

Kingsford to Centennial Park Walking and Cycling Improvements

Addendum review of environmental factors

Randwick City Council

July | 2022

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Prepared by Transport for NSW

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Document controls

Document status	Date	Prepared by	Reviewed by
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Final	12 July	Jarita Zeng	

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1 Introduction

1.1 Proposed modification overview

Due to funding arrangements, Transport for NSW (TfNSW) will be delivering the Kingsford to Centennial Park Walking and Cycleway Improvements project on behalf of Randwick City Council.

Now known as the Kingsford to Centennial Park Walking and Cycling Improvements project, this new 2.8 km long bi-directional cycleway is Stage 1 of a 4.7 km long cycleway that will ultimately link South Coogee with Centennial Park, via the Kingsford Light Rail Terminus.

Randwick City Council proposes to modify the Kingsford to Centennial Park Walking and Cycling Improvements project by removing an additional 16 trees (proposed modification) which will be impacted by construction of the determined project, Trees 24, 25, 57, 60, 61, 73, 74, 75, 79, 83, 88, 89, 90, 103, 105 and 129. The key features of the determined project are not proposed to change.

Previously, a number of trees had been assessed for removal as part of the determined project. Some of these trees have since been removed by Council and service providers as part of ongoing maintenance activities. Additionally, the first addendum REF (July 2021) assessed that some trees assessed in the project REF for removal could be retained. Upon review of the final project design, retention of those trees was not possible. As such, there are 36 trees which have been previously assessed for removal and would be removed to facilitate construction of the determined project. With the proposed modification, a total of 52 trees would be removed for the project.

The proposed modification is located periodically along the determined cycleway project shown in Figure 1-1 and the proposed modification is shown in Figure 1-2 to Figure 1-32. Chapter 3 describes the proposed modification in more detail.

A review of environmental factors (REF) was prepared for the Streetscape Upgrade and New Cycleway: Centennial Park to Kingsford Light Rail Terminus project on May 2019 (referred to in this addendum REF as the project REF).

In addition, the following addendum REF and consistency review assessment for the Kingsford to Centennial Park Walking and Cycling Improvements project has been prepared:

- Kingsford to Centennial Park Walking and Cycling Improvements Review of Environmental Factors Addendum, August 2021
- Consistency Memo – Alignment of Project Working Hours, December 2021



Figure 1-1: Location of the proposed modification

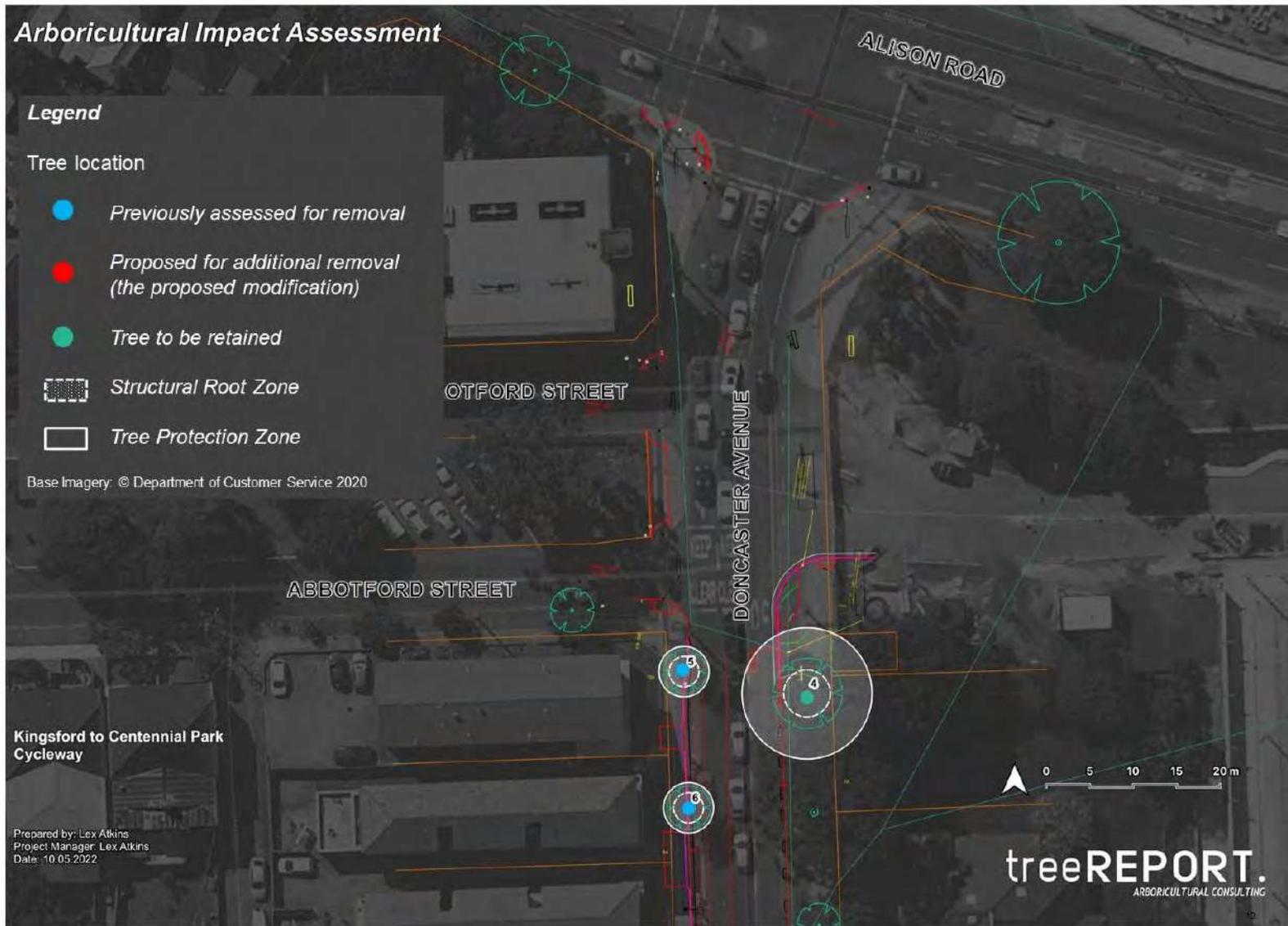


Figure 1-2: Proposed modification (Part 1 of 31)



Figure 1-3: Proposed modification (Part 2 of 31)



Figure 1-4: Proposed modification (Part 3 of 31)



Figure 1-5: Proposed modification (Part 4 of 31)



Figure 1-6: Proposed modification (Part 5 of 31)



Figure 1-7: Proposed modification (Part 6 of 31)

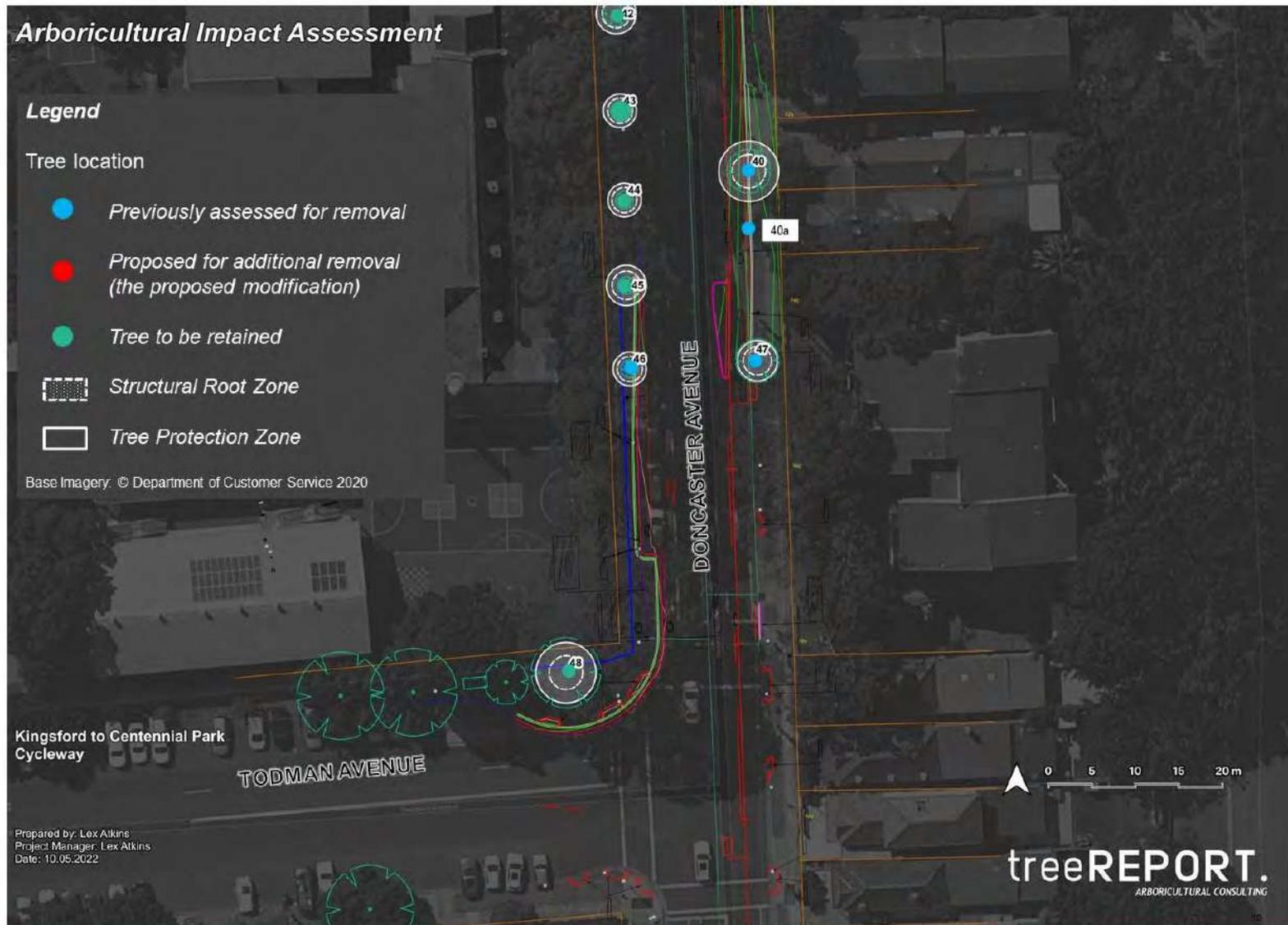


Figure 1-8: Proposed modification (Part 7 of 31)



Figure 1-9: Proposed modification (Part 8 of 31)



Figure 1-10: Proposed modification (Part 9 of 31)



Figure 1-11: Proposed modification (Part 10 of 31)



Figure 1-12: Proposed modification (Part 11 of 31)

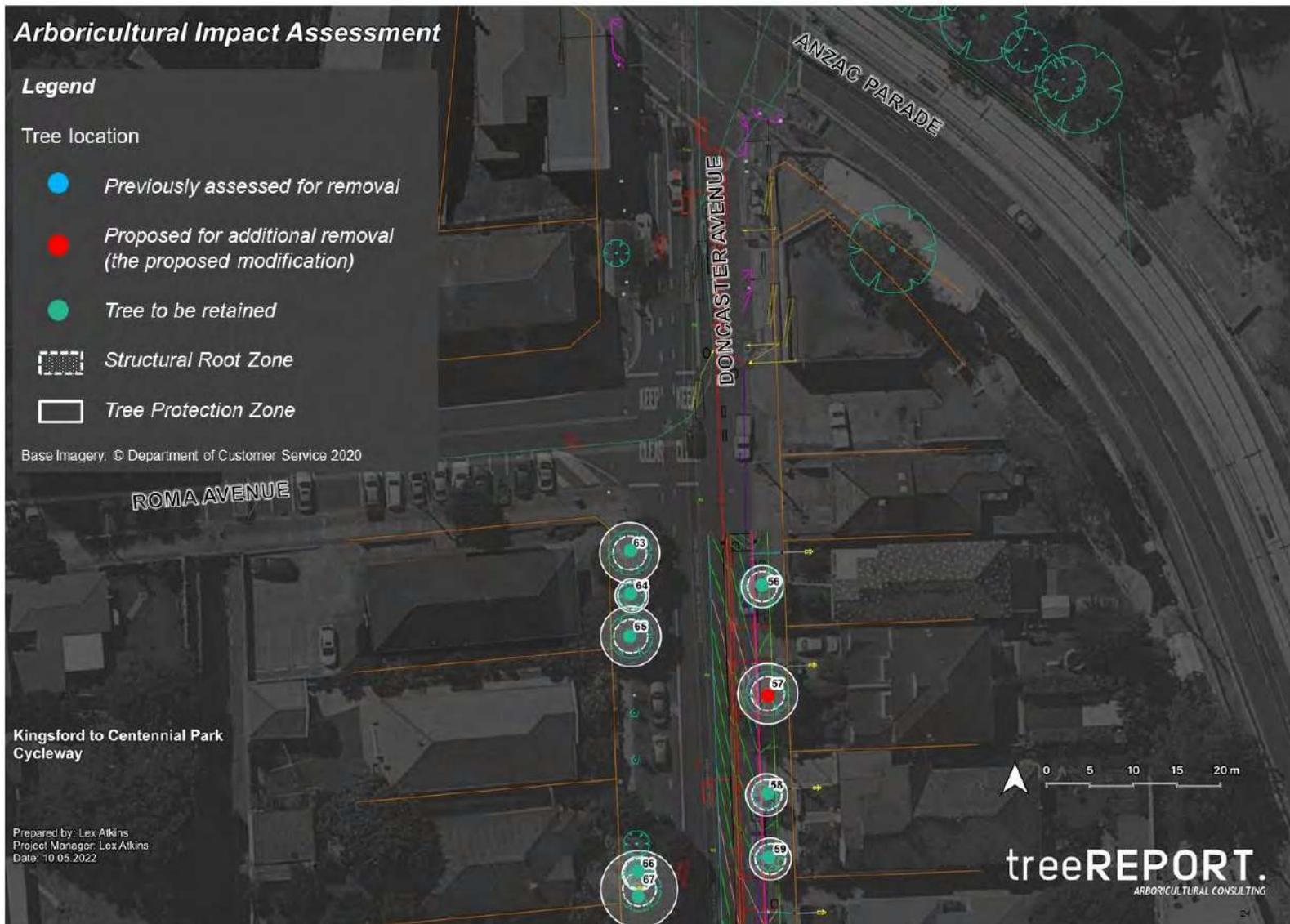


Figure 1-13: Proposed modification (Part 12 of 31)



Figure 1-14: Proposed modification (Part 13 of 31)



Figure 1-15: Proposed modification (Part 14 of 31)



Figure 1-16: Proposed modification (Part 15 of 31)

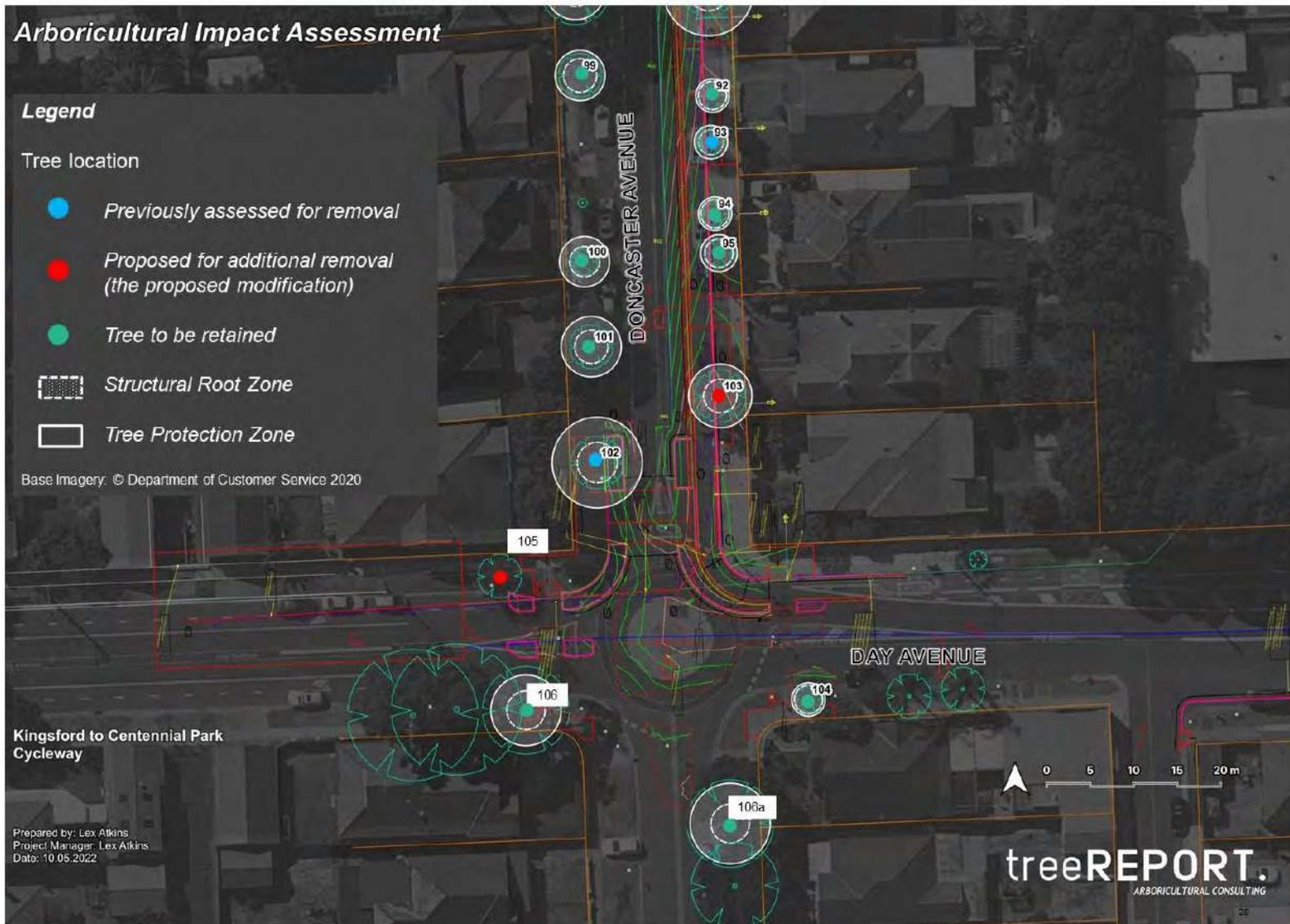


Figure 1-17: Proposed modification (Part 16 of 31)

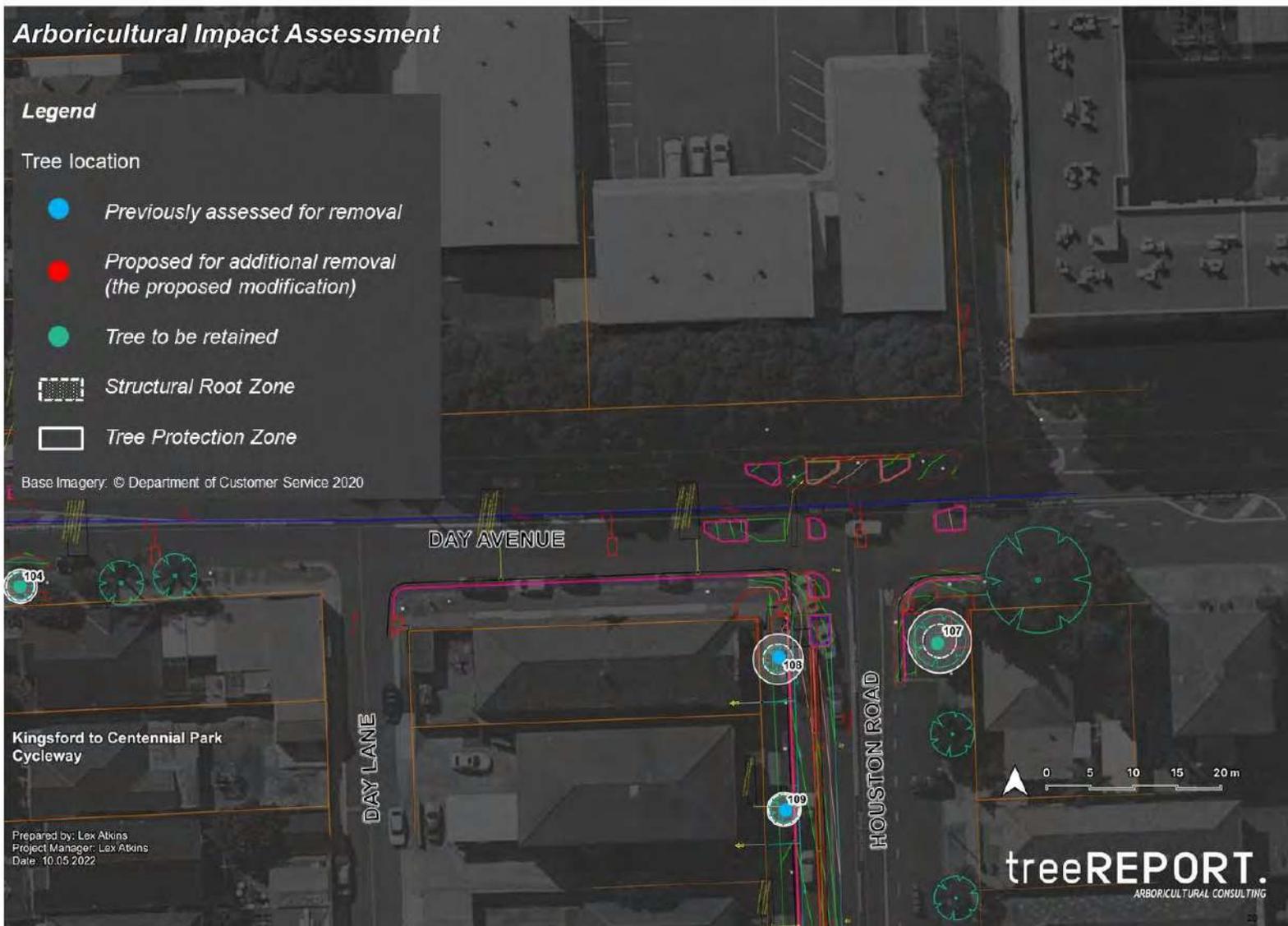


Figure 1-18: Proposed modification (Part 17 of 31)



Figure 1-19: Proposed modification (Part 18 of 31)

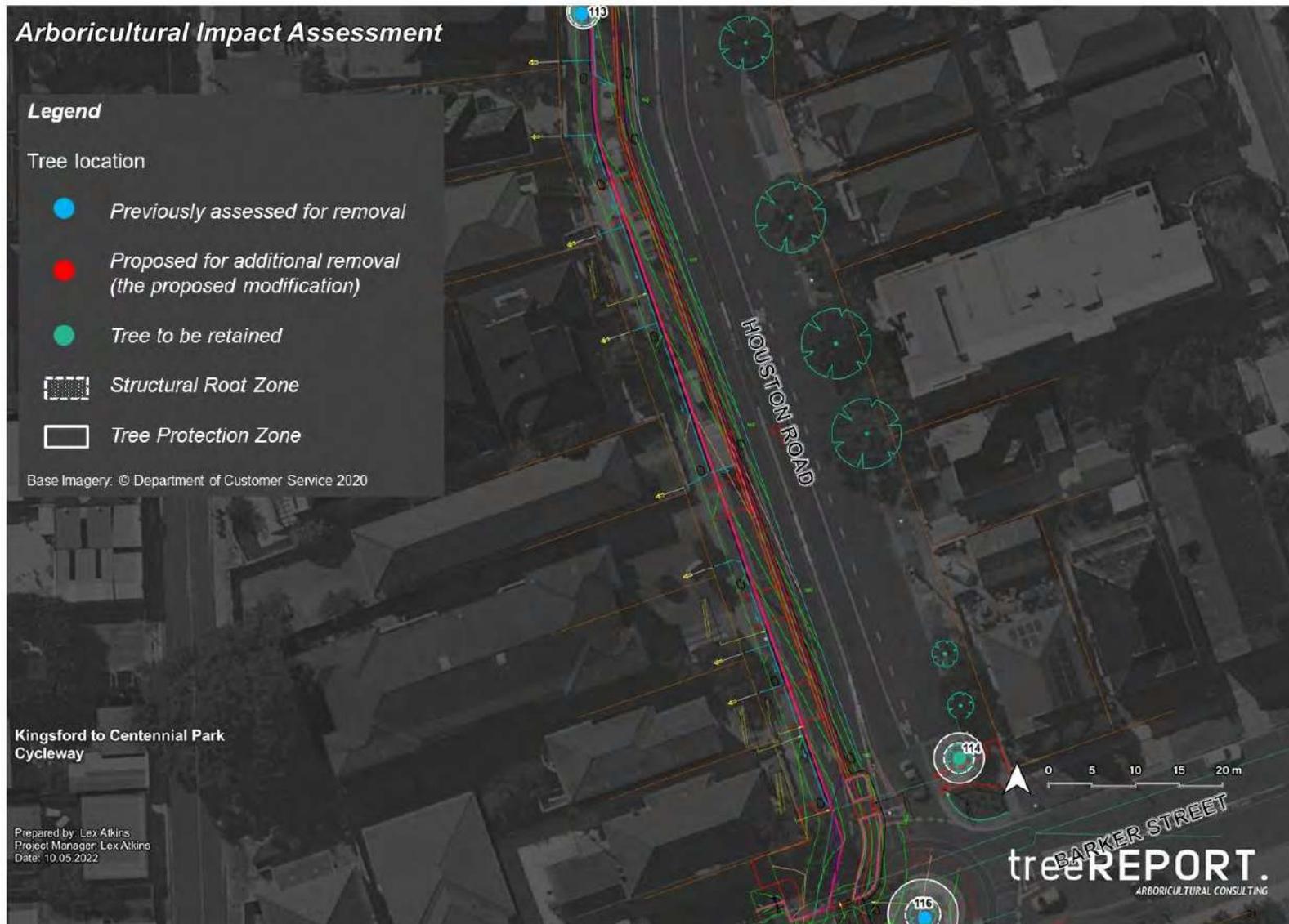


Figure 1-20: Proposed modification (Part 19 of 31)



Figure 1-21: Proposed modification (Part 20 of 31)



Figure 1-22: Proposed modification (Part 21 of 31)

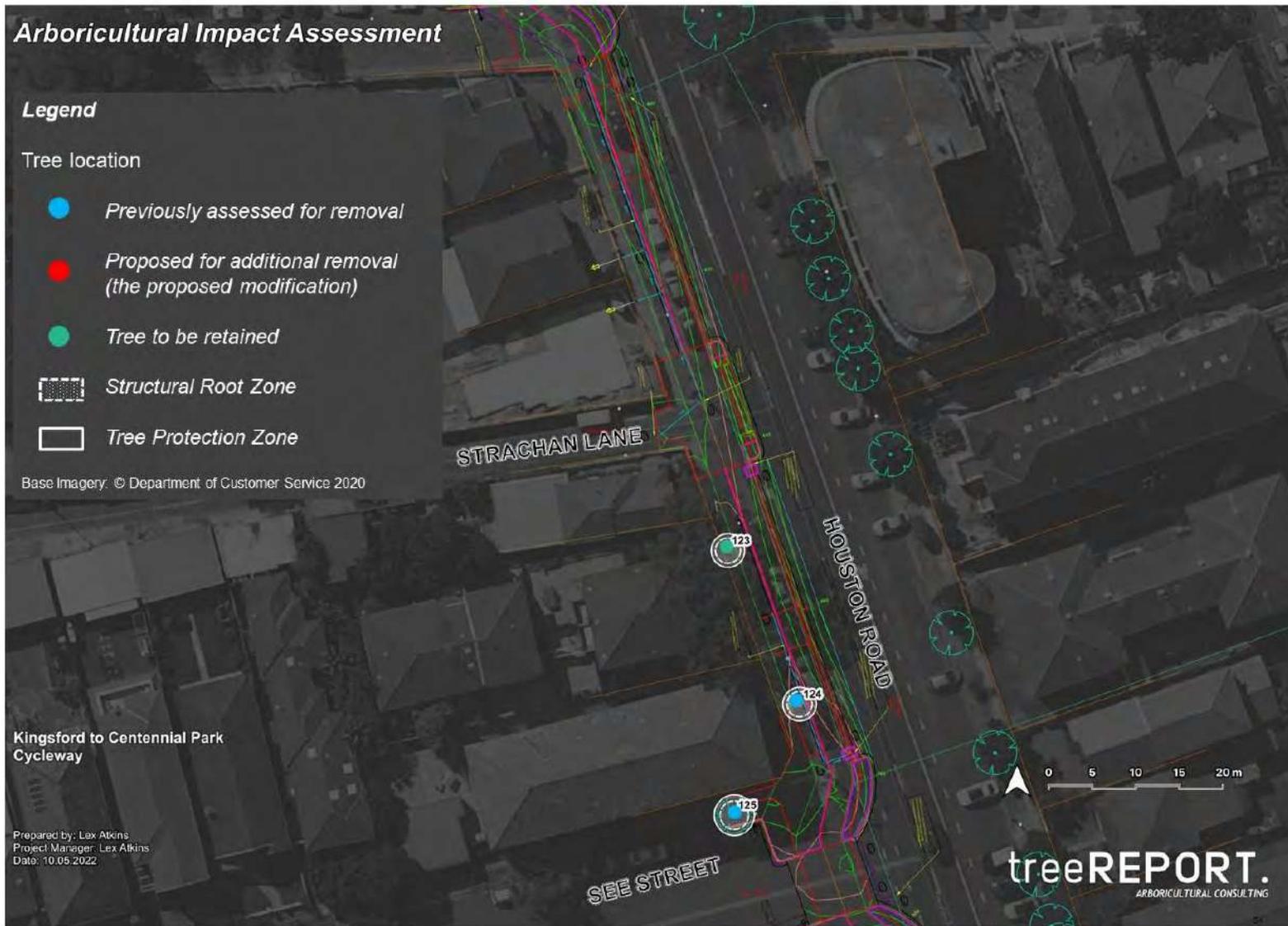


Figure 1-23: Proposed modification (Part 22 of 31)

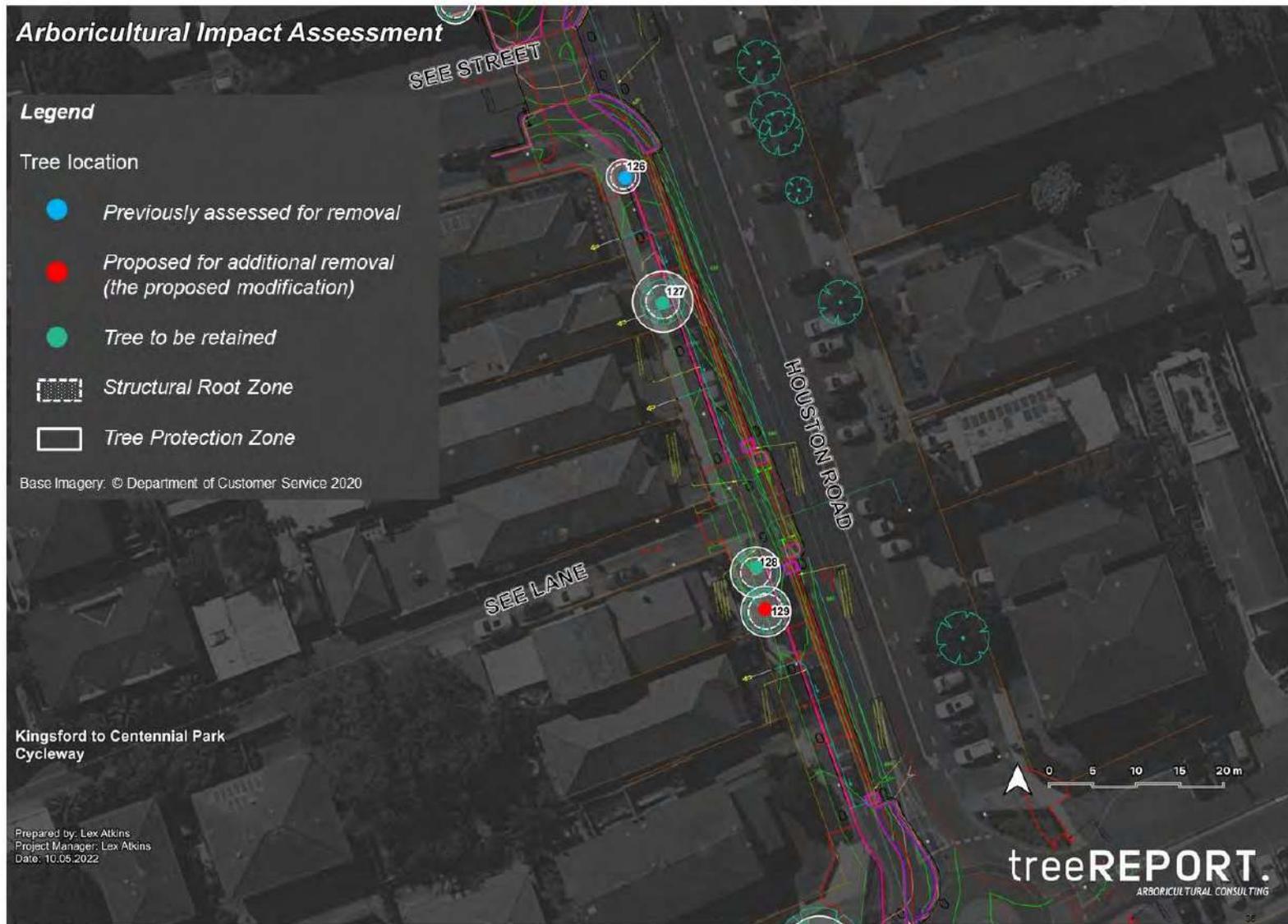


Figure 1-24: Proposed modification (Part 23 of 31)

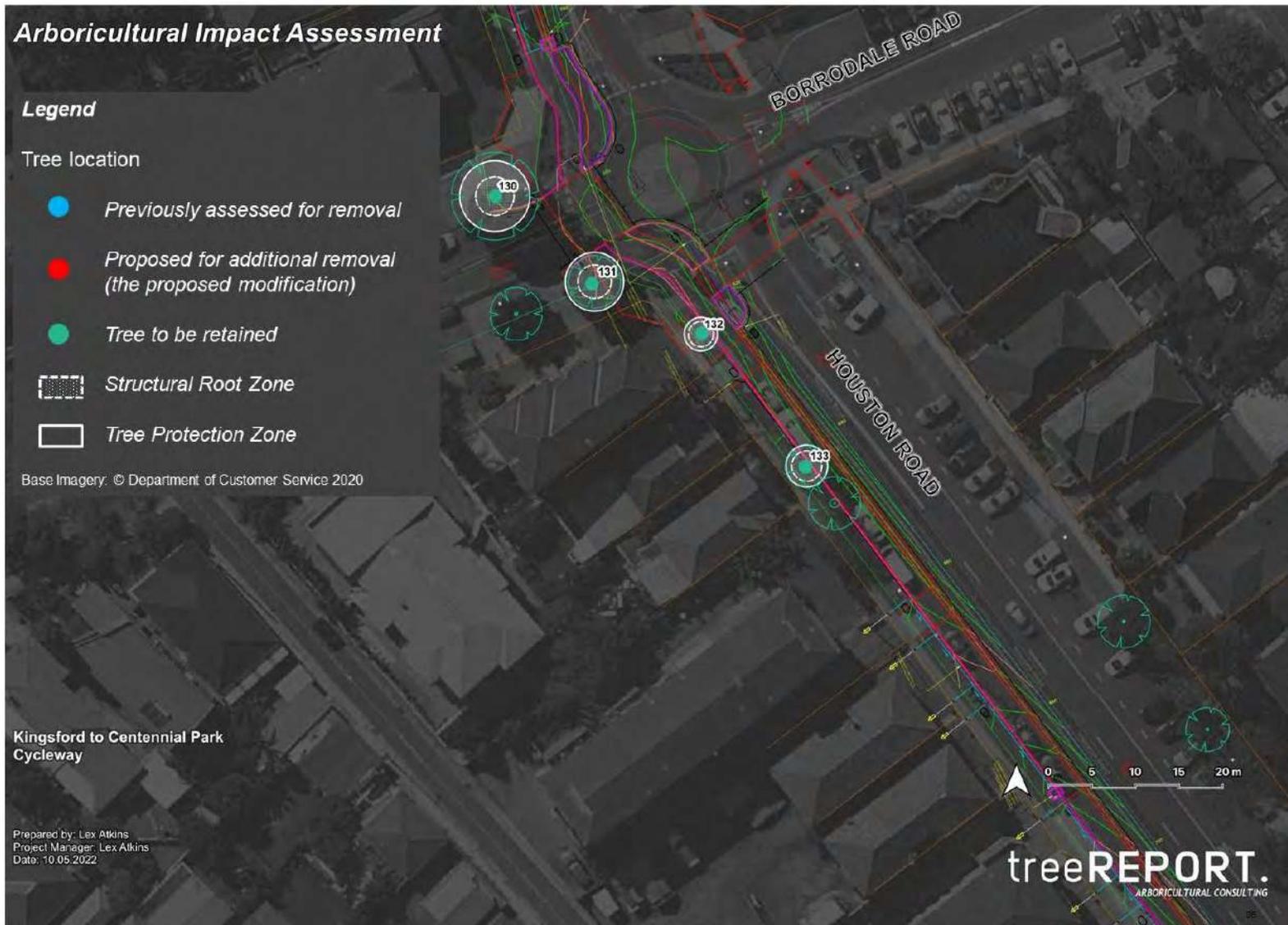


Figure 1-25: Proposed modification (Part 24 of 31)

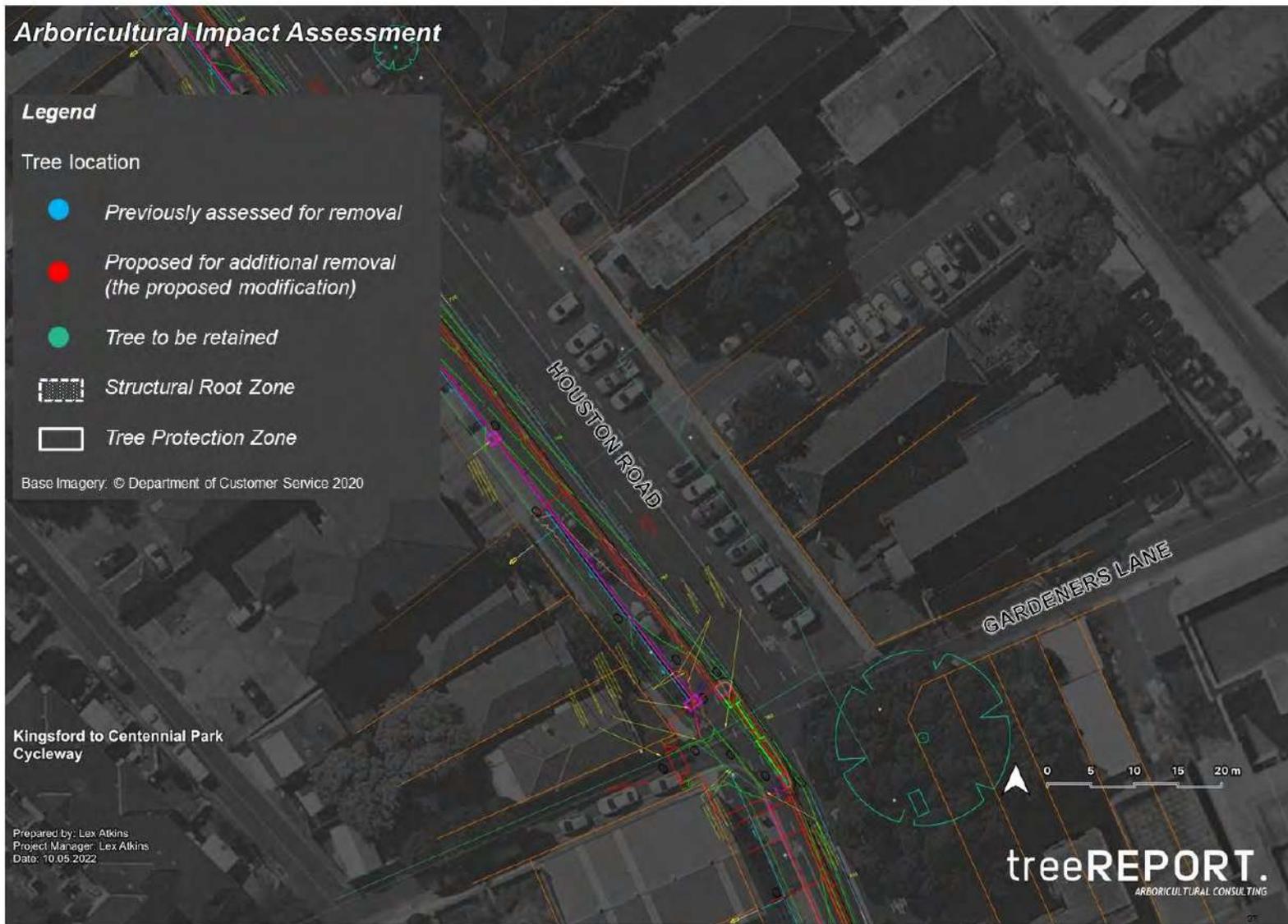


Figure 1-26: Proposed modification (Part 25 of 31)

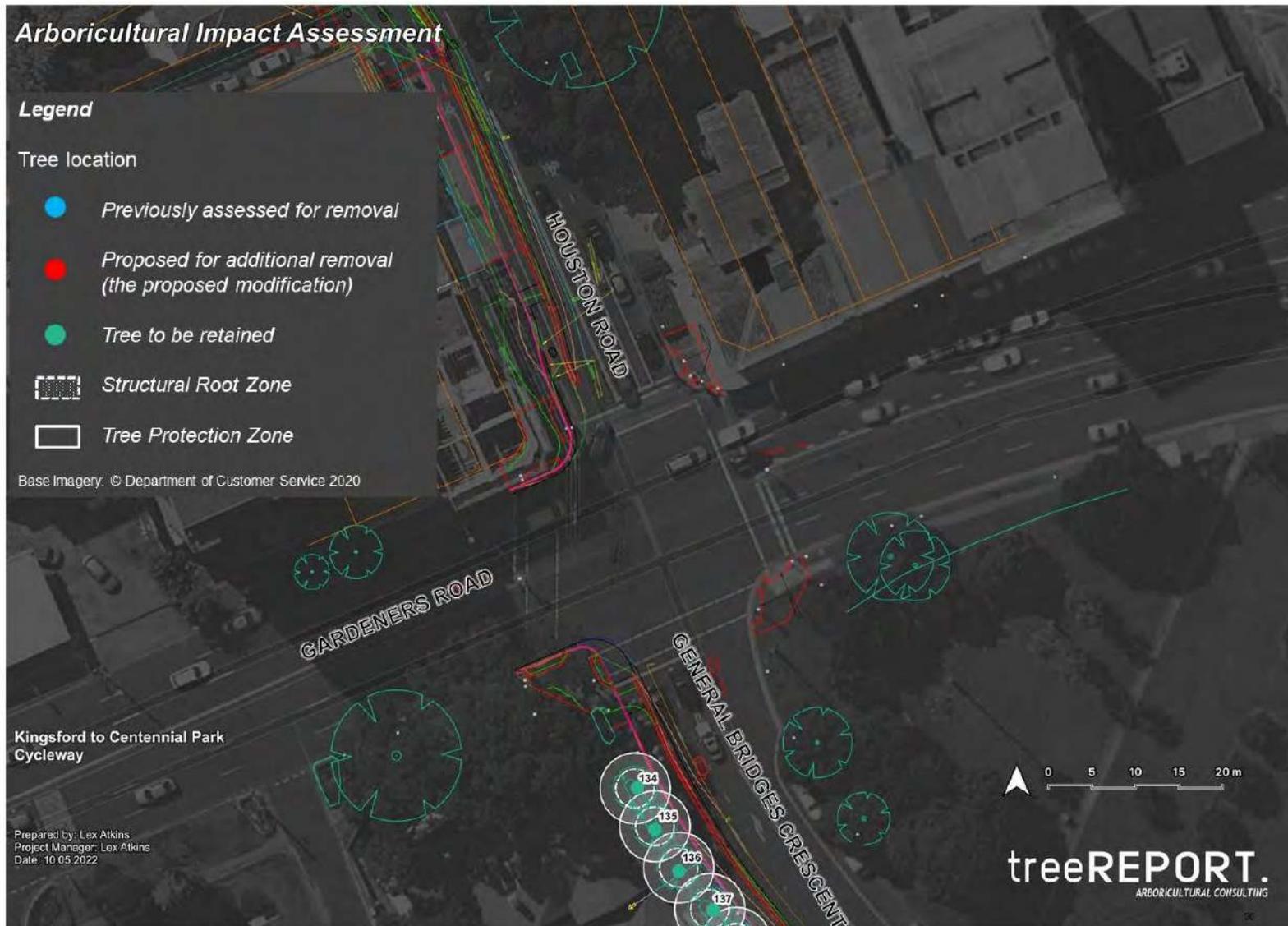


Figure 1-27: Proposed modification (Part 26 of 31)



Figure 1-28: Proposed modification (Part 27 of 31)



Figure 1-29: Proposed modification (Part 28 of 31)



Figure 1-30: Proposed modification (Part 29 of 31)



Figure 1-31: Proposed modification (Part 30 of 31)



Figure 1-32: Proposed modification (Part 31 of 31)

1.2 Purpose of the report

This addendum review of environmental factors (REF) has been prepared by Transport for NSW on behalf of Randwick City Council. For the purposes of these works, Randwick City Council is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This addendum REF is to be read in conjunction with the project REF and previous addendum REF for the project. The purpose of this addendum REF is to describe the proposed modification, to document and assess the likely impacts of the proposed modification on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been undertaken in context of Clause 171 of the Environmental Planning and Assessment Regulation 2021, *Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979* (Is an EIS Required? guidelines) (DUAP, 1995/1996), Roads and Road Related Facilities EIS Guideline (DUAP, 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the addendum REF helps to fulfil the requirements of:

- Section 5.5 of the EP&A Act including that Randwick City Council examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity

The findings of the addendum REF would be considered when assessing:

- Whether the proposed modification is likely to result in a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- The significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- The potential for the proposed modification to significantly impact any other matters of national environmental significance or Commonwealth land and therefore the need to make a referral to the Australian Government Department of Agriculture, Water and the Environment for a decision by the Australian Government Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2 Need and options considered

2.1 Strategic need for the proposed modification

Chapter 2 of the project REF addresses the strategic need for the project, the project objectives and the options that were considered. The proposed modification described and assessed in this addendum REF is consistent with the strategic need for the project.

The proposed modification is needed to facilitate construction of the determined project. The determined project cannot be constructed without impacting the additional trees subject to this proposed modification.

2.2 Proposal objectives and development criterion

Section 2.2 of the project REF identifies the proposal objectives that apply to the proposed modification:

- provide a high-quality new section of cycleway between Centennial Park and the Kingsford light Rail Terminus
- provide a safe and vibrant cycling and walking route
- deliver the best experience for all users of the road and pathway networks through the Randwick City Area.

An additional development criterion is proposed:

- minimise environmental impacts.

2.3 Alternatives and options considered

2.3.1 Methodology for selection of preferred option

The identified options for the proposed modification were analysed against the proposal objectives and development criterion described in Section 2.2.

The option which performed the best against the proposal objectives and development criterion was selected as the preferred option.

2.3.2 Identified options

The options identified for the proposed modification are:

- **Option 1: Construct the determined project with no modifications.** Only allow the 36 previously assessed trees to be impacted for construction of the project. The project would not be constructible.
- **Option 2: Construct the determined project with this proposed modification.** Impact the 36 previously assessed trees and 16 additional trees for construction of the project (the proposed modification).

2.3.3 Analysis of options

Table 2-1: Analysis of options

		Option 1	Option 2
Proposal objectives	Provide a high-quality new section of cycleway between Centennial Park and the Kingsford light Rail Terminus	☒ Objective not met. The cycleway would not be constructible per this option and would not be provided.	☑ Objective met. The cycleway would be constructible per this option and would be provided.
	Provide a safe and vibrant cycling and walking route	☒ Objective not met. The cycleway would not be constructible per this option and would not be provided.	☑ Objective met. The cycleway would be constructible per this option and would be provided.
	Deliver the best experience for all users of the road and pathway networks through the Randwick City Area	☑/☒ Objective partially met. The cycleway would not be constructible per this option and would not be provided, however street trees would not be removed, preserving the existing condition and amenity along the project alignment.	☑/☒ Objective partially met. The cycleway would be constructible per this option and would be provided, delivering an improved experience for all users of the road and pathway networks through the Randwick City Area, however, existing trees would be removed to facilitate the cycleway construction.
Development criterion	Minimise environmental impacts	☑ Criterion met. As the cycleway would no longer be constructible, construction of the cycleway would cease and no trees would be removed.	☑/☒ Criterion partially met. An additional 16 trees would be removed to those previously assessed; however, these additional trees have been limited only to those necessary for construction of the project.

2.4 Preferred option

Option 2 has been identified as the preferred option as it best meets the proposal objectives and development criterion.

3 Description of the proposed modification

3.1 The proposed modification

Randwick City Council proposes to modify the Kingsford to Centennial Park Walking and Cycling Improvements project to remove an additional 16 verge amenity trees along the proposed cycleway route. The proposed modification is shown in Figure 1-1 and detailed in Figure 1-2 to Figure 1-32.

Key features of the proposed modification would include:

- Additional removal of 16 trees, Trees 24, 25, 57, 60, 61, 73, 74, 75, 79, 83, 88, 89, 90, 103, 105 and 129.

Previously, a number of trees had been assessed for removal as part of the determined project. Some of these trees have since been removed by Council and service providers as part of ongoing maintenance activities. Additionally, the first addendum REF (July 2021) assessed that some trees assessed in the project REF for removal could be retained. Upon review of the final project design, retention of those trees was not possible. As such, there are 36 trees which have been previously assessed for removal and which would be removed to facilitate construction of the determined project. With the proposed modification, a total of 52 trees would be removed for construction of the project.

3.2 Construction activities

3.2.1 Work methodology

The work methodology for the proposed modification would be consistent with that of the determined project.

3.2.2 Construction hours and duration

The proposed modification could be completed within the construction hours and duration assessed as part of the determined project.

3.2.3 Plant and equipment

The following plant and equipment is proposed for the proposed modification:

- Elevated Working Platform (EWP)
- 5 tonne excavator
- Petrol-powered chainsaw (until midnight)
- Electric-powered chainsaw (after midnight, if required)
- Leaf blower
- Mulch grinder

3.2.4 Earthworks

The proposed modification would not result in additional earthworks for the project.

3.2.5 Source and quantity of materials

The proposed modification would produce additional vegetation matter to be disposed of as green waste. This waste stream would be consistent with those identified for the determined project and would not trigger additional approvals.

3.2.6 Traffic management and access

The proposed modification would not result in any changes for traffic management and access of the project.

3.3 Ancillary facilities

No changes to ancillary facilities are proposed.

3.4 Public utility adjustment

No public utility adjustments are proposed.

3.5 Property acquisition

No property acquisition is proposed.

4 Statutory and planning framework

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Transport and Infrastructure) 2021

SEPP (Transport and Infrastructure) aims to facilitate the effective delivery of infrastructure across the State.

Clause 2.108 of SEPP (Transport and Infrastructure) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposed modification is for road infrastructure facilities and is to be carried out by Transport for NSW on behalf of Randwick City Council, it can be assessed under Division 5.1 of the EP&A Act. Development consent is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under:

- State Environmental Planning Policy (Resilience and Hazards) 2021
- State Environmental Planning Policy (Planning Systems) 2021
- State Environmental Planning Policy (Precincts – Central River City)
- State Environmental Planning Policy (Precincts – Eastern Harbour City)
- State Environmental Planning Policy (Precincts – Regional) 2021

Section 2.10 to 2.15 of SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development.

Consultation, including consultation as required by SEPP (Transport and Infrastructure) (where applicable), is discussed in chapter 5 of this addendum REF.

4.1.2 Local Environmental Plans

Randwick Local Environmental Plan 2012

The proposed modification is located entirely within the previously assessed project footprint. The project is located within the Randwick local government area to which the Randwick Local Environmental Plan 2012 (Randwick LEP) applies.

As discussed in the determined project REF, the relevant provisions of the SEPP (Transport and Infrastructure) prevail over those of the Randwick LEP. As such, the determined project with proposed modification may be carried out as development without consent.

4.2 Other relevant NSW legislation

4.2.1 Roads Act 1993

The *Roads Act 1993* (Roads Act) regulates the carrying out of various activities in, on and over public roads. Under section 138 of the Roads Act, applicants are required to obtain approval from the relevant roads authority for the erection of a structure, the carrying out of work on or over a public road, or the digging up or disturbing the surface of a road. The *Roads Act 1993* supports Randwick City Council's legal right to undertake roadworks on certain roads.

The proposed modification requires work on Doncaster Avenue and Houston Road which are classified as local roads under the Roads Act.

Section 88 of the Roads Act permits a road authority, despite any other Act or law to the contrary, to remove or lop any tree or other vegetation that is on or overhanging a public road if, in its opinion, it is necessary to do so for the purpose of carrying out road work or removing a traffic hazard. Tree removal is required for the proposed works to carry out construction activities, in particular for construction of the determined Kingsford to Centennial Park Walking and Cycleway Improvements project.

4.2.2 Protection of the Environment and Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) establishes, amongst other things, the procedures for issuing licences for environmental protection in relation to aspects such as waste, air, water and noise pollution control. The owner or occupier of premises engaged in scheduled activities is required to hold an environment protection licence and comply with the conditions of that licence.

The proposed modification does not trigger requirement for an environmental protection licence in accordance with Part 3.2 of the POEO Act, however, per section 148 of the POEO Act, there is a duty to notify relevant authorities of any pollution incidents resulting from the proposed modification that cause or threaten material harm to the environment.

4.2.3 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017 and repeals the *Threatened Species Conservation Act 1995*, the *Nature Conservation Trust Act 2001* and parts of the *National Parks and Wildlife Act 1974*. The BC Act also repealed Section 5A of the EP&A Act which provided for Assessments of Significance. Assessments of Significance are now provided in Section 7.3 of the BC Act.

The BC Act introduces a Biodiversity Assessment Method (BAM) and Biodiversity Offsets Scheme (BOS). The BC Act lists a number of threatened species, populations or ecological communities to be considered in deciding whether a development or activity “likely to significantly affect threatened species”. A development or an activity is likely to significantly affect threatened species if:

- a) it is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3 (of the BC Act), or
- b) the development exceeds the BOS threshold if the biodiversity offsets scheme applies to the impacts of the development on biodiversity values, or
- c) it is carried out in a declared area of outstanding biodiversity value.

The BOS does not apply to development that is an activity subject to environmental impact assessment under Part 5 of the EP&A Act unless the proponent chooses to opt into the BOS. Randwick City Council has not opted in to the BOS for either the determined project or the proposed modification.

The proposed modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the BC Act, and therefore a Species Impact Statement (SIS) is not required. The biodiversity impacts of the proposed modification are assessed in Section 6.1.

4.2.4 Biosecurity Act 2015

The *Biosecurity Act 2015* (B Act) and its subordinate legislation commenced on 1 July 2017. The *Biosecurity Act 2015* replaces wholly or in part 14 separate pieces of biosecurity related

legislation including the Noxious Weeds Act 1993. Under the *Biosecurity Act 2015*, all plants, including weeds are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

The *Biosecurity Act 2015* and Regulations provide specific legal requirements for high risk activities and State level priority weeds. The State level priority weeds and associated legal requirements relevant to the region are outlined in the Greater Sydney Regional Strategic Weed Management Plan 2017 - 2022 (Greater Sydney Local Land Services, 2017) together with the high risk priority weeds from the regional prioritisation process. As such if present, priority weeds on the site should be assessed and controlled to fulfil the General Biosecurity Duty and minimise biosecurity risks.

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the EPBC Act a referral is required to the Australian Government for proposed 'actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These are considered in Appendix A and chapter 6 of the addendum REF.

A referral is not required for proposed road actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

Potential impacts to these biodiversity matters are also considered as part of chapter 6 of the addendum REF and Appendix A.

Findings – matters of national environmental significance (other than biodiversity matters)

The assessment of the proposed modification's impact on matters of national environmental significance and the environment of Commonwealth land found that there would be no change to the findings of the determined activity and would be unlikely to cause a significant impact on matters of national environmental significance or the environment of Commonwealth land. A referral to the Australian Government Department of Agriculture, Water and the Environment is not required.

4.4 Confirmation of statutory position

The proposed modification is categorised as development for the purpose of road infrastructure facilities and is being carried out by or on behalf of a public authority. Under clause 2.108 of SEPP (Transport and Infrastructure), the proposed modification is permissible without consent. The proposed modification is not State significant infrastructure or State significant development. The proposed modification can be assessed under Division 5.1 of the EP&A Act. Consent from is not required.

5 Consultation

The proposed modification does not seek to alter the key features of the determined project and the additional trees comprising the proposed modification are located on the public road verges managed by Randwick City Council. As such, it is not required to reconduct consultation with the local community and stakeholders regarding the proposed additional tree removal. The local community would be notified of the additional tree removal prior to carrying out removal of the additional trees as part of the regular project updates issued to the community.

6 Environmental assessment

This section of the addendum REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposed modification of the Kingsford to Centennial Park Walking and Cycleway Improvements project. All aspects of the environment potentially impacted upon by the proposed modification are considered. This includes consideration of the guidelines *Roads and Related Facilities EIS Guideline* (DUAP, 1996) and *Is an EIS required?* (DUAP, 1999) the factors specified in section 171 of the Environmental Planning and Assessment Regulation 2021. The factors specified in section 171(2) of the Environmental Planning and Assessment Regulation 2021 are also considered in Appendix A.

Site-specific safeguards and management measures are provided to ameliorate the identified potential impacts.

6.1 Trees

6.1.1 Existing environment

The existing environment of Doncaster Avenue and Houston Road is characterised by sparse, planted amenity trees which contribute to the low density, suburban and residential streetscape. The street trees line both sides of the road and comprise a range of tree species, sizes, age and condition, primarily the exotic *schinus molle* (Peppercorn tree) and *callistemon viminalis* (Weeping Bottlebrush).



Figure 6-1: Existing view south along Doncaster Avenue of Trees 60 and 61 proposed for removal as part of this addendum REF

6.1.2 Potential impacts

Subsequent to finalisation of the project's design plans, arborist assessment of the design's tree impacts was again carried out (refer Appendix D). The arborist assessed 166 trees along the route and determined that the majority of the trees along the project's cycleway route would be subject to major encroachment due to the proposed construction methodology and would require removal. This was not considered an acceptable level of impact so construction methodologies were adjusted and minor design elements were adjusted or removed to minimise the project's need to remove additional trees.

As a result, the proposed modification involves the removal of 16 additional trees (Trees 24, 25, 57, 60, 61, 73, 74, 75, 79, 83, 88, 89, 90, 103, 105 and 129) along the project alignment which would be impacted by construction of the determined Kingsford to Centennial Park Walking and Cycling Improvements project (refer Table 6-1).

Thirty-six trees along the project alignment have been previously assessed for removal. The proposed modification would result in a total of 52 street trees removed for the project. Given that this additional tree removal is dispersed across the project's 2.8-kilometre alignment, local impacts are expected to be minor.

Previously, 89 trees were to be planted as part of the determined project REF and first addendum REF (July 2021), however, additional planting will be provided as part of the proposed modification to compensate for the additional tree removal which comprises the proposed modification.

The proposed modification would result in additional impacts to existing trees along the project alignment, however, protection of trees to be retained and compensatory plantings are considered to mitigate the impact.

Table 6-1: Schedule of trees to be retained and removed along project alignment (*Note:* blue highlight denotes trees previously assessed for removal, red highlight denotes trees proposed for removal as part of this addendum REF)

Id.	Botanical name	Age class	Priority for retention	Retain / Remove
4	<i>Eucalyptus saligna</i>	Mature	High	Retain
5	<i>Schinus molle</i>	Mature	Medium	Remove
6	<i>Schinus molle</i>	Mature	Medium	Remove
7	<i>Schinus molle</i>	Mature	Medium	Remove
8	<i>Schinus molle</i>	Mature	Medium	Remove
9	<i>Schinus molle</i>	Semi-mature	Low	Remove
10	<i>Schinus molle</i>	Mature	Medium	Remove
11	<i>Schinus molle</i>	Mature	Medium	Retain
12	<i>Schinus molle</i>	Mature	Medium	Retain
13	<i>Schinus molle</i>	Mature	Medium	Retain
14	<i>Schinus molle</i>	Mature	Medium	Retain
15	<i>Schinus molle</i>	Mature	Medium	Retain
16	<i>Schinus molle</i>	Mature	Low	Remove

Id.	Botanical name	Age class	Priority for retention	Retain / Remove
17	<i>Schinus molle</i>	Mature	Medium	Retain
18	<i>Schinus molle</i>	Mature	Medium	Retain
19	<i>Callistemon viminalis</i>	Mature	Medium	Retain
20	<i>Schinus molle</i>	Mature	Medium	Retain
21	<i>Metrosideros excelsa</i>	Mature	Medium	Retain
22	<i>Schinus molle</i>	Mature	Medium	Retain
23	<i>Schinus molle</i>	Mature	Medium	Retain
24	<i>Schinus molle</i>	Mature	Medium	Remove
25	<i>Schinus molle</i>	Mature	Medium	Remove
26	<i>Schinus molle</i>	Mature	Medium	Retain
27	<i>Schinus molle</i>	Mature	Medium	Retain
28	<i>Schinus molle</i>	Mature	Medium	Retain
29	<i>Schinus molle</i>	Mature	Medium	Retain
30	<i>Schinus molle</i>	Mature	Medium	Retain
31	<i>Schinus molle</i>	Mature	Medium	Remove
32	<i>Melaleuca bracteata</i>	Mature	Medium	Remove
33	<i>Schinus molle</i>	Mature	Medium	Remove
34	<i>Schinus molle</i>	Mature	Medium	Remove
35	<i>Schinus molle</i>	Mature	Medium	Remove
36	<i>Schinus molle</i>	Mature	Medium	Retain
37	<i>Schinus molle</i>	Mature	Medium	Retain
38	<i>Schinus molle</i>	Mature	Medium	Retain
39	<i>Schinus molle</i>	Mature	Low	Remove
40	<i>Schinus molle</i>	Mature	Medium	Remove
40a*	<i>Schinus molle</i>	Mature	Medium	Remove
41	<i>Schinus molle</i>	Mature	High	Retain
42	<i>Schinus molle</i>	Mature	Medium	Retain
43	<i>Schinus molle</i>	Mature	Medium	Retain
44	<i>Schinus molle</i>	Mature	Medium	Retain

Id.	Botanical name	Age class	Priority for retention	Retain / Remove
45	<i>Schinus molle</i>	Mature	Medium	Retain
46	<i>Schinus molle</i>	Mature	Low	Remove
47	<i>Schinus molle</i>	Mature	Medium	Remove
48	<i>Jacaranda mimosifolia</i>	Mature	Medium	Retain
49	<i>Schinus molle</i>	Mature	Medium	Retain
50	<i>Schinus molle</i>	Mature	Medium	Retain
51	<i>Schinus molle</i>	Mature	Medium	Retain
52	<i>Schinus molle</i>	Mature	Medium	Retain
53	<i>Schinus molle</i>	Mature	Medium	Retain
54	<i>Schinus molle</i>	Mature	Medium	Retain
55	<i>Schinus molle</i>	Mature	Medium	Retain
56	<i>Callistemon viminalis</i>	Mature	Medium	Retain
57	<i>Schinus molle</i>	Mature	Medium	Remove
58	<i>Callistemon viminalis</i>	Mature	Medium	Retain
59	<i>Callistemon viminalis</i>	Mature	Medium	Retain
60	<i>Schinus molle</i>	Mature	Medium	Remove
61	<i>Robinia pseudoacacia</i>	Mature	Medium	Remove
62	<i>Syzygium sp.</i>	Mature	Medium	Retain
63	<i>Eucalyptus eugenioides</i>	Mature	Medium	Retain
64	<i>Callistemon citrinus</i>	Mature	Medium	Retain
65	<i>Eucalyptus eugenioides</i>	Mature	Medium	Retain
66	<i>Schefflera actinophylla</i>	Mature	Low	Retain
67	<i>Jacaranda mimosifolia</i>	Mature	Medium	Retain
68	<i>Lagerstroemia indica</i>	Mature	Low	Retain
69	<i>Eriobotrya japonica</i>	Semi-mature	Low	Retain
70	<i>Callistemon viminalis</i>	Mature	Medium	Retain
71	<i>Callistemon viminalis</i>	Mature	Low	Remove
72	<i>Callistemon viminalis</i>	Mature	Medium	Retain
73	<i>Callistemon viminalis</i>	Mature	Medium	Remove

Id.	Botanical name	Age class	Priority for retention	Retain / Remove
74	<i>Jacaranda mimosifolia</i>	Mature	Medium	Remove
75	<i>Jacaranda mimosifolia</i>	Mature	Medium	Remove
76	<i>Callistemon viminalis</i>	Mature	Medium	Retain
77	<i>Schinus molle</i>	Mature	Medium	Retain
78	<i>Olea europaea</i>	Mature	High	Retain
79	<i>Melaleuca quinquenervia</i>	Mature	High	Remove
80	<i>Tristaniopsis laurina</i>	Mature	High	Retain
81	<i>Callistemon viminalis</i>	Mature	Medium	Retain
82	<i>Callistemon viminalis</i>	Mature	Medium	Retain
83	<i>Callistemon viminalis</i>	Mature	Medium	Remove
84	<i>Callistemon viminalis</i>	Mature	Medium	Retain
85	<i>Callistemon viminalis</i>	Mature	Medium	Retain
86	<i>Olea europaea</i>	Mature	Low	Retain
87	<i>Olea europaea</i>	Mature	Medium	Retain
88	<i>Schinus molle</i>	Mature	Medium	Remove
89	<i>Schinus molle</i>	Mature	Medium	Remove
90	<i>Schinus molle</i>	Mature	Medium	Remove
91	<i>Schinus molle</i>	Mature	Medium	Remove
92	<i>Callistemon viminalis</i>	Mature	Low	Retain
93	<i>Callistemon viminalis</i>	Mature	Low	Remove
94	<i>Callistemon viminalis</i>	Mature	Low	Retain
95	<i>Callistemon viminalis</i>	Mature	Low	Retain
96	<i>Lophostemon confertus</i>	Mature	Medium	Retain
97	<i>Liquidambar styraciflua</i>	Mature	Medium	Retain
98	<i>Lophostemon confertus</i>	Mature	High	Retain
99	<i>Schinus molle</i>	Mature	Medium	Retain
100	<i>Schinus molle</i>	Mature	Medium	Retain
101	<i>Schinus molle</i>	Mature	Medium	Retain
102	<i>Schinus molle</i>	Mature	Medium	Remove

Id.	Botanical name	Age class	Priority for retention	Retain / Remove
103	<i>Callistemon viminalis</i>	Mature	Medium	Remove
104	<i>Fraxinus griffithii</i>	Mature	Low	Retain
105	<i>Schinus molle</i>	Mature	Medium	Remove
106	<i>Eucalyptus haemastoma</i>	Mature	High	Retain
107	<i>Jacaranda mimosifolia</i>	Mature	Medium	Retain
108	<i>Eucalyptus haemastoma</i>	Mature	Medium	Remove
109	<i>Callistemon viminalis</i>	Mature	Medium	Remove
110	<i>Tristaniopsis laurina</i>	Mature	Medium	Retain
111	<i>Plumeria sp.</i>	Mature	Low	Retain
112	<i>Tristaniopsis laurina</i>	Mature	Medium	Retain
113	<i>Callistemon viminalis</i>	Mature	Low	Remove
114	<i>Washingtonia robusta</i>	Mature	Low	Retain
115	<i>Eucalyptus tereticornis</i>	Mature	Medium	Retain
116	<i>Washingtonia robusta</i>	Mature	High	Remove
117	<i>Callistemon salignus</i>	Mature	High	Retain
118	<i>Tristaniopsis laurina</i>	Mature	Medium	Retain
119	<i>Tristaniopsis laurina</i>	Mature	Medium	Retain
120	<i>Tristaniopsis laurina</i>	Mature	Medium	Retain
121	<i>Tristaniopsis laurina</i>	Mature	Medium	Retain
122	<i>Tristaniopsis laurina</i>	Mature	Medium	Retain
123	<i>Callistemon viminalis</i>	Semi-mature	Low	Retain
124	<i>Eucalyptus sp.</i>	Mature	Low	Remove
125	<i>Eucalyptus haemastoma</i>	Semi-mature	Medium	Remove
126	<i>Michelia figo</i>	Mature	Low	Remove
127	<i>Callistemon salignus</i>	Mature	Medium	Retain
128	<i>Melaleuca quinquenervia</i>	Mature	Medium	Retain
129	<i>Melaleuca bracteata</i>	Mature	Medium	Remove
130	<i>Lophostemon confertus</i>	Mature	High	Retain
131	<i>Cupaniopsis anacardioides</i>	Mature	High	Retain

Id.	Botanical name	Age class	Priority for retention	Retain / Remove
132	<i>Cupaniopsis anacardioides</i>	Mature	Low	Retain
133	<i>Callistemon salignus</i>	Mature	Medium	Retain
134	<i>Washingtonia robusta</i>	Mature	High	Retain
135	<i>Washingtonia robusta</i>	Mature	High	Retain
136	<i>Washingtonia robusta</i>	Mature	High	Retain
137	<i>Washingtonia robusta</i>	Mature	High	Retain
138	<i>Washingtonia robusta</i>	Mature	High	Retain
139	<i>Washingtonia robusta</i>	Mature	High	Retain
140	<i>Washingtonia robusta</i>	Mature	High	Retain
141	<i>Washingtonia robusta</i>	Mature	High	Retain
142	<i>Washingtonia robusta</i>	Mature	High	Retain
143	<i>Washingtonia robusta</i>	Mature	High	Retain
144	<i>Lophostemon confertus</i>	Mature	Medium	Retain
145	<i>Livistona australis</i>	Mature	Medium	Retain
146	<i>Platanus orientalis</i>	Mature	Medium	Retain
147	<i>Platanus orientalis</i>	Mature	Medium	Retain
148	<i>Liquidambar styraciflua</i>	Mature	Medium	Retain
149	<i>Liquidambar styraciflua</i>	Mature	Medium	Retain
150	<i>Hibiscus tiliaceus</i>	Mature	Medium	Retain
151	<i>Livistona australis</i>	Semi-mature	Medium	Retain
152	<i>Eucalyptus acmenoides</i>	Mature	High	Retain
153	<i>Liquidambar styraciflua</i>	Mature	Medium	Retain
154	<i>Liquidambar styraciflua</i>	Mature	High	Retain
155	<i>Eucalyptus robusta</i>	Mature	High	Retain
156	<i>Eucalyptus robusta</i>	Mature	High	Retain
157	<i>Eucalyptus robusta</i>	Mature	High	Retain
158	<i>Eucalyptus robusta</i>	Mature	High	Retain
159	<i>Gleditsia triacanthos</i>	Mature	Low	Remove
160	<i>Gleditsia triacanthos</i>	Mature	Low	Remove

Id.	Botanical name	Age class	Priority for retention	Retain / Remove
161	<i>Syzygium paniculatum</i>	Mature	Medium	Remove
162	<i>Gleditsia triacanthos</i>	Mature	Low	Remove
163	<i>Syzygium paniculatum</i>	Mature	Medium	Remove
164	<i>Gleditsia triacanthos</i>	Mature	Low	Remove
165	<i>Gleditsia triacanthos</i>	Mature	Low	Remove
166	<i>Gleditsia triacanthos</i>	Mature	Low	Remove

*Tree 40a has been assessed as part of the arborist report developed for the determined project REF (then referred to as Tree 43) and was not included in the arborist report referenced in this addendum REF

6.1.3 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing
Tree impacts	Trees retained along the project which are subject to encroachment by construction works are to be monitored for health or structural deterioration and maintained accordingly.	Randwick City Council	After construction completion

6.2 Biodiversity

6.2.1 Methodology

An updated desktop review of the following biodiversity databases was undertaken on 17 June 2022:

- EPBC Act Protected Matters Search Tool
- BioNet Species Sightings
- Threatened Ecological Communities Greater Sydney

6.2.2 Existing environment

All the streetscape, amenity trees along the alignment have been planted and comprise a mixture of exotic and native species.

No threatened ecological communities or threatened flora species have been recorded within 100 metres of the project alignment (including proposed modification).

There have been four recorded sightings of the threatened fauna species, Grey-headed Flying-fox within 100 metres of the project alignment (including proposed modification). These sightings were of individual specimens. No further threatened fauna species have been recorded within 100 metres of the project alignment (including proposed modification).

6.2.3 Potential impacts

The Grey-headed Flying-fox is a mobile fauna species. Given the low number of recorded species sightings along the 2.8 kilometre project alignment, it is unlikely that the trees along the alignment are used for foraging, roosting or habitat. It is possible that mobile fauna species may be encountered during construction activities, however, such encounters could be adequately mitigated by the implementation of safeguards. As such, the proposed modification is not expected to impact upon the Grey-headed Flying-fox species.

Conclusion on significance of impacts

The modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the BC Act or FM Act and therefore a Species Impact Statement is not required.

The modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the EPBC Act.

6.2.4 Safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing
Unexpected species encounters	If unexpected threatened flora or fauna are discovered, works would stop immediately and the <i>Unexpected Threatened Species Find Procedure</i> in the <i>Biodiversity Guidelines</i> (RTA, 2011) implemented.	Contractor	During construction

6.3 Other impacts

6.3.1 Existing environment and potential impacts

The existing environment of each of the environmental factors is as described in the determined project REF as the proposed modification is located entirely within the determined project alignment.

Table 6-2: Potential impacts

Environmental factor	Potential impacts
Landscape character and visual impact	<p>The proposed modification would result in localised visual impacts due to the removal of mature trees in the road verges outside residential properties. The visual impacts would be low for the residential receivers and transient road users as there would be sufficient retained mature trees in the local areas surrounding trees to be removed. These impacts would also be temporary and mitigated by compensatory planting which would take time to reach the maturity of the existing trees to be removed.</p> <p>The landscape character of the existing environment would not be altered by the determined project nor the proposed modification.</p> <p>No additional safeguards proposed.</p>
Soil and water	<p>The proposed modification would not result in additional disturbance of soil or water.</p> <p>No additional safeguards proposed.</p>
Noise and vibration	<p>All trees comprising the proposed modification are adjacent to sensitive residential receivers. The proposed tree removal would be carried out during the day to minimise noise impacts to surrounding sensitive receivers. The safeguards and management measures of the previously determined project REF and first addendum REF (July 2021) are considered adequate to mitigate the potential noise impacts of the proposed modification.</p> <p>The proposed modification would not produce any potential vibration impacts.</p> <p>No additional safeguards proposed.</p>
Traffic and transport	<p>The proposed modification would result in minor additional traffic and transport impacts by extending the duration of traffic closures, temporary parking removal and property access disruptions required to construct the project's cycleway and associated infrastructure.</p> <p>No additional safeguards proposed.</p>
Non-Aboriginal heritage	<p>The trees comprising the proposed modification are located in public verge areas and are not adjacent any listed non-Aboriginal heritage items. As such, the proposed modification is not expected to impact non-Aboriginal items.</p>

Environmental factor	Potential impacts
	<p>Trees 24 and 25 are adjacent to the Racecourse heritage conservation area (C13) per the Randwick LEP, however, would not impact the heritage characteristics of the conservation area.</p> <p>No additional safeguards proposed.</p>
Aboriginal heritage	<p>The proposed modification would not result in additional ground disturbance and would not alter the risk of encountered unexpected Aboriginal heritage.</p> <p>No additional safeguards proposed.</p>
Socio-economic	<p>The proposed modification would not result in any socio-economic impacts.</p> <p>No additional safeguards proposed.</p>
Waste and resource recovery	<p>The removed tree vegetation would comprise a green waste stream consistent with those identified for the determined project.</p> <p>No additional safeguards proposed.</p>
Air quality	<p>The proposed modification would not result in any additional air quality impacts.</p> <p>No additional safeguards proposed.</p>

6.3.2 Safeguards and management measures

No additional safeguards and management measures proposed.

6.4 Cumulative impacts

6.4.1 Potential impacts

The proposed modification would extend the overall construction duration of the project by a couple of weeks and would not result in further cumulative impacts than the tree, biodiversity, noise and traffic and transport impacts described above.

6.4.2 Safeguards and management measures

No additional safeguards and management measures proposed.

7 Environmental management

7.1 Environmental management plans

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposed modification. Should the proposed modification proceed, these management measures would be addressed if required during detailed design and incorporated into the Contractors Environmental Management Plan (CEMP) and applied during the construction and operation of the proposed modification.

7.2 Summary of safeguards and management measures

Environmental safeguards and management measures for the Kingsford to Centennial Park Walking and Cycleway Improvements project are summarised in Table 7-1. Additional safeguards and management measures identified in this addendum REF are included in bold and italicised font. The safeguards and management measures will be incorporated into the CEMP and implemented during construction and operation of the proposed modification, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment.

Table 7-1: Summary of safeguards and management measures

Impact	Environmental safeguards	Responsibility	Timing
Tree impacts	Trees retained along the project which are subject to encroachment by construction works are to be monitored for health or structural deterioration and maintained accordingly.	Randwick City Council	After construction completion
Unexpected species encounters	If unexpected threatened flora or fauna are discovered, works would stop immediately and the <i>Unexpected Threatened Species Find Procedure</i> in the <i>Biodiversity Guidelines</i> (RTA, 2011) implemented.	Contractor	During construction

7.3 Licensing and approvals

No additional or changed licenses and approval requirements have been identified in this addendum REF.

8 Conclusion

8.1 Justification

Based on independent research undertaken by a leading economic researcher in *Inner City Regional Bicycle Network – Demand Assessment and Economic Appraisal* (AECOM, 2010) will provide access for 1.2 million people in 164 suburbs and across 15 (11 following the amalgamations) local government areas. AECOM estimates that the bicycle network is likely to deliver a net economic benefit of \$506 million (in today's dollars over a 30 year period), and that every dollar spent on delivering the interconnected cycleway, the network will generate an economic return of \$3.88.

The Kingsford to Centennial Park cycleway link is an integral part of the network, linking the south-eastern suburbs to the CBD, as well as the existing and other proposed cycle routes throughout the region.

The creation of a comprehensive, co-ordinated and practical cycling network across the local government area, and connecting to cycleways in adjoining local government areas, will benefit both cyclists and the wider community. Benefits include improvements to environmental and health conditions, reductions in traffic congestion and enhanced motorist, cyclist and pedestrian safety.

The cycleway project is consistent with the aims of *Sydney's Cycling Future* as it will improve the safety of and facilities for cyclists across Sydney.

On balance the determined project with the proposed modification is considered justified.

The environmental impacts of the proposal are not likely to be significant and therefore it is not necessary for approval to be sought for the proposal under Part 4 of the *Environmental Planning & Assessment, Act 1979*. The proposal will not have a substantial impact on any matters of national environmental significance.

8.2 Objects of the EP&A Act

Decisions made under the Environmental Planning & Assessment Act, 1979 must have regard to the objects of the Act, as set out in Section 4.1. The relevant objects are:

- a) *to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,*
- b) *to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,*
- c) *to promote the orderly and economic use and development of land,*
- d) *to promote the delivery and maintenance of affordable housing,*
- e) *to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,*
- f) *to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),*
- g) *to promote good design and amenity of the built environment,*
- h) *to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,*
- i) *to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,*

- j) *to provide increased opportunity for community participation in environmental planning and assessment.*

The proposed modification of the Kingsford to Centennial Park walking and cycling improvements are consistent with the objects of the Act, in as much as they are of relevance to the proposed modification.

In particular, the outcome following completion of the works represents the proper management of the public domain and would facilitate construction of the determined project cycleway thus promoting the social and welfare of the community by providing safe, convenient and healthy transport options and streetscape enhancements to improve the traffic, cycling and walking environment and connections across the local streets and between popular destinations.

Further, the implementation of the recommended safeguards and mitigation measures outlined in this REF will ensure the proposed modification is undertaken in such a way that it protects the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.

8.3 Ecologically sustainable development

The National Strategy for Ecologically Sustainable Development (NSES) has been formulated to ensure ESD is accounted for in all proposals. There are three core objectives:

- Enhance the well-being and welfare of individuals and the community by following a path of economic development that safeguards the welfare of future generations;
- Provide for equity within and between generations;
- Protect biological diversity and maintain essential ecological processes and life-support systems.

The EP&A Act acknowledges that ecologically sustainable development (ESD) should be considered in the assessment and approval of proposed development.

The proposed modification has been assessed against the following four principles of ecologically sustainable development (ESD) listed in the *Protection of the Environment Administration Act 1991*:

- *The precautionary principle;*
- *The principle of intergenerational equity;*
- *The principle of biological diversity and ecological integrity; and*
- *The principle of improved valuation of environmental resources.*

A discussion on the degree to which the proposed modification complies with these principles is provided below.

8.3.1 The precautionary principle

The precautionary principle states that:

if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions should be guided by:

- (i) *careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*

(ii) an assessment of the risk weighted consequences of various options

A range of investigations have been undertaken during the preparation of this addendum REF to ensure that the potential environmental impacts are able to be understood with a high degree of certainty. The proposal has evolved to avoid environmental impact where possible and mitigation measures have been recommended to minimise adverse impacts. No mitigation measures have been deferred due to a lack of scientific certainty. The proposal is therefore considered to be consistent with the precautionary principle.

8.3.2 Intergenerational equity

The principle of intergenerational equity states that:

the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

The proposed modification will not result in any impacts that are likely to adversely impact on the health, diversity or productivity of the environment for the future generation. Instead, the proposed modification will facilitate construction of the determined cycleway which will realise a number of positive impacts for the benefit present and future generations including:

- The potential for reduced traffic congestion and necessary vehicle trips;
- Improved health and lifestyle benefits afforded by the provision of a safe and dedicated cycleway route;
- The potential for environmental savings through reductions in vehicle emissions and noise pollution;
- Improved safety and 'journey ambience' for cyclists through the provision of a separate dedicated cycleway, removing them from the current mixed traffic environment;
- The potential for savings in government transport infrastructure building and operating costs;
- Improved pedestrian amenity through the provision of pedestrian crossings and reduced likelihood of cyclists riding on the footpath through the provision of a separate cycleway.

8.3.3 Conservation of biological diversity and ecological integrity

The principle of biological diversity and ecological integrity states that:

conservation of biological diversity and ecological integrity should be a fundamental consideration.

The proposed modification is unlikely to have an impact on biological diversity and ecological integrity. The proposed modification is to be built in a highly urbanised area where the potential for adverse impacts on biological diversity are considered minimal. The vegetation to be removed for the proposed modification is highly modified and urbanised and will be replaced with compensatory plantings.

8.3.4 Improved valuation, pricing and incentive mechanisms

The principle of improved valuation of environmental resources states that:

environmental factors should be included in the valuation of assets and services, such as:

- (i) *polluter pays – that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*
- (ii) *the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*
- (iii) *environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

The cost of environmental resources includes those costs that are incurred in order to protect the environment. In this way, any environmental safeguards that are imposed in order to minimise adverse impacts result in economic costs to the construction and operation of the project. This indicates that the valuation of environmental resources has been assigned.

As described in this addendum REF, the construction methodology for the proposed modification will be designed to minimise adverse impacts on the environment by confining works to defined areas and implementing appropriate mitigation measures where environmental impacts are expected.

8.4 Conclusion

This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration where relevant, of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modification as described in the addendum REF best meets the project objectives, but would still result in some impacts on the additional amenity trees proposed for removal. Safeguards and management measures as detailed in this addendum REF would ameliorate or minimise these expected impacts. The proposed modification would also facilitate construction of the determined Kingsford to Centennial Park Walking and Cycling Improvements project. On balance the proposed modification is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

The proposed modification would not result in a change to the findings of the project REF and previous addendum REF and would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposed modification is subject to assessment under Division 5.1 of the EP&A Act. Consent is not required.

Significance of impact under Australian legislation

The proposed modification would not likely cause a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of

the EPBC Act. A referral to the Australian Government Department of Agriculture, Water and the Environment is not required.

9 Certification

DECISION

Person who prepares the EIA

I certify to the best of my knowledge that:

- I am suitably qualified and competent to complete this REF:
- I have completed this REF and
- The assessment meets the requirements of sections 5A, 111 and 112 of the EP&A Act, clause 228 of the EP&A Regulation and other relevant legislation and guidelines discussed in Section 2.1 and Section 4.1.
- The information contained in the REF is not materially misleading, and
- My assessment has been adequately completed, and
- My conclusion as to the likely environmental impact of the project is reasonable and
- I am satisfied that subject to the inclusion of the mitigation measures included above, the project will not have a significant impact on the environment during both the construction and operation phases.

Signature



Date:

26 July 2022

Name

Jarita Zeng, Senior Environment and Sustainability Officer, Transport for NSW

Sign Off

Determining Officer – Council Officer Who Verifies the EIA

I certify to the best of my knowledge that:

- I am suitably qualified and competent to verify the completion of this REF.
- The person who completed this REF is suitably qualified and competent and

EITHER

- Based on the completed REF and my knowledge of the project, the assessment has been adequately completed, the project has minor and predictable impacts, the conclusion as to the likely environmental impact of the project is reasonable and the project can proceed subject to the relevant control measures and conditions in any approvals, licences or permits.

OR

- The project requires additional environmental assessment because:

NOTE: A site visit may be required depending on level of confidence and risk to the environment.

Signature



Date:

25 July 2022

Name

Frank Ko

10 References

Terms and acronyms used in this addendum REF

Term / Acronym	Description
BC Act	<i>Biodiversity Conservation Act 2016 (NSW).</i>
CEMP	Construction / Contractor's environmental management plan
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
NES	Matters of national environmental significance under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.

Appendix A

Consideration of section 171(2) factors and matters of National Environmental Significance and Commonwealth land

Section 171(2) Checklist

In addition to the requirements of the Is an EIS required? (1995/1996) guideline and the Roads and Related Facilities EIS Guideline (DUAP, 1996) as detailed in the addendum REF, the following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
<p>Any environmental impact on a community?</p> <p>The removal of additional street trees would temporarily reduce the visual amenity of the streetscapes until compensatory planting matures as described in Section 6.1.</p>	Short-term minor negative
<p>Any transformation of a locality?</p>	Nil
<p>Any environmental impact on the ecosystems of the locality?</p>	Nil
<p>Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</p> <p>The removal of additional street trees would temporarily reduce the visual amenity of the streetscapes until compensatory planting matures as described in Section 6.1.</p>	Short-term minor negative
<p>Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</p>	Nil
<p>Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)?</p>	Nil
<p>Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</p>	Nil
<p>Any long-term effects on the environment?</p>	Nil
<p>Any degradation of the quality of the environment?</p>	Nil
<p>Any risk to the safety of the environment?</p>	
<p>Any reduction in the range of beneficial uses of the environment?</p>	Nil
<p>Any pollution of the environment?</p>	Nil
<p>Any environmental problems associated with the disposal of waste?</p>	Nil
<p>Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</p>	Nil
<p>Any cumulative environmental effect with other existing or likely future activities?</p>	Short-term minor negative

Factor	Impact
Yes, the determined project and proposed modification would have cumulative tree impacts resulting in temporary reduction of visual amenity until compensatory planting matures as described in Section 6.1.	
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?	Nil
<p>Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1.</p> <p>Compensatory tree plantings will be selected in accordance with the <i>Randwick Street Tree Master Plan</i> (Randwick City Council).</p>	
Other relevant environmental factors	In considering the potential impacts of this proposal all relevant environmental factors have been considered, refer to Chapter 6 of this assessment.

Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to the Australian Government Department of Water, Agriculture and the Environment.

Under the EPBC Act strategic assessment approval a referral is not required for proposed road actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are assessed in detail as part of this addendum REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
Any impact on a World Heritage property?	Nil
Any impact on a National Heritage place?	Nil
Any impact on a wetland of international importance?	Nil
Any impact on a listed threatened species or communities?	Nil
Any impacts on listed migratory species?	Nil
Any impact on a Commonwealth marine area?	Nil
Does the proposed modification involve a nuclear action (including uranium mining)?	Nil
Additionally, any impact (direct or indirect) on Commonwealth land?	Nil

Appendix B

Statutory consultation checklists



Infrastructure SEPP

Certain development types

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
Car Park	Does the project include a car park intended for the use by commuters using regular bus services?	No		ISEPP cl. 95A
Bus Depots	Does the project propose a bus depot?	No		ISEPP cl. 95A
Permanent road maintenance depot and associated infrastructure	Does the project propose a permanent road maintenance depot or associated infrastructure such as garages, sheds, tool houses, storage yards, training facilities and workers' amenities?	No		ISEPP cl. 95A

Development within the Coastal Zone

Issue	Description	Yes / No / NA	If 'yes' consult with	ISEPP clause
Development with impacts on certain land within the coastal zone	Is the proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	No		ISEPP cl. 15A

Note: See interactive map here: <https://www.planning.nsw.gov.au/policy-and-legislation/coastal-management>. Note the coastal vulnerability area has not yet been mapped.

Note: a certified coastal zone management plan is taken to be a certified coastal management program

Council related infrastructure or services

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	ISEPP clause
Stormwater	Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	No		ISEPP cl.13(1)(a)
Traffic	Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	No		ISEPP cl.13(1)(b)
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of any part of the system?	No		ISEPP cl.13(1)(c)
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	No		ISEPP cl.13(1)(d)
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow?	No		ISEPP cl.13(1)(e)
Road & footpath excavation	Will the works involve more than minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	No		ISEPP cl.13(1)(f)

Local heritage items

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s)	ISEPP clause
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?	No		ISEPP cl.14

Flood liable land

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a minor extent?	No		ISEPP cl.15
Flood liable land	Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance	No		ISEPP cl.15AA

Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled Floodplain Development Manual: the management of flood liable land published by the New South Wales Government.

Public authorities other than councils

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the <i>National Parks and Wildlife Act 1974</i> , or on land acquired under that Act?	No		ISEPP cl.16(2)(a)
National parks and reserves	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No		ISEPP cl. 16(2)(b)
Aquatic reserves and marine parks	Are the works adjacent to an aquatic reserve or a marine park declared under the <i>Marine Estate Management Act 2014</i> ?	No		ISEPP cl.16(2)(c)
Sydney Harbour foreshore	Are the works in the Sydney Harbour Foreshore Area as defined by the <i>Sydney Harbour Foreshore Authority Act 1998</i> ?	No		ISEPP cl.16(2)(d)
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No		ISEPP cl.16(2)(f)
Artificial light	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No		ISEPP cl. 16(2)(g)
Defence communications buffer land	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhardt LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	No		ISEPP cl. 16(2)(h)
Mine subsidence land	Are the works on land in a mine subsidence district within the	No		ISEPP cl. 16(2)(i)

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
	meaning of the <i>Mine Subsidence Compensation Act 1961</i> ?			

Growth Centres SEPP

Issue	Potential impact	Yes / No	If 'yes' consult with	SEPP clause
Clearing native vegetation	Do the works involve clearing native vegetation (as defined in the Local Land Services Act 2013) on land that is not subject land (as defined in cl 17 of schedule 7 of the <i>Threatened Species Conservation Act 1995</i>)?	No		SEPP 18A

Appendix C

Neutral or beneficial effect on water quality assessment

Neutral or Beneficial Effect Assessment

State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 relates to the use of land within the Sydney drinking water catchment. In accordance with Clause 12 of the SEPP, Transport for NSW is required to consider whether or not an activity to which Division 5.1 of the EP&A Act applies will have a neutral or beneficial effect on water quality before carrying out the activity.

Factor	Impact
<p>1. Are there any identifiable potential impacts on water quality?</p> <p>What pollutants are likely?</p> <p>During construction and/or post construction?</p>	<p>Topsoil may be disturbed by the tree removal comprising the proposed modification. Topsoil may exit into and pollute the local stormwater system during construction (tree removal). This pollutant would be adequately managed by the soil management safeguards of the determined REF.</p>
<p>2. For each pollutant, list the safeguards needed to prevent or mitigate potential impacts on water quality (these may be DPE Water endorsed current recommended practices and/or equally effective other practices)</p>	<p>Erosion and sedimentation safeguards.</p>
<p>3. Will the safeguards be adequate for the time required? How will they need to be maintained?</p>	<p>Erosion and sedimentation safeguards will need to be inspected and maintained daily.</p>
<p>4. Will all impacts on water quality be effectively contained on the site by the identified safeguards (above) and not reach any watercourse, waterbody or drainage depression?</p> <p>Or will impacts on water quality be transferred outside the site for treatment? How? Why?</p>	<p>Water quality impacts will be effectively contained on the site by the identified safeguards (above) and not reach any watercourse, waterbody or drainage depression.</p>

Factor	Impact
5. Is it likely that a neutral or beneficial effect on water quality will occur? Why?	The proposed modification is likely to have a neutral effect on water quality.

Appendix D

Neutral or beneficial effect on water quality assessment

An aerial photograph of a residential street. The street is paved and has several cars parked along the sides. On either side of the street are houses with various roof colors and styles. There are many palm trees and other green plants scattered throughout the scene. The lighting suggests it's daytime, with shadows cast across the street.

treeREPORT.

ARBORICULTURAL CONSULTING

Arboricultural Impact Assessment

Kingsford to Centennial Park Cycleway

Version 1

Prepared for:

Burton Contractors c/o
TreeLink

April 2022

Document information

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Document status

Document version	Date	Revision description
Version d1	04/04/22	DRAFT for client review
Version 1	11/04/22	Final version following client comments

This document should be cited as 'Tree Report 2022: Arboricultural Impact Assessment – Kingsford to Centennial Park Cycleway; Version 1. Prepared for Burton Constructions c/o-TreeLink.

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Abbreviations

∅	Diameter
R	Radius
AGL	Above Ground Level
AQF	Australian Qualifications Framework
AS	Australian Standards
BGL	Below Ground Level
DBH	Diameter at Breast Height
DBR	Diameter at Root Flare
Id	Identification
m	Metre
mm	Millimetre
NDE	Non-Destructive Excavation
NO	Number
NSW	New South Wales
SP	Species
SRZ	Structural Root Zone
TPZ	Tree Protection Zone
VTA	Visual Tree Assessment

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1 Background

Introduction

Tree Report has been engaged by Burton Constructions c/o- TreeLink (herein referred to as the 'Client') to prepare an Arboricultural Impact Assessment (herein referred to as the 'AIA') and Tree Protection Plan (herein referred to as the 'TPP') for a proposed development (herein referred to as the 'Project') associated with the construction of the Kingsford to Centennial Park Cycleway. The purpose of this report is to:

- Identify trees (herein referred to as the 'Subject Trees') that have been identified by the Client.
- Assess the current overall health and condition of the Subject Trees.
- Assess and discuss likely impacts to the Subject Trees as a result of the proposed development.
- Evaluate the significance of the Subject Trees and assess their suitability for retention.

Project Overview

The project, developed by Randwick City Council and being delivered by Transport for NSW, is part of a \$240 million investment by the Australian and NSW Governments to fix congestion hotspots, expand the cycling network and help the economic recovery from the COVID-19 pandemic.

It includes a 2.8km two-way cycleway and shared path improvements along Doncaster Avenue, Day Avenue, Houston Road, General Bridges Crescent and Sturt Street. This will provide the local community and commuters a safe and convenient active transport option and improve accessibility.

The cycleway will connect the Kingsford Light Rail terminus to the Centennial Park cycleway at Alison Road, Randwick. It will also connect to Randwick City Council's planned cycleway between South Coogee and Kingsford.

Improvements also include new landscaping and trees, street lighting, traffic calming, seating and bike parking.

The new cycleway will not impact the current number of traffic lanes.

Key features of the Project, likely to affect the Subject Trees, are summarised as follows:

- Site preparation activities, including removal and demolition of selected hard surfaces, concrete paving, asphalt road and base course, kerb and guttering, pedestrian refuge, and kerb ramps.
- Construction of new crossings, upgraded paths and traffic calming measures.
- Construction of a new two-way 2.8km separated cycleway.
- Kerb-to-sky canopy pruning of Subject Trees **id. 12, 13, 15, 17, 18-31, 33-38, 45, 49-57, 60-68, 70, 72, 75-92, 96-103, 105, 109, 110, 117, 118, 121 & 148-150.**
- Installation of above and below ground services.
- Associated landscaping.
- Plant and vehicle movements.

Subject Trees

Inspection of the site was undertaken on the 22nd & 23rd of March 2022. A total of **166** individual trees were identified and recorded during the site inspection. Of these:

- **Thirty** Subject Trees (id. **1-3, 9, 16, 39, 46, 66, 68, 69, 71, 86, 92-95, 104, 111, 113, 114, 124, 126, 132, 159, 160, 162 & 164-166**) have been assessed as Low retention value.
- **Ninety-nine** Subject Trees (id. **5-8, 10-15, 17-38, 40, 42-45, 47-65, 67, 70, 72-77, 81-85, 87-91, 96, 97, 99-103, 105, 107-110, 112, 115, 118-122, 125, 127-129, 133, 144-151, 153, 161 & 163**) have been assessed as Medium retention value.
- **Twenty-seven** Subject Trees (id. **4, 41, 78-80, 98, 106, 116, 117, 130, 131, 134-143, 152 & 154-158**) have been assessed as High retention value.

*Further information, observations, and measurements specific to each of the Subject Trees can be found in **Section 4** and **Appendix II**.*

Study Area

The Study Area comprises of a 2.8km two-way cycleway and shared path improvements along Doncaster Avenue, Day Avenue, Houston Road, General Bridges Crescent and Sturt Street. The cycleway will connect the Kingsford Light Rail terminus to the Centennial Park cycleway at Alison Road, Randwick. It will also connect to Randwick City Council's planned cycleway between South Coogee and Kingsford.

The Site falls within the Randwick City Council Local Government Area (LGA).

The Project is mapped in **Figure 1.1**.



Figure 1.1: The Project

2 Method

Visual tree assessment

The subject trees were assessed in accordance with a stage one visual tree assessment (VTA) as formulated by Mattheck & Breloer (1994)¹, and practices consistent with modern arboriculture.

The following limitations apply to this methodology:

- Trees were inspected from ground level, without the use of any invasive or diagnostic tools and testing.
- Trees within adjacent properties or restricted areas were not subject to a complete visual inspection (i.e. defects and abnormalities may be present but not recorded).
- Tree locations were recorded using a handheld GPS device and accuracy was subject to satellite availability at the time of inspection.
- Tree heights, canopy spread and diameter at breast height (DBH) was estimated, unless otherwise stated.
- Tree identification was based on broad taxonomical features present and visible from ground level at the time of inspection.

Retention value

The retention value of a tree or group of trees is determined using a combination of environmental, cultural, physical and social values.

- **Low:** These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
- **Medium:** These trees are moderately important for retention. Their removal should only be considered if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
- **High:** These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by *Australian Standard AS4970 Protection of trees on development sites*.

This tree retention assessment has been undertaken in accordance with the Institute of Australian Consulting Arboriculturalists (IACA) Significance of a Tree, Assessment Rating System (STARS). The system uses a scale of High, Medium and Low significance in the landscape. Once the landscape significance of a tree has been defined, the retention value can be determined. Each tree must meet a minimum of three (3) assessment criteria to be classified within a category. Further details and the assessment criteria are in **Appendix V**.

¹ VTA is an internationally recognised practice in the visual assessment of trees as formulated by Mattheck & Breloer (1994). Principle explanations and illustrations are contained within the publication, Field Guide for Visual Tree Assessment by Mattheck, C., and Breloer, H. *Arboricultural Journal*, Vol 18 pp 1-23 (1994).

Encroachment assessment

- **Tree protection zone (TPZ):** The TPZ is the optimal combination of crown and root area (as defined by AS 4970-2009) that requires protection during the construction process so that the tree can remain viable. The TPZ is an area that is isolated from the work zone to ensure no disturbance or encroachment occurs into this zone. Tree sensitive construction measures must be implemented if work is to proceed within the Tree Protection Zone.
- **Structural root zone (SRZ):** The SRZ is the area of the root system (as defined by AS 4970-2009) used for stability, mechanical support and anchorage of the tree. Severance of structural roots (>50 mm in diameter) within the SRZ is not recommended as it may lead to the destabilisation and/or decline of the tree.
- **Root investigation:** When assessing the potential impacts of encroachment within the TPZ, consideration will need to be given to the location and distribution of the roots, including above or below ground restrictions affecting root growth. Location and distribution of roots may be determined through non-destructive excavation (NDE) methods such as hydro-vacuum excavation (sucker truck), air spade and manual excavation. Root investigation is used to determine the extent and location of roots within the zone of conflict. Root investigation does not guarantee the retention of the tree.

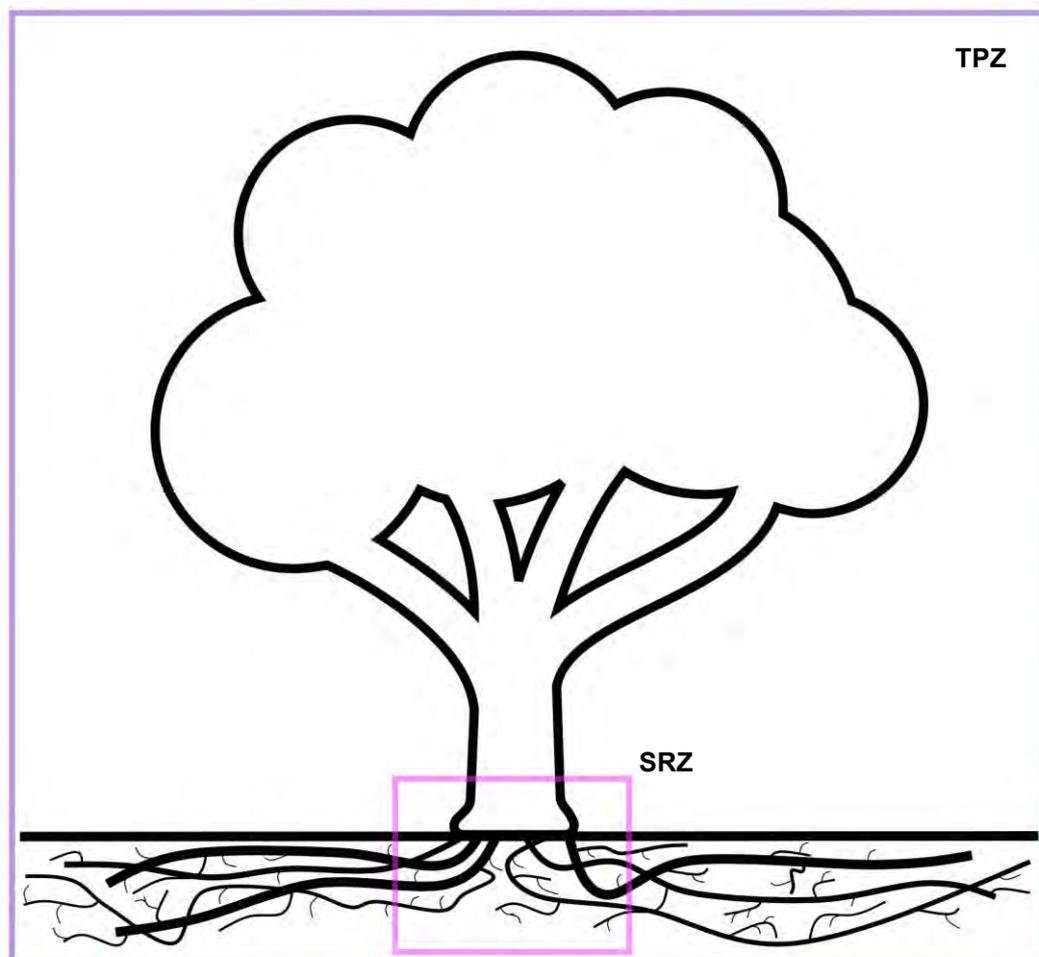


Figure 2.1: Indicative TPZ and SRZ

Encroachments within the TPZ

- **No encroachment (0%):** No likely or foreseeable encroachment within the TPZ.
- **Minor encroachment (<10%):** If the proposed encroachment is less than 10% (total area) of the TPZ, and outside of the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and be contiguous with the TPZ.
- **Major encroachment (>10%):** If the proposed encroachment is greater than 10% (total area) of the TPZ, the project arborist must demonstrate that the tree(s) remain viable. The area lost to this encroachment should be compensated for elsewhere and be contiguous with the TPZ. Tree sensitive construction techniques may be used for minor works within this area providing no structural roots are likely to be impacted, and the project arborist can demonstrate that the tree(s) remain viable. Root investigation by non-destructive methods may be required for proposed works within this area. All work within the TPZ must be carried out under the supervision of the project arborist.

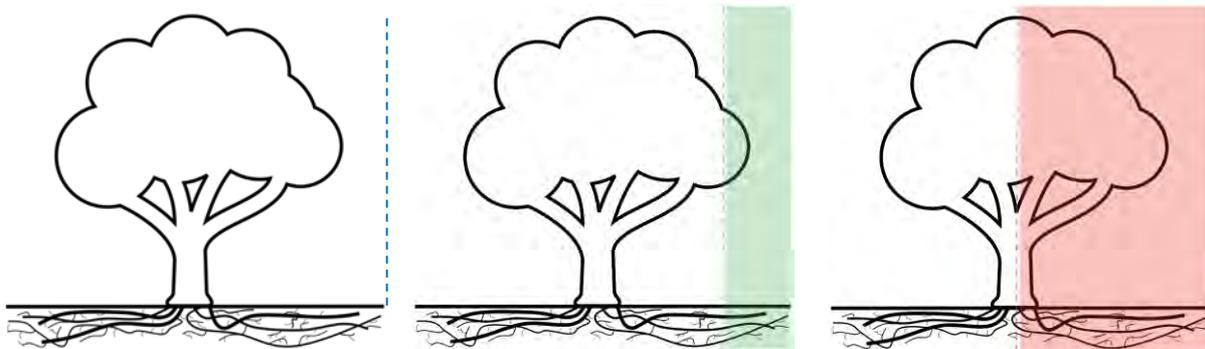


Figure 2.2: Indicative levels of encroachment

Mitigation measures

Encroachment within the TPZ must be compensated with a range of mitigation measures to ensure that impacts to the subject tree(s) are reduced or restricted wherever possible. Mitigation must be increased relative to the level of encroachment within the TPZ to ensure the subject tree remain viable. The table below outlines requirements under AS 4970-2009, and mitigation measures required within each category of encroachment. These mitigation measures will only apply if trees are proposed to be retained.

Level of Encroachment	Requirements Under AS 4970-2009
No encroachment (0%)	<ul style="list-style-type: none">• N/A
Minor encroachment (<10%)	<ul style="list-style-type: none">• The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ.• Detailed root investigations should not be required.• Tree protection must be installed.
Major encroachment (>10%)	<ul style="list-style-type: none">• The project arborist must demonstrate the Subject Tree(s) would remain viable.• Root investigation by non-destructive methods may be required.• Consideration of relevant factors including: Root location and distribution, tree species, condition, site constraints and design factors.• The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ.• Non-destructive root investigation may be required for any trees proposed for retention.

Table 2.1: Mitigation measures

3 Discussion

General

Trees on development sites: Construction and development can change the way an area is utilised by adding buildings, infrastructure, and pedestrians to the location. This can result in an increased potential of damage and harm to property and people. Therefore, trees that contain significant defects, are structurally poor or have a short useful life expectancy should be considered for removal.

Furthermore, it is not always possible or reasonably practicable to retain all trees within a proposed development. It can be better to select the higher retention value trees and protect these well, rather than trying to retain all trees and decreasing the quality of tree protection (Matheny & Clark, 1998).

Trees can be negatively affected in a number of ways during construction. These include root loss, lack of water and oxygen to the root zone, damage to the trunk or canopy and/or poisoning. Failure to protect trees, particularly root zones, during development can lead to an increased risk of tree death and/or failure post construction.

Impacts from excavation: Most tree roots will usually be found in the top 600mm of soil (Harris, Clark & Matheny, 1999). Radiating outwards from the base of the trunk are several large woody roots. These structural roots anchor the tree in the ground. Cutting or affecting those roots is likely to undermine the stability of the tree. The spread of a tree's structural roots, herein termed its Structural Root Zone (SRZ), is generally proportioned to the diameter of its trunk (Matthek & Breloer, 1994).

Beyond this zone extends the network of woody transport roots and fine absorbing roots, which absorb and transport water and nutrients. Most of these roots are found in the top 150mm of soil (Harris, Clark & Matheny, 1999). Trees can lose a portion of their absorbing roots without being significantly affected in the long term. Different species tolerate different amounts of root loss, with most healthy trees able to tolerate losing up to a third of their absorbing roots (Matheny & Clark, 1998).

For the purpose of the assessment, root investigation by non-destructive methods, carried out under the supervision of the project arborist will be required in order to determine viability where there is an encroachment of SRZ or >20% into a TPZ of a Subject Tree.

Impacts from canopy pruning: Tree canopy pruning involves the removal of living and dead tissues in an attempt to control or redistribute growth and to create a structurally sound mature form. Tree health and the ability to recover from the myriad of urban stressors are directly related to canopy area. The loss of live foliage and woody transport tissue can lead to a significant negative impact a Subject Tree's ability to photosynthesise light energy into chemical energy necessary for the normal physiological functioning and survival of the tree. Live crown ratios of 50%-60% maintain tree vitality while reducing the risk of premature limb/tree failure.

The cutting of branches which results in a stub, referred to as lopping is regarded as an unacceptable practice, except in certain circumstances. Lopping may result in:

- An increased rate of shoot production and elongation, which is weakly attached to the parent tree.
- Decay of the stubs.
- Poor form and visual amenity.
- Reduced life expectancy of the tree.
- Pre-disposing the tree to pathogenic infection and insect attack.

4 Results

Major (>10%) TPZ Encroachment

A total of one hundred and twenty-one Subject Trees (**id. 1-11, 14, 17-25, 33, 39-48, 51-53, 56-62, 68-76, 78-83, 88-95, 102-141, 145, 146, 148-150 & 156-166**) are located adjacent to the Project and have been identified by the Client for removal. Excavations required will result in a major encroachment (>10%) of the TPZ and are likely to have a significant impact on the Subject Trees' ability to store carbohydrates, use stored carbohydrates in times of stress and are likely to have a significant impact on the health, condition and/or stability of the Subject Trees long term.

A total of thirty-three Subject Trees (**id. 12, 13, 15, 26-31, 34-38, 49, 50, 54, 55, 63-67, 77, 84-87, 96-99 & 101**) are located adjacent to the Project and have been identified by the Client for kerb-sky canopy pruning. The required kerb-sky canopy pruning will result in a major encroachment (>10%) of total live canopy volume and is likely to have a significant negative impact a Subject Tree's ability to photosynthesise light energy into chemical energy necessary for the normal physiological functioning and survival of the Subject Trees long term.

Minor (<10%) TPZ Encroachment

A total of five Subject Trees (**id. 143, 144, 147, 152 & 155**) are located adjacent to the Project. Excavations required will result in a minor encroachment (<10%) of the TPZ and are unlikely to have a significant impact on the Subject Trees' ability to store carbohydrates, use stored carbohydrates in times of stress and are unlikely to have a significant impact on the health, condition and/or stability of the Subject Trees long term.

Subject Tree **id. 100** is located adjacent to the Project and has been identified by the Client for kerb-sky canopy pruning. The required kerb-sky canopy pruning will result in a minor encroachment (<10%) of total live canopy volume and is unlikely to have a significant negative impact a Subject Tree's ability to photosynthesise light energy into chemical energy necessary for the normal physiological functioning and survival of the Subject Trees long term.

No TPZ Encroachment

A total of six Subject Trees (**id. 16, 32, 142, 151, 153 & 154**) are located outside of the proposed area of disturbance and there are no foreseeable impacts to the Subject Trees as a result of the proposed development.

5 Recommendations

Trees proposed for removal

Major (>10%) TPZ Encroachment: Subject Trees **id. id. 1-11, 14, 17-25, 33, 39-48, 51-53, 56-62, 68-76, 78-83, 88-95, 102-141, 145, 146, 148-150 & 156-166** will be subject to a major of the TPZ and are proposed for removal as part of this development.

Major (>10%) Canopy Encroachment: Subject Trees **id. 12, 13, 15, 26-31, 34-38, 49, 50, 54, 55, 63-67, 77, 84-87, 96-99 & 101** have been identified by the Client for kerb-sky canopy pruning and are proposed for removal as part of this development.

No encroachment: Subject Tree **id. 16 & 32** been identified by the Client for removal irrespective of development impacts.

Tree proposed for retention

Minor (<10%) TPZ Encroachment: Subject Trees **id. 143, 144, 147, 152 & 155** will be subject to a minor impact as a result of the proposed development. Impact mitigation measures are not required for successful tree retention; **however**, tree protection (refer to **Chapter 7 & Appendix III**) should be implemented to protect the Subject Trees during the construction phase of the development.

No encroachment (0%): Subject Trees **id. 12, 142, 151, 153 & 154** are located outside the proposed area of disturbance and there are no foreseeable impacts to these trees as a result of the proposed development. Impact mitigation measures are not required for successful tree retention; **however**, tree protection (refer to **Chapter 7 and Appendix III**) should be implemented to protect the Subject Trees during the construction phase of the development.

Vegetation Offset

Offset replacement planting to compensate for the loss of the tree as part of this development should be undertaken in accordance with the relevant vegetation offset replacement policy and consist of tree species which are endemic to the local area and suited to the size of the area of which they are planted.

Tree Removal

- Any approved pruning and/or tree removal work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture.
- Any approved pruning must be in accordance with *AS 4373-2007, Pruning of Amenity Trees*.
- Any approved pruning and/or tree removal work is to be carried out in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).
- Permission must be granted from the relevant consent authority, prior to removing or pruning of any of the subject trees.

Tree Canopy Pruning

- Pruning must not exceed 10% total live canopy volume.
- No living tissue >75mmØ are to be removed.

- Any approved pruning must be in accordance with *AS 4373-2007, Pruning of Amenity Trees*.
- Final pruning cuts are achieved as close as possible to the branch collar without cutting into the branch collar or leaving a protruding stub.
- Any approved pruning and/or tree removal work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture.
- Any approved pruning must be in accordance with *AS 4373-2007, Pruning of Amenity Trees*.
- Any approved pruning and/or tree removal work is to be carried out in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).
- Permission must be granted from the relevant consent authority, prior to removing or pruning of any of the subject trees.

Where required canopy pruning is unable to be undertaken in accordance with the above specifications, an individual tree pruning specification must be prepared by the project arborist on a case-by-case basis.

6 Tree Protection Plan

General tree protection measures

The following general tree protection measures are recommended:

- The approved tree protection plan must be available onsite prior to the commencement of works, and throughout the entirety of the project.
- The Tree Protection Plan (**Appendix III**) must be implemented prior to commencement of works within 15m of a Subject Tree.
- Tree protection measures are to be installed in accordance with *AS 4970-2009, Protection of Trees on Development Sites*.
- The area lost to encroachment should be compensated for elsewhere, contiguous with the TPZ (**Appendix IV**).
- Any underground services proposed within the TPZ should be installed using tree sensitive methods such as: horizontal directional drilling boring, non-destructive excavation and carried out under the supervision of the project arborist.

Specific tree protection measures

The following specific tree protection measures are recommended:

- If, at any time, it is not feasible to carry out works in accordance with this report, an alternative must be agreed in writing with the Project Arborist.
- It is the responsibility of the Principal Contractor (herein referred to as the 'PC') to install and maintain tree protection measures in accordance with this report for the duration of the development.
- Subject Trees **id. 12, 142-144, 147 & 151-155** are to be protected via the use of tree trunk protection, in accordance with **Appendix III** and *AS 4970-2009, Protection of Trees on Development Sites*, and should be installed prior to commencement of construction activities within 15m of a Subject Tree.
- All proposed works within the TPZ of Subject Trees **id. 12, 142-144, 147 & 151-155** must be carried out under the supervision of the project arborist using tree sensitive techniques and not result in the loss of roots material >40mmØ.
- Where it is not feasible to install tree trunk protection due to unforeseen factors, a modified tree protection specification must be agreed to by the Project Arborist.
- Where possible, footings of existing structures and hardscapes proposed for demolition within the TPZ should remain in situ (just below grade) to prevent damage to existing root material.
- Exposed root material should be clean cut using secateurs, hand saw or similar.
- Structural soil as coarse or slightly coarser than the existing soil should be used for any fill requirements within the TPZ of a Subject Tree proposed for retention.

Hold points, inspections, and certification

The approved tree protection plan must be available onsite prior to the commencement of works, and throughout the entirety of the project. To ensure the tree protection plan is implemented, hold points have been specified in the schedule of works (**Table 2**). It is the responsibility of the PC to complete each of the tasks.

Once each stage is reached, the work will be inspected and certified by the project arborist and the next stage may commence. Alterations to this schedule may be required due to necessity, however, this shall be through consultation with the project arborist only.

Phase	Stage	Responsibility
Pre-construction	1 Engagement of AQF Level 5 (Diploma of Arboriculture) arborist for the role of project arborist.	PC
	2 Prior to demolition and site establishment indicate clearly with spray paint on trunks trees marked for removal only.	PC / Project Arborist
	3 Tree protection shall be installed in accordance with approved tree protection plan and certified by the project arborist prior to demolition and site establishment, this will include mulching of areas within the TPZ.	PC / Project Arborist
During Construction	4 Inspection and certification of trees by the project arborist should be undertaken monthly during the construction period.	PC / Project Arborist
	5 Project arborist to supervise and document all works carried out within the TPZ of trees to be retained.	PC / Project Arborist
	6 Inspection and certification of trees by project arborist after all major construction has ceased, following the removal of tree protection measures.	PC / Project Arborist
Post Construction	7 Final inspection and certification of trees by project arborist.	PC / Project Arborist

Table 6.1: Hold points, inspections & certification schedule

7 References

General references

- *Australian Standard, AS 4373-2007, Pruning of Amenity Trees.*
- *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites.*
- *Harris, R., Clark, J., Matheny, N. and Harris, V. 2004. Arboriculture. Upper Saddle River, N.J.: Prentice Hall.*
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- *Loughran, A. 2007. Native plant or weed. Paterson, N.S.W.: Tocal College, NSW Dept. of Primary Industries.*
- *Mattheck, C. 2007. Updated field guide for visual tree assessment. Karlsruhe: Forschungszentrum Karlsruhe.*
- *Mattheck, C., Bethge, K. and Weber, K. 2015. The body language of trees. Karlsruhe: Karlsruher Inst. für Technologie.*
- *Mattheck, C., Lonsdale, D. and Breloer, H. 1994. The body language of trees. London: H.M.S.O.*
- *MacLeod, R.D. and Cram, W.J. 1996. Forces Exerted by Tree Roots, Arboriculture Research Information Note, 134/96/EXT.*
- *Smiley, T. and Fite, K. 2008. Managing Trees During Construction. Arborist News. WorkCover NSW. 1998. Code of Practice: Amenity Tree Industry.*

Specific references

The conclusions and recommendations of this report are based on the *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites*, the findings from the site inspections and analysis of the following documents/plans:

- *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017.*
- *Randwick City Council: Development Control Plan (DCP) 2013.*
- *Randwick City Council: Tree Management Technical Manual, dated 17.01.2017.*
- *220321 EX TREES; supplied as DWG file.*
- *Design CAD 2d and Cadastre; supplied as DWG file.*

220321 EX TREES, SY170790-REF-0000-DR-STRM-3D & Design CAD 2d and Cadastre have been used as map layers for **Appendix I**.

Appendix I **Impact Assessment**

Arboricultural Impact Assessment

LEGEND

Tree Location

- Remove - Development Impacts
- Remove - Pruning Impacts
- Retain

▭ Structural Root Zone

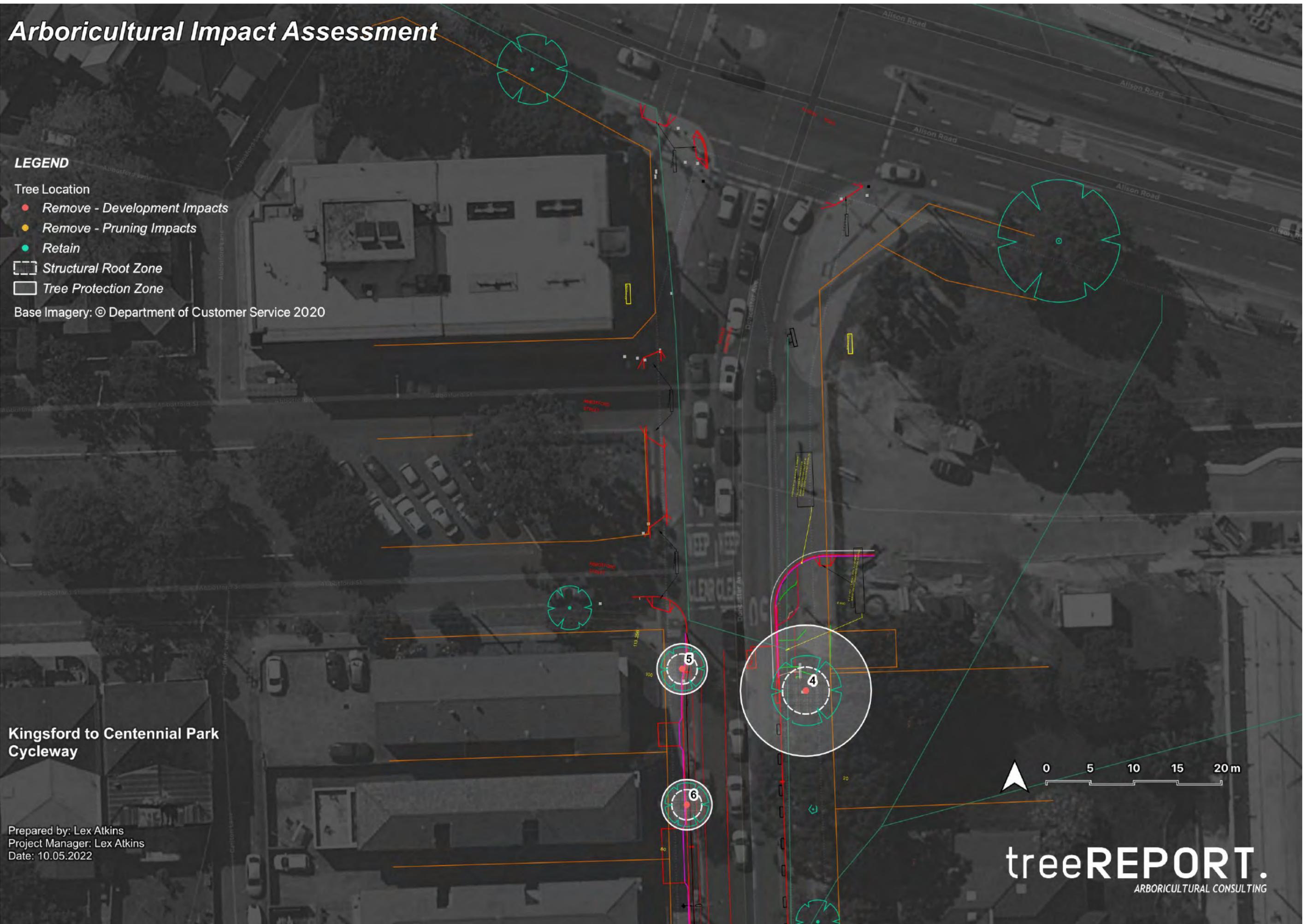
▭ Tree Protection Zone

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Date: 10.05.2022

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LEGEND

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- Retain

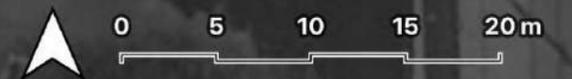
▭ Structural Root Zone

▭ Tree Protection Zone

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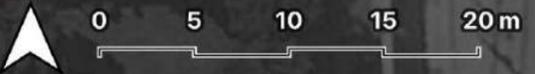
LEGEND

- Tree Location
 - Remove - Development Impacts
 - Remove - Pruning Impacts
 - Retain
- ▭ Structural Root Zone
- ▭ Tree Protection Zone

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LEGEND

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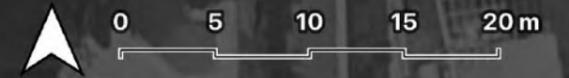
▭ Structural Root Zone

▭ Tree Protection Zone

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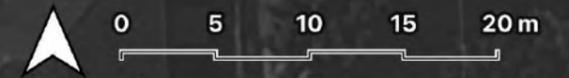
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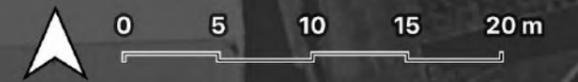
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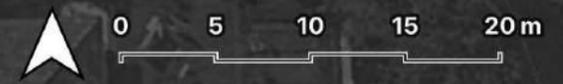
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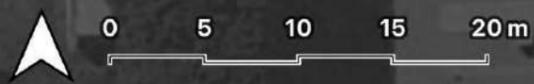
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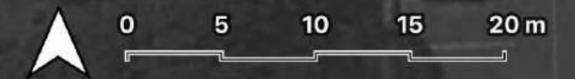
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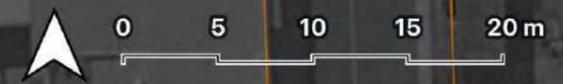
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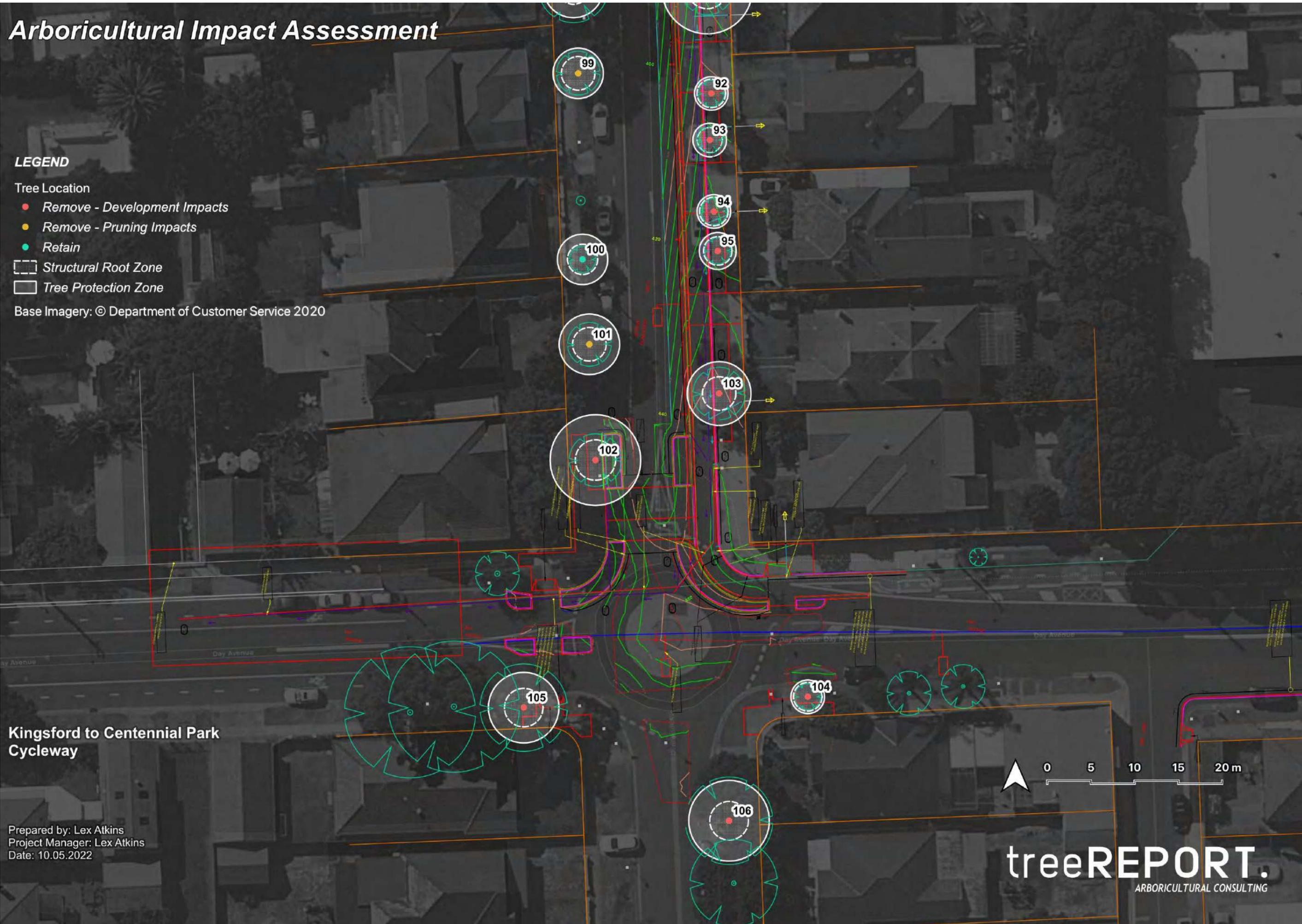
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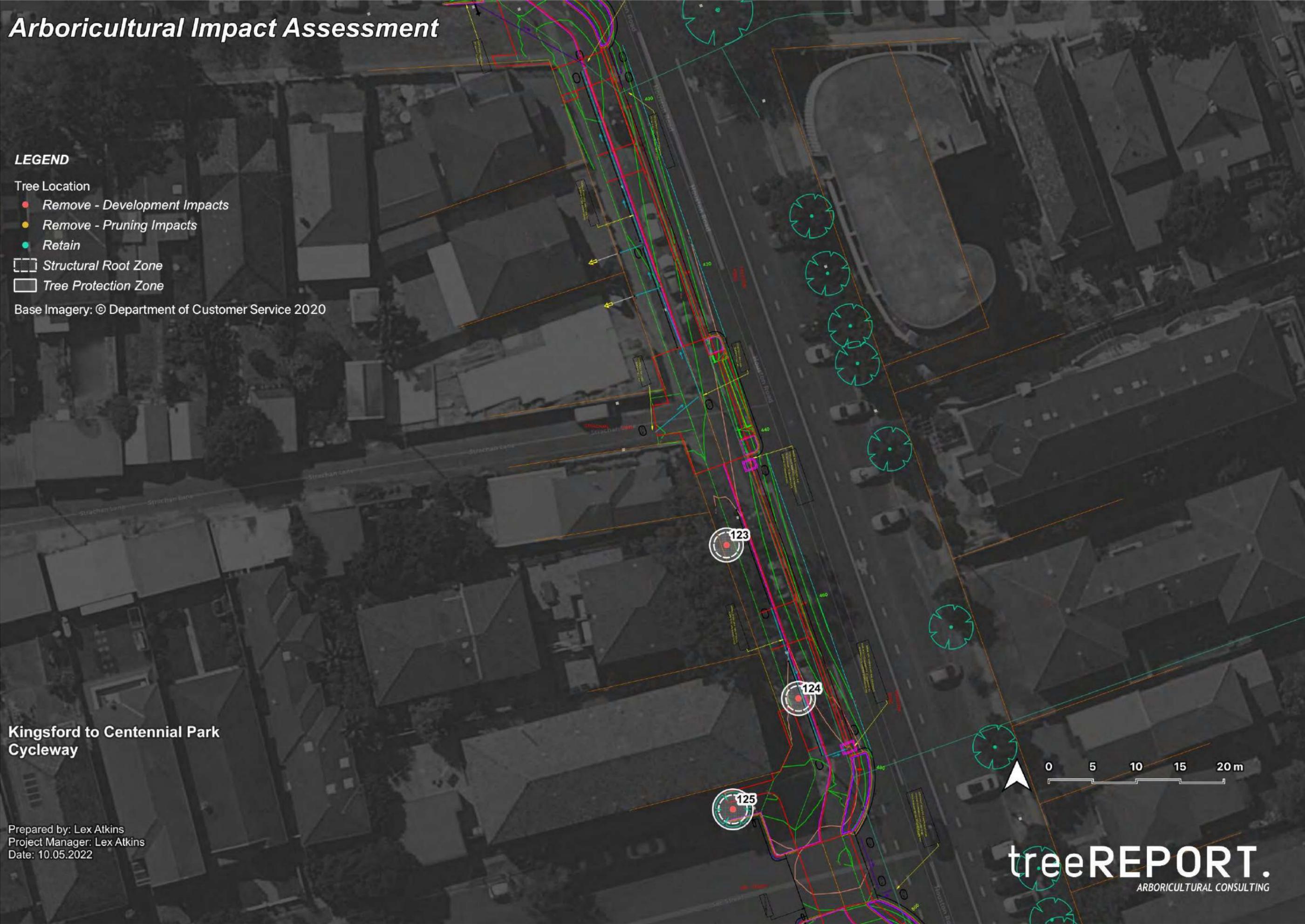
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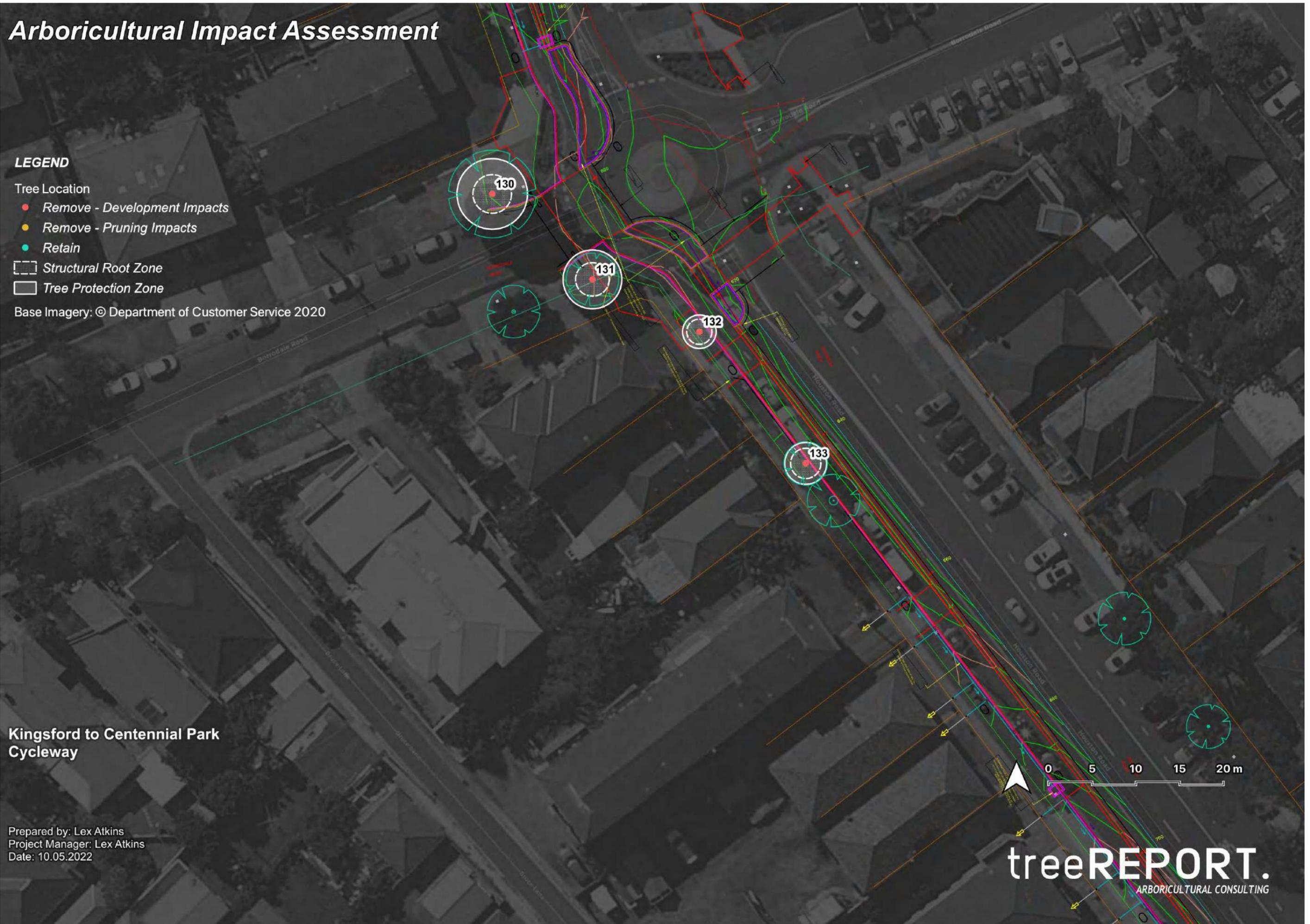
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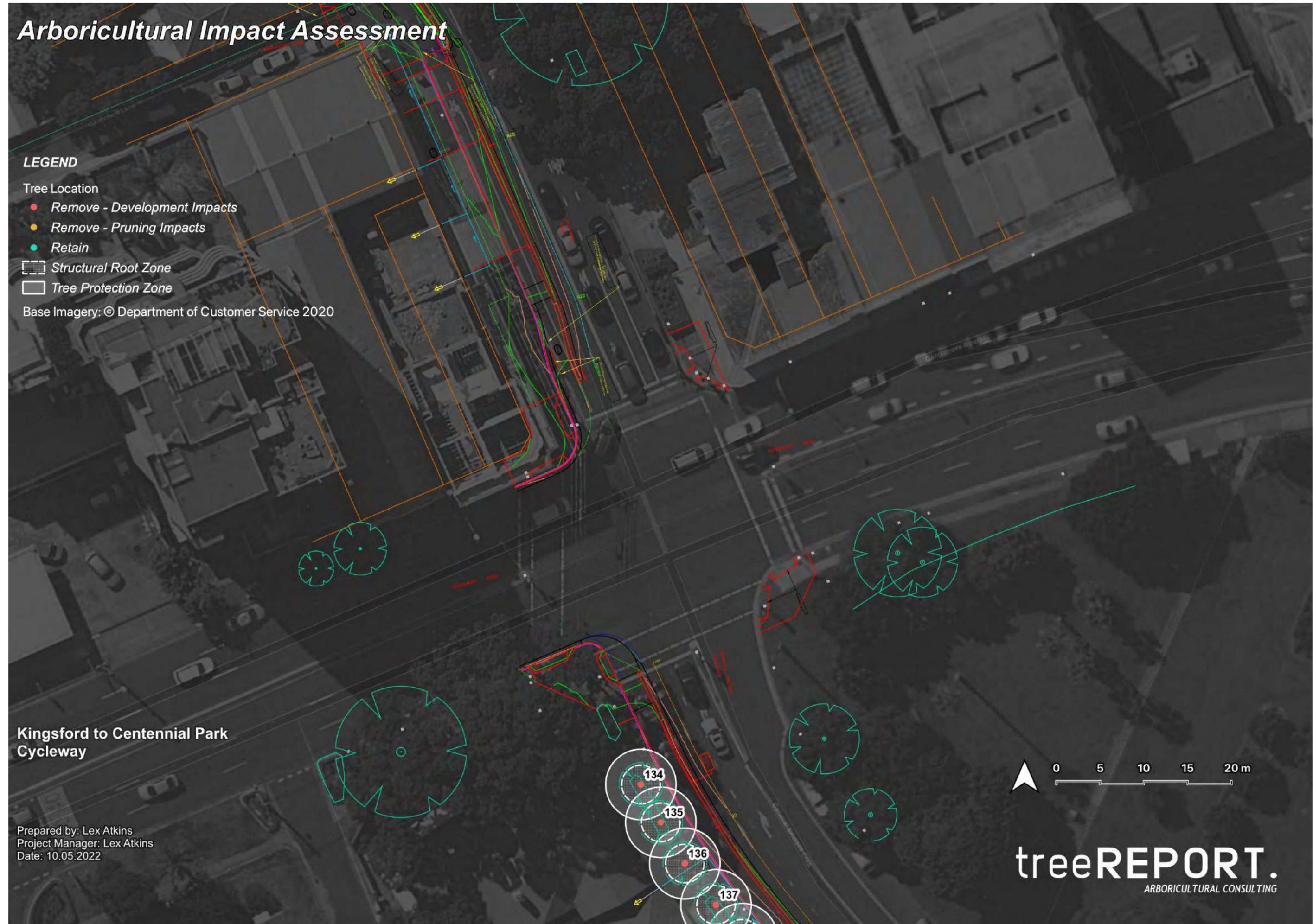
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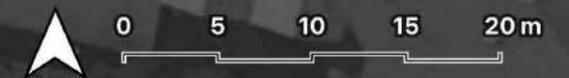
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Tree Location

● Remove - Development Impacts

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● Retain

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LEGEND

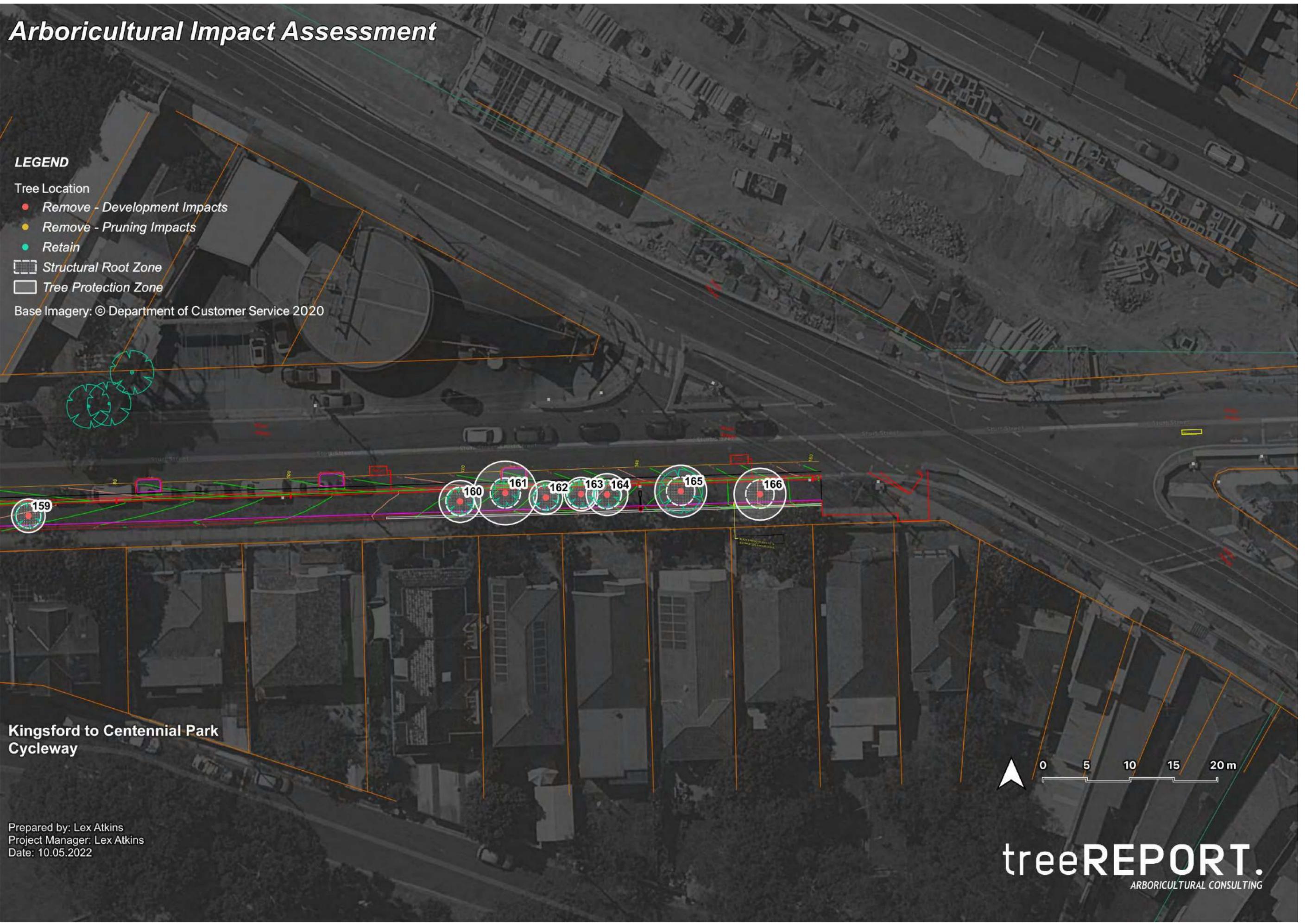
Tree Location

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- Remove - Pruning Impacts
- Retain

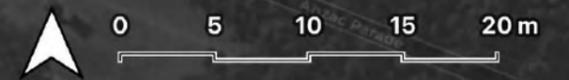
▭ Structural Root Zone

▭ Tree Protection Zone

Base Imagery: © Department of Customer Service 2020

Kingsford to Centennial Park
Cycleway

Prepared by: Lex Atkins
Project Manager: Lex Atkins
Date: 10.05.2022



treeREPORT.
ARBORICULTURAL CONSULTING

Appendix II **Tree Schedule**

Id.	Botanical name	Height (m)	Spread (m)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH 1 (Ømm)	DBH 2 (Ømm)	DBH 3 (Ømm)	Calculated DBH (mmØ)	SRZ (Rm)	TPZ (Rm)	Impact	Other notes	Proposal
1	<i>Corymbia maculata</i>	3	1	Good	Good	Juvenile	Low	Medium	Low	100	-	-	100	2	1.5	Major (>10%)	<ul style="list-style-type: none"> Located wholly within stockpile and plant movement area. 	Remove
2	<i>Corymbia maculata</i>	3	1	Poor	Fair	Juvenile	Low	Medium	Low	100	-	-	100	2	1.5	Major (>10%)	<ul style="list-style-type: none"> Located wholly within stockpile and plant movement area. 	Remove
3	<i>Corymbia maculata</i>	3	1	Good	Good	Juvenile	Low	Medium	Low	100	-	-	100	2	1.5	Major (>10%)	<ul style="list-style-type: none"> Located wholly within stockpile and plant movement area. 	Remove
4	<i>Eucalyptus saligna</i>	20	8	Good	Good	Mature	High	Medium	High	650	-	-	650	7.8	2.8	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
5	<i>Schinus molle</i>	5	4	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
6	<i>Schinus molle</i>	7	4	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
7	<i>Schinus molle</i>	5	4	Fair	Fair	Mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
8	<i>Schinus molle</i>	5	4	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
9	<i>Schinus molle</i>	5	4	Fair	Poor	Semi-mature	Low	Medium	Low	100	-	-	100	2	1.5	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
10	<i>Schinus molle</i>	7	9	Fair	Fair	Mature	Medium	Medium	Medium	450	-	-	450	5.4	2.4	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
11	<i>Schinus molle</i>	7	9	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
12	<i>Schinus molle</i>	5	4	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
13	<i>Schinus molle</i>	5	4	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
14	<i>Schinus molle</i>	6	5	Fair	Fair	Mature	Medium	Medium	Medium	200	150	-	250	3	2	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
15	<i>Schinus molle</i>	7	5	Fair	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
16	<i>Schinus molle</i>	4	2	Poor	Fair	Mature	Medium	Short	Low	200	-	-	200	2.4	1.7	Nil	<ul style="list-style-type: none"> Located below OHW. Proposed for removal irrespective of development impacts. 	Remove
17	<i>Schinus molle</i>	7	6	Fair	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
18	<i>Schinus molle</i>	5	6	Good	Fair	Mature	Medium	Medium	Medium	350	-	-	350	4.2	2.1	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
19	<i>Callistemon viminalis</i>	5	5	Fair	Fair	Mature	Medium	Medium	Medium	100	100	100	170	2	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
20	<i>Schinus molle</i>	5	3	Good	Fair	Mature	Medium	Medium	Medium	150	-	-	150	2	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
21	<i>Metrosideros excelsa</i>	4	4	Good	Fair	Mature	Medium	Medium	Medium	200	150	150	290	3.5	2.1	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
22	<i>Schinus molle</i>	7	5	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
23	<i>Schinus molle</i>	7	5	Fair	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove

Id.	Botanical name	Height (m)	Spread (m)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH 1 (Ømm)	DBH 2 (Ømm)	DBH 3 (Ømm)	Calculated DBH (mmØ)	SRZ (Rm)	TPZ (Rm)	Impact	Other notes	Proposal
24	<i>Schinus molle</i>	6	4	Fair	Fair	Mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
25	<i>Schinus molle</i>	8	6	Good	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
26	<i>Schinus molle</i>	7	6	Good	Fair	Mature	Medium	Medium	Medium	450	-	-	450	5.4	2.4	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major canopy pruning (>10%) required. 	Remove
27	<i>Schinus molle</i>	7	6	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major canopy pruning (>10%) required. 	Remove
28	<i>Schinus molle</i>	7	6	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major canopy pruning (>10%) required. 	Remove
29	<i>Schinus molle</i>	8	7	Good	Fair	Mature	Medium	Medium	Medium	450	-	-	450	5.4	2.4	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major canopy pruning (>10%) required. 	Remove
30	<i>Schinus molle</i>	6	5	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major canopy pruning (>10%) required. 	Remove
31	<i>Schinus molle</i>	6	5	Fair	Fair	Mature	Medium	Medium	Medium	450	-	-	450	5.4	2.4	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major canopy pruning (>10%) required. 	Remove
32	<i>Melaleuca bracteata</i>	6	3	Good	Fair	Mature	Medium	Medium	Medium	350	-	-	350	4.2	2.1	Nil	<ul style="list-style-type: none"> Proposed for removal irrespective of development impacts. 	Remove
33	<i>Schinus molle</i>	6	4	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
34	<i>Schinus molle</i>	6	4	Fair	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major canopy pruning (>10%) required. 	Remove
35	<i>Schinus molle</i>	6	5	Fair	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major canopy pruning (>10%) required. 	Remove
36	<i>Schinus molle</i>	4	4	Fair	Fair	Mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major canopy pruning (>10%) required. 	Remove
37	<i>Schinus molle</i>	5	6	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major canopy pruning (>10%) required. 	Remove
38	<i>Schinus molle</i>	6	6	Fair	Fair	Mature	Medium	Medium	Medium	450	-	-	450	5.4	2.4	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major canopy pruning (>10%) required. 	Remove
39	<i>Schinus molle</i>	6	6	Poor	Fair	Mature	Medium	Short	Low	200	-	-	200	2.4	1.7	Major (>10%)	<ul style="list-style-type: none"> Canopy dieback. Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
40	<i>Schinus molle</i>	9	4	Fair	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
41	<i>Schinus molle</i>	7	8	Fair	Fair	Mature	High	Medium	High	950	-	-	950	11.4	3.2	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
42	<i>Schinus molle</i>	5	3	Fair	Fair	Mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
43	<i>Schinus molle</i>	5	3	Fair	Fair	Mature	Medium	Medium	Medium	150	-	-	150	2	1.5	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
44	<i>Schinus molle</i>	6	3	Fair	Fair	Mature	Medium	Medium	Medium	150	-	-	150	2	1.5	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
45	<i>Schinus molle</i>	5	4	Fair	Fair	Mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
46	<i>Schinus molle</i>	4	2	Poor	Fair	Mature	Low	Short	Low	150	-	-	150	2	1.5	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
47	<i>Schinus molle</i>	8	5	Good	Fair	Mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove

Id.	Botanical name	Height (m)	Spread (m)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH 1 (Ømm)	DBH 2 (Ømm)	DBH 3 (Ømm)	Calculated DBH (mmØ)	SRZ (Rm)	TPZ (Rm)	Impact	Other notes	Proposal
48	<i>Jacaranda mimosifolia</i>	9	6	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
49	<i>Schinus molle</i>	9	5	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
50	<i>Schinus molle</i>	9	5	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
51	<i>Schinus molle</i>	9	5	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
52	<i>Schinus molle</i>	5	5	Fair	Fair	Mature	Medium	Medium	Medium	200	150	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
53	<i>Schinus molle</i>	5	4	Fair	Fair	Mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
54	<i>Schinus molle</i>	5	3	Fair	Fair	Mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
55	<i>Schinus molle</i>	5	3	Fair	Fair	Mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
56	<i>Callistemon viminalis</i>	5	4	Good	Fair	Mature	Medium	Medium	Medium	150	100	100	210	2.5	1.8	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
57	<i>Schinus molle</i>	7	5	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
58	<i>Callistemon viminalis</i>	4	3	Good	Fair	Mature	Medium	Medium	Medium	150	100	100	210	2.5	1.8	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
59	<i>Callistemon viminalis</i>	4	3	Good	Fair	Mature	Medium	Medium	Medium	150	100	100	210	2.5	1.8	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
60	<i>Schinus molle</i>	7	5	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
61	<i>Robinia pseudoacacia</i>	8	7	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
62	<i>Glochidion ferdinandi</i>	8	3	Good	Good	Mature	Medium	Medium	Medium	100	100	-	140	2	1.7	Major (>10%)	<ul style="list-style-type: none"> Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
63	<i>Eucalyptus eugenioides</i>	6	5	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
64	<i>Callistemon citrinus</i>	4	3	Good	Fair	Mature	Medium	Medium	Medium	150	-	-	150	2	1.7	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
65	<i>Eucalyptus eugenioides</i>	6	5	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
66	<i>Schefflera actinophylla</i>	4	3	Fair	Fair	Mature	Low	Short	Low	100	100	100	170	2	1.8	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
67	<i>Jacaranda mimosifolia</i>	7	5	Good	Fair	Mature	Medium	Medium	Medium	250	250	150	380	4.6	2	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
68	<i>Lagerstroemia indica</i>	5	3	Good	Fair	Mature	Low	Medium	Low	100	100	100	170	2	2.1	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
69	<i>Eriobotrya japonica</i>	2	1	Good	Fair	Semi-mature	Low	Medium	Low	100	-	-	100	2	1.5	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
70	<i>Callistemon viminalis</i>	5	6	Good	Fair	Mature	Medium	Medium	Medium	150	200	-	250	3	1.8	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
71	<i>Callistemon viminalis</i>	1	1	Good	Poor	Mature	Low	Short	Low	100	-	-	100	2	1.5	Major (>10%)	<ul style="list-style-type: none"> Stump regrowth. Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove

Id.	Botanical name	Height (m)	Spread (m)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH 1 (Ømm)	DBH 2 (Ømm)	DBH 3 (Ømm)	Calculated DBH (mmØ)	SRZ (Rm)	TPZ (Rm)	Impact	Other notes	Proposal
72	<i>Callistemon viminalis</i>	9	4	Good	Fair	Mature	Medium	Medium	Medium	300	150	-	340	4.1	2.1	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
73	<i>Callistemon viminalis</i>	9	4	Good	Fair	Mature	Medium	Medium	Medium	250	150	-	290	3.5	2.1	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
74	<i>Jacaranda mimosifolia</i>	10	5	Fair	Fair	Mature	Medium	Medium	Medium	550	-	-	550	6.6	2.1	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
75	<i>Jacaranda mimosifolia</i>	10	5	Fair	Fair	Mature	Medium	Medium	Medium	550	-	-	550	6.6	2.1	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
76	<i>Callistemon viminalis</i>	5	4	Good	Fair	Mature	Medium	Medium	Medium	150	100	100	210	2.5	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
77	<i>Schinus molle</i>	6	6	Fair	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
78	<i>Olea europaea</i>	9	8	Good	Good	Mature	High	Medium	High	350	150	-	380	4.6	2.3	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
79	<i>Olea europaea</i>	9	5	Good	Fair	Mature	High	Medium	High	350	150	-	380	4.6	2.3	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
80	<i>Tristaniopsis laurina</i>	7	8	Good	Good	Mature	High	Medium	High	200	150	150	290	3.5	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
81	<i>Callistemon viminalis</i>	5	5	Good	Fair	Mature	Medium	Medium	Medium	150	150	150	260	3.1	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
82	<i>Callistemon viminalis</i>	5	5	Good	Fair	Mature	Medium	Medium	Medium	200	200	100	300	3.6	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
83	<i>Callistemon viminalis</i>	5	4	Good	Fair	Mature	Medium	Medium	Medium	150	150	150	260	3.1	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
84	<i>Callistemon viminalis</i>	5	2	Fair	Fair	Mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Major (>10%)	<ul style="list-style-type: none"> Minor canopy pruning (<10%) required. 	Remove
85	<i>Callistemon viminalis</i>	6	5	Fair	Fair	Mature	Medium	Medium	Medium	350	-	-	350	4.2	2.1	Major (>10%)	<ul style="list-style-type: none"> Internodal pruning., Major canopy pruning (>10%) required. 	Remove
86	<i>Olea europaea</i>	4	3	Fair	Fair	Mature	Low	Medium	Low	150	-	-	150	2	1.5	Major (>10%)	<ul style="list-style-type: none"> Minor canopy pruning (<10%) required. 	Remove
87	<i>Olea europaea</i>	6	4	Fair	Fair	Mature	Medium	Medium	Medium	350	-	-	350	4.2	2.3	Major (>10%)	<ul style="list-style-type: none"> Major canopy pruning (>10%) required. 	Remove
88	<i>Schinus molle</i>	7	9	Fair	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
89	<i>Schinus molle</i>	7	4	Fair	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
90	<i>Schinus molle</i>	10	7	Fair	Fair	Mature	Medium	Medium	Medium	300	200	-	360	4.3	2.1	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
91	<i>Schinus molle</i>	6	8	Fair	Fair	Mature	Medium	Medium	Medium	450	-	-	450	5.4	2.4	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
92	<i>Callistemon viminalis</i>	5	3	Fair	Fair	Mature	Low	Medium	Low	100	100	100	170	2	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
93	<i>Callistemon viminalis</i>	5	3	Fair	Fair	Mature	Low	Medium	Low	150	-	-	150	2	1.5	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove
94	<i>Callistemon viminalis</i>	5	3	Fair	Fair	Mature	Low	Medium	Low	100	100	100	170	2	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove - D
95	<i>Callistemon viminalis</i>	5	3	Fair	Fair	Mature	Low	Medium	Low	150	100	-	180	2.2	1.7	Major (>10%)	<ul style="list-style-type: none"> Located below OHW. Major encroachment from proposed development footprint and/or 0.5m disturbance buffer. 	Remove - D

Id.	Botanical name	Height (m)	Spread (m)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH 1 (Ømm)	DBH 2 (Ømm)	DBH 3 (Ømm)	Calculated DBH (mmØ)	SRZ (Rm)	TPZ (Rm)	Impact	Other notes	Proposal
96	<i>Lophostemon confertus</i>	10	6	Good	Fair	Mature	Medium	Medium	Medium	250	200	-	320	3.8	2	Major (>10%)	• Major canopy pruning (>10%) required.	Remove
97	<i>Liquidambar styraciflua</i>	7	4	Good	Good	Mature	Medium	Medium	Medium	250	-	-	250	3	2	Major (>10%)	• Major canopy pruning (>10%) required.	Remove
98	<i>Lophostemon confertus</i>	10	6	Good	Fair	Mature	High	Medium	High	300	-	-	300	3.6	2	Major (>10%)	• Major canopy pruning (>10%) required.	Remove
99	<i>Schinus molle</i>	6	3	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	2	Major (>10%)	• Major canopy pruning (>10%) required.	Remove
100	<i>Schinus molle</i>	6	5	Fair	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Minor (<10%)	• Minor canopy pruning (<10%) required.	Retain
101	<i>Schinus molle</i>	6	8	Fair	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	• Major canopy pruning (>10%) required.	Remove
102	<i>Schinus molle</i>	6	8	Good	Fair	Mature	Medium	Medium	Medium	450	-	-	450	5.4	2.4	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
103	<i>Callistemon viminalis</i>	6	8	Fair	Fair	Mature	Medium	Medium	Medium	200	200	150	320	3.8	2	Major (>10%)	• Located below OHW. • Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
104	<i>Fraxinus griffithii</i>	4	3	Good	Good	Mature	Low	Medium	Low	100	100	100	170	2	1.7	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
105	<i>Schinus molle</i>	6	5	Good	Fair	Mature	Medium	Medium	Medium	350	-	-	350	4.2	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
106	<i>Eucalyptus haemastoma</i>	12	5	Good	Fair	Mature	High	Medium	High	400	-	-	400	4.8	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
107	<i>Jacaranda mimosifolia</i>	9	10	Good	Fair	Mature	Medium	Medium	Medium	250	200	-	320	3.8	2	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
108	<i>Eucalyptus haemastoma</i>	6	5	Good	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	• Located below OHW. • Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
109	<i>Callistemon viminalis</i>	6	5	Good	Fair	Mature	Medium	Medium	Medium	100	100	100	170	2	1.8	Major (>10%)	• Located below OHW. • Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
110	<i>Tristaniopsis laurina</i>	5	5	Good	Fair	Mature	Medium	Medium	Medium	150	150	100	230	2.8	2	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
111	<i>Plumeria sp.</i>	3	3	Good	Fair	Mature	Low	Medium	Low	150	150	100	230	2.8	1.5	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
112	<i>Tristaniopsis laurina</i>	5	5	Good	Fair	Mature	Medium	Medium	Medium	100	100	100	170	2	1.5	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
113	<i>Callistemon viminalis</i>	6	2	Poor	Fair	Mature	Medium	Short	Low	150	-	-	150	2	1.7	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
114	<i>Washingtonia robusta</i>	5	3	Good	Fair	Mature	Low	Medium	Low	250	-	-	250	3	1.8	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
115	<i>Eucalyptus tereticornis</i>	5	4	Good	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
116	<i>Washingtonia robusta</i>	12	3	Good	Fair	Mature	High	Medium	High	350	-	-	350	4.2	2.1	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
117	<i>Callistemon salignus</i>	9	7	Good	Fair	Mature	High	Medium	High	550	-	-	550	6.6	2.6	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
118	<i>Tristaniopsis laurina</i>	5	4	Good	Fair	Mature	Medium	Medium	Medium	150	150	100	230	2.8	2	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
119	<i>Tristaniopsis laurina</i>	5	4	Good	Fair	Mature	Medium	Medium	Medium	150	150	100	230	2.8	2	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove

Id.	Botanical name	Height (m)	Spread (m)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH 1 (Ømm)	DBH 2 (Ømm)	DBH 3 (Ømm)	Calculated DBH (mmØ)	SRZ (Rm)	TPZ (Rm)	Impact	Other notes	Proposal
120	<i>Tristaniopsis laurina</i>	5	5	Good	Fair	Mature	Medium	Medium	Medium	300	150	-	340	4.1	2.1	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
121	<i>Tristaniopsis laurina</i>	5	4	Good	Fair	Mature	Medium	Medium	Medium	300	150	-	340	4.1	2.1	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
122	<i>Tristaniopsis laurina</i>	4	3	Good	Fair	Mature	Medium	Medium	Medium	100	100	100	170	2	1.7	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
123	<i>Callistemon viminalis</i>	2	1	Good	Fair	Semi-mature	Low	Medium	Low	100	-	-	100	2	1.5	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
124	<i>Eucalyptus sp.</i>	4	2	Poor	Fair	Mature	Medium	Short	Low	150	-	-	150	2	1.5	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
125	<i>Eucalyptus haemastoma</i>	6	4	Good	Fair	Semi-mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
126	<i>Camellia japonica</i>	1	1	Good	Fair	Mature	Low	Short	Low	100	-	-	100	2	1.5	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
127	<i>Callistemon salignus</i>	6	5	Good	Good	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
128	<i>Callistemon salignus</i>	5	3	Good	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
129	<i>Melaleuca bracteata</i>	5	3	Good	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	2.1	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
130	<i>Lophostemon confertus</i>	12	6	Good	Good	Mature	High	Medium	High	350	-	-	350	4.2	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
131	<i>Cupaniopsis anacardioides</i>	9	6	Good	Good	Mature	High	Medium	High	200	150	150	290	3.5	2	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
132	<i>Cupaniopsis anacardioides</i>	3	2	Good	Fair	Mature	Low	Medium	Low	100	100	100	170	2	1.5	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
133	<i>Callistemon salignus</i>	6	4	Good	Fair	Mature	Medium	Medium	Medium	150	150	-	210	2.5	1.8	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
134	<i>Washingtonia robusta</i>	14	3	Good	Good	Mature	Medium	Long	High	350	-	-	350	4.2	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
135	<i>Washingtonia robusta</i>	14	3	Good	Good	Mature	Medium	Long	High	350	-	-	350	4.2	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
136	<i>Washingtonia robusta</i>	14	3	Good	Good	Mature	Medium	Long	High	350	-	-	350	4.2	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
137	<i>Washingtonia robusta</i>	14	3	Good	Good	Mature	Medium	Long	High	350	-	-	350	4.2	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
138	<i>Washingtonia robusta</i>	14	3	Good	Good	Mature	Medium	Long	High	350	-	-	350	4.2	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
139	<i>Washingtonia robusta</i>	14	3	Good	Good	Mature	Medium	Long	High	350	-	-	350	4.2	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
140	<i>Washingtonia robusta</i>	14	3	Good	Good	Mature	Medium	Long	High	350	-	-	350	4.2	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
141	<i>Washingtonia robusta</i>	12	3	Good	Good	Mature	Medium	Long	High	350	-	-	350	4.2	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
142	<i>Washingtonia robusta</i>	10	3	Good	Good	Mature	Medium	Long	High	350	-	-	350	4.2	2.3	Nil	• Located outside of the proposed area of disturbance.	Retain
143	<i>Washingtonia robusta</i>	10	3	Good	Good	Mature	Medium	Long	High	350	-	-	350	4.2	2.3	Minor (<10%)	• Minor encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Retain

Id.	Botanical name	Height (m)	Spread (m)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH 1 (Ømm)	DBH 2 (Ømm)	DBH 3 (Ømm)	Calculated DBH (mmØ)	SRZ (Rm)	TPZ (Rm)	Impact	Other notes	Proposal
144	<i>Lophostemon confertus</i>	14	6	Good	Fair	Mature	Medium	Medium	Medium	400	-	-	400	4.8	2.3	Minor (<10%)	• Minor encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Retain
145	<i>Livistona australis</i>	9	3	Fair	Good	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	• Located wholly within proposed area of disturbance.	Retain
146	<i>Platanus orientalis</i>	12	5	Good	Fair	Mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Major (>10%)	• Located below OHW. • Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
147	<i>Platanus orientalis</i>	10	4	Good	Fair	Mature	Medium	Medium	Medium	200	-	-	200	2.4	1.7	Minor (<10%)	• Minor encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Retain
148	<i>Liquidambar styraciflua</i>	12	6	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	• Located below OHW. • Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
149	<i>Liquidambar styraciflua</i>	12	6	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Major (>10%)	• Located below OHW. • Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
150	<i>Hibiscus tiliaceus</i>	6	7	Fair	Fair	Mature	Medium	Medium	Medium	200	200	-	280	3.4	2	Major (>10%)	• Located below OHW. • Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
151	<i>Livistona australis</i>	6	2	Good	Good	Semi-mature	Medium	Medium	Medium	250	-	-	250	3	1.8	Nil	• Located outside of the proposed area of disturbance.	Retain
152	<i>Eucalyptus acmenoides</i>	20	9	Fair	Fair	Mature	High	Medium	High	400	-	-	400	4.8	2.3	Minor (<10%)	• Minor encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Retain
153	<i>Liquidambar styraciflua</i>	10	6	Good	Fair	Mature	Medium	Medium	Medium	300	-	-	300	3.6	2	Nil	• Located outside of the proposed area of disturbance.	Retain
154	<i>Liquidambar styraciflua</i>	20	16	Good	Fair	Mature	High	Medium	High	600	-	-	600	7.2	2.7	Nil	• Located outside of the proposed area of disturbance.	Retain
155	<i>Eucalyptus robusta</i>	18	10	Fair	Fair	Mature	High	Medium	High	600	-	-	600	7.2	2.7	Minor (<10%)	• Minor encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Retain
156	<i>Eucalyptus robusta</i>	22	14	Good	Good	Mature	High	Medium	High	900	-	-	900	10.8	3.2	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
157	<i>Eucalyptus robusta</i>	22	14	Good	Good	Mature	High	Medium	High	850	-	-	850	10.2	3.1	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
158	<i>Eucalyptus robusta</i>	16	12	Good	Good	Mature	High	Medium	High	400	-	-	400	4.8	2.3	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
159	<i>Gleditsia triacanthos</i>	7	4	Fair	Fair	Mature	Low	Medium	Low	150	-	-	150	2	1.5	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
160	<i>Gleditsia triacanthos</i>	5	4	Fair	Fair	Mature	Low	Medium	Low	150	150	-	210	2.5	1.7	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
161	<i>Syzygium paniculatum</i>	4	3	Fair	Fair	Mature	Medium	Medium	Medium	200	200	150	320	3.8	1.8	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
162	<i>Gleditsia triacanthos</i>	5	4	Fair	Fair	Mature	Low	Medium	Low	150	-	-	150	2	1.5	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
163	<i>Syzygium paniculatum</i>	4	3	Fair	Fair	Mature	Medium	Medium	Medium	100	100	100	170	2	1.7	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
164	<i>Gleditsia triacanthos</i>	5	4	Fair	Fair	Mature	Low	Medium	Low	150	150	-	210	2.5	1.7	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
165	<i>Gleditsia triacanthos</i>	5	4	Fair	Fair	Mature	Low	Medium	Low	150	150	150	260	3.1	1.7	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove
166	<i>Gleditsia triacanthos</i>	5	4	Fair	Fair	Mature	Low	Medium	Low	150	150	150	260	3.1	1.7	Major (>10%)	• Major encroachment from proposed development footprint and/or 0.5m disturbance buffer.	Remove

Appendix III **Tree Protection Specifications**

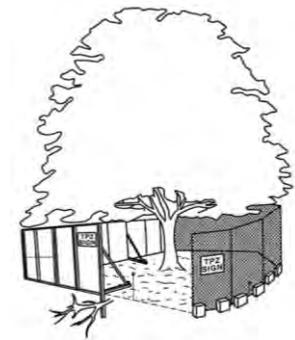
Tree protection fencing

Tree protection fencing must be established in the locations shown in **Appendix III**. Existing fencing, site hoarding or structures (such as a wall or building) may be used as tree protection fencing, providing the TPZ remains isolated from construction footprint.

Tree protection fencing must be installed prior to site establishment and remain intact until completion of works. Once erected, protective fencing must not be removed or altered without the approval of the project arborist.

Tree protection fencing shall be:

- Enclosed to the full extent of the TPZ (or as specified in the Recommendations and Tree Protection Plan).
- Temporary mesh panel fencing (minimum height 1.8m).
- Certified and inspected by the project arborist.
- Installed prior to the commencement of works.
- Prominently signposted with 300mm x 450mm boards stating, "NO ACCESS - TREE PROTECTION ZONE".



If tree protection fencing cannot be installed due to sloping or uneven ground, tree protection barriers must be installed as an alternative.

Specifications for tree protection barriers are as follows:

- Star pickets spaced at 2m intervals,
- Connected by a continuous high-visibility barrier/hazard mesh.
- Maintained at a minimum height of 1m.

Where approved works are required within the TPZ, fencing may be setback to provide construction access. Trunk, branch and ground protection shall be installed and must comply with *AS 4970-2009, Protection of Trees on Development Sites*. Any additional construction activities within the TPZ of the subject trees must be assessed and approved by the project arborist.

Trunk protection

Where provision of tree protection fencing is impractical or must be temporarily removed, trunk protection shall be installed to avoid accidental mechanical damage.

Specifications for trunk protection are as follows:

- A thick layer of carpet underfelt, geotextile fabric or similar wrapped around the trunk to a minimum height of 2m.
- 1.8m lengths of softwood timbers aligned vertically and spaced evenly around the trunk (with a small gap of approximately 50mm between the timbers).
- The timbers must be secured using galvanised hoop strap (aluminium strapping).

The timbers shall be wrapped around the trunk but not fixed to the tree, as this will cause injury/damage to the tree.

Ground protection

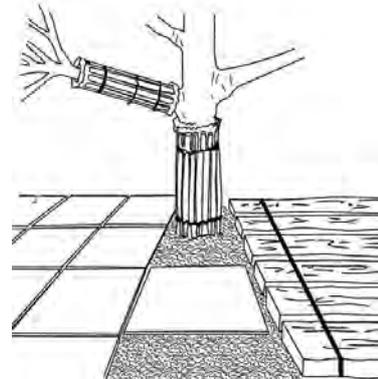
If temporary access for vehicle, plant or machinery is required within the TPZ ground protection shall be installed. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Where possible, areas of existing pavement shall be used as ground protection.

Specifications for light traffic access (<3.5 tonne) are as follows:

- Permeable membrane such as geotextile fabric.
- Layer of mulch or crushed rock (at minimum depth of 100mm)

Specifications for heavy traffic access (>3.5 tonne) are as follows:

- Permeable membrane such as geotextile fabric.
- Layer of lightly compacted road base (at minimum depth of 200mm)
- Geotextile fabric shall extend a minimum 300mm beyond the edge of the road base.



Pedestrian, vehicular and machinery access within the TPZ shall be restricted solely to areas where ground protection has been installed.

Excavations

All approved excavations (including root investigations) within the TPZ must be carried out using tree sensitive methods under supervision of the project arborist. These methods may include:

- Manual excavation (hand tools).
- Air spade.
- Hydro-vacuum excavations (sucker-truck).

Where approved by the project arborist, excavations using compact machinery fitted with a flat bladed bucket is permissible. Excavations using compact machinery shall be undertaken in small increments and guided by the Project Arborist who is to look for and prevent root damage to roots (>50mm in diameter).

Exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with geotextile fabric, and plastic membrane or glad wrap (where practical). Coverings shall be weighted to secure them in place. The geotextile fabric shall be kept damp at all times.

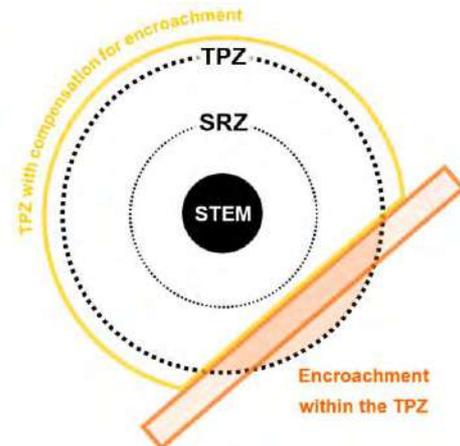
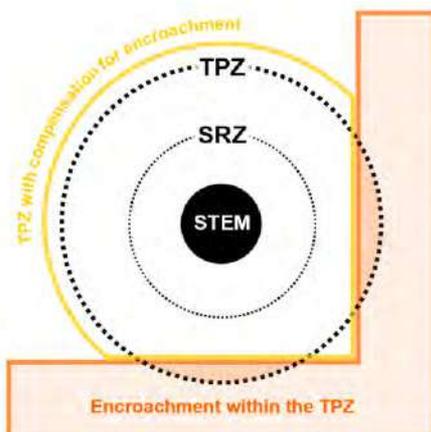
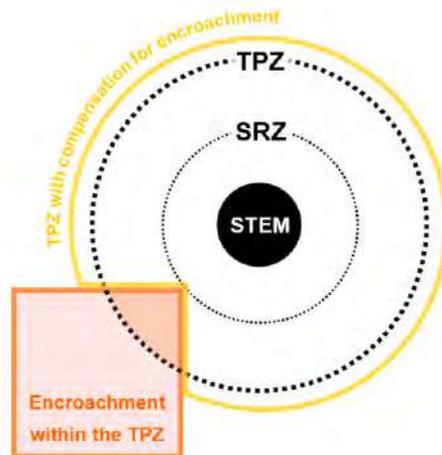
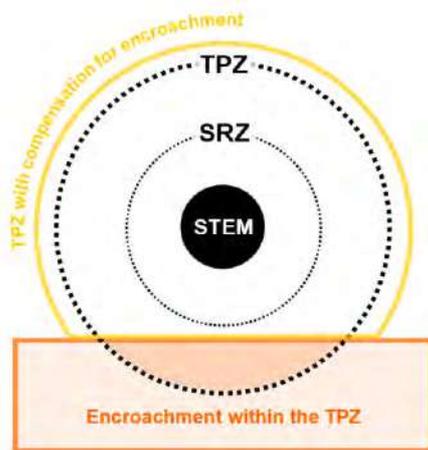
No over-excavation, battering or benching shall be undertaken beyond the footprint of any structure unless approved by the project arborist. Hand excavation and root mapping shall be undertaken along excavation lines within the TPZ prior to the commencement of mechanical excavation (to prevent tearing and shattering of roots from excavation equipment). Any conflicting roots (>50mm in diameter) shall be pruned using clean, sharp secateurs or a pruning saw to ensure a clean cut, free from tears. All root pruning must be documented and carried out by the project arborist.

Underground services

All underground services should be routed outside of the TPZ. If underground services need to be installed within the TPZ, they must be installed using tree sensitive excavation methods under supervision of the project arborist. Alternatively, boring methods such as horizontal directional drilling (HDD) may be used for underground service installation, providing the installation is at minimum depth of 800mm below grade. Excavations for entry/exit pits must be located outside the TPZ

Appendix IV **Encroachment within the TPZ**

The images below show how encroachment within the tree protection zone can be compensated for elsewhere.



Reference

Council of Standards Australia (August 2009)
AS 4970-2009 Protection of Trees on Development Sites
Standards Australia, Sydney.

Appendix V STARS© assessment matrix

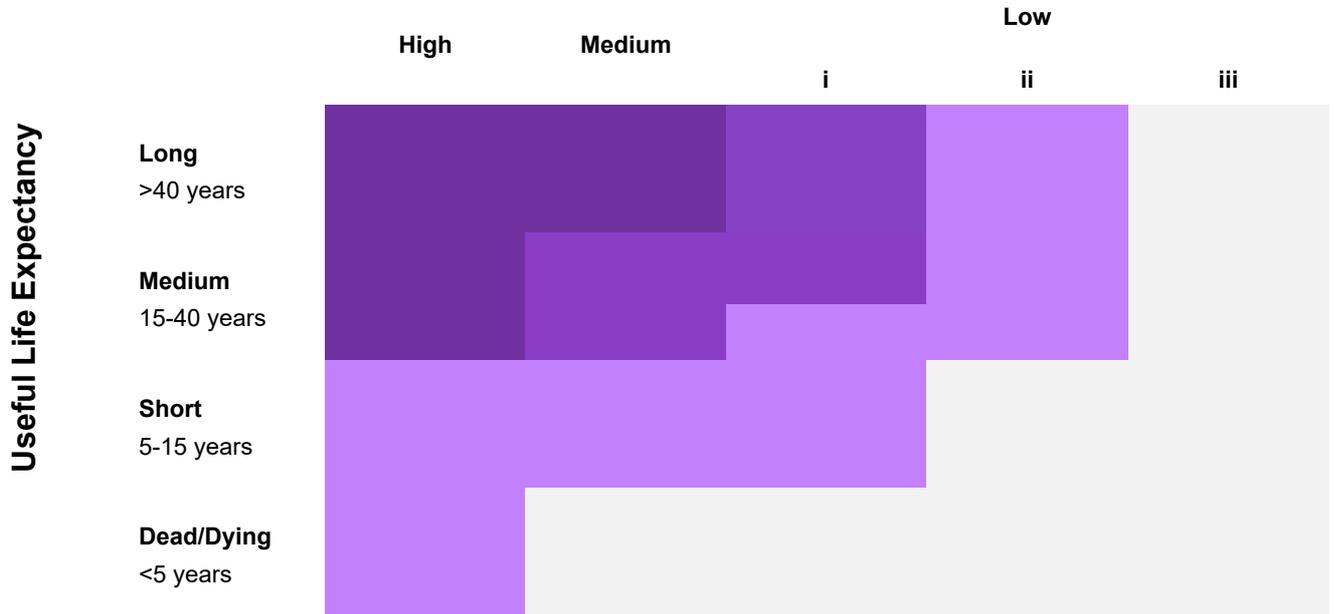
Tree Significance - Assessment Criteria - STARS®

Low	Medium	High
<p>i) Significance in landscape</p> <p>The tree is in fair-poor condition and good or low vigour.</p> <p>The tree has form atypical of the species</p> <p>The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings</p> <p>The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area</p> <p>The tree is a young specimen which may or may not have reached dimensions to be protected by local Tree Preservation Orders or similar protection mechanisms and can easily be replaced with a suitable specimen</p> <p>The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa in situ – tree is inappropriate to the site conditions</p> <p>The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms</p> <p>The tree has a wound or defect that has the potential to become structurally unsound.</p>	<p>The tree is in fair to good condition</p> <p>The tree has form typical or atypical of the species</p> <p>The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area</p> <p>The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street</p> <p>The tree provides a fair contribution to the visual character and amenity of the local area</p> <p>The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ</p>	<p>The tree is in good condition and good vigour</p> <p>The tree has a form typical for the species</p> <p>The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age.</p> <p>The tree is listed as a heritage item, threatened species or part of an endangered ecological community or listed on councils' significant tree register</p> <p>The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity.</p> <p>The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.</p> <p>The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ – tree is appropriate to the site conditions.</p>
<p>ii) Environmental Pest/Noxious Weed Species</p> <p>The tree is an environmental pest species due to its invasiveness or poisonous/allergenic properties.</p> <p>The tree is a declared noxious weed by legislation</p>		
<p>iii) Hazardous/Irreversible Decline</p> <p>The tree is structurally unsound and/or unstable and is considered potentially dangerous</p> <p>The tree is dead, or is in irreversible decline</p>		

Useful Life Expectancy - Assessment Criteria

Dead / Dying	Short	Medium	Long
Trees with a high level of risk that would need removing within the next 5 years.	Trees that appear to be retainable with an acceptable level of risk for 5-15 years.	Trees that appear to be retainable with an acceptable level of risk for 15-40 years.	Trees that appear to be retainable with an acceptable level of risk for more than 40 years.
Dead trees.			
Trees that should be removed within the next 5 years.	Trees that may only live between 5 and 15 more years.	Trees that may only live between 15 and 40 more years.	Structurally sound trees located in positions that can accommodate future growth.
Dying or suppressed or declining trees through disease or inhospitable conditions.	Trees that may live for more than 15 years but would be removed to allow the safe development of more suitable individuals.	Trees that may live for more than 40 years but would be removed to allow the safe development of more suitable individuals.	Storm damaged or defective trees that could be made suitable for retention in the long term by remedial tree surgery.
Dangerous trees through instability or recent loss of adjacent trees.	Trees that may live for more than 15 years but would be removed during the course of normal management for safety or nuisance reasons.	Trees that may live for more than 40 years but would be removed during the course of normal management for safety or nuisance reasons.	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.
Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form.			
Damaged trees that considered unsafe to retain.	Storm damaged or defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term.	Storm damaged or defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term.	
Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.			
Trees that will become dangerous after removal of other trees for the reasons.			

Tree Significance



Legend for Matrix Assessment

	<p>Priority for retention (High): These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 Protection of trees on development sites. Tree sensitive construction measures must be implemented if works are to proceed within the Tree Protection Zone.</p>
	<p>Consider for retention (Medium): These trees may be retained and protected. These are considered less critical; however, their retention should remain priority with the removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.</p>
	<p>Consider for removal (Low): These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.</p>
	<p>Priority for removal (Low): These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of the proposed development.</p>



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