



Arboricultural Impact Assessment and Tree Preservation Strategy

Address:

Mentone Grammar
Eastern Play Space

Report Commissioned By:

Mentone Grammar

Prepared By:

Mr. Joel Hinck *(Dip. Hort/Arb)*

Thursday 31st August 2023



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INTRODUCTION

This report is undertaken at the request of Mentone Grammar, the property owner. The report contents should not be made available to any other parties, other than those affected, unless by the express permission of McLeod Trees Pty Ltd.

This report is an analysis of a number of trees, which are located within the subject site at Mentone Grammar, Naples Road, Mentone, within neighbouring properties and the council owned nature strip.

The tree assessment and resolution plan identifies the health, condition and worthiness of retention of the trees, with a view to comment on, and make recommendations as to, the future management of the same in regard to any proposed redevelopment of the site.

The report covers a number of aspects, but essentially provides comment on the impact of any vegetation on the potential for redevelopment of the site and provides guidelines and management techniques to address any potential issues.

The results and recommendations of this assessment are provided within Section 7 of this report. This final section outlines the guidelines and recommended management techniques required for addressing tree management on the site prior to the planning stage of the development.

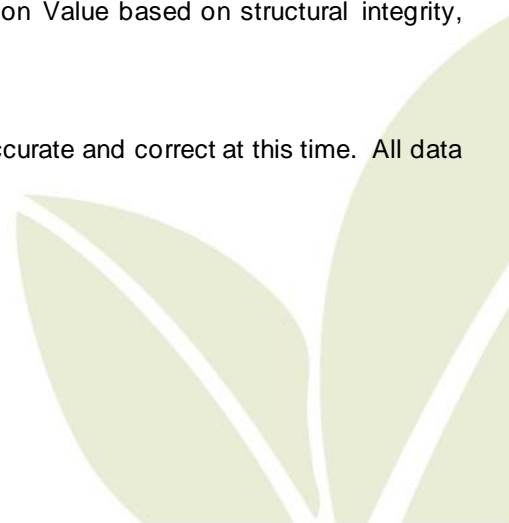


1. KEY OBJECTIVES

- 1.1. To inspect and assess the trees located within the subject site at Mentone Grammar, Naples Road, Mentone, within neighbouring properties and any council owned nature strips or public open space area, which have potential to be affected by proposed redevelopment of the site.
- 1.2. To provide information on the species, dimensions, health, structure, condition, useful life expectancy (ULE) and worthiness of retention of the trees and identify any potential conflicts between trees and the proposed development.
- 1.3. To provide recommendations and management strategies to resolve any potential conflicts between trees and proposed development.

2. METHODOLOGY

- 2.1. A site inspection was undertaken on 29th of August 2023. The nominated trees were inspected from the ground only and observations made of the growing environment and surrounding area. The trees were not climbed, and no samples of the trees or site soil were taken.
- 2.2. Observations were made of the trees to determine their health and condition, with measurements taken to establish canopy and trunk dimensions.
- 2.3. Tree Protection Zones were calculated using the Australian Standard – Protection of Trees on Development Sites (AS 4970 – 2009).
- 2.4. Each tree has been appointed an individual Tree Id. No. and marked accordingly on the attached site plan (Appendix 1).
- 2.5. The trees were classified with a Useful Life Expectancy and Retention Value based on structural integrity, condition and environmental and landscape character.
- 2.6. The data was recorded on the 29th of August 2023. All details were accurate and correct at this time. All data was collected on site by Mr. Joel Hinck (*Dip. Hort/Arb*).



3. REPORT LIMITATIONS

- 3.1. The survey undertaken in the vicinity of the subject site trees was of a preliminary nature, with a visual inspection being made from ground level only. None of the subject trees were climbed and no samples (soil, fungal etc.) were taken for analysis. Tree defects, not apparent from the ground-based visual inspection, are expressly excluded from the scope of this report.
- 3.2. In collecting the data, measurements such as Trunk Diameter (DBH) were obtained using a specialist diameter measuring tape, designed for the purpose, or estimated due to no access. Tree heights and canopy spread were estimated using the assessors' experience, education and knowledge. Tree Protection Zone calculations were made using the formula as per Australian Standard 4970 – 2009.
- 3.3. The report is limited, as per the brief, to offer recommendations in regard to tree retention and management strategies and associated recommended arboricultural works. Any works recommended, or further investigation, are not included as part of the scope of this report.

4. SUPPLEMENTARY INFORMATION

- 4.1. The following information was used in the preparation of this report:
 - Australian Standard – Protection of Trees on Development Sites (AS 4970 – 2009)
 - Landscape Site Plan – New Eastern Play Spaces – Craig Eldridge Design – 01/08/2023
 - City of Kingston Council Planning Scheme

5. OBSERVATIONS

- 5.1. The property is located within Kingston City Council, where it is classified as a General Residential Zone, Schedule 3 (GRZ3).
- 5.2. Kingston City Council Local Law requires an approved permit for the removal or destruction of any tree with a trunk circumference over 110cm measured at ground level.
- 5.3. There are no state planning overlays which effect vegetation management pertaining to the site.
- 5.4. There are eight (8) trees or tree groups located within the subject site, which have been assessed and will require consideration throughout proposed development process.
- 5.5. There zero (0) trees located within neighbouring properties, within close proximity to the adjoining boundary, which will require consideration throughout the proposed development process.
- 5.6. There are eight (8) trees located within the council owned road reserve adjacent to the subject site, these trees will require consideration throughout the proposed design discussions.
- 5.7. There are a number of smaller trees and shrubs within the subject site which are considered insignificant by way of size, species selection or retention value and do not require inclusion in this assessment.

6. DISCUSSION

6.1 Retention Values

A tree's worthiness of retention is based upon a number of criteria, taking into consideration such factors as health, condition and structure, as well as age, species, location and other factors which may affect the long-term tenure of the tree. The retention value does not take into consideration the future use of the land, rather that of the current situation and conditions, whereas worthiness of retention considers the tree's tenure in the future use of the landscape.

Trees designated as high retention value are those of good health, site significance and semi-mature trees with potential for good growth and development within the completed landscape.

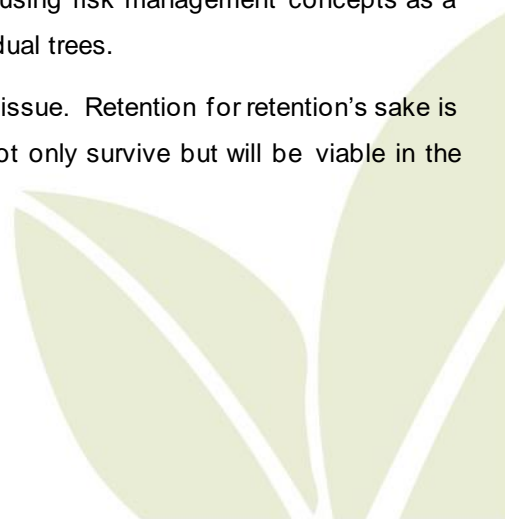
Trees designated as moderate retention value are those of fair health and structure which are considered to have potential within the future landscape, provided they do not impact upon the necessary development works. If these trees can be retained with minimal changes, they should be. However, they are not considered valuable enough to necessitate changes and adaptations to any development plans. By default, all trees on adjoining properties are classified with a moderate retention value, regardless of health or structural condition. Low retention values have been attributed to trees within the subject site that are either displaying poor health and/or structural integrity, are of inappropriate species selection, are inappropriate for the site or have reached their useful life expectancy.

6.2 Tree Retention

The existing trees on the site could be considered an opportunity or a constraint within the context of future management of the property; however, this would depend on many factors. The condition of the trees, the types of trees present and their location on the site are a few of the issues that may be considered when assessing which trees should be retained.

The possible retention and management of trees in the landscape relies on more substantial criteria than simply perceived visual benefits, although this is certainly considered. Issues such as tree health, structure and stability are fundamental and primary considerations in the process of identifying trees that could be potentially retained in the long term. These attributes are assessed using risk management concepts as a platform and they assist with determining the retention value of individual trees.

Importantly, tree removal should not always be considered a negative issue. Retention for retention's sake is a pointless activity if there is not a high possibility that the tree will not only survive but will be viable in the longer term (Hitchmough, 1994).



6.3 Tree Protection Zones

The Tree Protection Zone (TPZ) measurements provided are based on the Australian Standard for Protection of Trees on Development Sites (AS 4970 – 2009). These calculations are based on the formula of 12 times the Trunk Diameter (DBH).

Where it is deemed necessary that the development encroach upon the calculated Tree Protection Zone measurements of any tree to be retained, the Australian Standard allows for a 10% encroachment on one side of the TPZ, provided allowances are made to the remaining area and the Structural Root Zone (SRZ) is not compromised.

If during the preliminary design period it is determined that the area will require encroachment within the TPZ of greater than 10%, then exploratory root excavation may need to be undertaken in accordance with specifications as outlined in the Australian Standard.

6.4 Exploratory Root Excavation

Where it is proposed that development or excavation occur within the TPZ, exploratory root excavation may be required to be undertaken prior to the final design of any proposed works.

Wherever possible, any exploratory root excavation recommended must be undertaken in the form of hydro-excavation, or air spade technology which is able to remove the soil and leave an undamaged, skeletonised root system which can then be inspected by an arborist and root data collated accordingly.

By undertaking such exploration, the exact extent of roots within the area can be determined and installation methods and future design plans can be amended if necessary, utilising the knowledge of exact root development and locations. At which time an exact Structural Root Zone measurement can be calculated, and Root Location Graph be compiled to assist in design methods.

6.5 Overview of Site

All trees of value or significance within the site or on adjacent properties that warrant further discussion in terms of retention and protection recommendations have been assessed and are addressed within this report.



7. CONCLUSION AND RECOMMENDATIONS

7.1 Tree 1

- This tree is located within subject site and has a DBH of 90mm and a basal diameter of 120mm, resulting in a TPZ of 2.0m and a SRZ of 1.5m.
- This semi mature native tree represents a typical representation of the species and presents in fair health, with a fair structure and in fair overall condition.
- This tree has a low retention value and a low site significance.
- This tree is directly impacted by the proposed development and will subsequently require removal for the development to proceed as proposed.
- **This tree can be removed at any time, as it does not meet the protection requirements of Kingston Local Law.**

7.2 Tree 2

- This tree is located within subject site and has a DBH of 100mm and a basal diameter of 130mm, resulting in a TPZ of 2.0m and a SRZ of 1.5m.
- This semi mature native tree represents a typical representation of the species and presents in fair health, with a fair structure and in fair overall condition.
- This tree has a low retention value and a low site significance.
- This tree is directly impacted by the proposed development and will subsequently require removal for the development to proceed as proposed.
- **This tree can be removed at any time, as it does not meet the protection requirements of Kingston Local Law.**

7.3 Tree 3

- This tree is located within subject site, adjacent to the South-eastern boundary and has DBH of 410mm and a basal diameter of 580mm, resulting in a TPZ of 4.9m and a SRZ of 2.6m.
- This semi mature native tree represents typical representation of the species and presents in good health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a low site significance.
- No known construction works are proposed within this trees TPZ.
- This tree will require the implementation of tree protection measures for the duration of the proposed development.
- The area of the TPZ, should be designated for soft form landscaping only, with minimal compaction and/or grade change.
- Any underground services should be re-routed or diverted around the TPZ, to avoid conflict with this tree's root system. If this is unavoidable, non-destructive techniques such as directional boring or hydro-excavation should be considered.

- Therefore, providing tree protection measures as per Appendix 4 and AS 4970 - 2009 are implemented throughout the development process, this tree is unlikely to be directly impacted by the proposed development and should remain viable.

7.4 Tree 4

- This tree is located within subject site, adjacent to the South-eastern boundary and has a multiple stemmed DBH of 330mm and a basal diameter of 380mm, resulting in a TPZ of 4.0m and a SRZ of 2.2m.
- This mature native tree represents large ornamental specimen and presents in good health, with a fair structure and in fair overall condition.
- This tree has a low retention value and a low site significance.
- No known construction works are proposed within this trees TPZ.
- This tree will require the implementation of tree protection measures for the duration of the proposed development.
- The area of the TPZ should be designated for soft form landscaping only, with minimal compaction and/or grade change.
- Any underground services should be re-routed or diverted around the TPZ, to avoid conflict with this tree's root system. If this is unavoidable, non-destructive techniques such as directional boring or hydro-excavation should be considered.
- Therefore, providing tree protection measures as per Appendix 4 and AS 4970 - 2009 are implemented throughout the development process, this tree is unlikely to be directly impacted by the proposed development and should remain viable.

7.5 Tree 5

- This tree group is located within subject site, adjacent to the South-eastern boundary and has an approximate multiple stemmed DBH of 250mm and a basal diameter of 370mm, resulting in a TPZ of 3.0m and a SRZ of 2.2m.
- This mature native tree group represents four individual specimens and present in fair health, with a fair structure and in fair overall condition.
- This tree group has a moderate retention value and a low site significance.
- No known construction works are proposed within this trees TPZ.
- This tree group will require the implementation of tree protection measures for the duration of the proposed development.
- The area of the TPZ should be designated for soft form landscaping only, with minimal compaction and/or grade change.
- Any underground services should be re-routed or diverted around the TPZ, to avoid conflict with this tree's root system. If this is unavoidable, non-destructive techniques such as directional boring or hydro-excavation should be considered.

- Therefore, providing tree protection measures as per Appendix 4 and AS 4970 - 2009 are implemented throughout the development process, this tree is unlikely to be directly impacted by the proposed development and should remain viable.

7.6 Tree 6

- This tree is located within subject site, adjacent to the South-eastern boundary and has DBH of 180mm and a basal diameter of 230mm, resulting in a TPZ of 2.2m and a SRZ of 1.8m.
- This semi mature exotic tree represents typical representation of the species and presents in good health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a low site significance.
- No known construction works are proposed within this trees TPZ.
- This tree will require the implementation of tree protection measures for the duration of the proposed development.
- The area of the TPZ should be designated for soft form landscaping only, with minimal compaction and/or grade change.
- Any underground services should be re-routed or diverted around the TPZ, to avoid conflict with this tree's root system. If this is unavoidable, non-destructive techniques such as directional boring or hydro-excavation should be considered.
- Therefore, providing tree protection measures as per Appendix 4 and AS 4970 - 2009 are implemented throughout the development process, this tree is unlikely to be directly impacted by the proposed development and should remain viable.

7.7 Tree 7

- This council owned street tree is located within the Warrigal Road reserve, approximately 3.0m from the boundary and has a combined multiple stemmed DBH of 210mm and a basal diameter of 260mm resulting in a TPZ of 2.5m and a SRZ of 1.9m.
- This semi mature native tree represents a multiple stemmed specimen in fair health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a low site significance.
- No known development works are proposed within this trees TPZ.
- This tree will require the implementation of tree protection measures for the duration of any proposed development process.
- The area of TPZ within the subject site, should be designated for soft form landscaping only, with minimal compaction and/or grade change.
- Any proposed underground services should be re-routed or diverted around the TPZ, to avoid conflict with this tree root system. If this is unavoidable, non-destructive techniques such as directional boring at a minimum depth of 800mm or hydro-excavation should be considered under Arboricultural supervision.

- Therefore, providing tree protection measures as per Appendix 4 and AS 4970 - 2009 Protection of Trees on development Sites are implemented throughout the development process, this tree is unlikely to be directly impacted by the proposed development and should remain viable.

7.8 Tree 8

- This tree group is located within subject site, adjacent to the South-eastern boundary and has an approximate multiple stemmed DBH of 240mm and a basal diameter of 340mm, resulting in a TPZ of 2.9m and a SRZ of 2.1m.
- This mature exotic tree group represents seven individual specimen and present in fair health, with a fair structure and in fair overall condition.
- This tree group has a moderate retention value and a low site significance.
- No known construction works are proposed within this trees TPZ.
- This tree group will require the implementation of tree protection measures for the duration of the proposed development.
- The area of the TPZ should be designated for soft form landscaping only, with minimal compaction and/or grade change.
- Any underground services should be re-routed or diverted around the TPZ, to avoid conflict with this tree's root system. If this is unavoidable, non-destructive techniques such as directional boring or hydro-excavation should be considered.
- Therefore, providing tree protection measures as per Appendix 4 and AS 4970 - 2009 are implemented throughout the development process, this tree is unlikely to be directly impacted by the proposed development and should remain viable.

7.9 Tree 9

- This tree is located within subject site, adjacent to the South-eastern boundary and has an approximate multiple stemmed DBH of 230mm and a basal diameter of 380mm, resulting in a TPZ of 2.8m and a SRZ of 2.2m.
- This mature native tree represents a specimen in fair health, with a fair structure and in fair overall condition.
- This tree has a low retention value and a low site significance.
- No known development works are proposed within this trees TPZ.
- This tree will require the implementation of tree protection measures for the duration of the proposed development.
- The remainder of the TPZ, should be designated for soft form landscaping only, with minimal compaction and/or grade change.
- Any underground services should be re-routed or diverted around the TPZ, to avoid conflict with this tree's root system. If this is unavoidable, non-destructive techniques such as directional boring or hydro-excavation should be considered.

- Therefore, providing tree protection measures as per Appendix 4 and AS 4970 - 2009 are implemented throughout the development process, this tree is unlikely to be directly impacted by the proposed development and should remain viable.

7.10 Tree 10

- This council owned street tree is located within the Naples Road, road reserve, approximately 3.0m from the boundary and has a DBH of 590mm and a basal diameter of 640mm resulting in a TPZ of 7.1m and a SRZ of 2.7m.
- This mature native tree represents a large specimen in good health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a moderate site significance.
- This tree is directly impacted by the proposed widening of the road and addition of a bus lane and will subsequently require removal for the development to proceed as proposed.
- **This tree meets the protection requirements of Kingston Council Local Law; therefore, permission is required in order to remove this tree.**
- If permission to remove this tree cannot be obtained, significant design changes MUST be considered to ensure this tree is retained and protected, as per AS4970 – 2009 Protection of Trees on Development Sites and Appendix 4, for the duration of any proposed redevelopment within the subject site.

7.11 Tree 11

- This council owned street tree is located within the Naples Road reserve, approximately 3.0m from the boundary and has a DBH of 240mm and a basal diameter of 310mm resulting in a TPZ of 2.9m and a SRZ of 2.0m.
- This mature native tree represents a multiple stemmed specimen in fair health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a moderate site significance.
- This tree is directly impacted by the proposed widening of the road and addition of a bus lane and will subsequently require removal for the development to proceed as proposed.
- **This tree meets the protection requirements of Kingston Council Local Law; therefore, permission is required in order to remove this tree.**
- If permission to remove this tree cannot be obtained, significant design changes MUST be considered to ensure this tree is retained and protected, as per AS4970 – 2009 Protection of Trees on Development Sites and Appendix 4, for the duration of any proposed redevelopment within the subject site.

7.12 Tree 12

- This council owned street tree is located within the Naples Road reserve, approximately 3.0m from the boundary and has a DBH of 120mm and a basal diameter of 180mm resulting in a TPZ of 2.0m and a SRZ of 1.6m.
- This semi mature native tree represents a widely recognised weed species specimen in fair health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a low site significance.
- This tree is directly impacted by the proposed widening of the road and addition of a bus lane and will subsequently require removal for the development to proceed as proposed.
- **This tree meets the protection requirements of Kingston Council Local Law; therefore, permission is required in order to remove this tree.**
- If permission to remove this tree cannot be obtained, significant design changes MUST be considered to ensure this tree is retained and protected, as per AS4970 – 2009 Protection of Trees on Development Sites and Appendix 4, for the duration of any proposed redevelopment within the subject site.

7.13 Tree 13

- This council owned street tree is located within the Naples Road reserve, approximately 3.0m from the boundary and has a DBH of 70mm and a basal diameter of 120mm resulting in a TPZ of 2.0m and a SRZ of 1.5m.
- This semi mature exotic tree represents a widely recognised weed species specimen in fair health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a low site significance.
- This tree is directly impacted by the proposed widening of the road and addition of a bus lane and will subsequently require removal for the development to proceed as proposed.
- **This tree meets the protection requirements of Kingston Council Local Law; therefore, permission is required in order to remove this tree.**
- If permission to remove this tree cannot be obtained, significant design changes MUST be considered to ensure this tree is retained and protected, as per AS4970 – 2009 Protection of Trees on Development Sites and Appendix 4, for the duration of any proposed redevelopment within the subject site.

7.14 Tree 14

- This council owned street tree is located within the Naples Road reserve, approximately 3.0m from the boundary and has a DBH of 380mm and a basal diameter of 530mm resulting in a TPZ of 4.6m and SRZ of 2.5m.
- This mature native tree represents a co dominant stemmed specimen in fair health, with a poor structure and in fair overall condition.
- This tree has a moderate retention value and a moderate site significance.

- This tree is directly impacted by the proposed widening of the road and addition of a bus lane and will subsequently require removal for the development to proceed as proposed.
- **This tree meets the protection requirements of Kingston Council Local Law; therefore, permission is required in order to remove this tree.**
- If permission to remove this tree cannot be obtained, significant design changes MUST be considered to ensure this tree is retained and protected, as per AS4970 – 2009 Protection of Trees on Development Sites and Appendix 4, for the duration of any proposed redevelopment within the subject site.

7.15 Tree 15

- This council owned street tree is located within the Naples Road reserve, approximately 3.0m from the boundary and has a DBH of 590mm and a basal diameter of 630mm resulting in a TPZ of 7.1m and a SRZ of 2.7m.
- This mature native tree represents a large specimen in good health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a moderate site significance.
- This tree is directly impacted by the proposed widening of the road and addition of a bus lane and will subsequently require removal for the development to proceed as proposed.
- **This tree meets the protection requirements of Kingston Council Local Law; therefore, permission is required in order to remove this tree.**
- If permission to remove this tree cannot be obtained, significant design changes MUST be considered to ensure this tree is retained and protected, as per AS4970 – 2009 Protection of Trees on Development Sites and Appendix 4, for the duration of any proposed redevelopment within the subject site.

7.16 Tree 16

- This council owned street tree is located within the Naples Road reserve, approximately 3.0m from the boundary and has a DBH of 480mm and a basal diameter of 590mm resulting in a TPZ of 5.8m and a SRZ of 2.7m.
- This mature native tree represents a large specimen in fair health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a moderate site significance.
- This tree is directly impacted by the proposed widening of the road and addition of a bus lane and will subsequently require removal for the development to proceed as proposed.
- **This tree meets the protection requirements of Kingston Council Local Law; therefore, permission is required in order to remove this tree.**
- If permission to remove this tree cannot be obtained, significant design changes MUST be considered to ensure this tree is retained and protected, as per AS4970 – 2009 Protection of Trees on

Development Sites and Appendix 4, for the duration of any proposed redevelopment within the subject site.



7.17 Overview

There are no other trees or vegetation of significance within the site or adjoining properties which will affect redevelopment of the site.

All vegetation in the front and rear yard not discussed within this report represent small ornamental trees or shrubs and are recommended to be removed to allow the opportunity to develop a uniform landscape plan upon project completion.

Trees 1 and 2 – Are trees located within the subject site and are not considered worthy of retention or protection in the event of development or are likely to be directly impacted by the proposed development and will require removal to facilitate the development as proposed. These trees are recommended to be removed to allow for an unhindered development process. **These trees can be removed at any time as they do not meet the protection requirements of Kingston Council Local Law.**

Tree 3, 4, 5, 6, 8 and 9 – Are trees located within the subject site and are not impacted by the proposed development or have minor TPZ encroachments indicated by the proposed development. These trees will require the implementation of tree protection measures as per AS 4970 – 2009 Protection of Trees on Development Sites and Appendix 4, for the duration of the proposed development process.

Tree 7 – Is a council owned street tree, located within the Warragal Road road reserve not impacted by the proposed development. This tree **MUST** be protected throughout the development process, including the implementation of all tree protection measures as per AS 4970 – 2009 – Protection of Trees on Development Sites and Appendix 4 of this report.

Trees 10, 11, 12, 13, 14, 15 and 16 – Are council owned street trees located within the Naples Road reserve and are directly impacted by the proposed development and are therefore recommended to be removed to allow for an unhindered development process. **These council-owned street trees meet the protection requirements of Kingston Council Local Law, and as such will require further permission for removal.** If permission to remove these trees cannot be obtained, significant design changes **MUST** be considered to ensure this tree is retained and protected, as per AS4970 – 2009 Protection of Trees on Development Sites and Appendix 4, for the duration of any proposed redevelopment within the subject site.



8. REFERENCES

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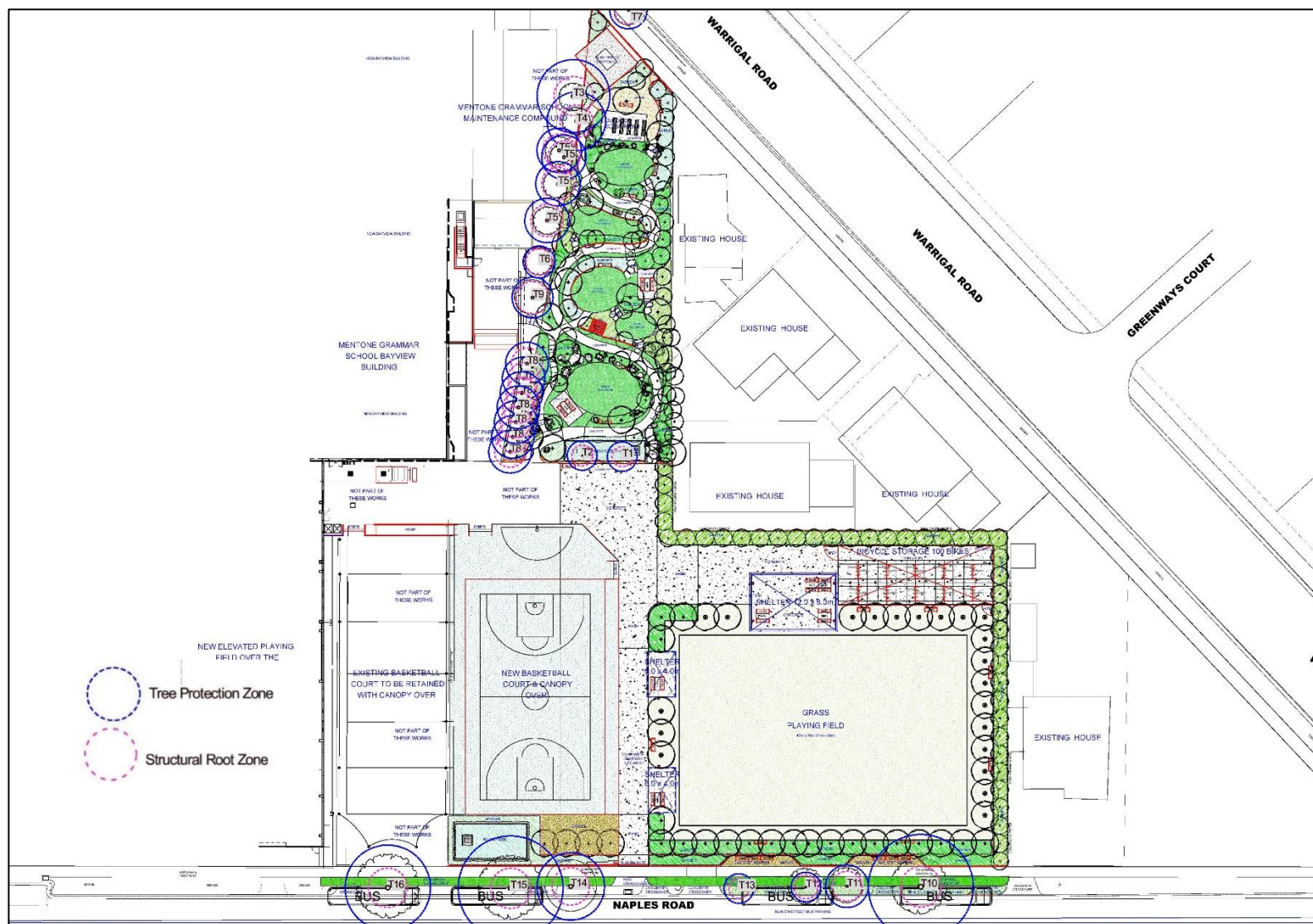
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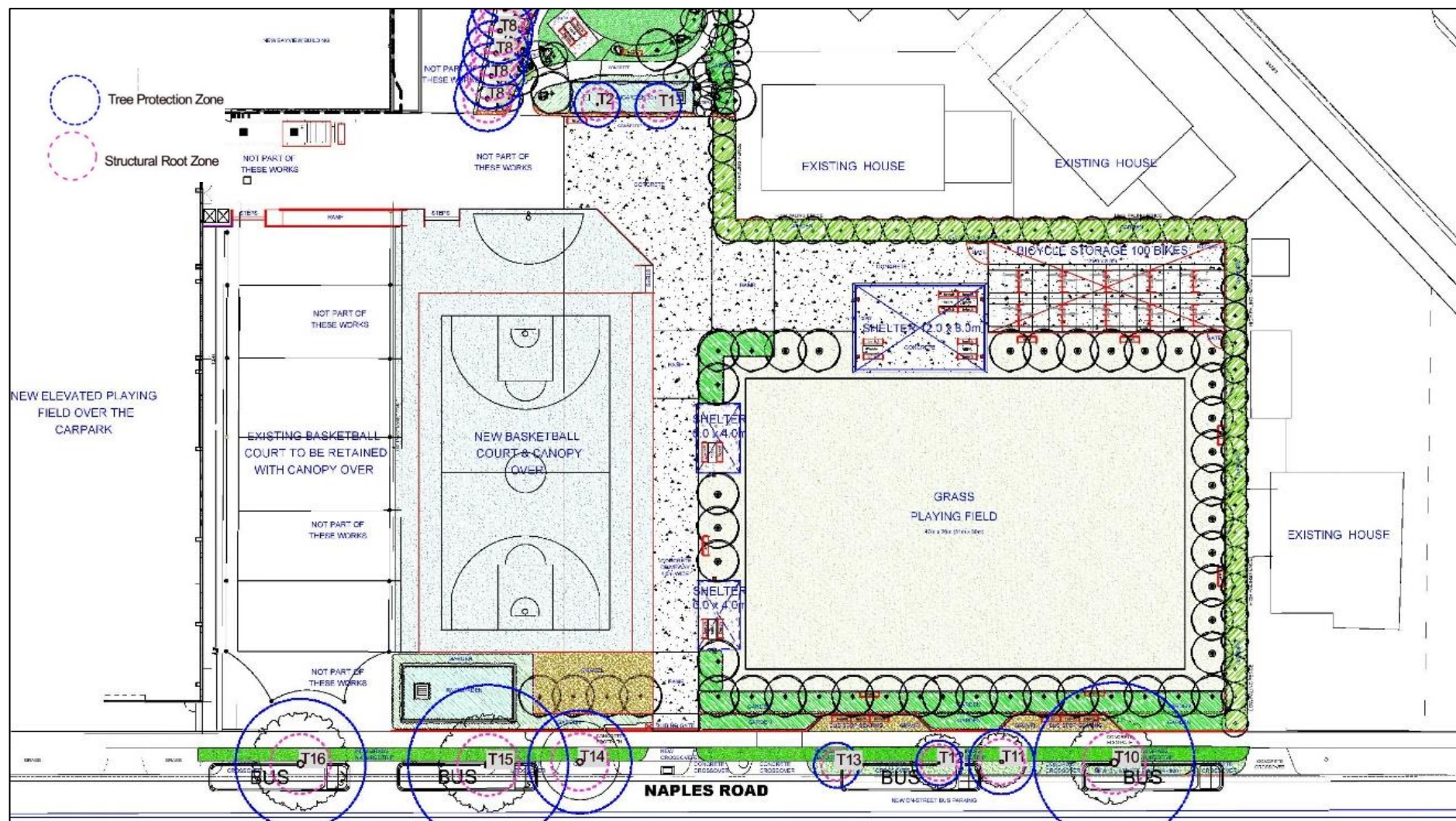
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APPENDIX 1: Proposed Site Plan (Tree location or size not to scale)



APPENDIX 1b: Proposed Site Plan (Tree location or size not to scale)



APPENDIX 2: Tree Data Details

Tree No	Genus	Species	Common Name	Origin	DBH (mm)	Basal diameter (mm)	TPZ (m)	SRZ (m)	Height (m)	Canopy Spread (m)	Health	Structure	Condition	Age	ULE (years)	Retention value	Site significance	Permit required	Observations	Recommendations
1	<i>Hymenosporum</i>	<i>flavum</i>	Native Frangipani	Aus. Native	90	120	2.0	1.5	4.0	2.0	Fair	Fair	Fair	Semi mature	6 - 20	Low	Low	No	Typical representation of the species, minor deadwood	Remove - Permission not required.
2	<i>Hymenosporum</i>	<i>flavum</i>	Native Frangipani	Aus. Native	100	130	2.0	1.5	5.0	2.0	Fair	Fair	Fair	Semi mature	6 - 20	Low	Low	No	Typical representation of the species, minor possum grazing	Remove - Permission not required.
3	<i>Eucalyptus</i>	<i>leucoxylon</i>	Yellow Gum	Vic. Native	410	580	4.9	2.6	7.0	9.0	Good	Fair	Fair	Semi mature	6 - 20	Moderate	Low	Yes	Spreading canopy, previously heavily pruned from overhead service wires, minor canopy decline, recent excavation works within TPZ	Retain - Implement tree protection measures.
4	<i>Melaleuca</i>	<i>viminialis</i>	Weeping Bottlebrush	Aus. Native	330	380	4.0	2.2	4.0	4.0	Good	Poor	Fair	Mature	6 - 20	Low	Low	No	Large ornamental specimen, multiple stems, previously heavily pruned	Retain - Implement tree protection measures.
5	<i>Myoporum</i>	<i>insulare</i>	Boobialla	Vic. Native	250	370	3.0	2.2	5.0	4.0	Fair	Fair	Fair	Mature	6 - 20	Moderate	Low	No	Represents four individual trees, leaning habit, unmanaged canopy, deadwood	Retain - Implement tree protection measures.
6	<i>Magnolia</i>	<i>grandiflora</i>	Magnolia	Exotic	180	230	2.2	1.8	5.0	3.0	Good	Fair	Fair	Semi mature	6 - 20	Low	Low	No	Typical ornamental specimen	Retain - Implement tree protection measures.
7	<i>Agonis</i>	<i>flexuosa</i>	Willow Myrtle	Aus. Native	210	260	2.5	1.9	5.0	3.0	Fair	Fair	Fair	Semi mature	6 - 20	Moderate	Low	Yes	Council owned street tree, leaning habit	Retain - Implement tree protection measures.
8	<i>Cupressus</i>	<i>leylandii</i>	Leyland Cypress	Exotic	240	340	2.9	2.1	7.0	4.0	Fair	Fair	Fair	Mature	6 - 20	Moderate	Low	No	Represents seven individual trees, hedge row, previously heavily pruned	Retain - Implement tree protection measures.
9	<i>Melaleuca</i>	<i>armillaris</i>	Bracelet Honey Myrtle	Vic Native	230	380	2.8	2.2	5.0	5.0	Fair	Fair	Fair	Mature	6 - 20	Low	Low	No	Multiple stems, suppressed canopy	Retain - Implement tree protection measures.

Tree No	Genus	Species	Common Name	Origin	DBH (mm)	Basal diameter (mm)	TPZ (m)	SRZ (m)	Height (m)	Canopy Spread (m)	Health	Structure	Condition	Age	ULE (years)	Retention value	Site significance	Permit required	Observations	Recommendations
10	<i>Banksia</i>	<i>integrifolia</i>	Coastal Banksia	Vic Native	590	640	7.1	2.7	11.0	10.0	Good	Fair	Fair	Mature	6 - 20	Moderate	Moderate	Yes	Council owned street tree, bifurcated co dominant stems	Remove - Permission from relevant authority required.
11	<i>Melaleuca</i>	<i>linariifolia</i>	Narrow Leaved Paperbark	Vic Native	240	310	2.9	2.0	4.0	4.0	Fair	Fair	Fair	Mature	6 - 20	Moderate	Moderate	Yes	Council owned street tree, multiple stems	Remove - Permission from relevant authority required.
12	<i>Pittosporum</i>	<i>undulatum</i>	Sweet Pittosporum	Vic Native	120	180	2.0	1.6	4.0	3.0	Fair	Fair	Fair	Semi mature	6 - 20	Moderate	Moderate	Yes	Council owned street tree	Remove - Permission from relevant authority required.
13	<i>Ligustrum</i>	<i>lucidum</i>	Broad Leaved Privet	Exotic	70	120	2.0	1.5	2.0	1.0	Fair	Fair	Fair	Semi mature	6 - 20	Moderate	Low	Yes	Council owned street tree, basal wound	Remove - Permission from relevant authority required.
14	<i>Melaleuca</i>	<i>bracteata</i>	Black Tea Tree	Aus Native	380	530	4.6	2.5	7.0	8.0	Fair	Poor	Fair	Mature	6 - 20	Moderate	Moderate	Yes	Council owned street tree, co dominant stems	Remove - Permission from relevant authority required.
15	<i>Melaleuca</i>	<i>styphelioides</i>	Prickly Leaved Paperbark	Aus Native	590	630	7.1	2.7	8.0	8.0	Fair	Fair	Fair	Mature	6 - 20	Moderate	Moderate	Yes	Council owned street tree, unfavourable attachments, asymmetrical canopy bias	Remove - Permission from relevant authority required.
16	<i>Melaleuca</i>	<i>styphelioides</i>	Prickly Leaved Paperbark	Aus Native	480	590	5.8	2.7	9.0	8.0	Fair	Fair	Fair	Mature	6 - 20	Moderate	Moderate	Yes	Council owned street tree, unfavourable attachments, extended lateral limbs	Remove - Permission from relevant authority required.

APPENDIX 3: Definition of Terms

The following is a definition of terms used for arboricultural assessments.

Tree # - Identification number provided and tagged for individual trees.

Genus/Species - Botanical name of tree to Genus and species level.

Common Name - Common name of tree.

Diameter at Breast Height (DBH) - DBH is measured at 1400mm above ground level. In cases where the tree has multiple stems, the measurement is taken at the narrowest point below the stems, or ground level on multi-spurred specimens.

Height - Average height in metres measured from ground only using specialised equipment where possible or estimated from ground level.

Canopy Spread - The average distance in meters of the spread of the canopy. For simplification, the distance measured North – South and East - West is averaged out to provide an overall canopy spread measurement.

Health - Health pertains to the tree vigour, performance, and ability to withstand pathogenic entry. Health is measured as a rating of Good, Fair to Poor.

Structure - Pertains to the physical structure of the tree, including the main scaffold branches and roots. Structure includes those attributes that may influence the probability of major trunk, root or limb failure. Structure is measured as a rating of Good, Fair to Poor

Condition - Condition is a combination of health and structure and provides an overall rating for each tree. As such a tree with a good health rating and a poor structure rating would be classified with a rating of Fair. Condition is measured as a rating of Good, Fair to Poor.

Retention Value - Retention Value of a tree pertains to the worthiness for retention. Based on a combination of factors, including species, location, condition, and future growth potential. The retention value is classified as a rating of High, Moderate and Low.

Useful Life Expectancy (ULE) - ULE quantifies the span of time the tree might reasonably be expected to provide useful amenity value, with an acceptable level of safety with acceptable standards of maintenance.

ULE classifications are measured over the following time spans.

- 0
- < 5 years
- 6 – 20 years
- > 20 years



Tree Protection Zone (TPZ) - The Tree Protection Zone is a specified area above and below ground and at a given distance from the trunk set aside for the protection of the trees' roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

The TPZ is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

The TPZ is calculated using the formula as outlined in the Australian Standard (AS 4970 – 2009).

Structural Root Zone (SRZ) – The Structural Root Zone is the area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be a much larger area.

The SRZ is calculated using the formula as outlined in the Australian Standard (AS 4970 – 2009).



APPENDIX 4: Tree Protection Guidelines

1. General

- 1.1. Tree Protection measures include a range of activities and structures. Structures are used to identify and isolate the Tree Protection Zone (TPZ) (refer to section 3).
- 1.2. The TPZ is a restricted area usually delineated by protective fencing (or use of an existing structure such as an existing fence or wall). It is installed prior to site establishment and remain intact until completion of the works.
- 1.3. Some works and activities within the TPZ may be authorized by the determining authority. These must be supervised by the project arborist. Any additional encroachment that becomes necessary as the site works progress must be reviewed by the project arborist and be acceptable to the determining authority before being carried out.

2. Activities restricted within the TPZ

- Activities generally excluded from the TPZ include but are not limited to:
- machine excavation including trenching;
- excavation for fencing;
- cultivation;
- storage;
- preparation of chemicals, including preparation of cement products;
- parking of vehicles and plant;
- refuelling;
- dumping of waste;
- wash down and cleaning of equipment;
- placement of fill;
- lighting of fires;
- soil level changes;
- temporary or permanent installation of utilities and signs, and
- physical damage to the tree.

3. Protective fencing

- 3.1. Fencing should be erected before any machinery or materials are brought onto the site and before the commencement of works, including demolition. Once erected, protective fencing must not be removed or altered without approval by the project arborist. The TPZ should be secured to restrict access.
- 3.2. AS 4687 specifies applicable fencing requirements. Shade cloth or similar should be attached to reduce the transport of dust, other particulate matter and liquids into the protected area.
- 3.3. Fence posts and supports should have a diameter greater than 20mm and be located clear of roots.
- 3.4. Existing perimeter fencing and other structures may be suitable as part of the protective fencing.

4. Signs

- 4.1. Signs identifying the TPZ should be placed around the edge of the TPZ and be visible from within the development site. The lettering on the sign should comply with AS 1319. A warning sign shall prominently be displayed on each fence. The sign shall be a minimum of 300mm X 200mm and clearly state: **"WARNING – Tree Protection Zone – This fence must not be removed without authorisation or consent"**.

5. Other Tree Protection Measures

5.1. General:

When tree protection fencing cannot be installed or requires temporary removal, other tree protection measures should be used, including those set out below.

5.2. Trunk and branch protection:

Where necessary, install protection to the trunk and branches of trees as required. The materials and positioning of protection are to be specified by the project arborist.

Do not attach temporary power lines, stays, guys etc. to the tree. Do not drive nails into the trunks or branches.

5.3. Ground protection:

If temporary access for machinery is required within the TPZ ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards.

These measures may be applied to root zones beyond the TPZ.

5.4. Root protection during works within the TPZ

Some approved works within the TPZ, such as regrading, installation of piers or landscaping may have the potential to damage roots.

If the grade is to be raised the material should be coarser or more porous than the underlying material. Depth and compaction should be minimized.

Manual excavation should be carried out under the supervision of the project arborist to identify roots critical to tree stability. Relocation or redesign of works may be required.

Where the project arborist identifies roots to be pruned within or at the outer edge of the TPZ, they should be pruned with a final cut to undamaged wood. Pruning cuts should be made with sharp tools such as secateurs, pruners, handsaws or chainsaws. Pruning wounds should not be treated with dressings or paints. It is not acceptable for roots within the TPZ to be 'pruned' with machinery such as backhoes or excavators.

Where roots within the TPZ are exposed by excavation, temporary root protection should be installed to prevent them drying out. This may include jute mesh or hessian sheeting as multiple layers over exposed roots and excavated soil profile, extending to the full depth of the root zone. Root protection sheeting should be pegged in place and kept moist during the period that the root zone is exposed.

Other excavation works in proximity to trees, including landscape works such as paving, irrigation, and planting can adversely affect root systems. Seek advice from the project arborist.

5.5. Installing underground services within the TPZ

All services should be routed outside the TPZ. If underground services must be routed within the TPZ, they should be installed by directional drilling or in manually excavated trenches.

The directional drilling bore should be at least 800mm deep. The project arborist should assess the likely impacts of boring and bore pits on retained trees.

For manual excavation of trenches the project arborist should advise on roots to be retained and should monitor the works. Manual excavation may include the use of pneumatic and hydraulic tools.

5.6. Scaffolding

Where scaffolding is required it should be erected outside the TPZ. Where it is essential for scaffolding to be erected within the TPZ, branch removal should be minimized. This can be achieved by designing scaffolding to avoid branches or tying back branches. Where pruning is unavoidable it must be specified by the project arborist in accordance with AS 4373.

NOTE: Pruning works may require approval by determining authority.

Ground below the scaffolding should be protected by boarding (e.g. scaffold board or plywood sheeting). Where access is required, a board walk, or other surface material should be installed to minimize soil compaction. Boarding should be placed over a layer of mulch and impervious sheeting to prevent soil contamination. The boarding should be left in place until the scaffolding is removed.

5.7. Maintaining the TPZ

- **Mulching**

The area within the TPZ should be mulched. The mulch must be maintained to a depth of 50 - 100 mm using material that complies with AS 4454. Where the existing landscape within the TPZ is to remain unaltered (e.g. garden beds or turf) mulch may not be required.

- **Watering**

Soil moisture levels should be regularly monitored by the project arborist. Temporary irrigation or watering may be required within the TPZ. An above-ground irrigation system should be installed and maintained by a competent individual.

- **Weed removal**

All weeds should be removed by hand without soil disturbance or should be controlled with appropriate use of herbicide.

APPENDIX 5: Assumptions and Limiting Conditions

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