

Arborist Tree Protection Management Plan – Batch 3

Appendix L11 to the Construction Management Plan
(GAJV-PLN-00017)



Central Interceptor

Doc No: GAJV-PLN-141

Revision: 1.0

Appendix L11 – Batch 3 TPMP

Appendix to the Construction Management Plan (GAJV-PLN-00017)



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CENTRAL INTERCEPTOR TREE PROTECTION MANAGEMENT PLAN

ALL BATCH 3 SITES:

- **PUMP STATION 23**
- **PUMP STATION 25**
- **HAVERSTOCK ROAD**
- **LYON AVENUE**
- **MOUNT ALBERT WAR MEMORIAL RESERVE**
- **NORGROVE AVENUE**
- **RAWALPINDI RESERVE**
- **WESTERN SPRINGS**

For:	Ghella Abergeldie JV (GA-JV)
Subject:	Tree Protection Management Plan for construction phase of Central Interceptor – Batch 3 sites
Prepared by:	Leon Saxon – Senior Consultant 0274 957 221 leon@arborlab.co.nz
Reviewed by:	Jon Redfern – Principle Consultant
Date:	November 2019

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INTRODUCTION

1. Arborlab Consultancy Services (Arborlab) has been engaged by Ghella Abergeldie JV to provide a Tree Management Plan (TPMP) to support the Construction Management Plan (CMP) required under the conditions of the designation and resource consent for the Central Interceptor (CI).
2. Arborlab provided an Arboricultural Assessment Report for Watercare in 2012 in relation to the Notice of Requirement for the Designation. The Central Interceptor Project surface sites are covered by the Auckland Unitary Plan: Operative in Part (AUP:OP) Designation 9466 - Central Interceptor Main Works. Arborlab provided a memo to Watercare in 2018 updating details of the vegetation on the sites.
3. This Tree Protection Management Plan covers the following sites:
 - Pump Station 23 (PS23)
 - Pump Station 25 (PS25)
 - Haverstock Road
 - Lyon Avenue
 - Mt Albert War Memorial Reserve
 - Norgrove Avenue
 - Rawalpindi Reserve
 - Western Springs Park



Figure 1 - Designation area, Pump Station 23 (PS23)



Figure 2 – Designation area, Pump Station 25 (PS25)



Figure 3 – Designation area, Haverstock Road



Figure 4 - Designation area, Lyon Avenue

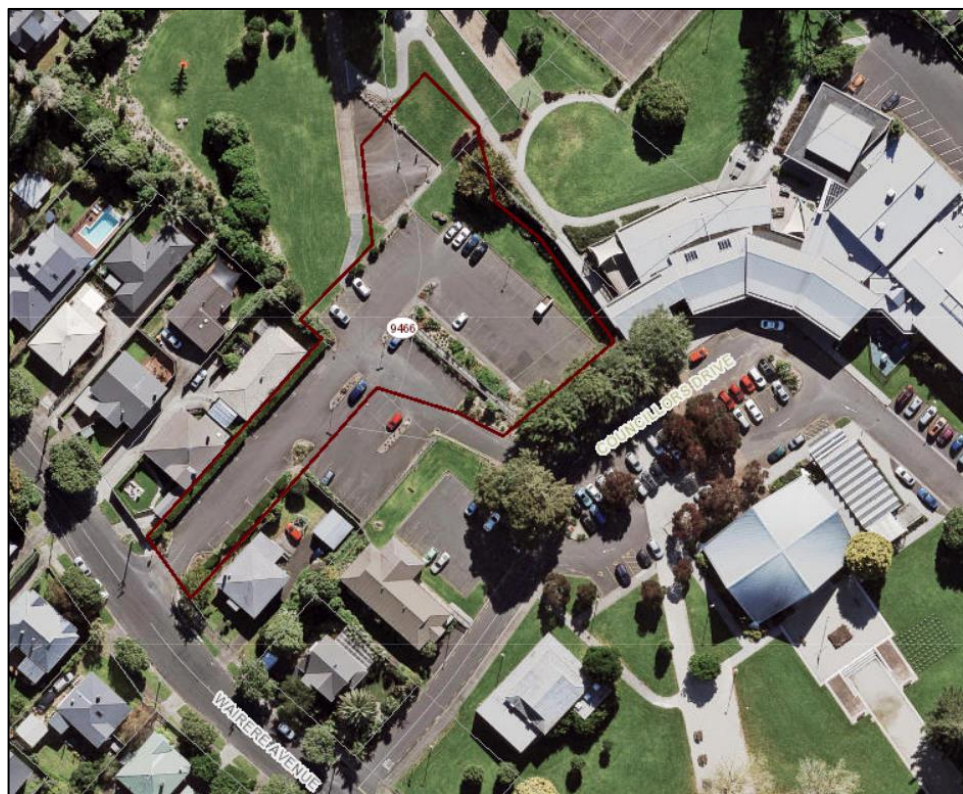


Figure 5 - Designation area, Mount Albert War Memorial Reserve



Figure 6 - Designation area, Norgrove Avenue



Figure 7 – Designation area, Rawalpindi Reserve



Figure 8 - Designation area, Western Springs

REGULATORY ENVIRONMENT

WATERCARE SERVICES LIMITED – CENTRAL INTERCEPTOR MAIN WORKS Designation Conditions – 23 January 2014

10.0 Tree Management

- 10.1 *The Requiring Authority shall provide details in the CMP as to how the potential impacts of construction on trees and vegetation will be managed. The details shall provide for the:*
- (a) Identification of trees to be protected, pruned, removed, or transplanted and procedures for marking these out on site.*
 - (b) The proposed location for any transplanted trees, including those required for visual screening purposes, and detail of any required landowner agreements if these locations are outside of the designated area.*
 - (c) Procedures for identifying and protecting significant trees to be retained where works occur in the dripline of such trees as identified by a suitably qualified person.*

Vegetation and Ecology (applies to resource consent PRC40962 only)

- 2.1 *The following matters shall be included in the CMP required under Condition 1.8 to address how the potential impacts of construction on trees and vegetation will be managed:*
- (a) identification of trees to be protected, pruned, removed, or transplanted and procedures for marking these out on site;*
 - (b) the proposed location for any transplanted trees, including those required for visual screen purposes, and detail of any required landowner agreements if these locations are outside of the designated area; and*
 - (c) procedures for identifying and protecting significant trees to be retained where works occur in the dripline of such trees as identified by a suitably qualified person.*

Site Specific Rule Infringements

The only sites covered in this plan that has work affecting trees outside of the designation area are:

- **Western Springs:** this relates to the removal of one cedar tree within Open Space zoned land. This activity will be a restricted-discretionary activity in accordance with E26.4.3.1(A92).
- **Rawalpindi Reserve:** this relates to the removal of three trees next to Meola Creek, likely in Open Space zoned land (depending on confirmation from topographic survey). If so, this activity will be a restricted-discretionary activity in accordance with E26.4.3.1 (A92).

DISCUSSION

4. Pump Station 23 (PS23)

The site at PS23, located at 39 Frederick Street, is an existing Watercare pump-station. It is accessed via an existing sealed driveway, with the land sloping up to the north from the driveway edge. Machinery access is required along this northern aspect of the site, and as such all of the vegetation within this area requires removal.

An established pōhutukawa tree and several weed species including tree privet (Trees 12, 13 & 15) will also require removal.

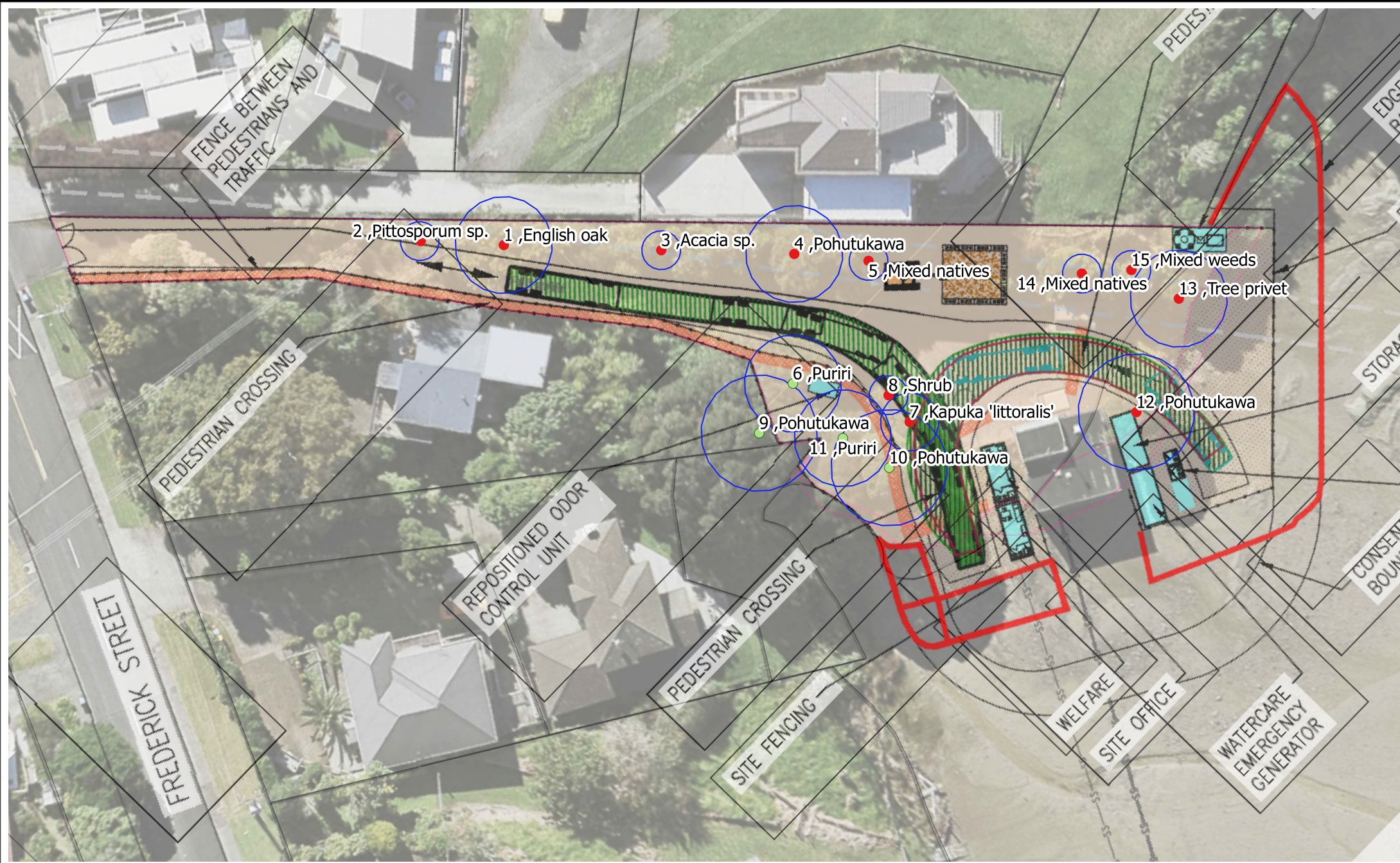
A group of four trees, two Puriri and two pōhutukawa (Trees 6, 9, 10 & 11) are located in a position at the western aspect of the work area within the designation, and are likely to be sufficiently isolated that they may be able to be retained. As construction space is limited on this site, it is likely that the area within the dripline and rootzone of trees 6, 10 & 11 will be required to be utilised for storage of equipment or laydown. Protection measures including pruning, by way of crown lift and lateral reduction, will provide sufficient clearance to truck movements and temporary surfacing will protect the root zones to allow for any potential storage buildings located beneath the trees. Where possible these trees will be attempted to be protected, but if they get damaged by construction works then they may require removal.



Figure 9 – Tree 6 which will likely require pruning over the access-way.

Table 1. PS23 Tree Inventory

Tree #	N° trees	Botanical name	Common name	Height (m)	No. stems at 1.4m	Aggregate girth at 1.4m (mm)	CSR (m)	Form	Structure	Health	Age class	Proposal
1	1	<i>Quercus robur</i>	English oak	8	1	1100	5	Poor	Fair	Good	Mature	Remove
2	5	<i>Pittosporum sp.</i>	Pittosporum sp.	4	1	300	2	Fair	Fair	Fair	Semi-mature	Remove
3	10	<i>Acacia sp.</i>	Acacia sp.	6	1	400	2	Good	Fair	Good	Mature	Remove
4	1	<i>Metrosideros excelsa</i>	Pohutukawa	8	1	1000	5	Good	Good	Good	Mature	Remove
5	4	<i>Mixed natives</i>	Mixed natives	4	1	400	2	Good	Fair	Good	Semi-mature	Remove
6	1	<i>Vitex lucens</i>	Puriri	10	1	1200	5	Good	Good	Excellent	Semi-mature	Prune/Retain where possible
7	1	<i>Griselinia littoralis</i>	Kapuka 'littoralis'	5	1	1000	3	Good	Good	Good	Mature	Remove
8	1	<i>Shrub</i>	Shrub	2	1	600	2	Good	Good	Excellent	Mature	Remove
9	1	<i>Metrosideros excelsa</i>	Pohutukawa	12	1	1400	6	Fair	Fair	Good	Mature	Retain
10	1	<i>Metrosideros excelsa</i>	Pohutukawa	12	1	2400	6	Fair	Fair	Good	Mature	Prune/Retain where possible
11	1	<i>Vitex lucens</i>	Puriri	12	1	1200	5	Fair	Good	Good	Mature	Prune/Retain where possible
12	1	<i>Metrosideros excelsa</i>	Pohutukawa	8	1	2000	6	Fair	Fair	Good	Mature	Remove
13	2	<i>Ligustrum lucidum</i>	Tree privet	8	1	800	5	Good	Fair	Excellent	Mature	Remove
14	6	<i>Mixed natives</i>	Mixed natives	5	1	4	2	Good	Good	Good	Semi-mature	Remove
15	6	<i>Mixed weeds</i>	Mixed weeds	5	1	4	2	Good	Good	Good	Semi-mature	Remove



Aerial images may not accurately reflect the actual vegetation cover. Vegetation is plotted as accurately as possible. Unless otherwise stated, project specific vegetation only has been plotted and captured.

Vegetation alteration/removal may be subject to resource consent requirements/conditions. It shall be the client's responsibility to determine whether or not this is the case.

Works within the root zone of trees should be supervised by an appointed works arborist.

Legend

●

 Remove

●

 Retain

CSR

Designation

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Central Interceptor
Frederick Street (PS23)

TREE LOCATION PLAN

Requested by		Date	
Surveyed by	LGS	OCT19	
Plotted by	LGS	OCT19	
Checked by	PVL	OCT19	
Drawing number	LGS-32392-PS23-01	Rev	C

5. **Pump Station 25 (PS25)**

The Pump Station 25 (PS25) site is accessed via a concrete driveway between No.32 and No.34 Miranda Street. The driveway has a selection of smaller growing mixed species on the left side and larger growing specimen trees (primarily pōhutukawa) growing on the right side. This vegetation will either require pruning, by way of crown-lifting, or removal, to provide sufficient clearance for truck movements.

Two small areas of native vegetation within the reserve conflict with the site layout and will require removal (Tree groups 6 and 7).

The location of the temporary pedestrian path diversion around the boundary of the site is still subject to confirmation. Once the route is confirmed, if the path is likely to affect any of the trees along the boundary of 30 and 32A Miranda Street then they will be assessed further at that time.



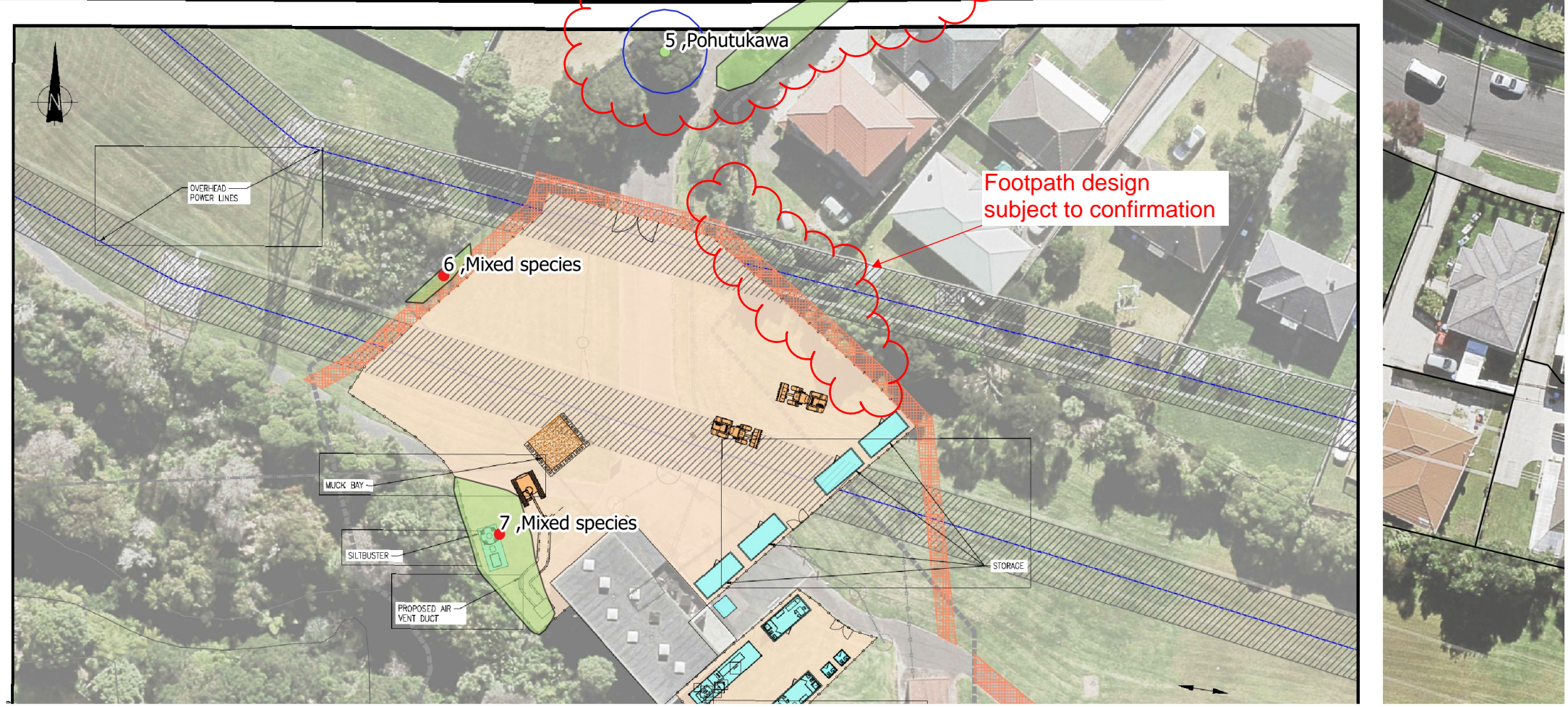
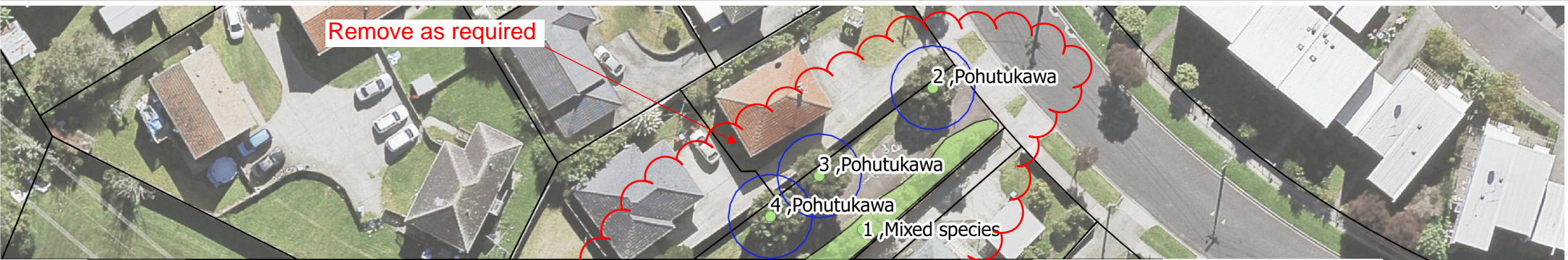
Figure 10 – Trees aligning access-way likely to require pruning.



Figure 11 – Native vegetation (group 7) requiring removal.

Table 2. PS25 Tree Inventory

Tree #	N° trees	Botanical name	Common name	Height (m)	Aggregate girth at 1.4m (mm)	CSR (m)	Form	Structure	Health	Age class	Proposal
1	20	<i>Mixed species</i>	Mixed species	6	500	4	Good	Fair	Good	Semi-mature	Retain and prune/ remove if required.
2	1	<i>Metrosideros excelsa</i>	Pohutukawa	6	1200	5	Good	Good	Good	Mature	Retain
3	1	<i>Metrosideros excelsa</i>	Pohutukawa	6	1200	5	Good	Good	Good	Mature	Retain
4	1	<i>Metrosideros excelsa</i>	Pohutukawa	6	1200	5	Good	Good	Good	Mature	Retain
5	1	<i>Metrosideros excelsa</i>	Pohutukawa	6	1200	5	Good	Good	Good	Mature	Retain
6	50	<i>Mixed species</i>	Mixed species	4	400	1	Good	Fair	Good	Semi-mature	Remove as required
7	50	<i>Mixed species</i>	Mixed species	7	600	3	Good	Fair	Good	Semi-mature	Remove as required



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Works within the root zone of trees should be supervised by an appointed works arborist.

Legend

Trees

- Retain
- Remove

CSR Groups

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Central Interceptor
Miranda Reserve (PS25)

TREE LOCATION PLAN

Requested by		Date
Surveyed by	LGS	OCT19
Plotted by	LGS	OCT19
Checked by	PVL	OCT19
Drawing number	LGS-32392-PS25-01	Rev
		C

6. Haverstock Road

The designation and resource consents allowed for access to the Haverstock Road site from two possible entry points. One from the end of Camden Road and the other from Haverstock Road (adjacent to 96 Haverstock Road).

The road reserve at the end of Camden Road contains an assortment of mostly exotic, mature trees (Trees 5 – 9). One tree of particular botanical interest is a monkey hand tree (*Chiranthodendron pentadactylon*).

The plans indicate that the entry point from Camden Road is no longer to be utilised for vehicular access. This means that trees 5 – 7 are no longer affected by the proposed works.

Trees 1 – 3 consisted of two willows and one privet. Since the original Arborlab report in 2012, these trees have been removed by other parties.

Tree 4 is a group listing consisting of a collection of cabbage trees/ti kouka (*Cordyline australis*). It is understood that these trees were planted during the period when cabbage tree decline began to occur as a research crop. As such, the trees have a high value to the research teams that were/are studying them. The trees conflict with the current construction layout and based on that will need to be either removed or relocated as agreed with the landowner, Plant and Food. Further discussions are underway with Plant and Food to identify opportunities to retain as many of the cabbage trees as possible.



Figure 12 - Trees located at the end of Camden Road (Trees 5 – 9).



Figure 13 – Collection of Cabbage trees (Tree 4) on the Haverstock Road site.

Table 3. Haverstock Road Tree Inventory

Tree #	N° trees	Botanical name	Common name	Height (m)	Aggregate girth at 1.4m (mm)	CSR (m)	Form	Structure	Health	Age class	Ownership	Proposal
1	0	<i>Ligustrum lucidum</i>	Tree privet	NA	NA	NA	NA	NA	NA	NA	Private	NA
2	0	<i>Salix caprea</i>	Willow	NA	NA	NA	NA	NA	NA	NA	Private	NA
3	0	<i>Salix caprea</i>	Willow	NA	NA	NA	NA	NA	NA	NA	Unclear	NA
4	80	<i>Cordyline australis</i>	Cabbage tree	5	600	2	Good	Good	Excellent	Semi-mature	Reserve	Relocate/ Remove
5	1	<i>Chiranthedendron pentadactylon</i>	Monkey paw	10	1400	6	Good	Good	Good	Mature	Road Reserve	Retain
6	4	<i>Cordyline australis</i>	Cabbage tree	9	1400	4	Good	Good	Excellent	Mature	Road Reserve	Retain
7	5	<i>Prunus sp.</i>	Flowering cherry	8	1000	5	Good	Fair	Fair	Mature	Road Reserve	Retain
8	1	<i>Grevillea robusta</i>	Silky oak	14	1600	6	Fair	Fair	Fair	Mature	Road Reserve	Retain
9	1	<i>Olea europaea</i>	Olive	NA	NA	NA	NA	NA	NA	NA	Road Reserve	NA

*WWRZ stands for 'Works Within the Root Zone'



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Legend			
Trees			
	Relocate		Retain
	Removed by others		Remove
	Group		
	Designation		

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Central Interceptor
Haverstock Road

TREE LOCATION PLAN

Requested by	Date	
Surveyed by	LGS	OCT19
Plotted by	LGS	OCT19
Checked by	PVL	OCT19
Drawing number	LGS-32392-Haverstock-01	Rev
		C

7. **Lyon Ave**

The Lyon Ave site is accessed via the end of Morning Star Place. All of the vegetation within the work site area will require removal other than one mature pōhutukawa (Tree 1). This vegetation is primarily comprised of young native vegetation but also includes a number of exotic trees.

Other vegetation, which is outside of the worksite but within the designation will be retained.

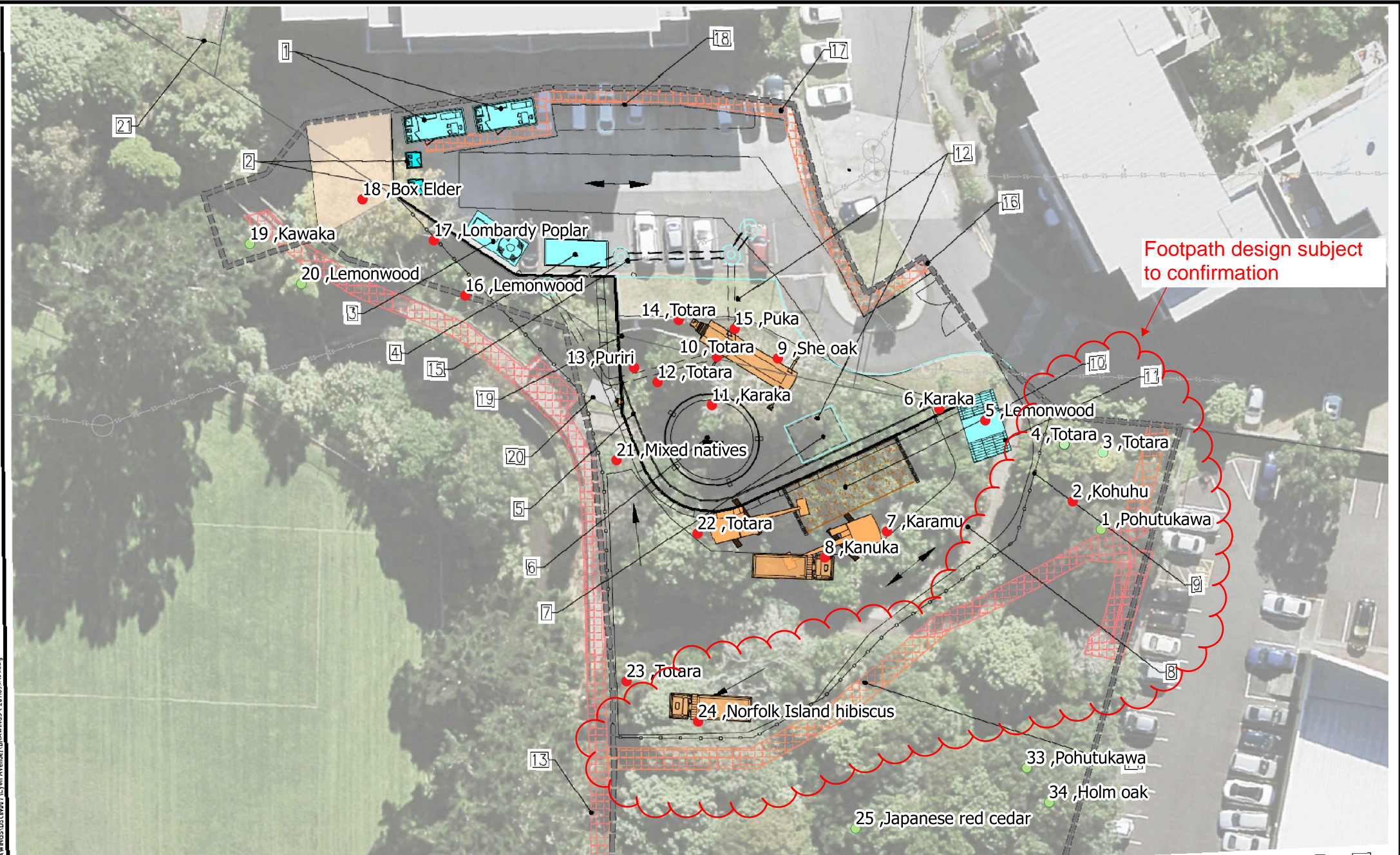
Tree 16 is a lemonwood tree located in the northern portion of the site. At this stage it is assumed to be within the designation, however confirmation of this is required by topographic survey. If the trunk of the tree is determined to be outside the designation then resource consent will be required to remove the tree.

A pedestrian path will be created around the outside of the worksite in order to maintain access to the existing walking tracks/boardwalks. The exact alignment of the path will be confirmed with guidance from the appointed works arborist in order to minimise adverse effects upon retained trees.

Mitigation planting will be covered in the Open Space Restoration Plan and Roy Clement Treeway Enhancement Plan, provided by others.

Table 4. Lyon Avenue Tree Inventory

Tree #	N° trees	Botanical name	Common name	Height (m)	Aggregate girth at 1.4m (mm)	DBH (mm)	CSR (m)	Form	Structure	Health	Age class	Ownership	Proposal
1	1	<i>Metrosideros excelsa</i>	Pohutukawa	11	2800	891	9	Good	Fair	Excellent	Mature	Reserve	Retain
2	1	<i>Pittosporum tenuifolium</i>	Kohuhu	6	700	223	1	Poor	Poor	Poor	FALSE	Reserve	Remove
3	1	<i>Podocarpus totara</i>	Totara	10	800	255	3	Good	Good	Excellent	Semi-mature	Reserve	Retain
4	1	<i>Podocarpus totara</i>	Totara	10	1300	414	5	Good	Good	Excellent	Mature	Reserve	Retain
5	1	<i>Pittosporum eugenioides</i>	Lemonwood	0	0	0	0	Poor	Poor	Dead	FALSE	Reserve	NA
6	1	<i>Corynocarpus laevigatus</i>	Karaka	0	0	0	0	Poor	Poor	Dead	FALSE	Reserve	NA
7	1	<i>Coprosma robusta</i>	Karamu	4	400	127	2	Fair	Fair	Good	Mature	Reserve	Remove
8	1	<i>Kunzea ericoides</i>	Kanuka	3	1000	318	1	Poor	Poor	Dead	FALSE	Reserve	NA
9	1	<i>Casuarina cunninghamiana</i>	She oak	0	0	0	0	Poor	Poor	Dead	FALSE	Reserve	NA
10	27	<i>Podocarpus totara</i>	Totara	6	800	255	2	Good	Fair	Good	Semi-mature	Reserve	Remove
11	1	<i>Corynocarpus laevigatus</i>	Karaka	0	0	0	0	Poor	Poor	Dead	FALSE	Reserve	Remove
12	1	<i>Podocarpus totara</i>	Totara	8	700	223	3	Good	Fair	Excellent	Semi-mature	Reserve	Remove
13	7	<i>Vitex lucens</i>	Puriri	6	400	127	2	Excellent	Good	Excellent	Semi-mature	Reserve	Remove
14	1	<i>Podocarpus totara</i>	Totara	8	800	255	3	Fair	Fair	Good	Semi-mature	Reserve	Remove
15	1	<i>Meryta sinclairii</i>	Puka	0	0	0	0	Poor	Poor	Poor	FALSE	Reserve	NA
16	3	<i>Pittosporum eugenioides</i>	Lemonwood	5	300	95	1	Good	Good	Good	Semi-mature	Reserve	Remove
17	1	<i>Populus nigra 'italica'</i>	Lombardy poplar	0	0	0	0	Poor	Poor	Poor	FALSE	Reserve	NA
18	1	<i>Acer negundo</i>	Box Elder	8	2000	637	9	Good	Poor	Good	Mature	Reserve	Remove
19	3	<i>Libocedrus plumosa</i>	Kawaka	8	600	191	2	Good	Good	Excellent	Mature	Reserve	Retain
20	3	<i>Pittosporum eugenioides</i>	Lemonwood	7	600	191	3	Good	Fair	Good	Mature	Reserve	Retain
21	8	<i>Mixed natives</i>	Mixed natives	7	600	191	2	Good	Fair	Good	Semi-mature	Reserve	Remove
22	1	<i>Podocarpus totara</i>	Totara	9	1100	350	3	Fair	Fair	Fair	Semi-mature	Reserve	Remove
23	1	<i>Podocarpus totara</i>	Totara	9	1000	318	5	Good	Good	Excellent	Mature	Reserve	Remove
24	1	<i>Lagunaria patersonii</i>	Norfolk Island hibiscus	12	1400	446	6	Good	Good	Excellent	Mature	Reserve	Remove
25	1	<i>Cryptomeria japonica</i>	Japanese red cedar	14	1300	414	5	Good	Good	Good	Mature	Reserve	Retain
26	24	<i>Mixed natives</i>	Mixed natives	10	1000	318	4	Good	Fair	Fair	Semi-mature	Reserve	Retain
27	1	<i>Podocarpus totara 'Aurea'</i>	Golden totara	12	1000	318	5	Good	Fair	Excellent	Mature	Reserve	Retain
28	6	<i>Mixed natives</i>	Mixed natives	10	1400	446	5	Good	Fair	Good	Mature	Reserve	Retain
29	3	<i>Podocarpus totara</i>	Totara	12	1000	318	5	Good	Good	Excellent	Mature	Reserve	Retain
30	1	<i>Vitex lucens</i>	Puriri	12	1400	446	6	Good	Fair	Excellent	Mature	Reserve	Retain
31	23	<i>Mixed natives</i>	Mixed natives	10	1000	318	3	Good	Fair	Good	Semi-mature	Reserve	Retain
32	37	<i>Mixed natives</i>	Mixed natives	10	1000	318	3	Good	Fair	Good	Semi-mature	Reserve	Retain
33	1	<i>Metrosideros excelsa</i>	Pohutukawa	12	1300	414	6	Fair	Fair	Good	Mature	Reserve	Retain
34	1	<i>Quercus ilex</i>	Holm oak	14	1100	350	5	Good	Good	Excellent	Mature	Reserve	Retain



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Works within the root zone of trees should be supervised by an appointed works arborist.

Legend	
Trees	● Retain
● Remove	

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Central Interceptor Lyon Avenue

TREE LOCATION PLAN

Requested by		Date
Surveyed by	LGS	OCT19
Plotted by	LGS	OCT19
Checked by	PVL	OCT19
Drawing number	Rev	
LGS-32392-Lyon-01	C	

8. **Mt Albert War Memorial Reserve**

The site at Mt Albert War Memorial Reserve is accessed via Wairere Avenue and is primarily located within an area of asphalt surfaced car-parking.

Five individually identified trees are located within the works footprint which require removal. This includes trees 1, 3, 4, 11 and 12. A low growing hedge of kapuka (Tree 2) growing alongside the carpark also requires removal.

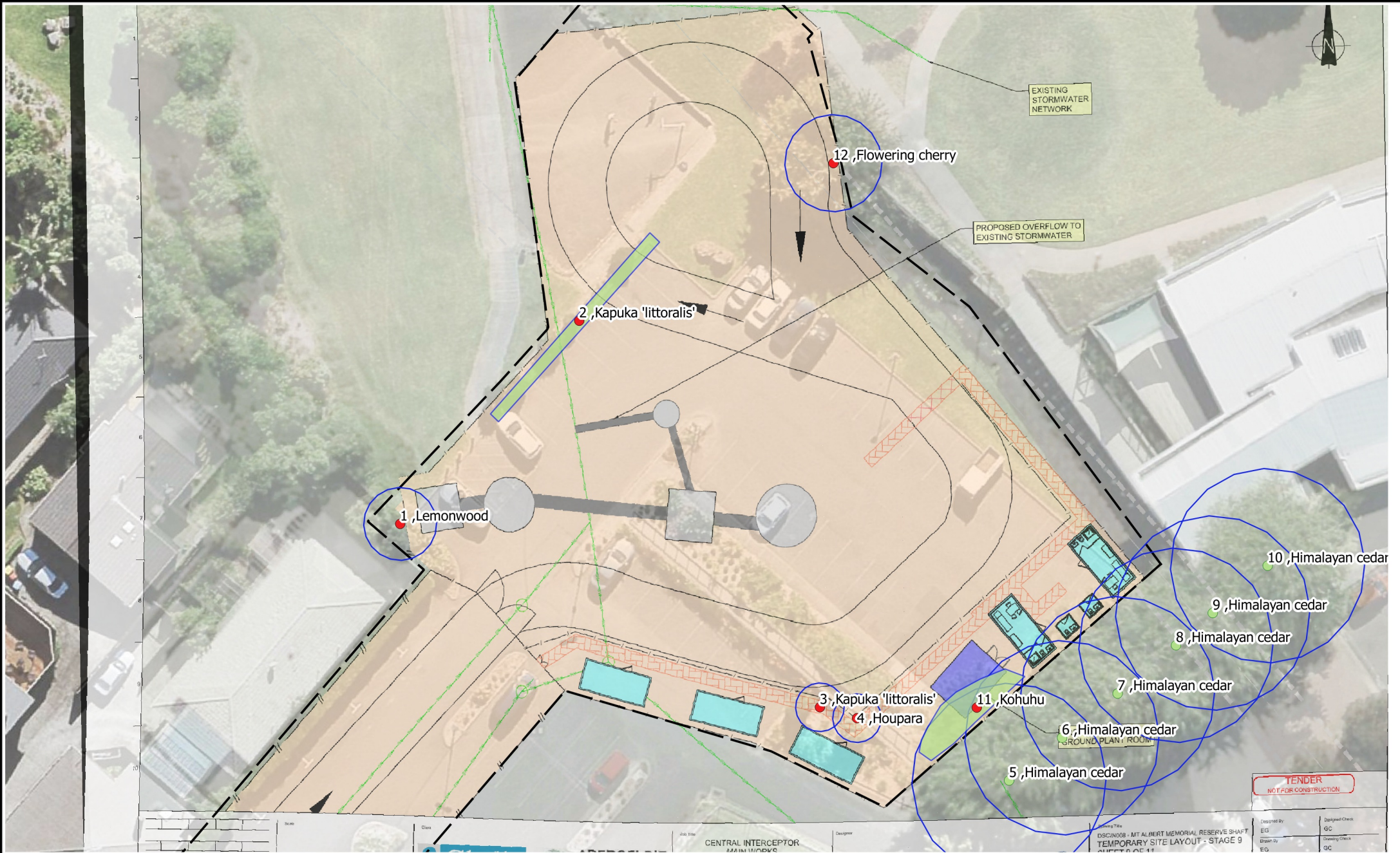
A group of cedar trees (trees 5 – 10) growing to the south-east of the work site overhangs the site. The trees are located atop a retaining wall and no root activity is anticipated to be encountered. Minor pruning may be required to provide greater clearance to the site.



Figure 14 – Group of cedar trees (Trees 5 – 10).

Table 5. Mount Albert War Memorial Reserve Tree Inventory

Tree #	N° trees	Botanical name	Common name	Height (m)	Aggregate girth at 1.4m (mm)	CSR (m)	Form	Structure	Health	Age class	Ownership	Proposal
1	1	<i>Pittosporum eugenioides</i>	Lemonwood	5	500	3	Fair	Poor	Fair	Mature	Reserve	Remove
2	1	<i>Griselinia littoralis</i>	Kapuka 'littoralis'	1.5	50	0.5	Fair	Fair	Good	Semi-mature	Reserve	Remove
3	1	<i>Griselinia littoralis</i>	Kapuka 'littoralis'	4	400	2	Good	Fair	Good	Semi-mature	Reserve	Remove
4	1	<i>Pseudopanax lessonii</i>	Houpara	5	500	2	Good	Fair	Good	Semi-mature	Reserve	Remove
5	1	<i>Cedrus deodara</i>	Himalayan cedar	10	2200	8	Fair	Poor	Good	Mature	Reserve	Retain
6	1	<i>Cedrus deodara</i>	Himalayan cedar	10	1200	8	Fair	Fair	Good	Mature	Reserve	Retain
7	1	<i>Cedrus deodara</i>	Himalayan cedar	10	1500	8	Fair	Fair	Good	Mature	Reserve	Retain
8	1	<i>Cedrus deodara</i>	Himalayan cedar	10	1500	8	Fair	Fair	Good	Mature	Reserve	Retain
9	1	<i>Cedrus deodara</i>	Himalayan cedar	10	1500	8	Fair	Fair	Good	Mature	Reserve	Retain
10	1	<i>Cedrus deodara</i>	Himalayan cedar	10	1500	8	Fair	Fair	Good	Mature	Reserve	Retain
11	4	<i>Pittosporum tenuifolium</i>	Kohuhu	5	300	2	Fair	Fair	Good	Semi-mature	Reserve	Remove
12	1	<i>Prunus sp.</i>	Flowering cherry	6	800	4	Good	Fair	Good	Mature	Reserve	Remove



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Works within the root zone of trees should be supervised by an appointed works arborist.

Legend

Trees

- Retain
- Remove

- Groups
- Crown Spread
- Designation

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CONSULTANCY SERVICES LIMITED
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**Central Interceptor
Mt Albert War Memorial**

TREE LOCATION PLAN

Requested by		Date
Surveyed by	LGS	OCT19
Plotted by	LGS	OCT19
Checked by	PVL	OCT19
Drawing number	LGS-32392-MtAlbert-01	
Rev	C	

9. Norgrove Avenue

The Norgrove Avenue site is accessed via the end of the cul-de-sac of Norgrove Avenue. From the end of the sealed road, the land slopes down to a stream where a grove of vegetation is growing (Trees 2 – 6). A retaining wall is required in this location and the only tree able to be retained in this group is Tree 2.

Tree 1 is a tarata (*Pittosporum eugenoides*) growing in the road reserve as a street tree. The site hoarding is likely to conflict with this tree and it may require removal.

The property at 27 Verona Avenue adjoins the site and has a hedge growing alongside the site boundary. The hedge will likely require minor trimming to create sufficient space for the site hoarding.

Tree 18 is a 14m tall Phoenix palm located in private property at 23 Verona Avenue on the boundary of the construction site. Landowner approval will be sought to remove, or at the very least prune, this tree to address the safety implications of working within the drop zone of the Phoenix palm fronds.

One willow within the reserve (Tree 23) will require crown lift pruning, involving the removal of a branch measuring approximately 150mm diameter as it will conflict with the site hoarding.

The remaining individually identified trees (comprised primarily of mature willows and poplars) within the site require removal.



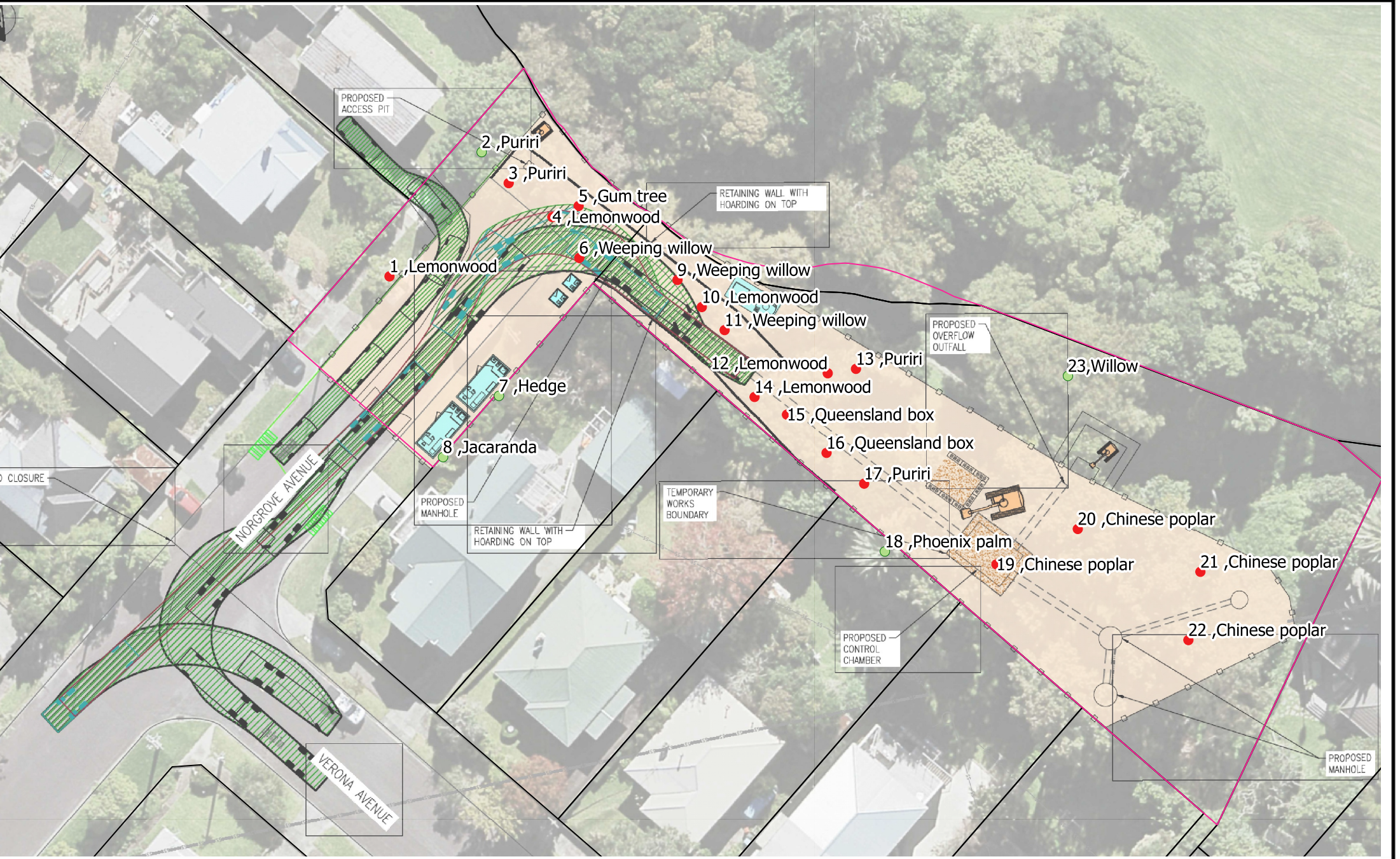
Figure 15 – Hedge of 27 Verona Avenue likely requiring trimming (Tree 7).



Figure 16 – The lowest stem on tree 23 will require removal as it conflicts with the site hoarding.

Table 6. Norgrove Avenue Tree Inventory

Tree #	N° tree s	Botanical name	Common name	Height (m)	Aggregate girth at 1.4m (mm)	CSR (m)	Form	Structure	Health	Age class	Ownership	Proposal
1	1	<i>Pittosporum eugenioides</i>	Lemonwood	4	500	2	Good	Good	Fair	Semi-mature	Road Reserve	Remove
2	1	<i>Vitex lucens</i>	Puriri	12	900	5	Fair	Fair	Good	Mature	Road Reserve	Retain
3	1	<i>Vitex lucens</i>	Puriri	12	900	5	Fair	Fair	Good	Mature	Road Reserve	Remove
4	5	<i>Pittosporum eugenioides</i>	Lemonwood	10	1300	5	Good	Good	Fair	Semi-mature	Road Reserve	Remove
5	1	<i>Eucalyptus sp.</i>	Gum tree	10	2400	6	Fair	Fair	Fair	Mature	Road Reserve	Remove
6	1	<i>Salix babylonica</i>	Weeping willow	15	1800	9	Good	Fair	Excellent	Mature	Road Reserve	Remove
7	1	<i>Mixed species</i>	Mixed species	6	1	2	Good	Good	Excellent	Mature	Unclear	Retain
8	1	<i>Jacaranda mimosifolia</i>	Jacaranda	4	500	2	Fair	Fair	Fair	Semi-mature	Unclear	Retain
9	1	<i>Salix babylonica</i>	Weeping willow	15	1800	9	Good	Fair	Excellent	Mature	Road Reserve	Remove
10	2	<i>Pittosporum eugenioides</i>	Lemonwood	10	1300	5	Good	Good	Fair	Semi-mature	Road Reserve	Remove
11	1	<i>Salix babylonica</i>	Weeping willow	15	1800	9	Good	Fair	Excellent	Mature	Road Reserve	Remove
12	9	<i>Pittosporum eugenioides</i>	Lemonwood	10	800	1	Poor	Fair	Fair	Mature	Reserve	Remove
13	2	<i>Vitex lucens</i>	Puriri	10	800	5	Poor	Fair	Good	Semi-mature	Reserve	Remove
14	1	<i>Pittosporum eugenioides</i>	Lemonwood	10	1300	5	Good	Good	Fair	Semi-mature	Road Reserve	Remove
15	1	<i>Lophostemon confertus</i>	Queensland box	14	1700	5	Good	Good	Good	Mature	Reserve	Remove
16	1	<i>Lophostemon confertus</i>	Queensland box	14	900	4	Good	Good	Good	Mature	Reserve	Remove
17	1	<i>Vitex lucens</i>	Puriri	12	1000	6	Good	Good	Good	Mature	Reserve	Remove
18	1	<i>Phoenix canariensis</i>	Phoenix palm	14	2500	5	Excellent	Good	Good	Mature	Unclear	Retain/Prune
19	1	<i>Populus yunnanensis</i>	Chinese poplar	20	2000	9	Fair	Fair	Good	Mature	Reserve	Remove
20	1	<i>Populus yunnanensis</i>	Chinese poplar	20	2000	9	Fair	Fair	Good	Mature	Reserve	Remove
21	1	<i>Populus yunnanensis</i>	Chinese poplar	20	2000	9	Fair	Fair	Good	Mature	Reserve	Remove
22	1	<i>Populus yunnanensis</i>	Chinese poplar	20	1500	9	Fair	Fair	Good	Mature	Reserve	Remove
23	1	<i>Salix sp.</i>	Willow	15	1500	7	Fair	Fair	Good	Mature	Reserve	Prune



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Vegetation alteration/removal may be subject to resource consent requirements/conditions. It shall be the client's responsibility to determine whether or not this is the case.

Works within the root zone of trees should be supervised by an appointed works arborist.

Legend

●

Remove

●

Retain

Designation

ARBORLAB

CONSULTANCY

09 379 3302

www.arborlab.co.nz

Central Interceptor
Norgrove Road

TREE LOCATION PLAN

Requested by		Date	
Surveyed by	LGS		OCT19
Plotted by	LGS		OCT19
Checked by	PVL		OCT19
Drawing number	LGS-32392-Norgrove-01		Rev
			B

10. Rawalpindi Reserve

The Rawalpindi site is accessed via a concrete driveway between Nos. 9 and 11 Rawalpindi Street.

Five of the trees originally identified within the 2012 Arborlab report have since been removed by others. A number of the specimen trees within the reserve have been historically damaged by vandalism.

The site is generally open grass with young specimen tree planting. All of the trees within the work site will be removed other than one pittosporum and one olive (Trees 2 and 4).

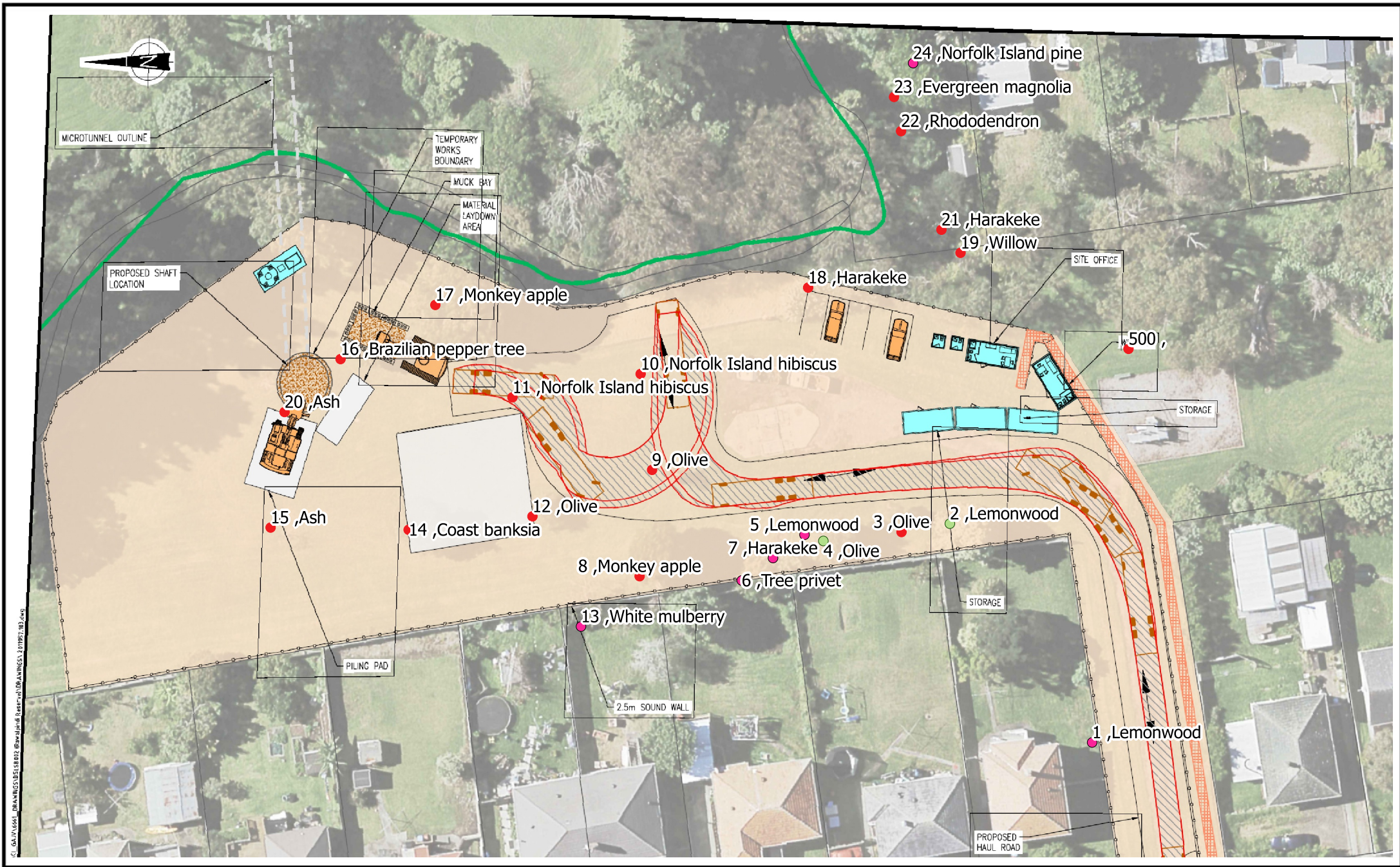
Three trees 21, 22, and 23 are scheduled for removal in order to facilitate the construction of the required sewer connections in this area. These trees are outside of the designation and as such will only be removed once any necessary resource consents and landowner approvals have been obtained. Tree 19 is currently assumed to be within the designation, but if a topographic survey determines that it is in fact outside the designation, then resource consent will be required to remove this tree also.



Figure 17 – Pittosporum and olive trees located at the edge of the work site able to be retained.

Table 7. Rawalpindi Reserve Tree Inventory

Tree #	N° trees	Botanical name	Common name	Height (m)	Aggregate girth at 1.4m (mm)	CSR (m)	Form	Structure	Health	Age class	Proposal
1	1	<i>Pittosporum eugenioides</i>	Lemonwood	0	0	0	Poor	Poor	Poor	NA	Removed by others
2	1	<i>Pittosporum eugenioides</i>	Lemonwood	8	1500	5	Good	Fair	Excellent	Mature	Retain
3	1	<i>Olea europaea</i>	Olive	6	400	2	Good	Fair	Poor	Semi-mature	Remove
4	1	<i>Olea europaea</i>	Olive	7	700	4	Good	Good	Good	Semi-mature	Retain
5	1	<i>Pittosporum eugenioides</i>	Lemonwood	0	0	0	Poor	Poor	Poor	NA	Removed by others
6	1	<i>Ligustrum lucidum</i>	Tree privet	5	1000	4	Good	Good	Excellent	Mature	Removed by others
7	1	<i>Acacia baileyana</i>	Cootamundra wattle	3	1	2	Good	Good	Excellent	Mature	Removed by others
8	1	<i>Syzygium smithii</i>	Monkey apple	10	1800	5	Good	Poor	Fair	Mature	Remove
9	1	<i>Olea europaea</i>	Olive	4	80	1	Fair	Fair	Poor	Semi-mature	Remove
10	1	<i>Lagunaria patersonii</i>	Norfolk Island hibiscus	NA	NA	NA	NA	NA	NA	NA	Remove
11	1	<i>Lagunaria patersonii</i>	Norfolk Island hibiscus	2	50	1	Poor	Poor	Poor	Juvenile	Remove
12	1	<i>Olea europaea</i>	Olive	5	500	2	Good	Good	Good	Semi-mature	Remove
13	1	<i>Morus alba</i>	White mulberry	NA	NA	NA	NA	NA	NA	NA	Removed by others
14	1	<i>Banksia integrifolia</i>	Coast banksia	8	1400	5	Good	Fair	Good	Mature	Remove
15	1	<i>Fraxinus sp.</i>	Ash	3	50	0.5	Poor	Poor	Poor	Juvenile	Remove
16	1	<i>Schinus terebinthifolius</i>	Brazilian pepper tree	4	400	2	Good	Good	Good	Mature	Remove
17	1	<i>Syzygium smithii</i>	Monkey apple	10	2000	5	Good	Fair	Good	Mature	Remove
18	5	<i>Acacia baileyana</i>	Cootamundra wattle	3	1	2	Good	Good	Excellent	Mature	Remove
19	1	<i>Salix caprea</i>		12	2600	10	Fair	Fair	Fair	Mature	Remove
20	1	<i>Fraxinus sp.</i>	Ash	3	50	0.5	Poor	Poor	Poor	Juvenile	Remove
21	1	<i>Acacia baileyana</i>	Cootamundra wattle	6	600	4	Good	Good	Good	Mature	Remove
22	1	<i>Rhododendron arborea</i>	Rhododendron	6	600	3	Good	Fair	Good	Mature	Remove
23	1	<i>Magnolia grandiflora</i>	Evergreen magnolia	14	2400	7	Good	Fair	Excellent	Mature	Remove
24	1	<i>Araucaria heterophylla</i>	Norfolk Island pine	NA	NA	NA	NA	NA	NA	NA	Removed by others
25	1	<i>Salix caprea</i>		12	2600	10	Fair	Fair	Fair	Mature	Remove



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Vegetation alteration/removal may be subject to resource consent requirements/conditions. It shall be the client's responsibility to determine whether or not this is the case.

Works within the root zone of trees should be supervised by an appointed works arborist.

11. **Western Springs**

The entrance to the Western Springs site is from Bullock Track. Vehicle access will then travel around the edge of the sports field, with several trees overhanging the access-way potentially requiring crown-lift pruning.

A group of trees, primarily ash and cabbage trees (ti-kouka) located within the western aspect of the site require removal.

The most significant group of trees within the reserve is a group of mature cedar trees (Tree group 10). It is proposed to construct an access-way within the sportsfield, to the east of the cedar trees. The accessway will exit onto Stadium Road via an existing concrete vehicle crossing. Minor pruning of two of the cedar trees may be required to provide sufficient clearance to trucks using the accessway. If the vehicle crossing requires strengthening, this may require the use of a geo-web cellular confinement system, and/or no-fines concrete, to ensure that the underlying root systems of the trees are not damaged.

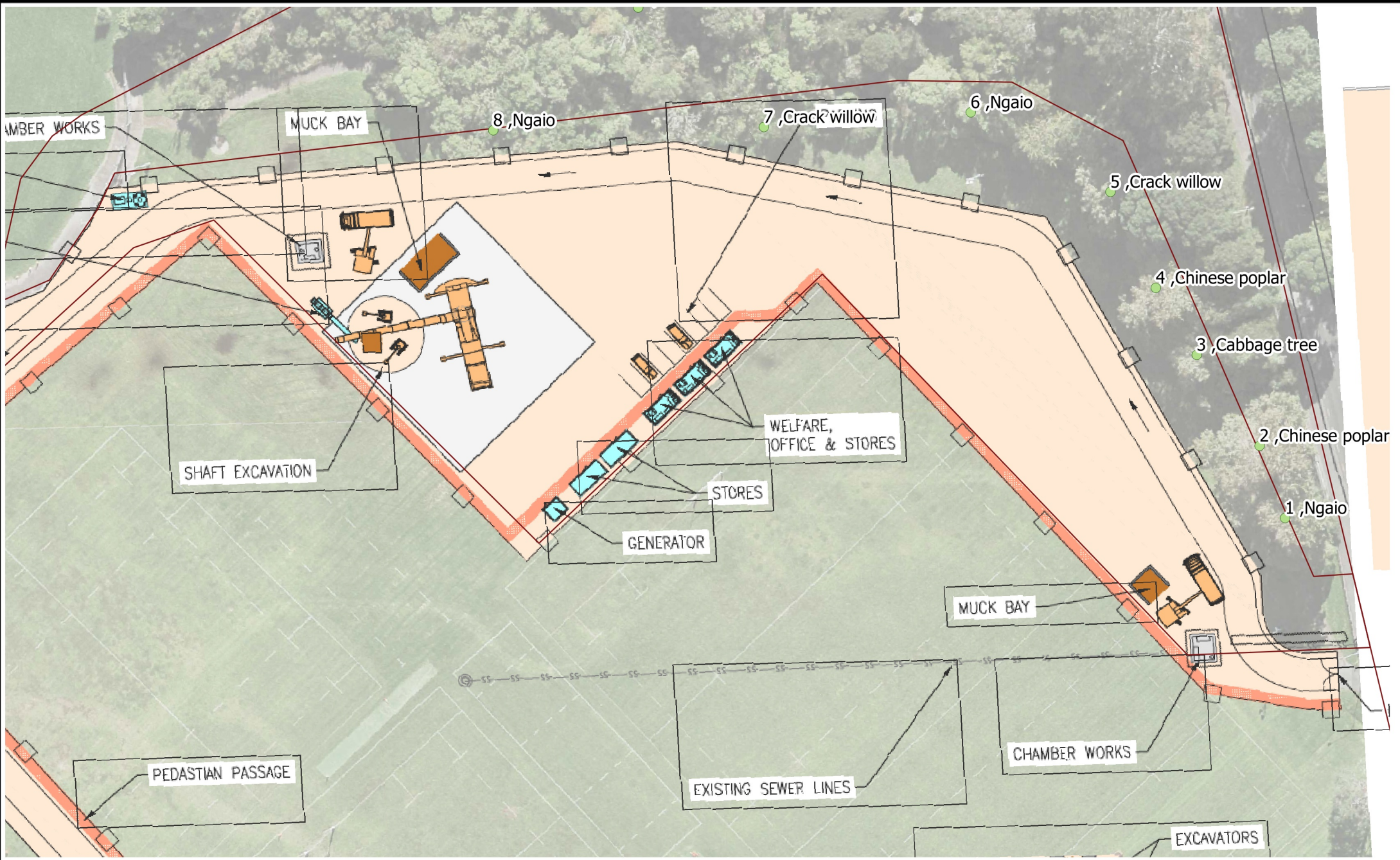
One of the cedar trees, which is isolated from the group, at its northern end, will require removal as it stands within the footprint of a significant excavation. This tree is outside of the designation and as such will only be removed once resource consent and landowner approval have been obtained.



Figure 18 – The individual cedar tree likely requiring removal (Tree 11).

Table 8. Western Springs Tree Inventory

Tree #	N° trees	Botanical name	Common name	Height (m)	Aggregate girth at 1.4m (mm)	CSR (m)	Form	Structure	Health	Age class	Proposal
1	1	<i>Myoporum laetum</i>	Ngaio	9	1300	6	Fair	Fair	Good	Mature	Retain
2	3	<i>Populus yunnanensis</i>	Chinese poplar	20	2000	10	Good	Fair	Good	Mature	Retain
3	1	<i>Cordyline australis</i>	Cabbage tree	8	1209	4	Good	Good	Fair	Mature	Retain
4	1	<i>Populus yunnanensis</i>	Chinese poplar	10	1200	5	Good	Fair	Good	Semi-mature	Retain
5	1	<i>Salix fragilis</i>	Crack willow	0	0	0	Poor	Poor	Poor	NA	Retain
6	1	<i>Myoporum laetum</i>	Ngaio	5	409	2	Fair	Fair	Fair	Semi-mature	Retain
7	1	<i>Salix fragilis</i>	Crack willow	0	0	0	Poor	Poor	Poor	NA	Retain
8	1	<i>Myoporum laetum</i>	Ngaio	4	400	2	Good	Good	Fair	Semi-mature	Retain
9	100	<i>Mixed natives</i>	Mixed natives	1	1	1	Good	Good	Good	Semi-mature	Retain
10	29	<i>Cedrus deodara</i>	Himalayan cedar	30	3000	15	Good	Good	Good	Mature	Retain
11	1	<i>Cedrus deodara</i>	Himalayan cedar	10	1400	8	Fair	Good	Good	Mature	Remove
12	1	<i>Fraxinus sp.</i>	Ash	4.5	250	3	Good	Good	Good	Semi-mature	Remove
13	1	<i>Cordyline australis</i>	Cabbage tree	6	250	1	Fair	Fair	Fair	Semi-mature	Remove
14	1	<i>Fraxinus sp.</i>	Ash	5	450	3	Good	Good	Good	Mature	Remove
15	0	<i>Plagianthus regius</i>	Ribbon wood	0	0	0	Poor	Poor	Poor	NA	Remove
16	1	<i>Fraxinus sp.</i>	Ash	5	450	3	Good	Good	Good	Mature	Remove
17	0	<i>Mixed shrubs</i>	Mixed shrubs	0	0	0	Excellent	Good	Excellent	Semi-mature	Remove
18	2	<i>Cordyline australis</i>	Cabbage tree	6	250	1	Excellent	Good	Fair	Semi-mature	Remove
19	1	<i>Fraxinus sp.</i>	Ash	5	450	3	Good	Good	Good	Mature	Remove



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Works within the root zone of trees should be supervised by an appointed works arborist.

Legend

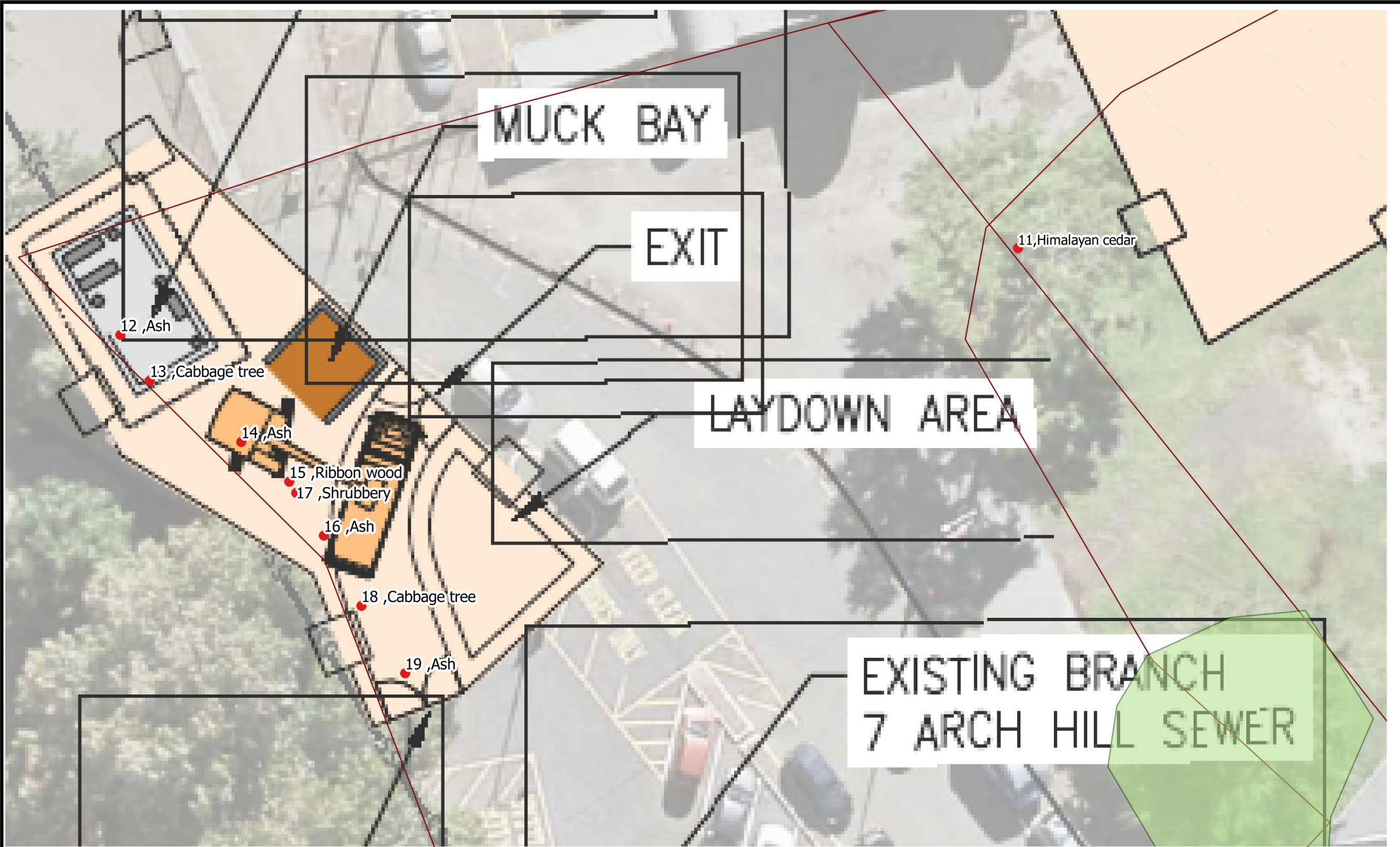
- Trees
- Group



Central Interceptor
Western Springs

TREE LOCATION PLAN

Requested by		Date
Surveyed by	LGS	OCT19
Plotted by	LGS	OCT19
Checked by	PVL	OCT19
Drawing number	LGS-32392-WS-01	Rev
		C



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Legend

- Trees
- Group



Central Interceptor
Western Springs

TREE LOCATION PLAN

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		C

TREE PROTECTION METHODOLOGY

1. Summary

- Site pre-commencement meeting held and documented.
- Temporary hard surfaces to be available where required whilst working in the vicinity of trees.
- Adherence to control methods as specified in the conditions of Resource Consents /Asset Owner Approvals (AOA).
- Works arborist to assist GAJV in the planning and execution of the works in the vicinity of the root zone of any of the retained trees.
- Arboricultural end of project report compiled and submitted if required or requested by GA-JV

2. Tree protection methodology

Pre-works

2.1 A suitably qualified and experienced arborist (works arborist) shall be engaged by the AOA/consent holder at the start of the project to assist GAJV in the planning and execution of the works in the vicinity of the trees. The appointed works arborist must be experienced in tree protection systems and construction methodologies, and will need to be capable of coordinating site works ensuring that the tree protection methodology is correctly implemented.

2.2 Identification of procedures for trees on site will be undertaken as set out in Table 2 below:

Table 2. Tree identification procedures

Action	How	Responsibility	To be documented/ confirmed by:
Identify trees for removal	Tree marked with a red X with dazzle 5 days prior to removal, in accordance with this plan. Checked by Approved Contractor before starting work each day. Approved contractor to contact GAJV if any discrepancies. Record that checks have been completed on daily 'tool box' pre start sheet.	GAJV Approved Contractor	GAJV
Identify trees for retention	Marked with pink ribbon, tied to tree 2 metres above ground level.	GAJV	GAJV
Identify scheduled trees	Attach 'scheduled tree' sign with tape/straps.	GAJV in consultation with the works arborist	GAJV
Identify retained trees; works in root zone / biosecurity	Identify exclusion area, attach 'protected tree' signs.	GAJV in consultation with the works arborist	GAJV

2.3 Prior to any works commencing, a meeting will be held at the site to discuss all the tree protection measures proposed and to gain clarification of any conditions of relevant consents imposed by Council. Present at the meeting should be:

- the consent holder
- the site's project manager (or other contractor representative)
- the works/supervisory arborist appointed by consent holder

The following Council officers must also be invited to attend this meeting:

- Team Leader Isthmus Monitoring (or representative);
- In the case of trees on Parks or road reserve land – the Senior Arboriculture and Eco Specialist (or equivalent), Operational Management and Maintenance, Auckland Council Community Services.

Supervision

2.4 A suitably qualified and experienced Arborist shall assist GAJV in the planning and execution of the tree protection measures, in accordance with the attached Tree Protection Methodology. The appointed works arborist will be experienced in tree protection systems and construction methodologies. Records will be kept digitally by the monitoring arborist which will be utilised to provide the required reporting.

Pre/Post Work Administration Procedures

2.5 Prior to works in the vicinity of protected trees to be retained commencing, the Environmental Manager will arrange a pre-start meeting. At the meeting, the following will be confirmed:

- The methodology and timing of the works
- Site access and areas for manoeuvring vehicles and machinery
- Areas for storing and/or stockpiling materials, spoil and equipment
- The care needed when working around trees
- The conditions of the resource consent.

It is the responsibility of the Construction Manager to ensure that all persons engaged or otherwise to work on the site are made aware of the conditions of consent, and that those conditions are adhered to at all times.

2.6 At the completion of works, the works arborist will provide a report to the contractor, if requested by GA-JV, 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

Inspections

2.7 Weekly environmental inspections will be undertaken by the GAJV which includes tree protection aspects.

Reporting

2.8 If required by GA-JV, a report of arboricultural monitoring can be compiled and provided. This report will include at a minimum the Supervising Arborist Records or approved similar method.

Protective Barrier Fencing

- 2.9 Prior to physical works commencing in the vicinity of protected trees, and where practicable to do so, a suitable protective fence shall be erected around the tree. The exact location and nature of the protective fence shall first be agreed and minuted upon with the works arborist. For the duration of time the protective fence is in place, the area enclosed by the fence shall be regarded as an exclusion zone, and no material is to be stored, emptied or disposed of within the area enclosed by the protective fence. No person, vehicle or machinery may enter the area enclosed by the protective fence unless otherwise authorised to do so by the works arborist.
- 2.10 If for any reason it becomes necessary to move the protective fencing, then for the duration of time that the protective fence is not in place, the area which was previously enclosed by the fence shall be regarded in the same manner as if the protective fence were still in place.
- 2.11 Protective barrier fencing shall consist of temporary barriers at least 1.25 metres in height anchored securely to the ground (or an accepted alternative approved by the Council arborist, or representative). The fencing should be erected so as to enclose as greater portion of the trees root zone as possible whilst allowing safe work areas and to exclude access or the storage of any materials from within the fenced areas. The fencing should be of sufficient durability to ensure the tree is protected from damage.
- 2.12 Signage shall be affixed to the fencing to identify the enclosed area as a Tree Protection Zone. An example of the signage that will be used is provided as an Appendix.

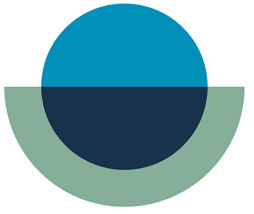
Works within the root zone or drip line

- 2.13 Works within the root zone and/or drip line of the trees will be undertaken in accordance with this plan. Where additional works are required or any amendments to the tree protection methodology, these will be undertaken in consultation with the works arborist.
- 2.14 No material is to be stored, emptied or disposed of within 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 within the root zone of the trees shall be stored carefully on an existing or temporary hard surface such as asphalt or plywood sheets respectively.
- 2.15 If during the course of the works, machinery or vehicle access/manoeuvring is required within the root zone of the trees, then depending on the nature of the loading of the machinery or vehicle, it may be necessary to cover those areas 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 wire planks, plywood or similar).
- 2.16 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.
- 2.17 All excavations which are to take place within the root zone of the tree shall be done so in conjunction with the works arborist.

- 2.18 Any roots of retained protected trees which are encountered during any part of the process are to be retained where possible. Every effort shall be made to retain all roots 35mm in diameter or greater. The severance of any tree roots greater than 35mm in diameter shall be done at the discretion and under the direction of the works arborist. Where roots are to be severed, they shall be cut cleanly by, or under the direction of, the works arborist with a sharp hand saw or loppers, and the area around the root shall be backfilled with the original material.
- 2.19 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 back filled with the original material. The method of wrapping or covering of any roots and the relevant materials used shall be specified by the works arborist.
- 2.20 If during the works, there are large areas of root zones exposed, then it may be necessary to protect the exposed root zone with a protective overlay sufficient enough to protect the ground and roots from being disturbed, for example a layer of geotextile fabric laid over a 150mm thick layer of wood mulch.
- 2.21 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.
- 2.22 If during the works, it becomes necessary to pour concrete and/or lay asphalt directly over exposed roots (for example during reinstatement, or footpath construction), then all exposed roots shall first be covered with a layer of fine sand not less than 75mm thick and a layer geotextile fabric shall be placed over the roots prior to pouring the concrete/asphalt.



TREE PROTECTION SIGN



DO NOT REMOVE OR DAMAGE THIS TREE

- No Materials Stored 
- No Machinery 
- No Digging 
- No Damaging Branches
- No Pruning or Damaging Roots

Tree Ref # _____

