

## Appendix 18

### Arboricultural Effects Assessment

# Eastern Busway EB3 Commercial and EB4 Link Road

Arboricultural Effects Assessment

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## List of Abbreviations and Definitions

Abbreviation and Definitions	Description
AEE	Assessment of Effects on the Environment
AUP(OP)	Auckland Unitary Plan (Operative in Part) (Updated 20 July 2023)
BPO	Best Practicable Option
EB1	Eastern Busway 1 (Panmure to Pakuranga)
EB2	Eastern Busway 2 (Pakuranga Town Centre)
EB3R	Eastern Busway 3 Residential (SEART to Pakuranga Creek)
EB3C	Eastern Busway 3 Commercial (Gossamer Drive to Botany)
EB4L	Eastern Busway 4 Link Road (link between Tī Rākau Drive and Te Irirangi Drive, Botany Town Centre)
EBA	Eastern Busway Alliance
km	Kilometre(s)
m	Metre(s)
NoR	Notice of Requirement
RTN	Rapid Transit Network
RMA	Resource Management Act 1991

## Executive Summary

The purpose of this report is to assess the arboricultural effects associated with the operation and construction of Eastern Busway 3 Commercial (EB3C) and Eastern Busway 4 Link Road (EB4L) sections of the Eastern Busway Project (the Project).

The purpose of this arboricultural report is to assess the arboricultural effects of the proposal and inform the Assessment of Effects on the Environment (AEE) relating to the Notices of Requirement (NoRs), and required regional consents and consents required under National Environment Standards for EB3C and EB4L and identify the ways in which any adverse effects will be appropriately managed.

Key elements of the EB3C works include the construction of two bridges, noise walls and retaining walls, stormwater drainage, and a cycleway. The proposed EB3C bridge structures (Bridges A and B), new and upgraded stormwater outfalls and an area of reclamation will require works in the coastal marine area (CMA).

The proposed EB4L footprint traverses parts of Guys Reserve and Whaka Maumahara Reserve and includes road widening at the intersection of Te Irirangi and Town Centre Drive (Botany). Key elements of the proposed EB4L works include a bridge structure (Bridge C), retaining walls, stormwater drainage, and a new walking and cycling pathway.

The assessment has been undertaken by utilising a Visual Tree Assessment (VTA) consistent with modern arboricultural practices (Mattheck and Breloer, 1994) to gather the relevant data of trees growing within, or with canopies or rootzones that extend into the EB3C and EB4L project boundaries. Utilising the gathered data and georeferencing, trees which require removal or likely require removal have been identified as a worst-case scenario.

The overarching principles of the Project will be to retain mature trees where possible.

For EB3C, there are 213 trees within the project footprint, or with canopies/rootzones that extend into the footprint. 110 trees are to be retained and 26 trees are to be moved to another location within the project footprint.

For EB4L, there are 76 trees within the project footprint. 23 trees are to be retained and 6 are to be moved to another location within the project footprint.

Trees that require removal or likely require removal have been identified as a worst-case scenario.

For EB3C, out of the 213 trees within the footprint, 77 trees are to be removed, 40 of which would ordinarily trigger requirements for resource consent under the Auckland Unitary Plan (Operative in Part) (AUP(OP)).

For EB4L, of the 76 trees within the footprint, 47 trees are to be removed, 32 of which would ordinarily trigger requirements for resource consent under the AUP(OP).

There are no Notable Trees identified under Schedule 10 of the AUP(OP) within the footprint of either EB3C or EB4L.

Removal of this number of semi-mature and mature trees from the urban ngahere (forest) is assessed to result in adverse effects on the tree cover within the Project's boundaries and will require mitigation.

A Tree Protection Management Plan (TPMP) is to be prepared prior to construction, which will provide the protocols and methodologies for tree management during construction. This is required by the conditions of consent.

Replacement planting is proposed to be undertaken as mitigation along the Project corridor, as well as within open space reserves. This will be undertaken in accordance with the Landscape Ecological and Arboricultural Mitigation plans (LEAM plans).

Following the recommended mitigation planting and the use of best practice tree management measures in accordance with the required TPMP, the adverse effects associated with the proposed tree removal and construction activities around retained trees will be suitably mitigated.

# 1 Introduction

## 1.1 Overview of the Eastern Busway Project

The Eastern Busway Project (the Project) is a package of works focusing on promoting an integrated, multi-modal transport system to support population and economic growth in southeast Auckland. This involves the provision of a greater number of improved public transport choices and aims to enhance the safety, quality and attractiveness of public transport and walking and cycling environments. The Project includes:

- 5 km of two-lane busway
- Two new bridges for buses across Pakuranga Creek (Bridges A and B)
- A new bridge within Guys Reserve and Whaka Maumahara (Bridge C)
- Improved active mode infrastructure (walking and cycling) along the length of the busway
- Three intermediate bus stations
- Two major interchange bus stations.

The Project forms part of the previous Auckland Manukau Eastern Transport Initiative (AMETI) programme (the Programme), which includes a dedicated busway and bus stations between Panmure, Pakuranga and Botany town centres. The dedicated busway will provide an efficient rapid transit network (RTN) service between the town centres, while local bus networks will continue to provide more direct local connections within the town centre areas. The Project also includes new walking and cycling facilities, as well as modifications and improvements to the road network.

The Programme includes the following works which do not form part of the Project:

- Panmure Bus and Rail Station and construction of Te Horeta Road (completed)
- Eastern Busway 1 (EB1) – Panmure to Pakuranga (completed).

The Project consists of the following packages:

- Early Works Consents – William Roberts Road (WRR) extension from Reeves Road to Tī Rākau Drive (LUC60401706); and Project Construction Yard at 169 – 173 Pakuranga Road (LUC60403744).
- Eastern Busway 2 (EB2) – Pakuranga Town Centre, including the Reeves Road Flyover (RRF) and Pakuranga Bus Station
- Eastern Busway 3 Residential (EB3R) – Tī Rākau Drive from the South-Eastern Arterial (SEART) to Pakuranga Creek, including Esdgewater and Gossamer Intermediate Bus Stations
- Eastern Busway 3 Commercial (EB3C) – which commences from Riverhills Park along Tī Rākau Drive to Botany, including two new bridges, and an offline bus route through Burswood (**this Assessment**)
- Eastern Busway 4 Link Road (EB4L) – Guys Reserve to the Botany Town Centre, including a link road through Guys and Whaka Maumahara Reserves to Te Irirangi Drive/Town Centre Drive intersection (**this Assessment**)

The overall Project is shown in Figure 1 below.

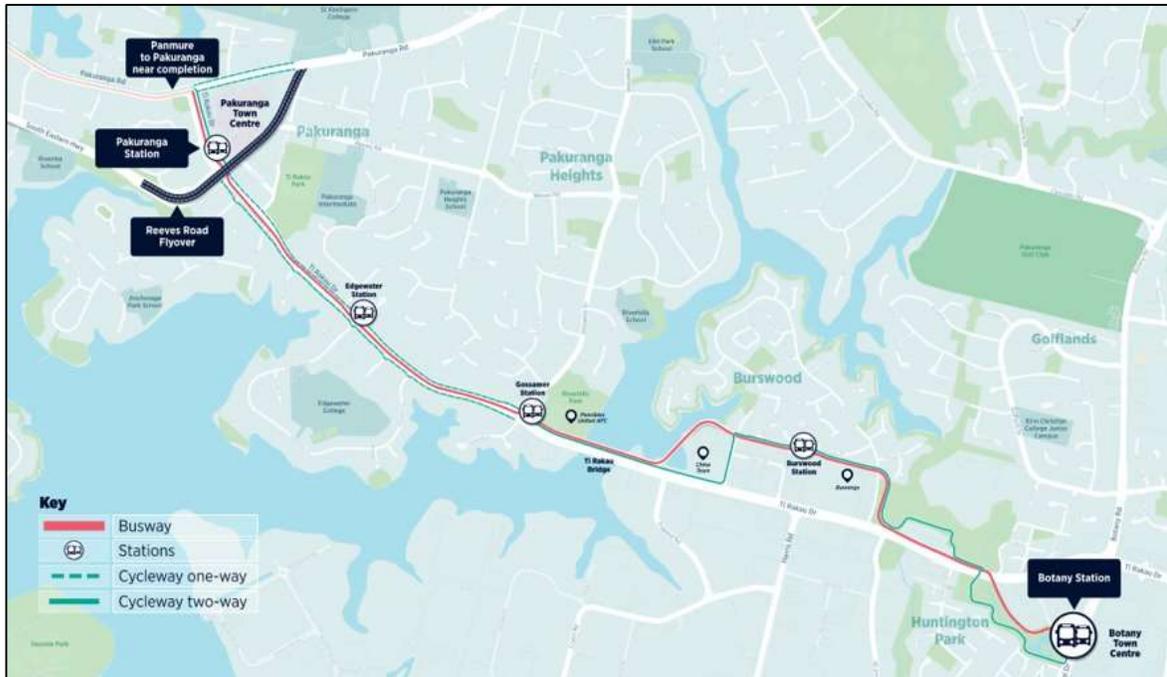


Figure 1-1 Project alignment

## 1.2 Project Objectives

The Project objectives are:

1. Provide a multimodal transport corridor that connects Pakuranga and Botany to the wider network and increases choice of transport options.
2. Provide transport infrastructure that integrates with existing land use and supports a quality, compact urban form.
3. Contribute to accessibility and place shaping by providing better transport connections between, within, and to the town centres.
4. Provide transport infrastructure that improves linkages, journey time and reliability of the public transport network.
5. Provide transport infrastructure that is safe for everyone.
6. “Provide or Safeguard future” transport infrastructure at (or in the vicinity of) Botany Town Centre to support the development of strategic public transport connection to Auckland Airport.

## 2 Proposal Description

The following sections provide a brief description of both EB3C and EB4L. These descriptions consist of the construction and operation of both EB3C and EB4L packages, with further details provided in the AEE and Notices of Requirement (NoRs). A full set of proposed plans is attached to the AEE.

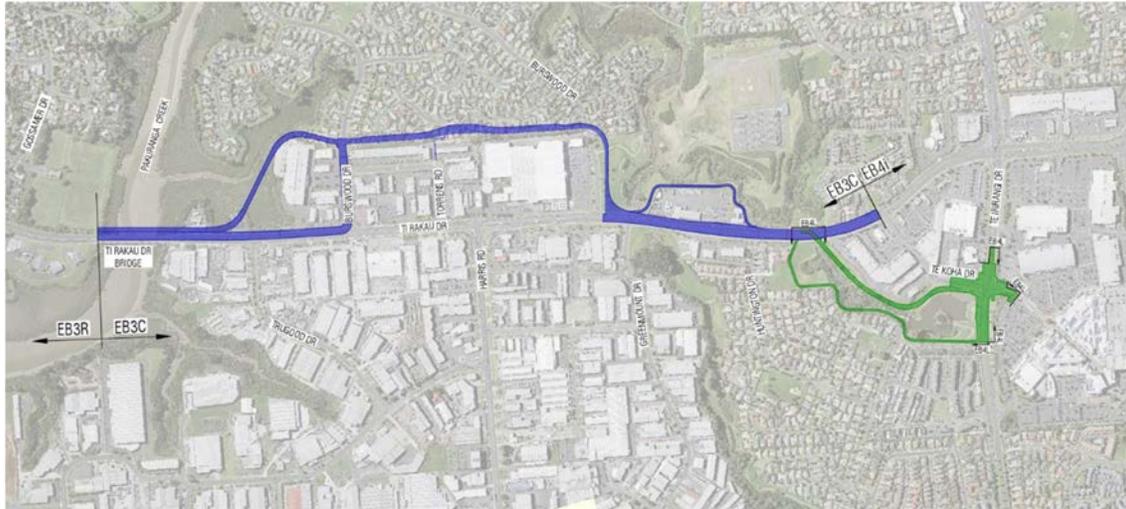


Figure 2-1 Eastern Busway 3 Commercial and 4 Link Road Project Extent

### 2.1 Eastern Busway 3 Commercial

The EB3C works will involve the establishment of an ‘off-line’ busway, cycleway, and stormwater upgrades. These works will take place within existing road reserves, Council reserves<sup>1</sup> and privately held land. The extent of works for EB3C runs between Riverhills Park (i.e., adjacent to the terminus of the EB3R package) in the west to Guys Reserve in the east, through the suburbs of Burswood and East Tāmaki.

The busway will be largely off-line (i.e., outside the current Tī Rākau Drive corridor), first crossing Pakuranga Creek by way of a new two-lane bridge (Bridge A) including abutments<sup>2</sup> and scour protection. It will then cross a coastal headland at 242 Tī Rākau Drive (a Mobil branded service station), and then an embayment within which a retaining wall, and a 4m<sup>2</sup> coastal reclamation will be constructed. The busway will cross a second headland at 254 Tī Rākau Drive (currently occupied by a pet store), before crossing a mangrove filled bay to the west of 262 Tī Rākau Drive (the ‘Chinatown’ retail business) via a second bridge (Bridge B). Bridge B will include two abutments with scour protection. Bridge B will require construction of a reinforced embankment at its northern end which includes imported fill, rip rap and permanent wick drains, and a 549m<sup>2</sup> coastal reclamation. In parallel, a retaining wall will be constructed to the eastern side of the embankment. Following this, the busway runs between the commercial area and residential area north of Tī Rākau Drive, crossing several residential sites. The busway also crosses Burswood Drive twice, with raised signalised crossings established to control both the busway and road traffic.

<sup>1</sup> Including Burswood Esplanade Reserve and Bard Place Reserve

<sup>2</sup> The western abutment and associated scour protection was included in the EB3R consenting package

A new ‘intermediate’ style bus station will be established at Burswood, before the busway then crosses over Burswood Esplanade Reserve and onto a widened Tī Rākau Drive (by the Howick and Eastern bus depot). The busway will then run beside the eastbound lanes of Tī Rākau Drive, before crossing over Tī Rākau Drive to connect with EB4L at Guys Reserve.

The busway will include a new cycleway, which will largely run parallel to the busway for most of this section of the Project. The exceptions to this include Bridge B, between 254 Tī Rākau Drive and Burswood Esplanade (west) – for this section the cycleway will continue along Tī Rākau Drive before turning into Burswood Drive West, as well as where the cycleway runs behind the Howick and Eastern bus depot.

Other works included in EB3C are the relocation of existing utility services, the provision of new or upgraded stormwater infrastructure and open space upgrades. Stormwater works will involve new outfalls discharging to Pakuranga Creek (and its tributaries) and rain gardens.

Lastly, EB3C involves the establishment of two laydown areas, one at 242 Tī Rākau Drive and the other within the boundaries of Burswood Esplanade Reserve. Both laydown areas are located on land that will be occupied by the Project upon its completion.



Figure 2-2 Eastern Busway 3 Commercial Project Area

## 2.2 Eastern Busway 4 Link Road

The EB4L works will involve the establishment of an ‘off-line’ dedicated two-way busway, shared pathway and stormwater upgrades. These works will take place in Guys Reserve, Whaka Maumahara Reserve, existing road reserve and Botany Town Centre land for the intersection improvements on Town Centre Drive.

EB4L commences south of Tī Rākau Drive, crossing through Guys Reserve, Whaka Maumahara Reserve and ending at the intersection of Te Irirangi Drive/Town Centre Drive.

The works will primarily involve the construction of a new two-way busway corridor which will run along the eastern side of Guys Reserve and Whaka Maumahara Reserve to provide access for bus services

between Pakuranga and Botany. The two-way busway is designed to integrate with EB3C and be a continuation of the EB3C busway.

This section of the busway will feature a bridge (Bridge C) approximately 350m long. This bridge is needed due to the sloping topography of the Reserves.

The busway will then connect to Te Irirangi Drive, following alterations to the existing intersection of Te Irirangi Drive/Town Centre Drive.

A shared pathway and minor retaining walls will also be constructed along the southern and western boundaries of Guys Reserve and Whaka Maumahara Reserve. The shared pathway will connect to existing walkways and will terminate at Te Irirangi Drive.

A new shared pathway and retaining wall will also be constructed along the western boundary of Te Irirangi Drive and is partially located within the Whaka Maumahara Reserve.

A new stormwater outfall (including riprap) will be constructed within Guys Reserve. The outfall will discharge stormwater over scour protection prior to its entry into a tributary of Pakuranga Creek. Additionally, a new stormwater connection will be constructed in Whaka Maumahara Reserve, adjacent to Te Irirangi Drive. This new connection will discharge via an existing outfall into the existing stormwater pond within the Reserve.

A construction laydown area will also be established within Guys Reserve, adjacent to Ti Rākau Drive and 47C Huntington Drive. A second laydown area will be established in Whaka Maumahara Reserve, between the existing stormwater pond and Te Irirangi Drive. Construction access will also be gained from Te Koha Road beside VTNZ's vehicle inspection premises located at 451 Ti Rākau Drive.



Figure 2-3 Eastern Busway 4 Link Road Project Area

## 3 Specialist Assessment

### 3.1 Assessment Content

This report describes the assessment of arboricultural effects associated with the operation and construction of the EB3C and EB4L sections of the Project.

Its purpose is to assess the arboricultural effects of the proposal and inform the AEE relating to the NoRs, required regional consents and consents required under National Environment Standards for EB3C and EB4L and identify the ways in which any adverse effects will be appropriately managed.

This arboricultural assessment involves:

- Identifying the trees within the EB3C and EB4L areas and providing a Tree Inventory (Appendix 4) and Tree Plans (Appendix 5)
- Determining which trees require removal, works within their root zones, and/or canopy pruning or relocation
- Identifying the extent of tree removal required and what replacement planting would be required to mitigate adverse effects
- Providing tree protection protocols and methodologies to minimise adverse effects on retained trees.

### 3.2 Specific Project Elements

The specific Project elements that are relevant to arboricultural effects relate to:

- The removal of trees that are located directly within the footprint of new roads, cycle/footpaths, and infrastructure
- Works (construction activities) and placement of permanent structures within the “protected root zones<sup>3</sup>” of retained trees as defined in the AUP(OP)
- Pruning of retained trees to provide sufficient clearance to new infrastructure.

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<sup>3</sup> Refer Appendix 3 for AUP(OP) definition of “Protected Root Zone”.

### 3.3 Reasons for Consent

Consent matters are set out in the EB3C and EB4L AEE. Matters relevant to this assessment include vegetation clearance within roads and open space zones, works within the protected root zone that are not otherwise provided for and tree alterations.

There may be instances during the construction period where unforeseen activities in proximity to trees are required (for example - services are found in unexpected locations which need relocating). Such activities may affect more than 20% of a road reserve tree's protected root zone or require severance of a root measuring greater than 80mm in diameter or pruning of a branch greater than 100mm diameter. It may be assessed in these instances that it is preferable to remove the tree. The potential for adverse effects on retained trees, and the methods for minimising those effects has been factored into the overall assessment of arboricultural effects.

## 4 Methodology and Analysis

### 4.1 Tree assessment steps

- Review of scope of area to be surveyed
- Undertake physical site survey and collect relevant data with handheld devices
- Prepare tree plans utilising QGIS software and corresponding tree inventory
- Overlay tree plans with road plans (utilising QGIS software)
- Provide initial feedback to design team
- Meet with design team to discuss potential construction effects
- Assess which trees are directly affected by the road itself and which may be affected by construction activities
- Meet with landscape / urban design team to discuss mitigation planting philosophy and possible tree retention
- Complete assessment of effects
- Identify and recommend potential mitigation and tree protection measures.

### 4.2 Tree Assessment Methodology

A Visual Tree Assessment (VTA) consistent with modern arboricultural practices (Mattheck and Breloer, 1994) was conducted. This assessment was carried out at ground level which is classified as a 'Level 2' assessment (Dunster et al. 2013).

Tree health assessments are generally based on experience and adaptation from generally accepted industry parameters. The indicators used to determine health are leaf shape, colour, size and form, foliage or bud formation, distribution within the canopy and canopy density. These indicators consider the tree's age and species type. The health is categorised as Good, Fair, Poor, Very Poor or Dead.

Form is generally assessed by symmetrical crown shape and categorised as Good, Fair, Poor or Very Poor.

No soil analysis, tissue sampling and/or geological investigations were carried out. All data was collected without the use of any invasive and/or diagnostic tools.

The tools used onsite to gather the necessary tree data were a measuring tape and hand-held devices. Measurements of trunk girths (measured at 1.4 m above ground level) and trunk girths at root flare have been accurately measured, while heights and crown spreads have been estimated.

Tree locations are plotted using a combination of GIS and overhead mapping. This method, although generally accurate, can be inexact, especially when recording trees in groups, and should not therefore be considered precise.

Tree root zone measurements will be calculated using the principles of AS 4970-2007, as required when construction activities are proposed within the root zones of trees to be retained. These calculations have not been prepared for every tree in the project area at this stage. These will be determined at detailed design stage in order to confirm requirements for tree removal and retention.

For those trees growing within an Auckland Council reserve or road reserve, tree owner approval (TOA) is required from Council's Community Facilities arborist. In accordance with the TOA Guidance

Document, this report references the Structural Root Zone (SRZ)<sup>4</sup> and the Tree Protection Zone (TPZ)<sup>5</sup>. Any assessment of Council trees using these root zones is for TOA process only and are not relevant to the rules and standards outlined in the AUP(OP).

- SRZ, as defined in the Australian Standard AS 4970-2009, is the area of the root system used for stability, mechanical support, and anchorage of the tree. Construction and work activities in this area are avoided or heavily limited
- TPZ, as defined in the Australian Standard AS 4970-2009, is the optimal combination of crown and root area that requires protection during the construction process so that the tree can remain viable. The TPZ is an area that is isolated to ensure that tree sensitive construction measures are implemented so that any disturbance or encroachment is mitigated.

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<sup>4</sup> SRZ calculation:  $SRZ_{(m)} = 0.27 \times DBH_{(cm)}^{0.56}$

<sup>5</sup> TPZ calculation:  $TPZ_{(m)} = DBH_{(m)} \times 12$

## 5 Existing Environment

### Chapter Summary

*This section of the report provides a description of the existing arboricultural values of the EB3C and EB4L areas of work.*

*The area identified as EB3C includes proposed works associated with two new bridges, an offline section of busway, a cycleway and new stormwater infrastructure. Two hundred and thirteen trees or groups of trees have been identified within the EB3C designation footprint (or with canopies/rootzones which extend into the designation boundaries). Species present include both native and exotic, and are located in road reserve, parks, residential and commercial properties.*

*The most relevant areas of arboricultural interest are the riparian margins within the esplanade reserves and specimen trees within Burswood Reserve.*

*The area identified as EB4L includes Guys Reserve, Whaka Maumahara Reserve and the intersection of Te Irirangi Drive and Town Centre Drive. The vegetation within the two reserves is predominantly comprised of early-mature native revegetation, with a smaller number of exotic trees present. At the intersection of Te Irirangi Drive and Town Centre Drive, some street trees are also present, including Washingtonia palms and pohutukawa, and a small area of landscape garden at the Botany Town Centre car park. Seventy-six trees or groups of trees have been identified within the EB4L designation footprint (or with canopies/rootzones which extend into the designation boundaries).*

### 5.1 Section EB3C Arboricultural Attributes

Key elements of the EB3C works include the construction of two bridges, noise walls and retaining walls, stormwater drainage, and a cycleway. The EB3C bridge structures, new and upgraded stormwater outfalls and an area of reclamation will require works in the coastal marine area (CMA).

The vegetation affected by the initial 500 m (approximately) of EB3C, between Pakuranga Creek and the rear of the Chinatown site is predominantly comprised of coastal foreshore trees which have been planted within the last 15 to 30 years. Some areas are dominated by pest species, particularly the foreshore beside Chinatown.

Where EB3C passes to the rear of the commercial buildings between Chinatown and Burswood Reserve there is limited vegetation, with the predominant typology being common hedging trees and shrubs.

The alignment then passes through Burswood Reserve where there are individual specimen trees and small groups (3-5 trees) of trees, predominantly of native origins. Burswood Reserve also contains a stream and associated native riparian vegetation.

Tree Plans relating to this section:

- LGS\_36078\_00A – EB3C Master Plan
- LGS\_36078\_3C\_01[A] – LGS\_36078\_3C\_15[A].

Two hundred and thirteen trees or groups of trees have been identified within the EB3C designation boundaries, including trees with canopy or rootzones extending into the designation from beyond.

Table 1 below provides a summary of trees by the different AUP(OP) zones throughout the site.

Table 1: Trees within EB3C by AUP(OP) zoning

Location	Total
Road Reserve	15
Open Space	108
Business / Residential zones	90
<b>Total</b>	<b>213</b>

The western end of the EB3C area has two small ‘headlands’ which extend north of Tī Rākau Drive into the CMA and are currently occupied by a petrol station (242 Tī Rākau Drive) and a retail shop (254 Tī Rākau Drive). Both sites have esplanade reserves adjacent to the foreshore, which have been planted with indigenous coastal vegetation (predominantly pōhutukawa). Some of the planting is contiguous with trees planted within the site boundaries.



Figure 5-1 The two small headlands and associated esplanade reserves can be seen near centre of image.

There is a section of the Chinatown site, which extends along the Tī Rākau Drive frontage and contains a group of planted native specimen trees, primarily karo, pōhutukawa and totara. These trees are generally growing individually (rather than a ‘bush’ setting), and many are of an age and size which makes them suitable for relocation. This group of trees also extends west into the previously mentioned esplanade reserve.



Figure 5-2 The road frontage of China Town on Tī Rākau Drive.



Figure 5-3 The trees located along the road frontage of China Town (Google street view July 2022).



Figure 5-4 Example of trees suitable for relocation (Arborlab Jan 2023).

The section of Tī Rākau Drive which EB3C passes through is devoid of street tree planting. However, there are a small number of street trees located within the side streets of Burswood Drive, Torrens Road and Greenmount Drive.

The proposed busway runs parallel to Tī Rākau Drive, to the rear (north) of the commercial properties between Chinatown and Burswood Reserve. There is a landscaped strip located within this alignment, which was not accessible during the site survey. The vegetation was assessed and found to be predominantly comprised of pest species. Some native vegetation is present, however no native trees measuring greater than 4m in height or 400mm in girth were noted.



Figure 5-5 Zoning of properties where the busway passes behind the commercial area of Tī Rākau Drive.

Where the busway leaves the rear of the commercial properties, it crosses Burswood Drive, into Burswood Reserve. Burswood Reserve is generally comprised of mown grass with both individual and grouped specimen trees. There is also a stream located between Burswood Drive and the Howick and Eastern bus depot, which runs under Tī Rākau Drive. The riparian margins have been planted with native revegetation. The stream also runs around the rear of the Howick and Eastern bus depot, where a shared cycle and footpath is proposed.



Figure 5-6 The Howick and Eastern bus depot and Burswood Reserve.

## 5.2 Section EB4L Arboricultural Attributes

EB4L traverses Guys Reserve and Whaka Maumahara Reserve and includes road widening at the intersection of Te Irirangi and Town Centre Drive. The works include a bridge structure, noise walls and retaining walls, stormwater drainage, and a new walking and cycling path.

EB4L includes Guys Reserve and Whaka Maumahara Reserve, which is divided into two separate Open Space zones under the AUP(OP). The south-eastern area of the Reserve is zoned Open Space – Conservation and the north-western area is zoned Open Space – Informal Recreation. The south-eastern area has a stormwater treatment pond which flows through the Reserves to the north-western area and enters a culvert to pass beneath Tī Rākau Drive.

The predominant vegetation within the reserve is that of early-mature native revegetation plantings.

Tree Plans relating to this section:

- LGS\_36078\_00A – EB4 Master Plan
- LGS\_36078\_4\_01[A] – LGS\_36078\_4\_05[A].

Seventy-six trees or groups of trees have been identified within the proposed EB4L designation footprint, including trees with canopy or rootzones extending into the proposed designation from beyond. The following summary tables provide the quantities of trees by location.

Table 2 below provides a summary of trees by the different AUP(OP) zones throughout the site.

Table 2 Trees within EB4L by AUP(OP) zoning

Location	Total
Road Reserve	18
Open Space	36
Business zones	22
<b>Total</b>	<b>76</b>



Figure 5-7 Native revegetation at the northern end of Guy's Reserve (Arborlab February 2022).

In several locations there are exotic trees growing amongst the native revegetation including a mature macrocarpa and a group of three mature Lombardy poplar (refer Figure 10 below).



Figure 5-8 Poplar trees and macrocarpa tree in Guy's Reserve (Arborlab February 2022).

A group of large, mature poplar trees are located on the southern side of and near the western end of the stormwater pond (refer Figure 11 below). The trees are a prominent feature in the landscape.



Figure 5-9 Large poplar trees in Guy's Reserve (Google streetview July 2022).

There are seven individual specimen trees growing near the existing Vehicle Testing New Zealand (VTNZ) site, with four located within a garden bed surrounding the VTNZ site and three located within Guys Reserve. There are also approximately four individual specimen trees within the north-eastern corner of the Reserve close to where the proposed busway joins Te Irirangi Drive. Two early- mature pōhutukawa street trees are located on the western side of Te Irirangi Drive close to where the proposed busway joins Te Irirangi Drive.

The intersection of Te Irirangi Drive and Town Centre Drive contains some sporadic street tree planting, including early-mature pōhutukawa and mature Washingtonia palms. There are also three early-mature Liquidambar trees<sup>6</sup> growing in a grass berm on the southern side of Town Centre Drive, and a landscaped area<sup>7</sup> above a block wall within the Botany Town Centre carpark.



*Figure 5-10 Looking west onto Town Centre Drive from Te Irirangi Drive (Arborlab April 2023)*

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<sup>6</sup> Tree's 3050 - 3052

<sup>7</sup> Tree's 3353 - 3358



*Figure 5-11 Looking east towards Te Irirangi Drive from Botany Town Centre car park (Arborlab April 2023)*

## 6 Assessment of Arboricultural Effects

### Chapter Summary

*The principles of the Project, including EB3C and EB4L stages, are to retain mature trees and only remove them if their retention is found to be unviable. Most trees will be retained.*

*Removal of trees which would ordinarily require resource consent (ie in the absence of the NoR) is proposed within the EB3C area, comprising principally of trees growing within reserve areas (30 trees) and a smaller number in road reserve land (4).*

*Removal of trees which would ordinarily require resource consent (ie in the absence of the NoR) is proposed within the EB4L area, comprising principally of trees growing within Guy's and Whaka Maumahara Reserves (25 trees/tree groups) and a smaller number in road reserve land (7).*

*These figures are based on a 'worst-case scenario', as assessed from the reference designs.*

*Removal of this number of mature trees within an urban environment such as the EB3C and EB4L sections of the Project will have an adverse effect that can be mitigated through replacement planting.*

*Trees which are proposed to be retained will generally be set back from construction and isolated with tree protection fencing. Where works are required within a retained trees protected root zone, or pruning of a retained tree is required, works will be carried out in accordance with section 7.1 of this report (Construction Mitigation for Retained Trees) and the certified Tree Protection Management Plan (TPMP).*

*Thirty-two trees are proposed to be relocated from within the EB3C and EB4L boundaries. The trees will be incorporated into the proposed landscape plans and will be relocated in accordance with arboricultural best practice techniques.*

### 6.1 Construction

#### 6.1.1 Eastern Busway 3 Commercial

Two hundred and thirteen trees or groups of trees have been identified within the wider EB3C works area (or with canopies/rootzones which extend into the designation boundaries). The following summary tables, Table 3 and Table 4 provide numbers of trees within the EB3C works area by location and whether they will be removed, retained or relocated. Table 3 identifies trees which would ordinarily trigger resource consent for their removal by virtue of their size and location (within road reserve or open space zone), and the associated actions proposed.

*Table 3: Trees within EB3C which would ordinarily require resource consent to remove and associated actions*

Location	Remove	Retain	Relocate	Total
Road Reserve	4	8	-	12
Reserve (Open Space Zone)	30	62	9	101
<b>Total</b>	<b>34</b>	<b>70</b>	<b>9</b>	<b>113</b>

Table 4 identifies trees which would not ordinarily trigger resource consent for their removal by virtue of their size and location (less than 4m in height or 400mm in road reserve or open space zone – or located in residential / commercial zones) and the associated actions proposed.

Table 4: Trees within EB3C which would not ordinarily require resource consent (permitted activity) to remove and associated actions

Location	Remove	Retain	Relocate	Total
Road Reserve	1	2	-	3
Reserve (Open Space Zone)	5	2	-	7
Private (Business/Residential Zones)	37	36	17	90
<b>Total</b>	<b>43</b>	<b>40</b>	<b>17</b>	<b>100</b>

Where the proposed new Bridge A crosses the Pakuranga Creek and makes landfall, seven early-mature pōhutukawa (Trees 3001 – 3007) and one semi-mature ti-kouka (Tree 3000) will require removal from the foreshore. There are also several pest species trees and native trees (Trees 3010 – 3021) within 242 Tī Rākau Drive, which will require removal to enable earthworks.

In addition, pest species located at 242 Tī Rākau Drive and the adjacent esplanade reserve will also be removed. This particular site will be used for storage of materials during construction. A tree protection fence will be required to isolate the retained vegetation around the periphery of the site from construction activities. At the completion of works the site will be almost entirely revegetated with native species. Some space will be utilised for a stormwater treatment pond, and maintenance access.

An area of vegetation between the two headlands requires removal to allow construction of a retaining wall within the CMA<sup>8</sup>. This is where the busway veers north-east as it approaches Bridge B, making landfall near the north-eastern corner of the Chinatown site.

The northern side of Tī Rākau Drive is to be widened through this area and there is a section of land between 254 Tī Rākau Drive and Chinatown’s accessway, where several semi-mature native trees are growing. The ground level slopes up from the edge of the existing footpath to form a small knoll, where these trees are growing. To achieve the required corridor width and associated battering earthworks, approximately thirteen of the trees would likely require removal<sup>9</sup>. A further twelve trees would require removal for the construction of a stormwater outfall<sup>10</sup>. Nineteen of the trees, due to their size and species characteristics, have been identified as suitable for relocation and re-use within the Project boundaries.

<sup>8</sup> Tree group 3058

<sup>9</sup> Trees 3085, 3086, 3093, 3105 – 3110, 3116 and 3121 – 3123

<sup>10</sup> Trees 3102 – 3104, Trees 3111 – 3115 and Trees 3117 – 31120).

One individual puriri tree (Tree 3105), will be removed to enable the busway to curve around the rear of the <sup>11</sup>Chinatown site<sup>12</sup>. Other riparian vegetation requires removal through this area (including for an outfall), but no large climax species trees were noted. The area is dominated by pest species, principally privet, with scattered native species consisting primarily of mahoe (*Meliccytus ramiflorus*) and mapou (*Myrsine australis*).

Two street trees (Trees 3138 and 3139) require removal to accommodate the busway intersection with Burswood Drive and the widened footpath / bidirectional cycleway on the western side of Burswood Drive.

There are no trees which would ordinarily require resource consent to remove, or notable trees (i.e. scheduled) trees, along the alignment of the busway behind the commercial properties (2-28 Torrens Road, and 320 Tī Rākau Drive & Corner, Burswood Drive, Burswood (Bunnings Warehouse Botany).

Twelve specimen trees (Trees 3186 – 3198) require removal within Burswood Reserve as they are located within the permanent alignment of the busway or its associated earthworks. The area is also proposed to be used as a temporary construction storage / laydown area.

Two areas of riparian planting will be removed from behind the Howick and Eastern bus depot, to enable construction of the shared path, associated retaining walls, new and upgraded stormwater infrastructure in the Burswood Reserve. These areas are approximately 95m<sup>2</sup> and 55m<sup>2</sup> each.

Near the eastern end of the Project boundaries, a row of nine trees (Trees 3226 – 3234) will require removal because of the widening of the corridor on the northern side of Tī Rākau Drive. Seven of these trees are pōhutukawa of an age and size where relocation is achievable.

As identified above, approximately thirty-four trees require removal or potentially require removal, which would ordinarily require resource consent if a NoR was not being sought. An additional forty-three trees may require removal that would not normally trigger requirements for resource consent. The trees requiring removal consist of a mixture of trees located within open space zoned reserve land (thirty-five), road reserve (five) and Business/Residential zoned land (37). The removal of trees within open space zoned land consists of trees within the Burswood Reserve<sup>13</sup>.

Removal of this number of semi-mature to mature trees within an urban environment such as the EB3C section of the Project will have an adverse effect on the arboricultural and amenity values of the area, which will require mitigating.

The overarching principle of the project is to retain mature trees where possible. Some of the retained trees may require works within their protected root zones including kerb removal and replacement, footpath upgrading, surface (asphalt) replacement and utilities installation. This has the potential to adversely affect trees through the severance of roots, alteration to permeable surfacing or direct damage from machinery. Such adverse effects can be appropriately managed by the recommended tree management protocols and tree protection methodologies.

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<sup>11</sup> Further detail regarding the use of the site is provided in the AEE.

<sup>12</sup> Tree 3105 – which is located on an open spaced zoned site.

<sup>13</sup> Arborlab Plans LGS\_36078\_01-04, LGS\_36078\_06, LGS\_36078\_10-12, & LGS\_36078\_14.

The ecological values of terrestrial vegetation within the Project area and affects upon it are detailed in the Ecological Effects Assessment.

### 6.1.1 Eastern Busway 4 Link Road

Seventy-six trees or groups of trees have been identified within EB4L designation boundaries, including trees with canopy or rootzones extending into the project footprint from beyond. The following summary tables, Table 5 and Table 6, provide numbers of trees within the EB4L works area, by their relevant AUP(OP) zoning and whether they will be removed, retained, or relocated.

Table 5: Trees within EB4L which would ordinarily require resource consent to remove and associated actions

Location	Remove	Retain	Relocate	Total
Road Reserve	7	11	-	18
Reserve	25	8	2	35
<b>Total</b>	<b>32</b>	<b>19</b>	<b>2</b>	<b>53</b>

Table 6: Trees within EB4L which would not ordinarily require resource consent to remove (permitted activity) and associated actions

Location	Remove	Retain	Relocate	Total
Road Reserve	-	-	-	-
Reserve	1	-	-	1
Private (Business/Residential Zones)	14	4	4	22
<b>Total</b>	<b>15</b>	<b>4</b>	<b>4</b>	<b>23</b>

The majority of the vegetation requiring removal for the EB4L section of works consists of native revegetation planting, rather than specimen trees. There are also four mature exotic trees, those being three Lombardy poplar<sup>14</sup> and one macrocarpa<sup>15</sup>, growing in amongst the native revegetation which require removal. This strip of native vegetation and the exotic trees require removal to establish the busway within the northern aspect of Guys Reserve.

The proposed cycle path which leads around the western and southern portion of Guys and Whaka Maumahara Reserves initially passes through an open grassy area. Approximately 130m into the reserve, the new path meets an existing path which will be replaced and widened. The path passes to the rear of a number of residential properties at Cottessmore Place and Guys Road. In order to widen the path and construct the associated retaining walls, a strip of native revegetation planting will require removal.

<sup>14</sup> Trees 3294, 3295 & 3296

<sup>15</sup> Tree 3292

The end of Guys Road adjoins the southern boundary of Guys Reserve where a footpath leads north-east into the Reserve. The path into the Reserve diverges at approximately 25m with one path continuing north-east and the other path travelling north-west along the south-western boundary of the Reserve. The path also extends a short distance (approximately 25m) south-east along Waihi Way. Within this area, a group of vegetation<sup>16</sup> requires removal behind No. 175 Guys Road, where the path deviates from the current alignment and ‘sweeps’ up around to Guys Road Reserve.

A group of Ngaio trees<sup>17</sup> requires removal where the path passes through the road reserve of Guys Road and back into Guys Reserve. Also within this area of Guys Reserve is a group of large poplar trees<sup>18</sup> which are set back from the proposed construction area sufficiently that they are able to be retained.



Figure 6-1 Snip of Arborlab Tree Plan LGS\_36078\_4\_03.

A group of trees growing near the existing VTNZ site will require removal to allow construction of the busway. Some of the trees are within Guys Reserve and some are within the VTNZ site. Five of the trees are pōhutukawa<sup>19</sup> of an age and size that makes them suitable for being relocated.

<sup>16</sup> Tree's 3333 – 3335, 3337, 3316 - 3321

<sup>17</sup> Tree group 3323

<sup>18</sup> Tree's 3324 - 3326

<sup>19</sup> Tree's 3297 - 3300

A group of early-mature specimen trees will require removal within the north-eastern corner of Guys Reserve, as well as two pōhutukawa street trees from Te Irirangi Drive for the busway and associated works to the intersection.

The busway will connect to Te Irirangi Drive, following alterations to the existing intersection of Te Irirangi and Town Centre Drive (Botany). These works will take place in the existing road reserve and Botany Town Centre Land for the intersection improvements on Town Centre Drive. As part of those works it is proposed to create an additional left turning lane out of the Botany Town Centre onto Te Irirangi Drive, and carry out alterations to the left turn lane from Te Irirangi Drive into Botany Town Centre car park. The works for the left turn lane out of the centre will require the removal of a group of trees, including three early-mature Liquidambar trees<sup>20</sup> growing in a grass berm, and several early-mature native trees<sup>21</sup> (pōhutukawa, titoki and coprosma) growing within a landscaped area. The alterations to the layout of the left turn into the centre will require the removal of a poorly formed pōhutukawa and a liquidambar growing within the grass berm.



Figure 6-2 Proposed intersection improvement works of Te Irirangi Drive and Town Centre Drive.

<sup>20</sup> Tree's 3350, 3351, 3352

<sup>21</sup> Tree's 3353 - 3358

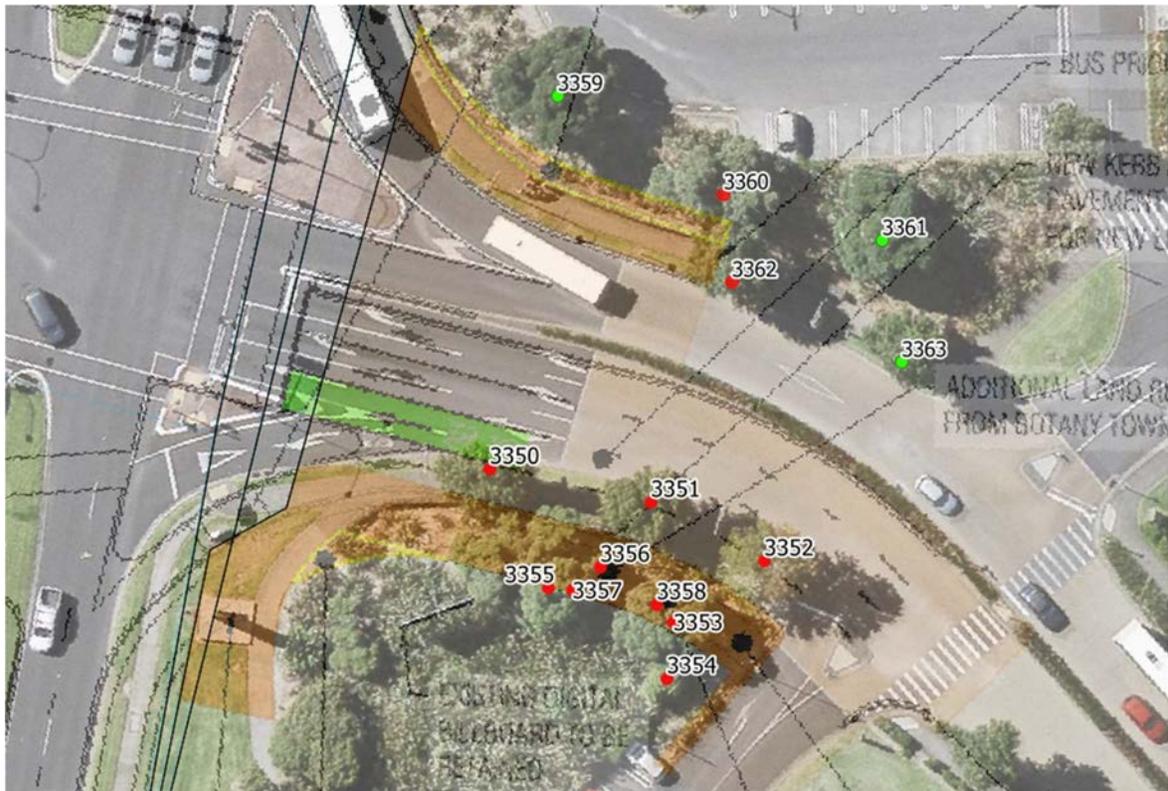


Figure 6-3 Snip of Arborlab Tree Plan LGS\_36078\_4L\_06. Green symbols indicate trees for retention and red symbols indicate trees likely to require removal

Removal of this number of trees (32 which would ordinarily require resource consent, and 15 which would not) within an urban environment such as the EB4L section of the Project will have an adverse effect on the arboricultural and amenity values of the area, which will require mitigating.

The overarching principle of the project is to retain mature trees where possible. Some of the retained trees may require works within their protected root zones. Adverse effects associated with works within trees' root zones can be appropriately managed by the recommended tree management protocols and tree protection methodologies.

## 7 Mitigation

### 7.1 Construction Mitigation for Retained Trees

It is proposed to retain mature trees within the EB3C project area where their retention is practicable. The approach will allow for works within root zones and trimming of trees, where their retention is viable long term, rather than removal in the first instance. A detailed Tree Protection Management Plan (TPMP) will be prepared (and required by conditions) which will outline:

- Management Plan Framework
- Roles and Responsibilities
- Project Staging
- Tree Protection Measures
- Bio-security Measures
- Sustainability Options.

A TPMP will be provided to Council for certification prior to construction. This will allow for the various responsibilities to be confirmed once contracts are approved.

The below measures provide a general outline of recommended tree protection measures during construction.

#### General Tree Protection Protocols and Methodologies

##### *Pre-works*

1. An arborist (appointed arborist) experienced in tree protection systems, protocols, and construction methodologies around trees, is to be engaged for the Project.
2. Prior to works commencing, the consent holder is to arrange a pre-start meeting with the works principal, contractor, representatives of Council and the appointed arborist. The pre-start meeting is to identify:
  - Areas where the appointed arborist will need to be on site monitoring works. The expected work timings near the tree
  - Work methodologies required
  - Access to the site for vehicles and equipment and potential for storage of the equipment in relation to the tree
  - Onsite audit recording method and final report requirements.
3. The construction area and areas where excavations will be required are to be identified prior to construction.

##### *During works*

4. All works within a tree's protected root zone (Tree Protection Zone (TPZ)), as defined by the AUP(OP), will be managed by the appointed arborist
5. The appointed arborist will audit all works and potential effects on the tree
6. Tree protection methodology amendments shall require approval from the appointed arborist and written confirmation from Council's Community Facilities' arborist

7. All work will be managed so that any potential adverse effects are minimised or mitigated
8. No chemicals or harmful fluids are to be emptied or disposed of within the TPZ
9. Damage and/compaction to existing soil structure is to be avoided by the exclusion of machinery, structures, and vehicles from the TPZ, unless protected with appropriate, fit for purpose, temporary load bearing surfaces
10. Excavation methods within the TPZ are to be dependent on work and tree protection requirements. The primary method of excavation while within the TPZ rootzone of the tree will be by the way of hand-held tools such as a spade, hydro and/or air excavation. These will be used at the edge of the required excavation footprint to expose any roots that can be retained. Once the roots are protected, the remaining area of excavation can be undertaken cautiously by a light machine excavator working on top of load bearing surfaces
11. Roots uncovered during the operation are to be retained and protected. However, if this cannot be achieved, the severance of any root in excess of 35 mm shall only be carried out if, at the discretion of the appointed arborist, the cumulative effects are within the tree's tolerances
12. Where roots are to be severed, they are to be cut by the appointed arborist, or a contractor approved by the appointed arborist
13. The backfill of excavations, around retained roots, is to utilise the original excavated material or a superior quality soil
14. Retained roots are to be protected through hessian or wool mulch wrapping (or a similar product), and where exposed to chemicals or concrete, to be covered in a layer of polythene (or a similar product). Surface roots are to be covered with geotextile fabric and a 75 mm layer of sand where affected by paving

#### *Post works*

15. Auditing reports are to be compiled by the appointed arborist and made available to The Council if requested.

## 7.2 Replacement Planting Strategy

LEAM plans showing proposed mitigation planting have been prepared as part of the application and a comprehensive Urban Design and Landscaping Plan (UDLP) and a Landscaping Plan for Town Centre Drive is required by the proposed conditions. Matters covered in this documentation include:

- Species selected
- Plant sizes
- Planting locations
- Number of specimen trees planted
- Maintenance requirements and timeframes.

The landscaping carried out as part of EB1 provides an example of the streetscape that can be provided for the busway alignment through EB3C and EB4L. In addition, space exists within the esplanade reserves and Burswood Reserve, within the Project boundaries for additional tree planting.

### 7.3 EB3C and EB4L Mitigation Planting

A set of LEAM plans have been prepared and are appended to the Landscape and Visual Assessment Report.

The landscape planting for EB3C and EB4L will include the planting of a substantial number of trees (427). The plan includes planting of 173 large growing trees at a grade of 160L which can attain large sizes at maturity. 254 smaller growing trees are proposed to be planted at a grade of 80L. Other areas of planting are also provided, including Lizard Habitat Restoration Planting (18,142m<sup>2</sup>), Revegetation Planting (24,913m<sup>2</sup>), Raingarden/Swale Planting (4,293m<sup>2</sup>), Coastal Vegetation Habitat Management and Planting (5,740m<sup>2</sup>). Several of these other planting areas include species such as Tawa, Kauri, Karaka, Totara, Puriri, Manuka, Kanuka and Pohutukawa. These are all species able to attain large dimensions at maturity. Taking account of these 'other' planting areas, the number, and area of tree growth within the project boundaries will be greatly increased.

While the planted trees will not initially provide the scale of some of the removed trees, they will gradually become mature specimens themselves. It is also acknowledged that the species proposed for planting will primarily be native, ensuring that the biodiversity values of the Project area will be enhanced by the mature landscaping. While the replacement trees will take time to establish, the arboricultural values of the streetscape within EB3C will be improved once the trees mature.

Thirty-two trees have been identified as being suitable for relocation within the Project boundaries. The trees will be replanted into a suitable location which allows for the long-term growth and development of the trees. The trees will be transplanted in accordance with arboricultural best practice techniques (refer to Appendix 1 for the proposed Tree Relocation Methodology).

## 8 Recommendations and Conclusions

### 8.1 Recommendations

For EB3C and EB4L, the TPMP will confirm which trees are to be removed and which trees are able to be retained, and outline measures which, so far as is reasonably practicable, avoid, remedy, or mitigate any adverse effects on those trees to be retained as part of the project.

LEAM plans showing proposed mitigation planting have been prepared as part of the application. A comprehensive UDLP will be prepared (required by conditions) that includes a replacement planting strategy. Replacement planting should be carried out in general accordance with the LEAM plans and the UDLP. A separate Landscaping Plan for Town Centre Drive is required to be prepared in consultation with Botany Town Centre by the proposed conditions.

The thirty-two trees identified within this report for relocation should be incorporated into the UDLP. The physical relocation works should be undertaken by suitably experienced large tree relocation specialists, in general accordance with Annexure 1.

### 8.2 Conclusions

EB3C requires the removal of approximately 34 trees which would ordinarily require resource consent and 43 trees which would not ordinarily require resource consent under the district plan provisions in the AUP(OP) (i.e. 77 trees in total). EB4L requires the removal of approximately 32 trees which would ordinarily require resource consent and 15 trees which would not ordinarily require resource consent (i.e. 47 trees in total). Removal of these trees will have an adverse effect upon arboricultural values within the immediate area, which will require mitigating.

It is considered that through implementation of the LEAM plan(s), the UDLP (required by conditions) and a Landscaping Plan for Town Centre Drive, sufficient planting will be carried out to effectively mitigate the adverse effects identified.

Thirty-two early mature trees are proposed to be relocated from proposed works areas within EB3C and EB4L to other locations within the Project boundaries, thereby minimising tree removal and providing a level of immediate maturity to the landscape.

One hundred and twenty-three trees are proposed to be retained within the EB3C and EB4L footprints (or with canopies/rootzones which extend into the Project footprints). Provided the recommended tree protection methodologies are followed, adverse effects on these trees will be suitably mitigated and these trees will continue to contribute to local environmental values.

# Appendix 1: Transplant Methodology

## Transplanting

1. Any relocation operation carries a degree of risk to the viability of the tree/s to be transplanted. There are many factors that can adversely affect the viability of any transplant operation. These factors need to be identified and remediated to ensure a high likelihood of success.
2. The key to a successful transplant operation is the size of the root ball that can be retained and moved as part of the transplant. A root ball of up to 10 to 12 times the diameter of the main stem measured at 300mm from ground level needs to be achieved to ensure a successful transplant (Harris et al 2010).

## Limitations of transplant discussion

3. There is always an inherent risk involved in relocating trees. All practical precautions to ensure the successful relocation of trees can be put in place; however certain predisposing factors such as pathogens, genetics and stress tolerance of individual trees can result in decline or poor health.
4. Tree health is an important consideration when transplanting trees, as a tree in good health is more likely to withstand the physiological stresses encountered.
5. The timing of the transplant operation is also important. Arboricultural best practise is to undertake relocations during the planting season June-August when trees expend least energy.

## Proposed Transplant Methodology

6. The trees are proposed to be directly transplanted to their final locations in one operation.
7. Prior to excavating the root balls of the trees, the trees will be sprayed with an anti-transpirant product to reduce water loss and wilting through transpiration.
8. A trench will be excavated around each of the trees to the recommended sizes outlined within Table 3. The trenches will be excavated primarily by hand to expose and sever roots, but also with the assistance of a small excavator (1 – 1.5 tonne). The trench will be at a depth approximately 800 – 1000mm deep to ensure a good clay sub soil. Another shorter trench, to the same depth and at right angles to the root ball, will be excavated to allow a wire cable to be pulled through beneath the rootball. This will undercut and release the rootball from the surrounding earth.
9. The trees' roots will be cleanly severed to the edge of the trench. The root ball is to wrapped in hessian and then shrink wrapped to reduce soil moisture loss. This will allow the root ball to be framed

and secured with load binder type straps and chains in preparation for lifting. Their root balls will need to be prepared and retained using steel frames to ensure they are held together during transport.

10. The trees are lifted onto a transporter with a sufficiently sized Hiab or crane (this can vary depending on weight of tree and distance of lift).



Figure Error! No text of specified style in document.-1 Example showing the lifting, the root ball and the steel frames.



Figure Error! No text of specified style in document.-2 - Example showing the lifting, the root ball and the steel frames.



Figure Error! No text of specified style in document.-3 – Trees loaded onto truck ready for transport

### **Replanting transplants**

11. The holes for the trees to be planted in should be excavated prior to the trees being removed from the ground so that their root systems are 'exposed' for as short a time as possible. The holes for the new positions should be excavated to be larger than the corresponding root ball and the excavated soil should be ready for backfilling.
  
12. The trees should be carefully placed into the hole and manoeuvred to be upright with the top of the rootball equal to the ground level. Once positioning is correct the chains and straps shall be removed. Any plastic wrap (if used) should also be removed. Hessian wrap should be removed where possible; however, small amounts may be left in the ground to decompose. The trees may need to be held in place while backfilling is carried out with the excavated material. Backfill should be carried out in layers, with light compaction carried out for each layer. Care shall be taken to ensure that sufficient soil is placed beneath the root ball and no 'spaces' allowed to be created.
  
13. The trees should be watered prior to transplanting to ensure turgidity. Some watering should be carried out during back filling to ensure good soil hydrology around the tree, whilst taking care to avoid altering the soil structure. Further watering shall be carried out once backfilling is complete to further settle the soil, improve contact between soil and roots and ensure adequate initial soil hydrology. Soil levels shall be topped up as required. Following watering, the root zone shall be mulched with a good quality mulch / compost mix to a depth of 100mm.

### **Aftercare**

14. The trees are to be watered twice weekly from October through to April (unless otherwise advised) with up to 50 litres of water each time. It is as important to ensure the trees are not over watered as

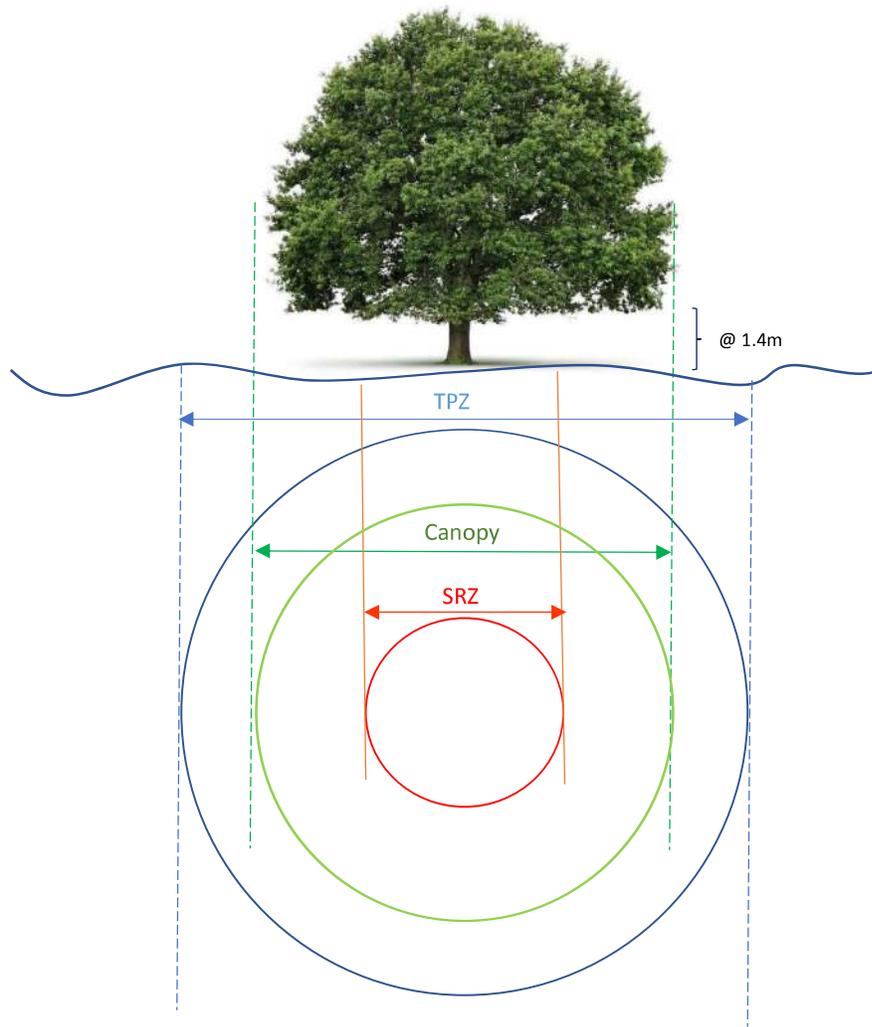
under watered; soil moisture should be monitored throughout this period using moisture meters and readings along with a visiting log kept, outlining the condition of the trees, water usage, fertiliser applied (where applicable) and any additional activities or vandalism. In overly dry conditions, during this period or if a dry winter should occur the trees should be sprayed with a solution that reduces transpiration and assists the tree in reducing water loss and maintenance levels increased to every three days.

#### **General tree protection principles and guidelines for working around roots**

15. As with any project, monitoring for the success of the transplant and survival is highly dependent on experienced and trained operators to undertake these works and follow best practice guidelines. It is recommended that the process be overseen by a competent and experienced arborist in order that informed and accurate decisions on root pruning, root ball size and depth can be made. Care must be taken with the moisture control/transpiration during the works. Poorly managed transplanting procedures can rapidly result in the decline of the trees once they are relocated.
16. It is acknowledged that roots will require severance in order to relocate the trees. All roots which are pruned will need to be pruned cleanly with a sharp hand saw or loppers perpendicular to the growing direction of the root.
17. The root balls need to be carefully wrapped and protected with moist hessian cloth, wool mulch or geotextile fabric for the duration of time which they are exposed. This cloth should then be wrapped in 'shrink wrap' and the root ball thoroughly drenched to ensure moisture is retained and the root ball does not collapse.
18. When trees are lifted by crane, it is advisable to secure a protective cushion around the stems that in close proximity to the chains to minimise the likelihood of impact damage from lifting chains. Large sheets of foam are suitable for this purpose.

## Appendix 2: Tree Protection Zone (TPZ) & Structural Root Zone (SRZ).

The Australian Standard AS 4970-2009 - *Protection of trees on development sites* is used for the allocation of tree protection zones. This method provides a TPZ that addresses both tree stability and growth requirements. TPZ distances are measured as a radius from the centre of the trunk at ground level.



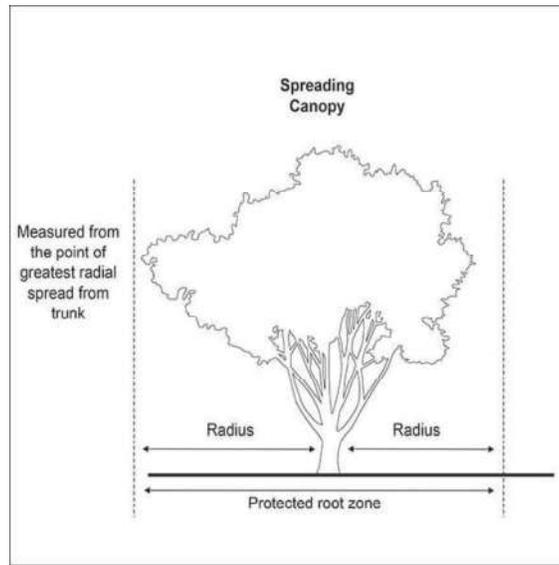
AS4970-2009, s3: The radius of the TPZ is calculated for each tree by multiplying its Diameter @ Breast Height measured @ 1.4m from ground level ( $DBH \times 12 = TPZ$ ). ( $DBH = \text{Trunk Girth @ 1.4m} \div \pi$ ).

To calculate the SRZ: Radius SRZ = Diameter Above Root Crown ( $DRC \times 50$ )  $^{\wedge}$  0.42  $\times$  0.64. If the DRC is less than 0.15m the SRZ will be 1.5m.

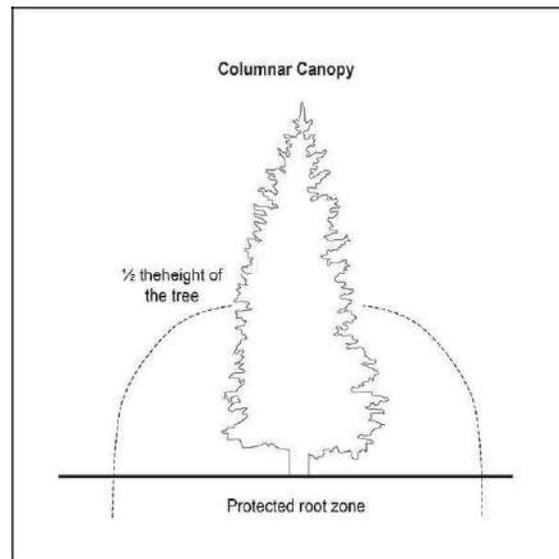
## Appendix 3: Auckland Unitary Plan Operative in part, J1 Definitions

**Protected root zone:** *“The circular area of ground around the trunk of a protected tree, the radius of which is the greatest distance between the trunk and the outer edge of the canopy. For columnar crown species the protected root zone is half the height of the tree”.*

**Figure J1.4.5 Protected root zone A**



**Figure J1.4.6 Protected root zone B**



## Appendix 4: Tree Inventory

**Table 1: EB3C – Trees with activities which ordinarily trigger resource consent**

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP(OP) Activity Status	Proposed Action
3000	1	Cordyline australis	5	630	1	Mature	Road Reserve	RD	Remove
3001	1	Metrosideros excelsa	9	920	4.5	Semi-Mature	Reserve	RD	Remove
3002	1	Metrosideros excelsa	8	990	6	Semi-Mature	Reserve	RD	Remove
3003	1	Metrosideros excelsa	5	610	5	Semi-Mature	Reserve	RD	Remove
3004	1	Metrosideros excelsa	3.5	380	3	Semi-Mature	Reserve	RD	Remove
3005	1	Metrosideros excelsa	7	770	7	Mature	Reserve	RD	Remove
3058	Group	Leptospermum scoparium	6	400	2	Semi-Mature	Road Reserve / Reserve	RD	Remove
3059	1	Metrosideros excelsa	5	250	3	Mature	Reserve	RD	Remove
3067	1	Metrosideros excelsa	7	1060	6	Mature	Reserve	RD	Remove
3068	1	Vitex lucens	7	710	8	Mature	Reserve	RD	Remove
3069	1	Metrosideros excelsa	7	630	6	Mature	Reserve	RD	Remove
3070	1	Corynocarpus laevigatus	6	510	4	Mature	Reserve	RD	Remove
3071	2	Metrosideros excelsa	6	650	4	Mature	Reserve	RD	Remove
3072	1	Metrosideros excelsa	5.5	490	3	Mature	Reserve	RD	Remove

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3074	1	<i>Metrosideros excelsa</i>	2.5	150	1.5	Mature	Reserve	RD	Remove
3085	1	<i>Metrosideros excelsa</i>	5	450	2	Mature	Reserve	RD	Relocate
3086	1	<i>Metrosideros excelsa</i>	5	150	2	Mature	Reserve	RD	Relocate
3125	1	<i>Vitex lucens</i>	6	880	5	Mature	Reserve	RD	Remove
3139	1	<i>Liquidambar styraciflua</i>	10	1320	6	Mature	Road Reserve	RD	Remove
3176	1	<i>Magnolia grandiflora</i>	5	670	4	Mature	Road Reserve	RD	Remove
3186	1	<i>Corynocarpus laevigatus</i>	5	660	4	Semi-Mature	Reserve	RD	Remove
3187	1	<i>Olea europaea</i>	7	970	5	Mature	Reserve	RD	Remove
3188	1	<i>Vitex lucens</i>	4	800	2	Semi-Mature	Reserve	RD	Remove
3189	1	<i>Corynocarpus laevigatus</i>	5.5	1070	3	Semi-Mature	Reserve	RD	Remove
3190	1	<i>Alnus glutinosa 'Imperialis'</i>	7	1060	6	Mature	Road Reserve	RD	Remove
3191	1	<i>Alectryon excelsus</i>	6	770	3	Mature	Reserve	RD	Remove
3192	1	<i>Alectryon excelsus</i>	5	760	3	Mature	Reserve	RD	Remove
3193	1	<i>Corynocarpus laevigatus</i>	5	1020	4	Semi-Mature	Reserve	RD	Remove
3194	1	<i>Corynocarpus laevigatus</i>	4	640	2.5	Semi-Mature	Reserve	RD	Remove

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3195	1	<i>Alectryon excelsus</i>	5.5	700	5	Mature	Reserve	RD	Remove
3196	1	<i>Vitex lucens</i>	4.5	830	5	Semi-Mature	Reserve	RD	Remove
3197	1	<i>Corynocarpus laevigatus</i>	5.5	740	3	Semi-Mature	Reserve	RD	Remove
3198	1	<i>Alectryon excelsus</i>	5	890	5.5	Mature	Reserve	RD	Remove
3224	Group	<i>Kunzea ericoides</i>	5	300	3	Mature	Reserve	RD	Remove
3226	1	<i>Metrosideros excelsa</i>	6	750	4	Semi-Mature	Reserve	RD	Relocate
3227	1	<i>Metrosideros excelsa</i>	6	900	4	Semi-Mature	Reserve	RD	Relocate
3228	1	<i>Pittosporum eugenioides</i>	5	300	3	Semi-Mature	Reserve	RD	Remove
3229	1	<i>Metrosideros excelsa</i>	6	750	4	Semi-Mature	Reserve	RD	Relocate
3230	1	<i>Metrosideros excelsa</i>	5	600	3	Semi-Mature	Reserve	RD	Relocate
3231	1	<i>Metrosideros excelsa</i>	6	850	4	Semi-Mature	Reserve	RD	Relocate
3232	1	<i>Metrosideros excelsa</i>	6	850	3	Semi-Mature	Reserve	RD	Relocate
3233	1	<i>Pittosporum eugenioides</i>	4	300	3	Semi-Mature	Reserve	RD	Remove
3234	1	<i>Metrosideros excelsa</i>	5	320	3	Semi-Mature	Reserve	RD	Relocate

**Table 2: EB3C – Trees within project boundaries with activities that would not ordinarily require resource consent**

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP(OP) Activity Status	Proposed Action
3006	1	Metrosideros excelsa	7	490	5	Semi-Mature	Reserve	PA	Remove
3007	1	Metrosideros excelsa	8	990	6	Mature	Reserve	PA	Remove
3008	1	Metrosideros excelsa	7	880	5	Semi-Mature	Reserve	PA	Retain and Protect
3009	1	Metrosideros excelsa	8	730	6	Semi-Mature	Reserve	PA	Retain and Protect
3010	1	Schinus terebinthifolius	5	800	4.5	Semi-Mature	Business - Light Industry	PA	Remove
3011	1	Schinus terebinthifolius	7	900	5	Semi-Mature	Business - Light Industry	PA	Remove
3012	1	Schinus terebinthifolius	6	2100	6	Mature	Business - Light Industry	PA	Remove
3013	1	Acacia longifolia	5.5	1200	6	Semi-Mature	Business - Light Industry	PA	Remove
3014	1	Schinus terebinthifolius	5	800	5	Semi-Mature	Business - Light Industry	PA	Remove

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3015	1	<i>Metrosideros excelsa</i>	7	1500	4	Semi-Mature	Business - Light Industry	PA	Remove
3016	1	<i>Acacia longifolia</i>	5.5	1200	6	Semi-Mature	Business - Light Industry	PA	Remove
3017	1	<i>Griselinia littoralis</i>	5	450	4	Mature	Business - Light Industry	PA	Remove
3018	1	<i>Griselinia littoralis</i>	5	450	4	Mature	Business - Light Industry	PA	Remove
3019	1	<i>Griselinia littoralis</i>	5	450	4	Mature	Business - Light Industry	PA	Remove
3020	1	<i>Griselinia littoralis</i>	5	300	2	Mature	Business - Light Industry	PA	Remove
3021	1	<i>Griselinia littoralis</i>	5	450	3	Mature	Business - Light Industry	PA	Remove
3022	1	<i>Metrosideros excelsa</i>	7	830	7	Semi-Mature	Business - Light Industry	PA	Retain and Protect
3023	1	<i>Myoporum laetum</i>	6	1350	7	Semi-Mature	Reserve	PA	Retain and Protect
3024	1	<i>Myoporum laetum</i>	6	1000	5	Semi-Mature	Reserve	PA	Retain and Protect
3025	1	<i>Acacia longifolia</i>	7	450	3.5	Semi-Mature	Business - Light Industry	PA	Remove

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3026	1	<i>Metrosideros excelsa</i>	8	450	3	Semi-Mature	Business - Light Industry	PA	Retain and Protect
3027	1	<i>Metrosideros excelsa</i>	7	750	7	Semi-Mature	Reserve	PA	Retain and Protect
3028	1	<i>Metrosideros excelsa</i>	7	1000	8	Mature	Reserve	PA	Retain and Protect
3029	1	<i>Metrosideros excelsa</i>	7	800	4	Semi-Mature	Business - Light Industry	PA	Retain and Protect
3030	1	<i>Cordyline australis</i>	4	1200	1.5	Semi-Mature	Business - Light Industry	PA	Retain and Protect
3031	1	<i>Metrosideros excelsa</i>	8	750	6	Mature	Reserve	PA	Retain and Protect
3032	1	<i>Metrosideros excelsa</i>	7	900	6	Semi-Mature	Reserve	PA	Retain and Protect
30325	1	<i>Metrosideros excelsa</i>	7	450	3.5	Semi-Mature	Reserve	PA	Retain and Protect
3033	1	<i>Metrosideros excelsa</i>	7	800	4	Semi-Mature	Reserve	PA	Retain and Protect
3034	1	<i>Metrosideros excelsa</i>	6	320	5	Semi-Mature	Reserve	PA	Retain and Protect
3035	1	<i>Metrosideros excelsa</i>	6	300	4	Semi-Mature	Reserve	PA	Retain and Protect
3036	1	<i>Metrosideros excelsa</i>	7	2000	5	Semi-Mature	Reserve	PA	Retain and Protect
3037	1	<i>Corynocarpus laevigatus</i>	7	750	3	Semi-Mature	Reserve	PA	Retain and Protect

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3038	1	Metrosideros excelsa	7	800	4	Semi-Mature	Reserve	PA	Retain and Protect
3039	1	Metrosideros excelsa	7	2000	5	Mature	Reserve	PA	Retain and Protect
3040	1	Metrosideros excelsa	7	1000	5	Mature	Reserve	PA	Retain and Protect
3041	1	Metrosideros excelsa	7	1000	5	Mature	Reserve	PA	Retain and Protect
3042	1	Metrosideros excelsa	7	2000	5	Mature	Reserve	PA	Retain and Protect
3043	1	Metrosideros excelsa	7	1500	5	Mature	Reserve	PA	Retain and Protect
3044	3	Eucalyptus sp.	7	1700	4	Mature	Reserve	PA	Retain and Protect
3045	1	Metrosideros excelsa	7	1700	4	Mature	Reserve	PA	Retain and Protect
3046	1	Metrosideros excelsa	7	1500	5	Mature	Reserve	PA	Retain and Protect
3047	1	Metrosideros excelsa	7	1700	4	Mature	Reserve	PA	Retain and Protect
3048	1	Metrosideros excelsa	7	2000	5	Mature	Reserve	PA	Retain and Protect
3049	1	Metrosideros excelsa	4	1000	5	Mature	Reserve	PA	Retain and Protect
3050	1	Metrosideros excelsa	7	1000	6	Mature	Business - Light Industry	PA	Retain and Protect
3051	1	Metrosideros excelsa	7	2500	6	Mature	Reserve	PA	Retain and Protect

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3052	1	Metrosideros excelsa	7	2500	6	Mature	Reserve	PA	Retain and Protect
3053	1	Schinus terebinthifolius	7	1000	6	Mature	Business - Light Industry	PA	Remove
3054	1	Metrosideros excelsa	8	2000	4	Mature	Business - Light Industry	PA	Retain and Protect
3055	1	Metrosideros excelsa	8	3000	5	Mature	Reserve	PA	Retain and Protect
3056	1	Metrosideros excelsa	9	2000	4	Mature	Business - Light Industry	PA	Retain and Protect
3057	1	Metrosideros excelsa	5	2000	4	Mature	Business - Light Industry	PA	Remove
3060	1	Metrosideros excelsa	7	590	4	Mature	Reserve	PA	Retain and Protect
3061	1	Metrosideros excelsa	6	900	4	Mature	Reserve	PA	Retain and Protect
3062	1	Metrosideros excelsa	4	250	3	Mature	Reserve	PA	Retain and Protect
3063	1	Metrosideros excelsa	6	610	4	Mature	Reserve	PA	Retain and Protect
3064	1	Metrosideros excelsa	4	240	4	Mature	Reserve	PA	Retain and Protect
3065	1	Metrosideros excelsa	6	660	6	Mature	Reserve	PA	Retain and Protect
3066	1	Metrosideros excelsa	6	480	4	Mature	Reserve	PA	Remove

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3073	1	<i>Metrosideros excelsa</i>	4	280	2	Mature	Reserve	PA	Retain and Protect
3075	1	<i>Metrosideros excelsa</i>	7	950	6	Mature	Reserve	PA	Retain and Protect
3076	1	<i>Metrosideros excelsa</i>	7	830	6	Mature	Reserve	PA	Retain and Protect
3077	1	<i>Corynocarpus laevigatus</i>	6	610	5	Mature	Reserve	PA	Retain and Protect
3078	1	<i>Pittosporum crassifolium</i>	5.5	370	3	Mature	Reserve	PA	Retain and Protect
3079	1	<i>Metrosideros excelsa</i>	5.5	440	3	Mature	Reserve	PA	Retain and Protect
3080	1	<i>Metrosideros excelsa</i>	5	520	3	Mature	Reserve	PA	Retain and Protect
3081	1	<i>Pittosporum crassifolium</i>	5	320	3	Mature	Reserve	PA	Retain and Protect
3082	1	<i>Metrosideros excelsa</i>	5	170	2	Mature	Reserve	PA	Retain and Protect
3083	1	<i>Metrosideros excelsa</i>	5	480	3	Mature	Reserve	PA	Retain and Protect
3084	1	<i>Pittosporum crassifolium</i>	5	440	3	Mature	Reserve	PA	Retain and Protect
3087	1	<i>Pittosporum crassifolium</i>	5	440	3	Mature	Reserve	PA	Retain and Protect
3088	1	<i>Metrosideros excelsa</i>	5.5	400	3	Mature	Reserve	PA	Retain and Protect
3089	1	<i>Metrosideros excelsa</i>	4.5	160	3	Mature	Reserve	PA	Retain and Protect
3090	1	<i>Pittosporum crassifolium</i>	5	320	3	Mature	Reserve	PA	Retain and Protect

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3091	1	<i>Pittosporum crassifolium</i>	5	310	3	Mature	Reserve - Business - Light Industry	PA	Retain and Protect
3092	1	<i>Metrosideros excelsa</i>	5	300	3	Mature	Business - Light Industry	PA	Retain and Protect
3093	1	<i>Metrosideros excelsa</i>	5	450	3	Mature	Business - Light Industry	PA	Relocate
3094	1	<i>Metrosideros excelsa</i>	5	320	3	Mature	Business - Light Industry	PA	Retain and Protect
3095	1	<i>Metrosideros excelsa</i>	5	290	3	Mature	Business - Light Industry	PA	Retain and Protect
3096	1	<i>Metrosideros excelsa</i>	5	400	3	Mature	Reserve - Business - Light Industry	PA	Retain and Protect
3097	1	<i>Pittosporum crassifolium</i>	5	300	3	Mature	Business - Light Industry	PA	Retain and Protect
3098	1	<i>Pittosporum crassifolium</i>	5	120	3	Mature	Business - Light Industry	PA	Retain and Protect
3099	1	<i>Podocarpus totara</i>	6	1240	4	Mature	Business - Light Industry	PA	Retain and Protect
3100	1	<i>Podocarpus totara</i>	6	1080	4	Mature	Business - Light Industry	PA	Retain and Protect

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3101	1	Podocarpus totara	6	1240	4	Mature	Business - Light Industry	PA	Retain and Protect
3102	1	Corynocarpus laevigatus	5	430	3	Mature	Business - Light Industry	PA	Remove
3103	1	Myrsine australis	4.5	150	2	Mature	Business - Light Industry	PA	Remove
3104	1	Pittosporum crassifolium	4	250	2	Mature	Business - Light Industry	PA	Remove
3105	1	Podocarpus totara	4	500	2	Mature	Business - Light Industry	PA	Relocate
3106	1	Metrosideros excelsa	5	330	3	Semi-Mature	Business - Light Industry	PA	Relocate
3107	1	Metrosideros excelsa	4	220	2	Mature	Business - Light Industry	PA	Relocate
3108	1	Metrosideros excelsa	4	150	2	Mature	Business - Light Industry	PA	Relocate
3109	1	Metrosideros excelsa	5	380	3	Mature	Business - Light Industry	PA	Relocate
3110	1	Metrosideros excelsa	5	150	3	Mature	Business - Light Industry	PA	Relocate

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3111	1	Metrosideros excelsa	2.5	60	1.5	Mature	Business - Light Industry	PA	Remove
3112	1	Metrosideros excelsa	5	200	3	Mature	Business - Light Industry	PA	Relocate
3113	1	Podocarpus totara	5	240	3	Mature	Business - Light Industry	PA	Relocate
3114	1	Pittosporum crassifolium	4	320	2	Mature	Business - Light Industry	PA	Relocate
3115	1	Pittosporum crassifolium	4	150	2	Mature	Business - Light Industry	PA	Relocate
3116	1	Metrosideros excelsa	5	210	3	Mature	Business - Light Industry	PA	Relocate
3117	1	Metrosideros excelsa	5	240	3	Mature	Business - Light Industry	PA	Relocate
3118	1	Pittosporum crassifolium	4.5	260	3	Mature	Business - Light Industry	PA	Relocate
3119	1	Pittosporum crassifolium	2.5	120	1.5	Mature	Business - Light Industry	PA	Relocate
3120	1	Pittosporum crassifolium	3.5	290	2	Mature	Business - Light Industry	PA	Relocate

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3121	1	<i>Metrosideros excelsa</i>	2.5	300	1.5	Mature	Business - Light Industry	PA	Relocate
3122	1	<i>Podocarpus totara</i>	5	850	3	Mature	Business - Light Industry	PA	Remove
3123	1	<i>Metrosideros excelsa</i>	6	500	4	Mature	Business - Light Industry	PA	Remove
3124	Group	<i>Melicytus ramiflorus</i>	5	300	3	Mature	Business - Light Industry / Coastal Transition	PA	Retain and Protect
3126	1	<i>Pittosporum eugenioides</i>	6	600	3	Mature	Business - Light Industry	PA	Remove
3127	1	<i>Pittosporum eugenioides</i>	6	600	3	Mature	Business - Light Industry	PA	Remove
3128	1	<i>Pittosporum eugenioides</i>	6	600	3	Mature	Business - Light Industry	PA	Retain and Protect
3129	1	<i>Pittosporum eugenioides</i>	5	600	3	Mature	Business - Light Industry	PA	Retain and Protect
3130	1	<i>Pittosporum eugenioides</i>	6	600	3	Mature	Business - Light Industry	PA	Retain and Protect
3131	1	<i>Pittosporum eugenioides</i>	6	600	3	Mature	Business - Light Industry	PA	Retain and Protect

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3132	1	<i>Pittosporum eugenioides</i>	6	600	3	Mature	Business - Light Industry	PA	Retain and Protect
3133	1	<i>Melicytus ramiflorus</i>	6	600	3	Mature	Business - Light Industry	PA	Retain and Protect
3134	1	<i>Magnolia grandiflora</i>	6	600	3	Mature	Business - Light Industry	PA	Retain and Protect
3135	1	<i>Magnolia grandiflora</i>	6	600	3	Mature	Business - Light Industry	PA	Retain and Protect
3136	1	<i>Washingtonia robusta</i>	10	1400	2.5	Mature	Business - Light Industry	PA	Retain and Protect
3137	1	<i>Washingtonia robusta</i>	10	1400	2.5	Mature	Business - Light Industry	PA	Retain and Protect
3138	1	<i>Alectryon excelsus</i>	3	240	2	Mature	Road Reserve	PA	Remove
3140	1	<i>Magnolia grandiflora</i>	7	350	4	Mature	Business - Light Industry	PA	Retain and Protect
3141	1	<i>Liquidambar styraciflua</i>	10	1580	6	Mature	Business - Light Industry	PA	Retain and Protect
3168	1	<i>Alnus glutinosa 'Imperialis'</i>	11	1560	6	Mature	Road Reserve	PA	Retain and Protect
3169	8	<i>Pseudopanax crassifolius</i>	4	300	2	Mature	Business - Light Industry	PA	Remove

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3170	1	Hymenosporum flavum	6	450	4	Semi-Mature	Mixed Housing Suburbam	PA	Remove
3171	1	Cordyline australis	4	300	1	Mature	Mixed Housing Suburbam	PA	Remove
3172	1	Pittosporum eugenioides	5	300	3	Mature	Mixed Housing Suburbam	PA	Retain and Protect
3173	1	Magnolia grandiflora	7	1000	5	Mature	Road Reserve	PA	Retain and Protect
3174	1	Magnolia grandiflora	8	1010	5	Mature	Road Reserve	PA	Retain and Protect
3175	1	Magnolia grandiflora	4.5	420	2	Semi-Mature	Road Reserve	PA	Retain and Protect
3177	1	Alnus glutinosa 'Imperialis'	7	1000	6	Mature	Road Reserve	PA	Retain and Protect
3178	1	Alnus glutinosa 'Imperialis'	7	1030	6	Mature	Road Reserve	PA	Retain and Protect
3179	1	Alnus glutinosa 'Imperialis'	7	1080	6	Mature	Road Reserve	PA	Retain and Protect
3180	1	Corynocarpus laevigatus	4.5	450	2	Semi-Mature	Reserve	PA	Retain and Protect
3181	1	Corynocarpus laevigatus	5	750	2	Semi-Mature	Reserve	PA	Retain and Protect
3182	37	Kunzea ericoides	4	300	3	Semi-Mature	Reserve	PA	Retain and Protect
3183	1	Olea europaea	4.5	1020	4	Mature	Reserve	PA	Retain and Protect

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3184	1	<i>Coprosma robusta</i>	4	300	2	Mature	Reserve	PA	Retain and Protect
3185	1	<i>Metrosideros excelsa</i>	3	400	2	Young	Reserve	PA	Retain and Protect
3199	18	<i>Olea europaea</i>	5.5	1080	6	Mature	Reserve	PA	Retain and Protect
3200	10	<i>Pittosporum eugenioides</i>	5	400	3	Mature	Reserve	PA	Retain and Protect
3201	1	<i>Pittosporum eugenioides</i>	4	150	3	Mature	Reserve	PA	Retain and Protect
3202	1	<i>Pittosporum crassifolium</i>	2	180	3	Semi-Mature	Reserve	PA	Remove
3203	2	<i>Populus nigra</i>	18	1800	7	Mature	Reserve	PA	Retain and Protect
3204	1	<i>Washingtonia robusta</i>	11	1800	2	Mature	Business - Light Industry	PA	Remove
3205	1	<i>Washingtonia robusta</i>	8	1800	2	Mature	Business - Light Industry	PA	Remove
3206	1	<i>Washingtonia robusta</i>	5	1800	2	Mature	Business - Light Industry	PA	Remove
3207	1	<i>Washingtonia robusta</i>	8	1800	2	Mature	Business - Light Industry	PA	Remove
3208	1	<i>Washingtonia robusta</i>	8	1800	2	Mature	Business - Light Industry	PA	Remove

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3209	1	Washingtonia robusta	8	1800	2	Mature	Business - Light Industry	PA	Remove
3211	1	Washingtonia robusta	5	1800	2	Mature	Business - Light Industry	PA	Remove
3212	1	Washingtonia robusta	5	1800	2	Mature	Business - Light Industry	PA	Remove
3213	1	Washingtonia robusta	5	1800	2	Mature	Business - Light Industry	PA	Remove
3214	1	Washingtonia robusta	5	1800	2	Mature	Business - Light Industry	PA	Remove
3215	10	Coprosma robusta	5	300	2	Mature	Business - Light Industry	PA	Remove
3216	2	Cordyline australis	5	300	1	Mature	Reserve	PA	Remove
3217	1	Sophora microphylla	5	300	4	Mature	Business - Light Industry	PA	Retain and Protect
3218	1	Washingtonia robusta	10	1800	2	Mature	Business - Light Industry	PA	Retain and Protect
3219	1	Washingtonia robusta	10	1800	2	Mature	Business - Light Industry	PA	Retain and Protect
3220	1	Washingtonia robusta	10	1800	2	Mature	Business - Light Industry	PA	Retain and Protect

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age-class	AUP(OP) Zone	AUP[OP] Activity Status	Proposed Action
3221	1	Washingtonia robusta	7	1800	2	Mature	Business - Light Industry	PA	Retain and Protect
3222	1	Washingtonia robusta	7	1800	2	Mature	Business - Light Industry	PA	Retain and Protect
3223	7	Griselinia lucida	4	300	2	Mature	Business - Light Industry	PA	Retain and Protect
3225	10	Mixed species	2.5	300	2	Semi-Mature	Reserve	PA	Retain and Protect
3235	10	Pittosporum crassifolium	5	300	3	Semi-Mature	Reserve	PA	Retain and Protect
3236	1	Cordyline australis	2	300	0.5	Semi-Mature	Road Reserve	PA	Retain and Protect
3237	1	Cordyline australis	2.5	300	0.5	Semi-Mature	Road Reserve	PA	Retain and Protect
3238	1	Pittosporum crassifolium	3.5	150	1	Semi-Mature	Road Reserve	PA	Retain and Protect

**Table 1: EB4 – Trees within project boundaries with activities which would ordinarily trigger resource consent**

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age class	AUP(OP) Zone	AUP(OP) Activity Status	Proposed Action
3240	4	<i>Dodonaea viscosa</i>	4	200	1.5	Semi-Mature	Open Space - Informal Recreation	RD	Remove
3241	1	<i>Leptospermum scoparium</i>	4	1	1	Young	Open Space - Informal Recreation	RD	Remove
3291	1	<i>Casuarina cunninghamiana</i>	6	900	4	Mature	Open Space - Informal Recreation	RD	Remove
3292	1	<i>Cupressus macrocarpa</i>	15	2500	8	Mature	Open Space - Informal Recreation	RD	Remove
3294	1	<i>Populus nigra 'italica'</i>	16	1600	4	Mature	Open Space - Informal Recreation	RD	Remove
3295	1	<i>Populus nigra 'italica'</i>	16	1600	4	Mature	Open Space - Informal Recreation	RD	Remove
3296	1	<i>Populus nigra 'italica'</i>	16	1600	4	Mature	Open Space - Informal Recreation	RD	Remove
3301	1	<i>Metrosideros excelsa</i>	5	600	4	Semi-Mature	Open Space - Conservation Zone	RD	Relocate
3303	1	<i>Quercus robur</i>	9	1200	6	Semi-Mature	Open Space - Conservation Zone	RD	Remove
3304	1	<i>Quercus robur</i>	9	1200	6	Semi-Mature	Open Space - Conservation Zone	RD	Remove

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age class	AUP(OP) Zone	AUP(OP) Activity Status	Proposed Action
3305	1	Metrosideros excelsa	5	3000	4	Semi-Mature	Open Space - Conservation Zone	RD	Remove
3306	1	Metrosideros excelsa	4	600	3	Semi-Mature	Open Space - Conservation Zone	RD	Remove
3307	1	Metrosideros excelsa	5	2000	4	Semi-Mature	Open Space - Conservation Zone	RD	Relocate
3308	1	Metrosideros excelsa	3.5	750	3	Semi-Mature	Road Reserve	RD	Remove
3309	1	Agathis australis	6	500	1	Semi-Mature	Open Space - Conservation Zone	RD	Remove
3311	6	Corynocarpus laevigatus	5	400	2.5	Semi-Mature	Open Space - Informal Recreation	RD	Remove
3312	50	Kunzea ericoides	6	500	3	Semi-Mature	Open Space - Informal Recreation	RD	Remove
3313	1	Vitex lucens	7	800	3	Semi-Mature	Open Space - Informal Recreation	RD	Remove
3314	1	Beilschmiedia tarairi	7	750	2	Semi-Mature	Open Space - Informal Recreation	RD	Remove
3315	1	Podocarpus totara	7	750	3	Semi-Mature	Open Space - Informal Recreation	RD	Remove
3316	1	Melicytus ramiflorus	5	500	3	Mature	Open Space - Informal Recreation	RD	Remove

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age class	AUP(OP) Zone	AUP(OP) Activity Status	Proposed Action
3317	1	Lagunaria patersonii	8	1100	4	Mature	Open Space - Informal Recreation	RD	Remove
3318	1	Lagunaria patersonii	8	1100	4	Mature	Open Space - Informal Recreation	RD	Remove
3319	1	Lagunaria patersonii	8	1100	4	Mature	Road Reserve	RD	Remove
3320	1	Myoporum laetum	5	400	4	Semi-Mature	Road Reserve	RD	Remove
3321	1	Radermachera sinica	6	400	3	Semi-Mature	Road Reserve	RD	Remove
3323	8	Myoporum laetum	6	1400	5	Mature	Road Reserve	RD	Remove
3333	1	Lagunaria patersonii	8	1100	4	Mature	Open Space - Informal Recreation	RD	Remove
3334	1	Metrosideros excelsa	8	1400	6	Mature	Open Space - Informal Recreation	RD	Remove
3335	1	Corynocarpus laevigatus	6	500	4	Mature	Open Space - Informal Recreation	RD	Remove
3337	1	Alectryon excelsus	9	750	4	Mature	Open Space - Informal Recreation	RD	Remove
3339	1	Metrosideros excelsa	3.5	750	3	Semi-Mature	Road Reserve	RD	Remove
3341	3	Myoporum laetum	3.5	750	3	Semi-Mature	Open Space	RD	Remove
3342	1	Metrosideros excelsa	3.5	750	3	Semi-Mature	Road Reserve	RD	Remove



**Table 2: EB4 – Trees within project boundaries with activities which would not ordinarily require resource consent**

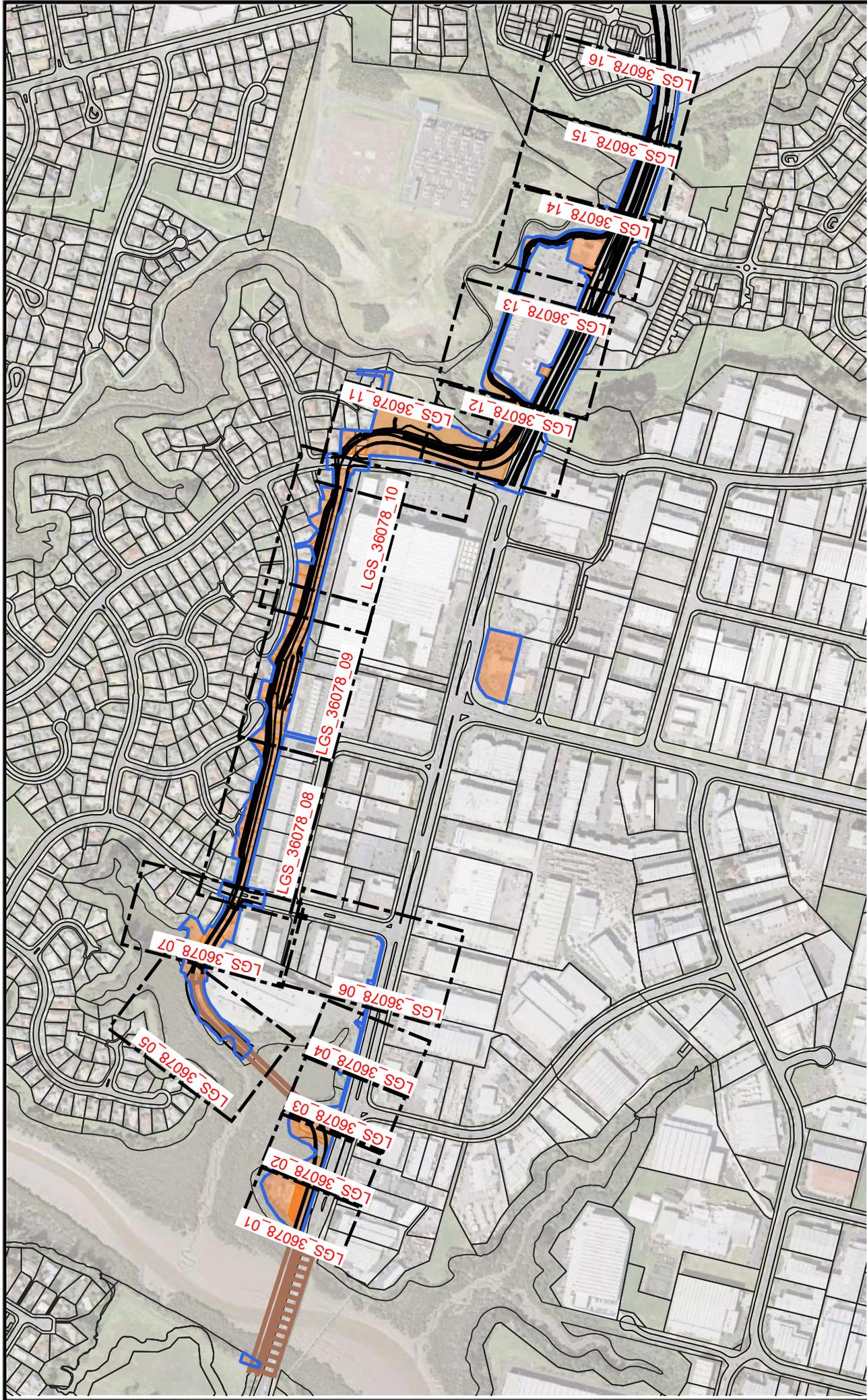
Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age class	AUP(OP) Zone	AUP(OP) Activity Status	Proposed Action
1156	1	Metrosideros excelsa	8	1000	5	Mature	Business - Mixed Use	PA	Retain
3239	1	Metrosideros excelsa	3	500	2	Young	Business - Mixed Use	PA	Remove
3293	1	Quercus robur	5	270	1	Mature	Business - Mixed Use	PA	Remove
3297	1	Metrosideros excelsa	5	600	3	Semi-Mature	Business - Mixed Use	PA	Relocate
3298	1	Metrosideros excelsa	5	500	3	Semi-Mature	Business - Mixed Use	PA	Relocate
3299	1	Metrosideros excelsa	5	500	3	Semi-Mature	Business - Mixed Use	PA	Relocate
3300	1	Metrosideros excelsa	5	500	3	Semi-Mature	Business - Mixed Use	PA	Relocate
3302	1	Crotageous monogyna	6	400	2	Semi-Mature	Business - Mixed Use	PA	Remove
3310	1	Alder sp.	8	900	8	Mature	Open Space - Conservation Zone	PA	Retain
3322	1	Metrosideros excelsa	7	1800	3.5	Mature	Road Reserve	PA	Retain
3324	1	Populus yunnanensis	30	3000	15	Mature	Open Space - Conservation Zone	PA	Retain
3325	1	Populus yunnanensis	30	2000	15	Mature	Open Space - Conservation Zone	PA	Retain
3326	1	Populus yunnanensis	30	5400	15	Mature	Open Space - Conservation Zone	PA	Retain

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age class	AUP(OP) Zone	AU(OP) Activity Status	Proposed Action
3327	1	Metrosideros excelsa	4	1200	2	Semi-Mature	Road Reserve	PA	Retain
3328	1	Metrosideros excelsa	4	1200	2	Semi-Mature	Road Reserve	PA	Retain
3329	1	Metrosideros excelsa	4	1200	2	Semi-Mature	Road Reserve	PA	Retain
3330	1	Metrosideros excelsa	4	600	2	Semi-Mature	Road Reserve	PA	Retain
3331	1	Metrosideros excelsa	4	600	2	Semi-Mature	Road Reserve	PA	Retain
3332	8	Pittosporum eugenioides	6	600	3	Semi-Mature	Road Reserve	PA	Retain
3336	1	Cupressus macrocarpa	12	2200	8	Mature	Open Space - Informal Recreation	PA	Retain
3340	1	Metrosideros excelsa	3.5	350	3	Semi-Mature	Open Space	PA	Remove
3343	1	Dacrycarpus dacrydioides	4.5	300	1.5	Semi-Mature	Open Space	PA	Retain
3344	1	Dacrycarpus dacrydioides	4.5	300	1.5	Semi-Mature	Open Space	PA	Retain
3345	10	Dacrycarpus dacrydioides	4.5	300	1.5	Semi-Mature	Open Space	PA	Retain
3346	1	Washingtonia robusta	10	1000	1.5	Mature	Road Reserve	PA	Retain
3347	1	Washingtonia robusta	10	1000	1.5	Mature	Road Reserve	PA	Retain
3348	1	Metrosideros excelsa	3.5	750	3	Semi-Mature	Road Reserve	PA	Retain
3349	1	Metrosideros excelsa	3.5	750	3	Semi-Mature	Road Reserve	PA	Retain

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age class	AUP(OP) Zone	AU(OP) Activity Status	Proposed Action
3350	1	Liquidambar styraciflua	8	1000	5	Semi-Mature	Business Metropolitan Centre	PA	Remove
3351	1	Liquidambar styraciflua	8	990	5	Semi-Mature	Business Metropolitan Centre	PA	Remove
3352	1	Liquidambar styraciflua	7	940	5	Semi-Mature	Business Metropolitan Centre	PA	Remove
3353	1	Metrosideros excelsa	6.5	1480	4	Semi-Mature	Business Metropolitan Centre	PA	Remove
3354	4	Alectryon excelsus	5	450	2	Semi-Mature	Business Metropolitan Centre	PA	Remove
3355	1	Metrosideros excelsa	6.5	1480	6	Semi-Mature	Business Metropolitan Centre	PA	Remove
3356	4	Alectryon excelsus	5	450	2	Semi-Mature	Business Metropolitan Centre	PA	Remove
3357	13	Alectryon excelsus	4.5	300	1.5	Semi-Mature	Business Metropolitan Centre	PA	Remove
3358	1	Coprosma arborea	5	300	3.5	Semi-Mature	Business Metropolitan Centre	PA	Remove
3359	1	Metrosideros excelsa	8	5000	5	Mature	Private	PA	Retain
3360	1	Metrosideros excelsa	8	5000	5	Mature	Private	PA	Remove
3361	1	Metrosideros excelsa	8	5000	5	Mature	Private	PA	Retain
3362	1	Liquidambar styraciflua	8	1000	5	Semi-Mature	Private	PA	Remove

Tree ID	Tree quantity	Species	Height (m)	Girth (mm)	CSR (m)	Age class	AUP(OP) Zone	AUP(OP) Activity Status	Proposed Action
3363	1	Liquidambar styraciflua	8	1000	5	Semi-Mature	Private	PA	Retain

## Appendix 5: Tree Location Plans



Allerl Design may not accurately reflect the actual vegetation conditions stated, project specific vegetation survey has been performed and confirmed.  
 Vegetation preservation must be subject to existing current requirements and regulations. It is the client's responsibility to determine whether or not this is the case.  
 All other information not shown or listed should be represented by an appointed works program.



**EASTERN BUSWAY 3  
 COMMERCIAL**  
**MASTER TREE PLAN**

Requested by	SC & LGS	Date	DEC22
Submitted by	LGS	Checked by	JR
Checked by	JR	Drawn number	LGS_36078_3C_00
Drawn number	LGS_36078_3C_00	Sheet	B



Requested by	SC & LGS	DEC22
Survived by	LGS	DEC22
Plotted by	JR	DEC22
Checked by		
Drawing number	LGS_36078_3C_01	B

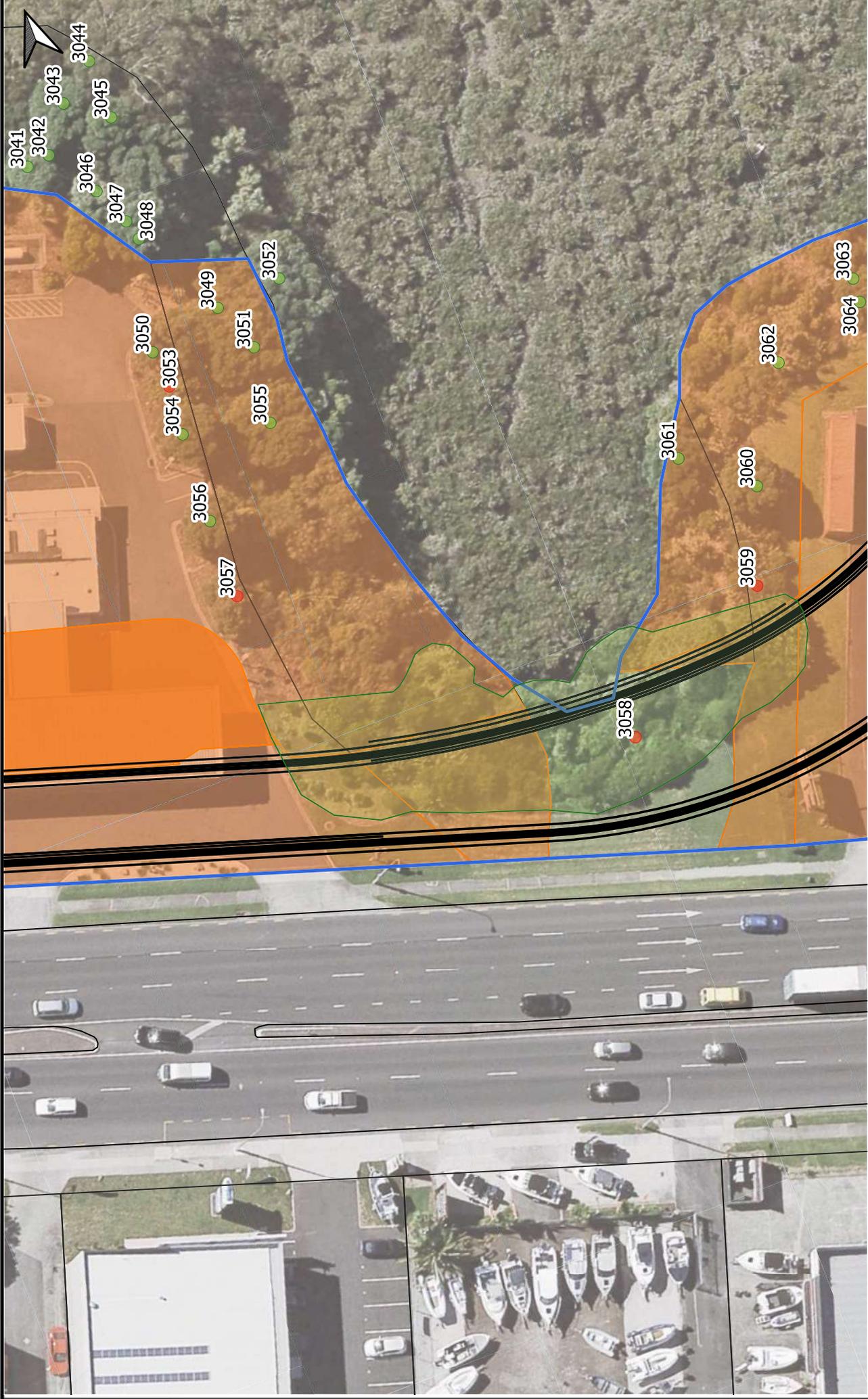
**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**



<b>Legend</b>	Groups	Green rectangle
Trees	Designation BDY	Blue line
	Bridges	Orange line
	Land acquisition	Orange shaded area
	Retain and Protect	Green dot
	Remove	Red dot
	Relocate	Purple dot

All data herein may not accurately reflect the actual vegetation conditions on-site. The information presented herein is for informational purposes only and does not constitute a warranty of any kind. The user assumes all responsibility for the use of the information presented herein. The user acknowledges that the user of this information is not a professional and should be supervised by an appropriate professional.



After a plan is approved, the actual location of trees to be removed or relocated will be determined by a field survey. The location of trees to be removed or relocated will be determined by a field survey. The location of trees to be removed or relocated will be determined by a field survey.

**Legend**  
**Trees**  
● Retain and Protect  
● Remove  
● Relocate

**Groups**  
 Designation BDY  
 Bridges  
 Land acquisition



**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**

Requested by	SC & LGS	DEC22
Reviewed by	LGS	DEC22
Checked by	JR	DEC22
Drawing number	LGS_36078_3C_02	B





Requested by	SC & LGS	Drawn	DEC22
Survived by	LGS	Plotted by	DEC22
Checked by	JR	Checked by	DEC22
Drawing number	LGS_36078_3C_04	File	B

**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**



<b>Legend</b>	<b>Trees</b>	<b>Groups</b>
Green square	Green circle	Green outline
Blue square	Red circle	Blue outline
Orange square	Purple circle	Orange outline
		Orange outline
		Orange outline
		Orange outline

All tree groups may not accurately reflect the actual vegetation on the site. Designation BDY, Bridges, and Land acquisition are for informational purposes only. Project specific vegetation survey has been completed and reported.

Vegetation classification may not be subject to intensive ground truthing. It is the responsibility of the client to determine the accuracy of the data. The client is responsible for determining the accuracy of the data. The client is responsible for determining the accuracy of the data. The client is responsible for determining the accuracy of the data.

Work sheets and tree files should be kept for reference by the client.



All data herein may not accurately reflect the actual vegetation conditions stated, project specific vegetation survey has been performed and updated.  
 Vegetation classification and removal may be subject to intensive ground verification conditions. It is the user's responsibility to determine whether or not this is the case.  
 Work is subject to any other conditions that may be required by any applicable laws or regulations.

- Legend**
- Groups
  - Retain and Protect
  - Remove
  - Relocate
  - Designation BDY
  - Bridges
  - Land acquisition



**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**

Requested by	SC & LGS	Date	DEC22
Survived by	LGS	Date	DEC22
Polled by	JR	Date	DEC22
Checked by	LGS_36078_3C_05	Plan	B
Drawing number			



Requested by	SC & LGS	DEC22
Survived by	LGS	DEC22
Polled by	JR	DEC22
Checked by	LGS_36078_3C_06	Per
Drawing number		B

**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**



	Groups
	Designation BDY
	Bridges
	Land acquisition
	Retain and Protect
	Remove
	Relocate

**Legend**

**Trees**

After a plan is approved, accuracy of field the actual vegetation conditions stated, project specific vegetation may have been noted and captured.

Vegetation identification may not be subject to inclusion or exclusion based on site conditions. It is the client's responsibility to determine whether or not this is the case.

Vegetation not shown or shown should be represented by an appropriate work item.



Requested by	SC & LGS	DEC22
Survived by	LGS	DEC22
Plotted by	JR	DEC22
Checked by	LGS_36078_3C_07	B

**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**



<b>Legend</b>	<b>Trees</b>	<b>Groups</b>
Retain and Protect	Designation BDY	Bridges
Remove	Land acquisition	
Relocate		

All data herein is for informational purposes only. The actual location of trees and other features may vary from the information shown on this map. The user assumes all responsibility for the use of this information. The user acknowledges that the user of this information is not a professional and should not be relied upon for any professional work.



All data herein may not accurately reflect the actual vegetation conditions on site. The user assumes all responsibility for the accuracy of the data. The user assumes all responsibility for the accuracy of the data. The user assumes all responsibility for the accuracy of the data.

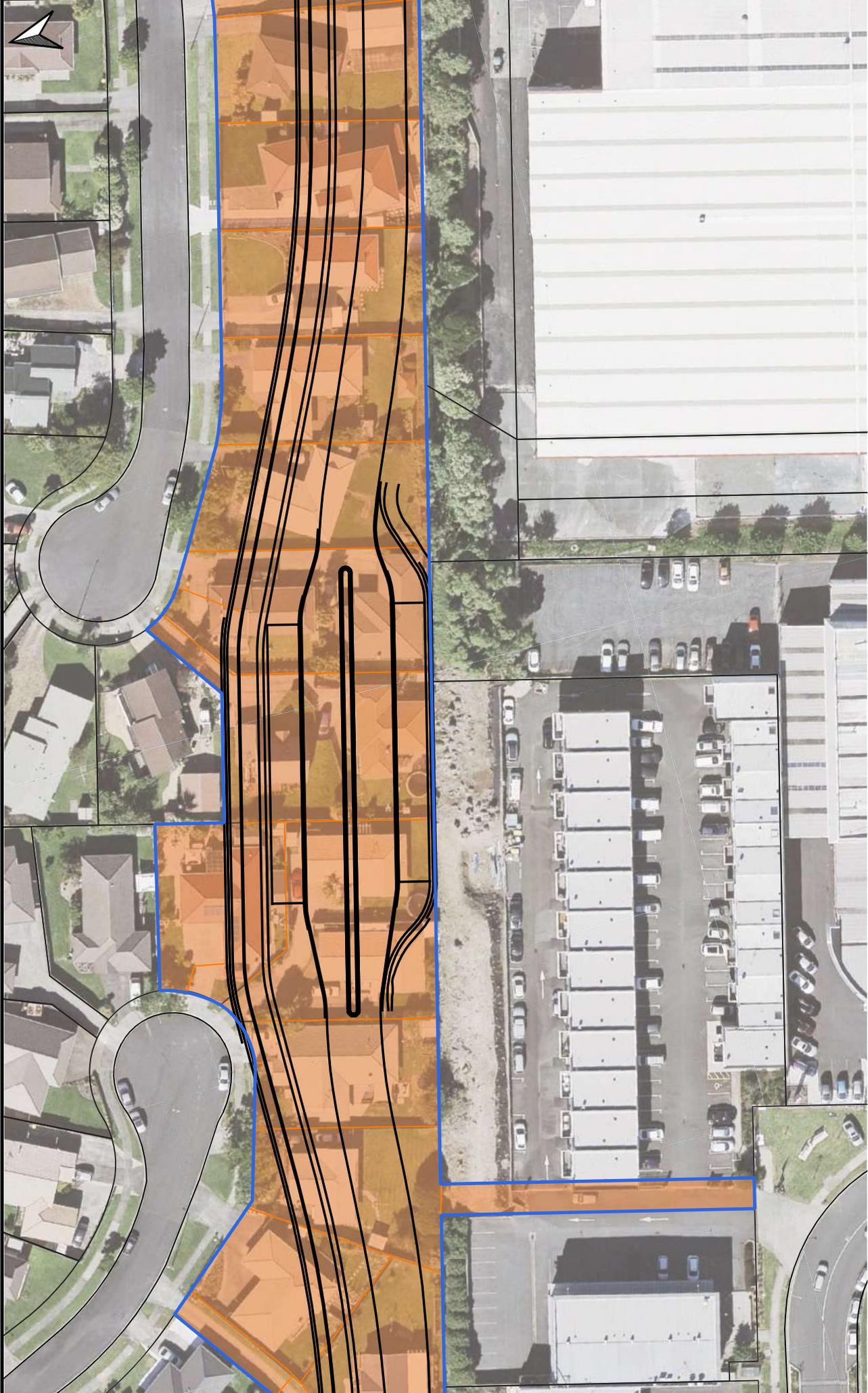
- Legend**
- Trees**
- Retain and Protect
  - Remove
  - Relocate
- Groups**
- Groups
- Designation BDY**
- Designation BDY
  - Bridges
  - Land acquisition



**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**

Requested by	SC & LGS	DEC22
Survived by	LGS	DEC22
Polled by	JR	DEC22
Checked by	LGS_36078_3C_08	B
Drawing number		



After a plan is approved, it may not accurately reflect the actual vegetation conditions on site. The contractor is responsible for conducting a site-specific vegetation survey and reporting the results to the appropriate authorities. The contractor is responsible for determining the appropriate vegetation management plan and implementing it. The contractor is responsible for determining the appropriate vegetation management plan and implementing it. The contractor is responsible for determining the appropriate vegetation management plan and implementing it.

- Legend**
- Trees
    - Retain and Protect
    - Remove
    - Relocate
  - Groups
    - Designation BDY
    - Bridges
    - Land acquisition



**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**

Requested by	SC & LGS	DEC22
Survived by	LGS	DEC22
Polled by	JR	DEC22
Checked by	LGS_36078_3C_09	Per
Drawing number	B	



All air photos may not accurately reflect the actual vegetation conditions stated. Project specific vegetation survey has been performed and captured.  
 Vegetation identification may not be subject to intensive ground investigations. It is the client's responsibility to determine whether or not this is the case.  
 Works schedules and time of view should be supported by an appointed works program.

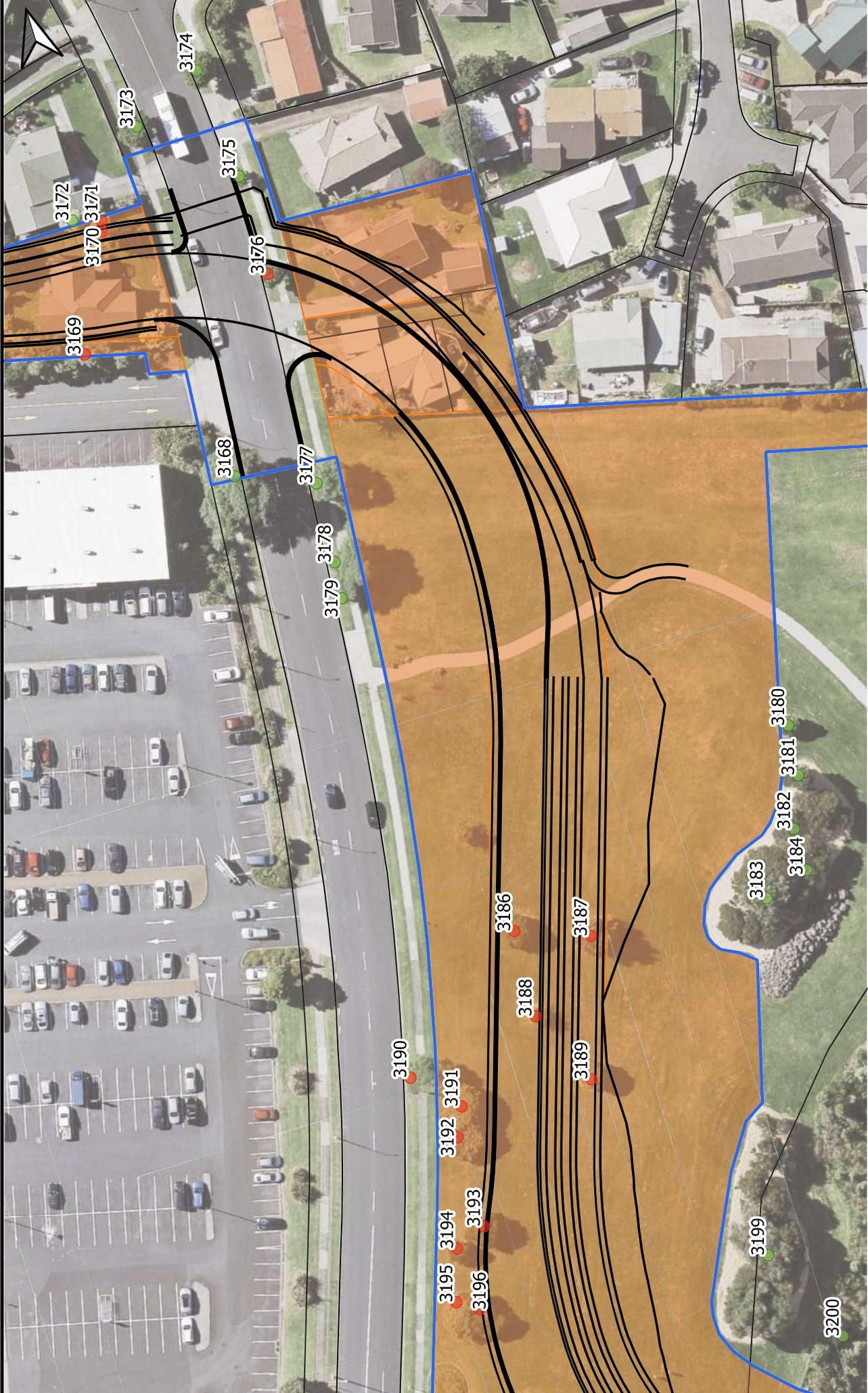
- Legend**
- Trees**
- Retain and Protect
  - Remove
  - Relocate
- Groups
  - Designation BDY
  - Bridges
  - Land acquisition



**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**

Requested by	SC & LGS	Date	DEC22
Survived by	LGS		DEC22
Checked by	JR		DEC22
Drawing number	LGS_36078_3C_10	Rev	B



Requested by	SC & LGS	DEC22
Survived by	LGS	DEC22
Plotted by	JR	DEC22
Checked by	LGS_36078_3C_11	B

**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**



**Legend**

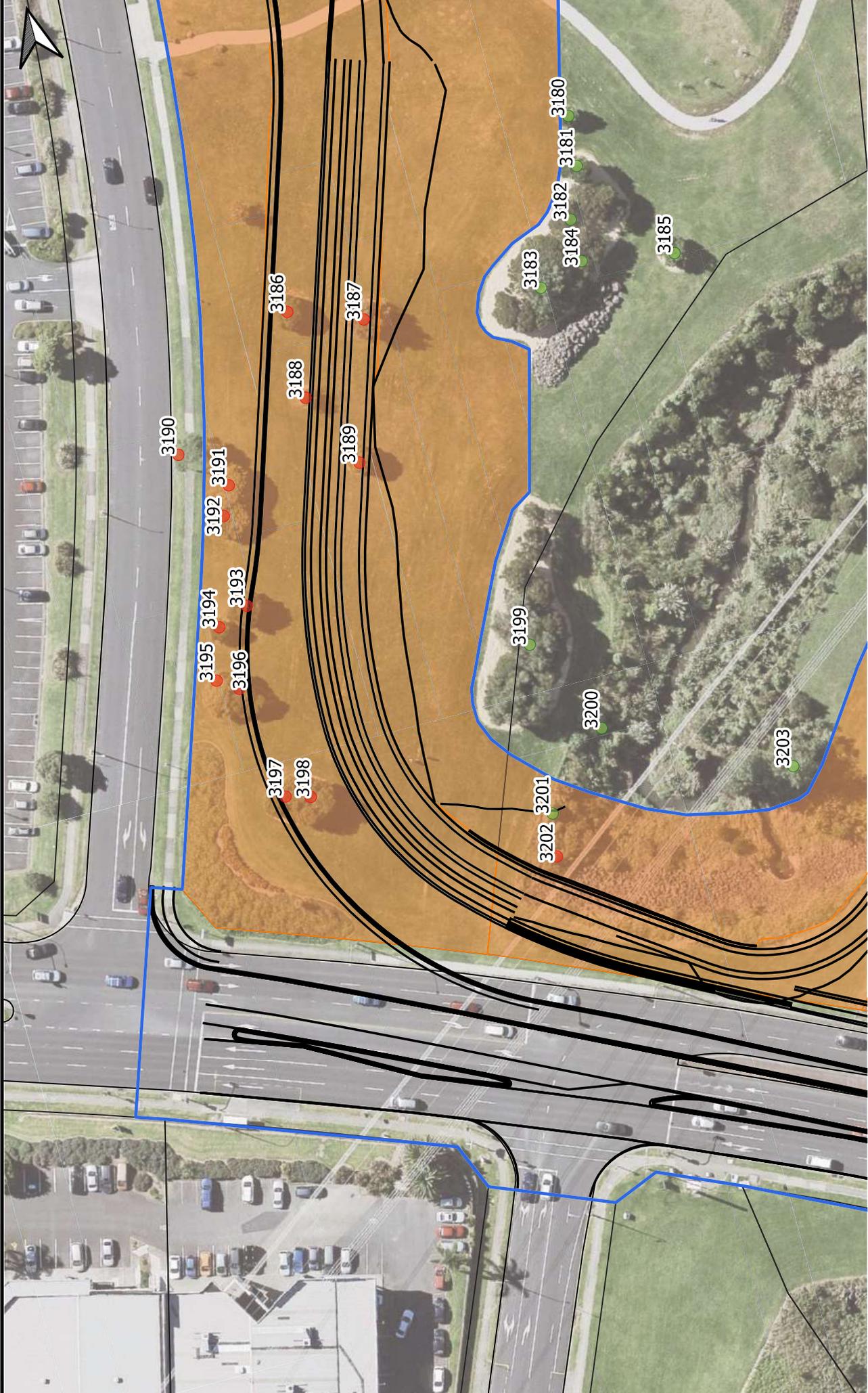
**Trees**

- Green circle: Retain and Protect
- Red circle: Remove
- Purple circle: Relocate

**Groups**

- Green outline: Designation
- Blue outline: BDY
- Orange outline: Bridges
- Brown outline: Land acquisition

All tree groups may not accurately reflect the actual vegetation characteristics stated. Project specific vegetation survey has been performed and reported.  
Vegetation characteristics may be subject to inclusion or exclusion based on site conditions. It is the user's responsibility to determine whether or not this is the case.  
Works sheets and tree files should be reported by appropriate work sheets.



Requested by	SC & LGS	DEC22
Survived by	LGS	DEC22
Polled by	JR	DEC22
Checked by	LGS_36078_3C_12	B
Drawing number		

**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**



<b>Legend</b>	<b>Trees</b>	<b>Groups</b>
Retain and Protect	Green circle	Green line
Remove	Red circle	Blue line
Relocate	Purple circle	Orange line
		Designation BDY
		Bridges
		Land acquisition

All tree groups may not accurately reflect the actual vegetation conditions stated. Project specific vegetation survey has been performed and reported.

Vegetation classification may not be subject to relocation or removal. It is the responsibility of the client to determine whether or not this is the case.

Works indicated will have to be reported by an appointed works architect.



All data herein may not accurately reflect the actual vegetation conditions stated, project specific vegetation may have been planted and captured.  
 Vegetation classification may not be subject to intensive ground investigations. It is the user's responsibility to determine whether or not this is the case.  
 Works, whether on or off-site, should be supervised by an appointed works officer.

- Legend**
- Trees
    - Retain and Protect
    - Remove
    - Relocate
  - Groups
    - Designation BDY
    - Bridges
    - Land acquisition

**Eastern Busway**  
 Quantifying Green Infrastructure  
 Sustainability

**EASTERN BUSWAY 3  
 COMMERCIAL**

**TREE LOCATION PLAN**

Requested by	SC & LGS	Drawn	DEC22
Survived by	LGS	Plotted by	DEC22
Checked by	JR	Checked by	DEC22
Drawing number	LGS_36078_3C_13	Year	B



After origin may not accurately reflect the actual vegetation conditions stated, project specific vegetation survey has been performed and updated.

Vegetation identification may be subject to misclassification or misinterpretation. It is the user's responsibility to determine whether or not this is the case.

Wetlands, shallow water areas, and other features should be represented by an appropriate symbol.

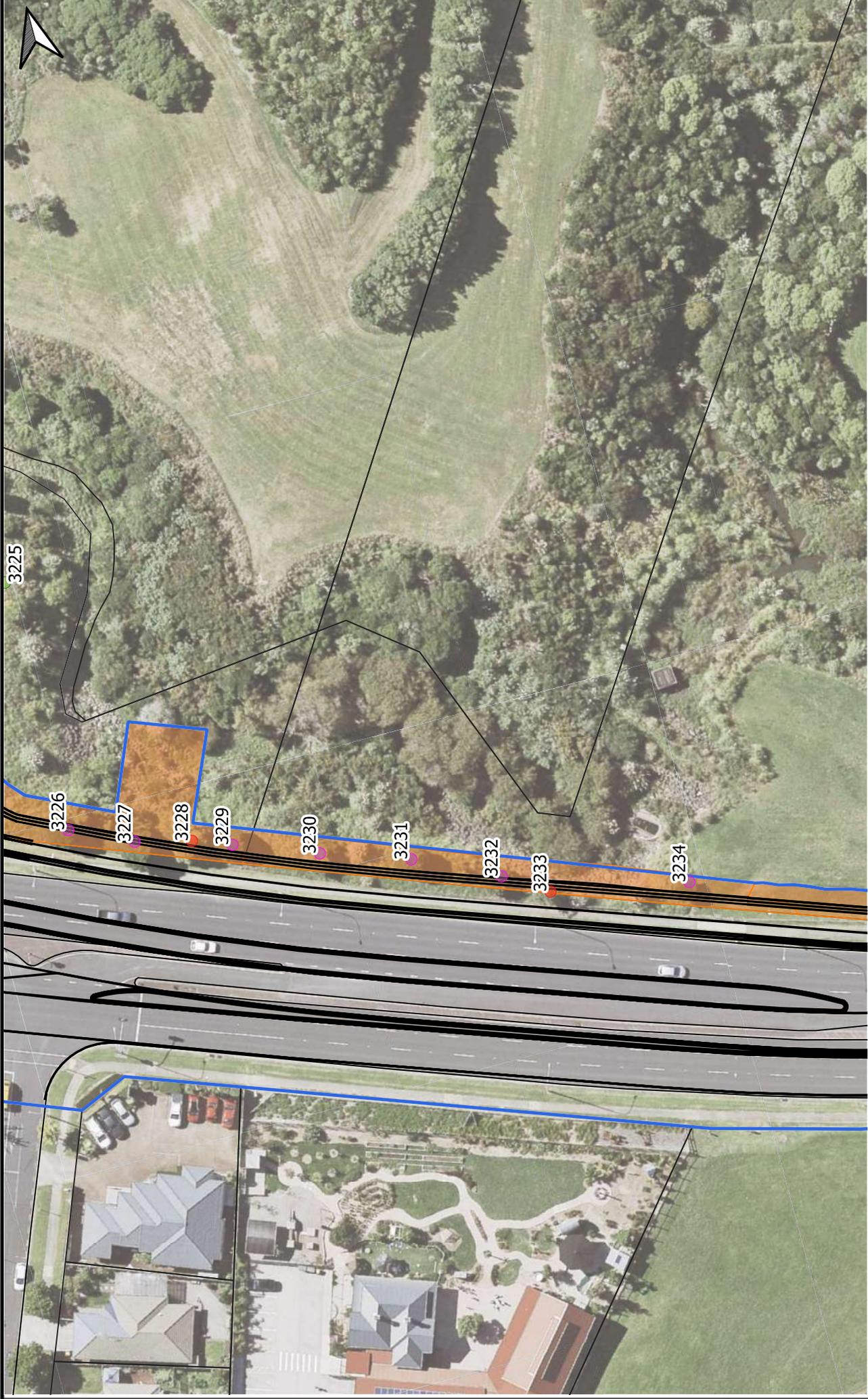
- Legend**
- Trees**
- Retain and Protect
  - Remove
  - Relocate
- Groups**
- Designation BDY
  - Bridges
  - Land acquisition



**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**

Requested by	SC & LGS	DEC22	Drawn	B
Survived by	LGS	DEC22		
Plotted by	JR	DEC22		
Checked by	LGS_36078_3C_14			
Drawing number				



All data herein may not accurately reflect the actual vegetation conditions stated, project specific vegetation may have been planted and captured.  
 Vegetation identification may be subject to misinterpretation and/or misclassification. It is the client's responsibility to determine whether or not this is the case.  
 Works indicated on this plan should be supervised by an appointed works officer.

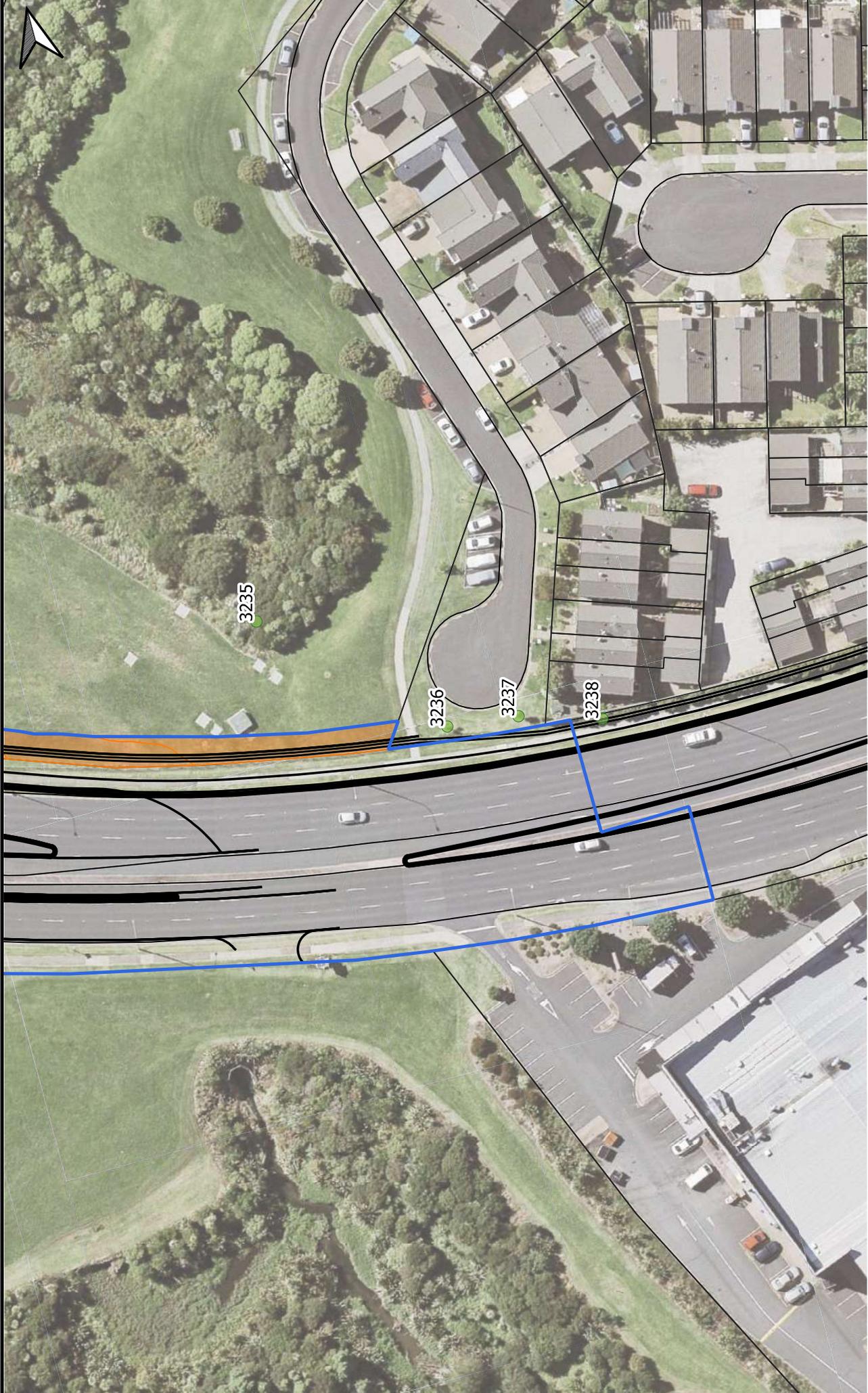
- Legend**
- Trees
    - Retain and Protect
    - Remove
    - Relocate
  - Groups
    - Designation
    - BDY
    - Bridges
    - Land acquisition



**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**

Requested by	SC & LGS	DEC22
Survived by	LGS	DEC22
Plotted by	JR	DEC22
Checked by	LGS_36078_3C_15	B



Requested by	SC & LGS	DEC22
Survived by	LGS	DEC22
Plotted by	JR	DEC22
Checked by	LGS_36078_3C_16	16
Drawing number		B

**EASTERN BUSWAY 3  
COMMERCIAL**

**TREE LOCATION PLAN**

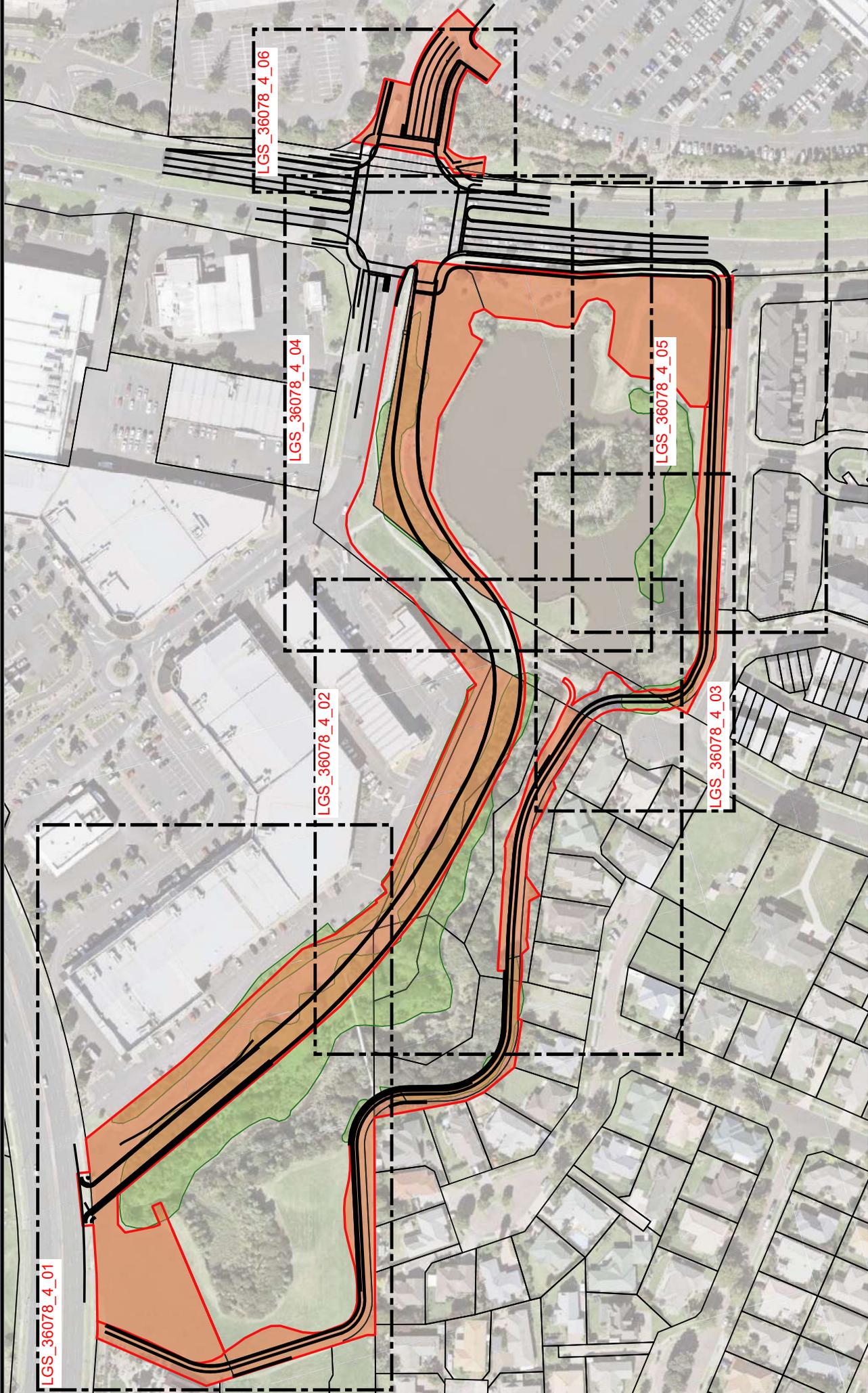


	Groups
	Designation BDY
	Bridges
	Land acquisition
	Retain and Protect
	Remove
	Relocate

**Legend**

**Trees**

All tree groups may not accurately reflect the actual vegetation conditions. Site-specific vegetation data should be used where available. Vegetation data should not be subject to interpretation. Vegetation data should be used to determine whether or not the site is suitable for development. Vegetation data should be used to determine whether or not the site is suitable for development. Vegetation data should be used to determine whether or not the site is suitable for development.



LGS\_36078\_4\_01

LGS\_36078\_4\_02

LGS\_36078\_4\_04

LGS\_36078\_4\_06

LGS\_36078\_4\_05

LGS\_36078\_4\_03

After a plan is approved, it may not accurately reflect the actual vegetation conditions on the ground. The contractor is responsible for verifying the conditions stated, project specific vegetation survey has been performed and reported.

Vegetation preservation may be subject to various circumstances. It is the contractor's responsibility to determine whether or not this is the case.

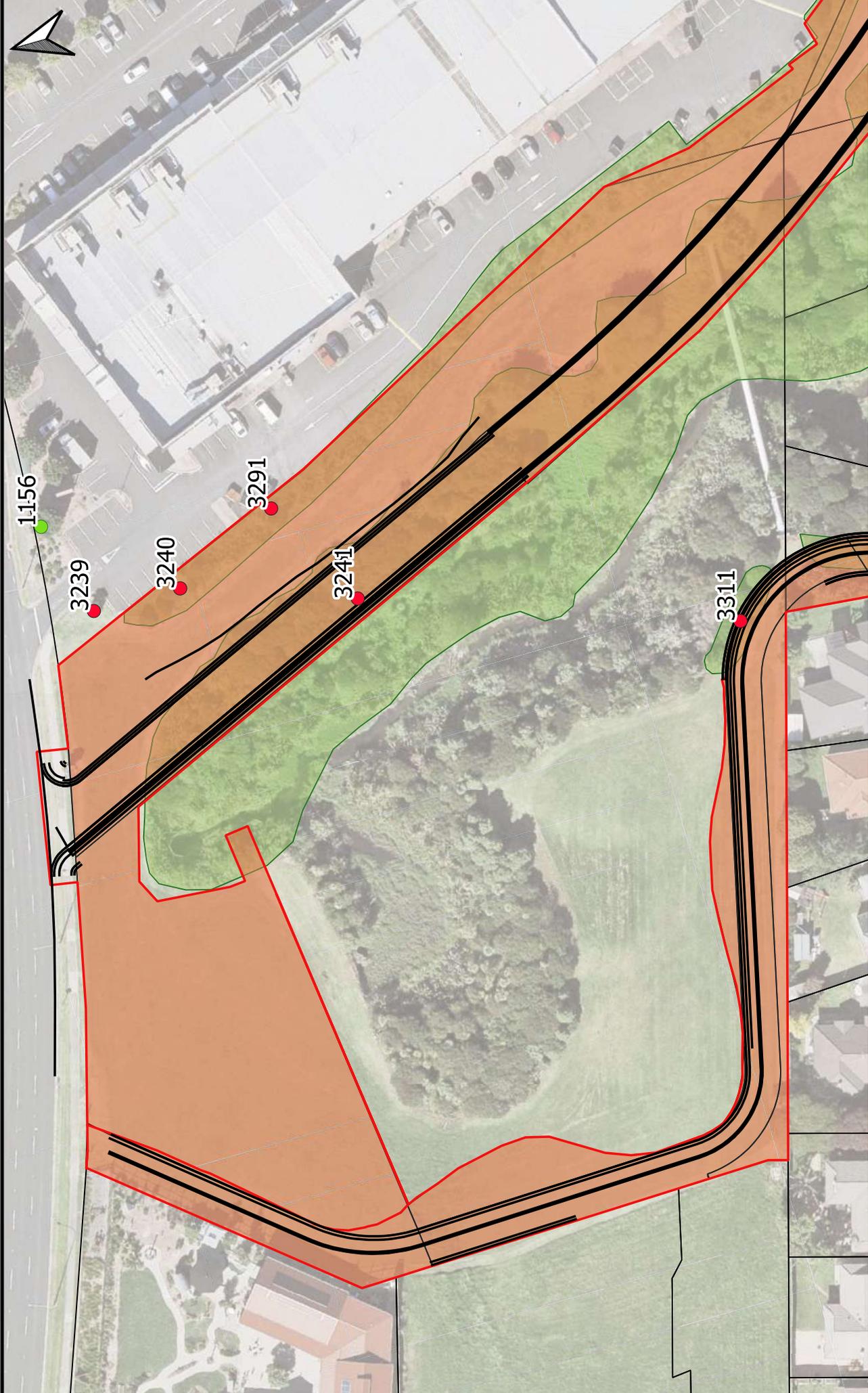
Vegetation removal and/or relocation should be reported by the contractor.

- Legend**
- Trees**
- Retain
  - Remove
  - Land Acquisition
- Groups**
- Land Acquisition

Requested by	LGS	Date	JAN23
Survived by	LGS	Plotted by	JR
Checked by	JR	Drawn by	JR
Drawing number	LGS_36078_4_00	Sheet	B

**EASTERN BUSWAY 4  
LINK ROAD  
MASTER TREE PLAN**





All data herein may not accurately reflect the actual location of trees. The data was collected using a laser scanner. The data is provided as a reference only. The user is responsible for verifying the accuracy of the data. The user is responsible for determining the appropriate action to be taken based on the data. The user is responsible for determining the appropriate action to be taken based on the data.

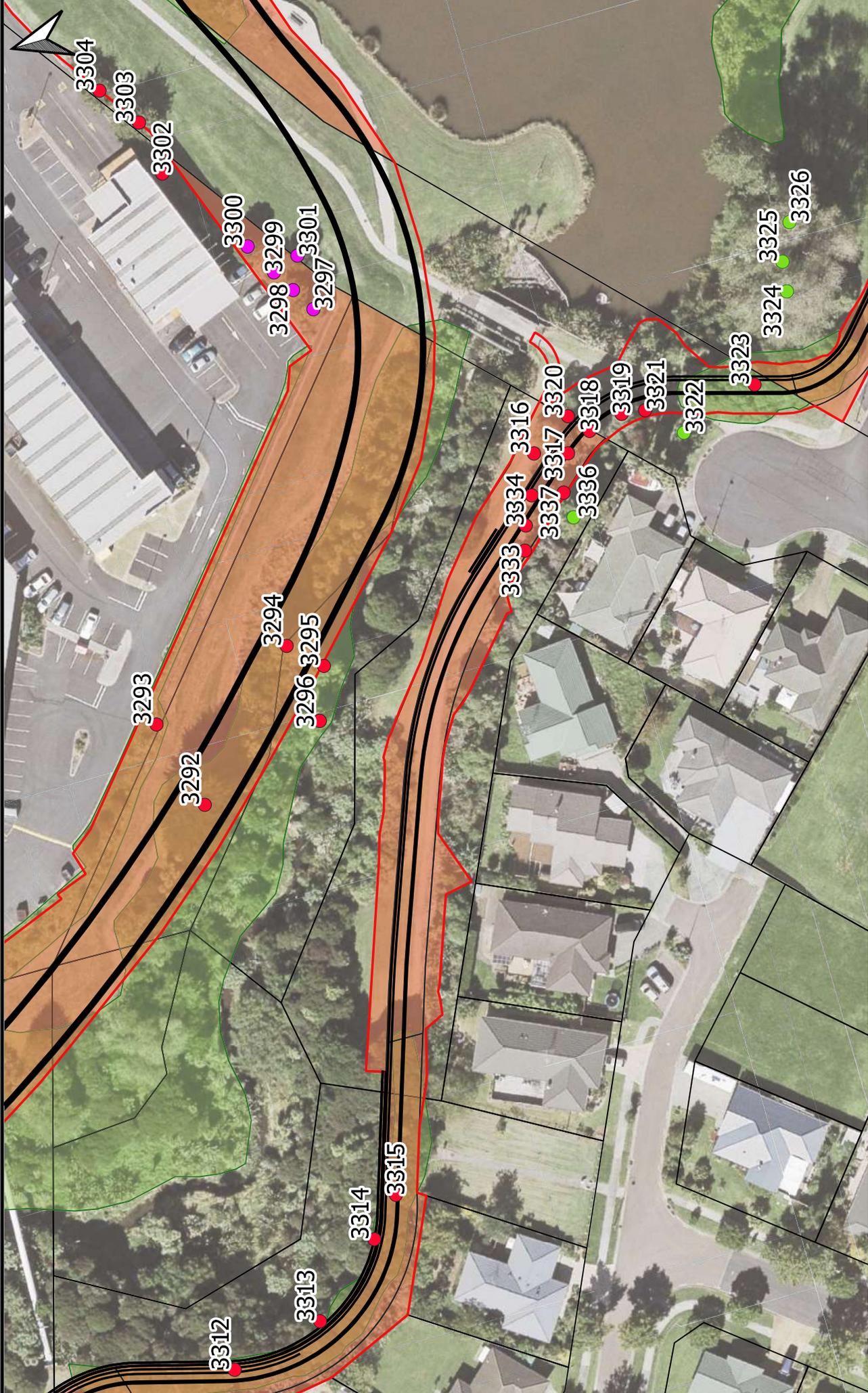
- Legend**
- Trees**
- Retain
  - Relocate
  - Remove
- Groups**
- Land Acquisition



**EASTERN BUSWAY 4  
LINK ROAD**

**TREE LOCATION PLAN**

Requested by	LGS	Date	JAN23
Survived by	LGS	Checked by	JR
Plotted by	JR	Drawing number	LGS_36078_4_01
Checked by	JR	Sheet	B



Requested by	LGS	Date	JAN23
Survived by	LGS	Per	JAN23
Plotted by	JR	Per	JAN23
Checked by	LGS_36078_4_02	Per	B

**EASTERN BUSWAY 4  
LINK ROAD**

**TREE LOCATION PLAN**



<b>Legend</b>	<b>Groups</b>
<b>Trees</b>	<b>Land Acquisition</b>
<span style="color: green;">●</span> Retain	<span style="background-color: #d2691e; width: 15px; height: 10px; display: inline-block;"></span>
<span style="color: magenta;">●</span> Relocate	<span style="background-color: #90ee90; width: 15px; height: 10px; display: inline-block;"></span>
<span style="color: red;">●</span> Remove	<span style="background-color: #d2691e; width: 15px; height: 10px; display: inline-block;"></span>

All data herein may not accurately reflect the actual vegetation conditions on-site. Project specific vegetation data has been used for this plan. Vegetation data should not be subject to litigation. Responsibility to determine whether or not this is the case, lies with the client. All data should be represented by an appropriate north arrow.



Requested by	LGS	Date	JAN23
Survived by	LGS	Plotted by	JAN23
Checked by	JR	Checked by	JAN23
Drawing number	LGS_36078_4_03	From	B

**EASTERN BUSWAY 4  
LINK ROAD**

**TREE LOCATION PLAN**



<b>Legend</b>	<b>Groups</b>
<b>Trees</b>	<b>Land Acquisition</b>
Retain	Land Acquisition
Relocate	
Remove	

All data herein may not accurately reflect the actual location of trees. The information is provided for informational purposes only. The information is not intended to be used for any other purpose. The information is not intended to be used for any other purpose. The information is not intended to be used for any other purpose.



After a plan is approved, the actual location of trees to be retained, relocated, or removed will be determined by a field survey. The field survey will be conducted by a qualified arborist. The field survey will be conducted by a qualified arborist. The field survey will be conducted by a qualified arborist.

- Legend**
- Trees**
- Retain
  - Relocate
  - Remove
- Groups**
- Land Acquisition

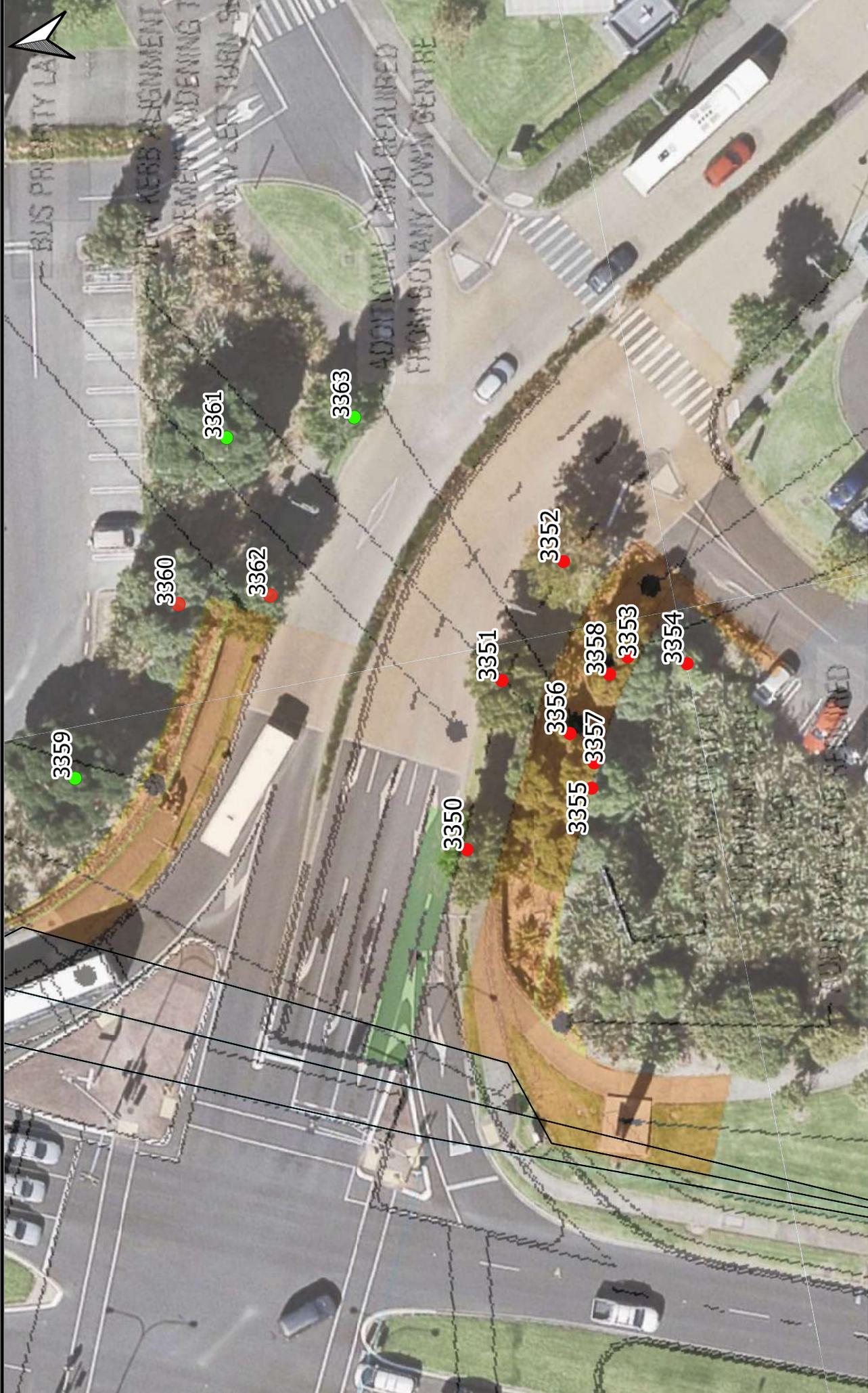


**EASTERN BUSWAY 4  
LINK ROAD**

**TREE LOCATION PLAN**

Requested by	LGS	Date	JAN23
Survived by	LGS		JAN23
Plotted by	JR		JAN23
Checked by			
Drawing number	LGS_36078_4_04	Rev	B





Allotment may not accurately reflect the actual location of trees. Allotment is for information only. Once the trees are located, the project specific vegetation survey will be undertaken and the final report will be provided to the client. Allotment is for information only. Once the trees are located, the project specific vegetation survey will be undertaken and the final report will be provided to the client.

- Legend**
- Trees
    - Green circle: Retain
    - Purple circle: Relocate
    - Red circle: Remove
  - Groups
    - Green rectangle: Land Acquisition
    - Orange rectangle: Retain



**EASTERN BUSWAY 4  
LINK ROAD**

**TREE LOCATION PLAN**

Requested by	LGS	Date	JAN23
Survived by	LGS	Permit	JAN23
Checked by	JR	Permit	JAN23
Drawing number	LGS_36078_4_06	Sheet	B