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Arboricultural Assessment of Effects

of

A concrete pathway, boardwalk and bridge construction, along with upgrading an aggregate track.

At

Tamaki Path, Stage 2 – Point England

Prepared for Andrew Mackenzie
reNature

Prepared by Sean McBride
Director

Date 28 March 2024_V2
Job ref # 2758
Reviewed by Tracey Funnell

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1. Instructions

1.1 **Auckland Council's** Community Facilities will upgrade the network of walking tracks and construct new concrete pathways, bridges and boardwalks at Tamaki Path, referred to as Stage 2, in Point England. The upgrades include renewing an aggregate pathway, constructing both 2 m and 3 m wide bridges and boardwalks, along with 2 m and 3 m wide concrete pathways. The project is part of a wider coastal pathway project that runs from Dunkirk Reserve to Wai-O-Taiki Bay. The Tree Consultancy Company have been engaged by reNature to provide an arboricultural assessment of the project as this relates to protected trees. The scope of services is as follows:

- Review the information provided, carry out a site visit and ground-based visual tree inspection
- Attend a site walkover with the project team
- Liaise with the project team around arboricultural limitations, and assist with design options
- Prepare a GIS Tree Plan, depicting key aspects of the proposal in relation to trees
- Prepare an arboricultural assessment, detailing our findings and any mitigating measures available
- Prepare and submit an application for Tree Owner Approval

2. Site description and summary of proposed activities

2.1 The Project site considered for this assessment is located within the coastal esplanade reserve in Point England running between the rear of Concord Place, to the north and terminating at Fernhill Place (Figure 1). The esplanade reserve contains a mixture of native bush area, streams, open pasture, coastal fringes and weed infested areas abutting residential properties. The area is under transformation with the development of denser residential development, park, and infrastructure improvements. One of the infrastructure projects is to create walking/cycling coastal path. This assessment is directly related to achieving this wider public asset. According to the Unitary Plan, a Significant Ecological Area overlay is present over certain parts of the forested areas within the Project area.



Figure 1 – Point England. Area of works withing red box (noting all works within council land)

- 2.2 The extent of the proposed works for the Project can be separated into three aspects:
- i. The first aspect is the construction of new 2 m and 3 m wide boardwalk and bridge structures, that will span over streams, valleys and overland flow paths. One 3 m wide bridge, with a length of approximately 28 m will be constructed from a Kainga Ora development at the rear of Concord Place, to the sports fields within Point England Reserve, where it will connect into other pathway networks (designed and constructed by others). A second 16 m long bridge, with 18-28 m long approaching boardwalks is proposed to be constructed over a valley to the rear of properties within Marion Place. Other smaller bridges and boardwalks are proposed.
 - ii. The second aspect of the work comprises constructing 2 – 3 m wide concrete pathways, which will serve as a primary alignment of Tamaki Path. The gradients of the pathway and bridges above have been designed for full accessibility, with the pathway alignment generally situated to the rear of adjacent private properties.
 - iii. The last aspect of the works is the renewal and upgrading of an aggregate pathway, that traverses through an area of both native and exotic vegetation. Small boardwalks will be constructed over streams and overland flow paths, and minor realignments are proposed to allow for more gentle gradients.
- 2.3 The Project is depicted in the following drawings, which have been relied upon for my assessment. The final layout for the works has undergone revisions to ensure that the encroachments on trees are minimised to the extent practicable. There are further allowances within the final construction alignment to minimise the arboricultural impacts even further.
- Engineering drawings prepared by reNature, dated 31 January 2024, Revision 1.

3. Site assessment and limitations

- 3.1 I visited the Project site on the 29th of November 2024 with the wider project team, including a council ecologist. At this meeting, discussions were had around the types of construction activities that were likely to occur within the Project area, and refinements in the alignment were made to minimise impacts on trees, where constraints were initially identified. The alignment new pathway infrastructure was then revised, following specialist input.
- 3.2 During February and March 2024, I undertook additional site visits to investigate the Project area in more detail. Given the nature of the site, being principally new areas with dense vegetation, I recorded the general species type and condition of various areas. Where considered arboriculturally warranted, I captured individual tree locations and removed more specific details on the overall condition of that tree, along with estimated heights and canopy spreads. Several of these trees had their trunks measured, to be able to project structural root zone areas. Overall, the tree inspection comprised a ground-based visual inspection in the realms of what is defined as Level 2 Visual Tree Assessment, and any obvious tree risk features noted.
- 3.3 The individual tree locations that were captured, were recorded using the GPS capabilities of a smartphone, and all relevant data was entered into a data collection application. By using the GPS capabilities of a smartphone, there is a limitation on the accuracy of the trunk position shown.
- 3.4 Appended to this assessment is a set of Tree Location Plans (drawings 2758_001_A to 2758_003_A), that depicts the proposed alignment and the key areas that will be discussed in this assessment, i.e., where there are specific tree constraints that warrant consideration for consenting purposes and for implementation purposes (e.g., during construction). The individually recorded trees and referenced by number in the appended Tree Inventory (Appendix D).

4. Arboricultural assessment of effects

- 4.1 In terms of effects, the track network upgrades are separated into the three principal sections, defined within 2.2, each of which is discussed as follows in terms of the arboricultural characteristics, constraints, the proposed upgrades, and the key tree alterations required. Each section is labelled on the appended tree plans for interpretation of the following text.
- 4.2 One section of track adjacent to TP 2 and TP 4 will be decommissioned where locally sourced forest duff will be strategically placed at the track entrances to cover the surface and discourage future use when within the forested areas. Over time, native vegetation will naturalise these areas.

Bridge and boardwalk structures

- 4.3 A new 25 m or so long 3 m wide bridge/boardwalk is proposed to be constructed at the rear of 10 Concord Place. Most of the residential properties within Concord Place are planned to be redeveloped by Kainga Ora, and as part of these works, new pathways will be constructed within that development (outside of this Project scope). The new bridge is proposed to span over a stream and provide a connection to the sports.
- 4.4 Within the reserve, some 2 m from the property boundary is a semi-mature pohutukawa (tree 15) of good condition. Of the trees noted within the reserve, this, and other immediately surrounding native trees, are some of the more mature within the park.
- 4.5 Currently the bridge is proposed on the trunk edge, where removal would be required. There is scope to push the bridge at least 2 m to the southwest, where potential impacts will be significantly reduced. With the suggested new position of the bridge, only minor canopy pruning will be required (i.e. pruning that will have minimal impact on tree health and shape).
- 4.6 The piers for the bridge will be some 4 m away from the base of the tree, and indiscriminate root loss in these areas will be sufficiently clear of the tree, to ensure insignificant impacts occur. This is contingent on adequate arboricultural supervision being undertaken during construction.

On the southern side of the bridge, the landing will be positioned where a fallen poplar is located, taking advantage of the resulting cleared area. The removal of one 5 m or so tall kanuka, and smaller cabbage tree and mahoe will be required (figure 2), however, the position minimises the need to removal additional vegetation.



Figure 2 – Landing to be positioned where fallen poplar is located. Kanuka, whiteywood and cabbage tree for removal circled

- 4.7 A second 38 m or so long boardwalk is proposed to the rear of 5 to 7 Teuila Grove, in an area that is dominated by weedy plant species, and small native plants such as mahoe and kawakawa. Several mature poplar trees are further west of the bridge; however, other self-seeded poplar trees are adjacent and within the alignment of the bridge, and these will require removal (Figure 3). In addition to this, an early mature puriri tree, which is in poor health, will require removal. Arboriculturally, the puriri is not a specimen considered to warrant mandatory retention, and its removal can be mitigated with replacement planting.



Figure 3 – Smaller self-seed poplar for removal

- 4.8 Midway along TP 2, the aggregate track passes over a stream and was wet underfoot at the time of inspection. As part of the renewals, it is proposed to construct a new boardwalk. Near the boardwalk alignment is a large fallen macrocarpa that will require removal. In addition to this, the occasional smaller native plant may require removal, and it is my view this removal will be relatively unnoticeable.
- 4.9 To the north of this boardwalk, and within TP 3 alignment, a 23 m or so long boardwalk will be constructed over an overland flow path. The alignment of the boardwalk will span across an area dominated by privet, with the occasional mapou, and removal will be required. None of this vegetation is arboriculturally remarkable (Figure 4).



Figure 4 – Approximate location of boardwalk

- 4.10 The last bridge/boardwalk of significance within the Project area is a 16 m long bridge, with an 18 m and 28 m boardwalk leading up to it from each side. The boardwalk is to replace a steep section of existing track and small bridge. To ensure the new structure is all-accessible, the height will be increased, with a maximum gradient being no more than 5%. The alignment is also to be straightened over the stream.
- 4.11 Immediately adjacent to the existing bridge is a semi-mature karo tree that has self-seeded under the bridge and formed a sweeping trunk from underneath (figure 5), to have a trunk that is immediately adjacent to the structure. This karo will require removal to construct the new bridge. There is a good opportunity to undertake enhancement native planting adjacent to the stream, which will mitigate the tree removal.



Figure 5 – Karo for removal

Concrete pathways

- 4.12 Several 2 m and 3 m wide concrete pathways are proposed to be constructed along the entire length of the project area. The southern most section of the concrete path will commence from adjacent to 104 Taniwah Street, connecting into an existing concrete path. Along the private property boundary, the site drops relatively steeply to the existing track network, and in order to construct the path with an adequate grade, a retaining wall will be required to be constructed within the reserve. The earthworks to construct the retaining wall will compromise the health and longevity of an 8 m or so tall ash tree (Figure 6), which is overall a fair specimen. Relocating the path to another location will impact a greater number of trees, therefore, from an arboricultural perspective, the current alignment is the preferred.



Figure 6 – Ash tree proposed to be removed

- 4.13 The retaining wall and pathway will sweep around to align roughly parallel with the rear of the private properties, passing through a group of native, exotic and pest plant species of up to some 5 m in height. From an arboricultural perspective, the majority of the vegetation is insignificant.
- 4.14 Where the path is adjacent to 8 Manaaki Crescent, the alignment traverses past a mature titoki, which is assessed to be a very good specimen. The final alignment of the concrete path is to be clear of this tree, to ensure no long-term sustained impact occur. To achieve this, the removal of a 3 m or so tall puriri that is in between the titoki and property boundary. The puriri is overall in poor health, and poor future prognosis.
- 4.15 From the above, the concrete path heads towards a pasture area, where minimal trees are present. Before the boardwalk approach, it does encroach into the root zone of a mature gum and willow tree, both of which did not have any obvious signs of tree risk features that would warrant intervention. The canopy of the tree hangs low, and crown lifting may be required. In terms of construction methodology, should large roots be encountered, then a root-bridging footpath may need to be constructed. Figure 7 below is an example of a root-bridging detail.

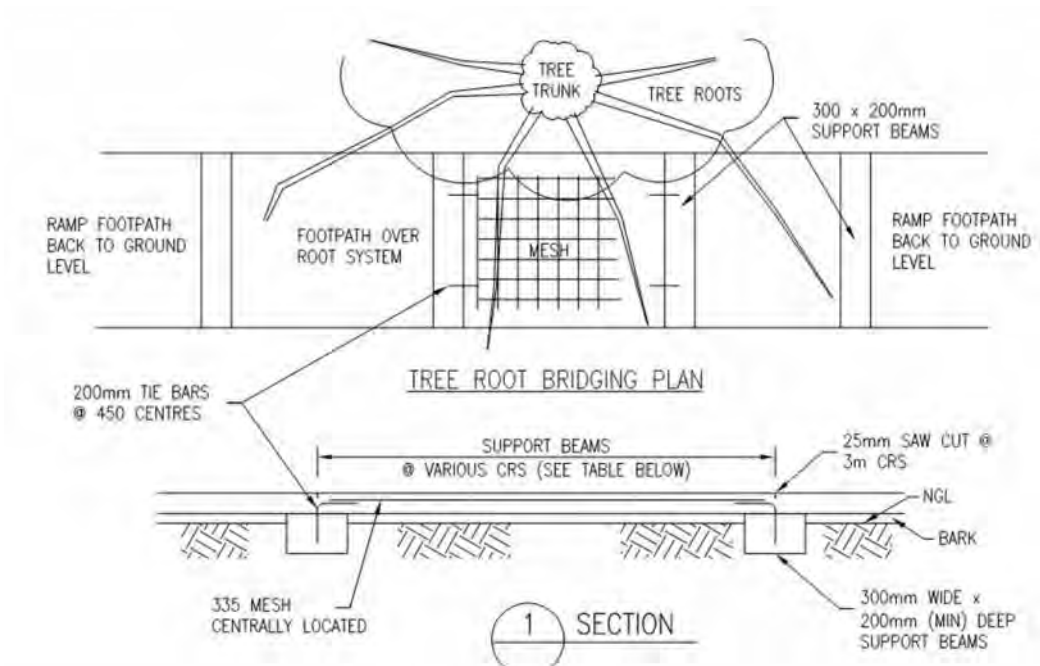


Figure 7 – Root bridging example

4.16 A 3 m wide section of pathway runs behind the private properties along Silverton Avenue. To the rear of 50 to 52A, and near the coastal bank, is a stand of seven mature pines (Figure 8). I have reviewed historical images available online, and it is clear this group of pines are declining, with evidence of relatively rapid decline occurring in the last 24 months. One of the pine trees canopy entirely has brown needles (indicating the tree has very recently died), and the remaining show early signs of the needle discoloration. Having reviewed the historical images (examples provided in Appendix E), it is my view that the remaining pine trees are likely to be dead or in poor health within the next five years.



Figure 8 – Pines proposed to be removed

4.17 The path alignment adjacent to the pines needs to navigate steep and undulating topography to provide a suitable gradient. To achieve this, a degree of cut and fill will be required, and given the depths of site cuts to achieve the gradients, the earthworks will encroach some 6 to 8 m away from the pine tree trunks. With declining tree health and the earthworks to achieve the suitable gradient, tree removal is required and, in my view, a prudent outcome. Replacement planting will be required to mitigate the tree loss.

Aggregate track renewal

4.18 An existing track, referenced as TP 2, traverses along a stream edge where relatively dense native and exotic vegetation is present. The principal native species within this group comprises mahoe, coprosma and kanuka, manuka and the very occasional puriri. Overall, the vegetation is not arboriculturally significant, however, the puriri have the potential to develop into large specimens.

4.19 Realignment of the track, in certain areas, is proposed to create a gentler gradient for uses. This will result in the requirement to remove vegetation. As mentioned above, the puriri trees have the capability to establish into large trees, therefore, removal of these should be avoided.

4.20 In this instance, ecological effects will almost certainly outweigh arboricultural, therefore, it is best to defer mitigation to the project ecologist.

Site access and materials transport

4.21 The contractors awarded the work will need to bring machinery and materials to the site, and likely follow the network of tracks. The use of additional materials may be needed in some areas to provide further protection to exposed roots, e.g., geotextile fabric or plywood sheets, or overhead warnings such as flagging tape to highlight overhead conflicts. Site access and machinery will need to be discussed at a pre-start meeting between the contractor and an appointed supervising arborist, and again at key stages of the project where new site access is required, and the machinery cannot practicably work from the new track surface.

General construction activities

4.22 All construction projects carry an inherent risk of damage to nearby trees. Such damage can be caused by machine tracking through tree root zones, soil churning and soil compaction in tree root zones, overhead branch strikes, spillage, or discharge of phytotoxic substances such as petrol or diesel. These sorts of collateral impacts can, in extreme cases, cause damage to trees, but can be practicably managed through an arboricultural work specification. A critical component of this is to appoint an appropriately qualified and experienced supervising arborist to assist with the work. The assessment of effects in this section is predicated on the recommended tree protection measures in Appendix A being implemented on site during construction.

4.22 Various other additional aspects of the construction works will require confirmation from the main contractor before works commence. These include details on the below; all of which have the potential to adversely affect vegetation:

- Transporting of materials to the area of works
- Excavations within the root zone of trees
- Removal of existing structures
- Laydown areas to temporary store materials/equipment
- Silt and sediment controls
- Placement of excess soil

- 4.23 Excavations to establish typical silt fencing (should it be required) has potential to sever tree roots. It is not uncommon for silt control measures to use non-dig methods, such as filter socks, when near the sensitive root systems of trees.
- 4.24 Excess soil is inevitable during the renewal works and the removal of this from the site may cause more damage, through machinery movement, than if the soil were to remain on site. It has been assessed that there are sufficient locations on site where excess soil can be placed and in a manner that the effect on trees will be negligible.
- 4.25 The impacts of the proposed upgrade are the removal of trees under 10 m in height due to direct conflict with the track alignment. The trees identified for removal are arboriculturally unremarkable or are in poor health and have been selected to enable healthier trees to remain and limit the impacts to their roots by redirecting the path around roots. The removal of additional understory vegetation along with root disturbance and potential damage to tree roots due to construction impacts associated with the upgrades are likely to occur but are expected to be minimal. Mitigation for the loss of the tree is best addressed by the project ecologist.

5. Statutory assessment

- 5.1 The proposed site activities require the removal of trees, work within protected root zones, and branch pruning of several trees along the alignment. The affected vegetation is situated within open space zoned land, within 10 m of an urban streams, coastal areas and within an area defined as a Significant Ecological Area under the Auckland Unitary plan. Chapters E15 and E16 of the Auckland Unitary Plan applies.
- 5.2 The proposed track upgrade triggers three rules from Chapter E15, according to rule A19 in Activity Table E15.4.1, Vegetation alteration or removal within 10 m of an urban stream is a Restricted Discretionary activity. Rule A22 states that no more than 25 m² of vegetation is to be removed from coastal areas, when within: (a) a horizontal distance of 20m from the top of any cliff with; (b) a slope angle steeper than 1 in 3 (18 degrees); and (c) within 150m of mean high water springs. In addition to this, Rule A43 in Activity table E15.4.2 states that vegetation alteration or removal in a SEA not otherwise provided for is a Discretionary Activity.
- 5.3 According to rule A10 in Activity Table E16.4.1, it is a Restricted Discretionary Activity to remove trees that are taller than 4 m or have a trunk circumference that is greater than 400 mm. The removal of trees to enable the track works exceed these measurements and is therefore a Restricted Discretionary Activity. Works will also be required within the root zone of numerous trees and will not comply with the permitted standards as it will result in the disturbance of greater than 20% of the protected root zone accordingly, work in the root zone of the site trees is a Restricted Discretionary Activity.
- 5.4 The Permitted Standard (E16.6.1) for pruning trees within open space zones specifies that the maximum **branch diameter to be pruned must not exceed 100 mm. And that no more than 20% of the tree's crown** may be removed in any one operation. Pruning is not anticipated to exceed either 20 % of any tree' crown or exceed 100 mm. Accordingly, the crown pruning is a Permitted Activity.
- 5.5 Furthermore, given the affected vegetation is in the open space zoned land, tree owner approval from **the council's urban forest specialist will be required.**
- 5.6 The following rules of the Unitary Plan apply to the project.

E15 Vegetation management and biodiversity

Activity Table E15.4.1

(A19) Vegetation alteration or removal within 10m of urban streams - Restricted Discretionary Activity

(A22) Vegetation alteration or removal of greater than 25m² of contiguous vegetation, or tree alteration or tree removal of any indigenous tree over 3m in height, that is within: (a) a horizontal distance of 20m from the top of any cliff with; (b) a slope angle steeper than 1 in 3 (18 degrees); and (c) within 150m of mean high water springs

Activity Table E15.4.2

(A43) Vegetation alteration or removal in a SEA not otherwise provided for – Discretionary activity

E16 Trees in open space zones

Activity Table E16.4.1

(A5) Tree trimming or alteration that complies with Standard E16.6.1 – Permitted Activity

(A8) Works within the protected root zone that do not comply with Standard E16.6.2 Restricted Discretionary Activity

(A10) Tree removal of any tree greater than 4 m in height or greater than 400 mm in girth – Restricted Discretionary Activity.

6. Conclusions and recommendations

- 6.1 Upgrading of the track and pathway network is proposed to occur in Point England, for a Project that is known as the Tamaki Path, a coastal pathway network running between Dunkirk Reserve and Wai-O-Taiki Bay. The Project will require the removal of vegetation, which has been assessed to be arboriculturally insignificant. Works in the root zone of other trees, along with tree pruning, is a requirement of the works, however this can be managed to levels that cause minimal effects on trees. The upgrading works includes aggregate path renewal, and the construction of new concrete pathways and boardwalks.
- 6.2 Work practices and alignments will need to be slightly modified in places and minor adjustments to the positions of boardwalk/bridge post holes will be needed in some areas to avoid important roots. Overall, though, the effects of the track upgrade on the surrounding trees can be managed in a fashion such that impacts to the existing trees will be minimal. This is contingent on the following recommendations being adhered to.
- 6.3 It is recommended that a suitably qualified and experienced on-site supervisory arborist (the 'works arborist') be engaged at the start of the project. The role of the works arborist is to supervise and coordinate all works and activities within the root zone of protected trees.
- 6.4 It is recommended that site access routes (e.g., for machinery etc.) be determined and agreed upon between the contractors and the appointed works arborist prior to a new access route being required. This includes the use of a helicopter to bring materials and equipment to the site.
- 6.5 It is recommended that the tree protection methodology in Appendix A be adhered to at all times during the physical works. Importantly, this is to include the appointment of a supervising works arborist.
- 6.6 It is recommended that any tree pruning work be carried out by trained and competent arboricultural professionals in accordance with current accepted best practice, e.g., MIS308. Trees are to be crown lifted to provide suitable clearances over the new track / boardwalk surface.

Please contact the author for further information.

Author

A handwritten signature in blue ink, appearing to read 'Sean McBride', is displayed on a light yellow rectangular background.

Sean McBride

Director

Appendix A – Tree protection methodology

1. Tree protection must form a part of any site-specific hazard management and is to be included in daily toolbox meetings and all site inductions.
2. No work shall take place within the root zone of the trees without prior approval from the works arborist. Any amendments to the tree protection methodology shall require prior written approval from the works arborist.

Pre-start

3. The consent holder is to engage the services of a suitably qualified and experienced on-site supervisory **arborist (the 'works arborist'), who is to supervise and coordinate all works and activities within the root zone of protected trees.**
4. Prior to any works commencing on site, the consent holder is to arrange a site meeting with the **works arborist, council's monitoring officer, council's arborist and the contractor who has overall responsibility** of the works. The purpose of this meeting is to discuss conditions of consent. At this meeting, the contractor responsible is to confirm to the satisfaction of the works arborist and council the following:
 - Programming of works
 - Site access and transportation of materials
 - Temporary storage areas for materials
 - Silt and sediment controls
 - Excavations within the vicinity of protected trees

Reporting

5. At the completion of works, the works arborist at their **discretion shall 'sign off' the work of the contractor**, and if requested, provide a brief account of the project to the council arborist (if necessary, with photos). The account of works shall include, but not be limited to:
 - The effects of the works to the subject trees
 - Any remedial work which may be necessary

Ground protection

6. No material is to be stored, emptied or disposed of in or around the root zone of any of the trees unless otherwise authorised to do so by the works arborist. Any material which is to be stored or temporarily placed in or around the root zone of any of the trees shall be stored carefully on an existing or temporary hard surface such as asphalt or plywood sheets respectively.
7. If during the course of the works, machinery or vehicle access / manoeuvring is required in or around the root zone of any of the trees, then those areas are to be covered with a protective overlay sufficient to protect the ground from being muddied, compacted, churned up or otherwise disturbed (for example **'Track Mats', or a layer of mulch or sand/SAP7 overlaid if necessary**, with a raft of wired planks, plywood or similar) (see detail TP-04).
8. If machinery / vehicles are to be operated or stored within the root zone area on an existing or temporary load bearing surface, then the machinery / vehicle shall not cause any detrimental effect to the tree(s) through compaction, physical damage, spillage of lubricants and fuels or discharge of waste emissions.

Excavations in and around root zones

9. All excavations which are to take place in or around the root zone of any of the trees shall be done so in conjunction with the works arborist, through a careful combination of pneumatic soil displacement, hand digging and machine excavation, and to the satisfaction of the works arborist. Where the works arborist deems it likely that roots will be encountered in the holes, then these areas shall first be explored using hand tools only, to check for the presence of such roots.
10. Where concrete is to be poured into excavations containing exposed roots, then all exposed roots shall first be covered in a layer of polythene to prevent the concrete from contacting the exposed root (see detail TP-06).

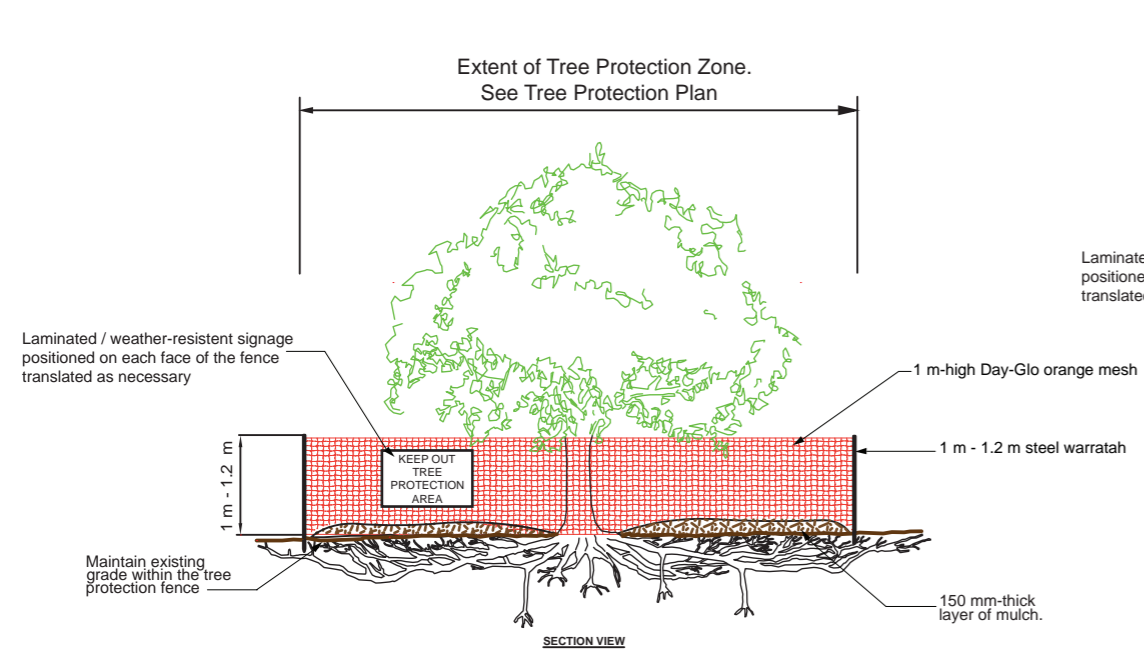
11. The cutting, breaking and lifting of any concrete and / or asphalt in and around the root zone of any of the trees shall be done so in conjunction with the works arborist through a careful combination of machine and hand operated equipment. Ideally, the concrete / asphalt will first be cracked or broken with a steel bar or sledgehammer, and the sections carefully lifted out by hand. At the discretion of the works arborist, the cutting, cracking, lifting and removal of concrete / asphalt may proceed with machinery, such as a concrete cutter, and / or small excavator. All excavators and machinery shall sit on the existing concrete / asphalt surface and work slowly backwards away from the trees.

Protecting and pruning roots

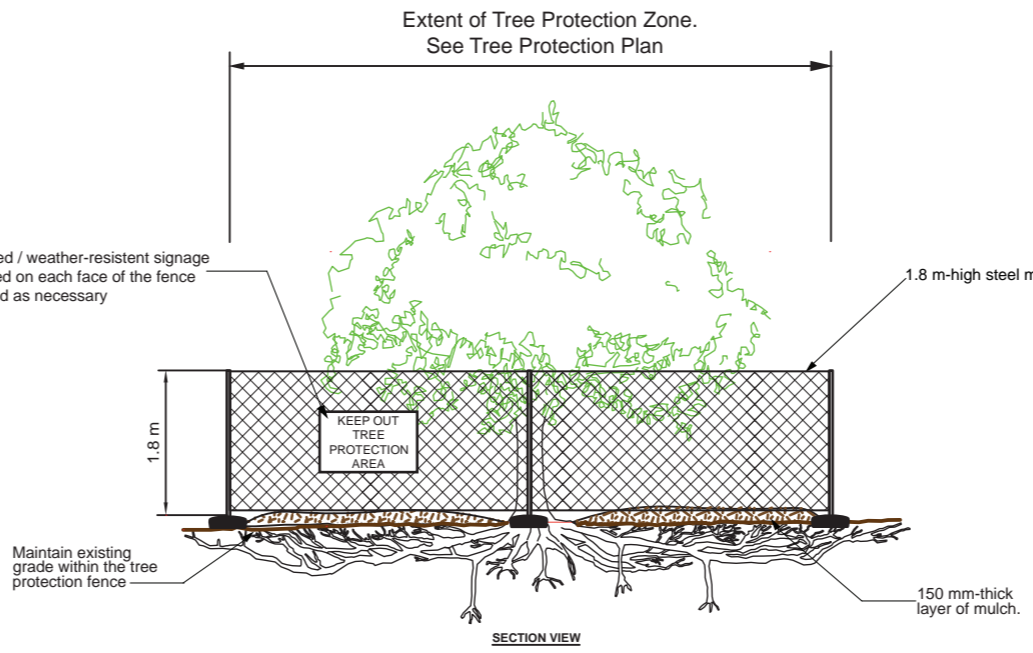
12. Every effort shall be made to avoid root severance from all trees by exploring on-site alternatives to construction / engineering, i.e., adjusting finished levels and post hole locations etc. Where root severance is unavoidable, the severance of any root is to be carried out by the works arborist who shall select the most appropriate implement for the task. Roots shall be cut cleanly to ensure that the traumatic cambium is able to initiate new root growth as effectively as possible and the exposed cut faces should be covered over immediately with moist soil.
13. Where roots to be retained are encountered and there is need for these roots to remain exposed in order that works are not impeded, then those roots shall be covered with a suitable protective material (such as moist Hessian, or a wool mulch) in order to protect them from desiccation and/or mechanical damage, until such a time as the area around the root can be backfilled with the original material. The wrapping or covering of any roots shall be undertaken by the works arborist.

Appendix B – Tree protection details

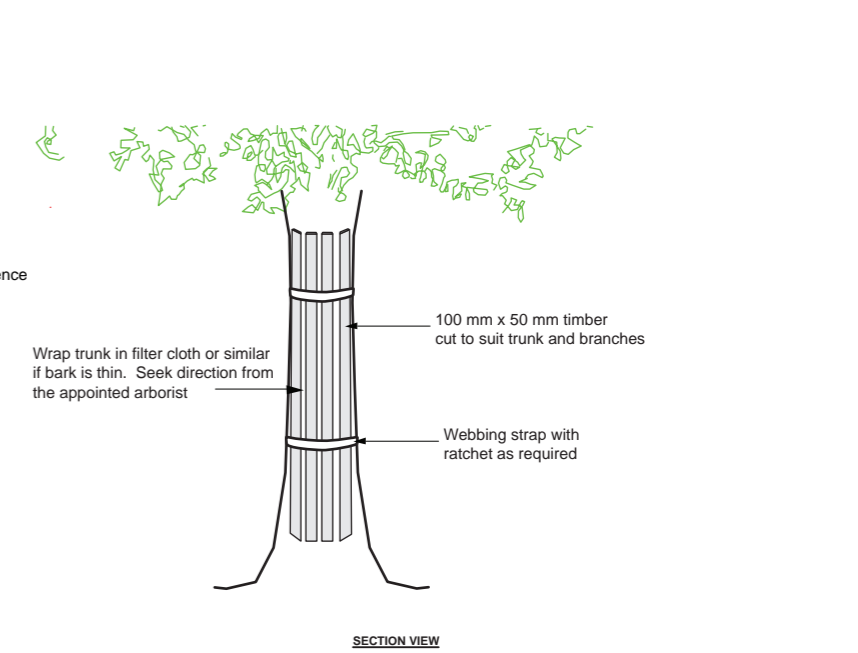




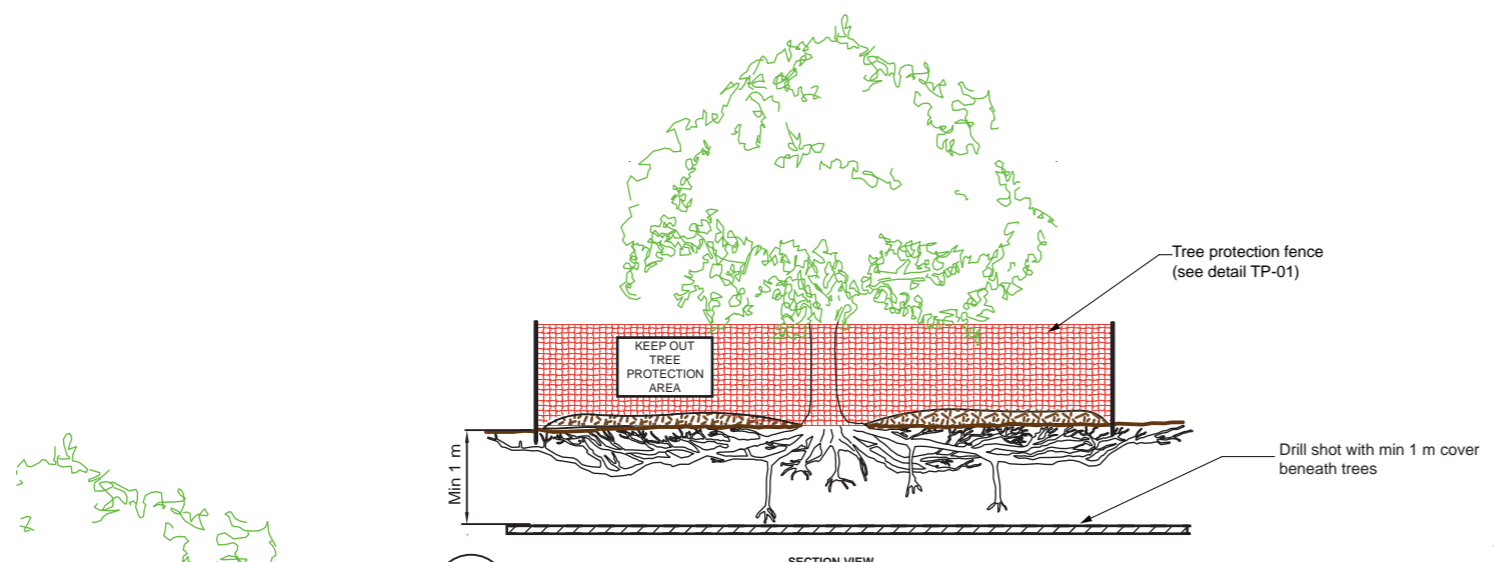
TP-01 TREE PROTECTION - TREE PROTECTION FENCING



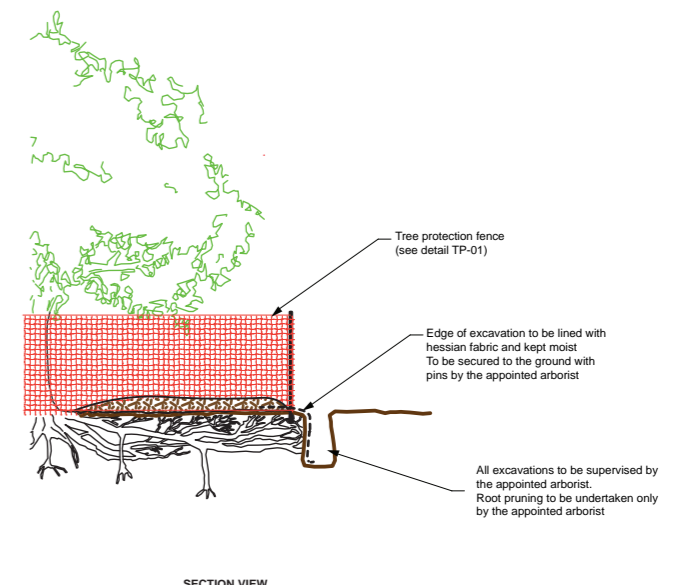
TP-02 TREE PROTECTION - TREE PROTECTION FENCING



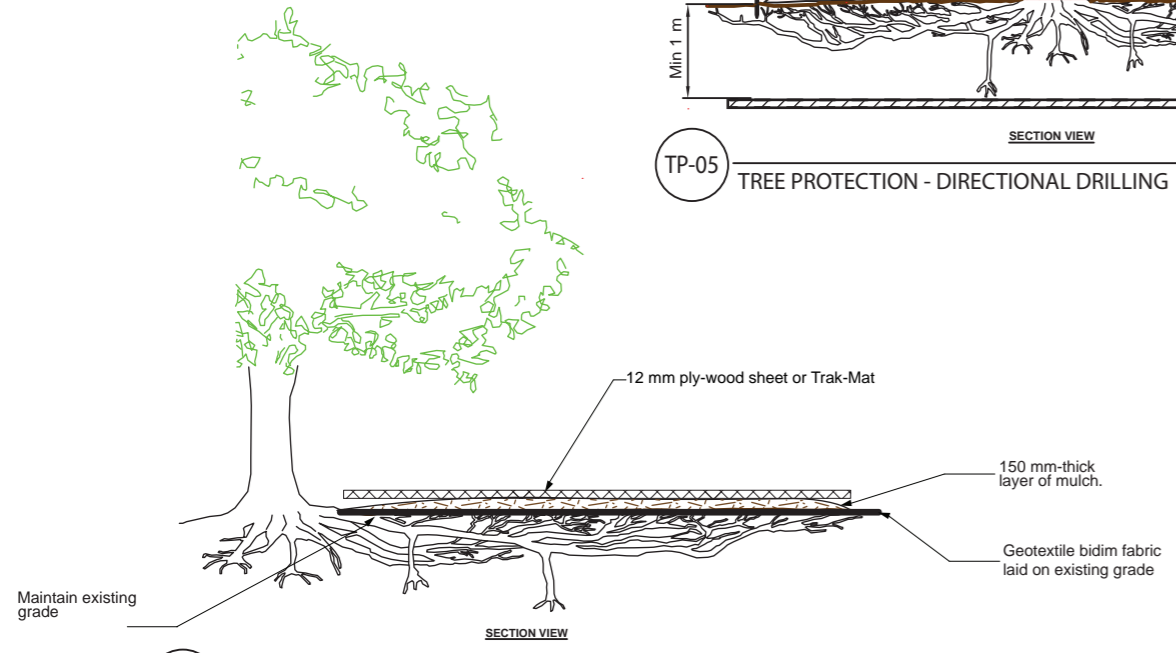
TP-03 TREE PROTECTION - TRUNK PROTECTION



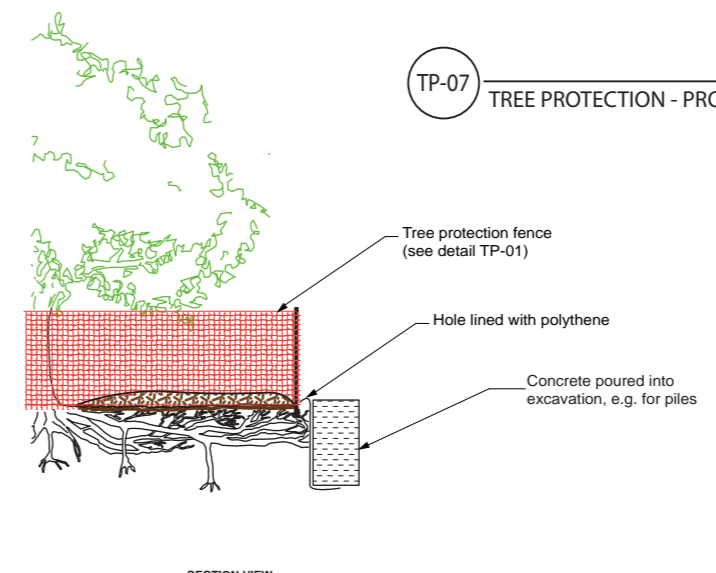
TP-05 TREE PROTECTION - DIRECTIONAL DRILLING



TP-07 TREE PROTECTION - PROTECTING ROOTS



TP-04 TREE PROTECTION - GROUND PROTECTION



TP-06 TREE PROTECTION - EXCAVATIONS CONTAINING ROOTS

All works around trees are to proceed in strict accordance with the tree protection methods
 All works around trees are to be supervised by an appointed works arborist
 No pruning of branches or roots unless undertaken by the appointed works arborist
 No equipment or material is to enter or be stored inside the protective fence
 Details scaled as shown

STANDARD TREE PROTECTION DETAIL



| | | |
|----------|----------------|------------|
| Drawing | TTCC- TP- 2020 | |
| Revision | 001 | Date |
| | | 14-08-2020 |





Legend

- Tree
- 3 m Boardwalk-Bridge
- 2 m Boardwalk-Bridge
- 2 m path
- Aggregate Track_VA
- 3m Concrete Path



Bridge to b, to enable retention of tree 15 (pohutukawa). Final position to be confirmed on site.
 Tree 15.
 Remove T16, Yucca

Southern end of bridge to be where fallen poplar trees are located.
 One 5 m tall kanuka
 4 m cabbage tree and mahoe will require removal

Legend

- Tree
- 3 m Boardwalk-Bridge
- 2 m Boardwalk-Bridge
- 2 m path
- Aggregate Track_VA
- 3m Concrete Path



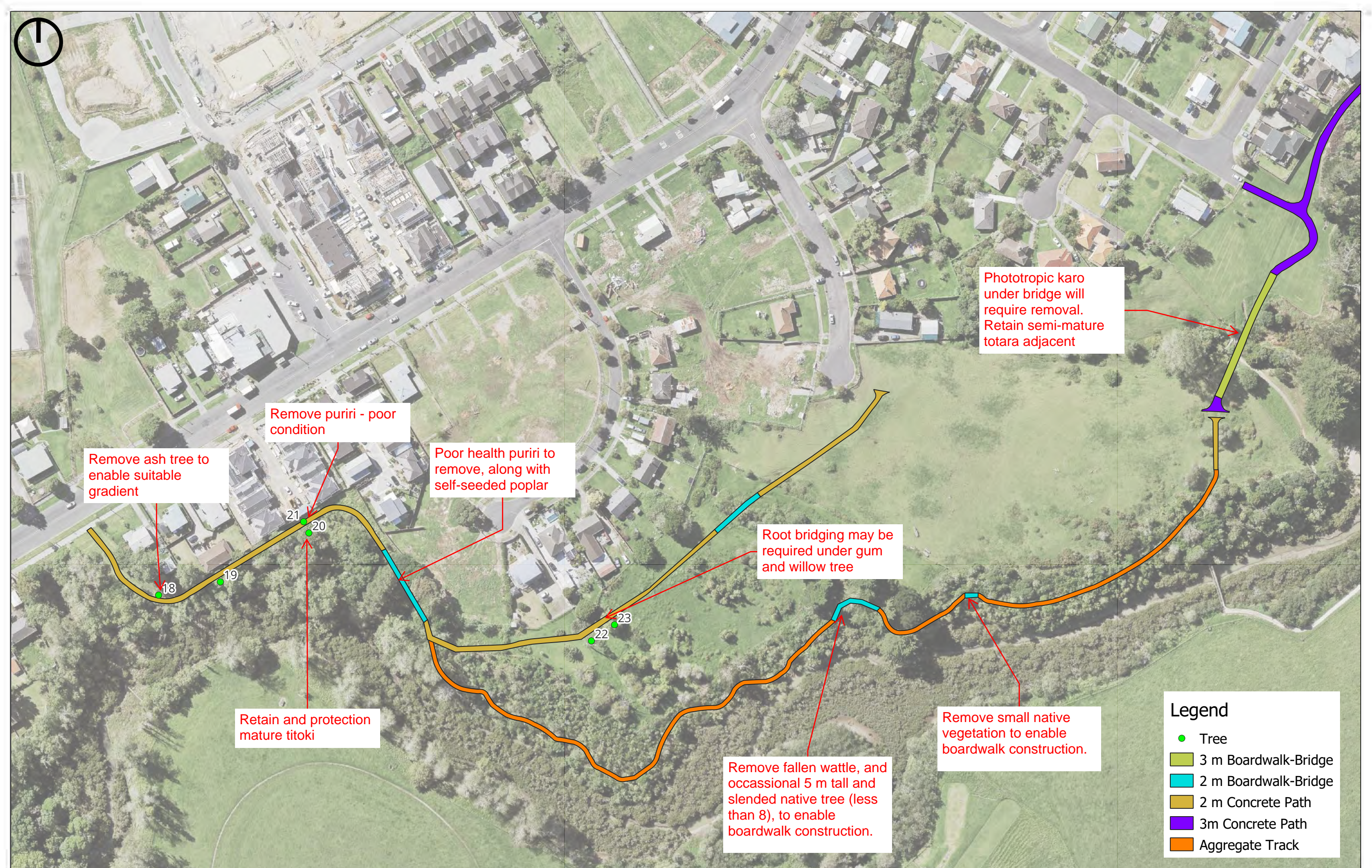
Appendix C - Tamaki Path Point England; Stage 2 Bay Concord Place Bridge - Tree Plan



Project No. 2758

Drawing: 2758_001_A

Rev: A
 MAR2024



Phototropic karo under bridge will require removal. Retain semi-mature totara adjacent

Remove puriri - poor condition

Remove ash tree to enable suitable gradient

Poor health puriri to remove, along with self-seeded poplar

Root bridging may be required under gum and willow tree

Retain and protection mature titoki

Remove fallen wattle, and occasional 5 m tall and slended native tree (less than 8), to enable boardwalk construction.

Remove small native vegetation to enable boardwalk construction.

Legend

- Tree
- 3 m Boardwalk-Bridge
- 2 m Boardwalk-Bridge
- 2 m Concrete Path
- 3m Concrete Path
- Aggregate Track



Appendix C - Tamaki Path Point England; Stage 2 Bay Taniwha to Kotae Road, Tree Plan



Project No. 2758

Drawing: 2758_002_A

Rev: A
MAR2024



Legend

- Tree
- 3 m Boardwalk-Bridge
- 2 m Boardwalk-Bridge
- 2 m Concrete Path
- 3m Concrete Path
- Aggregate Track

Declining pines
recommended to be
removed (7 x)

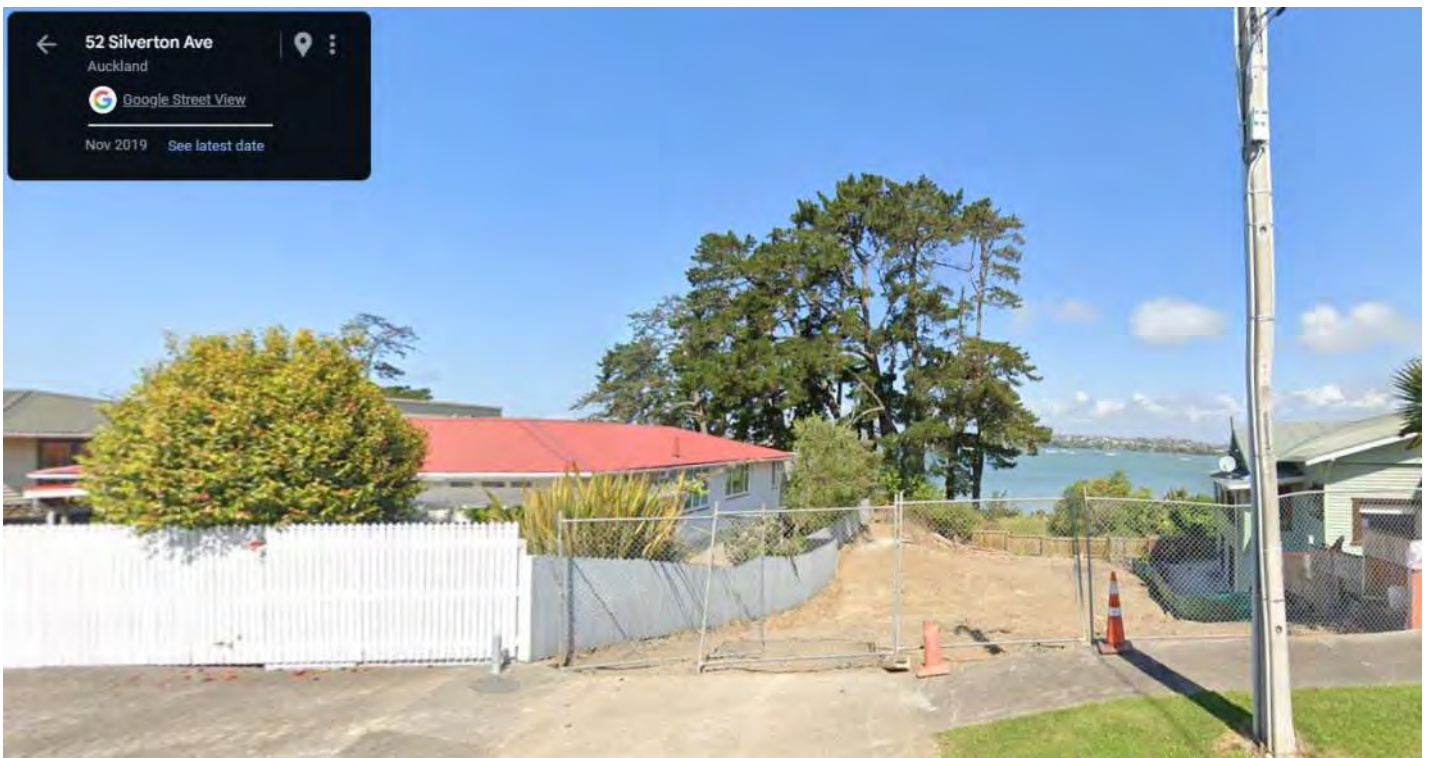
Appendix D – Tree Inventory



| Tree number | Number of trees | Species | Common name | Height (m) | DBH (cm) | AUP root zone radius (m) | Root zone radius (m) (Day, 2010) | Overall vitality | Live crown volume | Branch structure | Form | Age class | Arboricultural comments and observations |
|-------------|-----------------|--------------------------------|--------------|------------|----------|--------------------------|----------------------------------|------------------|-------------------|------------------|------|--------------|--|
| 15 | 1 | <i>Metrosideros excelsa</i> | Pōhutukawa | 12.2 | 3.9 | 4.5 | 1.6 | Good | 0 | Fair | Good | Mature | Girdling roots visible and shallow surface roots visible proliferating towards footpath. Tree is 1.8m from existing fence . Small branch approx. 50mm diameter to be pruned. |
| 16 | 1 | <i>Yucca sp</i> | Yucca | 7.6 | 37.2 | 3.8 | 5.1 | Good | 0 | Fair | Good | Mature | Tree is approx. 1m from fence edge. Leaning over the fence. Will be impacted by the bridge so recommend removal |
| 17 | 2 | <i>Populus nigra</i> | Black poplar | 23 | 57.3 | 8 | 5.2 | Good | 0 | Fair | Fair | Mature | 2 trees measurements estimated owing to access. Approx 7-8m distance between. Bridge ends within the fallen tree gap. Small kanuka in between approx. 3.5m in height |
| 18 | 1 | <i>Fraxinus sp.</i> | Ash | 11.4 | 29.6 | 4 | 5.0 | Poor | 0 | Fair | Fair | Early mature | Tree is showing signs of poor vitality. Leaf chlorosis. 1 40mm branch to be reduced to union |
| 19 | 2 | <i>Corynocarpus laevigatus</i> | Karaka | 10 | 27.1 | 3 | 4.9 | Good | 0 | Fair | Good | Early mature | 2x karaka next to each other. Approx 5m from fence line. Some minor pruning required for clearance. 2x stems to be pruned approx 75mm in diameter |
| 21 | 1 | <i>Vitex lucens</i> | Pūriri | 5 | 20.1 | 2 | 4.5 | Poor | 0 | Poor | Fair | Early mature | Tree is 70% dead |
| 22 | 1 | <i>Eucalyptus sp.</i> | Gum tree | 26 | 66.8 | 12 | 5.3 | Fair | 0 | Fair | Fair | Mature | |

**Please note: Trees 1 – 14 are located elsewhere in the project and are not impacted by the proposal

Appendix E – Historical photographs of the pine trees for removal





21 March 2024