Arboricultural Impact Assessment

Address:
93 Monash Street,
Sunshine

Report Commissioned By:
Clarke Hopkins Clarke

Prepared By:
Mr. Joel Hinck (Dip. Hort/Arb)

Thursday 18th March 2021

McLEOD TREES
For a greener future, better managed.

Contents

INTRODUCTION

This report is undertaken at the request of Clarke Hopkins Clarke, the proposed developer. 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 nominated trees, which are located within the subject site at 93 Monash Street, Sunshine 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 stage 1 of the 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 93 Monash Street, Sunshine, 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 the 17th March 2021. 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 17th March 2021. 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)
- Existing Site/Demolition Plan – Clarke Hopkins Clarke –04/03/2021
- Proposed Plan - Stage 1 – Clarke Hopkins Clarke – 04/03/2021
- Brimbank City Council Planning Scheme

5. OBSERVATIONS

5.1. The property is located within Brimbank City Council, where it is classified as a Neighbourhood Residential Zone, Schedule 1 (NRZ1). There are no local laws or planning overlays which effect vegetation on this site.

5.2. There are Two (2) council owned trees, located within the council road reserve on Station Place, Sunshine that will require protection throughout the development process.

5.3. There are Nine (9) trees, located within the property boundaries, which will require assessment and further discussion regarding the proposed stage 1 redevelopment within the site.

6. DISCUSSION

6.1 Retention Values

A trees 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 trees 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 the front setback of the subject site, approximately 1.8m from the Southern boundary and has a DBH of 790mm and a basal diameter of 1050mm, resulting in a TPZ of 9.5m and an SRZ of 3.4m.
- This mature native species presents with a bifurcated primary union, with fungal fruiting bodies and extensive associated decay present. This tree represents a tree in fair health, with a poor structure and in fair condition overall.
- This tree has a moderate retention value and a moderate site significance.
- This tree is designated for removal as per the demolition plans.
- This tree is directly impacted by the proposed demolition and construction of a learning building and associated courtyard, subsequently the removal of this tree is required for the development to proceed as proposed.
- This tree can be removed without further permission.

7.2 Tree 2

- This tree is located within the front setback of the subject site, 1.8m from the Southern boundary and has a DBH of 350mm and a basal diameter of 390mm, resulting in a TPZ of 4.2m and an SRZ of 2.2m.
- This native species has a co dominant stemmed from and represents a specimen in good health, with a fair structure and in fair condition overall.
- This tree has a moderate retention value and a moderate site significance.
- The proposed demolition of the existing building and proposed deck installation represents a minor encroachment to the TPZ of this tree.
- This tree will require the implementation of tree protection measures for the duration of the 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 underground services should be re-routed or diverted around the TPZ, to avoid conflict with this trees 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 of this report 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.

7.3 Tree 3

- This tree is located within the front setback of the subject site, 2.0m from the Southern boundary and has a DBH of 510mm and a basal diameter of 610mm, resulting in a TPZ of 6.1m and an SRZ of 2.7m.
- This native species has a co dominant stemmed from and represents a specimen in fair health, with a fair structure and in fair condition overall.
- This tree has a moderate retention value and a moderate site significance.
- No development works are proposed within the TPZ of this tree.
- This tree will require the implementation of tree protection measures for the duration of the 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 underground services should be re-routed or diverted around the TPZ, to avoid conflict with this trees 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 of this report 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.

7.4 Tree 4

- This tree is located within the private open space of the subject site, approximately 0.5m from the existing building location and has a DBH of 420mm and a basal diameter of 510mm, resulting in a TPZ of 5.0m and an SRZ of 2.5m.
- This exotic tree represents a multi stemmed tree in good health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a moderate site significance.
- No development works are proposed within the TPZ of this tree.
- This tree will require the implementation of tree protection measures for the duration of the 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 underground services should be re-routed or diverted around the TPZ, to avoid conflict with this trees 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 of this report 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.

7.5 Tree 5

- This tree is located within the private open space of the subject site, approximately 1.0m from the existing building location and has a DBH of 380mm and a basal diameter of 400mm, resulting in a TPZ of 4.6m and an SRZ of 2.3m.
- This exotic tree represents a multi stemmed tree in good health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a moderate site significance.
- The proposed demolition of the existing building represents a direct encroachment to the TPZ of this tree.
- All demolition works within the TPZ of this tree will be required to be undertaken sensitively, under supervision of a suitably qualified arborist.
- This tree will require the implementation of tree protection measures for the duration of the 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 underground services should be re-routed or diverted around the TPZ, to avoid conflict with this trees 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 of this report 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.

7.6 Tree 6

- This tree is located within the private open space of the subject site, approximately 2.0m from the existing building location and has a DBH of 380mm and a basal diameter of 400mm, resulting in a TPZ of 4.6m and an SRZ of 2.3m.
- This exotic tree represents a multi stemmed tree in fair health, with a fair structure and in fair overall condition.
- This tree has a moderate retention value and a moderate site significance.
- The proposed demolition of the existing building represents a direct encroachment to the TPZ of this tree.
- All demolition works within the TPZ of this tree will be required to be undertaken sensitively, under supervision of a suitably qualified arborist.
- This tree will require the implementation of tree protection measures for the duration of the 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 underground services should be re-routed or diverted around the TPZ, to avoid conflict with this trees 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 of this report 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.

7.7 Tree 7

- This tree is located within the rear private open space of the subject site, approximately 2.5m from the existing building location and has a multi stemmed DBH of 260mm and a basal diameter of 330mm, resulting in a TPZ of 4.6m and an SRZ of 2.3m.
- This native tree represents a co dominant stemmed specimen in fair health, with a fair structure and in fair condition overall.
- This tree has a moderate retention value and a low site significance.
- No development works are proposed within the TPZ of this tree.
- This tree will require the implementation of tree protection measures for the duration of the 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 underground services should be re-routed or diverted around the TPZ, to avoid conflict with this trees 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 of this report 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.

7.8 Tree 8

- This tree is located within the rear private open space of the subject site, approximately 1.0m from the existing building location and has a DBH of 130mm and a basal diameter of 160mm, resulting in a TPZ of 2.0m and an SRZ of 1.5m.
- This native tree represents a multi stemmed tree in good health, with a fair structure and in fair overall condition.
- This tree has a low retention value and a low site significance.
- The proposed demolition of the existing building represents a direct encroachment to the TPZ of this tree.
- All demolition works within the TPZ of this tree will be required to be undertaken sensitively, under supervision of a suitably qualified arborist.

- This tree will require the implementation of tree protection measures for the duration of the 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 underground services should be re-routed or diverted around the TPZ, to avoid conflict with this trees 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 of this report 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.

7.9 Tree 9

- This tree group is located within the rear private open space of the subject site, approximately 1.0m from the existing building location and has an average approximate DBH of 130mm and a basal diameter of 160mm, resulting in a TPZ of 2.0m and an SRZ of 1.5m.
- This exotic tree group represents Three (3) individual specimens in good health, with a fair structure and in fair overall condition.
- This tree group has a low retention value and a low site significance.
- The proposed demolition of the existing building represents a direct encroachment to the TPZ of this tree group.
- All demolition works within the TPZ of these trees will be required to be undertaken sensitively, under supervision of a suitably qualified arborist.
- This tree group will require the implementation of tree protection measures for the duration of the 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 underground services should be re-routed or diverted around the TPZ, to avoid conflict with this trees 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 of this report 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.

7.10 Tree 10

- This council owned street tree is located within the Station Place road reserve to the South of the subject site and has a DBH of 510mm and a basal diameter of 550mm, resulting in a TPZ of 6.1m and an SRZ of 2.6m.
- This native tree represents a previously lopped specimen in good health, with a poor structure and in fair overall condition.
- This council owned tree has a moderate retention value and a moderate site significance.
- No development works are proposed within the TPZ of this tree.
- This tree will require the implementation of tree protection measures for the duration of the proposed development process.
- The remainder of the TPZ within the subject site, 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 trees 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 are implemented throughout the development process, this tree is unlikely to be directly impacted by the proposed development.

7.11 Tree 11

- This council owned street tree is located within the Station Place road reserve to the South of the subject site and has a DBH of 490mm and a basal diameter of 600mm, resulting in a TPZ of 5.9 and an SRZ of 2.7m.
- This native tree represents a previously lopped specimen in fair health, with a poor structure and in fair overall condition.
- This council owned tree has a moderate retention value and a moderate site significance.
- No development works are proposed within the TPZ of this tree.
- This tree will require the implementation of tree protection measures for the duration of the proposed development process.
- The remainder of the TPZ within the subject site, 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 trees 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 are implemented throughout the development process, this tree is unlikely to be directly impacted by the proposed development.

7.12 Overview

Tree 10 and 11 – Are council owned nature strip trees, located within the Station Place road reserve to the South of the subject site These trees are not directly impacted by the proposed development. These trees **MUST** be protected throughout the development process, including all tree protection measures as per AS4790 – 2009 Protection of Trees on Development Sites and Appendix 4 of this report.

Tree 1 – Is a tree located within subject site. This tree is directly impacted by the proposed demolition and construction of a learning building and associated courtyard, subsequently the removal of this tree is required for the development to proceed as proposed. This tree can be removed without further permission.

Trees 3, 4 and 7 – Are trees located within the subject site, not directly impacted by the proposed development. These trees **MUST** be protected throughout the development process including all tree protection measures as per AS4790 – 2009 Protection of Trees on Development Sites and Appendix 4 of this report.

Trees 2, 5, 6, 8 and 9 - Are trees and a tree group located within the subject site with minor encroachments to these trees TPZ proposed during demolition. These trees **MUST** be protected throughout the development process including all tree protection measures as per AS4790 – 2009 Protection of Trees on Development Sites and Appendix 4 of this report.

8. REFERENCES

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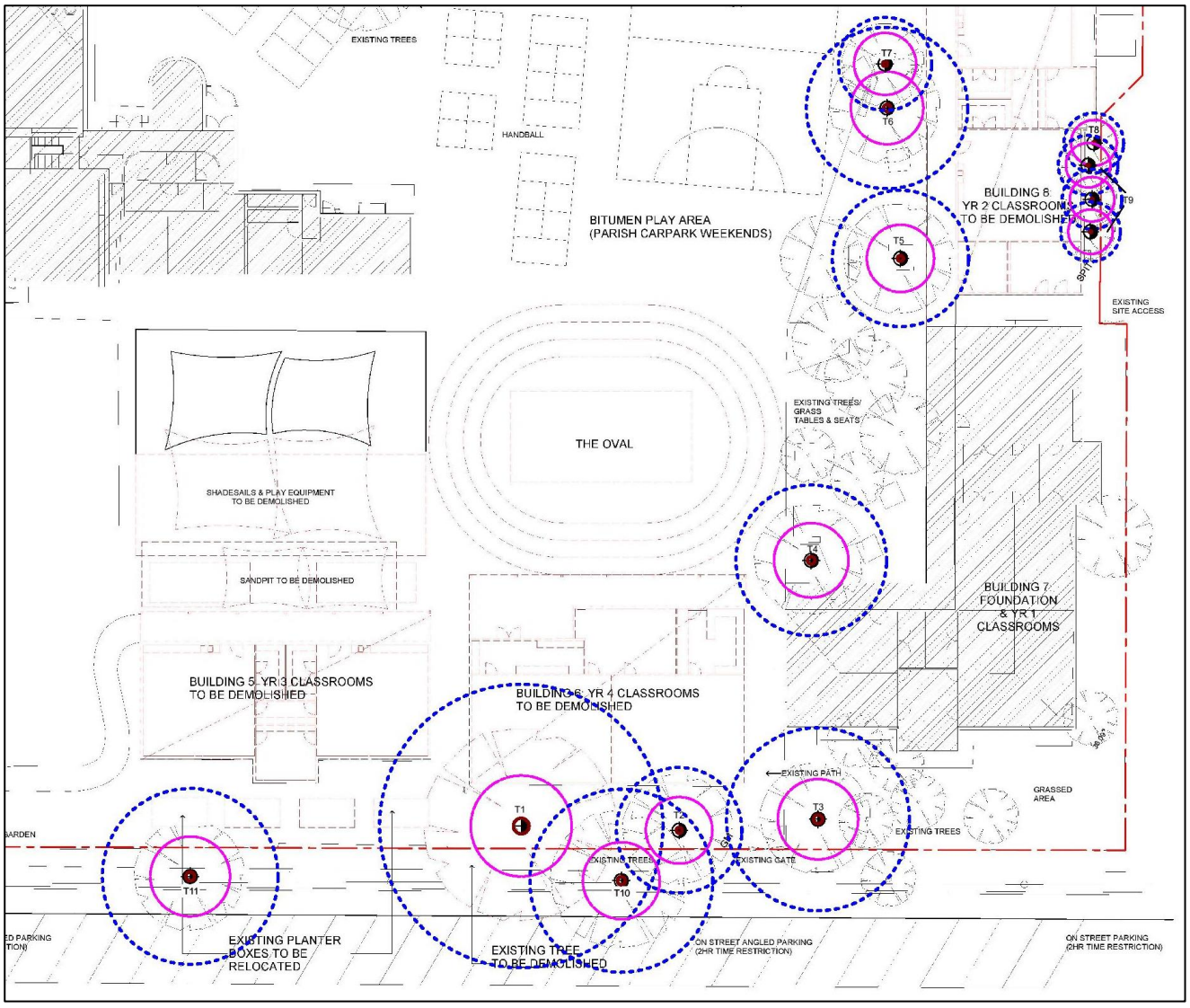
APPENDIX 1: Existing Site Plan



APPENDIX 2: Tree Data Details

Tree No	Genus	Species	Common Name	DBH (mm)	Basal Diameter (mm)	TPZ (m)	SRZ (m)	Height (m)	Canopy Spread (m)	Health	Structure	Condition	Site Significance	Retention value	Age	ULE (years)	Permit Requirement	Observations	Recommendations
1	*Eucalyptus*	*mannifera*	Red Spotted Gum	790	1050	9.5	3.4	15.0	14.0	Fair	Poor	Fair	Moderate	Moderate	Mature	6 - 20	No	Bifurcation with swelling and included bark, fungal fruiting bodies present, associated decay within primary union, excessive deadwood	**Remove** - Permision not required
2	*Angophora*	*costata*	Smooth Barked Angophora	350	390	4.2	2.2	11.0	10.0	Good	Fair	Fair	Moderate	Moderate	Mature	>20	No	Co dominant stems, previously heavily pruned from overhead electrical infrastructure	**Retain**- Implement Tree Protection Measures
3	*Eucalyptus*	*nicholii*	Narrow Leaved Black Peppermint	510	610	6.1	2.7	15.0	9.0	Fair	Fair	Fair	Moderate	Moderate	Mature	6 - 20	No	Bifurcated co dominant stems, previously heavily pruned from overhead electrical infrastructure, active split within stem, canopy decline	**Retain**- Implement Tree Protection Measures
4	*Robinia*	*pseudoacacia*	Robinia	420	510	5.0	2.5	9.0	10.0	Good	Fair	Fair	Moderate	Moderate	Mature	6 - 20	No	Bifurcated form, multiple stems, included bark union, minor canopy decline	**Retain**- Implement Tree Protection Measures
5	*Robinia*	*pseudoacacia*	Robinia	380	400	4.6	2.3	10.0	9.0	Fair	Fair	Fair	Moderate	Moderate	Mature	6 - 20	No	Bifurcated form, included bark unions, minor canopy decline	**Retain** - Implement Tree Protection Measures
6	*Robinia*	*pseudoacacia*	Robinia	450	480	5.4	2.4	10.0	10.0	Fair	Fair	Fair	Moderate	Moderate	Mature	6 - 20	No	Basal wound with associated decay, co dominant stems, unfavourable attachments, minor canopy decline	**Retain**- Implement Tree Protection Measures
7	*Agonis*	*flexuosa*	Willow Myrtle	180, 190 (260)	330	3.1	2.1	7.0	6.0	Fair	Fair	Fair	Low	Moderate	Mature	6 - 20	No	Co dominant stems, suppressed canopy, canopy decline	**Retain** - Implement Tree Protection Measures
8	*Callistemon*	*viminalis*	Weeping Bottlebrush	130	160	2.0	1.5	5.0	4.0	Good	Fair	Fair	Low	Low	Mature	6 - 20	No	Multiple stems	**Retain**- Implement Tree Protection Measures
9	*Arbutus*	*unedo*	Irish Strawberry	120	150	2.0	1.5	5.0	4.0	Good	Fair	Fair	Low	Low	Mature	>20	No	Represents three individual trees,	**Retain** - Implement Tree Protection Measures
10	*Eucalyptus*	*leucoxylon*	Yellow Gum	510	550	6.1	2.6	9.0	13.0	Good	Poor	Fair	Moderate	Medium	Mature	6 - 20	Yes (Council Owned)	Council owned street tree, previously heavily pruned from overhead electrical infrastructure	**Retain** - Implement Tree Protection Measures
11	*Eucalyptus*	*sideroxylon*	Red Ironbark	490	600	5.9	2.7	9.0	13.0	Fair	Poor	Fair	Moderate	Medium	Mature	6 - 20	Yes (Council owned)	Council owned street tree, previously heavily pruned from overhead electrical infrastructure	**Retain** - Implement Tree Protection Measures

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-sparred 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
5 – 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).

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

- McLeod Trees Pty Ltd contracts with you on the basis that you promise that all legal information which you provide, including land title and ownership of other property, are correct. McLeod Trees Pty Ltd is not responsible for verifying or ascertaining any of these issues.

- McLeod Trees Pty Ltd contracts with you on the basis that you promise that all affected property complies with all applicable statutes and subordinate legislation.

- McLeod Trees Pty Ltd will take all reasonable care to obtain necessary information from reliable sources and to verify data. However, McLeod Trees Pty Ltd neither guarantees nor is responsible for the accuracy of information provided by others.

- If, following delivery of this report, you later require a representative of McLeod Trees Pty Ltd to attend court to give evidence or to assist in the preparation for a hearing because of this report, you must pay an additional hourly fee at our current rate for expert evidence.

- Alteration of this report invalidates the entire report.

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- Sketches, diagrams, graphs and photographs in this report are intended as visual aids, are not to scale unless stated to be so, and must not be construed as engineering or architectural reports or as surveys.

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    - The information in this report covers only those items which were examined and reflects the condition of those items at the time of the inspection.
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