TREE SURVEY
ARBORICULTURAL CONSULTANTS

# ARBORICULTURAL IMPACT ASSESSMENT & TREE PROTECTION PLAN

## Lakemba Station - Southwest Metro Upgrade

**Version 8**

**Prepared for:**
**HSEJV**

**17 June 2022**

# Document information

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|---|---|
| **Title:** | Lakemba Station |
| **Report type:** | Arboricultural Impact Assessment (AIA) & Tree Protection Plan (TPP) |
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|---|---|---|
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| Version 1 | 30/03/21 | Minor updates following HSEJV review |
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# Abbreviations

| Abbreviation | Description |
|---|---|
| AQF | Australian Qualifications Framework |
| AS | Australian Standards |
| DBH | Diameter at Breast Height |
| 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 |

# Contents

# 1 Introduction

## 1.1 Purpose of this report

Tree Survey was commissioned by HSEJV, a joint venture between Haslin and Stephen Edwards Constructions, to prepare an Arboricultural Impact Assessment (AIA) and Tree Protection Plan (TPP) for the construction of a Metro Services Building. Construction of the Metro Services Building will be carried out under the NSW Government's Sydney Metro City & Southwest program.

This report has been produced this report to satisfy the Planning Approval conditions related to tree and vegetation removal as part of the Marrickville, Canterbury, and Lakemba Station Upgrades Project which will be carried out by HSEJV. This report has been written in accordance with the requirements of the HSEJV Southwest Metro Package 4 works, and Sydney Metro City & Southwest - Sydenham to Bankstown - Instrument of Approval, CSSI 8256 Mod1, Condition of Approval E5. Table 1 cross-references sections in this report that address each applicable planning approval requirement relating to CCRs.

**Table 1: Planning Approval Conditions Cross-References**

| Condition | Condition Requirements | Section |
|---|---|---|
| **E5 (a)** | A description of the conditions of the tree(s) and its amenity and visual value | **Section 3, Appendix I** |
| **E5 (b)** | Consideration of all options to avoid tree removal, including the relocation of services, redesign, or relocation of ancillary components (such as substations, fencing, etc.) and reduction of standard offsets to underground services | **Section 5** |
| **E5 (c)** | Measures to avoid the removal of trees or minimise damage to existing trees and ensure the health and stability of those trees to be protected. This includes details of any proposed canopy or root pruning, root protection zone, excavation, site controls on waste disposal, vehicular access, storage of materials, and protection of public utilities | **Section 5, Section 6** |

Condition of Approval E5 states *"The Proponent must commission an independent experienced and suitably qualified arborist, to prepare a comprehensive Tree Report(s) before removing any trees as detailed in the documents listed in Condition A1. The Tree Report may be prepared for the entire CSSI or separate reports may be prepared for individual areas where trees are required to be removed. The report(s) must identify the impacts of the CSSI on trees and vegetation within and adjacent to the Construction footprint. A copy of the report(s) must be submitted to the Planning Secretary before the removal or pruning of any trees, including those affected by site establishment Work. All recommendations of the report must be implemented by the Proponent unless otherwise agreed by the Planning Secretary."*

## 1.2 Project overview and location

Sydney Metro City & Southwest is a new 30km metro line extending metro rail from the end of Sydney Metro Northwest at Chatswood under Sydney Harbour, through new CBD stations and southwest to Bankstown. It is due to open in 2024 with the capacity to run a metro train every two minutes each way through the centre of Sydney. The Sydney Metro City & Southwest comprises of two components;

- Chatswood to Sydenham project
- Sydenham to Bankstown upgrade

The Southwest Metro Upgrade will include station upgrades on the T3 Bankstown line between Sydenham and Bankstown, NSW. Works will occur predominately within the rail corridor. The works associated with the Canterbury, Marrickville, and Lakemba Stations will be undertaken by a Haslin Constructions and Stephen Edwards Constructions joint venture referred to as HSEJV. The works include new infrastructure and modifications to the existing Canterbury, Marrickville, and Lakemba Stations. This document refers to the Lakemba Station Upgrade which includes:

- Refurbish and repurpose rooms of existing platform buildings;
- Refurbish concourse area;
- Construction of the Sydney Metro Services Building;
- Regrade platform as per Sydney Metro's requirement and provide drainage, platform screen doors, platform edge screens, and mechanical gap fillers to Platform 1 and 2;
- New cabling and containment for LV services and lighting;
- Installation of new glass screens to existing concourse and footbridge;
- Provide new landscaped plaza at Railway Parade including additional bicycle hoops and feature paving;
- Installation of new vertical protection screens to both sides of the existing Haldon Street Bridge;
- Minor refresh of existing entry concourse stairs;
- Installation of new CSR cable route; and
- Installation of security fencing.

Specifically, this document refers to the impacts associated with trees for the Metro Services Building (MSB), galvanised steel troughing (GST), anti-throw screens, and associated service upgrade at Lakemba (refer to figures on next page):

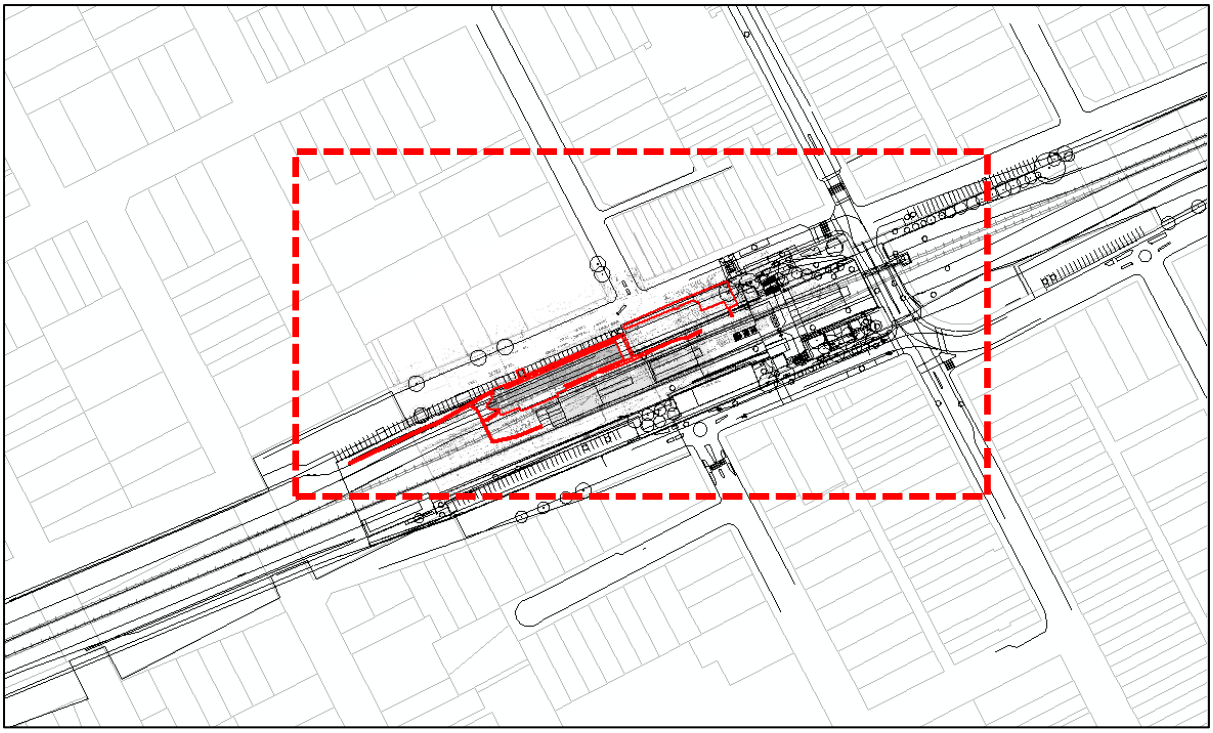

**Figure 1: Location of the proposed MSB and associated works**

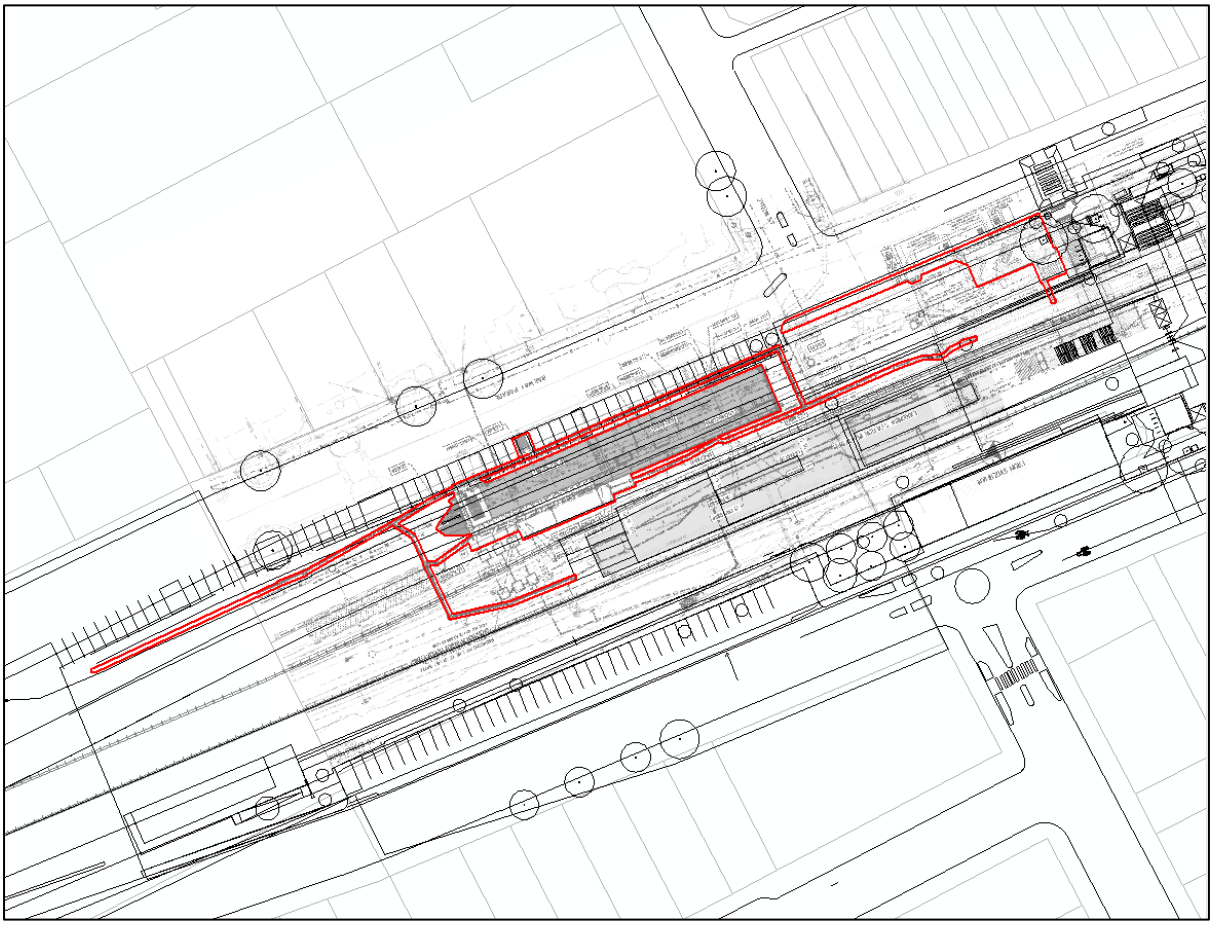

**Figure 2: Closer view of the MSB and associated works**

# 2 Background

## 2.1 Existing trees and vegetation

The ecological potential of the project site has been assessed under the Sydney Metro City & Southwest Sydenham to Bankstown Environmental Impact Statement (EIS). Section 2.5 of the EIS states *"The majority of the study area has been heavily modified by past and ongoing disturbances associated with urban development and the active rail corridor. Urban development, clearance, and ongoing maintenance of the rail corridor have resulted in fragmentation, a high level of disturbance, and degradation of vegetation communities. The majority of vegetation in the project area and surrounding study area comprises exotic or planting native species on highly modified landforms. There are small, isolated patches of remnant or regrowth native vegetation in small portions of the study area associated with rail cuttings with less disturbed soil profiles. Native vegetation and habitat within the project area are in medium to poor condition, and features impacts from existing maintenance activities, edge effects, weed infestation, and exotic pests."*

The EIS also states *"There is relatively low native species richness within the study area, which confirms that the native vegetation has been extensively modified and is in moderate to poor condition. A total of 129 flora species from 40 families were recorded within the study area, comprising 63 native and 66 exotic species. Poaceae (grasses, 22 species, 11 native), Myrtaceae (flowering shrubs and trees, 20 species, 13 native), Fabaceae (23 species, 17 native), and Asteraceae (flowering herbs, 11 species, 2 native) were the most diverse families recorded. One threatened flora species (Downy Wattle) was recorded in the study area, outside the project area."*

## 2.2 Definition of a tree

In accordance with the Sydney Metro City & Southwest Sydenham to Bankstown Instrument of Approval, a tree is defined as a *"Long-lived woody perennial plant greater than (or usually greater than) 3m in height with one or relatively few main stems or trunks".*

## 2.3 Tree and vegetation removal

The Sydney Metro City & Southwest Sydenham to Bankstown Upgrade – Submissions and Preferred Project Report (SPIR) *states "It is expected that large areas of the planted native vegetation and exotic scrub and forest would not require removal for the corridor works, however, this is subject to the detailed design of the proposed works, including fencing and the communications services route. This vegetation would potentially include trees that provide screening along the corridor for surrounding properties. The need to clear vegetation would be reviewed by the construction contractor/s and minimised wherever practicable."* The SPIR also states "*about 16.3 hectares of vegetation (not including vegetation classed as exotic grassland) may need to be removed, including:*

- *Up to 7.3 hectares of planted native vegetation.*
- *Up to nine hectares of exotic scrub and forest.*

The SPIR does not specify where these areas of clearing are located as this was to be developed as part of detailed design. Furthermore, these areas represent the clearing to occur for corridor works from Sydenham to Bankstown under all work packages (refer to the Sydney Metro City & Southwest Sydenham to Bankstown Upgrade Staging Report for more information of the different packages under which the project has been staged). As such, minimisation of impacts is driven through the design and construction methodology. Refer to Section 4 for more information on minimisation of impacts through design and construction methodology. Refer to Section 5 for Mitigation Measures.

## 2.4 Threatened ecological communities

In regard to plant communities Section 22.2 of the EIS states *"two of the native plant communities identified conform to the following threatened ecological communities listed under the TSC Act:*

- *Sydney Turpentine Ironbark Forest in the Sydney Basin Bioregion (Sydney Turpentine Ironbark Forest).*
- *Shale Gravel Transition Forest in the Sydney Basin Bioregion (Shale Gravel Transition Forest).*

*No threatened ecological communities listed under the EPBC Act are located in the study area."*

## 2.5 Documents and plans referenced

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:

- Critical State Significant Infrastructure (CSSI) Approval 8256 MOD 1.
- Sydney Metro Sydenham to Bankstown Upgrade - Conditions of Approval, dated 12/12/18
- Sydenham to Bankstown Environmental Impact Statement (EIS).
- Sydney Metro City & Southwest Sydenham to Bankstown Upgrade – Submissions and Preferred Project Report (SPIR).
- Civil Engineering Plans prepared by Metron T2M, dated 19/12/19.
- Survey Plans provided by HSEJV in DWG format.

The site plan has been used as a map layer in the **Arboricultural Impact Assessment** and **Tree Protection Plan**.

# 3 Method

## 3.1 Visual Tree Assessment (VTA)

Phil Witten, Consulting Arborist of Tree Survey, attended the project site to undertake tree inspections and assessments on the 26th of February 2021. The subject trees were assessed in accordance with a 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).
- Diameter at breast height (DBH) has been accurately measured using a diameter tape (where access to the trees was available). Tree height and canopy spread were estimated unless otherwise stated.
- Tree protection zones have been calculated in accordance with Australian Standard, AS 4970-2009, Protection of Trees on Development Sites using the DBH measurements.

## 3.2 Significance of a Tree, Assessment Rating System (STARS).

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 Aboriculturalists (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 the **Appendices.**

[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).

### 3.3 Amenity value

To determine the amenity value of a tree we assess a number of different factors, which include but are not limited to the information below:

- Tree vigour.
- The form of the tree (typical or atypical).
- Visibility from the surrounding properties.
- Contribution to the visual character and amenity of the local area.
- Restrictions on tree growth including above or below ground influences.
- Tree species and its suitability for the site conditions.
- Social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.
- The relationship between the tree and the site.
- Whether the tree is protected by any statuary conditions.
- The habitat value of the tree.
- Whether the tree is considered a noxious weed species.

Upon consideration of these factors, an amenity value rating is assigned to the tree using one of the following values.

- Very high
- High
- Moderate
- Low
- Very low

### 3.4 Opportunity to retain trees

Removal of the trees and vegetation for the project predominantly relates to the construction of service buildings, utility adjustments, and construction impact areas. These design components are integral to the functionality of the new Sydney Metro line. Due to limited space within the project boundary, existing services, and the access track, it is not feasible or reasonable to move these design components to accommodate the existing trees and vegetation. In accordance with the Sydney Metro Sydenham to Bankstown Interim Tree Management Strategy, tree and vegetation removal has been limited through detailed design and construction planning. Avoidance of impacts to trees and vegetation on the project has been undertaken based on the following hierarchy through the design process:

1. Avoid impacts to the tree, ensuring design and construction falls outside the tree protection zone.
2. Impacts within the tree protection zone, but no trimming or removal.
3. Trimming of trees with visual or amenity value (including privacy screening).
4. Removal of trees with visual or amenity value (including privacy screening).
5. Trimming of trees with ecological value (habitat, threatened vegetation communities, threatened flora species).
6. Removal of trees with ecological value (habitat, threatened vegetation communities, threatened flora species).

It is understood the designers have explored a number of means for retaining trees and vegetation on the project site. These include;

- Alignment of components such as the metro services building have been located to minimise impacts to vegetation in accordance with the hierarchy listed above.
- Clearance restrictions between existing and proposed services (i.e. Qenos high-pressure gas main) have been reviewed
- Clearance between services, structures, and vegetation has been assessed to ensure accessibility and maintainability of the metro services building while reducing impacts to vegetation.

Construction methodologies and practices have been revised to minimise impact areas and reduce clearing wherever possible. This has included the use of existing access areas and reducing boundary impacts during construction as far as practical. Where the project impacts on vegetation or other ground surfaces, the location is to be rehabilitated and revegetated to restore the location to as good or better than the original condition, in consultation and collaboration with the landholder.

# 4 Arboricultural Impact Assessment (AIA)

## 4.1 Impact assessment

There are two types of zones (as defined by AS 4970-2009) that need to be considered when undertaking an arboricultural impact 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 calculated by measuring the diameter at breast height (DBH) and multiplying it by twelve (12). The resulting value is applied as a radial measurement from the centre of the trunk to delineate the TPZ.
- **Structural root zone (SRZ):** The SRZ is the area of the root system used for stability, mechanical support, and anchorage of the tree.

Encroachment within the TPZ is acceptable, providing that the arborist can demonstrate that the tree will remain viable. There are three (3) levels of encroachment (as defined by AS 4970-2009):

- **No encroachment (0%): No encroachment within the TPZ.**
- **Minor encroachment (<10%): The encroachment is less than 10% of the TPZ.**
- **Major encroachment (>10%): The encroachment is greater than 10% of the TPZ.**

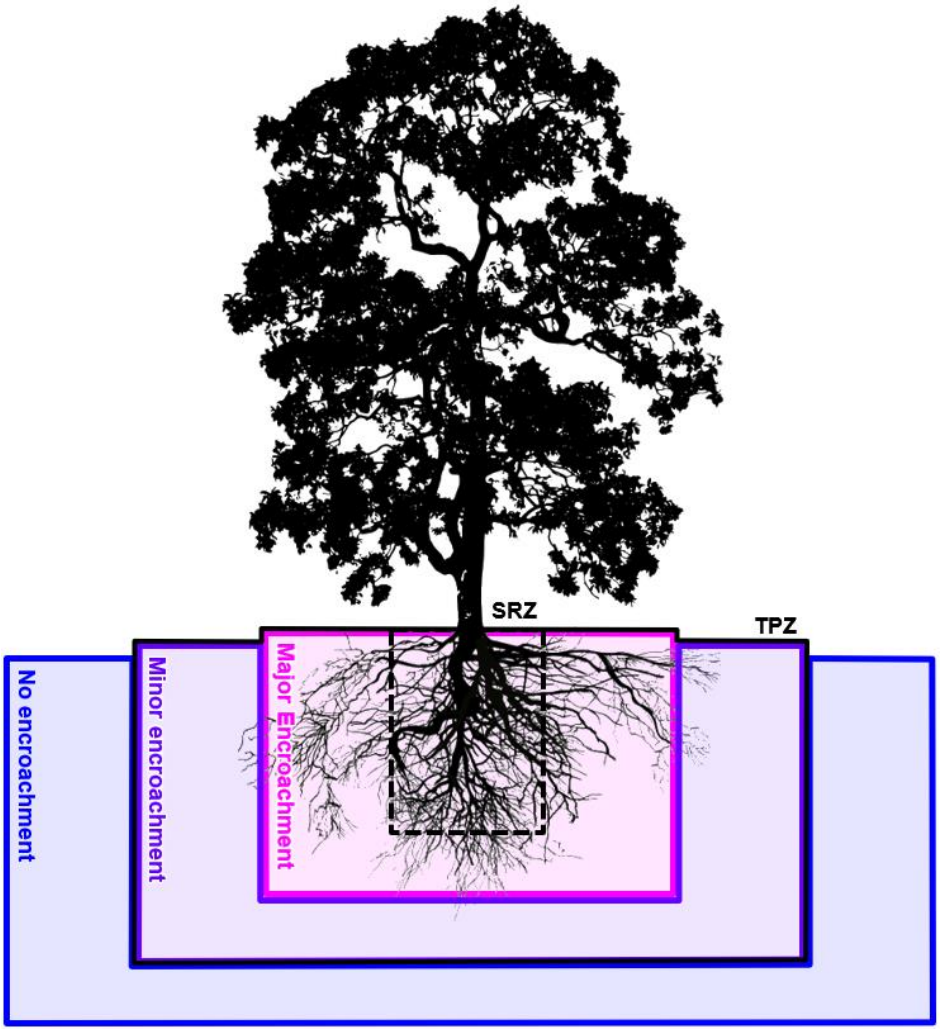


**Figure 1: Three (3) levels of encroachment**

## 4.2 Mitigating the impacts

Encroachment within the TPZ should be compensated with a range of mitigation measures to ensure that impacts to the subject tree(s) are reduced or restricted wherever possible. Mitigation should be increased relative to the level of encroachment within the TPZ to ensure the subject tree(s) 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.

**Table 2: Mitigation measures**

| Encroachment | Mitigation Measures |
|---|---|
| **No encroachment** (0%) | • N/A |
| **Minor encroachment** (<10%) | • The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ.<br>• Detailed root investigations should not be required.<br>• Tree protection must be installed. |
| **Major encroachment** (>10%) | • The project arborist must demonstrate the tree(s) would remain viable.<br>• Root investigation by non-destructive methods may be required for any trees proposed for retention.<br>• Consideration of relevant factors, including root location and distribution, tree species, condition, site constraints, and design factors.<br>• The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ.<br>• The project arborist will be required to supervise any works within the TPZ.<br>• Tree protection must be installed. |
| **Major encroachment** (>20%) | • Encroachment of greater than 20% (of the total TPZ area) can begin to impact the structural root zone (SRZ) and is generally more difficult to mitigate.<br>• Impacts within the SRZ are not recommended as it may lead to the destabilisation and/or decline of the tree.<br>• Root investigation by non-destructive methods may be required for any trees proposed for retention.<br>• Consideration of relevant factors, including root location and distribution, tree species, condition, site constraints, and design factors.<br>• The project arborist must demonstrate the tree(s) would remain viable. |

# 5 Results

**Table 3** shows the results of the arboricultural assessment. Key points are:

## 5.1 No encroachment

No trees fall within the category of “no encroachment”.

## 5.2 Minor encroachment

A total of **2** trees will be subject to a minor encroachment of less than 10% within the TPZ:

- **Retain:** A total of **2** trees **(Tree 680, 3290)** will be subject to a minor encroachment of less than 10% within the TPZ. The encroachment will not impact the SRZ and is highly unlikely to impact the overall health or condition of these trees. Under the current proposal, these trees can be successfully retained.
- **Remove:** No trees within the category of “minor encroachment” are proposed for removal.

## 5.3 Major encroachment

A total of **22** and **3** groups of trees will be subject to a major encroachment of greater than 10% within the TPZ:

- **Retain:** A total of **3** trees **(Tree 678, 679, 3285)** will be subject to an encroachment between 10% and 20%. The encroachment is a result of the conflict between the TPZ and the construction footprint. This encroachment is considered to be a low impact encroachment for the following reasons:
  - The encroachment only impacts a small area of the TPZ
  - The encroachment only occurs on one side of the TPZ.

  Several tree protection measures including supervision of excavations by the project arborist are outlined in **Chapter 6** to ensure that these trees remain in good health and condition throughout (and following) the proposed development. Under the current proposal, these trees can be successfully retained.
- **Remove:** A total of **18** trees **(Tree 1, 2, 3, 4, 676, 677, 681, 3277, 3278, 3279, 3280, 3281, 3282, 3284, 3286, 3287, 3288, 3289, 3291)** and **3** groups of trees **(G1, G2, G3)** will be subject to an encroachment of greater than 20% within the TPZ. Encroachment of greater than 20% (of the total TPZ area) can begin to impact the structural root zone (SRZ) and is generally more difficult to mitigate. Impacts within the SRZ are not recommended as it may lead to the destabilisation and/or decline of the tree. These trees are located within, or directly adjacent to the proposed construction footprint and cannot be retained under the current proposal.

**Table 3: Results of the arboricultural assessment**

| Id. | Botanical name | Encroachment | % Encroachment within TPZ | Description of impacts | Considerations and restrictions | Result |
|---|---|---|---|---|---|---|
| **676** | *Lophostemon confertus* | **Major** | **83%** | - The trees are located within, or directly adjacent to the footprint of the proposed hard surfacing.<br><br>- The extent of encroachment within the tree protection zone (greater than 20%) will result in damage to structural roots. The structural roots and structural root zone (SRZ) is the area of the root system used for stability, mechanical support, and anchorage of the tree. Impacts within the SRZ are not recommended as it may lead to the destabilisation and/or decline of the tree | - This assessment has been carried out on a “construct only” project, without the option to relocate or redesign.<br><br>- During the design phase, the layout of the design has been located to minimise impacts to vegetation in accordance with the hierarchy listed in Section 3.4. | **Remove** |
| **677** | *Cupressus torulosa* | **Major** | **80%** | | | **Remove** |
| **678** | *Corymbia citriodora* | **Major** | **19%** | - The subject trees are located adjacent to the proposed kerb, guttering, and pavement work.<br><br>- The subject trees are set back far enough that the proposed encroachment within the TPZ will not exceed 20%. | - Tree protection mitigation will be required. | **Retain** |
| **679** | *Corymbia citriodora* | **Major** | **19%** | | | **Retain** |
| **680** | *Corymbia citriodora* | **Minor** | **9%** | | | **Retain** |
| **681** | *Lophostemon confertus* | **Major** | **26%** | - The subject tree will be impacted by trenching for services within the SRZ and a significant encroachment within the canopy for overhead wires. | - This assessment has been carried out on a “construct only” project, without the option to relocate or redesign service routes. | **Remove** |
| **3277** | *Eucalyptus microcorys* | **Major** | **24%** | - This vegetation is located directly adjacent to the Metro Services Building (MSB) and/or the proposed CSR and sewer. These works will comprise significant open-cut excavations of up to 5m in depth.<br><br>- These works, and specifically the excavations will have a significant and unavoidable impact upon the root zones of these trees.<br><br>- The extent of encroachment within the tree protection zone (greater than 20%) will result in damage to structural roots. The structural roots and structural root zone (SRZ) is the area of the root system used for stability, mechanical support, and anchorage of the tree.<br><br>- Impacts within the SRZ are not recommended as it may lead to the destabilisation and/or decline of the tree. | - This assessment has been carried out on a “construct only” project, without the option to relocate or redesign service routes.<br><br>- During the design phase, the alignment of the MSB has been located to minimise impacts to vegetation in accordance with the hierarchy listed in Section 3.4. These considerations included a Qenos high-pressure gas main that runs the length of the site, adjacent to the proposed CSR route, and the existing access track which needs to be maintained through the rail corridor to allow for maintenance of infrastructure and emergency response.<br><br>- The location, depth, and extent of services to be installed in this area, mean that alternative options for installation, including non-destructive excavation (NDE) and horizontal directional drilling (HDD), are not available. Further to this, HDD or boring methods would require an entry/exit pit to be located within the TPZ of the subject trees, which would likely cause a significant impact on the trees on its own accord. | **Remove** |
| **3278** | *Lophostemon confertus* | **Major** | **89%** | | | **Remove** |
| **3279** | *Eucalyptus microcorys* | **Major** | **33%** | | | **Remove** |
| **3280** | *Lophostemon confertus* | **Major** | **91%** | | | **Remove** |
| **3281** | *Eucalyptus microcorys* | **Major** | **37%** | | | **Remove** |
| **3282** | *Eucalyptus microcorys* | **Major** | **26%** | | | **Remove** |
| **3284** | *Lophostemon confertus* | **Major** | **41%** | | | **Remove** |
| **3285** | *Eucalyptus microcorys* | **Major** | **19%** | - The subject tree is located adjacent to the proposed service route. The subject tree is set back far enough that the proposed encroachment within the TPZ will not exceed 20%. | - Tree protection mitigation will be required. | **Retain** |
| **3286** | *Cinnamomum camphora* | **Major** | **100%** | - The subject trees are located adjacent to the proposed boundary fence upgrade.<br><br>- These trees are required to be removed to allow for construction clearances.<br><br>- These trees are of low value and are not considered important for retention.<br><br>- These trees are directly within the footprint of the piling rig. These trees will need to be removed to ensure the safe operation of this machinery. | - Tree removal is required to allow new fencing to be installed.<br><br>- Removal of Cinnamomum camphora and Lantana species will be managed in accordance with the Biosecurity Act 2015. | **Remove** |
| **3287** | *Lantana species* | **Major** | **100%** | | | **Remove** |
| **3288** | *Acacia longifolia* | **Major** | **100%** | | | **Remove** |
| **3289** | *Acacia longifolia* | **Major** | **100%** | | | **Remove** |

| Id. | Botanical name | Encroachment | % Encroachment within TPZ | Description of impacts | Considerations and restrictions | Result |
|---|---|---|---|---|---|---|
| **1** | *Morus sp.* | **Major** | **100%** | - These trees are located in the alignment and cannot be retained. | - These trees are within the proposed construction footprint and cannot be retained.<br>- This assessment has been carried out on a “construct only” project, without the option to relocate or redesign service routes. | **Remove** |
| **2** | *Celtis occidentalis* | **Major** | **100%** | | | |
| **3** | *Grevillea sp.* | **Major** | **100%** | | | |
| **4** | *Acacia decurrens* | **Major** | **100%** | | | |
| **G1** | *Mixed vegetation* | **Major** | **100%** | - This group of vegetation is located within the disturbance footprint. | - These groups of trees are within the proposed construction footprint and cannot be retained.<br>- This assessment has been carried out on a “construct only” project, without the option to relocate or redesign service routes. | **Remove** |
| **G2** | *Mixed vegetation* | **Major** | **100%** | | | |
| **G3** | *Mixed vegetation* | **Major** | **100%** | | | |
| **3290** | *Acacia longifolia* | **Minor** | **10%** | - Minor canopy encroachment. | - Pruning is required | **Prune** |
| **3291** | *Plumbago species* | **Major** | **100%** | - This shrub is within the disturbance footprint. | - This shrub is within the disturbance footprint. | **Remove** |


Arboricultural Impact Assessment
Page 1 of 7
3288
3290
3286
3289
3291
3287
678
677
676
679
680
681
3277
3279
3278
3281
3280
3282
3285
NOT TO BE USED FOR CLEARING
Legend
The subject trees
No encroachment
Minor encroachment
Major encroachment
Protection zones
TPZ (continuous line)
SRZ (dashed line)
Other items
Construction footprint
Disturbance footprint (500mm buffer)
Railway
0
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40
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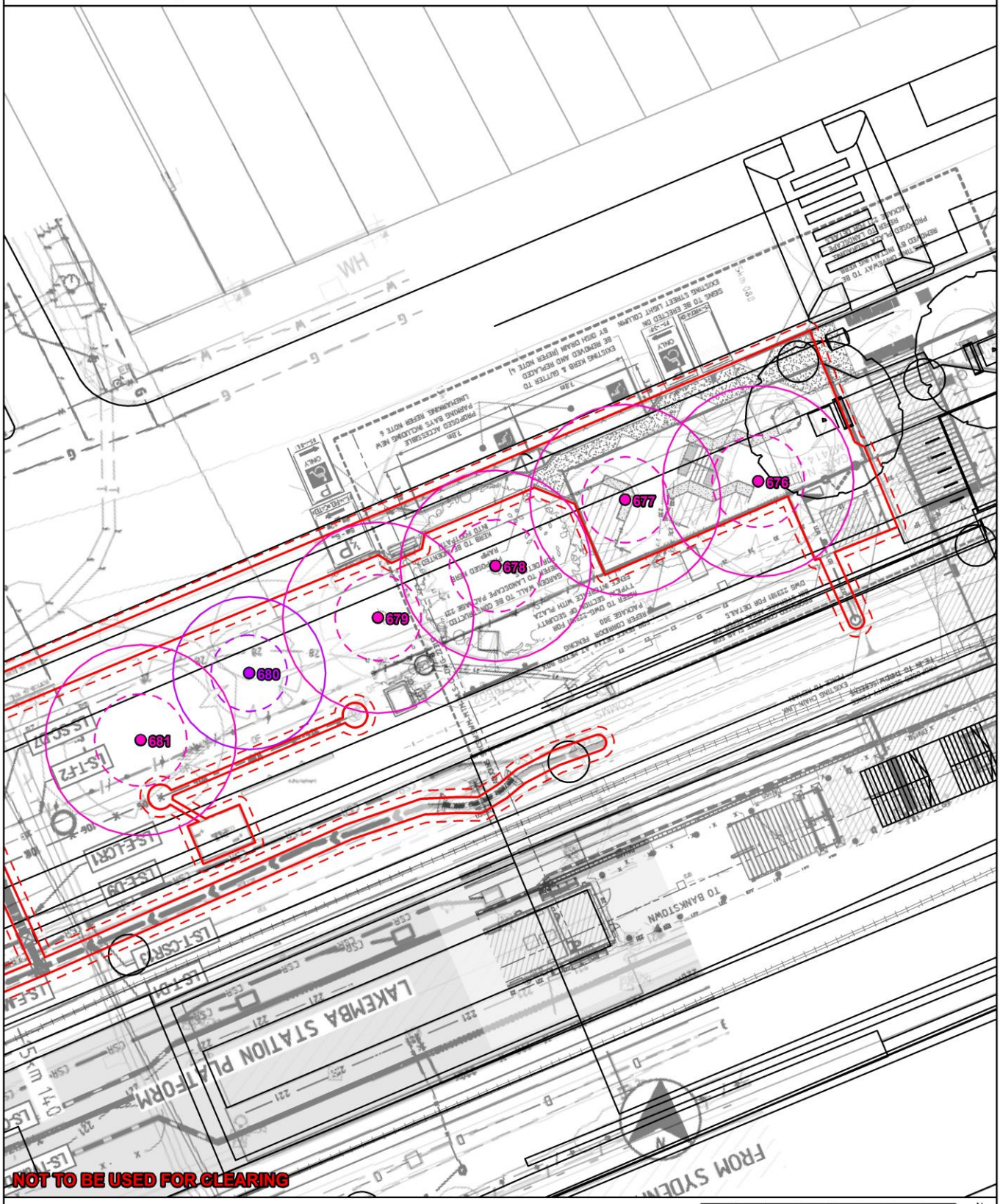
TREE SURVEY

**Arboricultural Impact Assessment** **Page 2 of 7**




**Legend**

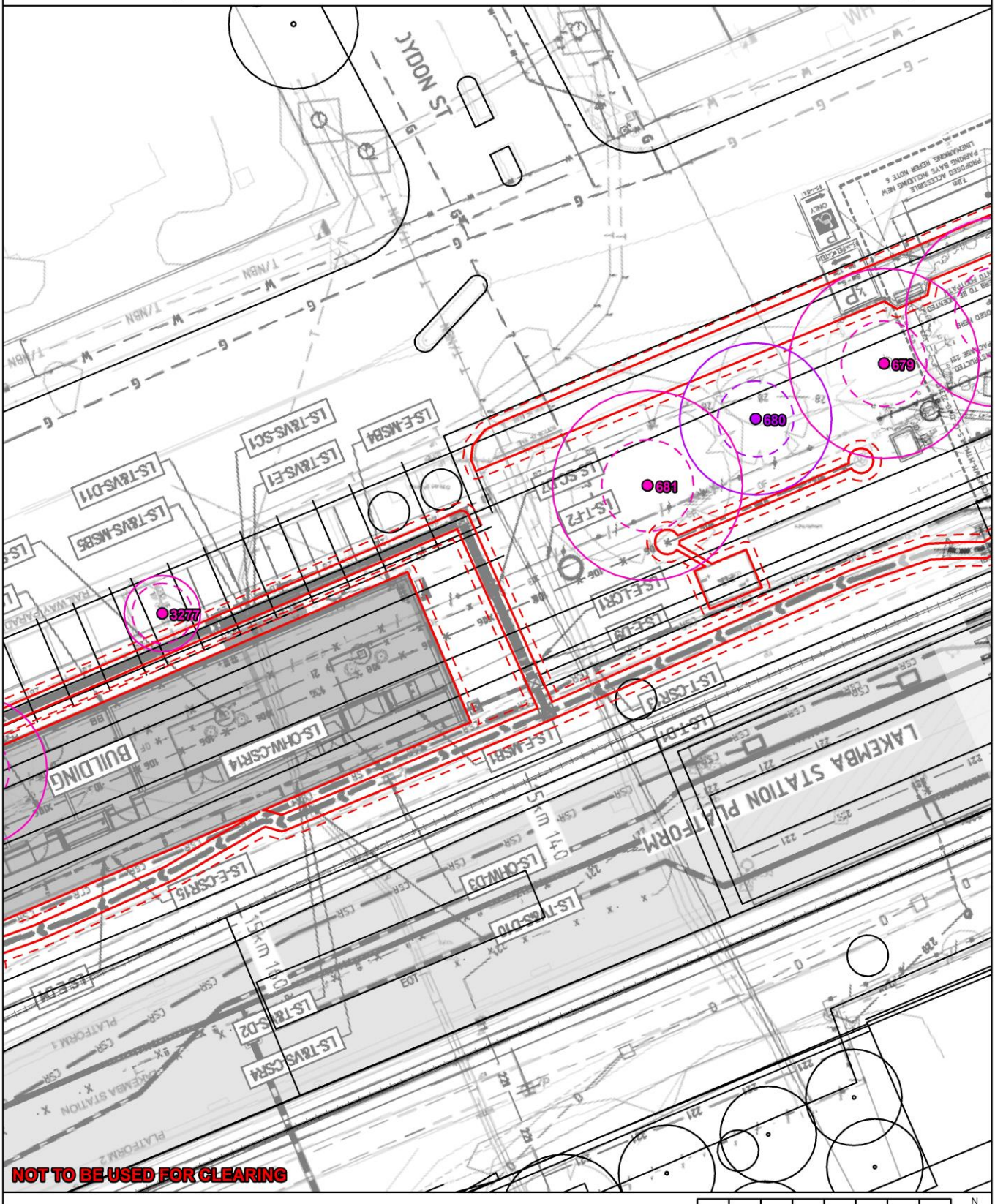
**The subject trees**
- No encroachment
- Minor encroachment
- Major encroachment

**Protection zones**
- TPZ (continuous line)
- SRZ (dashed line)

**Other items**
- Construction footprint
- Disturbance footprint (500mm buffer)
- Railway

TREE SURVEY

**Arboricultural Impact Assessment** **Page 3 of 7**




**Legend**

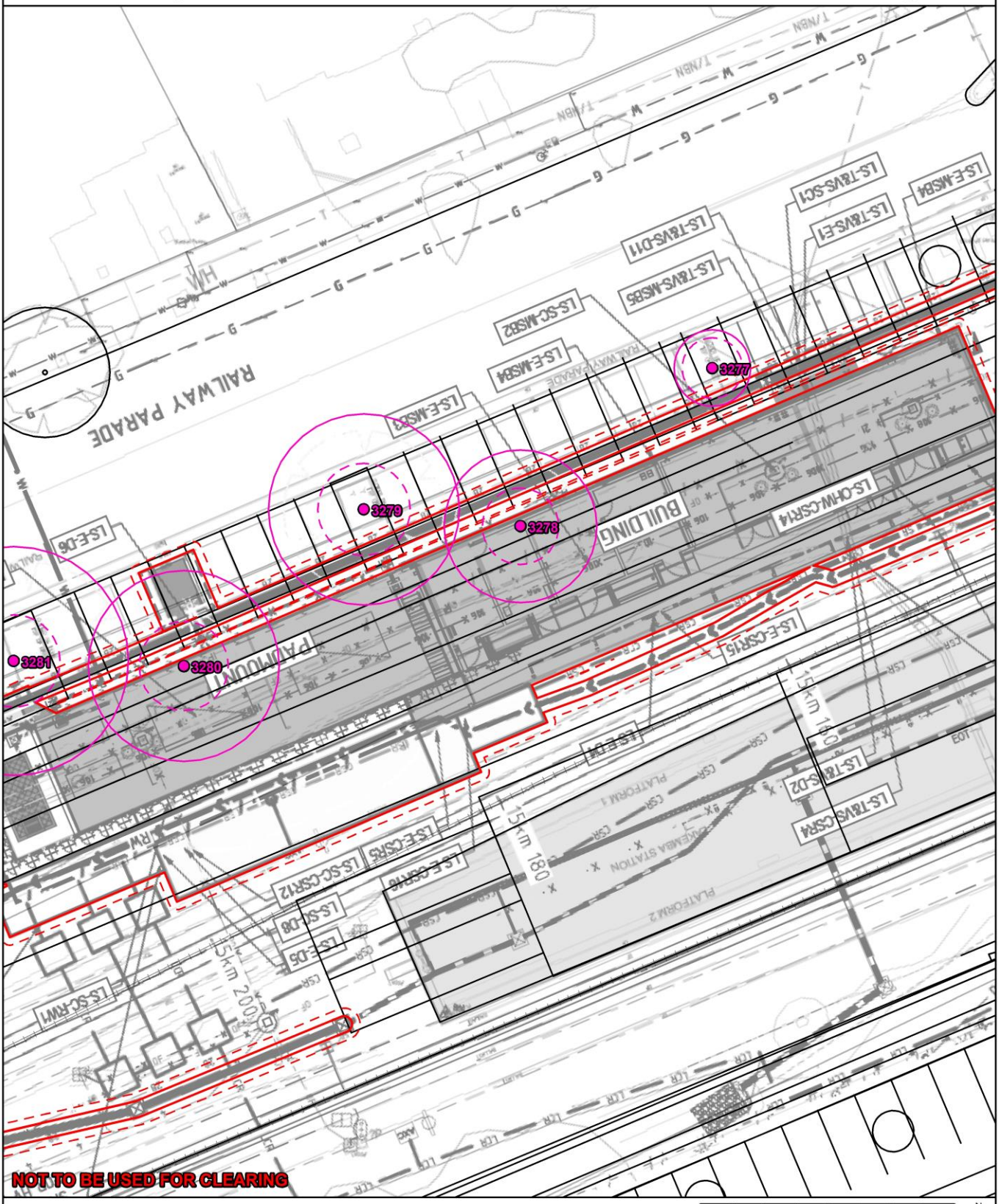
**The subject trees**
- No encroachment
- Minor encroachment
- Major encroachment

**Protection zones**
- TPZ (continuous line)
- SRZ (dashed line)

**Other items**
- Construction footprint
- Disturbance footprint (500mm buffer)
- Railway

TREE SURVEY

**Arboricultural Impact Assessment** **Page 4 of 7**




**Legend**

**The subject trees**
- No encroachment
- Minor encroachment
- Major encroachment

**Protection zones**
- TPZ (continuous line)
- SRZ (dashed line)

**Other items**
- Construction footprint
- Disturbance footprint (500mm buffer)
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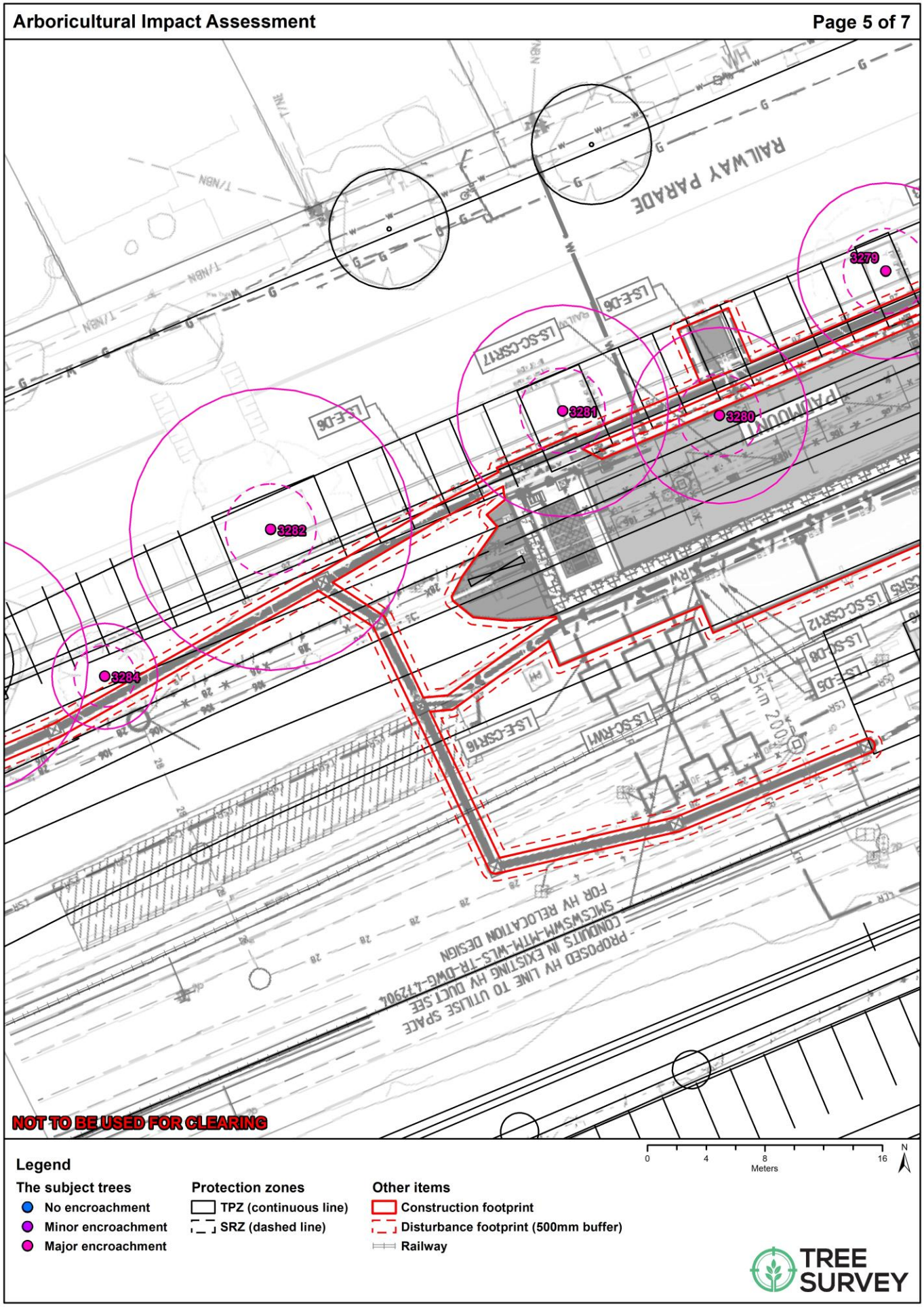
TREE SURVEY


Arboricultural Impact Assessment
Page 5 of 7
RAILWAY PARADE
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NOT TO BE USED FOR CLEARING
Legend
The subject trees
No encroachment
Minor encroachment
Major encroachment
Protection zones
TPZ (continuous line)
SRZ (dashed line)
Other items
Construction footprint
Disturbance footprint (500mm buffer)
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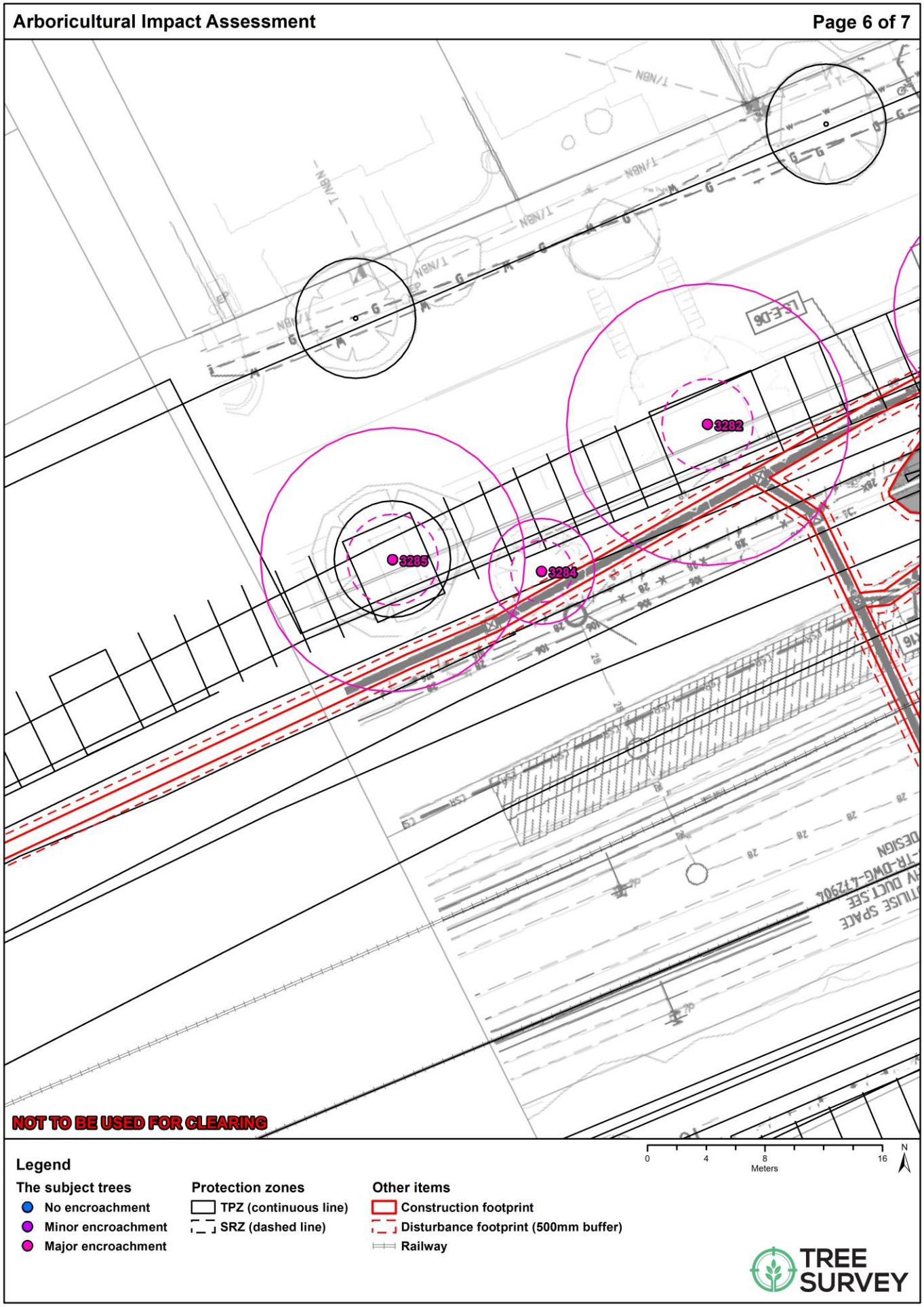
TREE SURVEY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Page 6 of 7
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The subject trees
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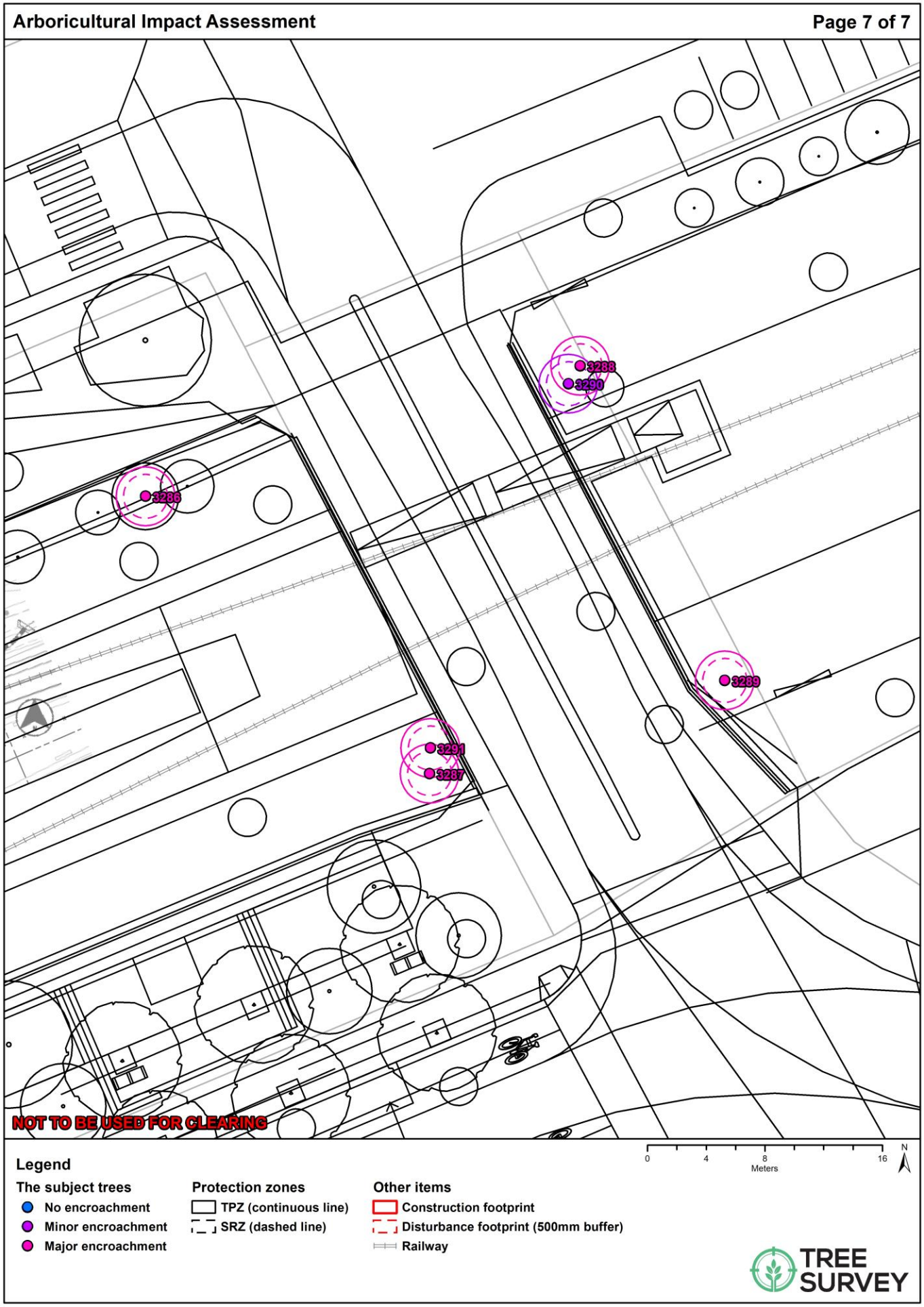
TREE SURVEY


Arboricultural Impact Assessment
Page 7 of 7
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NOT TO BE USED FOR CLEARING
Legend
The subject trees
No encroachment
Minor encroachment
Major encroachment
Protection zones
TPZ (continuous line)
SRZ (dashed line)
Other items
Construction footprint
Disturbance footprint (500mm buffer)
Railway
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TREE SURVEY


**Figure 1: Indicative location of Tree 1, 2, 3, 4 and vegetation groups.**

# 6 Tree Protection Plan (TPP)

This chapter provides details on tree protection mitigations. A summary of proposed tree removals and trees to be retained is outlined below:

## 6.1 Trees proposed for retention

A total of **4** trees are proposed for retention. The following recommendations apply to these trees:

- Tree protection mitigation will be required in accordance with this tree protection plan (this chapter).

## 6.2 Trees proposed for pruning

A total of **1** tree is proposed for pruning. The following recommendations apply to these trees:

- Removing multiple smaller branches rather than large singular branches/portions of the tree will decrease the impacts of pruning and the sizes of the pruning wounds.
- All pruning work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture in accordance with *Australian Standard AS 4373-2007, Pruning of Amenity Trees*.
- All pruning work must be carried out under the supervision of an arborist with a minimum AQF Level 5 qualification in Arboriculture.
- The final pruning cut shall be at the branch collar in accordance with AS4373-2007.

## 6.3 Trees proposed for removal

A total of **19** trees and **3** groups of trees are proposed for removal. The following recommendations apply to these trees:

- In accordance with Condition E4 of the Conditions of Approval, where trees are to be removed, the Proponent must provide a 2:1 ratio replacement of trees. Replacement trees must be planted within the project boundary or on public land up to 500 metres from the project boundary. Replacement tree plantings can be undertaken beyond 500 metres on public land within the local government areas to which the CSSI approval applies if requested by the relevant council(s) or where no more practicable land for planting can be found within and up to 500 metres from the CSSI boundary. The location of replacement trees must be determined in consultation with the relevant council(s).
- In accordance with Condition E6 of the Conditions of Approval, replacement trees are to have a minimum pot size of 75 litres except where the plantings are consistent with the pot sizes specified in a relevant council's plans/programs/strategies for vegetation management, street planting, or open space landscaping, or as agreed by the relevant council. In areas not subject to council plans/programs/strategies, pot sizes should be informed through consultation with the relevant council(s).
- All tree removal work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture, in accordance with Australian Standard AS 4373-2007, Pruning of Amenity Trees, the Work Health and Safety Act 2011 and Work Health and Safety Regulations 2017.
- Removal of *Cinnamomum camphora* and *Lantana species* will be managed in accordance with the Biosecurity Act 2015.

### 6.4 Tree protection fencing

Tree protection fencing must be established at the locations shown in the tree protection plan. 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 the construction footprint. Tree protection fencing must be installed prior to site establishment and remain intact until the completion of works. Once erected, protective fencing must not be removed or altered without the approval of the project arborist. Specifications for the tree protection fencing are as follows:

- Temporary mesh panel fencing (minimum height of 1.8m).
- Installed prior to site establishment and remain intact until the completion of works.
- Protective fencing must not be removed or altered without the approval of the project arborist.
- Prominently signposted with 300mm x 450mm boards stating, “NO ACCESS - TREE PROTECTION ZONE.”
- Certified and inspected by the project arborist.


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 Australian Standard, 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.

### 6.5 Restricted activities within the TPZ

The TPZ is an area that is isolated from the work zone to ensure no disturbance or encroachment occurs in this zone. Activities generally excluded from the TPZ (unless otherwise approved under the development consent) include, but are not limited to:

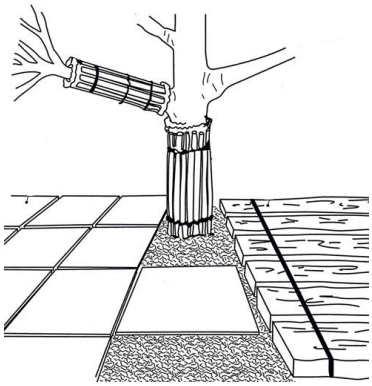
- Machine excavation and trenching.
- Ripping or cultivation of the soil.
- Storage of building materials, waste, and waste receptacles.
- Disposal of waste materials and chemicals including paint, solvents, cement slurry, fuel, oil, and other toxic liquids.
- Movement and storage of plant, equipment, and vehicles.
- Soil level changes, including the placement of fill material.
- Mechanical removal of vegetation.
- Affixing of signage or hoardings to trees.
- Other physical damage to the trunk or root system.
- Any other activity that is likely to cause damage to the tree.

## 6.6 Trunk protection

Where the 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.

## 6.7 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 the 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.
- A layer of mulch or crushed rock (at a minimum depth of 100mm)

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

- Permeable membrane such as geotextile fabric.
- A layer of lightly compacted road base (at a minimum depth of 200mm)
- Geotextile fabric shall extend a minimum of 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.

## 6.8 Mulch

The area within the TPZ should be mulched with good quality composted wood chip/leaf mulch that complies with Australian Standards, AS 4454-2012, Composts, soil conditioners, and mulches, and should be maintained at a depth of 150mm-200mm. Mulching around the base of the tree will provide nutrients and organic matter to the soil as it breaks down, improving and maintaining the overall health of the trees.

## 6.9 Irrigation

Temporary irrigation should be set up in the TPZ of all trees to be retained and should distribute water evenly throughout the area of the TPZ. The irrigation should be used for at minimum one hour daily throughout all stages of the development.

## 6.10 Demolition

The demolition of all existing structures inside or directly adjacent to the TPZ of trees to be retained must be undertaken in consultation with the project arborist. Any machinery is to work from inside the footprint of the existing structures or outside the TPZ, to minimise soil disturbance and compaction. If it is not feasible to locate demolition machinery outside the TPZ of trees to be retained, ground protection will be required. The demolition should be undertaken inwards into the footprint of the existing structures, sometimes referred to as the 'top-down, pull back' method.

## 6.11 Excavations

The project arborist must supervise and certify that all excavations and root pruning are in accordance with AS4373-2007 and AS4970-2009. All excavations (including root investigations) within the TPZ must be carried out using tree-sensitive methods under the supervision of the project arborist. These methods may include:

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

The recommended techniques for common types of excavations have been outlined below:

- **Continuous strip footings:** Manual excavation shall be undertaken along excavation lines within the TPZ prior to the commencement of mechanical excavation. Manual excavation should be a depth of 1 metre (or to unfavourable root growth conditions such as bedrock or heavy clay, if agreed by the project arborist). Any conflicting roots 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. After all root pruning is completed, machine excavation is permitted within the footprint of the structure.
- **Post or pier footings:** Manual excavation or the use of high-pressure air or a combination of high-pressure water and a vacuum device is utilised at the location of pier footings within the TPZ. Any conflicting roots 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. After all root pruning is completed, machine excavation is permitted within the footprint of the structure.

No over-excavation, battering, or benching shall be undertaken beyond the footprint of any structure unless approved by the project arborist.

## 6.12 Underground services

Where possible, 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 the 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 a minimum depth of 800mm below grade. Excavations for entry/exit pits must be located outside the TPZ.

### 6.13 Tree removal mitigation measures

HSEJV will implement a number of measures to ensure the correct vegetation and trees are removed and to mitigate the risk of damage to trees and vegetation that will remain. These mitigation measures include;

- Implementing all protection measures as identified within this report.
- HSEJV will track the removal of trees and vegetation using an excel database for tree removal.
- HSEJV will implement a vegetation removal permitting system to ensure no trees are removed without approval, as per the hold points in the CEMP.
- All trees to be removed or trimmed will be appropriately demarcated.
- Qualified and experienced arborists will be engaged to remove and trim trees.
- Where works will occur in the vicinity of trees that are to remain intact, demarcation or barriers will be put in place around the tree at the extent of the structural root zone. Access tracks will be clearly delineated and defined within the Environmental Control Maps.
- Staff and workers to be educated on vegetation trimming and removal requirements.
- A copy of this report must be submitted to the Secretary for information before the removal, damage, and/or pruning of any trees, including those affected by the site establishment works.
- All recommendations of this report must be implemented by HSEJV unless otherwise agreed by the Secretary.
- Pre-clearing surveys and inspections for endangered and threatened flora and fauna species would be undertaken by qualified ecologists prior to any clearing occurring in accordance with REMM B2.
- Impacts to Downy Wattle Turpentine - Grey Ironbark open forest on shale, Degraded Turpentine - Grey Ironbark open forest on shale, and Broad-leaved Ironbark – Grey Box would be avoided. The locations of these species and communities would be marked on plans, fenced on site, and avoided in accordance with REMM B4.
- Equipment storage and stockpiling would be restricted to identified compound sites and already cleared land in accordance with REMM B5.
- A trained ecologist would be present during the clearing of native vegetation or removal of potential fauna habitat to avoid impacts on resident fauna and to salvage habitat resources as far as is practicable in accordance with REMM B6.
- HSEJV will consult with relevant local stakeholders in regards to visual amenity impacts.
- All green waste produced by tree removal will be taken to a registered tip for recycling or reused onsite as per the NSW EPA mulch order 2016 and the mulch exemption 2016, and following the NSW EPA Guidance on resource recovery order and exemption for mulch.

### 6.14 Site Inspections

In accordance with the *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites*, inspections must be conducted by the project arborist at the following key project stages:

- Prior to any work commencing on-site (including demolition, earthworks, or site clearing) and following the installation of tree protection.
- During any excavations, building works, and any other activities carried out within the TPZ of any tree to be retained & protected.
- A minimum of once per month during the construction phase.
- After all major construction has ceased, following the removal of tree protection.

It shall be the responsibility of the project manager to notify the project arborist prior to any works within the TPZ of any protected tree at a minimum of 48 hours' notice. To ensure the tree protection plan is implemented, hold points have been specified in the schedule of work (**Table 4**).

**Table 4: Schedule of work**

| Construction stage | Hold point | Description |
|---|---|---|
| Pre-construction | 1 | Prior to demolition and/or site establishment, indicate clearly (with spray paint on trunks) trees marked for removal only. |
| | 2 | Tree protection (for trees that will be retained) shall be installed prior to demolition and site establishment. This may include the mulching of areas within the TPZ. The project arborist shall inspect and certify tree protection. |
| During Construction | 3 | Scheduled inspection of trees by the project arborist should be undertaken monthly during the construction period. |
| | 4 | Project arborist to supervise and document all works carried out within the TPZ of trees to be retained. |
| | 5 | Inspection of trees by project arborist after all major construction has ceased, following the removal of tree protection measures. |
| Post Construction | 6 | Final inspection of trees by project arborist. |


Tree Protection Plan
Page 1 of 7
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Legend
The subject trees
Retain
Prune
Remove
Protection zones
TPZ (continuous line)
SRZ (dashed line)
Tree protection measures
Tree protection fence
Arborist supervision
0
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Meters
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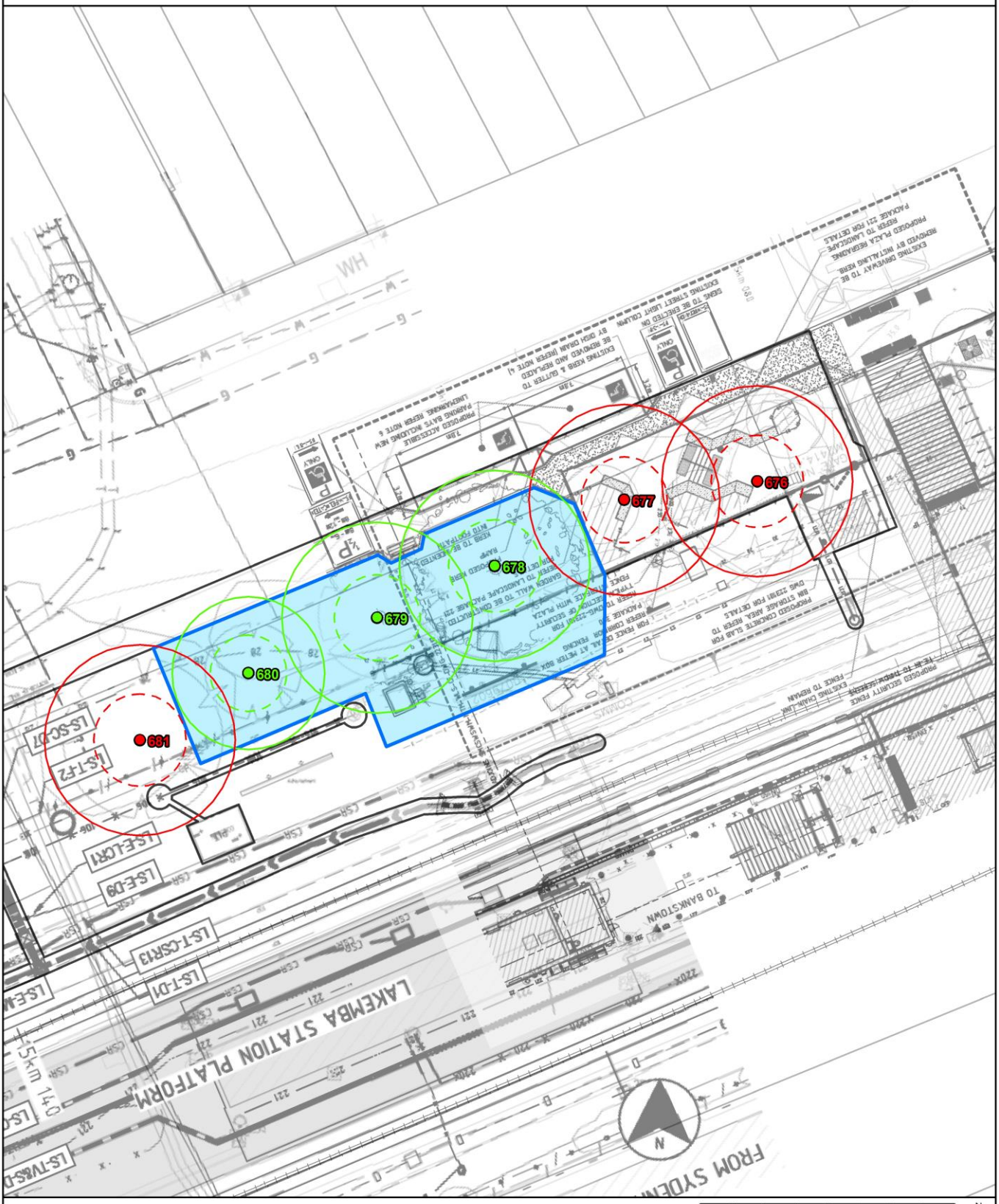
TREE SURVEY

**Tree Protection Plan** **Page 2 of 7**




**Legend**

**The subject trees**
- Retain
- Remove

**Protection zones**
- TPZ (continuous line)
- SRZ (dashed line)

**Tree protection measures**
- Tree protection fence
- Arborist supervision

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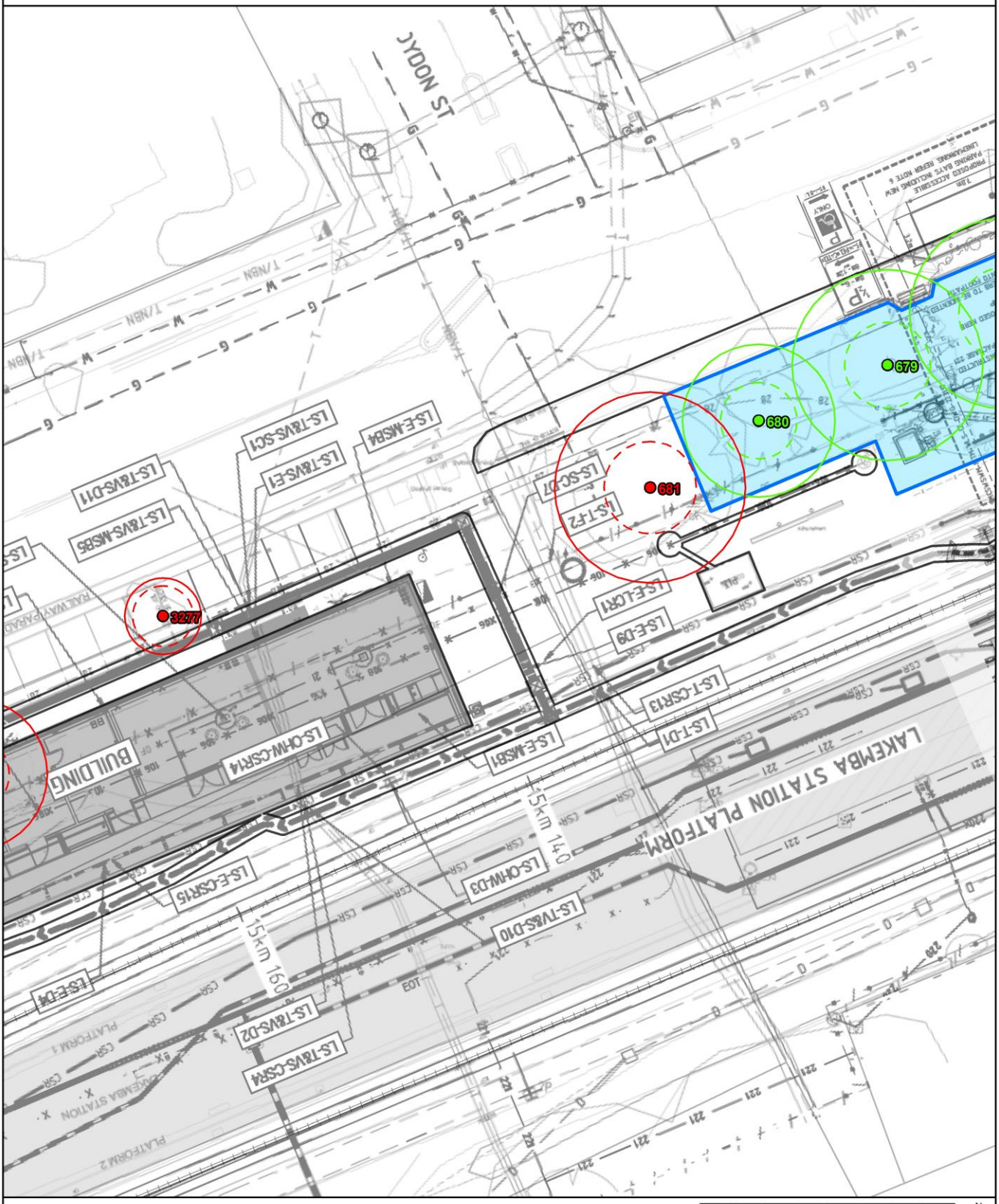
TREE SURVEY

**Tree Protection Plan** **Page 3 of 7**




**Legend**

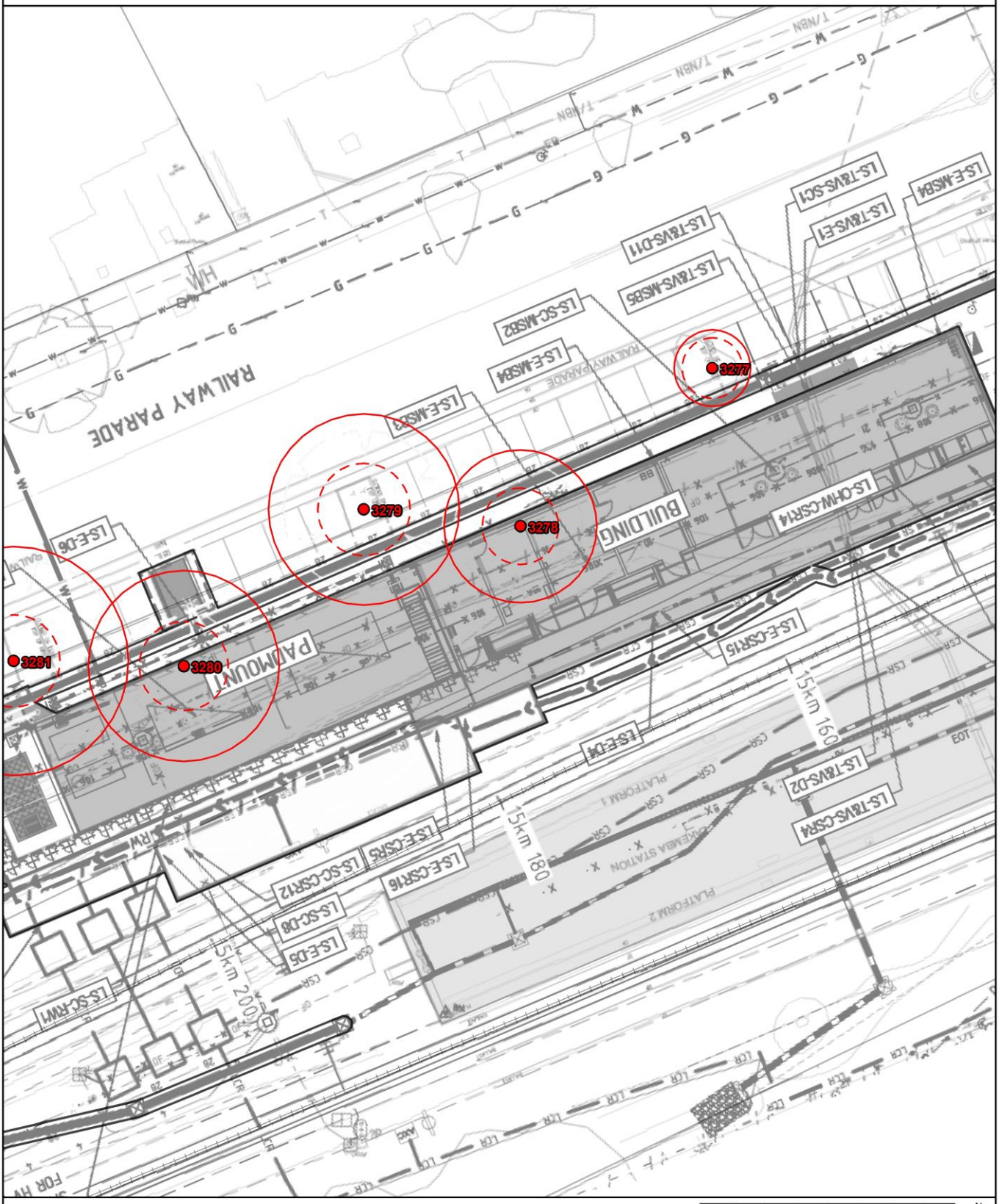
**The subject trees**
- Retain
- Remove

**Protection zones**
- TPZ (continuous line)
- SRZ (dashed line)

**Tree protection measures**
- Tree protection fence
- Arborist supervision

TREE SURVEY

**Tree Protection Plan** **Page 4 of 7**

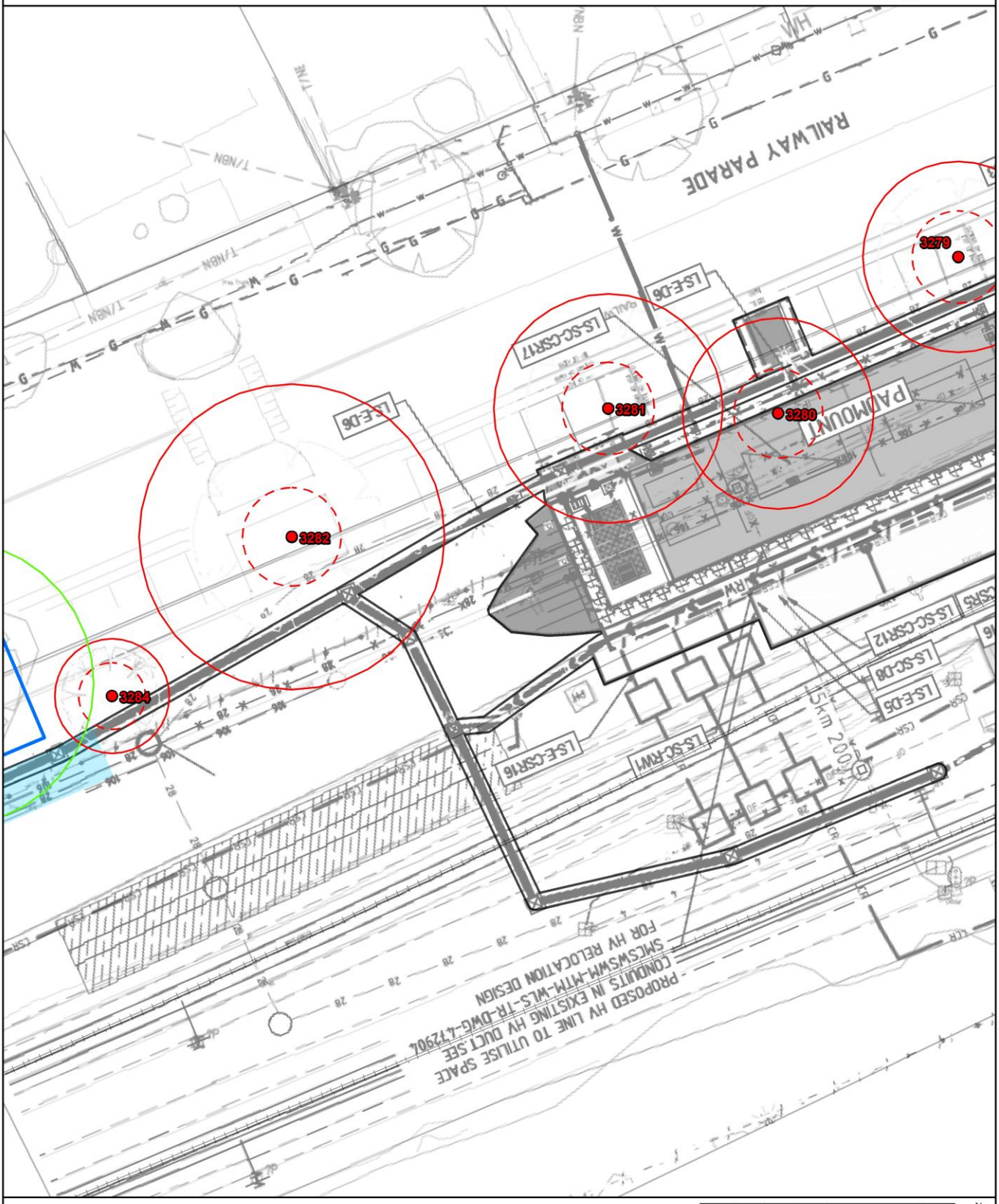



**Legend**

| The subject trees | Protection zones | Tree protection measures |
|---|---|---|
| Retain | TPZ (continuous line) | Tree protection fence |
| Remove | SRZ (dashed line) | Arborist supervision |

TREE SURVEY

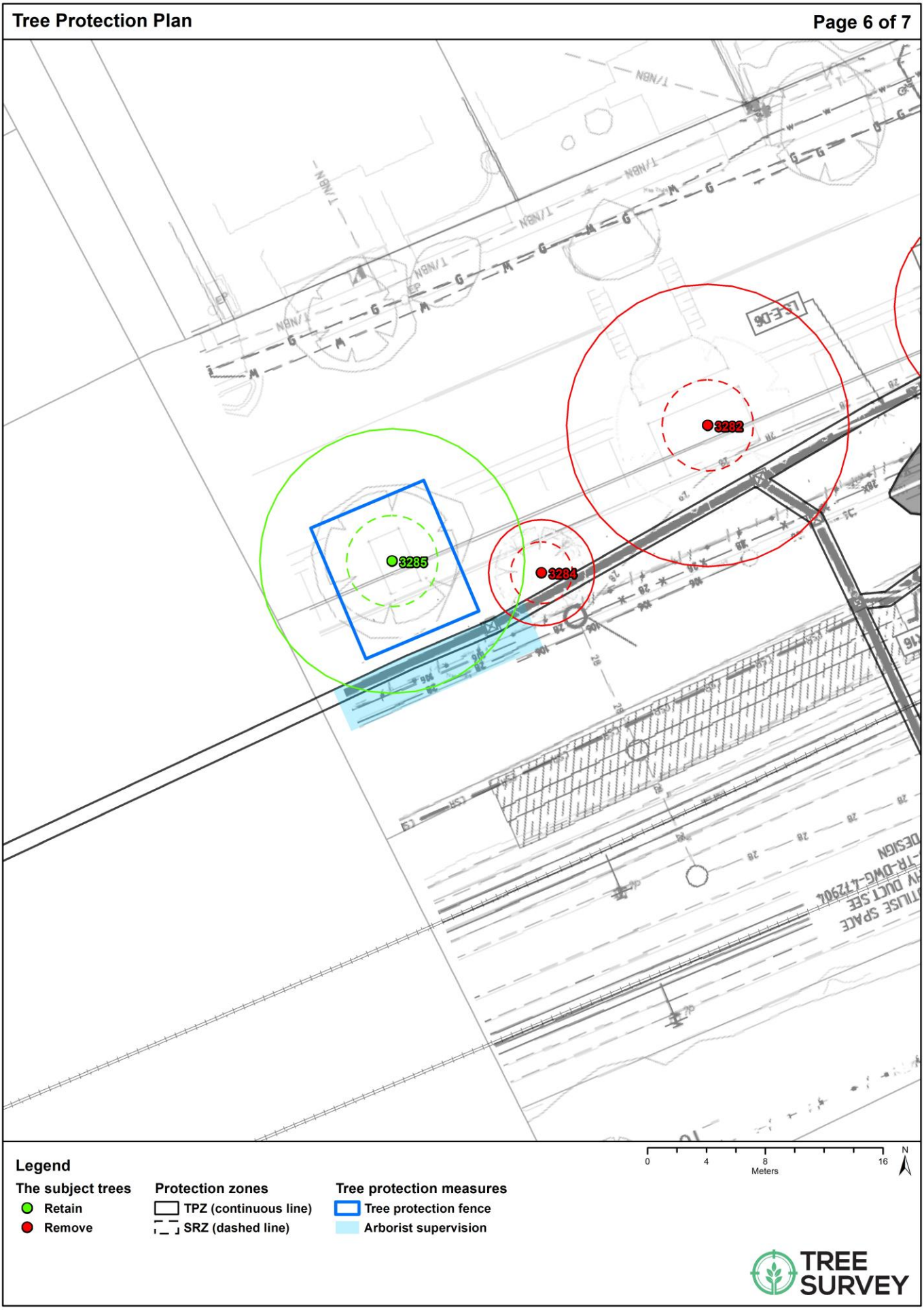
**Tree Protection Plan** **Page 5 of 7**




**Legend**

| The subject trees | Protection zones | Tree protection measures |
|---|---|---|
| Retain | TPZ (continuous line) | Tree protection fence |
| Remove | SRZ (dashed line) | Arborist supervision |

TREE SURVEY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Page 6 of 7
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Protection zones
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Tree protection measures
Tree protection fence
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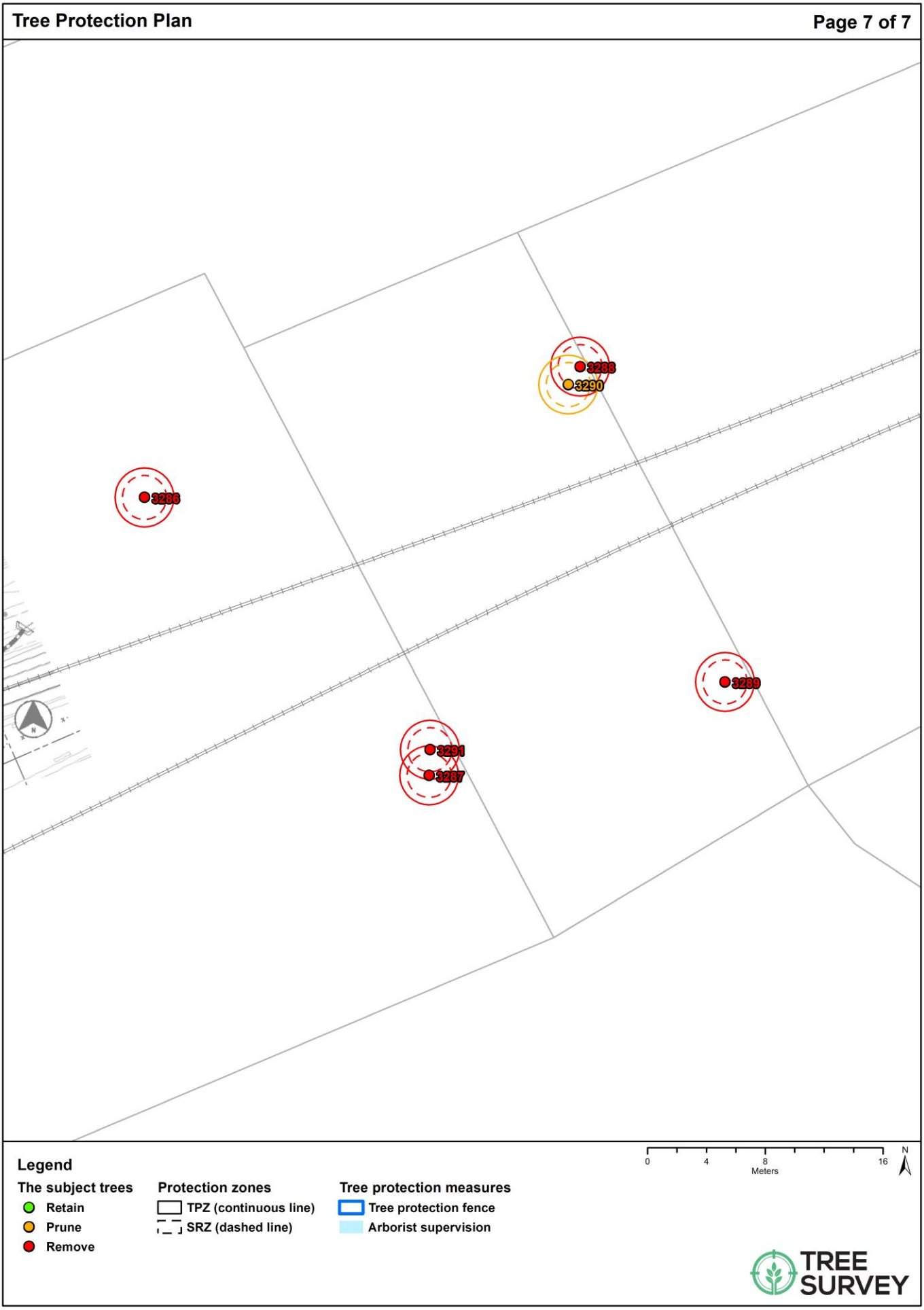
Tree Protection Plan
Page 7 of 7
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Legend
The subject trees
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Prune
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Protection zones
TPZ (continuous line)
SRZ (dashed line)
Tree protection measures
Tree protection fence
Arborist supervision
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TREE SURVEY

# Appendix I - Tree Schedule

| Id. | Botanical name | Height (metres) | Spread (metres diameter) | Health | Structure | Age class | Amenity value | Tree significance | Useful life expectancy | Priority for retention | DBH 1 (millimetres diameter) | DBH 2 (millimetres diameter) | DBH 3 (millimetres diameter) | DBH Combined (millimetres diameter) | DRB (millimetres diameter) | TPZ (metres radius) | SRZ (metres radius) | Other notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | *Morus sp.* | 5 | 5 | Good | Fair | Mature | Low | Low | Low | Short | 200 | - | - | 200 | 200 | 2.4 | 1.7 | - |
| **2** | *Celtis occidentalis* | 6 | 4 | Fair | Fair | Mature | Low | Low | Low | Short | 200 | - | - | 200 | 200 | 2.4 | 1.7 | - |
| **3** | *Grevillea sp.* | 3 | 3 | Fair | Fair | Mature | Low | Low | Low | Short | 200 | - | - | 200 | 200 | 2.4 | 1.7 | - |
| **4** | *Acacia decurrens* | 5 | 3 | Fair | Fair | Mature | Low | Low | Low | Short | 300 | - | - | 300 | 300 | 3.6 | 2 | - |
| **676** | *Lophostemon confertus* | 11 | 6 | Fair | Good | Mature | Medium | Medium | Medium | Medium | 650 | - | - | 650 | 750 | 6.0 | 2.9 | - |
| **677** | *Cupressus torulosa* | 13 | 4 | Good | Good | Mature | High | Medium | Long | High | 550 | - | - | 550 | 600 | 6.0 | 2.7 | - |
| **678** | *Corymbia citriodora* | 21 | 7 | Good | Good | Mature | High | High | Long | High | 650 | - | - | 650 | 750 | 6.0 | 2.9 | - |
| **679** | *Corymbia citriodora* | 19 | 5 | Good | Good | Mature | High | High | Long | High | 500 | - | - | 500 | 600 | 6.0 | 2.7 | - |
| **680** | *Corymbia citriodora* | 17 | 5 | Good | Good | Mature | High | High | Long | High | 400 | - | - | 400 | 450 | 4.8 | 2.4 | - |
| **681** | *Lophostemon confertus* | 9 | 6 | Good | Good | Mature | High | High | Long | High | 650 | - | - | 650 | 750 | 6.0 | 2.9 | - |
| **3277** | *Eucalyptus microcorys* | 5 | 4 | Good | Good | Semi-mature | Medium | Medium | Long | Medium | 200 | - | - | 200 | 250 | 2.4 | 1.9 | - |
| **3278** | *Lophostemon confertus* | 6 | 4 | Good | Good | Mature | High | High | Long | High | 400 | - | - | 400 | 450 | 4.8 | 2.4 | - |
| **3279** | *Eucalyptus microcorys* | 18 | 6 | Good | Good | Mature | High | High | Long | High | 550 | - | - | 550 | 750 | 6.0 | 2.9 | - |
| **3280** | *Lophostemon confertus* | 8 | 4 | Good | Fair | Mature | Medium | High | Short | Medium | 400 | 160 | 200 | 500 | 650 | 6.0 | 2.8 | - |
| **3281** | *Eucalyptus microcorys* | 18 | 12 | Good | Good | Mature | High | High | Long | High | 600 | - | - | 600 | 750 | 7.2 | 2.9 | - |
| **3282** | *Eucalyptus microcorys* | 14 | 12 | Good | Good | Mature | High | High | Long | High | 500 | 400 | 380 | 800 | 850 | 9.6 | 3.1 | - |
| **3284** | *Lophostemon confertus* | 5 | 5 | Good | Good | Semi-mature | Medium | Medium | Medium | Medium | 300 | - | - | 300 | 350 | 3.6 | 2.1 | - |
| **3285** | *Eucalyptus microcorys* | 16 | 16 | Good | Good | Mature | Medium | Medium | Medium | High | 750 | - | - | 750 | 850 | 9 | 3.1 | - |
| **3286** | *Cinnamomum camphora* | 5 | 5 | Fair | Fair | Semi-mature | Low | Low | Medium | Low | 150 | - | - | 150 | 150 | 2 | 1.5 | - |
| **3287** | *Lantana species* | 7 | 7 | Good | Fair | Semi-mature | Low | Low | Medium | Low | 150 | - | - | 150 | 150 | 2 | 1.5 | - |
| **3288** | *Acacia longifolia* | 4 | 3 | Fair | Fair | Semi-mature | Low | Low | Short | Low | 150 | - | - | 150 | 150 | 2 | 1.5 | - |
| **3289** | *Acacia longifolia* | 4 | 3 | Fair | Fair | Semi-mature | Low | Low | Short | Low | 150 | - | - | 150 | 150 | 2 | 1.5 | - |
| **3290** | *Acacia longifolia* | 4 | 3 | Fair | Fair | Semi-mature | Low | Low | Short | Low | 150 | - | - | 150 | 150 | 2 | 1.5 | - |
| **3291** | *Plumbago species* | 2 | 4 | Fair | Fair | Semi-mature | Low | Low | Short | Low | 150 | - | - | 150 | 150 | 2 | 1.5 | - |
| **G1** | *Mixed vegetation* | A group of vegetation comprising of introduced and native ground covers, grasses, and small shrubs <3m in height. | | | | | | | | | | | | | | | | - |
| **G2** | *Mixed vegetation* | A group of vegetation comprising of introduced and native ground covers, grasses, and small shrubs <3m in height. | | | | | | | | | | | | | | | | - |
| **G3** | *Mixed vegetation* | A group of vegetation comprising of introduced and native ground covers, grasses, and small shrubs <3m in height. | | | | | | | | | | | | | | | | - |

# Appendix II – Tree images

## Tree 1

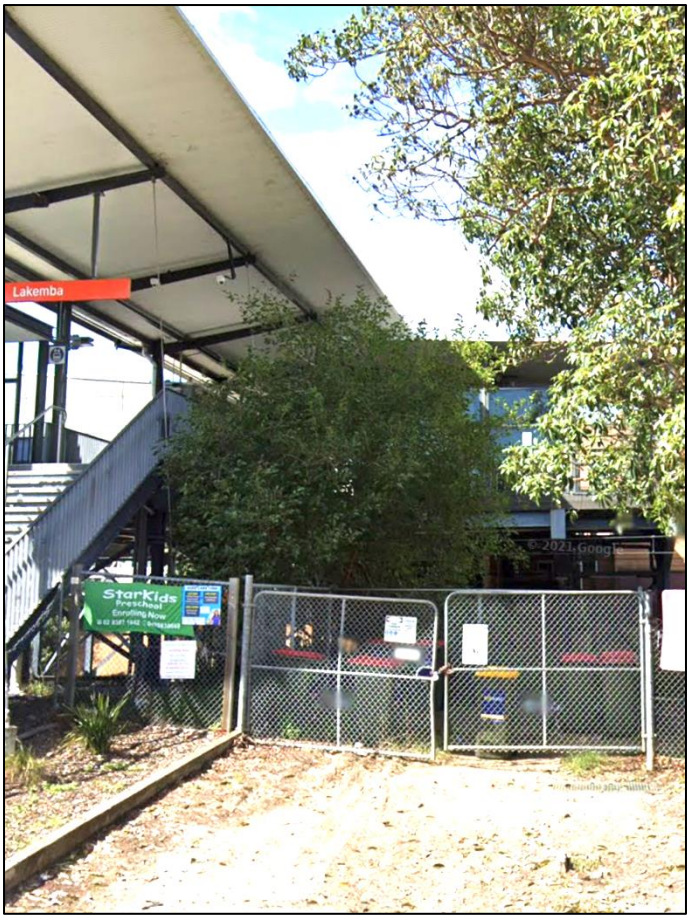


**Figure 1: Tree to be removed**

## Tree 2

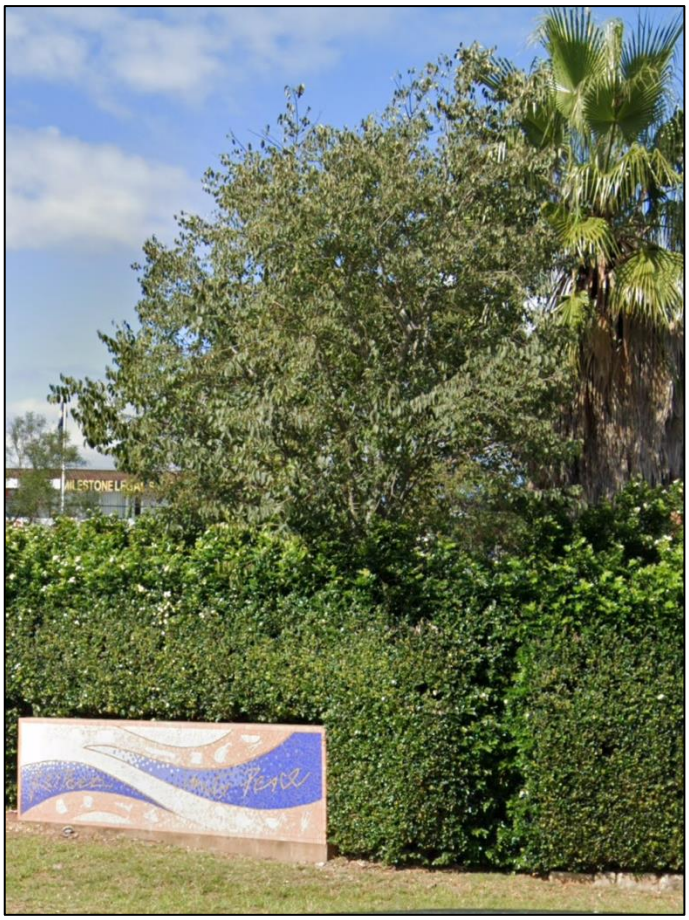

**Figure 2: Tree to be removed**

**Tree 3**

**Figure 3: Tree to be removed (behind hedge)**

**Tree 4**

**Figure 4: Tree to be pruned**

**Tree 3290**

**Figure 5: Tree to be pruned**

**Tree 3291**

**Figure 6: Shrub to be removed**

**Group 1**

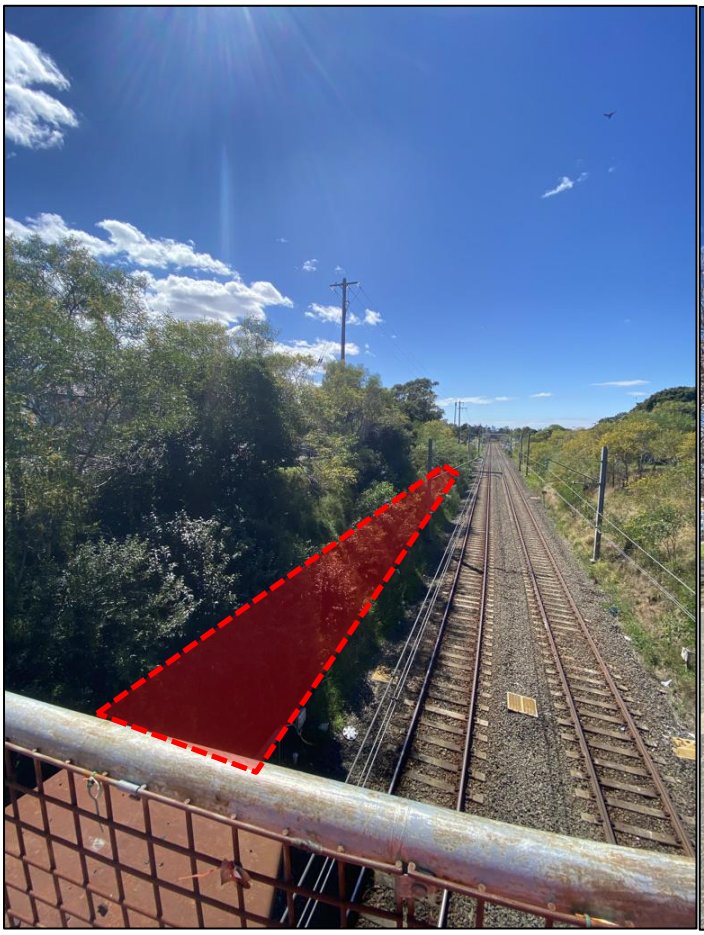

**Figure 7: Indicative vegetation to be removed**

**Group 2**


**Figure 8: Vegetation to be removed**

## Group 3

**Figure 9: Vegetation to be removed**

# Appendix III - STARS© assessment matrix

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, AS4970-2009 Protection of trees on development sites.

This tree retention assessment has been undertaken in accordance with the Institute of Australian Consulting Aboriculturalists (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.

## Tree Significance - Assessment Criteria

| Low Significance | Medium Significance | High Significance |
|---|---|---|
| The tree is in fair-poor condition and good or low vigour.<br><br>The tree has form atypical of the species<br><br>The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings<br><br>The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area<br><br>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<br><br>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<br><br>The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms<br><br>The tree has a wound or defect that has the potential to become structurally unsound. | The tree is in fair to good condition<br><br>The tree has form typical or atypical of the species<br><br>The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area<br><br>The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street<br><br>The tree provides a fair contribution to the visual character and amenity of the local area<br><br>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 | The tree is in good condition and good vigour<br><br>The tree has a form typical for the species<br><br>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.<br><br>The tree is listed as a heritage item, threatened species or part of an endangered ecological community or listed on council's significant tree register<br><br>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.<br><br>The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group, or has commemorative values.<br><br>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. |
| **Environmental Pest / Noxious Weed** | | |
| The tree is an environmental pest species due to its invasiveness or poisonous/allergenic properties.<br><br>The tree is a declared noxious weed by legislation | | |
| **Hazardous / Irreversible Decline** | | |
| The tree is structurally unsound and/or unstable and is considered potentially dangerous.<br><br>The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term. | | |

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

## Tree Significance

| Useful Life Expectancy | High Significance | Medium Significance | Low Significance | Environmental Pest / Noxious Weed | Hazardous / Irreversible Decline |
|---|---|---|---|---|---|
| **Long** >40 years | | | | | |
| **Medium** 15-40 years | | | | | |
| **Short** <1-15 years | | | | | |
| **Dead** | | | | | |

## Legend for Matrix Assessment

| | |
|---|---|
| | **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. |
| | **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. |
| | **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. |
| | **Priority for removal (Low):** These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention. |

### Reference

IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS)
Institute of Australian Consulting Arboriculturists
Australia, www.iaca.org.au