TREE SURVEY

ARBORICULTURAL IMPACT ASSESSMENT & TREE PROTECTION PLAN

286 Sydney Road, Balgowlah
Version 1

Prepared for:
Blue Sky Building Designs

31 July 2024

Document information

Title:	286 Sydney Road, Balgowlah
Report type:	Arboricultural Impact Assessment (AIA) & Tree Protection Plan (TPP)
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Document status

Document status	Date	Revision description
Version 1	31/07/24	Final version

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 Background

1.1 Introduction

Tree Survey was commissioned by Blue Sky Building Designs to prepare an Arboricultural Impact Assessment (AIA) and Tree Protection Plan (TPP) for a proposed development located at 286 Sydney Road, Balgowlah.

The purpose of this report is to:

- Assess all trees within and adjacent to the development footprint.
- Evaluate the impacts of the proposed works and assess suitability for tree retention.
- Identify trees that require removal and specify protection for trees that will be retained.

1.2 The proposal

The key features of the proposal are summarised as follows:

- Demolition of existing structures.
- Construction of a proposed residential duplex dwelling.
- Associated landscaping.

1.3 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 (AS4970), the findings from the site inspections, and analysis of the documents/plans listed in **Table 1**.

Table 1: Documents and plans

Document	Author	Version	Date
Architectural Plan	Blue Sky Building Designs	1	24/07/24
Survey Plan	Structerre	1	23/04/24

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

1.4 Council tree preservation

The Northern Beaches Council tree preservation controls define a tree as any tree with a height equal to or greater than 5 metres above ground level. Trees and vegetation that fall within these specifications are protected unless listed as an exempt species. Trees that do not meet the prescribed dimensions have generally not been included in this report.

2 Method

2.1 Visual Tree Assessment (VTA)

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

The following limitations apply to this methodology:

- Trees are inspected visually from ground level without the use of any invasive or diagnostic tools and testing.
- Trees within private 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 are estimated unless otherwise stated.
- Tree protection zones have been calculated in accordance with AS4970 using the DBH and diameter at root buttress (DRB) measurements.
- Tree identification is based on broad taxonomical features present and visible from ground level at the time of inspection.

2.2 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 modifications 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.
- **High:** These trees are considered important for retention and should be considered for retention where possible. Design modification or relocation of building/s should be considered to accommodate the setbacks as prescribed by AS4970.

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.**

3 Arboricultural Impact Assessment (AIA)

3.1 Tree protection zones

The Australian Standard, Protection of Trees on Development Sites (AS4970), describes two zones that need to be considered when undertaking an arboricultural impact assessment:

- **Tree protection zone (TPZ):** The TPZ is the combination of crown and root area that requires protection during the construction process so that the tree can remain viable. The TPZ is calculated by measuring the 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 defined by AS4970:

- **Nil 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.**

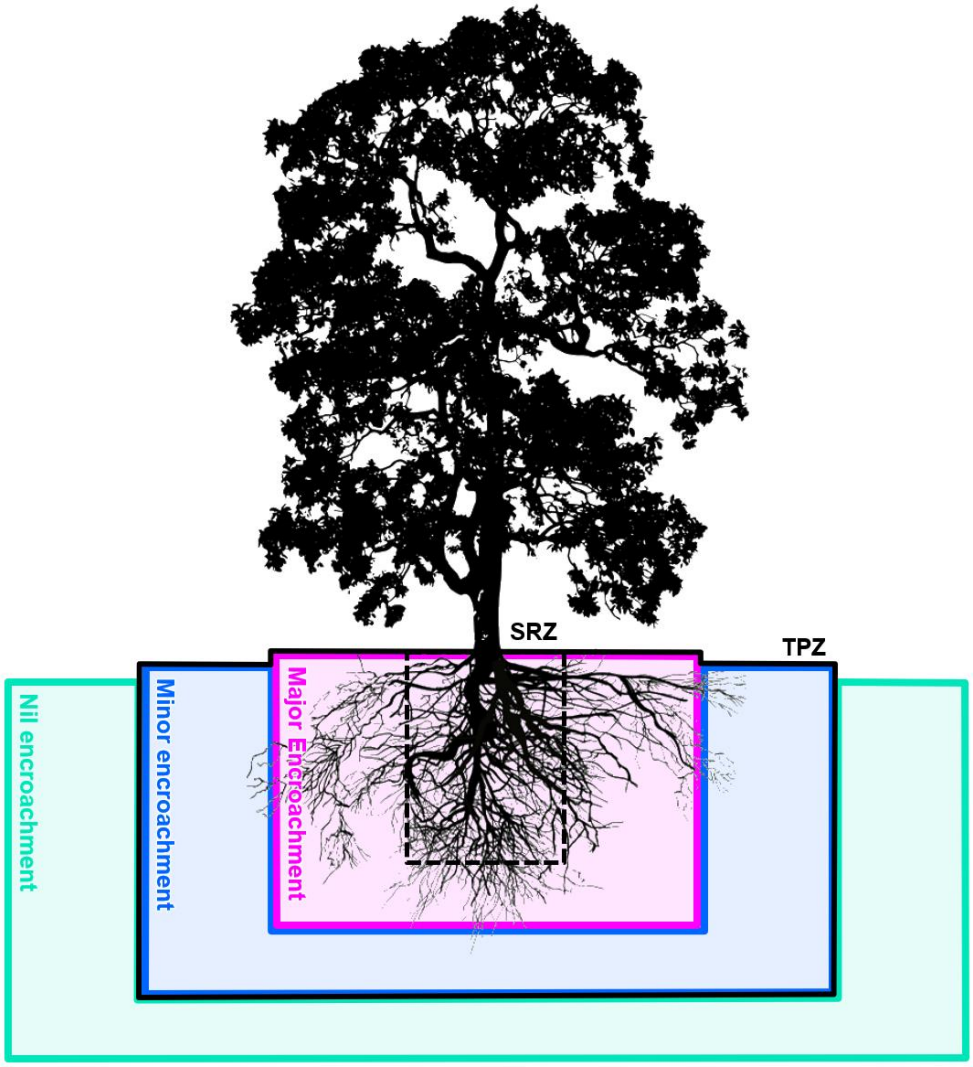


Figure 1: Three (3) levels of encroachment

4 Results

Table 2 shows the results of the arboricultural assessment. Key points are:

4.1 Encroachment within the TPZ

A summary of trees impacted by the proposed construction footprint is outlined below:

- **Nil encroachment (0%):** A total of **8** trees will be subject to nil encroachment.
- **Minor encroachment (<10%):** A total of **0** trees will be subject to minor encroachment.
- **Major encroachment (>10%):** A total of **6** trees will be subject to major encroachment.

4.2 Tree removal and retention

A total of **14** trees were assessed and included in this report:

- **Retain:** A total of **0** trees are proposed for retention.
- **Remove:** A total of **14** trees are proposed for removal.

Table 2: Results of the arboricultural assessment

Id.	Botanical name	Height (metres)	Spread (metres diameter)	Health	Structure	Age class	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)	Encroachment	% Encroachment within TPZ	Other notes	Proposal
1	*Ulmus species*	7	8	Fair	Fair	Mature	Medium	Medium	Medium	300	-	-	400	300	3.6	2.3	**Major**	**50%**	Street tree. Dormant	**Remove**
2	*Pittosporum undulatum*	4	4	Poor	Fair	Mature	Low	Short	Low	150	150	150	400	260	3.1	2.3	**Major**	**93%**	Canopy dieback. Foliage necrotic with historic borer damage	**Remove**
3	*Plumeria sp.*	4	7	Fair	Fair	Mature	Low	Medium	Low	200	200	100	300	300	3.6	2.0	**Major**	**42%**	Ornamental tree next to the fence line.	**Remove**
4	*Melia azedarach*	7	10	Fair	Fair	Mature	Low	Medium	Low	250	300	-	500	390	4.7	2.5	**Major**	**76%**	-	**Remove**
5	*Radermachera sinica*	8	6	Fair	Fair	Mature	Low	Medium	Low	200	100	-	350	220	2.6	2.1	**Major**	**97%**	-	**Remove**
6	*Cupressus sempervirens*	10	4	Fair	Fair	Mature	Medium	Medium	Medium	350	-	-	450	350	4.2	2.4	**Major**	**47%**	Multi-stemmed. Included junctions typical of species.	**Remove**
7	*Glochidion ferdinandi*	4	3	Poor	Fair	Semi-mature	Low	Short	Low	150	-	-	200	150	2.0	1.7	**Nil**	**0%**	Canopy dieback. Tree is growing on a lean. Tree not shown on survey.	**Remove**
8	*Glochidion ferdinandi*	5	4	Fair	Fair	Semi-mature	Low	Medium	Low	100	100	-	250	140	2.0	1.8	**Nil**	**0%**	Tree not on survey.	**Remove**
9	*Dead tree*	3	2	Poor	Poor	Dead	Low	Dead	Low	150	-	-	200	150	2.0	1.7	**Nil**	**0%**	Dead tree.	**Remove**
10	*Pittosporum undulatum*	7	8	Fair	Fair	Mature	Low	Medium	Low	300	100	150	450	350	4.2	2.4	**Nil**	**0%**	Basal decay. Cavity (>10cm). Tree impacting on neighbours' residence. Unsuitable location.	**Remove**
11	*Dead tree*	4	2	Poor	Poor	Dead	Low	Dead	Low	100	-	-	150	100	2.0	1.5	**Nil**	**0%**	Dead tree.	**Remove**
12	*Ligustrum lucidum*	7	9	Fair	Fair	Mature	Low	Short	Low	300	200	-	500	360	4.3	2.5	**Nil**	**0%**	Weed species.	**Remove**
13	*Ligustrum lucidum*	5	5	Fair	Fair	Mature	Low	Short	Low	150	100	-	300	180	2.2	2.0	**Nil**	**0%**	Suppressed canopy. Weed species. Tree has asymmetrical crown from adjacent tree.	**Remove**
14	*Ligustrum sp.*	8	5	Fair	Poor	Mature	Low	Short	Low	300	-	-	350	300	3.6	2.1	**Nil**	**0%**	Weed species. Tree has interwoven with a small pittosporum.	**Remove**

5 Discussion

5.1 Nil encroachment

A total of **8** trees will be subject to nil encroachment within the TPZ:

- **Retain:** No trees within the category of “nil encroachment” are proposed for retention.
- **Remove:** A total of **8** trees will be subject to nil encroachment within the TPZ. These trees are low-value and not worthy of retention. These trees are recommended for removal, regardless of development impacts.

5.2 Minor encroachment

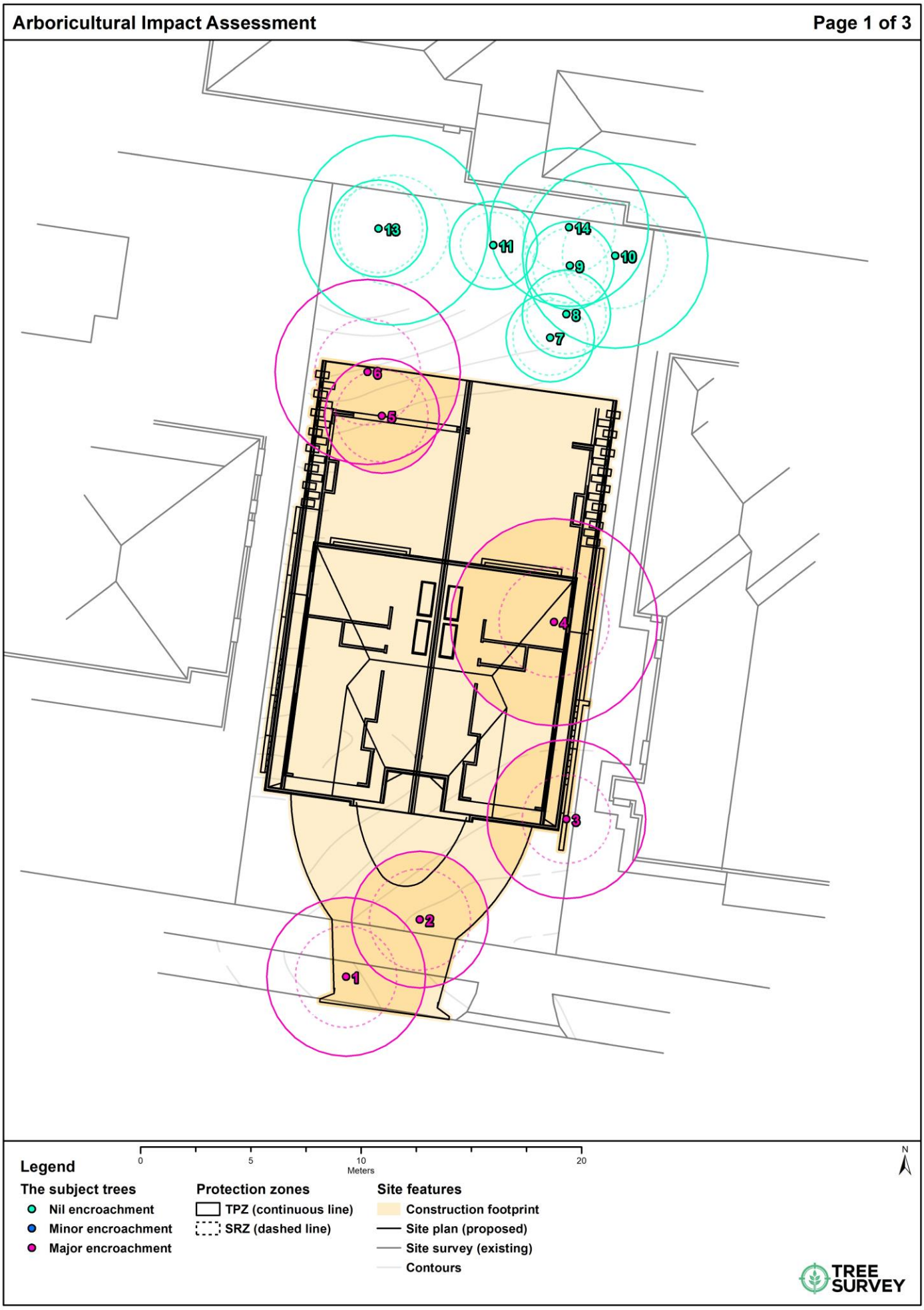
No trees have been assessed within the category of “minor encroachment”.

5.3 Major encroachment

A total of **6** trees will be subject to a major encroachment of greater than 10% within the TPZ:

- **Retain:** No trees within the category of “major encroachment” are proposed for retention.
- **Remove:** A total of **6** trees will be subject to a major encroachment of greater than 20% within the TPZ. Encroachment of greater than 20% can begin to impact the structural root zone (SRZ) and is more likely to compromise tree stability” (Costello, Watson, and Smiley (2017, p.21[1]). Impacts within the SRZ are not recommended as it may lead to the destabilisation and/or decline of the tree. These trees are located inside or directly adjacent to the proposed construction footprint and cannot be retained under the current proposal.

[1] Costello, L., Watson, G. and Smiley, E., 2017. Root Management. International Society of Arboriculture.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The subject trees
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Major encroachment
Protection zones
TPZ (continuous line)
SRZ (dashed line)
Site features
Construction footprint
Site plan (proposed)
Site survey (existing)
Contours
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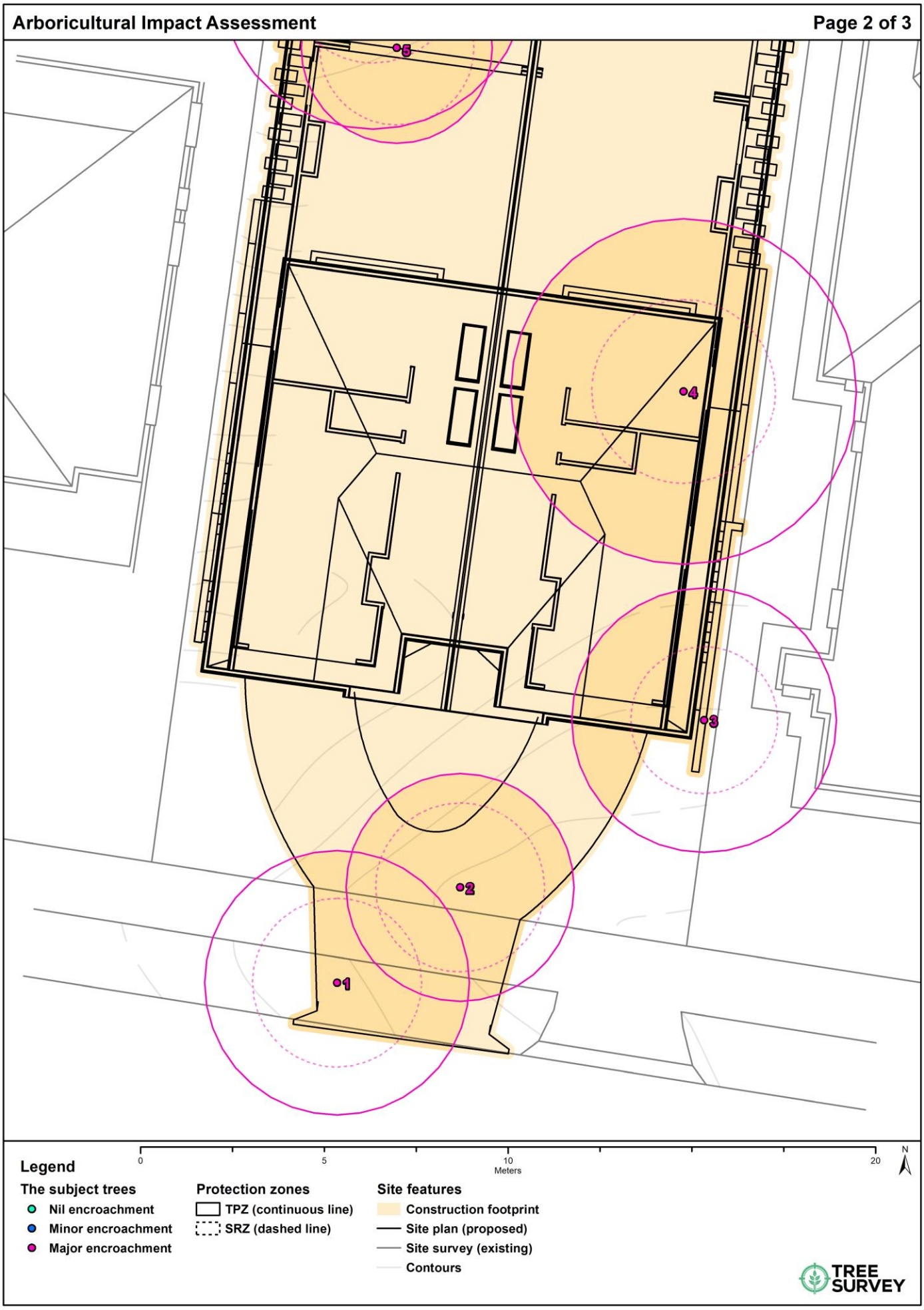
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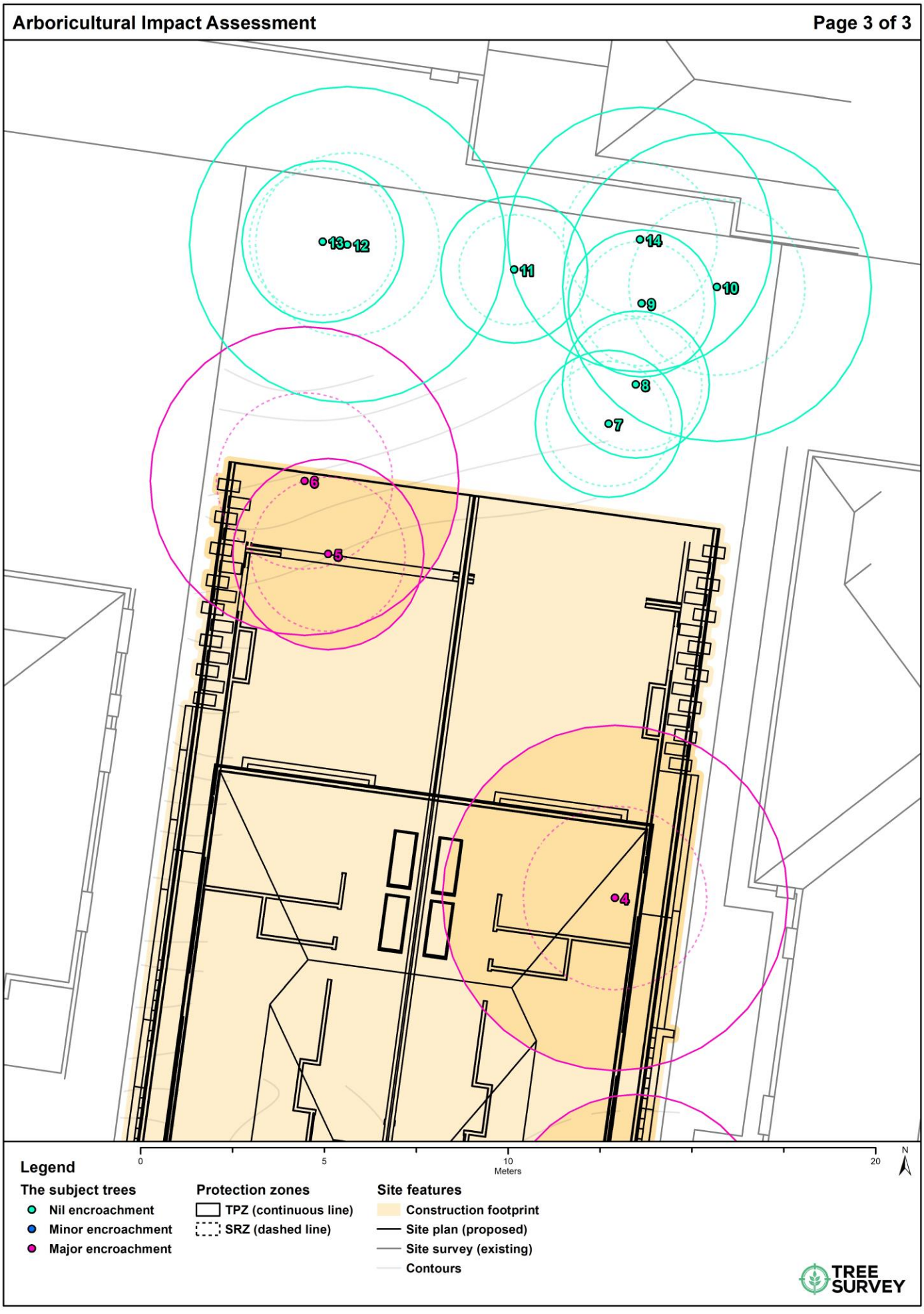
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6 Tree Protection Plan (TPP)

6.1 Tree removal and retention

A summary of the total proposed tree removals is outlined below:

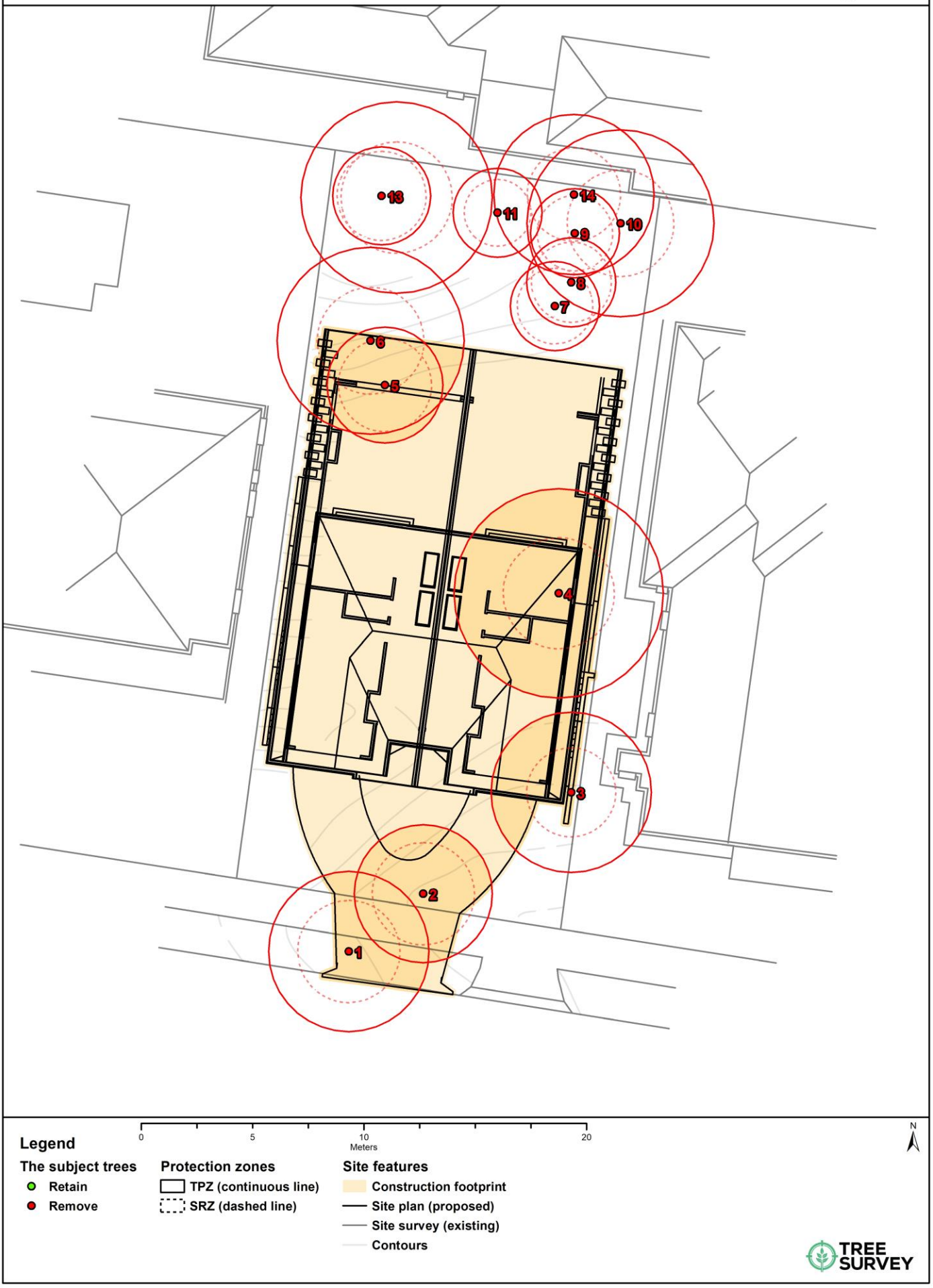
- **Retain:** A total of **0** trees are proposed for retention.
- **Remove:** A total of **14** trees are proposed for removal.

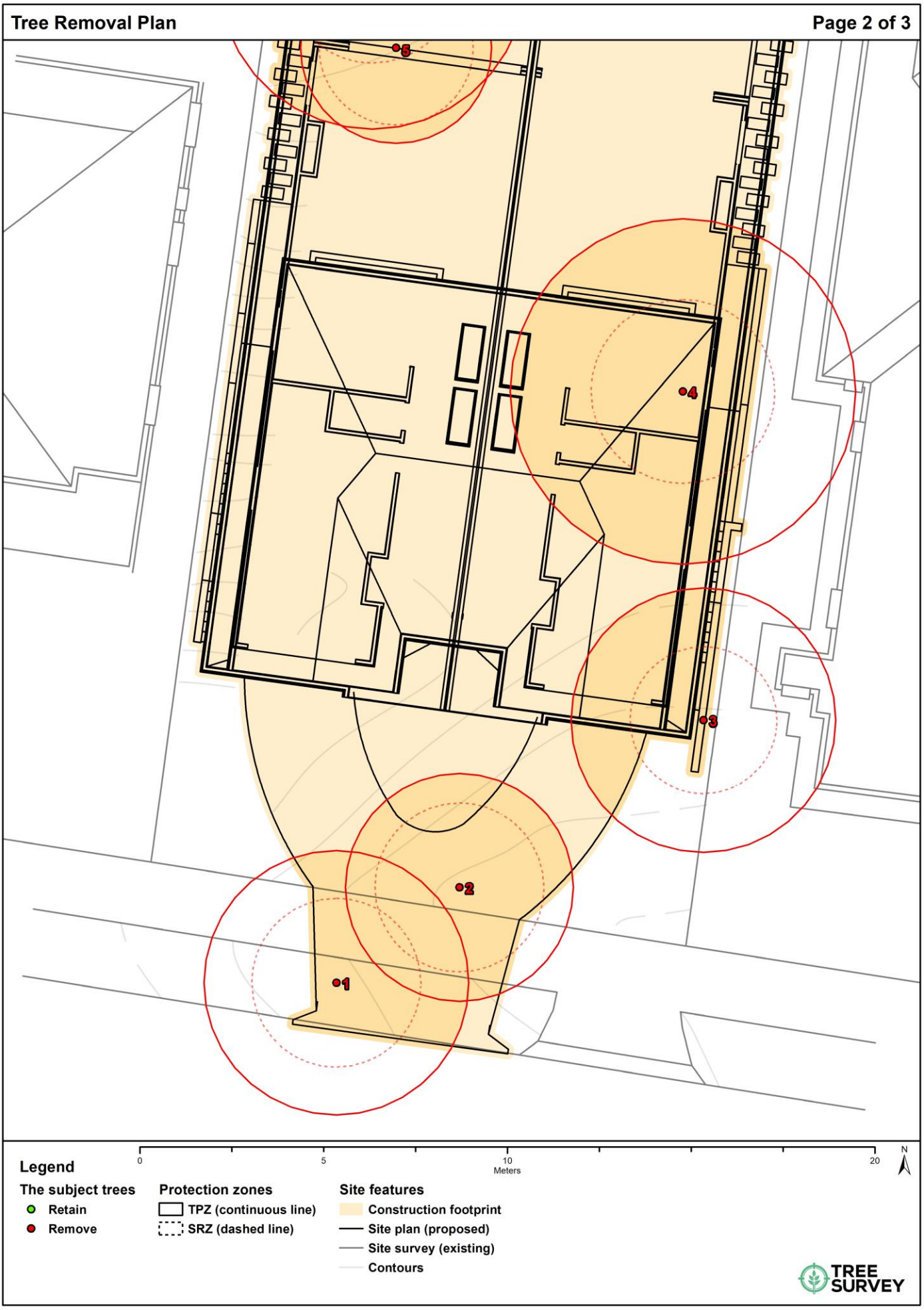
6.2 Tree removal

The following recommendations apply to the removal of trees:

- Approval from the relevant consent authority is required prior to any on-ground work.
- Any loss of trees should be offset with replacement planting in accordance with the relevant vegetation offset policy or as recommended by the relevant consent authority.
- All tree removal work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture.

Tree Removal Plan

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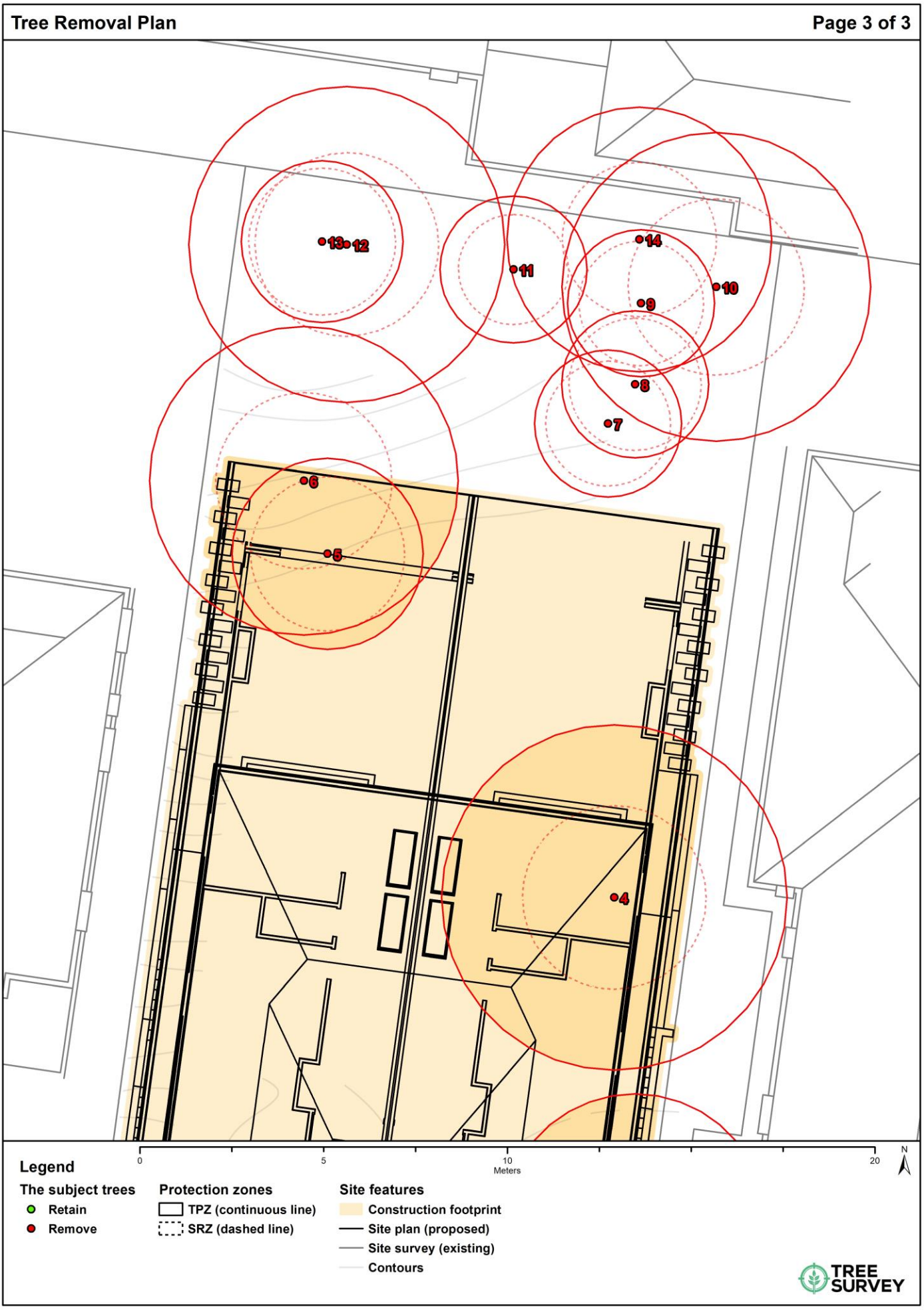
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References

Australian Standard, AS 4970-2009, Protection of Trees on Development Sites

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Roberts, J., Jackson, N. and Smith, D. (2006). Tree roots in the built environment.

Appendix I - 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. The tree has form atypical of the species The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area 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 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 The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms The tree has a wound or defect that has the potential to become structurally unsound.	The tree is in fair to good condition The tree has form typical or atypical of the species The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street The tree provides a fair contribution to the visual character and amenity of the local area 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 The tree has a form typical for the species 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. 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 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. The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group, or has commemorative values. 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. 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. 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. Dead trees. Trees that should be removed within the next 5 years. Dying or suppressed or declining trees through disease or inhospitable conditions. Dangerous trees through instability or recent loss of adjacent trees. Dangerous trees through structural defects, including cavities, decay, included bark, wounds, or poor form. Damaged trees that considered unsafe to retain. Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. Trees that will become dangerous after removal of other trees for the reasons.	Trees that appear to be retainable with an acceptable level of risk for 5-15 years. Trees that may only live between 5 and 15 more years. Trees that may live for more than 15 years but would be removed to allow the safe development of more suitable individuals. Trees that may live for more than 15 years but would be removed during the course of normal management for safety or nuisance reasons. 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. Trees that may only live between 15 and 40 more years. Trees that may live for more than 40 years but would be removed to allow the safe development of more suitable individuals. Trees that may live for more than 40 years but would be removed during the course of normal management for safety or nuisance reasons. 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. Structurally sound trees located in positions that can accommodate future growth. Storm damaged or defective trees that could be made suitable for retention in the long term by remedial tree surgery. 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)
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Australia, www.iaca.org.au