

PEERS BROWN MILLER LTD

Arboricultural & Environmental Consultants

ARBROICULTURAL ASSESSMENT OF THE PROPOSED BAYSWATER MARINE PRECINCT DEVELOPMENT

PREPARED FOR: Bayswater Marina Harbour Holdings Limited
BY: Chris Scott-Dye
DATE: 19 May, 2021

1.0 Introduction

Peers Brown Miller Ltd has been commissioned by Bayswater Marina Holdings Limited to provide an arboricultural assessment of the proposed Bayswater Maritime Precinct development.

An initial baseline survey of the site was carried out in October 2017, which identified sixty-eight (68) Pohutukawa (*Metrosideros excelsa*) trees, two (2) Norfolk Island pine (*Araucaria heterophylla*) and one (1) Cabbage tree (*Cordyline australis*) within the site.

Although privately owned, the zoning for this land (Marina Zone) adopts the provisions of the Open Space Zoning – Sport and Active Recreation Zone (as detailed below the F3.4.1 Activity table) for activities that are not otherwise specified in the Marina Zone provisions. Therefore, all of the trees within the site are considered protected under the Auckland Unitary Plan (AUP) because they are greater than 4m in height.

It is also noted that trees greater than 3m in height, indigenous, and within 20m of the Mean High Water Springs (MHWS) also have an extra layer of protection.

The proposed maritime precinct development will involve major ground level alterations including the building up of land in places. As such, the vast majority of the existing trees on site cannot be retained in situ. However, it is proposed to transplant a number of these trees, store them during construction, and include them as part of the future landscape.

Further to this, there are five (5) semi-mature Pohutukawa trees located on the adjacent site in an area of land that has Open Space zoning. These trees have a portion of their respective canopies overhanging the site. Works within the protected root zone and pruning of these trees' forms part of the proposal.

This report includes a tree schedule, with information pertaining to the individual trees and the proposed action – retention in place, transplanting or removal. These activities are discussed in detail in Section 5.0 of this report and assessed against the relevant rules as determined by the AUP, in Section 7.0.

2.0 Plan References

The proposed landscape plan set has been provided by Boffa Miskell Ltd. Relevant pages are included in the body of this report and as Appendix 1. The plan set is referenced;

- Bayswater Maritime Precinct, Masterplan Set - by Boffa Miskell, dated February 2021

Also included as an appendix to this report is the Tree Location Plan. Tree numbers have been overlaid onto the site survey, which is referenced;

- Bayswater Marina, Geodetic datum 2000, Auckland vertical datum – by Hampson and Associates Ltd, dated 20/12/13

Various engineering/earthworks plans have been provided by Airey Consultants Ltd., screenshots of which are included in the body of this report.

3.0 Relevant Statutory Framework

The trees described in this report, and the activities affecting them are subject to the following Auckland Unitary Plan, (AUP) rules;

- E15.4.1(A21) '*Vegetation alteration or removal of greater than 25m² of contiguous vegetation or tree removal or tree alteration of any indigenous tree over 3m in height within 20m of mean high water springs (MHWS)*' – a **Restricted Discretionary Activity**

- E16.4.1(A10) '*Tree removal of any tree greater than 4m in height or greater than 400mm in girth*' – a **Restricted Discretionary Activity**
- E16.4.1(A5) '*Tree trimming or alteration*' – A **Permitted Activity**
- E16.4.1(A7) '*Works within the protected root zone*' - A **Permitted Activity**

Accordingly, an application is to be made, under the rules cited above, via this application process, for resource consent to carry out the above detailed Restricted Discretionary Activities.

Tree Owners Approval (TOA) for the works within the root zones of the Council trees will also be sought – it is noted that this is not part of the Resource Consent process. Further details and an assessment are provided in Section 5.0 of this report.

4.0 Existing trees

Tree numbers have been overlaid onto the site survey to create the Tree Location Plan. These tree numbers correspond to the Tree schedule, which details information on the subject tree statures – as recorded in 2017.

Following the initial tree survey, a site visit was carried out between Peers Brown Miller and Jeff Fell from Specimen Tree Landscapes, to determine which trees at the site are deemed appropriate as potential transplant specimens. These trees have been indicated in **green** on the Tree Location Plan and Tree Schedule.



Figure 1 – screenshot of the Tree Location Plan. Green numbers indicate potential transplant specimens, red – those that are not suitable, and black - trees that will be retained and protected in situ

4.1 Tree Table Categories

The following categories have been used within the tree report tables and, where appropriate, the criterion used to define each category is defined.

- **Tree No.** : refers to the number assigned to a tree and shown on the corresponding tree location plans
- **Species** : refers to the common and scientific name given to the tree
- **Height** : refers to the estimated Height of the tree in metres
- **Girth** : refers to the stem diameter measured at 1.0m above ground level
- **Age** : an estimation of the age of the tree, described as:
 - OM** – Over Mature; trees reaching the end of their life, in decline and senescent.
 - M** – Mature; fully grown, with only small annual increments.
 - SM** – Semi mature; up to one-third of total life expired.
 - Y** – Young established tree
 - J** – Juvenile tree, recent planting.
- **Health** : refers to the overall physiological condition of the tree, described as:

Good – Fully foliated healthy canopy but possibly including some suppressed or damaged branches

Fair – Slightly reduced leaf cover, minor dead wood or isolated major dead wood

Poor – Overall sparse leafing or extensive dead wood

4.2 Tree Table

Tree No	Species	Height (m)	Spread (m)	Girth (cm)	Age	Protected	Health	Condition	Transplant potential
1	Pohutukawa <i>Metrosideros excelsa</i>	7	4.5	41 x 2 stems	S/ M	Yes	Good	Trunk 400mm from path. Surface roots to path edge. Edge of swale drain.	Yes
2	Pohutukawa <i>Metrosideros excelsa</i>	6.5	4	25	S/ M	Yes	Good	Trunk 400mm from path. Surface roots to path edge. Edge of swale drain.	Yes
3	Pohutukawa <i>Metrosideros excelsa</i>	7	4.5	39	S/ M	Yes	Fair	Sparse canopy. Trunk 400mm from path. Surface roots to path edge. Edge of swale drain.	Yes
4	Pohutukawa <i>Metrosideros excelsa</i>	5	4	41 x 2 stems	S/ M	Yes	Good	Trunk 500mm from path. Surface roots to path edge. Edge of swale drain.	Yes
5	Pohutukawa <i>Metrosideros excelsa</i>	5.5	5	41 x 2 stems	S/ M	Yes	Good	Trunk 400mm from path. Surface roots to path edge. Edge of swale drain.	Yes
6	Pohutukawa <i>Metrosideros excelsa</i>	7	5	36	S/ M	Yes	Good	Trunk 500mm from path. Surface roots to path edge. Edge of swale drain.	Yes
7	Pohutukawa <i>Metrosideros excelsa</i>	6	6	50 x 2 stems	S/ M	Yes	Good	Trunk 500mm from path. Surface roots to path edge. Edge of swale drain.	No
8	Pohutukawa <i>Metrosideros excelsa</i>	6	6	35	S/ M	Yes	Good	Trunk 500mm from path. Surface roots to path edge. Edge of swale drain.	Yes
9	Pohutukawa <i>Metrosideros excelsa</i>	4	3	28 x 2 stems	S/ M	Yes	Fair	Trunk 900mm from path. Edge of swale drain.	Yes
10	Pohutukawa <i>Metrosideros excelsa</i>	6	4.5	41 x 2 stems	S/ M	Yes	Good	Trunk 500mm from path. Surface roots to path edge. Edge of swale drain.	Yes
11	Pohutukawa <i>Metrosideros excelsa</i>	6.5	5.5	38	S/ M	Yes	Fair	Stem defect. Thinning open canopy. Trunk 500mm from path.	Yes
12	Pohutukawa <i>Metrosideros excelsa</i>	5	6	50	S/ M	Yes	Good	Trunk 500mm from path. Edge of swale drain.	Yes
13	Pohutukawa <i>Metrosideros excelsa</i>	7.5	7	50 x 2 stems	S/ M	Yes	Good	Trunk 500mm from path. Edge of swale drain.	Yes
14	Pohutukawa <i>Metrosideros excelsa</i>	7	6.5	35	S/ M	Yes	Good	Trunk 500mm from path. Edge of swale drain.	Yes
15	Pohutukawa	7.5	7.5	44	S/	Yes	Good	Historic pruning wounds on	Yes

Tree No	Species	Height (m)	Spread (m)	Girth (cm)	Age	Protected	Health	Condition	Transplant potential
	<i>Metrosideros excelsa</i>				M			trunk. Edge of swale.	
16	Pohutukawa <i>Metrosideros excelsa</i>	6.5	6	41 x 4 stems	S/ M	Yes	Good	Trunk inclusion.	Yes
17	Pohutukawa <i>Metrosideros excelsa</i>	7.5	8	41	S/ M	Yes	Good	Trunk inclusion. Surface root within car park	No
18	Pohutukawa <i>Metrosideros excelsa</i>	7.5	7.5	50	S/ M	Yes	Fair	Recent stem failure.	No
19	Pohutukawa <i>Metrosideros excelsa</i>	7.5	6	28	S/ M	Yes	Fair	Trunk inclusion. Previously topped. Recent branch failure.	No
20	Pohutukawa <i>Metrosideros excelsa</i>	8	6.5	50 x 3 stems	S/ M	Yes	Fair	Previously topped. Weak branch unions	No
21	Cabbage tree <i>Cordyline australis</i>	6	2	25	M	Yes	Poor	Basal decay. Thinning canopy.	No
22	Pohutukawa <i>Metrosideros excelsa</i>	7.5	8	50 x 2 stems	S/ M	Yes	Fair	Previous pruning events.	Yes
23	Pohutukawa <i>Metrosideros excelsa</i>	7.5	6.5	28	S/ M	Yes	Fair	Previously topped. Weak branch unions.	Yes
24	Pohutukawa <i>Metrosideros excelsa</i>	7.5	6	50 x 2 stems	S/ M	Yes	Fair	Previously topped. Weak branch unions.	Yes
25	Pohutukawa <i>Metrosideros excelsa</i>	5.5	6.5	36	S/ M	Yes	Good	Aerial roots. Minor girdling roots.	Yes
26	Pohutukawa <i>Metrosideros excelsa</i>	6.6	5	28	S/ M	Yes	Poor	Historic branch failure. Trunk inclusion.	Yes
27	Pohutukawa <i>Metrosideros excelsa</i>	7	6	35	S/ M	Yes	Fair	Girdling roots. Services within 1.0 of trunk.	Yes
28	Pohutukawa <i>Metrosideros excelsa</i>	7.5	6	47 x 2 stems	S/ M	Yes	Fair	Thinning open canopy. Large prune wound on trunk.	Yes
29	Pohutukawa <i>Metrosideros excelsa</i>	7.5	8	38	S/ M	Yes	Fair	Recent branch failure.	Yes
30	Pohutukawa <i>Metrosideros excelsa</i>	7.5	7.5	38 x 3 stems	S/ M	Yes	Good	Spreading canopy. Girdling roots.	Yes
31	Pohutukawa <i>Metrosideros excelsa</i>	7	7	35	S/ M	Yes	Fair	Open thinning canopy. Poor pruning events. Historic branch failure.	Yes
32	Pohutukawa <i>Metrosideros excelsa</i>	7.5	8	36	S/ M	Yes	Fair	Open thinning canopy. Previous pruning events. Branch end weight loading.	No

Tree No	Species	Height (m)	Spread (m)	Girth (cm)	Age	Protected	Health	Condition	Transplant potential
33	Pohutukawa <i>Metrosideros excelsa</i>	7	7.5	47 x 3 stems	S/ M	Yes	Fair	Branch/stem inclusions.	Yes
34	Pohutukawa <i>Metrosideros excelsa</i>	6	5	35	S/ M	Yes	Good	Small occluding stem wound.	Yes
35	Pohutukawa <i>Metrosideros excelsa</i>	7	6.5	46 x 2 stems	S/ M	Yes	Fair	Basal decay. Stem inclusion.	Yes
36	Pohutukawa <i>Metrosideros excelsa</i>	5	4	35 x 2 stems	S/ M	Yes	Fair	Basal wounds. Epicormic growth on trunk.	Yes
37	Pohutukawa <i>Metrosideros excelsa</i>	6.5	6	48 x 3 stems	S/ M	Yes	Good	Girdling roots.	Yes
38	Pohutukawa <i>Metrosideros excelsa</i>	6	5	25	S/ M	Yes	Fair	Girdling roots. Stem wounds.	Yes
39	Pohutukawa <i>Metrosideros excelsa</i>	7.5	8	40	S/ M	Yes	Good	Stem inclusions. Historic pruning events.	Yes
40	Pohutukawa <i>Metrosideros excelsa</i>	7.5	7.5	54 x 2 stems	S/ M	Yes	Good	Large surface roots. Historic branch failure.	Yes
41	Pohutukawa <i>Metrosideros excelsa</i>	7.5	7.5	54 x 2 stems	S/ M	Yes	Good	Large surface roots.	N/A
42	Pohutukawa <i>Metrosideros excelsa</i>	7.5	6.5	38	S/ M	Yes	Good	Large surface roots.	N/A
43	Pohutukawa <i>Metrosideros excelsa</i>	7.5	8	50 x 2 stems	S/ M	Yes	Good	Large surface roots. Historic branch failure.	N/A
44	Pohutukawa <i>Metrosideros excelsa</i>	7.5	7.5	35	S/ M	Yes	Good	Large surface roots. Historic branch failure.	N/A
45	Pohutukawa <i>Metrosideros excelsa</i>	7.5	7.5	55 x 3 stems	S/ M	Yes	Good	Large surface roots. Included stem union.	N/A
46	Pohutukawa <i>Metrosideros excelsa</i>	8.5	9.5	47	S/ M	Yes	Good	Large surface roots. Historic branch failure. End loading of lateral branches.	N/A
47	Norfolk Island pine <i>Araucaria heterophylla</i>	15	8	41	S/ M	Yes	Good	Minor girdling roots.	No
48	Norfolk Island pine <i>Araucaria heterophylla</i>	12	8	38	S/ M	Yes	Good	Minor girdling roots.	No
49	Pohutukawa <i>Metrosideros excelsa</i>	6	6	41 x 2 stems	S/ M	Yes	Fair	Forms part of a closely planted group.	No
50	Pohutukawa <i>Metrosideros</i>	7	6	47 x 3 stems	S/ M	Yes	Fair	Forms part of a closely planted group.	No

Tree No	Species	Height (m)	Spread (m)	Girth (cm)	Age	Protected	Health	Condition	Transplant potential
	<i>excelsa</i>								
51	Pohutukawa <i>Metrosideros excelsa</i>	6	6	38 x 3 stems	S/ M	Yes	Fair	Historic branch failure. Forms part of a closely planted group.	No
52	Pohutukawa <i>Metrosideros excelsa</i>	6	4.5	30	S/ M	Yes	Good	Historic branch failure. Forms part of a closely planted group.	No
53	Pohutukawa <i>Metrosideros excelsa</i>	6.5	6	41 x 2 stems	S/ M	Yes	Good	Stem inclusions. Forms part of a closely planted group.	No
54	Pohutukawa <i>Metrosideros excelsa</i>	7.5	6.5	44 x 3 stems	S/ M	Yes	Good	Forms part of a closely planted group. Historic pruning events.	No
55	Pohutukawa <i>Metrosideros excelsa</i>	6.5	5.5	44	S/ M	Yes	Good	Forms part of a closely planted group. Historic pruning events.	No
56	Pohutukawa <i>Metrosideros excelsa</i>	7.5	6	65 x 4 x stems	S/ M	Yes	Good	Forms part of a closely planted group. Historic pruning events.	No
57	Pohutukawa <i>Metrosideros excelsa</i>	7.5	5.5	73 x 5 stems	S/ M	Yes	Good	Forms part of a closely planted group. Historic pruning events.	No
58	Pohutukawa <i>Metrosideros excelsa</i>	6.5	6	50 x 4 stems	S/ M	Yes	Good	Forms part of a closely planted group. Historic pruning events.	No
59	Pohutukawa <i>Metrosideros excelsa</i>	7.5	6.5	45 x 2 stems	S/ M	Yes	Good	Forms part of a closely planted group. Partially suppressed	No
60	Pohutukawa <i>Metrosideros excelsa</i>	8	7	65 x 3 stems	S/ M	Yes	Good	Large surface roots.	Yes
61	Pohutukawa <i>Metrosideros excelsa</i>	7	6	30	S/ M	Yes	Fair	Thinning open canopy.	Yes
62	Pohutukawa <i>Metrosideros excelsa</i>	6.5	6	57 x 3 stems	S/ M	Yes	Good	Historic basal pruning	Yes
63	Pohutukawa <i>Metrosideros excelsa</i>	7	7	35 x 2 stems	S/ M	Yes	Good	Historic pruning events. Drawn up.	Yes
64	Pohutukawa <i>Metrosideros excelsa</i>	7.5	5	31	S/ M	Yes	Good	Large surface roots	Yes
65	Pohutukawa <i>Metrosideros excelsa</i>	7	5.5	25	S/ M	Yes	Good	Mower damage to surface roots	Yes
66	Pohutukawa <i>Metrosideros excelsa</i>	8	7	50 x 4 stems	S/ M	Yes	Good	Historic pruning events. Forms part of a closely planted group of 3.	No
67	Pohutukawa <i>Metrosideros excelsa</i>	6	6.5	75 x 4 stems	S/ M	Yes	Good	Historic pruning events. Forms part of a closely planted group of 3.	No

Tree No	Species	Height (m)	Spread (m)	Girth (cm)	Age	Protected	Health	Condition	Transplant potential
68	Pohutukawa <i>Metrosideros excelsa</i>	7	6	57 x 3 stems	S/ M	Yes	Good	Historic pruning events. Forms part of a closely planted group of 3.	No
69	Pohutukawa <i>Metrosideros excelsa</i>	6	7	35	S/ M	Yes	Good	Thinning canopy. Girdling roots	Yes
70	Pohutukawa <i>Metrosideros excelsa</i>	6	7.5	35	S/ M	Yes	Good	Thinning canopy. Girdling roots	No
71	Pohutukawa <i>Metrosideros excelsa</i>	6	5.5	30	S/ M	Yes	Good	Large surface roots. Leaning to north.	Yes
72	Pohutukawa <i>Metrosideros excelsa</i>	8	8	150	S/ M	Yes	Good	Located adjacent to site on Council land. Large base, multi leader	N/A
73	Pohutukawa <i>Metrosideros excelsa</i>	10	7	100	S/ M	Yes	Good	Located adjacent to site on Council land. Large base, multi leader	N/A
74	Pohutukawa <i>Metrosideros excelsa</i>	10	7	220	S/ M	Yes	Good	Located adjacent to site on Council land. Large base, multi leader	N/A
75	Pohutukawa <i>Metrosideros excelsa</i>	12	7	220	S/ M	Yes	Good	Located adjacent to site on Council land. Large base, multi leader	N/A
76	Pohutukawa <i>Metrosideros excelsa</i>	10	6	220	S/ M	Yes	Good	Located adjacent to site on Council land. Large base, multi leader	N/A

5.0 Proposed works

5.1 Trees proposed for retention within the site

A row of six (6) Pohutukawa trees within the site are proposed for retention (Trees 41-46).



Figure 2 – Trees 41-46

Following arboricultural feedback to the project team, the sites earthworks plan and proposed underground services locations have been altered, in order to help successfully retain these trees - as is visible in the following screenshots from the Engineering plan set;

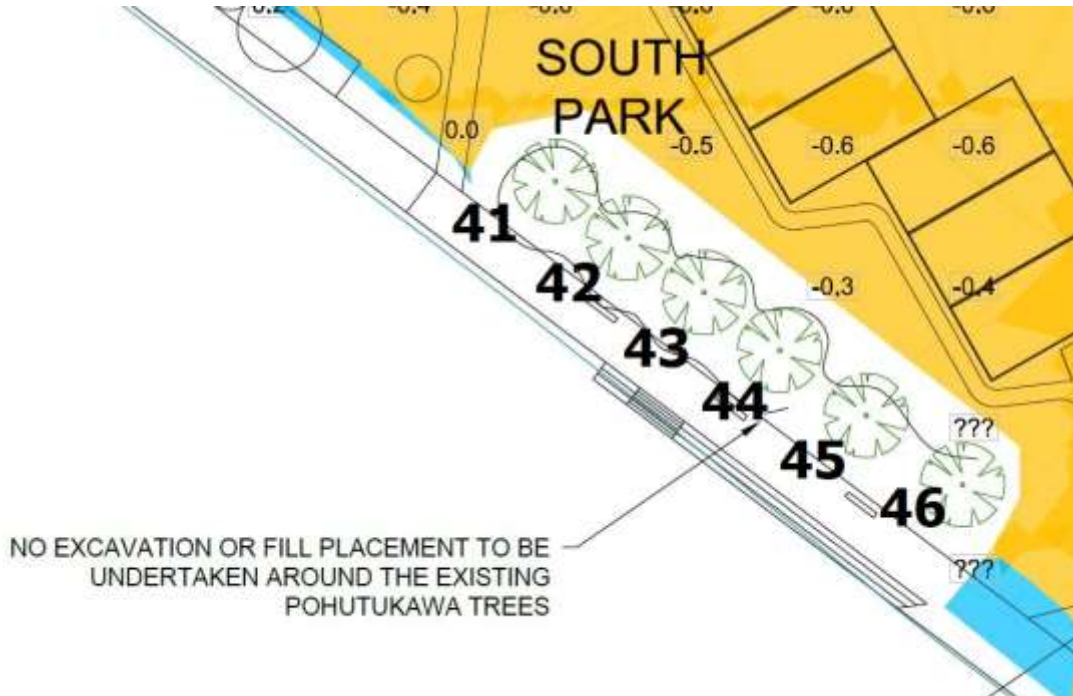


Figure 3 – Earthworks within proximity of the subject Pohutukawa trees. The closest earthworks are further than 4.0m from the trees

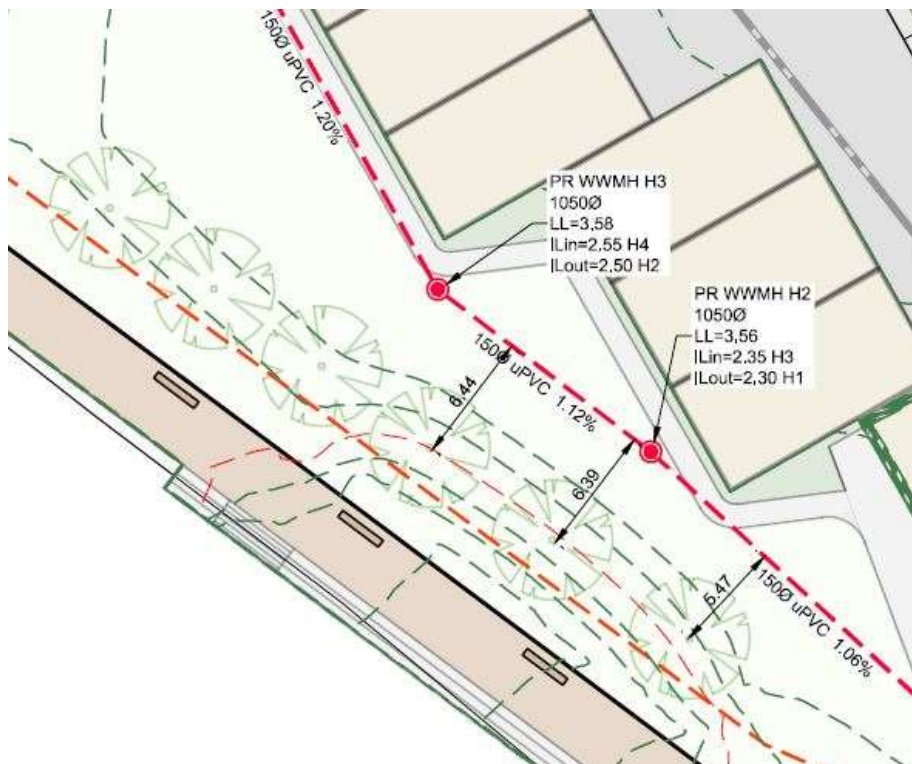


Figure 4 – Proposed wastewater line in relation to these Pohutukawa Trees

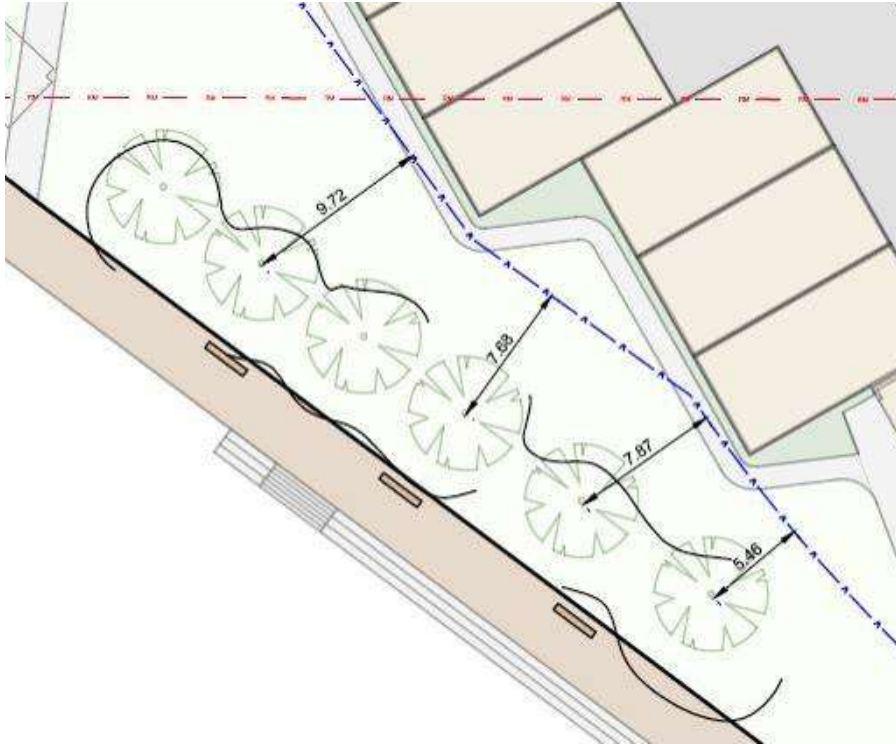


Figure 5 – Proposed water line in relation to these Pohutukawa Trees

Based on the above detailed extent of works, it is assessed that these trees can successfully be retained – provided the tree Protection Methodologies are adhered to.

5.2 Trees proposed for retention adjacent to the site

A row of five (5) Pohutukawa trees are located on Council land adjacent to the site's existing and proposed entry road. Although works will be undertaken within the protected root zone of these trees, arboricultural measures will be employed to ensure the health of the trees is protected from the effects of these works (tree protection measures are detailed in Section 8.0). These works include upgrading the road, the existing sanitary sewer pump station and to provide new car parks. Pruning of the lower branches on the western aspect of the tree grouping is also proposed.



Figure 6 –Panorama photograph of Trees 72-76. Note the approximate location of the upgraded road edge marked in orange, and the upgraded wastewater pump location ringed in red

The following screenshot from the earthworks plan indicates the extent of the works that are required for the upgrading works;

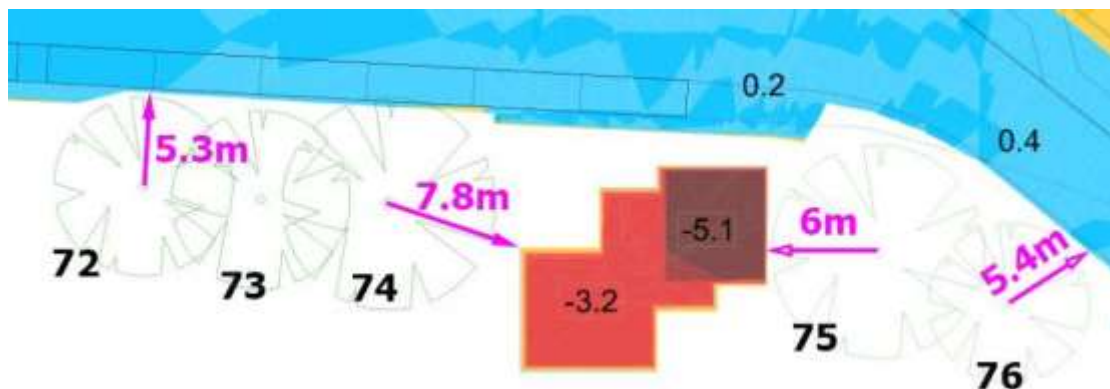


Figure 7 – screenshot from the earthworks plan

The earthworks required for the upgraded internal road are appropriately distanced from the subject trees and are not extensive in depth. With regard to the wastewater pump station, the project engineer has provided the following comments;

The pump station is an upgrade of the existing one and utilises some elements of the existing one, so it cannot be relocated (as we would still need to excavate in this area to decommission the existing one). Pump station depth cannot be adjusted. The excavation could be shored with sheet piling or similar to ensure we don't need extensive batters near the trees.

Overall, the proposed earthworks extent around these trees is acceptable from an arboricultural perspective and will enable the proposed development

of the site. All earthworks within the root zones of these trees are to be supervised by the works arborist.

The proposed pruning of these Pohutukawa trees would only involve a minor canopy reduction on the lower tree canopy that faces the site. This pruning would be carried out in accordance with the Permitted Pruning standards as detailed in E16.6 of the AUP.

5.3 Trees proposed for removal/transplant

The proposed marina development includes terrace housing, apartments, commercial spaces, and two parks - spread across three neighbourhood precincts: south, central and north.

Transplanting of some of the best Pohutukawa specimens is proposed, as well as large grade replacement Pohutukawa, and other native tree species, mixed shrub, and groundcover planting. The following Tree Strategy plan designates the locations for these trees in the future landscape;



Figure 8 – Boffa Miskell Tree Strategy Plan

Forty-one (41) trees have been assessed as potential candidates for successful transplanting. The proposed planting plan/tree strategy will include thirty-one (31) Pohutukawa as part of the future landscape (it is anticipated that these 31 will be from the transplanted stock of trees).

This surplus of suitable trees ensures that the best specimens will be selected, and also provides an additional stock of trees if some of the transplanted trees were to decline.

5.4 Summary of the proposed works

All of the trees within the site are protected due to the adoption of the E16 Open Space Rules – as specified in the AUP for Marina zoning.

Overall, the removal of sixty-five (65) protected trees is proposed. Six (6) protected Pohutukawa trees will be retained and protected in situ (with earthworks proposed within a minor percentage of their root zone areas).

The removal of these trees is assessed as a **Restricted Discretionary Activity** under **E16.4.1(A10)** of the AUP. An assessment against the relevant **E16.8.2 Assessment Criteria** is provided in Section 7.0 of this report.

Twenty-two (22) trees within the site have another layer of protection under **E15.4.1(A21)** of the AUP because they are greater than 3m in height, are indigenous, and are within 20m of the MHWS. As detailed, six (6) of these trees are being retained and protected in situ.

The removal of the trees within 20m of the MHWS is assessed as a **Restricted Discretionary Activity** under **E15.4.1(A21)** of the AUP. An assessment against the relevant **E15.8.2 Assessment Criteria** is provided in Section 7.0 of this report.

6.0 Transplanting of trees

6.1 Factors that will determine whether trees can be successfully relocated are:

- the existing health and structure of the tree
- the relocation of this tree at a suitable time of the year
- soil type and profile and its influence on obtaining a viable rootball
- location of services both above and below ground in close proximity to the tree
- being able to obtain the necessary access for required machinery
- planting of the trees in their new location
- aftercare maintenance following the transplant

Each point is discussed in more detail as follows:

6.2 Health and Structure

Pohutukawa, as a species, is considered a suitable species for transplanting due to its tolerance of root severance during the transplanting process and high transplanting success rate; however, quality of stock and aftercare are important factors in any transplanting process.

6.3 Suitable Time of Year to Transplant

It is recommended that these trees are transplanted during the standard planting period from late March to mid-September, although I would recommend that autumn would be the most optimal time. Transplanting could be done outside these months; however, the process can become more complex and there would need to be an increase in watering and aftercare maintenance.

6.4 Obtaining a Viable Rootball

A quality rootball would be required to be excavated and maintained intact throughout the relocation process so as to successfully transplant the trees.

Soil auger samples revealed the presence of topsoil to approximately 300mm depth - with moist clay extending to a depth of 1.1m at which point the auger was terminated. The presence of clay at this depth is very conducive to the excavation of a suitable rootball, as clay holds together well once excavated.

The approximate size of the excavated rootball would be between 2.5 to 3.6m in diameter. The prepared rootball diameter of an open grown tree should be approximately ten times the diameter of the stem, as measured at 1.0m above ground level.¹

To reduce the likelihood of the rootball collapsing during the relocation process the sides of the rootball would need to be firmly secured with specially designed straps attached to the tree frame used to lift and transport the tree.

To further reduce the likelihood of the rootball suffering a partial or complete collapse during relocation, the lifts should be kept to a minimum, as each time the tree is set down and then lifted again, it has the potential to cause a partial or complete failure of the rootball.

6.5 The Location of Services in Proximity to the Tree

The presence of underground services in proximity to the trees would need to be established prior to the transplanting process, as this would potentially impact upon a successful transplant.

6.6 Access for required Machinery

It is assumed that there would be adequate access for a small sized excavator (approximately 3-5 tonne) to dig the required rootball. Rootballs of these dimensions would require a larger excavator (approximately 20 tonne) or truck mounted Hiab to transport the prepared trees within the site.

6.7 Planting of the Trees in their New Location

The size of the trees and their prepared rootballs needs to be considered during the construction phase of the site development.

Adequate drainage to prevent ponding of the new planting locations would be required to enable the successful establishment of the transplants. If it was found that natural drainage was insufficient, then it is recommended that this should be installed.

To ensure the trees are given the best possible environment to flourish in their new locations, it is recommended that compost be incorporated into the upper level of the topsoil used as backfill around the rootball. The entire rootball should be well watered and then covered with a 150mm thick layer of well-aged mulch out to approximately the extent of the driplines.

In view of the size of rootball required to transplant the trees successfully, it is not considered economically viable or practical to transport the trees to potential planting locations off site, as this would require over dimensional loads and heavy lifting gear.

6.8 Aftercare Maintenance

To ensure that the effects of the transplanting process are minimised and the trees are given the best possible conditions to thrive in after planting, it is recommended that an aftercare maintenance programme is set in place for approximately 3 years following transplanting.

This maintenance should be undertaken by personnel with experience in providing aftercare to large, transplanted trees.

The maintenance should include but not limited by the following:

- Monitoring moisture levels in the planting pits and rootballs
- Monitoring of tree condition
- Watering
- Adjustment to guying or staking systems (if any)
- Maintaining the mulch level
- Fertilising as required
- Pest and disease control
- Formative pruning to include the removal of deadwood and crossing branches
- Weed control

Near the completion of each year's maintenance the trees should be assessed by an arborist and the following year's maintenance programme prepared based on the results of that assessment.

7.0 Assessment criteria

7.1 Assessment of trees within 20m of the MHWS

As detailed in Sections 4.0 and 5.0, sixteen (16) trees protected under E15.4.1 (A21) are proposed for alteration/removal. Therefore, an assessment of the proposed works is provided below against E15.8.2 Assessment Criteria.

E15.8.2. Assessment criteria - Vegetation management and biodiversity		
Item		Discussion
1a(i)	<i>the extent to which the vegetation alteration or removal is minimised and adverse effects on the ecological and indigenous biodiversity values of the vegetation are able to be avoided, remedied or mitigated</i>	All trees that are designated as appropriate for transplanting will be transplanted. Preference has been given to transplant the larger and healthier of the existing trees. Given the scale of proposed development at the site (cut + fill etc.); this is considered the best option for minimising the adverse effects on the ecological and indigenous biodiversity values.
1a(ii)	<i>whether vegetation removal will have an adverse effect on threatened species or ecosystems</i>	No threatened species or ecosystems have been identified at the site. As detailed on the Boffa Miskell Tree Strategy, the future landscape will include a greater number of trees and tree species. This will increase the sites overall biodiversity. One hundred and twenty-nine (129) trees are proposed as part of the future landscape.
1a(iii)	<i>the extent to which the proposal for vegetation alteration or removal has taken into account relevant objectives and policies in Chapter B7.2 Indigenous biodiversity, B4</i>	Indigenous fauna or biodiversity would not be significantly compromised by the proposed works as the majority of the larger healthy Pohutukawa will be transplanted and will continue to thrive. Planting of new trees in the future landscape forms part of the development proposal. This will increase the site's

	<i>Natural heritage, Chapter E18 Natural Character of the coastal environment and E19 Natural Features and natural landscapes in the coastal environment</i> <i>B7.2 - Indigenous biodiversity</i>	overall biodiversity.
	<i>B4 - Natural heritage</i>	The subject Pohutukawa trees are not listed as heritage trees and are all described as semi-mature. Effort is being made to retain trees via transplanting.
	<i>E18 - Natural Character of the coastal environment</i>	The subject property is a coastal environment. However, the proposed works would not compromise the natural character of the site – as there are a greater number of trees being introduced than removed. It is noted that the existing site is predominantly made up of carparking and mown grass.
	<i>E19 - Natural Features and natural landscapes in the coastal environment</i>	Long term, neither natural features nor landscapes will be adversely affected by the proposed vegetation alteration. The future landscape will have a greater number of trees – which will appropriately mitigate the proposed tree removals
1b(i)	<i>the extent to which the vegetation serves to avoid or mitigate natural hazards and the amount of vegetation to be retained or enhanced</i>	The subject trees are planted within and surrounding a carpark. It is not anticipated that they were planted to mitigate natural hazards. However, the majority of the larger Pohutukawa trees will be transplanted back to similar positions that they were originally growing in. The reason that these trees are not being retained in situ is because 2-3m of fill is proposed for vast areas of the coastal strip of land (where these trees are located). It is not practicable to retain these trees with such large alterations to the ground levels.
1b(ii)	<i>the extent to which the vegetation alteration or removal will increase natural hazard risks</i>	The protected tree removal/relocations/alterations are all located on the northern side of the site – an area that is already encompassed by the Bayswater Marina, which is protected by the presence of a rock rip-rap seawall. This marina acts as a buffer for natural hazards such as erosion through wave action. This site is being further protected by increasing the ground levels of this coastal strip – and thus avoiding future inundation, even taking into account sea level rise.
1b(iii)	<i>whether the vegetation alteration or removal is necessary to mitigate an identified bushfire risk</i>	Not applicable to this proposal.
1c(i)	<i>the extent to which vegetation alteration or removal will adversely affect soil conservation, water quality and</i>	The works will be carried out in accordance with modern sediment control measures. The long-term prospects for this site are enhanced via the increase in levels adjacent

	<i>the hydrological function of the catchment and measures to avoid remedy or mitigate any adverse effects</i>	to the coast (prevent coastal inundation) which will arguably reduce erosion and increase water quality over time.
1d(i)	<i>the extent to which vegetation alteration or removal will have adverse effects on the values identified for scheduled outstanding natural landscape, outstanding natural features, outstanding natural character and high natural character areas</i>	The environment in which the trees stand in is not identified as being any one of the four named scheduled natural environments.
1d(ii)	<i>the extent to which vegetation alteration or removal adversely affects landscape, natural features and natural character values particularly on adjacent public space including the coast, reserves and walkways and measures to avoid, remedy or mitigate any adverse effects</i>	There will be a temporary loss of the listed values during the construction phase of the development. However, with the transplanting of the trees back into the landscape and introduction of extra landscape planting, the natural character will be enhanced (mid-long term) via the increase in biodiversity.
1e(i)	<i>the extent to which the vegetation alteration or removal will have adverse effects on the amenity values of any adjacent open space including the coast, parks, reserves and walkways and measures to avoid, remedy or mitigate any adverse effects</i>	See comment for 1d above – the mid to long term amenity will also be enhanced.
1f(i)	<i>whether the vegetation alteration or removal is necessary to enable reasonable use of a site for a building platform and associated access, services and living areas, and existing activities on the site</i>	The alteration and removals are required in order to facilitate the proposed landscape use.
1f(ii)	<i>the extent to which the vegetation removal is necessary taking into account the need for, or purpose of, the proposed building or structure</i>	As detailed, major earthworks are proposed throughout the site, with cut + fill of several metres in many areas.
1f(iii)	<i>the extent to which the vegetation alteration or removal is necessary to enable reasonable use of the site for farming purposes</i>	Not applicable to this proposal.
1f(iv)	<i>whether the vegetation alteration or removal will</i>	Several new roads are being constructed as part of the precincts. This development includes terrace housing

	<i>improve the reliance and security of the network utility, or road network</i>	and apartments within walking distance to the ferry terminal. This will provide an opportunity for future residents/commuters to use public transport.
1f(v)	<i>whether the vegetation alteration or removal is necessary for a structure that has a functional or operational need to be in the proposed location</i>	As detailed, the tree alteration/removals are proposed in order to carry out major re-design including significant alterations to the ground levels.
1f(vi)	<i>the extent of the benefits derived from infrastructure and the road network</i>	See comment for 1f(iv) above.
1g(i)	<i>whether there are practical alternative locations and methods including consideration of an application to infringe development control where this would result in retention and enhancement of vegetation on the site</i>	Transplanting of the majority of the larger Pohutukawa trees is proposed in order to facilitate the proposed development and to retain these trees as part of the future landscape. New native tree species will also be planted on the site.
1g(ii)	<i>whether the effects from the alteration or removal of vegetation and land disturbance can be minimised through works being undertaken on an alternative location on the site, and/or method of undertaking the works</i>	Transplanting of the trees is seen as the best practice - given the future landscape use
1h(i)	<i>the extent to which revegetation can remedy or mitigate adverse effects, including eco-sourcing and the ongoing maintenance of revegetation measures</i>	Transplanting the trees back into the site is in a sense eco-sourcing – as the trees were already growing in this area. Ongoing maintenance of the planting will be carried out as part of the sites landscaping strategy. Revegetation through new planting will also be undertaken.
1i(i)	<i>whether conditions of consent can avoid remedy or mitigate adverse effects including the imposition of bonds, covenants or similar instruments</i>	Conditions of consent are recommended in this report (see section 8). It is my opinion that the imposition of a bond or a covenant is not warranted in this case.

7.2 Assessment of tree removals against the E16 rules

E16.8.2 assessment criteria for the proposed removal of Tree 4		
1(a)	<i>the specific values of the trees including any ecological values with respect to water and soil conservation, ecosystem services, stability, ecology, habitat for birds and amelioration of natural hazards;</i>	The majority of the large Pohutukawa trees that are in good health will be transplanted back into the site. As detailed on the Boffa Miskell Tree Strategy, the future landscape will include a greater number of trees and tree species. This will increase the sites overall biodiversity - one hundred and twenty-nine (129) trees are proposed as part of the future landscape.
(b)	<i>the loss of amenity values that tree or trees provided</i>	There will be a temporary loss of the listed values during the construction phase of the development. However, with the transplanting of the trees back into the landscape and introduction of extra landscape planting, the natural character will be enhanced (mid-long term) via the increase in biodiversity.
(c)	<i>the risk of actual damage to people and property from the tree or trees including the extent to which adverse effects on the health and safety of people have been addressed as required under health and safety legislation;</i>	The subject trees do not pose any significant risks to people or property – outside of extreme weather events. The trees will be transplanted by an experienced contractor who will ensure that the trees are securely anchored during storage, and the construction phase of the project.
(d)	<i>any alternative methods that could result in retaining the tree or trees;</i>	Due to the scale of the proposed development, and proposed grade changes over the majority of the site, it is not considered practical to retain the trees in situ. Therefore, the majority of the larger trees that are in good health will be transplanted.
(e)	<i>the degree to which any proposed mitigation adequately compensates for the values that trees provide;</i>	Mitigation planting is proposed as part of the development proposal. From an arboricultural perspective the proposed planting will adequately compensate for the values that the existing trees provide.
(f)	<i>the degree to which the proposal is consistent with best practice guidelines for tree management;</i>	The list of Tree protection methodologies that are detailed in Section 8.0 of this report will ensure that the works are carried out in accordance with best practice.
(g)	<i>methods to contain and control plant pathogens and diseases including measures for preventing the spread of soil and the safe</i>	The subject trees were in good health at the time of inspection. The works arborist will monitor the condition of the trees, including any presence of Myrtle rust – with correct biosecurity protocols

	<i>disposal of plant material;</i>	followed.
(h)	<i>the provision of a tree works plan to address the effects of the works on the tree or trees and outlining the proposed methods to be used, and where applicable: (i) the provision of a landscape plan; or (ii) consistency with any reserve management plan.</i>	A comprehensive Tree Protection Methodology is outlined in Section 8.0 of this report.
(i)	<i>the need for the direction and supervision of an on-site monitoring arborist while the works are being carried out;</i>	A works arborist supervising the arboricultural components of the project is one of the conditions that detailed in the Tree Protection measures, in Section 8.0 of this report
(j)	<i>the functional and operational needs of infrastructure; and</i>	Several new roads are being constructed as part of the precincts. This development includes terrace housing and apartments within walking distance to the ferry terminal. This will provide an opportunity for future residents/commuters to use public transport.
(k)	<i>the benefits derived from infrastructure.</i>	See comment for j above.

8.0 Tree Protection

The following tree protection measures should be adopted as conditions of consent to ensure that the works are carried out in accordance with best arboricultural practice.

(a) Prior to any works commencing at the site (including demolition), a meeting should be held at the site to discuss all issues pertaining to the protection of the trees and to gain a common understanding of the proposed tree protection measures and the relevant conditions of consent in that regard. Present at the meeting should be;

- The site foreman or project manager
- Council compliance
- The worksite supervisory arborist
- Other relevant subcontractors

(b) Protective fencing shall be put in place within the property to protect the root zone areas of Trees 41-46 & 72-76. This fencing shall consist of 1.8 metre steel mesh fencing and shall be placed beyond the canopy extents. It shall remain in place for the duration of the project. If any

works are required within the fenced off areas, the works arborist is required to be onsite for direct supervision.

- (c) The following activities shall not take place within the protective fences or the root zone of any tree that is proposed for retention;
- No storage of materials, spoil or equipment of any sort
 - No discharge or washings from fuels, oils or other toxic liquids including paint and concrete
 - No passage of vehicles or machinery – unless approved by the works arborist and appropriate ground protection measures are put in place to reduce compaction of the ground (e.g. track-matts and/or a layer of mulch).
- (d) Any excavations required within the root zones of trees proposed for transplanting or retention shall be supervised by the works arborist. Roots shall be treated by the works arborist in accordance with modern arboricultural practice, with all roots greater than 35mm retained where practicable. Retained roots shall be prevented from drying out with a layer of hessian, and protected from concrete with a barrier of polythene.
- (e) Any pruning of the trees shall be carried out by a qualified and Council approved arborist in consultation with the works arborist. The pruning would be carried out in accordance with the E16 Permitted Pruning Standards.
- (f) The recommended methodologies/aftercare that is detailed in Section 6.0 regarding the transplanting of trees shall be adhered to.
- (g) An onsite monitoring log shall be kept by the works arborist, logging the tree protection consent conditions and the details of any site visits.

9.0 Conclusion

This report details arboricultural information pertinent to the proposed Bayswater Maritime Precinct development.

- All of the trees within the site are considered protected under E16 of the AUP because they are greater than 4m in height and the land is zoned as Marina Zone. The E16 Open Space rules are adopted for the Marina Zoning – as specified in the AUP (below the F3.4.1 Activity table)

- Twenty-two (22) of the trees within the site are protected under E15.4.1(A21) of the AUP because they are greater than 3m in height, indigenous, and within 20m of the MHWS.
- Five protected Council trees are also within close proximity of the site boundary, so have been included in this assessment.

Due to the introduction of terrace housing, apartments, commercial spaces, and new parks, major earthworks are proposed across the site. As a result, the majority of the trees need to be removed/relocated.

Forty-one (41) of the Pohutukawa trees at the site have been highlighted as potential transplant specimens.

In total, there are;

- Seventy one (71) existing trees within the site (six (6) of which will be retained in situ)
- Proposed transplanting of approximately thirty-six (36) trees
- Proposed removal of approximately thirty five (35) trees
- Proposed protection/retention of five Council trees that have root zones that extend into the site

Consent is sought for the proposed removal/transplant of sixty-five (65) protected trees under **E16.4.1(A10)** of the AUP. This is assessed as a **Restricted Discretionary Activity**.

Sixteen (16) of these trees are greater than 3m in height, indigenous, and are within 20m of the MHWS. These removals/transplants are therefore also assessed as a **Restricted Discretionary Activity** under **E15.4.1(A21)**.

Tree Ownership Approval is also sought from the Council urban Forest Specialist for the proposed pruning and root zone alteration of the five Council owned trees.

One hundred and twenty-nine (129) trees are proposed as part of the future landscape. It is anticipated that thirty-one (31) of these will be obtained from the stock of transplanted Pohutukawa (this figure is anticipating the potential decline of up to five of the transplanted trees). Overall, the site's long term biodiversity will be enhanced following the implementation of the proposed planting.

The works are therefore assessed as acceptable from an arboricultural perspective, provided they are carried out in accordance with the Tree

Transplant Methodology and Tree Protection Methodologies detailed in Sections 6.0 & 8.0 of this report.

Please contact Peers Brown Miller Ltd if any further arboricultural input is required.



Chris Scott-Dye
Consultant Arborist
0211583946

Reviewed By:



Matthew Paul
Director
Peers Brown Miller Ltd



<p>HAMPSON & ASSOCIATES Ltd Land & Engineering Surveyors PO Box 302229 North Harbour Ph.(09) 414 0325 Fax (09) 414 0329 Email surveyors@hampson.co.nz</p>	<p>Client EMPIRE NOMINEES Ltd</p>	<p>Notes GEODEIC DATUM 2000 AUCKLAND VERTICAL DATUM</p>	<table border="1"> <tr> <td>Drawn</td> <td>Agreed</td> <td>Date</td> </tr> <tr> <td>LS</td> <td></td> <td>20/12/19</td> </tr> <tr> <td>Checked</td> <td>Agreed</td> <td>Date</td> </tr> <tr> <td>Verified</td> <td>Agreed</td> <td>Date</td> </tr> <tr> <td>Approved</td> <td>Agreed</td> <td>Date</td> </tr> </table>	Drawn	Agreed	Date	LS		20/12/19	Checked	Agreed	Date	Verified	Agreed	Date	Approved	Agreed	Date	<p>Drawing Title BAYSWATER MARINA</p>	<p>Project No. 6211 Scale 1:500(BA1) 1:1000(BA2) Drawing No. Rev. CD1 0</p>
Drawn	Agreed	Date																		
LS		20/12/19																		
Checked	Agreed	Date																		
Verified	Agreed	Date																		
Approved	Agreed	Date																		

TREE STRATEGY

KEY:

- TRANSPLANTED POHUTUKAWA (31)
- KARAKA (15)
- TARAIRE (15)
- TAWAPOU (10)
- NIKAU PALM (46)
- CABBAGE TREE + LANCEWOOD (12)



