to roost together (Figure 6c).

MANGROVE / SALT MARSH AREA, WEST END OF CAUSEWAY

Pest control to be established in this area. Banded rail is currently present and this habitat is in close proximity to the construction platform. This intervention will provide connectivity





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GREENHITHE BRIDGE WATERMAIN DUPLICATION & CAUSEWAY RECLAMATION

Indicative Bird Mitigation Concept Plan

Concept designed by Tonkin & Taylor and drawn by Boffa Miskell Limited

| Date: 30 June 2015 | Revision: _ 2 |

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Project Manager: **Shannon.Bray@boffamiskell.co.nz** | *Drawn:* JPa | *Checked:* JGo

Figure A.4