





Technical Report H - Assessment of Arboricultural Effects

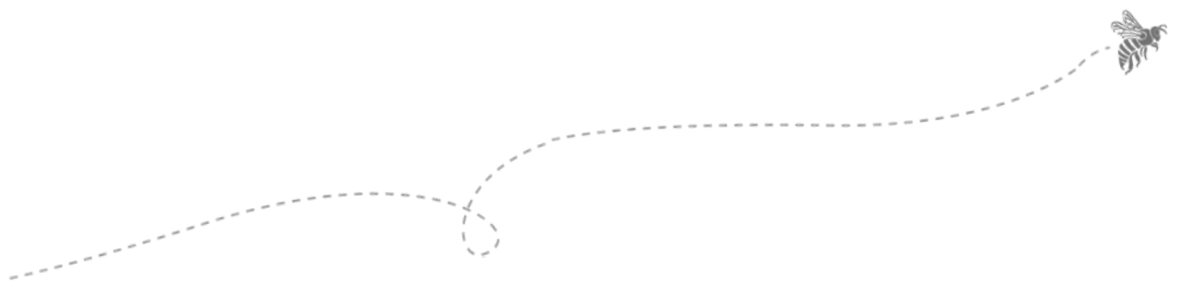
North Harbour 2 Watermain and Northern Interceptor in Shared Corridor

Client:	Watercare Services Limited, c/o Aecom
Address:	From Shetland Street, Titirangi to Corinthian Drive, Albany

Report compiled by:	Samuel Earp	
Report reviewed by:	Craig Webb	

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Final



CONTENTS

Contents	2
1 EXECUTIVE SUMMARY	3
2 Introduction	3
3 Site Description.....	6
3.1 Private trees.....	6
3.2 Roadside reserve and park trees	7
3.3 Street trees	7
4 Construction Methodology	7
5 General construction management	7
6 Assessment of Arboricultural Effects.....	8
6.1 Effects on trees to be retained	8
6.2 Effects of removing trees and proposed mitigation.....	8
7 Tree Protection Methodology	11
8 Conclusion	12
9 Recommendations	13
Appendix A: Tree Location Plans	15
Appendix B: Tree Details Table.....	39

1 EXECUTIVE SUMMARY

The proposed North Harbour 2 watermain (NH2) and Northern Interceptor installation (NI) includes removal and works within the dripline of trees within and adjacent to the designation footprint. Trees potentially affected by the works are growing within road reserve land, public open space, private land and the motorway corridor. The proposed work requires resource consent for activities within the dripline of protected trees according to the Operative Auckland Council District Plans: Waitakere and North Shore Sections.

The proposed works have the potential to adversely affect the above and below ground parts of trees within and adjacent to the designation footprint. *GreensceneNZ Limited* has undertaken site surveys to compile an inventory of trees within and adjacent to the designation footprint that may be affected by the works.

Due to the alignment of the NH2 watermain and NI pipeline in the shared corridor being primarily within the road carriageway it is not likely that significant root activity will be encountered during excavations required to carry out the proposed works.

It has been assessed that proposed tree removal at certain locations will result in adverse environmental effects. In two locations it has been assessed that the effects are potentially more than minor. These locations, at Oteha Stream Crossing and Shetland Street, Titirangi, involve tree removal of a scale that will require mitigation by replanting to address adverse effects. The adverse effects will be reduced to a minor level by replanting of the sites upon completion of the works. With the exception of the two locations, the effects on the protected trees (after mitigation in the form of replacement planting) are assessed as being less than minor.

The tree protection methodologies provided in Section 7 of this report have been developed to address construction site issues in relation to trees and to mitigate adverse effects caused by the proposed works. If the proposed works are carried out in accordance with the tree protection methodologies provided in Section 7 of this report, the overall effect on the trees, to be retained, arising from the proposed works will be less than minor.

2 INTRODUCTION

GreensceneNZ Limited has been commissioned by Watercare Services Limited (Watercare) to assess the potential arboricultural effects related to the construction, operation and maintenance of Watercare's proposed North Harbour 2 Watermain (NH2) project between Titirangi and Albany and the land use effects associated with the construction, operation and maintenance of the Northern Interceptor (NI) project between Westgate and Hobsonville, where a shared corridor is proposed for both water and wastewater infrastructure.

The NH2 will convey potable water from storage reservoirs in Titirangi, via west Auckland and North Shore to storage reservoirs in Albany (a length of approximately 33km). Its purpose will be to increase capacity and resilience of the water supply network to western and northern Auckland.

The NH2 project incorporates:

- Pipeline installation, operation and maintenance of a new watermain of 1200 mm (west of Greenhithe Bridge) and 900mm (east of Greenhithe Bridge) nominal diameters (DN);

- Pipeline length of approximately 33km mostly within public road reserve; and
- Other features including valve chambers, scour valves, air valves, line valves, bulk supply points, pipe bridges, and associated works.

Most of the watermain will be constructed by open trenching, micro tunnelling or bored tunnel (the latter two referred to as “trenchless technology”) within a typical construction corridor of approximately 12 – 22m width with additional areas required for erosion and sediment control devices, traffic management, construction yards and storage areas at intervals along the route for construction purposes.

The NI project comprises of a new wastewater pipeline and associated activities to convey flows from north-west Auckland to the Hobsonville Pump Station, and then to the Rosedale Wastewater Treatment Plant (WWTP).

The proposed NI project in the shared corridor begins in the vicinity of Hobsonville Road (West Harbour), near the intersection of the Upper Harbour and North Western Motorways (SH18 and SH16). From this location, the alignment follows the southern side of the SH18, continuing northeast to the Hobsonville Pump Station. Future phases of the NI project will also include new pipelines between the Hobsonville Pump Station and the SH18 causeway.

Within the shared corridor, the NI project incorporates the following:

- A new 5km wastewater pipeline of 2100mm DN;
- 16 pits / shafts for trenchless technology construction purposes. Five of these will be permanent manholes (MT Pits 2, 7, 11, 13 & 17) while the others (MT Pits 3, 4, 5, 6, 8, 9, 10, 12, 14, 15 and 16) will be temporary only until construction / testing is completed;
- MT Pit 7 will be a drop structure with permanent access, to allow for a future wastewater pipeline connection across SH18;
- A new 50m long wastewater pipeline and manholes connecting the 2100mm ND pipeline to the existing pump station;
- A new 1750 l/s Pump Station with future capacity across the site of 3,500l/s;
- Wastewater storage (within pipeline);
- Two 800m 1500mm DN rising mains (length to the causeway); and
- A 2100mm DN pipe installed by trenchless technology at SH18.

The proposed alignment of NH2 and the location of the NI project are shown in Figure 1 below.

A full description of the proposed works and construction methodology is included in the North Harbour 2 Watermain and Northern Interceptor Shared Corridor Assessment of Effects on the Environment (the AEE report) prepared by AECOM Consulting Services (NZ) Ltd (AECOM) and Jacobs New Zealand Limited (Jacobs).

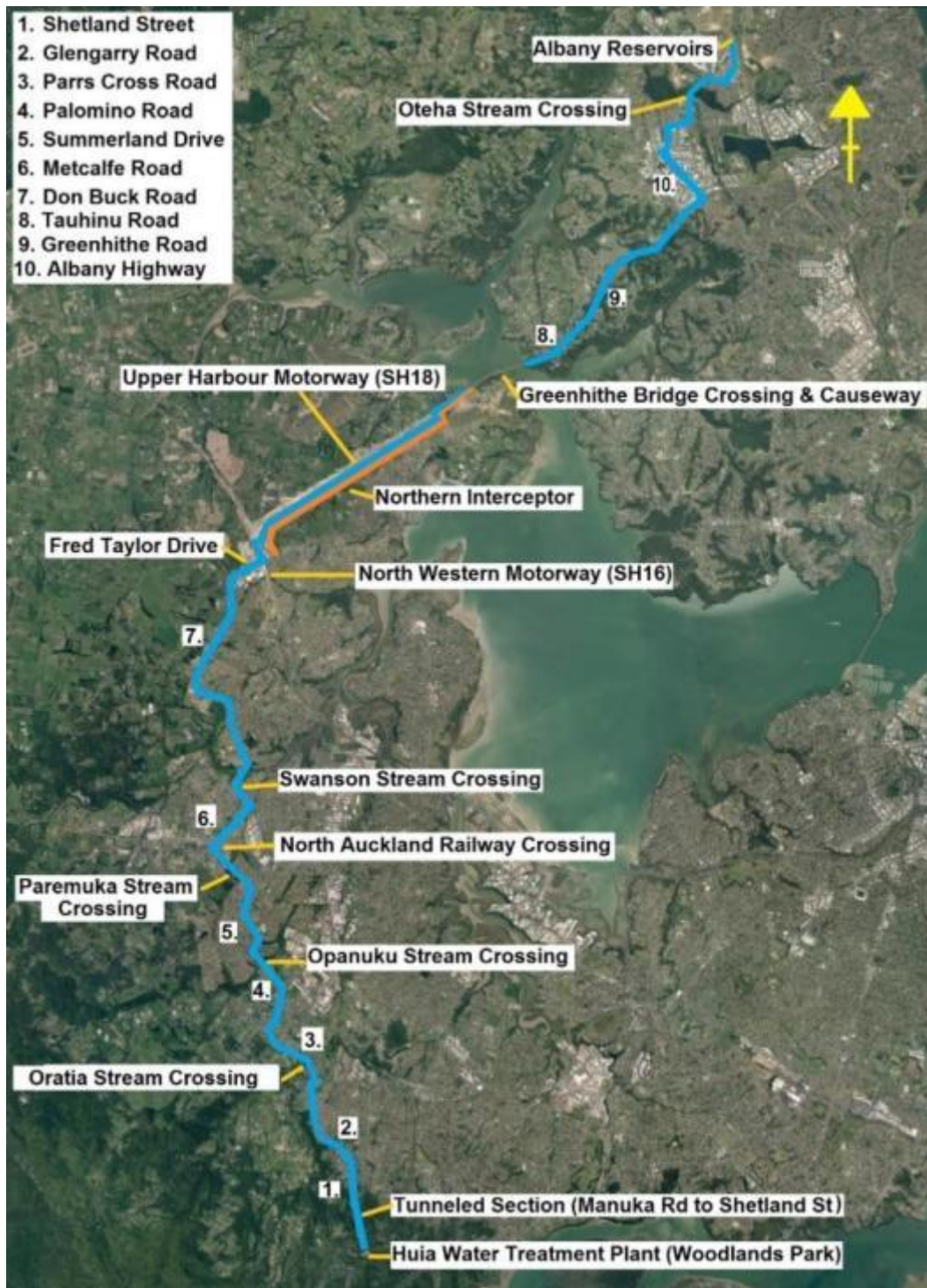


Figure 1 – Blue line is the proposed NH2 route and Orange line is NI section within shared corridor

Watercare is proposing to designate land for the NH2 project between Titirangi and Albany and the NI project between Westgate and Hobsonville, and will also be seeking various resource consents for NH2 under the Resource Management Act 1991 (RMA). This technical report provides specialist input for the AEE which supports the Notices of Requirement for designation (NOR) and the resource consent applications. The alignment drawings referred to in this report are contained within Volume 3 of the AEE. Resource consents required for works associated with the NI project will be sought by Watercare at a later date, nearer to the proposed date of construction.

This report provides the following:

- A description of the environmental baseline for the particular receiving environment(s) potentially affected by the project;
- Description of specific aspects of the project in relation to the subject area being investigated;
- Description of the investigations undertaken to assess the affected tree asset and arboricultural issues;
- Recommended mitigation and management measures and resultant post mitigation assessment of effects;
- An assessment of the actual or potential effects on the identified tree asset (construction, operation and maintenance). This includes the identification of activities that could result in potential adverse effects on trees and, in turn, identifying design refinements or construction methodologies that could avoid, remedy or mitigate such effects; and
- Conclusions.

This assessment is based on the following plans supplied to *GreensceneNZ Limited*:

Watercare Services Limited and AECOM, September 2015, North Harbour No. 2 Watermain – Preliminary Design Drawings.

Tree location plans displaying the locations of all of the potentially affected trees located in the proximity of the proposed alignment are provided in Appendix A of this report; a tree details table with information relating to each of the identified trees or groups of trees is provided in Appendix B.

3 SITE DESCRIPTION

The site is divided into three areas which include: Titirangi to Westgate (NOR1), the Eastern side of Greenhithe Bridge to Albany Reservoir (NOR2) and Westgate to the Greenhithe Bridge Crossing and Causeway (NOR3). The works are largely confined to the road reserve, SH16 motorway corridor and open space areas.

The route passes through varied land use areas with varying landscapes and development, including:

- Well-treed / forested suburbs in the Waitakere Ranges foothills of Titirangi;
- Less-densely vegetated suburbs of West Auckland and Albany;
- Several suburban stream valleys with variable vegetation cover;
- Transit corridors with mass revegetation planting areas; and
- Sparsely vegetated commercial and light-industrial precincts in Albany.

Trees that are located within the proposed NOR alignment or overhanging from adjoining neighbouring property on either side of the proposed NOR can be classified into three types, as follows:

3.1 Private trees

A variety of privately-owned trees overhang the road and road reserve from residential and commercial properties. Common species include pohutukawa (*Metrosideros excelsa*), English oak (*Quercus robur*) and American sweet gum (*Liquidambar styraciflua*). Most private trees identified were exotic species of commonly occurring species.

3.2 Roadside reserve and park trees

Tree species growing in the various roadside reserve areas, such as adjacent to the several stream crossings along the route include native species such as kohuhu (*Pittosporum tenuifolium*), karo (*Pittosporum crassifolium*), kanuka (*Kunzea robusta*), tī kōuka (*Cordyline australis*), pohutukawa and karamu (*Coprosma robusta*). Exotic species include Chinese privet (*Ligustrum sinense*), lilly pilly (*Syzygium smithii*) and black wattle (*Acacia mearnsii*).

Included in this classification are large areas of native vegetation planted as part of SH18 Motorway embankment enhancements, which includes mass plantings of native species such as kanuka, tī kōuka and harakeke (*Phormium spp.*)

A few small reserves were encountered along the designation footprint that is associated with the watermain installation and some of them will serve as site compounds and / or laydown areas whilst works are being carried out. Trees within Council parks include pohutukawa, rimu, oak, pine and swamp cypress. The route includes a micro-tunnel section below Woodlands Park, Waitakere Ranges Regional Park. Trees here are deemed to be unaffected by the proposed works, which involve trenchless pipe installation below the designation footprint, however, a small triangle of land is affected at the junction of Shetland Road and Woodlands Park, which requires removal of a few trees within the Regional Park.

3.3 Street trees

The majority of solitary specimen street trees identified were of commonly used species, which include pohutukawa, titoki (*Alectryon excelsus*), American sweet gum, southern magnolia (*Magnolia grandiflora*) and bead tree (*Melia azedarach*). Most trees identified were early mature or small trees.

4 CONSTRUCTION METHODOLOGY

Section 2 of the AEE sets out in detail the proposed works for the NH2 and NI.

The NH2 aspect of the project primarily involves open trench methodologies for pipeline installation within the road corridor. Portions of the route involve construction of pipe-bridges for stream crossings and trenchless methods of pipeline installation.

The NI aspect of the project does not raise any particular arboricultural issues due to the construction methodology (trenchless) and (ii) the vegetation here generally being small, mass-planted vegetation planted as part of the motorway corridor.

5 GENERAL CONSTRUCTION MANAGEMENT

Consistent with Watercare construction practice, management plans are to be prepared and implemented by the successful contractor to address relevant matters relating to the environment, including tree protection.

Site establishment works will generally comprise a combination of the following:

- Establishment of erosion and sediment control measures;
- Appropriate vegetation removal to make room for construction activity;
- Identification of existing services and undertaking relocations if necessary;
- Site levelling and drainage works;
- Formation of vehicular access and manoeuvring areas around construction site;
- Establishment of site buildings, services (water, electricity etc); and

- Construction of site perimeter fencing, noise mitigation barriers, temporary / alternative access setup.

Berm Vegetation

Construction of the NH2 and NI, particularly along road berms and through parks, will require some disturbance to existing vegetation and trees. Where deemed practicable and necessary through arboricultural assessment, construction activity and the final pipeline route will be adjusted to avoid or minimise unacceptable disturbance to existing vegetation and trees.

6 ASSESSMENT OF ARBORICULTURAL EFFECTS

6.1 Effects on trees to be retained

Due to the alignment of the pipelines being primarily within the road carriageway it is not likely that significant root activity will be encountered during excavations required to carry out the proposed works. However, there are instances where the likelihood of encountering roots increases, generally due to the occurrence of large trees overhanging the road corridor. Excavations required in the berm and in reserve and stream bank areas are also more likely to cause root system disturbance.

Depending on the specific activity, it will not be practical or achievable to retain tree roots encountered during excavations so pruning of the tree root systems is therefore likely. The tree protection methodologies provided in Section 7 of this report have been developed so as to mitigate the adverse tree health effects associated with the disturbance of the tree root systems. Adherence to the tree protection methodologies will mitigate the likely adverse tree health effects to a level that can be considered less than minor.

A range of activities carried out as part of the proposed works have the potential to cause damage to the above-ground parts of the trees to be retained, resulting in adverse tree health and aesthetic effects. Furthermore, root damage can occur as a result of vehicles and machinery moving or operating within the driplines of trees. The tree protection methodologies provided in Section 7 of this report aim to address and mitigate these issues. As such, if carried out in accordance with this report, the proposed works will not result in any adverse health and aesthetic effects caused by damage to the above-ground part of any tree.

Additionally, pruning is to be carried out to reduce conflicts between the trees' canopies and the proposed works. The required pruning is generally minor in nature and therefore not likely to result in any noticeable reduction in the health of the trees or the environmental contribution provided by the trees.

6.2 Effects of removing trees and proposed mitigation

The removal of vegetation and trees will be required to facilitate the proposed works in the following locations:

NOR1

- End of Shetland Road, Titirangi;
- Oratia Stream Crossing, Parrs Cross Road, Henderson;
- Opanuku Stream Crossing, Border Road/Palomino Drive, Henderson;

- Paremuka Stream Crossing, Munroe Road, Ranui;
- Intersection of Swanson Road and Universal Drive, Henderson; and
- Swanson Stream Crossing, Don Buck Road, Massey.

NOR 2

- State Highway 18 Motorway Corridor between Greenhithe Bridge and William Pickering Drive (various locations); and
- Oteha Stream Crossing, Bush Road, Albany.

NOR 3

- State Highway 18 Motorway Corridor between Fred Taylor Drive and Hobsonville Pump Station (various locations); and
- Hobsonville Pump Station.

The vegetation proposed for removal includes recently planted trees and native plants growing within the motorway corridor and vegetation within stream embankments and adjacent open-space land where pipe-bridge construction is required. In most cases the vegetation is of small dimensions and of relatively low significance and / or comprises exotic weed species. The following areas contain trees of greater significance, the removal of which would result in adverse environmental effects as result of the loss of mature trees. However, provided that the recommended avoidance / mitigation measures are addressed then these effects can be mitigated.

Mitigation

Measures to mitigate adverse effect on the treed environment will be required where trees and vegetation are required to be removed for the pipeline installation works. The mitigation measures generally involve reinstatement, preparation, planting and establishment maintenance of new trees to replace trees that are removed. Adherence to the tree protection measures also mitigates effects of the works on existing trees that are to be retained.

Specifically developed tree protection measures and replacement planting programmes suitable for each site and stage of works will be developed with the intention of mitigating adverse effects on trees.

NOR 1

End of Shetland Road

The forest environment at the end of Shetland Road, Titirangi, includes native trees (listed in Tree Details Table as G1) that are part of a continuous natural forest area. The works in this area for the installation of permanent infrastructure will require the removal of a group of approximately eight mature native trees. The removal of an area of this forest for the establishment of a site compound for tunnelling and installation of a permanent access chamber will alter the environment at this location. The extent to which the forest is affected has not been exactly determined at this stage and the removal of trees, requirement for tree protection measures and any replacement planting is subject to confirmation with the project arborist (and ecologist) prior to project commencement. While the extent of the works area is not yet finalised, consent is sought to remove all trees within the construction area.

Mitigation

Mitigation options for replanting of trees will be restricted to peripheral areas, so as to maintain clearance from the infrastructure, which includes the pipeline, an air-valve chamber

and an access shaft. The works in this location therefore result in a net loss in the tree cover of the area immediately adjacent to the end of Shetland Road. Replanting around the site will provide some level of mitigation, however, opportunities for planting and weed removal within nearby off-site locations may provide additional benefits and offset the loss of trees.

Oratia Stream Crossing

Several groups of mature exotic trees are growing within rural land adjacent to Parrs Cross Road, on either side of the Oratia Stream. The removal of large black poplar (G27) and a group of three pin oak (part of G28) would diminish the well-treed nature of the location. The pipe alignment avoids removal of other trees in this group by crossing back to the road reserve after the crossing of Oratia Stream.

Mitigation

The return to the road carriageway should be as soon as possible after the stream crossing, so as to avoid additional trees being affected. Replanting with a large grade specimen tree would be required upon completion of the works to mitigate the loss of these trees.

Intersection of Swanson Road and Universal Drive

A specimen tree (T70) in the roundabout at the intersection of Swanson Road, Universal Drive and Don Buck Road is a significant feature of this location. The pin oak is a healthy, well-formed specimen tree. Removal of this tree is required as the proposal is to trench through the centre of the intersection from Swanson Road to Don Buck Road.

Mitigation

Replanting with a large grade specimen tree would be required upon completion of the works to mitigate the loss of this tree.

Swanson Stream Crossing

A stand of trees comprised of one cypress and four oak (G74) are within the small park on the southern side of the Swanson Stream, adjacent to Don Buck Road. These trees, along with an oak on the southern side of the stream (part of G75) have reasonable qualities as specimen park trees that are worthy of consideration in relation to activities associated with the stream crossing.

Mitigation

Replanting with large grade specimen trees would be required upon completion of the works to mitigate the loss of these trees. Large-grade replacement trees are preferred here as the intention is to promote quality specimen trees to replace the trees that are removed.

NOR 2

Oteha Stream Crossing

There are three options for crossing the Oteha Stream in this location. Depending on the option that is chosen for the crossing of the Oteha Stream adjacent to Bush Road, removal of mature native trees that are part of a stand of forest may be required. Option 1 avoids removal of any trees, so is preferred from an arboricultural perspective. Options 2 and 3 involve installation of a pipe-bridge that would require clearance of trees including one large kahikatea and totara and tanekaha trees (part of G131). The extent to which the forest is affected has not been determined at this stage and the removal of trees, requirement for tree

protection measures and any replacement planting is subject to confirmation with the project arborist (and ecologist) prior to construction. While the extent of the works area is not yet finalised, consent is sought to remove all trees within the construction area.

Mitigation

The removal of large mature trees may be mitigated by replacement planting. In this case, due to the size and age of the trees to be removed, the limits imposed by the new permanent infrastructure on replanting and the timeframe involved for a replacement tree to reach maturity, the effects of tree removal in Options 2 and 3 will not reduce adverse effects to a point where they are less than minor.

NOR 3

Hobsonville Pump Station

Clearance of existing vegetation located around the existing pump station will be required to complete the works associated with the Hobsonville Pump Station. The largest trees affected in this site are gum trees, which are assessed to generally be in poor condition, likely as a result of a combination of insect browsing and historic alteration to their growing environment. The trees are large and highly visible, however their condition reduces their value from a visual perspective and the trees have no particular arboricultural qualities. The understory native vegetation is not of any particular quality, however should be retained wherever possible as a natural ground cover. Removal of exotic weeds and revegetation with native species will enhance the qualities of the site.

Mitigation

Generally, proposed vegetation removal can be mitigated through replacement planting and the removal and control of exotic weed species that degrade the riparian areas.

7 TREE PROTECTION METHODOLOGY

All identified trees proposed to be retained and growing in close proximity to the proposed works, are to be protected in a manner that ensures that potential adverse effects are avoided and / or minimised. As such, the works should be carried out in accordance with the following tree protection methodologies:

1. A suitably qualified arborist ('appointed arborist') should be employed by Watercare to direct tree protection measures and monitor and supervise all works within the dripline of the protected trees for the duration of the works.
2. Any tree pruning or removal works required should be carried out by Council approved arborists in accordance with correct arboricultural practices.
3. Prior to works commencing on any distinct stage of NH2 and NI within the shared corridor there should be a pre-commencement meeting on site with the consent holder, the project manager / site foreman, and the consent holder's appointed arborist. This meeting should discuss and confirm the proposed work, works methodologies, conditions of consent, tree protection and protective fencing requirements.
4. Areas for stockpiling materials and for storing machinery that are within the dripline area of trees that are to be retained should include measures to avoid soil excavation, modification and compaction. This should include emplacement of materials such as

- geotextile fabric, coarse metal aggregates and / or wood-chip mulch on existing ground level to prevent compaction of top soil. The site lay-down area should be confirmed with the appointed arborist prior to commencement of the works on each site.
5. Where appropriate, protective fencing is to be erected and positioned between the line of works and all permeable areas within the dripline of protected trees so as to restrict access to / storage in such areas. The protective fencing is to be erected prior to any works occurring in close proximity to protected trees.
 6. All excavation machinery is to operate from outside the dripline of protected trees unless the machinery can operate from and remain fully on top of an existing impermeable hard surface or temporary surface, such as track-mats emplaced for this purpose.
 7. Treatment of tree roots associated with the watermain installation and open trenching works is to be undertaken in the following manner:
 - a) Where possible, exposed tree roots are to be retained and protected from damage and from drying-out by a covering of hessian (or accepted equivalent) that is to be kept damp until the excavated area can be backfilled.
 - b) Tree roots that require removal will be cleanly cut back to the edge of excavations with a sharp implement such as a handsaw or a pair of secateurs. All root pruning that is required will be undertaken by the appointed arborist.
 8. No washing of equipment or machinery should be undertaken within the dripline or within seepage range of any protected tree. Special attention should be paid to concrete products and petrol / diesel operated machinery so as to not contaminate the soil within the dripline of any protected tree.
 9. Removal of trees within the works site areas should be mitigated by replacement planting of suitable species in locations where they were removed from or in new areas where there is agreement from Council or respective landowners.

8 CONCLUSION

The proposed NH2 watermain and NI shared corridor involves the installation of a watermain and wastewater main by open trenching and trenchless methods within the dripline of some trees protected under the Auckland Council District Plan (Waitakere and North Shore Sections). Trenchless methods are generally preferred from an arboricultural perspective, as the tunnel is directed below the depth at which tree roots will be encountered.

The proposed open trenching and ground surface works have the potential to cause damage to and disturbance of trees' root systems and damage to the above ground parts of the trees. The tree protection methodologies provided in Section 7 of this report have been developed to address these issues and mitigate any adverse effects caused by the proposed works.

Additionally, canopy pruning is proposed to reduce conflicts between the trees and the proposed works. The proposed pruning is assessed as being within the tolerances of the trees and not likely to result in any noticeable reduction in aesthetic values.

If the proposed works are carried out in accordance with the tree protection methodologies provided in Section 7 of this report, the effect on trees to be retained will be minimised.

NOR 1

It has been assessed that the proposed tree removal will not result in any adverse environmental effects that can be considered more than minor as the effects of the proposed tree removals can be mitigated through replacement planting. The well-treed environment at the end of Shetland Road will be permanently modified by the infrastructure installation, as planting of replacement trees will not be possible in the location of the proposed access chamber and new pipeline.

NOR 2

It has been assessed that tree and vegetation removal alongside the SH18 motorway corridor will not result in any adverse environmental effects that can be considered more than minor as the effects of the proposed tree removals can be mitigated through replacement planting.

It has been assessed that the proposed tree removal required for pipeline installation will not result in any adverse environmental effects that can be considered more than minor as the effects of the proposed tree removals can be mitigated through replacement planting. Options that avoid excavations within the forest area will avoid the effects on the significant forest area, however if Options 2 or 3 are chosen the effects will be more than minor due to the removal of large mature native trees.

NOR 3

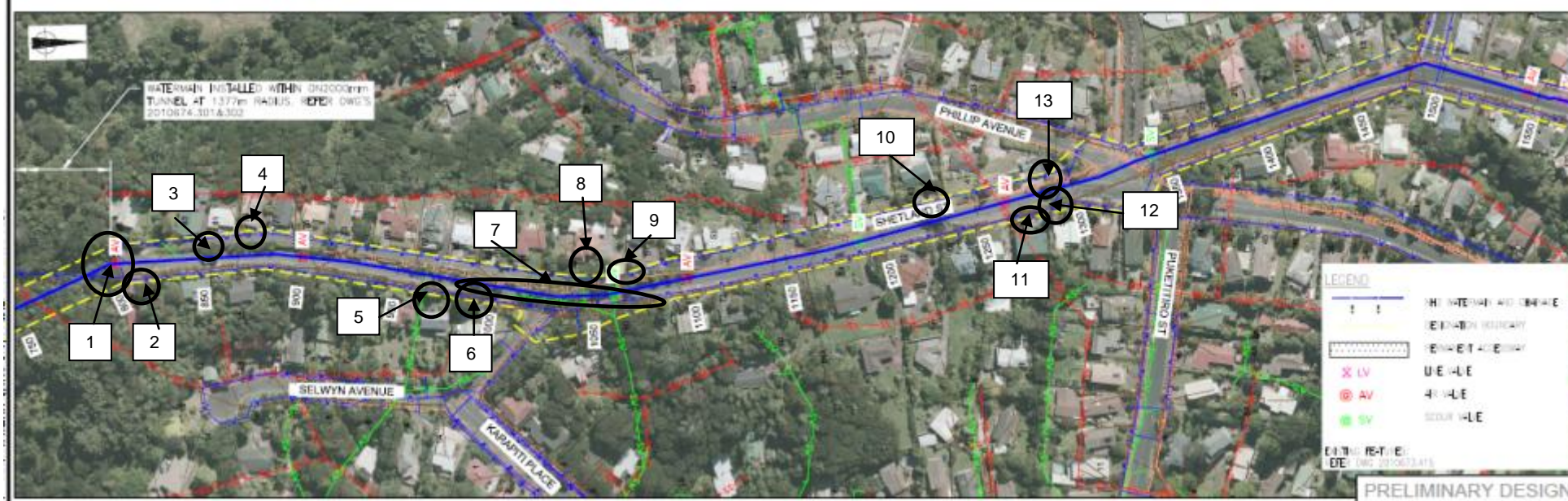
It has been assessed that tree and vegetation removal alongside the SH18 motorway corridor will not result in any adverse environmental effects that can be considered more than minor as the effects of the proposed tree removals can be mitigated through replacement planting.

9 RECOMMENDATIONS

1. The Requiring Authority should employ an arborist ('appointed arborist') to monitor, direct and supervise all works within the dripline of protected trees that are to be retained and protected for the duration of the works.
2. All works associated with NH2 and NI should be carried out in accordance with the Arboricultural Assessment report *GreensceneNZ Ltd*, dated 29 April 2016, submitted with the application.
3. Where specified in the tree details table in Appendix B the Requiring Authority or nominated contractor should confirm the specific requirements relating to trees in locations where site works and site compounds impact on trees. This should include the number of trees to be removed / area of vegetation to be removed, extent and position of tree protection measures and mitigation measures (including replacement planting) specific to each location.
4. The Requiring Authority should ensure that all contractors, sub-contractors and work site supervisory staff who are carrying out works covered by this consent are advised of the conditions of consent and act in accordance with the conditions. A copy of the conditions of consent should be available at all times on the work site when works are occurring.

5. Within the next planting season (i.e. autumn to spring) immediately following the completion of the works in any distinct section of the NH2, the Requiring Authority should enable planting to replace all vegetation removed as part of this consent. The replacement trees should be planted and maintained in accordance with correct arboricultural practices. Weed management plans and restoration planting plans shall be provided where required to demonstrate mitigation of effects in specific locations.

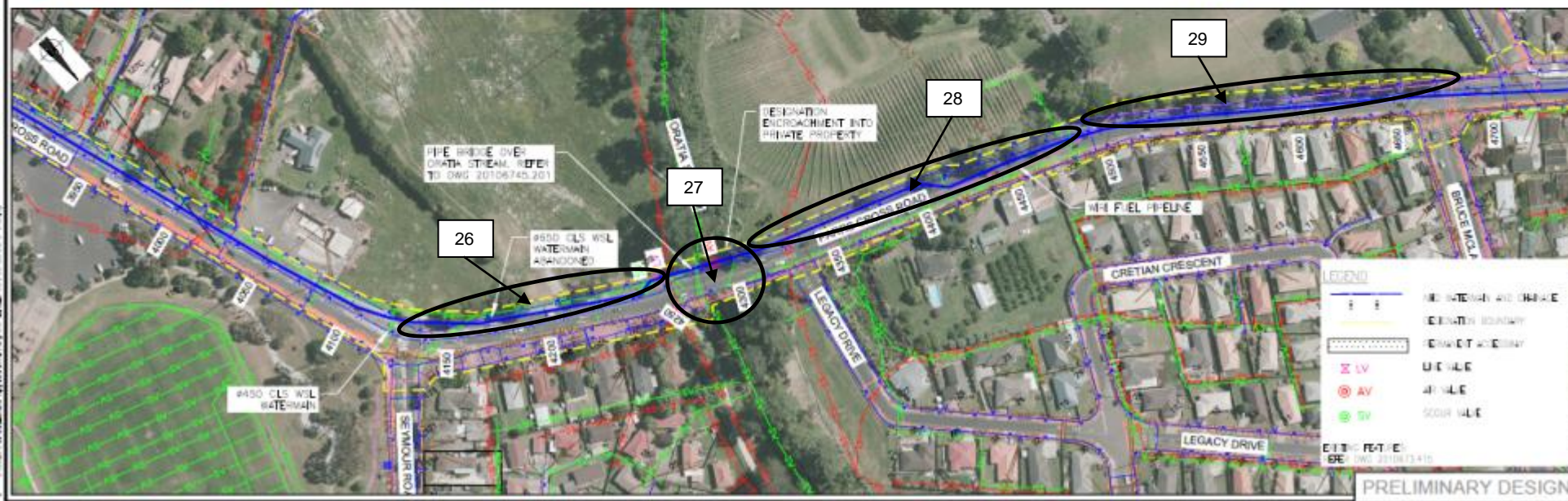
APPENDIX A: TREE LOCATION PLANS



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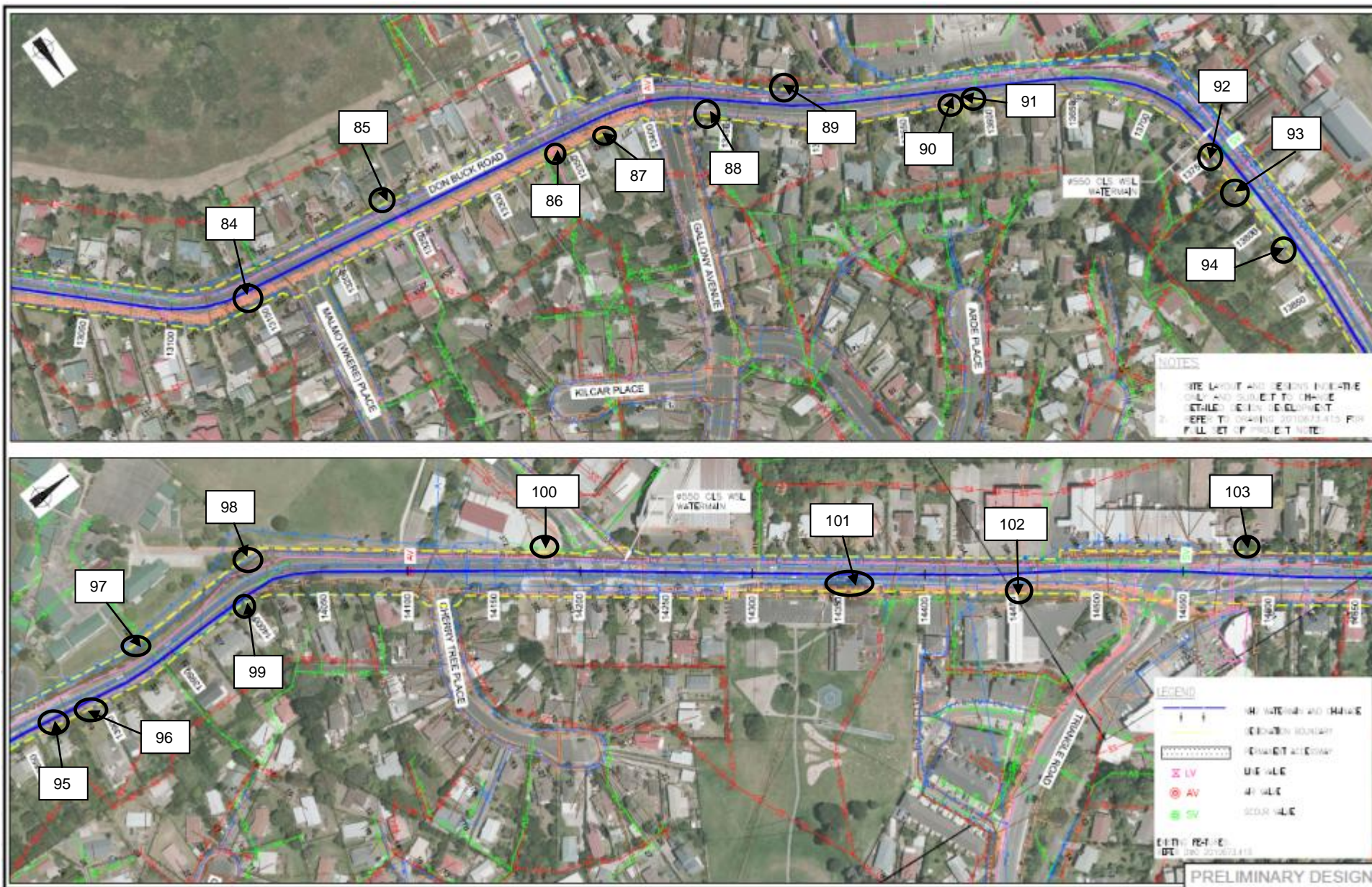


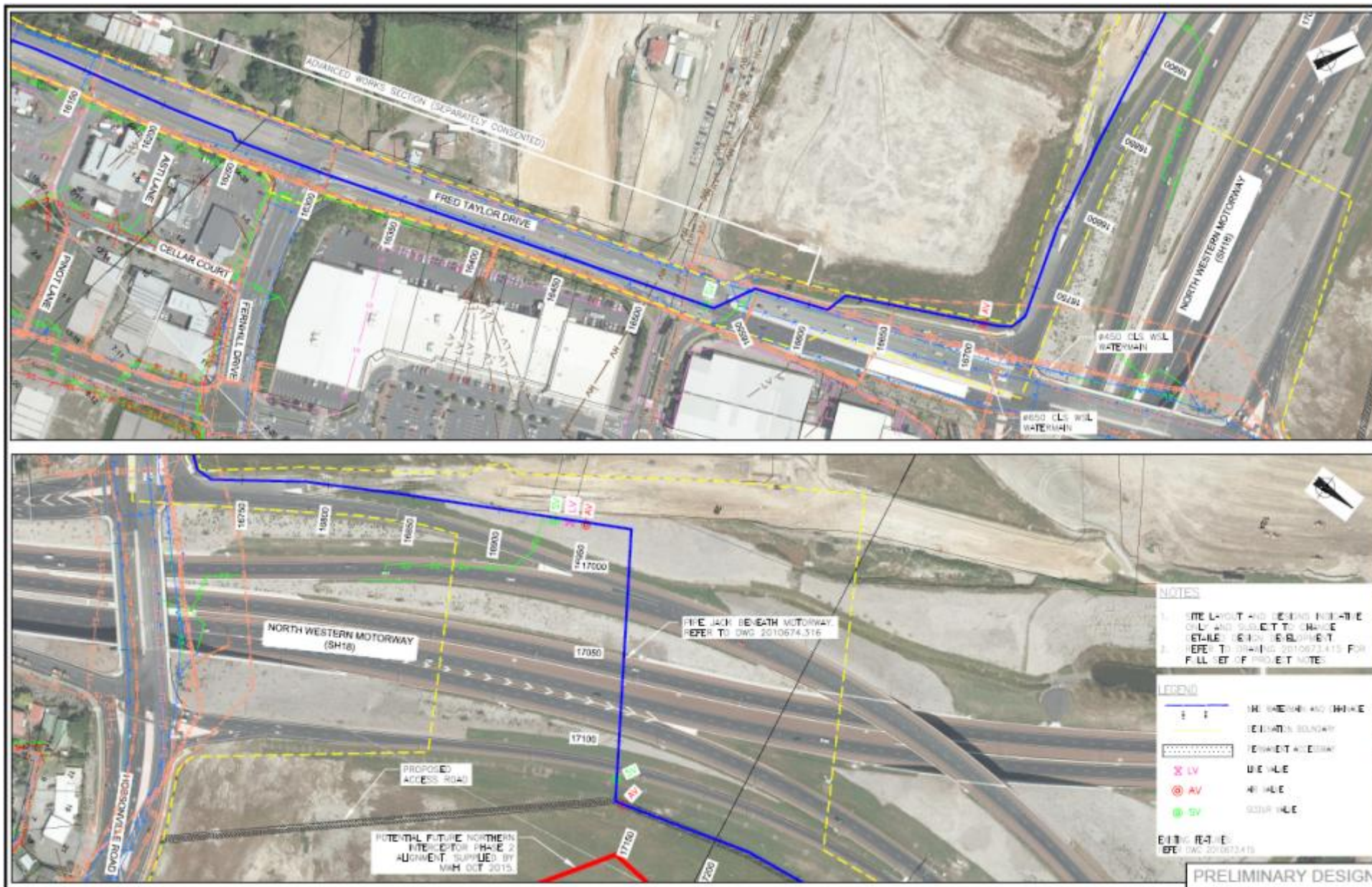


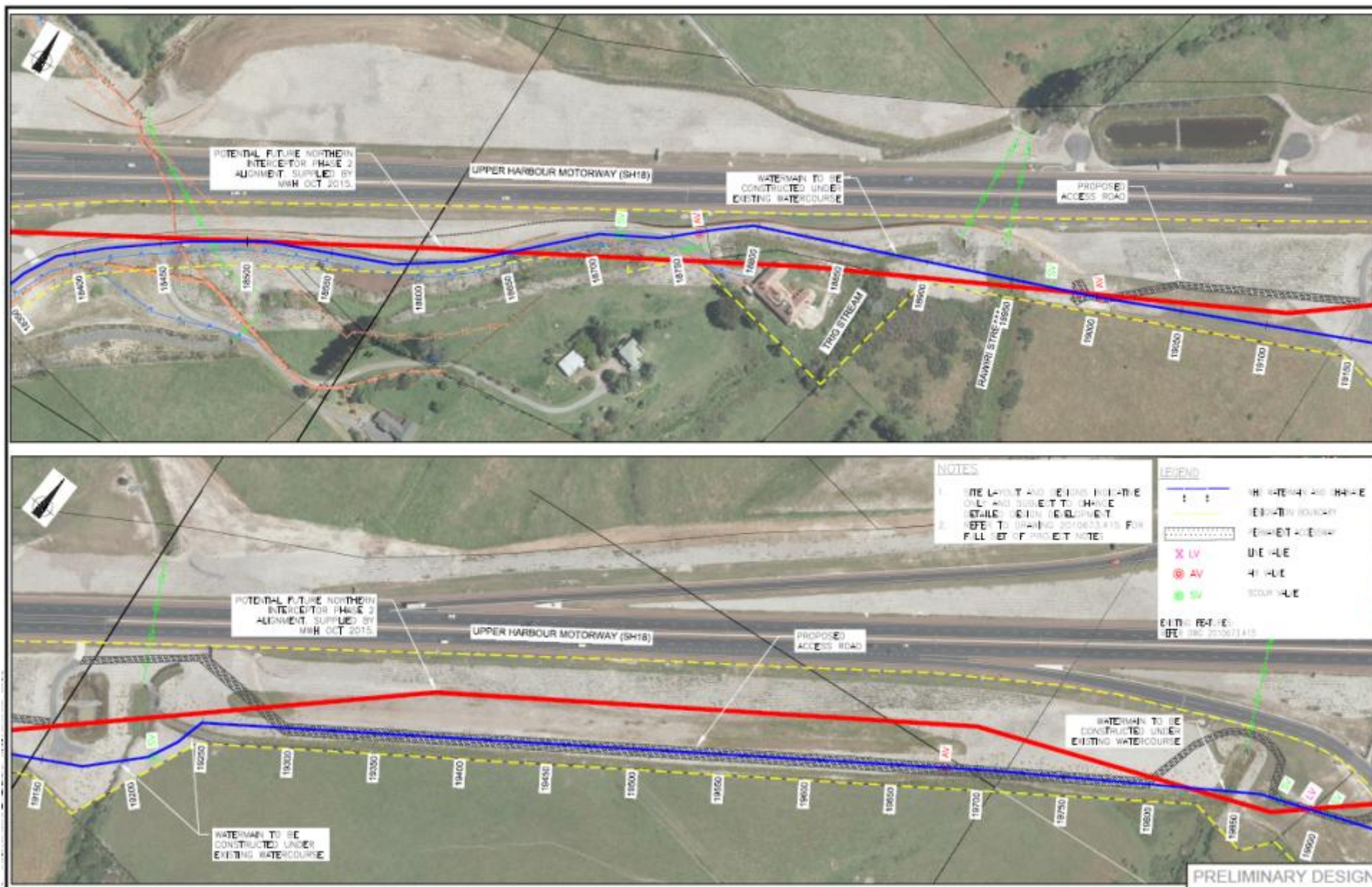


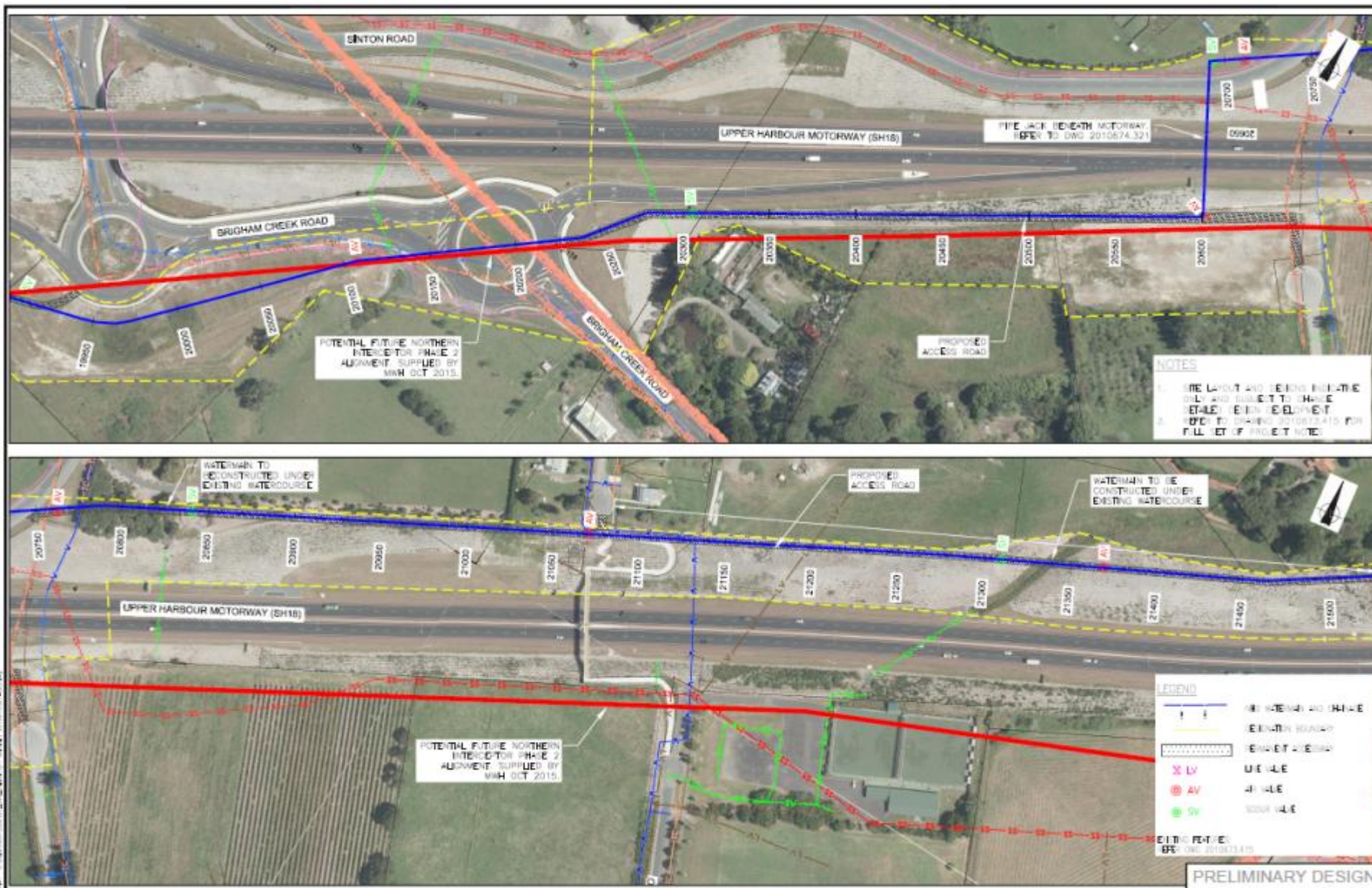


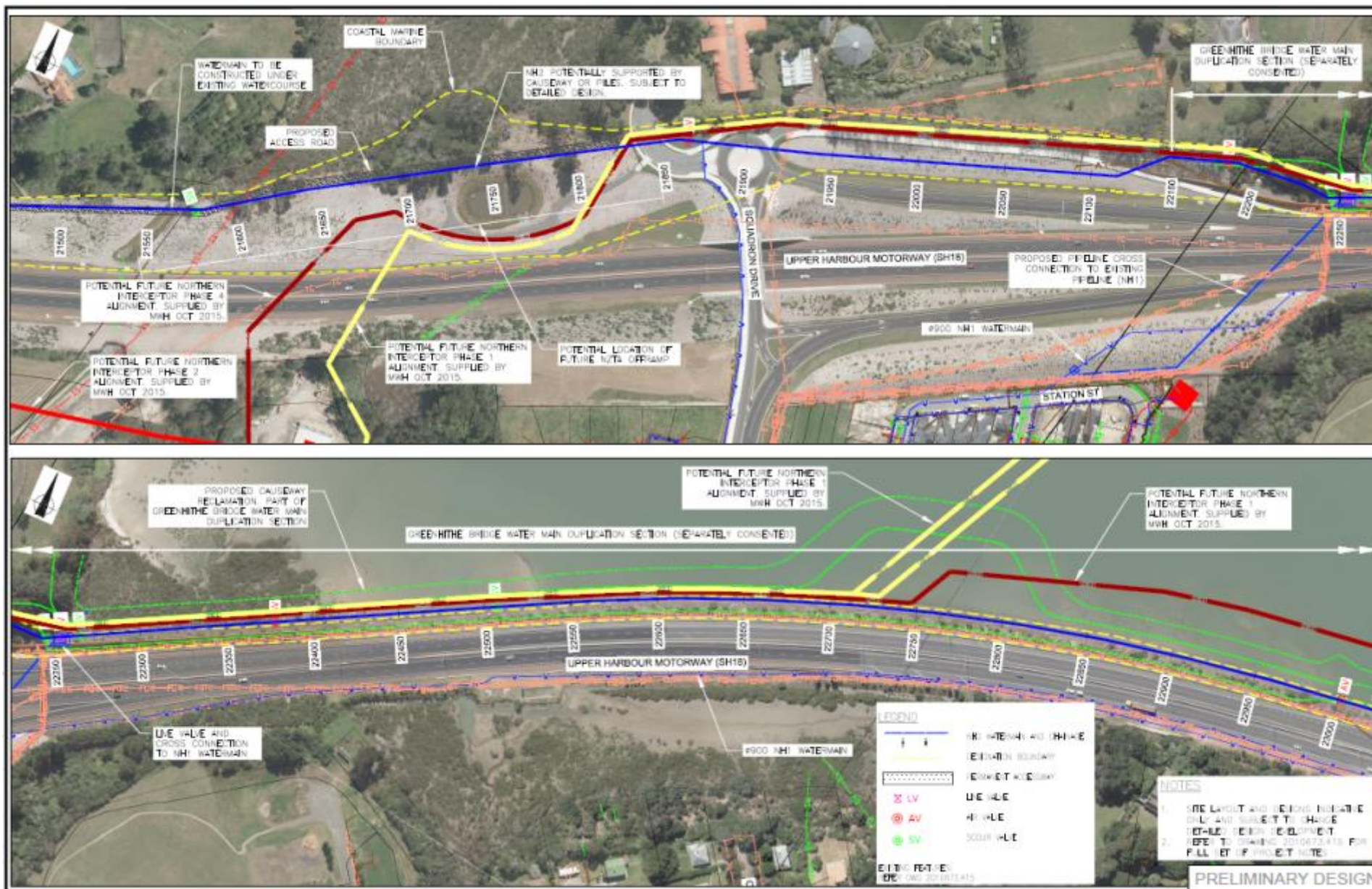


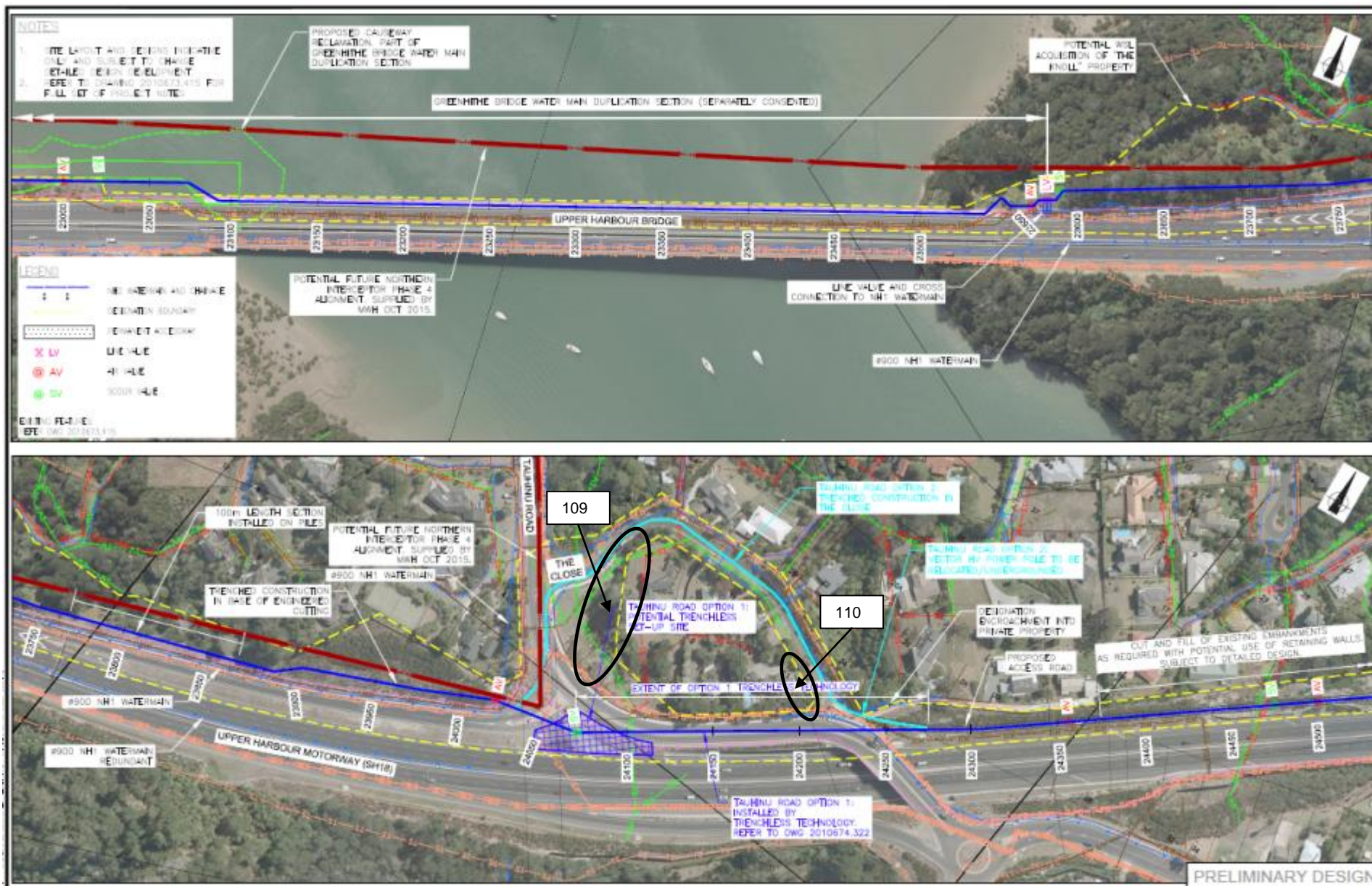






















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APPENDIX B: TREE DETAILS TABLE

Please Note:

- all measurements are approximations only
- 'G' in Tree No. column denotes group of trees
- 'T' in Tree No. column denotes single trees
- 'R' in Recommendations column denotes **removal** / replacement of tree/s
- 'TPF' in Recommendations column denotes **tree protection fence** required to isolate tree/s from construction activities
- 'CP' in Recommendations column denotes **canopy pruning** may be required to clear work corridor and/or prevent damage to trees by construction vehicles or passing high-sided vehicles.

Waitakere Section – NOR1						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
G 1.	kanuka, <i>Kunzea robusta</i> kahikatea, <i>Dacrycarpus dacrydioides</i> mahoe, <i>Melicytus ramiflorus</i> ponga, <i>Cyathea dealbata</i> totara, <i>Podocarpus totara</i> , hard beech, <i>Fuscospora truncata</i> tawa, <i>Beilschmedia tawa</i>	10	Shetland Street (end of cul-de-sac)	Y	Trees located at the end of a cul-de-sac, on the edge of Waitakere Ranges Regional Park. Trees are healthy, growing in a native bush / woodland environment. Exotic weeds (Indian balsam and Agapanthus) present in bush margin. Trenchless installation is proposed for the section of pipe from the reservoir to this location. Establishment of a site compound and permanent access shaft will require removal of trees.	R
T 2.	totara, <i>Podocarpus totara</i>	6	No.102 Shetland Street	N	Tree in good health, growing in private property and overhanging the carriageway.	TPF, CP
T 3.	kanuka, <i>Kunzea robusta</i>	8	No.81 Shetland Street	Y	Tree in good health, Council-owned tree growing on slip-road embankment and overhanging the carriageway.	CP
T 4.	Flowering cherry, <i>Prunus sp.</i> (x2)	6	No.79 Shetland Street	N	Trees in good health, growing in private property and overhanging the carriageway.	Unaffected
G 5.	karo, <i>Pittosporum crassifolium</i> pohutukawa, <i>Metrosideros excelsa</i>	5	No.84 Shetland Street	N	Trees in good health, growing in private property and overhanging the carriageway.	CP
G 6.	pohutukawa, <i>Metrosideros excelsa</i> bottlebrush, <i>Callistemon sp.</i>	6	No.82 Shetland Street	N	Trees in good health, growing in private property and overhanging the carriageway.	CP

Waitakere Section – NOR1						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
G 7.	pohutukawa, <i>Metrosideros excelsa</i> (x7)	12	Shetland Street	Y	Trees in good health, multi-stemmed trees typical of the species. Trees are Council-owned and growing on slip-road embankment and overhanging the carriageway.	CP
T 8.	puriri, <i>Vitex lucens</i>	10	No.59 Shetland Street	N	Mature tree, in good health, growing in private property and overhanging slip road.	Exclude high-sided vehicles and construction machinery from slip road.
G 9.	kanuka, <i>Kunzea robusta</i> (x2) pohutukawa, <i>Metrosideros excelsa</i> (x2)	6	No.57 Shetland Street	Y	Growing amongst a stand of smaller native trees, growing on road embankment and overhanging the carriageway.	Unaffected
G 10.	silky oak, <i>Grevillea robusta</i> coast banksia, <i>Banksia integrifolia</i>	12	No.43 Shetland Street	Y	Growing on road reserve as part of a stand of trees that include privately-owned Lawson cypress and tarata.	TPF, CP
G 11.	southern magnolia, <i>Magnolia grandiflora</i> Brazilian pepper, <i>Schinus terebinthifolius</i> pohutukawa, <i>Metrosideros excelsa</i>	6	No.54 Shetland Street	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
T 12.	claret ash, <i>Fraxinus angustifolia</i> subsp. <i>Oxycarpa</i>	6	No.52 Shetland Street	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
T 13.	kanuka, <i>Kunzea robusta</i>	7	No.41 Shetland Street	Y	Tree in good health, growing in road reserve and overhanging the carriageway.	CP
G 14.	English oak, <i>Quercus robur</i> wild cherry, <i>Prunus avium</i>	8	No.124 Glengarry Road	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	CP
T 15.	kanuka, <i>Kunzea robusta</i>	8	No.250 Glengarry Road	N	Tree in good health, growing in private property and overhanging the carriageway.	CP
T 16.	kanuka, <i>Kunzea robusta</i>	10	No.262 Glengarry Road	Y	Council-owned tree growing within grass berm and overhanging the carriageway. Form of the tree has been affected by channel pruning to provide clearance from overhead utility wires.	CP
G 17.	Coast banksia, <i>Banksia integrifolia</i> (x3)	8	No.199 Glengarry Road	N	Tree in good health, growing in road reserve and overhanging the carriageway.	CP

Waitakere Section – NOR1						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
T 18.	kanuka, <i>Kunzea robusta</i>	6	No.202 Glengarry Road	N	Tree in good health, growing in private property and overhanging the carriageway.	CP
G 19.	birch, <i>Betula</i> sp. (x3)	6	No.203 Glengarry Road	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
G 20.	birch, <i>Betula</i> sp. (x2)	6	No.207 Glengarry Road	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
G 21.	birch, <i>Betula</i> sp. (x4)	6	Nos.211-223 Glengarry Road	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
T 22.	kanuka, <i>Kunzea robusta</i>	6	Nos.226-234 Glengarry Road	Y	Tree in good health, growing in private property and overhanging the carriageway. The site is defined as non-urban under the District Plan due to being a vacant lot, therefore tree protection rules apply.	CP
G 23.	birch, <i>Betula</i> sp. (x2)	7	Nos.308-312 Glengarry Road	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
G 24.	birch, <i>Betula</i> sp. (x2)	6	Nos.330-332 Glengarry Road	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
G 25.	birch, <i>Betula</i> sp. (x2)	6	Nos.338-340 Glengarry Road	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
G 26.	pin oak, <i>Quercus palustris</i> kanuka, <i>Kunzea robusta</i> sweet gum, <i>Liquidambar styraciflua</i>	12	No.109 Parrs Cross Road	Y	Trees are mature and in good health, growing in private property and overhanging the carriageway. The site is defined as non-urban under the District Plan due to being over 4,000m ² , therefore tree protection rules apply.	CP
G 27.	black poplar, <i>Populus nigra</i> (x4)	7	Parrs Cross Road (stream crossing)	Y	Early mature trees, protected due to growing within a riparian margin. Proposed pipe bridge to be constructed over Oratia Stream.	R Confirm pipe-bridge access and construction requirements with project arborist to confirm tree removal and tree protection requirements.

Waitakere Section – NOR1						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
G 28.	pin oak, <i>Quercus palustris</i> (x5) sweet gum, <i>Liquidambar styraciflua</i> English oak, <i>Quercus robur</i>	12	Nos.79-97 Parrs Cross Road	Y	Trees in good health, growing in private property and overhanging the carriageway. The site is over 4000m ² and considered 'non-urban' under the District plan therefore tree are protection rules apply.	R Confirm pipe-bridge access and construction requirements with project arborist to confirm tree removal and tree protection requirements.
G 29.	Algerian oak, <i>Quercus canariensis</i> Lombardy poplar, <i>Populus nigra</i> 'Italica' (x4) pin oak, <i>Quercus palustris</i> (x8)	10	Nos.75-77 Parrs Cross Road	Y	Tree in good health, growing in private property and overhanging the carriageway. The site is over 4000m ² and considered 'non-urban' under the District plan therefore tree are protection rules apply.	CP
G 30.	kanuka, <i>Kunzea robusta</i> pohutukawa, <i>Metrosideros excelsa</i> tarata, <i>Pittosporum eugenioides</i> totara, <i>Podocarpus totara</i> kowhai, <i>Sophora microphylla</i>	6	Nos.45-41 Parrs Cross Road	Y	Trees growing on road reserve embankment and overhanging the carriageway.	Unaffected
T 31.	sweet gum, <i>Liquidambar styraciflua</i>	14	No.33 Parrs Cross Road	Y	Council-owned tree growing within road reserve. Low scaffold branches overhanging the carriageway.	CP
G 32.	weeping willow, <i>Salix babylonica</i> pohutukawa, <i>Metrosideros excelsa</i> sweet gum, <i>Liquidambar styraciflua</i>	8	No.34 Parrs Cross Road	N	Tree in good health, growing in private property and overhanging the carriageway of Forrest Hill Road.	CP
T 33.	pin oak, <i>Quercus palustris</i>	6	No.64 Forrest Hill Road	N	Trees growing in private property and overhanging the carriageway.	Unaffected
G 34.	sheoak, <i>Casuarina cunninghamiana</i> (x3)	10	No.45 Forrest Hill Road	N	Trees growing in private property and overhanging the carriageway.	CP
T 35.	English oak, <i>Quercus robur</i>	14	No.2 Forrest Hill Road	N	Specimen tree, good health, growing in private property and overhanging the carriageway.	TPF, CP
G 36.	bead tree, <i>Melia azedarach</i> (x11)	8	Nos.9 – 45 Border Road	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF

Waitakere Section – NOR1						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
G 37.	ti kouka (cabbage tree), <i>Cordyline australis</i> karamu, <i>Coprosma robusta</i> puriri, <i>Vitex lucens</i> kanuka, <i>Kunzea robusta</i> houhere, <i>Houheria populnea</i> titoki, <i>Alectryon excelsus</i>	5	No.69 Border Road (stream crossing)	Y	Trees range in size and form, protected due to growing within a riparian margin. Proposed pipe bridge to be constructed over Opanuku Stream.	R
G 38.	swamp cypress, <i>Taxodium distichum</i> (x3) mahoe, <i>Meliccytus ramiflorus</i> puriri, <i>Vitex lucens</i> (x4) kanuka, <i>Kunzea robusta</i> karamu, <i>Coprosma robusta</i> (x2) rimu, <i>Dacrydium cupressinum</i>	-	Palomino Drive (Opanuku Walkway)	Y	Trees growing within a Council-owned reserve. Opanuku Walkway may be utilised to set up a site works compound. Ensure that any temporary structures, machinery access, storage of materials and vehicle movement is outside of the dripline of trees.	TPF Confirm site compound requirements with project arborist to confirm tree removal and tree protection requirements.
G 39.	bead tree, <i>Melia azedarach</i> (x9)	6	Nos.43 – 69 Palomino Drive	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
G 40.	bead tree, <i>Melia azedarach</i> (x10)	6	Nos.38 – 62 Palomino Drive	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
G 41.	bottlebrush, <i>Callistemon</i> sp. (x6)	5	No.39 Palomino Drive	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF
T 42.	pin oak, <i>Quercus palustris</i>	8	No.19 Palomino Drive	Y	Good form and health. Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
T 43.	sweet gum, <i>Liquidambar styraciflua</i>	8	No.16 Palomino Drive	N	Tree growing in private property. Large scaffold branch overhanging the carriageway.	CP
T 44.	sweet gum, <i>Liquidambar styraciflua</i>	8	No.14 Palomino Drive	Y	Council-owned tree growing within grass berm and overhanging the carriageway.	TPF, CP
T 45.	Japanese maple, <i>Acer palmatum</i>	5	No.10 Palomino Drive	N	Council-owned tree growing within grass berm and overhanging the carriageway. Tree is not of sufficient dimensions that afford its protection.	TPF, CP
T 46.	Queensland box, <i>Lophostemon confertus</i>	6	No.1 Palomino Drive	Y	Council-owned tree growing within grass berm and overhanging the carriageway.	TPF, CP

Waitakere Section – NOR1						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
T 47.	English oak, <i>Quercus robur</i>	14	No.6 Summerland Drive	Y	Mature Council-owned tree growing within grass berm and overhanging the carriageway. Tree is of a large stature and in generally good health despite reduced foliar density in the upper crown.	TPF
T 48.	English oak, <i>Quercus robur</i>	10	No.3 Summerland Drive	Y	Mature Council-owned trees growing within grass berm and overhanging the carriageway. Tree is of a large stature and in generally good health.	TPF, CP
T 49.	titoki, <i>Alectryon excelsus</i>	5	No.8 Summerland Drive	N	Council-owned tree growing within grass berm and overhanging the carriageway. Tree is not of sufficient dimensions that afford its protection.	TPF
G 50.	titoki, <i>Alectryon excelsus</i> (x2)	5	Nos.34 – 36 Summerland Drive	N	Council-owned trees growing within grass berm and overhanging the carriageway. Tree is not of sufficient dimensions that afford its protection.	TPF
G 51.	southern magnolia, <i>Magnolia grandiflora</i> (x13)	4	Nos.64 – 100 Summerland Drive	N	Council-owned trees growing within grass berm and overhanging the carriageway. Tree is not of sufficient dimensions that afford its protection.	TPF, CP
G 52.	southern magnolia, <i>Magnolia grandiflora</i> (x8)	4	Nos.69 – 101 Summerland Drive	N	Council-owned trees growing within grass berm and overhanging the carriageway. Tree is not of sufficient dimensions that afford its protection.	TPF, CP
G 53.	Chinese privet, <i>Ligustrum sinense</i> black wattle, <i>Acacia mearnsii</i> ponga, <i>Cyathea dealbata</i>	-	Nos.58 – 62 Munroe Road (stream crossing)	Y	Trees range in size and form, protected due to growing within a riparian margin with the exception of Chinese privet and black acacia due to them being environmentally damaging plants. Proposed pipe bridge to be constructed over Paremuka Stream.	R
T 54.	English oak, <i>Quercus robur</i>	14	No.37 Munroe Road	N	Specimen tree in good health, growing in private property and overhanging the carriageway.	CP
T 55.	Flowering cherry, <i>Prunus sp</i> (x4)	4	Nos.119 – 129 Metcalfe Road	N	Council-owned trees growing within grass berm and overhanging the carriageway. Tree is not of sufficient dimensions that afford its protection.	TPF
T 56.	purple plum, <i>Prunus cerasifera</i>	4	No.99 Metcalfe Road	N	Council-owned tree, fair health, growing within grass berm and overhanging the carriageway. Tree is not of sufficient dimensions that afford its protection.	TPF
T 57.	Flowering cherry, <i>Prunus sp</i>	4	No.69 Metcalfe Road	N	Council-owned tree, growing within grass berm and overhanging the carriageway. Tree is not of sufficient dimensions that afford its protection.	TPF
G 58.	Flowering cherry, <i>Prunus sp</i> banksia, <i>Banksia sp.</i> bead tree, <i>Melía azedarach</i>	7	No.61 Metcalfe Road	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP

Waitakere Section – NOR1						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
G 59.	Flowering cherry, <i>Prunus sp</i>	7	Nos.55 – 35 Metcalfe Road	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	TPF, CP
T 60.	fried egg plant, <i>Gordonia axilaris</i> .	6	No.36 Metcalfe Road	N	Mature tree in good health, multi-stemmed form, growing in private property and overhanging the carriageway.	Unaffected
T 61.	bead tree, <i>Melia azedarach</i>	7	No.27 Metcalfe Road	Y	Mature tree, spreading crown that is typical of the species. Large dead limb and internal decay suspected. Council-owned tree growing within grass berm and overhanging the carriageway.	TPF, CP
T 62.	lilly pilly, <i>Syzygium smithii</i>	14	No.14 Metcalfe Road	N	Mature tree in good health, multi-stemmed form, growing in private property and overhanging the carriageway.	Unaffected
T 63.	pohutukawa, <i>Metrosideros excelsa</i>	8	No.12 Metcalfe Road	N	Mature tree in good health, multi-stemmed form, growing in private property and overhanging the carriageway.	CP
T 64.	red robin, <i>Photinia sp.</i>	4	No.10 Metcalfe Road	N	Council-owned tree, growing within grass berm and overhanging the carriageway. Tree is not of sufficient dimensions that afford its protection.	TPF
T 65.	common alder, <i>Alnus glutinosa</i>	4	No.8 Metcalfe Road	Y	Council-owned tree growing within grass berm and overhanging the carriageway.	TPF
G 66.	golden elm, <i>Ulmus glabra</i> 'Lutescens' sweet gum, <i>Liquidambar styraciflua</i>	12	No.8 Metcalfe Road	N	Mature trees in good health growing in private property and overhanging the carriageway.	Unaffected
T 67.	Chinese juniper, <i>Juniperus chinensis</i>	6	No.1 Metcalfe Road	Y	Council-owned tree growing within elevated planter and overhanging the carriageway.	Unaffected
T 68.	gum, <i>Eucalyptus sp.</i> (x2)	14	No.362 Swanson Road (corner Metcalfe Road)	N	Mature trees in good health growing in private property and overhanging the carriageway.	CP
T 69.	corkscrew willow, <i>Salix matsudana</i>	6	No.326 Swanson Road	Y	Council-owned tree, leaning form, growing within grass berm and overhanging the carriageway.	TPF, CP
T 70.	pin oak, <i>Quercus palustris</i>	10	Swanson Road (Swanson Road roundabout)	Y	Council-owned tree growing within traffic island in the middle of the Swanson Road roundabout.	R

Waitakere Section – NOR1						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
T 71.	ti kouka (cabbage tree), <i>Cordyline australis</i> (x2)	6	Swanson Road (Swanson Road roundabout)	Y	Council-owned trees growing within traffic island in the middle of the Swanson Road roundabout. Trenchless pipe installation methodologies or complete diversion of pipe alignment should be implemented to avoid damage and / or the removal of these trees.	R
T 72.	silver dollar gum, <i>Eucalyptus cinerea</i>	14	No.2 Universal Drive (Swanson Road roundabout)	N	Mature tree in good health, prominent within the streetscape, growing in private property and overhanging the carriageway.	Unaffected
T 73.	Monterey pine, <i>Pinus radiata</i>	16	No.2 Don Buck Road	Y	Mature Council-owned tree, growing within grass berm and overhanging the carriageway.	CP
G 74.	English oak, <i>Quercus robur</i> (x5) Mexican white cedar, <i>Cupressus lusitanica</i>	8	Nos.20-28 Don Buck Road (Don Buck Corner)	Y	Trees growing within a Council reserve. Don Buck Corner reserve may be utilised to set up a site works compound.	R, TPF Confirm site compound requirements with project arborist to confirm tree removal and tree protection requirements.
G 75.	English oak, <i>Quercus robur</i> silver birch, <i>Betula pendula</i> Chinese privet, <i>Ligustrum sinense</i> ti kouka (cabbage tree), <i>Cordyline australis</i> karo, <i>Pittosporum crassifolium</i> kapuka, <i>Griselinia littoralis</i>	6	Don Buck Road (stream crossing)	Y	Trees range in size and form, protected due to growing within a riparian margin with the exception of Chinese privet as this is listed as an environmentally damaging species under the District Plan. Proposed pipe bridge to be constructed over Swanson Stream.	R, TPF Confirm site compound requirements with project arborist to confirm tree removal and tree protection requirements.
G 76.	sweet gum, <i>Liquidambar styraciflua</i> silky oak, <i>Grevillea robusta</i>	8	No.45 Don Buck Road	N	Trees growing in private property and overhanging the carriageway.	Unaffected
T 77.	sweet gum, <i>Liquidambar styraciflua</i>	12	No.95 Don Buck Road	N	Trees growing in private property and overhanging the carriageway.	Unaffected
T 78.	puriri, <i>Vitex lucens</i>	5	No.150 Don Buck Road	N	Trees growing in private property and overhanging the carriageway.	CP
T 79.	pohutukawa, <i>Metrosideros excelsa</i>	8	No.205 Don Buck Road	Y	Council-owned tree in good health, growing within grass berm and overhanging the carriageway.	TPF, CP
G 80.	kanuka, <i>Kunzea robusta</i> pohutukawa, <i>Metrosideros excelsa</i>	6	No.207 Don Buck Road	Y	Council-owned trees in good health, growing within grass berm and overhanging the carriageway.	CP

Waitakere Section – NOR1						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
T 81.	black locust, <i>Robinia pseudoacacia</i>	5	No.2 Donovan Avenue (Don Buck Road)	N	Tree growing in private property and overhanging the carriageway.	Unaffected
T 82.	pohutukawa, <i>Metrosideros excelsa</i>	8	No.219 Don Buck Road	N	Tree growing in private property and overhanging the carriageway.	CP
G 83.	coral tree, <i>Erythrina x sykseii</i> English oak, <i>Quercus robur</i> Norfolk Island hibiscus, <i>Lagunaria patersonia</i>	8	No.221 Don Buck Road	N	Trees growing in private property and overhanging the carriageway.	CP
T 84.	pohutukawa, <i>Metrosideros excelsa</i>	10	No.251 Don Buck Road	N	Tree growing in private property and overhanging the carriageway.	CP
T 85.	pohutukawa, <i>Metrosideros excelsa</i>	6	No.240 Don Buck Road	Y	Council-owned tree growing within grass berm and overhanging the carriageway. Form of the tree has been affected by channel pruning to provide clearance from overhead utility wires.	TPF
T 86.	Norfolk Island pine, <i>Araucaria heterophylla</i>	14	No.273 Don Buck Road	N	Tree growing in private property and overhanging the carriageway.	CP
T 87.	pohutukawa, <i>Metrosideros excelsa</i>	7	No.275 Don Buck Road	Y	Council-owned tree in good health, growing within grass berm and overhanging the carriageway.	TPF, CP
T 88.	copper sheen, <i>Leptospermum</i> 'Copper Sheen'	5	No.2a Gallony Avenue (Don Buck Road)	N	Tree growing in private property and overhanging the carriageway.	Unaffected
T 89.	English oak, <i>Quercus robur</i>	6	No.268 Don Buck Road	Y	Council-owned tree growing within grass berm and overhanging the carriageway.	CP
G 90.	golden elm, <i>Ulmus glabra</i> 'Lutescens' silver dollar gum, <i>Eucalyptus cinerea</i>	8	No.293 Don Buck Road	N	Tree growing in private property and overhanging the carriageway.	CP
T 91.	golden elm, <i>Ulmus glabra</i> 'Lutescens'	6	No.295 Don Buck Road	N	Mature tree in good health growing in private property and overhanging the carriageway.	CP
T 92.	pohutukawa, <i>Metrosideros excelsa</i>	8	No.307 Don Buck Road	N	Tree in good health growing in private property and overhanging the carriageway.	CP
T 93.	narrow-leaved black peppermint, <i>Eucalyptus nicholii</i>	8	No.309 Don Buck Road	N	Tree growing in private property and overhanging the carriageway.	CP
T 94.	pohutukawa, <i>Metrosideros excelsa</i>	8	No.313 Don Buck Road	N	Trees growing in private property and overhanging the carriageway.	CP

Waitakere Section – NOR1						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
T 95.	pohutukawa, <i>Metrosideros excelsa</i>	8	No.317 Don Buck Road	N	Tree growing in private property and overhanging the carriageway.	CP
G 96.	totara, <i>Podocarpus totara</i> pohutukawa, <i>Metrosideros excelsa</i>	8	No.319 Don Buck Road	N	Trees growing in private property and overhanging the carriageway.	CP
G 97.	bottlebrush, <i>Callistemon</i> sp. kohuhu, <i>Pittosporum tenuifolium</i>	4	No.326 Don Buck Road	Y	Council-owned trees growing within grass berm and overhanging the carriageway.	CP
T 98.	pohutukawa, <i>Metrosideros excelsa</i>	8	No.326 Don Buck Road (Massey Primary School)	Y	Council-owned tree growing within grass berm and overhanging the carriageway.	CP
T 99.	English oak, <i>Quercus robur</i>	8	No.329 Don Buck Road	N	Tree growing in private property and overhanging the carriageway.	Unaffected
T 100.	pohutukawa, <i>Metrosideros excelsa</i>	6	No.372 Don Buck Road	Y	Council-owned tree growing within grass berm and overhanging the carriageway.	TPF, CP
G 101.	Brazilian pepper tree, <i>Schinus terebinthifolius</i> bottlebrush, <i>Callistemon</i> sp. narrow-leaved black peppermint, <i>Eucalyptus nicholii</i>	12	No.395 Don Buck Road	N	Trees growing in private property and overhanging the carriageway.	TPF
T 102.	puriri, <i>Vitex lucens</i>	10	No.397 Don Buck Road (petrol station)	Y	Council-owned tree in good health, growing within grass berm and overhanging the carriageway.	TPF, CP
T 103.	sweet gum, <i>Liquidambar styraciflua</i>	10	No.408 Don Buck Road	Y	Council-owned trees in good health, growing within grass berm and overhanging the carriageway.	CP

Waitakere Section – NOR1						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
G 104.	pohutukawa, <i>Metrosideros excelsa</i> (x4) kapuka, <i>Griselinia littoralis</i> black wattle, <i>Acacia mearnsii</i> sheoak, <i>Casuarina cunninghamiana</i> Mexican white cedar, <i>Cupressus lusitanica</i> Mexican weeping pine, <i>Pinus patula</i> Monterey pine, <i>Pinus radiata</i> lilly pilly, <i>Syzygium smithii</i> (x8) claret ash, <i>Fraxinus angustifolia</i> subsp. <i>Oxycarpa</i>	-	Nos.460 - 470 Don Buck Road (road reserve)	Y	Trees growing within a Council-owned road reserve. Road reserve area may be utilised to set up a site works compound. Black wattle trees are not protected as they are listed as environmentally damaging plants under the District Plan.	R, TPF Confirm site compound requirements with project arborist to confirm tree removal and tree protection requirements.
G 105.	pohutukawa, <i>Metrosideros excelsa</i> karamu, <i>Coprosma robusta</i> ngaio, <i>Myoporum laetum</i> kapuka, <i>Griselinia littoralis</i> akeake, <i>Dodonaea viscosa</i> houhere (ribbonwood), <i>Hoheria populnea</i> bottlebrush, <i>Callistemon sp</i>	-	Nos.2-14 Royal Road (Don Buck Road, road reserve)	Y	Growing on road reserve embankment on eastern side of road.	Unaffected
G 106.	pohutukawa, <i>Metrosideros excelsa</i> (x13) English oak, <i>Quercus robur</i>	-	Nos.453 – 471 Don Buck Road (road reserve)	Y	Road reserve area may be utilised to set up a site works compound. Ensure that any temporary structures, machinery access, storage of materials and vehicle movement are outside of the dripline of trees.	TPF Confirm site compound requirements with project arborist to confirm tree protection requirements.
T 107.	lilly pilly, <i>Syzygium smithii</i> (x9)	8	No.494 Don Buck Road	Y	Council-owned trees in good health, growing within grass berm in a linear stand and overhanging the carriageway.	TPF, CP
G 108.	Phoenix palm, <i>Phoenix canariensis</i> pohutukawa, <i>Metrosideros excelsa</i> (x2)	6	No.575 Don Buck Road	Y	Council-owned trees in good health, growing within grass berm and overhanging the carriageway.	TPF, CP

North Shore Section – NOR2						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
G 109.	kanuka, <i>Kunzea robusta</i> ti kouka (cabbage tree), <i>Cordyline australis</i> karamu, <i>Coprosma robusta</i> tanekaha (celery pine), <i>Phyllocladus trichomanoides</i> Monterey pine, <i>Pinus radiata</i> black wattle, <i>Acacia mearnsii</i>	-	The Close (corner Tauhinu Road, road reserve)	Y	Affected by Option 2. Road reserve area may be utilised to set up a site works compound. Ensure that any temporary structures, machinery access, storage of materials and vehicle movement are outside of the dripline of trees.	R, TPF Confirm site compound requirements with project arborist to confirm tree removal and tree protection requirements. Option 1 preferred for this section from an arboricultural perspective.
G 110.	totara, <i>Podocarpus totara</i> Monterey pine, <i>Pinus radiata</i> black wattle, <i>Acacia mearnsii</i>	-	No.13 The Close	N	Affected by Option 2. Trees growing in private property and overhanging the carriageway.	Option 1 preferred for this section from an arboricultural perspective.
G 111.	kanuka, <i>Kunzea robusta</i> karamu, <i>Coprosma robusta</i>	-	William Pickering Drive (cul-de-sac)	Y	Council-owned trees in good health, growing within area depicted as a paper road under the District Plan.	R
T 112.	pohutukawa, <i>Metrosideros excelsa</i>	6	No.2c William Pickering Drive	Y	Council-owned tree in good health, growing within grass berm and overhanging the carriageway.	TPF, CP
T 113.	pohutukawa, <i>Metrosideros excelsa</i>	6	No.3 William Pickering Drive	Y	Council-owned tree, good form and health, growing within grass berm and overhanging the carriageway.	TPF, CP
G 114.	pin oak, <i>Quercus palustris</i> (x2)	8	No.16 William Pickering Drive	Y	Council-owned trees, good form and health, growing within grass berm and overhanging the carriageway.	TPF, CP
T 115.	pin oak, <i>Quercus palustris</i>	7	No.20 William Pickering Drive	Y	Council-owned tree, die-back within the upper crown, growing within grass berm and overhanging the carriageway.	TPF, CP
T 116.	pin oak, <i>Quercus palustris</i>	8	No.26 William Pickering Drive	Y	Council-owned tree, good form and health, growing within grass berm and overhanging the carriageway.	TPF, CP
T 117.	pin oak, <i>Quercus palustris</i> (x3)	8	No.28 William Pickering Drive	Y	Council-owned trees, good form and health, growing within grass berm and overhanging the carriageway.	TPF, CP

North Shore Section – NOR2						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
T 118.	sweet gum, <i>Liquidambar styraciflua</i> (x4)	10	No. 2 Northwood Avenue (Rosedale Road)	Y	Council-owned trees, in good health, growing within grass berm and overhanging the carriageway.	TPF, CP
T 119.	sweet gum, <i>Liquidambar styraciflua</i> (x3)	8	No.344 Rosedale Road	Y	Council-owned trees, in good health, growing within grass berm and overhanging the carriageway.	TPF, CP
T 120.	sweet gum, <i>Liquidambar styraciflua</i> (x8)	10	Nos.11-22 Rutgers Place (Rosedale Road)	Y	Council-owned trees, in good health, growing within grass berm and overhanging the carriageway.	TPF, CP
T 121.	sweet gum, <i>Liquidambar styraciflua</i> (x4)	8	No.324 Rosedale Road	Y	Council-owned trees, in good health, growing within grass berm and overhanging the carriageway.	TPF, CP
T 122.	kanuka, <i>Kunzea robusta</i> (x3)	10	No.319 Rosedale Road	Y	Council-owned trees, in good health, growing within grass berm and overhanging the carriageway.	Unaffected
G 123.	sweet gum, <i>Liquidambar styraciflua</i> (x4) claret ash, <i>Fraxinus angustifolia</i> subsp. <i>Oxycarpa</i>	8	No.320 Rosedale Road	Y	Council-owned trees, in good health, growing within grass berm and overhanging the carriageway.	TPF, CP
T 124.	English oak, <i>Quercus robur</i>	10	Rosedale Road (corner Bush Road)	Y	Council-owned tree, in good form and health, growing within grass berm and overhanging the carriageway.	TPF, CP
T 125.	kanuka, <i>Kunzea robusta</i>	6	No.92 Bush Road	Y	Council-owned tree, leaning form in fair health, growing within grass berm and overhanging the carriageway.	TPF, CP
G 126.	claret ash, <i>Fraxinus angustifolia</i> subsp. <i>Oxycarpa</i>	10	No.92 Bush Road	Y	Council-owned tree, fair health, thinning crown and small leaves, overhanging the carriageway.	TPF, CP
T 127.	tulip tree, <i>Liriodendron tulipifera</i>	8	No.86 Bush Road	Y	Council-owned tree, in good health, growing within road reserve and overhanging the carriageway.	TPF, CP
T 128.	English oak, <i>Quercus robur</i>	14	No.80 Bush Road	N	Specimen tree, good form and health, growing in private property and overhanging the carriageway.	CP
T 129.	sweet gum, <i>Liquidambar styraciflua</i>	10	No.75 Bush Road	Y	Council-owned tree, in good health, growing within road reserve and overhanging the carriageway.	TPF, CP
T 130.	pin oak, <i>Quercus palustris</i> (x2)	8	No.75 Bush Road	Y	Council-owned trees, in good health, growing within road reserve and overhanging the carriageway.	TPF, CP

North Shore Section – NOR2						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
G 131.	totara, <i>Podocarpus totara</i> kanuka, <i>Kunzea robusta</i> mahoe (whitey wood), <i>Melicytus ramiflorus</i> ti kouka (cabbage tree), <i>Cordyline australis</i> kahikatea, <i>Dacrycarpus dacrydioides</i> kowhai, <i>Sophora microphylla</i> kauri, <i>Agathis australis</i> pate (seven finger), <i>Schefflera digitata</i> karaka, <i>Corynocarpus laevigatus</i> karamu, <i>Coprosma robusta</i> mapou, <i>Myrsine australis</i> rimu, <i>Dacrydium cupressinum</i> ponga, <i>Cyathea dealbata</i> Monterey pine, <i>Pinus radiata</i> black wattle, <i>Acacia mearnsii</i> Yunnan poplar, <i>Populus yunnanensis</i>	-	Bush Road (Fernhill Escarpment)	Y	Trees are growing in a native bush / woodland within Council-owned reserve. Option 1 avoids tree removal. Options 2 and 3 would require removal of group of trees at southern end of bush for stream crossing, including totara and tanekaha and significant kahikatea.	R, TPF Option 1 is the preferred option from an arboricultural perspective. Confirm site compound requirements with project arborist to confirm tree removal and tree protection requirements.

North Shore Section – NOR2						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
G 132.	totara, <i>Podocarpus totara</i> kanuka, <i>Kunzea robusta</i> mahoe (whitey wood), <i>Melicytus ramiflorus</i> ti kouka (cabbage tree), <i>Cordyline australis</i> kahikatea (white pine), <i>Dacrycarpus dacrydioides</i> kowhai, <i>Sophora microphylla</i> karaka, <i>Corynocarpus laevigatus</i> karamu, <i>Coprosma robusta</i> mapou, <i>Myrsine australis</i> rimu (red pine), <i>Dacrydium cupressinum</i> nikau palm, <i>Rhopalostylis sapida</i> Monterey pine, <i>Pinus radiata</i>	-	Bush Road (Burnside Escarpment)	Y	Trees are growing in a native bush / woodland Council-owned reserve.	Unaffected
T 133.	pohutukawa, <i>Metrosideros excelsa</i> (x2)	12	Bush Road (Fernhill Escarpment)	Y	Tree growing within a Council-owned reserve.	TPF Where possible, ensure activities associated with trenchless pipe installation including temporary structures, machinery access, storage of materials and vehicle movement are outside of the dripline of trees.
G 134.	karo, <i>Pittosporum crassifolium</i> pohutukawa, <i>Metrosideros excelsa</i> kanuka, <i>Kunzea robusta</i> akeake, <i>Dodonaea viscosa</i> ti kouka (cabbage tree), <i>Cordyline australis</i> Monterey pine, <i>Pinus radiata</i>	-	Corinthian Drive (Spencer Ridge Road)	Y	Affected by Option 1. Council-owned trees, early mature specimens in good health.	Option 2 is the preferred option from an arboricultural perspective. If this is not possible then replanting will be required.

North Shore Section – NOR2						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
G 135.	pohutukawa, <i>Metrosideros excelsa</i> karamu, <i>Coprosma robusta</i> ngaio, <i>Myoporum laetum</i> kanuka, <i>Kunzea robusta</i> karo, <i>Pittosporum crassifolium</i>	-	Corinthian Drive (Spencer Ridge Road)	Y	Affected by Option 1. Council-owned trees, early mature specimens in good health.	Option 2 is the preferred option from an arboricultural perspective. If this is not possible then replanting will be required.
G 136.	karo, <i>Pittosporum crassifolium</i> pohutukawa, <i>Metrosideros excelsa</i> kanuka, <i>Kunzea robusta</i> akeake, <i>Dodonaea viscosa</i> houhere (ribbonwood), <i>Hoheria populnea</i>	-	Corinthian Drive (Spencer Ridge Road)	Y	Affected by Option 1. Council-owned trees, early mature specimens in good health.	Option 2 is the preferred option from an arboricultural perspective. If this is not possible then replanting will be required.

NOR3						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
G 137.	silver fern, <i>Cyathea dealbata</i> karamu, <i>Coprosma robusta</i> gorse, <i>Ulex europaeus</i> black wattle, <i>Acacia mearnsii</i> Chinese privet, <i>Ligustrum sinense</i> Japanese honeysuckle, <i>Lonicera japonica</i> tree privet, <i>Ligustrum lucidum</i> woolly nightshade, <i>Solanum mauritianum</i> phoenix palm, <i>Phoenix canariensis</i> gum tree, <i>Eucalyptus sp</i> pampas grass, <i>Cortaderia selloana</i> Monterey pine, <i>Pinus radiata</i> Sydney golden wattle, <i>Acacia longifolia</i>	various	Around the Hobsonville Pump Station	Y	Clearance of existing vegetation located around the existing pump station will be required to complete the permanent access road, open trenching and boundary fence construction. The largest trees affected in this site are gum trees, which are assessed to generally be in poor condition, likely as a result of a combination of insect browsing and historic alteration to their growing environment. The trees are large and highly visible, however their condition reduces their value from a visual perspective and the trees have no particular arboricultural qualities. The understory native vegetation that is affected by the access road and boundary fence is not of any particular quality, however should be retained wherever possible as a natural ground cover. Removal of exotic weeds and revegetation with native species will enhance the qualities of the site.	R, TPF Confirm site compound requirements with project arborist to confirm tree removal and tree protection requirements.

NOR3						
Tree No.	Species	Height (m)	Location	Protected (Y/N)	Comments	Recommendations
138.	various native species, including: harakeke, <i>Phormium spp.</i> kanuka, <i>Kunzea robusta</i> ti kouka (cabbage tree), <i>Cordyline australis</i>	1-2	SH18 motorway corridor	N	Mass plantings of native species along the motorway corridor.	R Replanting with a commensurate revegetation programme upon completion of the works.