

DRURY ACCESS RAMP PROJECT

Appendix G – Arboricultural Assessment

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Abbreviations

Abbreviation	Term
AEE	Assessment of Environmental Effects
AUP	Auckland Unitary Plan (Operative in Part 2016)
CEMP	Construction Environment Management Plan
CIA	Cultural Impact Assessment
CVA	Cultural Values Assessment
NIMT	North Island Main Trunk
NOR	Notice of Requirement
NUO	Network Utility Operator
P2B	SH1 Upgrades Project between Papakura to Bombay
RMA	Resource Management Act 1991
SH1	State Highway 1 Motorway, the Southern Motorway
SH22	State Highway 22, Great South Road
the Project	Drury Access Ramp Project
Waka Kotahi	Waka Kotahi NZ Transport Agency

1 INTRODUCTION

1.1 Project Background Drury Interchange

This Report supports the application lodged by Waka Kotahi NZ Transport Agency (Waka Kotahi) for the construction of a new southbound access ramp at Drury Interchange (The Project).

The proposal is considered in the context of the Papakura to Bombay Project (P2B). P2B is a Waka Kotahi project set to improve the safety and functionality of State Highway 1 (SH1) and provide for long term growth in the south of Auckland. Waka Kotahi has structured P2B in to five stages. The most pertinent of these is Stage 1B1, which pertains to the approved upgrades of Drury Interchange. Stage 1B1 was approved under the COVID-19 Recovery (Fast Track Consenting) Act 2020 ("FTA").

In addition, the proposed site for the Project interfaces the following consented and future developments in the area:

- Future development areas in Drury Centre Precinct which are detailed in section 2.1 below;
- Realigned SH1 corridor and SH22 / Great South Road as consented in Stage 1B1 of the Papakura to Drury ("P2D") project by Waka Kotahi;
- Future proofing works along North Island Main Trunk (NIMT) rail corridor by KiwiRail as part of Papakura to Pukekōhe (P2P) rail electrification works; and

1.2 **Project Description Drury Centre Access Ramp**

The proposal is for the construction of a new southbound access ramp from SH1 to provide direct connection to future development areas in Drury Town Centre. The approximate location of the proposed off-ramp in relation to the surrounding existing and planned environment is referred to in the AEE and shown in Figure 1-1-2 below.



Figure 1-2: Location plan of Drury Access

The following activities are proposed for the Project:

- Construction of a 245m long seven span structure bridge from southbound lane of SH1 to an area off Flanagan Road.
- Foundation piling works for bridge support; and
- Establishment of a left-hand shoulder lane on the bridge with a minimum width of 2m and right -hand shoulder 1m in width.

Works affecting trees and vegetation will include:

- Works adjacent to the Hingaia Stream as per of the bridge piling works
- Construction of the new retaining wall between Chainage 550 & 600

Further details of the proposed off-ramp are shown on the plans attached as **Appendix B**.

The Project takes place within the existing Flanagan Road (considered as a local road in the AUP and existing services and utilities, which include: 1200mm diameter underground Waikato watermain parallel to the NIMT corridor; underground sewer and watermain pipes along Flanagan Road; and high voltage overhead lines located directly above the proposed ramp, which is planned to be removed.

1.3 Purpose of this Report

This report on *arboricultural matters* forms part of a suite of technical reports prepared the Project. Its purpose is to inform the AEE for:

- NoR for alteration to the existing Designation 6706 for which Waka Kotahi is the Requiring Authority under section 181 of the RMA; and
- Resource consent application for national environmental standard matters under NES-CS and NES-F; and
- Resource consent application for regional matters under the AUP.

The report will:

- Describe the existing treed environment and identify the relevant protected trees and vegetation within the Project area.
- Assess the effects on the identified areas or structures affected by the proposed works.
- Recommend mitigation and management measures to address potential adverse effects.

In assessing the effects related to arboriculture, the main elements associated with the proposed works that are assessed in this report are:

- During the construction phase, the effects of:
 - Vegetation removal required to facilitate the proposed works
- During the operation phase, the effects of:
 - Ongoing pruning and clearance for new structures

2 EXISTING ENVIRONMENT

The following is an overview of the existing trees and vegetation within the Project area. A detailed overview of the existing environment can be found in Section 1 of **Appendix A**.

2.1 Planning Environment

2.1.1 Designations

The primary designation which covers the majority of the Project corridor is Designation 6706, which is described in **Table 2-1** below. The corresponding planning environment maps are contained in **Appendix J**.

Table 2-1: The Designation in the Project area

Reference No.	Requiring Authority	Designation and Purpose	Location	Conditions
Designation 6706	Waka Kotahi	Motorway purposes between Auckland and Hamilton	SH1, north of Takanini interchange to the south of Quarry Road, Drury	Conditions specific to Stages 1B1 and 1B2 of the P2DS Project.

There are a number of designations that overlap the Project corridor, which are described in **Table 2-2** below. The corresponding existing environment maps are contained in **Appendix J**.

Table 2-2: Overlapping designations in the Project area

Reference No.	Requiring Authority	Designation and Purpose	Location		
Designation 6302	KiwiRail	NIMT Railway Line	South of the Drury Interchange.		
Designation 6566	Watercare Services Ltd	Water supply purposes – pump station and associated structures	Flanagan Road and NIMT		

2.2 Existing vegetated environment

The following is an overview of the existing trees and vegetation in the Project area. A detailed overview of the existing environment can be found in Section 1 of **Appendix A**.

2.3 Summary

The trees and vegetation growing within the project area typical of an urban and semi-rural setting, with the majority of vegetation within and adjacent to the works footprint being planted exotic or indigenous vegetation. The remaining vegetation is identified as weed species or naturally occurring shrub species such as Harakeke (*Phormium tenax*).

The trees within the Project area are separated into two main areas, as outlined in the following sections:

2.4 Vegetation growing adjacent to the Hingaia Stream

The Project will cross Great South Road, and onto Flanagan Road. The Project will span the Hingaia Stream, with new concrete abutments to be constructed on the northern and southern sides. The portion of the Project to cross the Hingaia Stream is identified as 10R Karaka Road.

2.4.1 10R Karaka Road

Significant vegetation within 10R Karaka Road include several groupings of Crack Willow (*Salix x fragilis*). One such cluster is growing in close proximity to the proposed bridge structure, which will include the construction of at least two (2) new piers near the subject trees (Tree 2 and Group 3at Chainage 450-500)

The subject grouping is located directly west of the proposed structure, with the trees approximately 18 metres in height. The proposed bridge structure will stand at approximately 11.0m in height from existing ground to the bridge surface. At least 30% of Tree 2 would stand within the footprint of the new bridge structure.

2.4.2 KiwiRail Land

The remaining vegetation affected by the Project is growing on the KiwiRail land on the southern side of the Hingaia Stream.

This vegetation includes a semi-mature Privet (*Ligustrum lucidum*), another mature Crack Willow and various herbaceous weeds and shrubs including Japanese Honeysuckle (*Lonicera japonica*) and Gorse (*Ulex europaeus*).

The Privet (Tree 4) stands directly within the footprint of Pier 5 with the Crack Willow (Tree 5) between 6-8 from the outer edge.



Figure 2-1: Tree 2 & Group 3 in Red, Tree 4 & 5 in Magenta

2.4.3 Vegetation growing within 108 Flanagan Road

From Flanagan Road, the Project travels south through 108 Flanagan Road. While no vegetation within 108 Flanagan Road is subject to protection, the Project avoids a cluster of mixed plantings located directly to the west of the new ramp alignment.

This cluster of trees (Group 6) is a mixture of semi-mature indigenous species such as Kanuka (*Kunzea ericoides*), Totara (*Podocarpus totara*) and Kauri (*Agathus australis*) as well as a number of exotic plantings including Crack Willow and Magnolia (*Magnolia grandiflora*).



Figure 2-2: Cluster of non-protected tree grouping within 108 Flanagan Road (Group 6)

3 ASSESSMENT OF EFFECTS

The following sections discuss the positive effects and the potential adverse impacts of the Project works on trees and vegetation. Further detail on the assessments is provided in **Appendix A**.

This assessment of effects has taken into consideration the statutory requirements described in Section 1.3 of this report in respect of the impact on trees and vegetation.

3.1 Assessment Methodology Overview

This assessment has been prepared in accordance with the typical arboricultural assessment process of largescale infrastructure projects. As with the earlier P2DS Stage 1B1 and 1B2 arboricultural assessments, this assessment has been undertaken in accordance with the methodology outlined below:

- An overview and workshop were attended by the author. This workshop defined the proposed route and detailed the specific areas to be assessed as part of the project.
- A review of the project's preliminary route and outcomes were reviewed, and additional information requested from the project lead team. This informed the initial survey works.
- A high-level desktop survey of all trees and vegetation affected by the proposed works corridor was undertaken. A high-level route and works footprint plan set were used to inform the initial survey in order to assess the presence of street or park trees, large areas of densely planted vegetation or significant individual trees (such as Notable trees).
- The exact number of trees, areas of vegetation affected by the proposed works were then refined.
- This arboricultural assessment has then been prepared to summarize the anticipated arboricultural effects. The report will provide a recommended mitigation strategy, assessment of arboricultural effects in terms of the Auckland Unitary Plan rules pertaining to trees and vegetation on roads, open space zoned land, SEA and riparian area from an arboricultural perspective to inform the RC process and planning AEE.
- For the purposes of this arboricultural assessment, vegetation standing on private property is not assessed in terms of effects unless it is subject to a specific overlay or meets the criteria for protect by virtue of trigging a regional AUP rule such as riparian or coastal vegetation protection.

3.2 Affected Trees – Road Reserve and Open Space Zoned Land/SEA overlay

The **Attachment 1** Tree Schedule and **Appendix B** Tree Plans identify the locations of the vegetation described in the following sections.

3.2.1 Vegetation within 10R Karaka Road

The Crack Willow trees growing within 10R Karaka Road are typically be subject to protection under the tree rules pertaining to trees growing on open space zoned land. While the Crack Willow trees are weed species, they would exceed the 6.0m in height or 600mm in girth threshold for protection and as such would normally be protected under Rule E26.4.3.1 (A26). However, 10R Karaka Road is subject to Designation 6706. As such, this vegetation is not subject to protection.

However, Tree Owner Approval (TOA) is still required for the removal of these trees due to their Council ownership.

It is anticipated that the three (3) Crack Willows directly to the west of the Project would be removed (Tree 2 and Group 3) to enable construction and eliminate the potential risk to the future structure posed by failing limbs or structural sections, a typical trait of the species when changes occur nearby in terms of 'unaccustomed wind forces' or changes in group dynamics.

3.3 Affected Trees – KiwiRail land

Trees 4 and 5 standing on KiwiRail land and the remaining pest plant species within the footprint of the proposed bridge piers of the Project would be required to be removed to enable construction.

All vegetation in this location is identified as a pest plant and as such is not subject to protection under the AUP (E26.3.3.1 (A74)). Furthermore, no protection is afforded to trees standing on Kiwirail land.

3.4 Non - protected trees – 108 Flanagan Road

As noted in Section 2, there is no protected vegetation within 108 Flanagan Road. However, Group 6 will be retained and protected as part of the Project. As such, a tree protection methodology is provided in this report to ensure this is the case. It is recommended that all works near this grouping, and any additional tree or group to be retained, be undertaken in accordance with this methodology.

4 AUP REQUIREMENTS – ROAD RESERVE/ OPEN SPACE

The removal of the protected trees required to facilitate the Project works require assessment against the AUP, specifically Section E26.4 - Network utilities and electricity generation – Trees in roads and open space zone, contained in Chapter E26 of the AUP. An assessment of the relevant AUP standards is contained in the following sections.

4.1 Tree removal and works associated with the open space area

The removal of three (3) protected Crack Willow trees (Tree 2 and Group 3) are proposed within 10R Karaka Road to undertake the construction of the new offramp.

The removal of the protected trees growing on Open Space Zoned land is typically subject to the following rules:

- Rule E26.4.3.1 (A82): Pest Plant removal (less than 4m in height or 400mm in girth in Open Space zones) –
 Permitted Activity
- Rule E26.4.3.1 (A91): Alteration or removal of trees less than 4m in height and/or 400mm or more in girth –
 Permitted Activity
- Rule E26.4.3.1 (A92): Alteration or removal of trees 4m or more in height and/or 400mm or more in girth Restricted Discretionary Activity

However, the removal of these three protected trees would be a permitted activity, due to the existing 6706 Designation.

5 RECOMMENDED CONSTRUCTION METHODOLOGIES

5.1 Introduction

Group 1 & 6 are proposed for retention as part of the proposal. While technically not protected, it is recommended that a set of tree protection methodologies be applied to ensure the trees are not damaged as part of the works, in accordance with best practice.

The effects of the works adjacent to Group 1 & 6 will be managed through implementing the recommended measures set out in Section 5.3.1

5.2 Works within the protected root zone

The effects of the works adjacent to Group 6 will be mitigated by ensuring the works are undertaken in accordance with best arboricultural practice and best practice construction methodologies as recommended. These recommendations are outlined below within 5.3.1 to 5.3.4.

5.3 Recommended tree protection methodology

This section outlines a set of recommended appropriate works methods and tree protection measures that should be adopted to ensure that adverse effects on the protected trees to be retained within the vicinity of the proposed construction areas are minimised and/or avoided.

5.3.1 **Pre-commencement recommendations**

5.3.1.1 Works site supervisory arborist

a) The consent holder shall employ the services of a suitably qualified and experienced arborist (the worksite supervisory arborist) to directly oversee all works related to the generally protected trees or trees for retention directly affected or within the vicinity of the proposed works. The worksite supervisory arborist shall be retained by the consent holder for the duration of the works until the works are considered complete, including any necessary reinstatement works.

5.3.1.2 **Pre-start meeting**

- b) Prior to the commencement of any works within the protected root zone of trees, the consent holder shall hold a pre-start meeting that:
 - is scheduled no less than five days before the anticipated commencement of any tree works;
 - includes the following personnel from Council: Monitoring Officer, and Arborist Street tree advisor;
 - includes representation from the consent holder, including their site foreman or manager, works site supervisory arborist (see Condition a) and any other relevant employees/contractors that will be working near or under the protected trees.

The following matters shall be discussed at the meeting:

- The extent of the works.
- Resource consent conditions; and
- Tree protection and mitigation measures pertaining to the protected trees as part of the works.

Following the completion of the meeting, a copy of the pre-commencement meeting minutes shall be provided to Council (Team Leader Central Monitoring, and Arborist – Street tree advisor) and the other meeting attendees on request.

5.3.1.3 Temporary Protective Fencing

c) Prior to any works commencing, the consent holder shall erect temporary protective fencing around the permeable area beneath all trees proposed for retention within the scope of the development area, as directed by the works arborist. The protective fence shall stand at least 1.5 metres tall and be constructed using hurricane wire mesh fencing. The consent holder shall be responsible for ensuring that the temporary fencing remains intact until all works are completed.

Temporary relocation of the fencing can be undertaken under the supervision of the works supervisory arborist where works approved by this consent cannot be safely undertaken while the fencing is in place. When the works that require temporary relocation of the fencing are completed, the fencing shall be reinstalled in accordance with Condition (c).

5.3.2 Development in progress recommendations

d) A copy of the resource consent and the Arboricultural Assessment prepared by Peers Brown Miller Limited, dated shall be held on site at all times (available on site) during the works. Where there is any conflict between the aforementioned report and the conditions of consent, the conditions of consent shall be adhered to.

5.3.3 Works within the protected root zone

- e) The works site supervisory arborist should be present during any excavation works occurring within the protected root zone of any tree to be retained. Any material to be removed within the protected root zone of trees within areas outside those mentioned in the Arboricultural Assessment prepared by Peers Brown Miller Limited, dated shall be discussed and approved by the works site supervisory arborist, prior to works commencing.
- f) Where possible all excavations required within the protected root zone of any protected tree shall be undertaken by hand using hand held tools (i.e. spade, crowbar), under direct supervision of the works site supervisory arborist.
- g) If any significant roots are encountered during any excavations within the protected root zone of any protected tree, any exposed roots should be covered and protected from drying out.
- h) If any significant roots are encountered during excavation in the root zone of any protected tree, that root should be accommodated, unless the works site supervisory arborist is satisfied that severance of such a root would not cause a deterioration of the health of the tree. No roots beyond the permitted threshold of 80mm in diameter at severance can occur without the approval of the work site supervisory arborist.
- i) There shall be no storage (or temporary storage) of any description (i.e. no products, no fluids, no machinery, no tools, etc) within the protected root zone of any protected tree. Special attention shall be paid to any petrol/diesel operated machinery to avoid contaminating the soil in the root zone of the trees.
- j) All equipment/vehicles shall be manoeuvred to/ within the site in a manner that avoids any damage to the root zone and canopy of the protected trees.
- k) Where machine excavation is required outside any existing hard areas (e.g. road surfaces) within the protected root zones of any protected tree, track movements must be kept to a minimum - with materials installed progressively from the previously metaled/hard surface.

5.3.4 Post Development Recommendations

 Compliance with all conditions of consent relating to tree protection shall be monitored by the appointed works arborist - with the detail of each visit and communication being logged. The completed log shall be provided to the consent holder at the completion of Drury Ramp project to serve as a compliance report.

n) A completion report prepared by the appointed arborist shall be supplied to the Council Team Leader Monitoring within one month of completion of all site works. The completion report shall confirm (or otherwise) that the works have been undertaken in general accordance with the tree protection measures contained in the conditions of consent, the works were completed under the direction of a suitably qualified and experienced arborist, and the impact of the works on the protected trees has been no greater than that permitted by the conditions of consent.

6 CONCLUSION

This report has been prepared to provide an assessment of trees and vegetation to be impacted by the Project. It provides an assessment of trees that grow on both publicly owned and private land.

Where possible, works have been minimised when working near the Hingaia Stream. Where appropriate, replacement native planting will be undertaken within the riparian and open space areas following the completion of the construction works. It is considered this planting will enhance the existing environment by improving diversity and removing pest plant species in the adjacent areas.

Positive Arboricultural effects of the Project are:

Removal of pest plant vegetation from the project area

Potential Adverse effects of the Project are:

- Localised loss of trees and vegetation where the wider area has a limited number of mature trees
- Potential negative effects on retained trees as a result of fringe impacts or physical damage from construction or excavations

These effects can be managed or mitigated by:

• Undertaking all works in accordance with the recommendations provided in Section 5.0

APPENDICES

WAKA KOTAHI NZ TRANSPORT AGENCY

ATTACHMENT 1 – TREE SCHEDULE

This Appendix describes in more detail the methodology and analysis undertaken with respect to arboriculture associated with the Project.

Table Key	
Tree No.	Refers to the number assigned to each tree
Tree Species – Common Name	The generally accepted common, or Maori, name of the tree is given
Tree Species – Botanical Name	The genus and species, and cultivar or variety where known, is given. Where the species is unknown the tree is identified as; (Genus) sp.
Protective Status	This refers to the protective status of the tree as defined by the AUP (where relevant).
	NOR = Refers to trees within the NoR but standing on AT Land. Although protected under district plan rules, these trees are not protected under the NOR & designation. (Only regional plan rules apply)
	P = Refers to trees protected as part of the Auckland Unitary Plan rules
	NP = No Protection.
	Protected trees are highlighted fully in red text (removal) and green text (retain) to clearly separate these trees from the non-protected trees. Activity status of each trees remains red or green depending on activity status. AUP (Auckland Unitary Plan) relates to their specific protection status.
Height (in metres)	This refers to the height of the tree in metres (approximate).
Girth (in millimetres)	This refers to the diameter of the tree stem in millimetres, as measured at 1.4 metres from ground level, and the aggregate girth of stems greater than 250mm in diameter for multi-stemmed trees. (approximate)
Age	Y – Young
	SM – Semi Mature
	M - Mature
Condition	This category addresses the physiological condition of the tree as a whole, described as;
	Good – Full healthy canopy but possibly including some suppressed or damaged branches
	Moderate – Slightly reduced leaf cover, minor dead wood or isolated major dead wood
	Poor – Overall sparse leafing and/or extensive dieback. Irreversible decline
Location	Adjacent street number to tree (where tree is located in road reserve) or otherwise within the property

Activity	Anticipated activity affecting tree
Terms used in the Tree Table	WWRZ – works within the protected root zone
Colour coding (Activity)	Red text – protected tree to be removed Green text – protected tree to be retained
	Black text – non-protected tree

Tree No.	Botanical Name	Common Name			٨		Health	Structure	Location	
			leight (m)	iirth (mm)	ıge Categor	rotection tatus	Comments	and Form		Activity
Group 1	Salix fragilis (group)	Crack Willow	15 +	2000+	SM	NP within 6706 designation	Moderate	Moderate	Northeast of the proposed bridge crossing	Retain – tree protection measures as required
Tree 2	Salix fragilis	Crack Willow	15 +	2000+	SM	NP within 6706 designation	Moderate	Moderate	West of the proposed offramp/bri dge	Remove – footprint of proposed offramp/bridge structure
Group 3	Salix fragilis x2	Crack Willow	15 +	2000+	SM	NP within 6706 designation	Moderate	Moderate	West of the proposed offramp/bri dge	Remove – footprint of proposed offramp/bridge structure
Tree 4	Salix fragilis	Crack Willow	15 +	2000+	SM	KiwiRail land (NP)	Moderate	Moderate	Southwest side of Hingaia Stream adjacent to the proposed offramp/bri dge	Remove – footprint of proposed offramp/bridge structure
Tree 5	Ligustrum lucidum	Privet	6.0	800+	SM	KiwiRail land (NP)	Moderate	Moderate	Southwest side of Hingaia Stream adjacent to the proposed offramp/bri dge	Remove – footprint of proposed offramp/bridge structure
Group 6	Podocarpus totara (various) Myrsine australis (multiple)	Totara Mapou	2-12+	250+	Y- SM	108 Flanagan Road (private)	Moderate	Moderate	East of proposed off ramp (Retain – protective fencing. Works in accordance with

WAKA KOTAHI NZ TRANSPORT AGENCY

Tree No.	Botanical Name	Common Name	Height (m)	Girth (mm)	Age Category	Protection status	Health Comments	Structure and Form	Location	Activity
	Kunzea ericoides (multiple) Agathis australis (multiple) Acacia sp. Magnolia sp.	Kanuka Kauri Wattle Magnolia			M				Chainage 550 - 650	recommended tree protection measures.

ATTACHMENT 2 – TREE PLAN





Drury Access Ramp Project

Aurecon Group Limited Level 3, 110 Carlton Gore Road Newmarket, Auckland 1023