Integrated Management System

Planning Approval Consistency Assessment Form

SM ES-FT-414

Sydney Metro Integrated Management System (IMS)

Assessment Name:	Five Dock Tree Removal
Prepared by:	AFJV Environmental Advisor
Prepared for:	Sydney Metro
Assessment number:	AFJV08
Status:	Draft for SM review
Version:	01
Planning approval:	CSSI 10038 Sydney Metro West Concept and Stage 1
Date required:	March 2022
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Form information – do not alter

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The Planning Approval Consistency Assessment Form should be completed in accordance with the Sydney Metro Planning Approval Consistency Assessment Procedure (SM ES-PW-314) and Sydney Metro Environmental Planning and Approval Manual (SM ES-ST-216)

1.0 Existing Approved Project

Planning approval reference details (Application/Document No. (including modifications)):

- CSSI 10038 Sydney Metro West Concept and Stage 1 (11 March 2021)
- Administrative Modification 1 (28 July 2021).

Date of determination:

11 March 2021

Type of planning approval:

CSSI, Critical State Significant Infrastructure

Description of existing approved project you are assessing for consistency:

Sydney Metro West (the Concept)

Sydney Metro West (the Concept) would involve the construction and operation of a metro rail line around 24 kilometres long between Westmead and Hunter Street in the Sydney CBD. The key components are expected to include (as described in Chapter 6 of the Environmental Impact Statement (EIS)):

- Construction and operation of new passenger rail infrastructure between Westmead and the central business district of Sydney, including:
  - Tunnels, stations (including surrounding areas) and associated rail facilities
  - Stabling and maintenance facilities (including associated underground and overground connections to tunnels)
- Modification of existing rail infrastructure (including stations and surrounding areas)
- Ancillary development.

Sydney Metro West - all major civil construction works between Westmead and The Bays (the approved project)

The Sydney Metro West Project Concept and all major civil construction works between Westmead and The Bays, including station excavation and tunnelling was determined on 11 March 2021. The scope of Stage 1 of the planning approval process for Sydney Metro West (the approved project) is described in Chapter 9 of the EIS, with the key features including:

- Tunnel excavation including tunnel support activities between Westmead and The Bays
- Station excavation for new metro stations at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays
- Shaft excavation for services facilities
- Civil work for the stabling and maintenance facility at Clyde.

To construct the above, the Sydney Metro West Stage 1 is divided into multiple packages, each with their own design and construction scope The package relevant to this Consistency Assessment is the Central Tunnel Package (CTP) which has an overall design and construction timeframe of approximately three years, from July 2021 to Q4 2024.

This consistency assessment is relevant to the Five Dock Station. The Five Dock Station is described Section 9.5.8 of the EIS. The Five Dock Station would require two construction sites, a western construction site and an eastern construction site (eastern site shown in Figure 1):

- The Five Dock Station western construction site would cover about 4,150 square metres and would be located between Great North Road and East Street, to the north of Fred Kelly Place and south of St Albans Anglican Church. This site currently contains commercial buildings
- The Five Dock Station eastern construction site would cover about 2,150 square metres and would occupy the Second Avenue council car park and a number of residential properties located on Waterview Street. The proposal relates the eastern construction site only.

The construction site would be used to excavate Five Dock Station using a mined technique. Shafts would be excavated within the two construction sites to the station cavern to provide access during construction. The construction sites would include spoil storage and removal, water supply, water treatment and disposal, material storage and office facilities, worker amenities and parking would be included at the eastern construction site. The excavations would require the removal of about 165,000 cubic metres of spoil.

Relevant background information (including EA, REF, Submissions Report, Director General's Report, MCoA):

- Sydney Metro West Concept and Stage 1, Environment Impact Statement, April 2020
- Sydney Metro West Concept and Stage 1, Amendment Report, November 2020
- Sydney Metro West Concept and Stage 1, Submissions Report, November 2020
- Sydney Metro West Concept and Stage 1 - Assessment Report (SSI 10038), March 2021
- Sydney Metro West Concept and Stage 1, Conditions of Approval (CoA), released on 11 March 2021 and updated on 28 July 2021.

2.0 Description of proposed development/activity/works

Describe ancillary activities, duration of work, working hours, machinery, staffing levels, impacts on utilities/authorities, wastes generated or hazardous substances/dangerous goods used.

The proposal relates the eastern construction site only. Construction at the Five Dock eastern site involves construction of a retaining wall along the site boundary, adjacent to adjoining properties on Great North Road. There are five trees located in adjoining properties that AFJV identified as being at risk of root damage, as identified in Figure 1.

Figure 1 Five Dock Station eastern construction site indicative tree locations

An Australian Qualifications Framework (AQF) Level 5 Arborist has inspected the site and determined that three trees can remain, however, two trees that are located directly adjacent to the eastern construction site would require removal. This is due to encroachment into their Tree

Protection Zone (TPZ) (Tree 1 by 68% and Tree 2 by 24%). Encroachment of greater than 20% of the TPZ can begin to impact the structural root zone (SRZ) and is more likely to compromise tree stability. Impacts within the SRZ are not recommended as it may lead to the destabilisation and/or decline of the tree. As such, if the trees were to remain they would present a public safety risk after construction of the retaining wall. Therefore, it is proposed to remove the two trees. The removal of the trees was not considered in the EIS.

It is intended to access the trees for removal from the eastern site (as opposed to accessing via the private properties on Great North Road). The trees would be removed with equipment including chainsaws, wood chippers and potentially a crane. The trees would be removed by a by an arborist with a minimum AQF Level 3 qualification in Arboriculture.

3.0 Timeframe

When will the proposed change take place? For how long?

The proposed change would take place in Q1 or Q2 2022. It would likely take about one to two shifts and all works would be conducted during standard construction hours.

4.0 Site description

Provide a description of the site on which the proposed works are to be carried out, including, Lot and Deposited Plan details, where available. Map to be included here or as an appendix. Detail of land owner.

Five Dock Station is located towards the middle of the Five Dock local commercial centre at Great North Road, with a proposed future station entrance on Fred Kelly Place. As described in the EIS[1], Five Dock Station will be constructed from two surface construction sites, a western construction site and an eastern construction site as described below:

- The Five Dock Station western construction site would cover about 4,150 square metres and would be located between Great North Road and East Street, to the north of Fred Kelly Place and south of St Albans Anglican Church.
- The Five Dock Station eastern construction site would cover about 2,150 square metres and would occupy the Second Avenue council car park and a number of residential properties located on Waterview Street. The construction site would be used to excavate Five Dock Station using a mined technique.

[1] EIS Section 9.5.8 *Five Dock Station construction site*

5.0 Site Environmental Characteristics

Describe the environment (i.e., vegetation, nearby waterways, land use, surrounding land use), identify likely presence of protected flora/fauna and sensitive area.

The Five Dock Station is located within the Five Dock commercial area, being an existing built-up area of mixed land use including commercial and residential areas. The site has been heavily disturbed as part of previous development, and there is no naturally occurring native vegetation present within the construction footprint. Additionally, the site does not contain any sensitive environmental features and the nearest waterway is Iron Cove Creek / Dobroyd Canal which is a concrete-lined disturbed waterway located approximately 700 metres to the southeast. The proposed change is located on neighbouring properties on Great North Road which is directly adjacent to the Five Dock eastern construction site.

6.0 Justification for the proposed works

Address the need for the proposed works, whether there are alternatives to the proposed works (and why these are not appropriate), and the consequences with not proceeding with the proposed work.

As described in Section 2, a retaining wall and acoustic shed are being constructed at the boundary of the Five Dock eastern construction site. The need for an acoustic shed (or other acoustic measures) was identified in Section 9.5.8 of the EIS. AFJV identified that the level of excavation/ground disturbance required for the construction of the retaining wall and acoustic shed may potentially impact the root zones of nearby trees. An arborist was engaged to carry out a visual inspection. The visual inspection was conducted on 7 February 2022. The arborist determined that two trees that are located directly adjacent to the eastern construction site would require removal. This is due to the level of encroachment into their TPZ's, as described in Section 2. If the trees were to remain they would present a public safety risk after construction of the retaining wall/acoustic shed due to impacts to the trees roots. The alternative would require an offset of about six metres from the trees in order to protect the TPZ's. This level of offset would substantially alter the design of the site including that of the retaining wall and acoustic shed. It would also result in an area of the excavation works becoming not feasible due to the offset. Therefore, it is proposed to remove the two trees.

7.0 Environmental Benefit

Identify whether there are environmental benefits associated with the proposed works. If so, provide details:

The key environmental benefit is improved public safety.

8.0 Control Measures

Will a project and site specific EMP be prepared? Are appropriate control measures already identified in an existing EMP?

The Five Dock construction site will be managed under the project CEMP (Construction Environment Management Plan). Appropriate control measures are already identified in the CEMP that will accommodate the changes proposed in this assessment. In addition, the recommendations of the Arboricultural Impact Assessment (AIA) and Tree Protection Plan (TPP) would be implemented.

9.0 Climate Change Impacts

Is the site likely to be adversely affected by the impacts of climate change? If yes, what adaptation/mitigation measures will be incorporated into the design?

The effects of climate change on the Sydney Metro West Stage 1 project was discussed in the EIS Chapter 26. The proposed change is expected to result in a negligible change to that assessed in the EIS.

10.0 Impact Assessment – Construction

Attach supporting evidence in the Appendices if required. Make reference to the relevant Appendix if used.

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed/activity, relative to the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
Flora and fauna	Biodiversity impacts were assessed in Chapter 22 of the EIS. The EIS states, that there is no naturally occurring native vegetation present at the site, with some planted trees and shrubs being present, consisting of exotic and native species. The proposed change would involve the removal of two trees that were not identified for removal in the EIS. The trees have been assessed in the AIA and TPP prepared by the project arborist and included in Appendix A. All trees assessed were assigned a retention value, the retention value of a tree or group of trees is determined using a combination of environmental, cultural, physical, and social values (refer to Appendix A for further detail). The trees were identified as follows: • Tree 1 is a mature *Corymbia maculate* (spotted gum) with high retention value • Tree 2 is a mature *Radermachera sinica* (China doll) with medium retention value. A further three trees were also inspected for potential impacts: • Tree 3 is a mature *Corymbia maculate* (spotted gum) with high retention value • Tree 4 is a semi mature *Corymbia maculate* (spotted gum) with medium retention value	The recommendations listed in the AIA and TPP in Appendix A must be implemented.	Y	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed/activity, relative to the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
	• Tree 5 is a mature *Jacaranda mimosifolia* (Blue Jacaranda) with medium retention value. Trees 3-5 can all be retained. The encroachment on Tree 3 was assessed as minor. As a result, tree protection measures as outlined in Appendix A must be installed. There was no assessed encroachment on Tree 4 or Tree 5, as a result no specific management measures would be required. AFJV have sought to retain as many trees as practical, with three of the five trees assessed being identified for retention. This is consistent with the objectives of CoA's D2 and D9. The trees to be removed would be recorded in AFJV's tree removal register and be replaced by Sydney Metro in accordance with CoA C-B8 and REMM LV13. Whilst the trees subject to removal were not identified in the EIS, the overall biodiversity impact would remain broadly consistent with that outlined in the EIS. As well as implementing the measures outlined in the AIA and TPP, the removal of the trees would be undertaken in accordance with the projects pre-clearing procedure and the trees included in the projects tree removal register.				
Water	No change from approved project.	No additional measures	Y	Y	
Air quality	No change from approved project.	No additional measures	Y	Y	
Noise and vibration	Removal of the two trees would cause temporary noise impacts. However, the works would be limited to standard construction hours and to one	No additional measures	Y	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed/activity, relative to the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
	to two shifts. Equipment would include chainsaws and a potentially a crane. The equipment to be used for the proposed works includes a chainsaw, woodchipper and potentially a crane. This is consistent with the equipment required for site establishment activities. It is therefore likely that noise impacts would be consistent with those outlined in the EIS for site establishment.				
Aboriginal heritage	No change from approved project	No additional measures	Y	Y	
Historical heritage	No change from approved project	No additional measures	Y	Y	
Community and stakeholder	AFJV commenced consultation with the property owner in late December 2021, explaining that tree trimming and below-ground work is required for the Project, which may cause impact to the root system of the trees, and requesting an on site meeting to discuss. In January 2022, the owner provided access to the property for the purpose of an arborist inspection and agreed to follow on conversation with AFJV once the arborist report is ready. Following receipt of the arborist report, AFJV has continued consultation with the property owner and has advised of the need to remove the trees and discuss potential mitigation measures.	No additional measures	Y	Y	
Traffic	No change from approved project	No additional measures	Y	Y	
Waste	The proposed change would result in additional generation of green waste. Waste would be managed in accordance with Waste Management	No additional measures	Y	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed/activity, relative to the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
	Plan and be disposed of at an appropriately licenced facility.				
Social	Access to the relevant properties at the rear of Great North Road may cause temporary access impacts to property owners and/or tenants. Whilst access would be taken directly from the construction site, the yards at the rear of the affected properties may not be accessible durin removal of the trees, Further consultation would be undertaken with owners prior to the removal of the trees to minimise this impact.	No additional measures	Y	Y	
Economic	No change from approved project	No additional measures	Y	Y	
Visual	Landscape character and visual amenity impacts were assessed in Chapter 15 of the Stage 1 EIS. The assessed viewpoints at the Five Dock construction site that were most relevant to the eastern site were viewpoints 5, 6 and 7. These viewpoints were assessed as having a minor or moderate adverse visual impact. The landscape character impact was assessed as being minor or moderate. The proposal would not result in additional visual impacts to the extent that there are no changes proposed to the types of activities occurring within the construction site. However, the removal of the two trees may slightly reduce the level of screening for receivers from the acoustic shed. Overall, the landscape character and visual impacts are considered to be broadly consistent with that assessed in the Stage 1 EIS.	No additional measures	Y	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed/activity, relative to the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
Urban design	No change from approved project	No additional measures	Y	Y	
Geotechnical	No change from approved project	No additional measures	Y	Y	
Groundwater	No change from approved project	No additional measures	Y	Y	
Land use and property	No change from approved project	No additional measures	Y	Y	
Climate Change	No change from approved project	No additional measures	Y	Y	
Risk	As described in Section 6, the proposed change would remove the risk of the trees becoming a public safety risk due to root damage potentially resulting in their destabilisation or decline of the tree.	No additional measures	Y	Y	
Other	No change from approved project	No additional measures	Y	Y	
Management and mitigation measures	No change from approved project	No additional measures	Y	Y	

11.0 Impact Assessment – Operation

Attach supporting evidence in the Appendix if required. Make reference to the relevant Appendix if used.

Stage 1 of the planning application for Sydney Metro West (subject of this Consistency Assessment) is for major civil construction work for Sydney Metro West between Westmead and The Bays. At this stage, measures to avoid or minimise impacts have been developed only for major civil construction work for Sydney Metro West between Westmead and The Bays – which involves construction only. Impacts applicable to the operational aspects of Sydney Metro West including operation stage environmental mitigation measures would be developed when planning approval applications are made for future stages. As such, operational impacts of the proposal are not applicable, and therefore there are no changes from the approved project are anticipated.

Aspect	Nature and extent of impacts (negative and positive) during operation (if control measures implemented) of the proposed activity/works, relative to the Approved Project	Proposed Control Measures in addition to project COA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
Flora and fauna	No change from approved project	No additional measures	Y	Y	
Water	No change from approved project	No additional measures	Y	Y	
Air quality	No change from approved project	No additional measures	Y	Y	
Noise and vibration	No change from approved project	No additional measures	Y	Y	
Aboriginal heritage	No change from approved project	No additional measures	Y	Y	
Historical heritage	No change from approved project	No additional measures	Y	Y	
Community and stakeholder	No change from approved project	No additional measures	Y	Y	
Traffic	No change from approved project	No additional measures	Y	Y	
Waste	No change from approved project	No additional measures	Y	Y	

Aspect	Nature and extent of impacts (negative and positive) during operation (if control measures implemented) of the proposed activity/works, relative to the Approved Project	Proposed Control Measures in addition to project COA and REMMs	Minimal Impact Y/N	Endorsed	
				Y/N	Comments
Social	No change from approved project	No additional measures	Y	Y	
Economic	No change from approved project	No additional measures	Y	Y	
Visual	No change from approved project	No additional measures	Y	Y	
Urban design	No change from approved project	No additional measures	Y	Y	
Geotechnical	No change from approved project	No additional measures	Y	Y	
Land use	No change from approved project	No additional measures	Y	Y	
Climate Change	No change from approved project	No additional measures	Y	Y	
Risk	No change from approved project	No additional measures	Y	Y	
Other	No change from approved project	No additional measures	Y	Y	
Management and mitigation measures	No change from approved project	No additional measures	Y	Y	

12.0 Consistency with the Approved Project

Based on a review and understanding of the existing Approved Project and the proposed modifications, is there is a transformation of the Project?	No. The proposed change would not transform the project. The project would continue to undertake works to provide a new metro rail line between Westmead and The Bays as part of the approved project.
Is the project as modified consistent with the objectives and functions of the Approved Project as a whole?	Yes. The proposed change would be consistent with the objectives and functions of the approved project as a whole.
Is the project as modified consistent with the objectives and functions of elements of the Approved Project?	Yes. The proposed change would be consistent with the objectives and functions of elements of the approved project.
Are there any new environmental impacts as a result of the proposed works/modifications?	No. There are no new environmental impacts. All risks identified for the approved project and the proposed change would be adequately addressed through the application of the mitigation measures provided in the Environmental Impact Statement, Submissions Report, Amendment Report and the Instrument of Approval.
Is the project as modified consistent with the conditions of approval?	Yes. The proposed change is consistent with the conditions of approval.
Are the impacts of the proposed activity/works known and understood?	Yes. The impacts of the proposed change are understood.
Are the impacts of the proposed activity/works able to be managed so as not to have an adverse impact?	Yes. The impacts of the proposal are understood and will be accounted for by implementing the existing mitigation measures provided in the Environmental Impact Statement, Submissions Report, Amendment Report and the Instrument of Approval for the approved project. These would be implemented through the Construction Environment Management Plan.

13.0 Other Environmental Approvals

Identify all other approvals required for the project:	None.

Author certification

To be completed by person preparing checklist.

I certify that to the best of my knowledge this Consistency Checklist: • Examines and takes into account the fullest extent possible all matters affecting or likely to affect the environment as a result of activities associated with the Proposed Revision; and • Examines the consistency of the Proposed Revision with the Approved Project; is accurate in all material respects and does not omit any material information.			
Name:	Erran Woodward	Signature:	
Title:	Environmental Advisor		
Company:	AFJV	Date:	11/03/2022

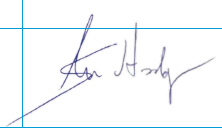
This section is for Sydney Metro only.

Application supported and submitted by			
Name:	Yvette Buchli	Date:	18/03/2022
Title:	Associate Director Planning Approvals	Comments:	
Signature:			

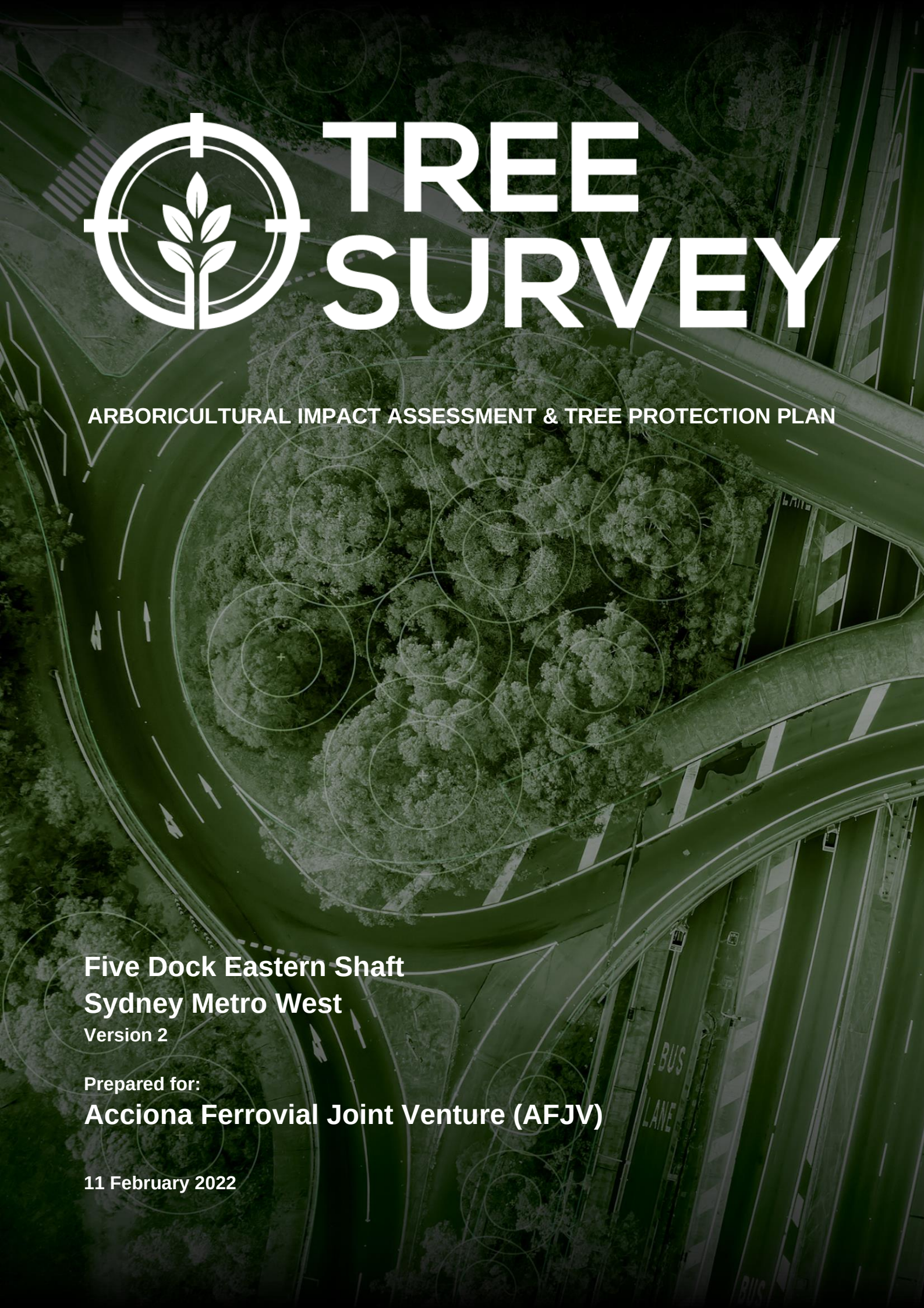
Based on the above assessment, are the impacts and scope of the proposed activity/modification consistent with the existing Approved Project?

Yes ☒ The proposed activity/works are consistent and no further assessment is required.

No ☐ The proposed works/activity is not consistent with the Approved Project. A modification or a new activity approval/ consent is required. Advise Project Manager of appropriate alternative planning approvals pathway to be undertaken.

Endorsed by			
Name:	S Hodgson	Date:	18/3/2022
Title:	Director Environment, Sustainability & Planning, West	Comments:	
Signature:			

Appendix A Arboricultural Impact Assessment and Tree Protection Plan



ARBORICULTURAL IMPACT ASSESSMENT & TREE PROTECTION PLAN

Five Dock Eastern Shaft
Sydney Metro West

Version 2

Prepared for:

Acciona Ferrovial Joint Venture (AFJV)

11 February 2022

Document information

Title:	Five Dock Eastern Shaft
Report type:	Arboricultural Impact Assessment (AIA) & Tree Protection Plan (TPP)
Prepared by:	 **Phil Witten** Principal Arborist & GIS Analyst Diploma of Arboriculture │AQF 5 Graduate Certificate of Arboriculture │AQF 8 Registered Consulting Arborist No. 2458 Advanced QTRA │TRAQ Qualification
Contact details:	**Tree Survey Pty Limited** ☎ 0425 536 670 ✉ phil@treesurvey.com.au 💻 www.treesurvey.com.au ➢ PO Box 125, Hornsby NSW 1630, Australia

Document status

Document status	Date	Revision description
Version 1	10/02/22	Minor updates following AFJV review
Version 2	11/02/22	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 Acciona Ferrovial Joint Venture (AFJV) to prepare an Arboricultural Impact Assessment (AIA) and Tree Protection Plan (TPP) for the construction of the proposed Eastern Shaft at the Five Dock Compound. These works will be carried out as part of the Sydney Metro West Project.

The purpose of this report is to:

- Identify the trees within and adjacent to the proposed disturbance footprint.
- Assess the potential impacts of the development on the subject trees.
- Evaluate the significance of the subject trees and assess their suitability for retention.

1.2 Sydney Metro West (the concept)

Sydney Metro West (the Concept) would involve the construction and operation of a metro rail line around 24 kilometres long between Westmead and Hunter Street in the Sydney CBD. The key components are expected to include (as described in Chapter 6 of the Environmental Impact Statement (EIS)):

- Construction and operation of new passenger rail infrastructure between Westmead and the central business district of Sydney, including:
    - Tunnels, stations (including surrounding areas), and associated rail facilities.
    - Stabling and maintenance facilities (including associated underground and overground connections to tunnels).
- Modification of existing rail infrastructure (including stations and surrounding areas).
- Ancillary development.

1.3 Sydney Metro West (the approved project)

The Sydney Metro West Project Concept; and all major civil construction works between Westmead and The Bays, including station excavation and tunnelling was determined on 11 March 2021. The scope of Stage 1 of the planning approval process for Sydney Metro West (the approved project) is described in Chapter 9 of the EIS, with the key features including:

- Tunnel excavation including tunnel support activities between Westmead and The Bays.
- Station excavation for new metro stations at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, and The Bays.
- Shaft excavation for services facilities.
- Civil work for the stabling and maintenance facility at Clyde.

To construct the above, the Sydney Metro West Stage 1 is divided into multiple packages, each with its own design and construction scope. The package relevant to this assessment is the Central Tunnel Package (CTP) which has an overall design and construction timeframe of approximately three years, from July 2021 to Q4 2024.

This assessment relates to the construction of the proposed Eastern Shaft located at the Five Dock Compound and the potential impact of the Eastern Shaft on adjacent trees.

1.4 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 documents/plans listed in **Table 1**.

Table 1: Documents and plans

Document	Author	Version	Date
General Arrangement Plan	Acciona Ferrovial Joint Venture (AFJV)	2	27/07/21
-	-	-	-
-	-	-	-

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

1.5 The subject trees

A total of **5** trees were assessed and included in this report. 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.

A tree retention assessment has been undertaken in accordance with the Institute of Australian Consulting Aboriculturalists (IACA) Significance of a Tree, Assessment Rating System (see **Appendices**). Further information, observations, and measurements specific to each of the subject trees can be found in **Chapter 3**.

[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).

2 Arboricultural Impact Assessment (AIA)

2.1 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):

- **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.**

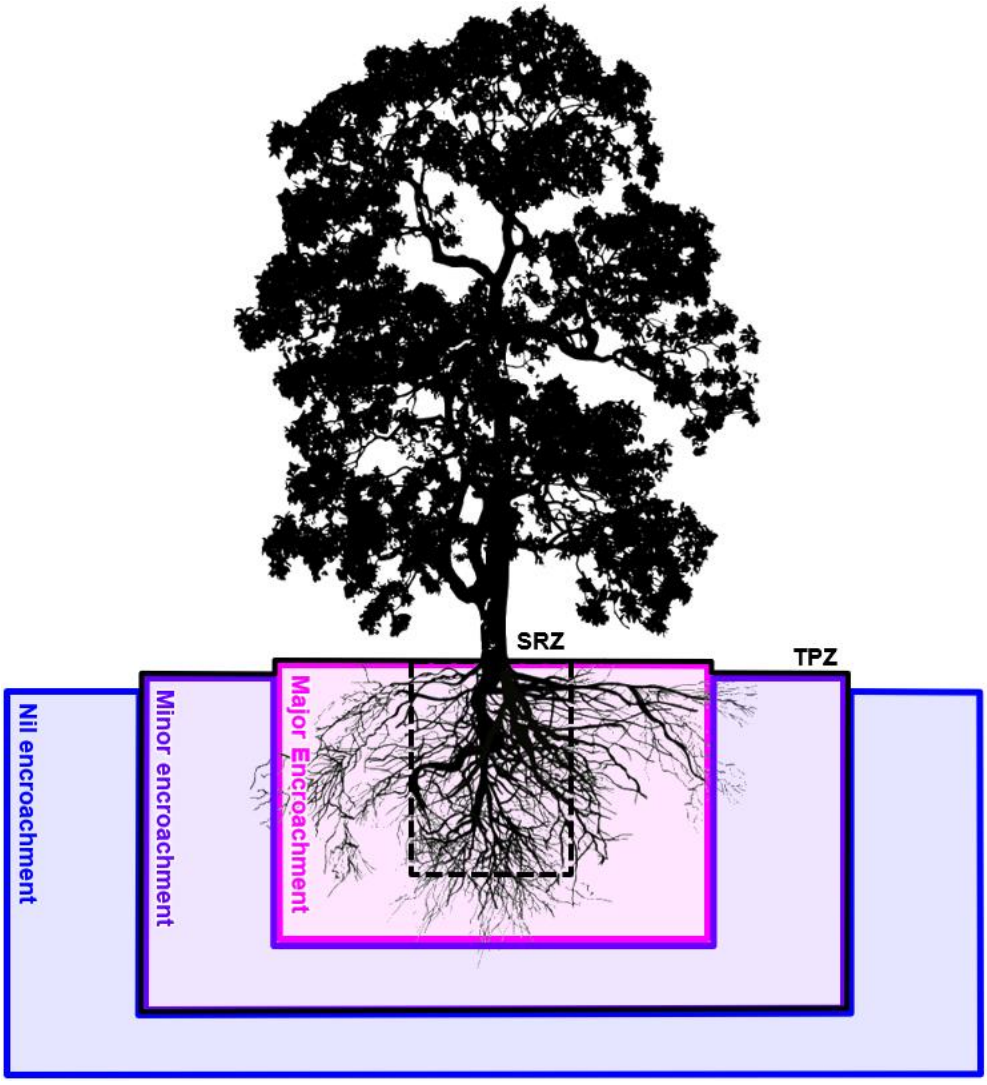


Figure 1: Three (3) levels of encroachment

2.2 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
Nil encroachment (0%)	• N/A
Minor encroachment (<10%)	• The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. • Detailed root investigations should not be required. • Tree protection must be installed.
Major encroachment (>10%)	• The project arborist must demonstrate the tree(s) would remain viable. • Root investigation by non-destructive methods may be required for any trees proposed for retention. • Consideration of relevant factors, including root location and distribution, tree species, condition, site constraints, and design factors. • The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. • The project arborist will be required to supervise any works within the TPZ. • Tree protection must be installed.

3 Results

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

3.1 Encroachment within the TPZ

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

- **Nil encroachment (0%):** A total of **2** trees are located outside the construction footprint.
- **Minor encroachment (<10%):** A total of **1** tree will be subject to a minor encroachment.
- **Major encroachment (>10%):** A total of **2** trees will be subject to a major encroachment.

3.2 Tree removal and retention

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

- **Retain:** A total of **3** trees are proposed for retention.
- **Remove:** A total of **2** trees are proposed for removal.

4 Discussion

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

4.1 Nil encroachment

A total of **2** trees will be subject to nil encroachment within the TPZ:

- **Retain:** A total of **2** trees are located outside of the proposed construction footprint. No impacts on this tree are foreseeable under the current proposal.
- **Remove:** No trees within the category of “nil encroachment” are proposed for removal.

4.2 Minor encroachment

A total of **1** tree will be subject to a minor encroachment of less than 10% within the TPZ:

- **Retain:** A total of **1** tree 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 this tree. Under the current proposal, this tree can be successfully retained.
- **Remove:** No trees within the category of “minor encroachment” are proposed for removal.

4.3 Major encroachment

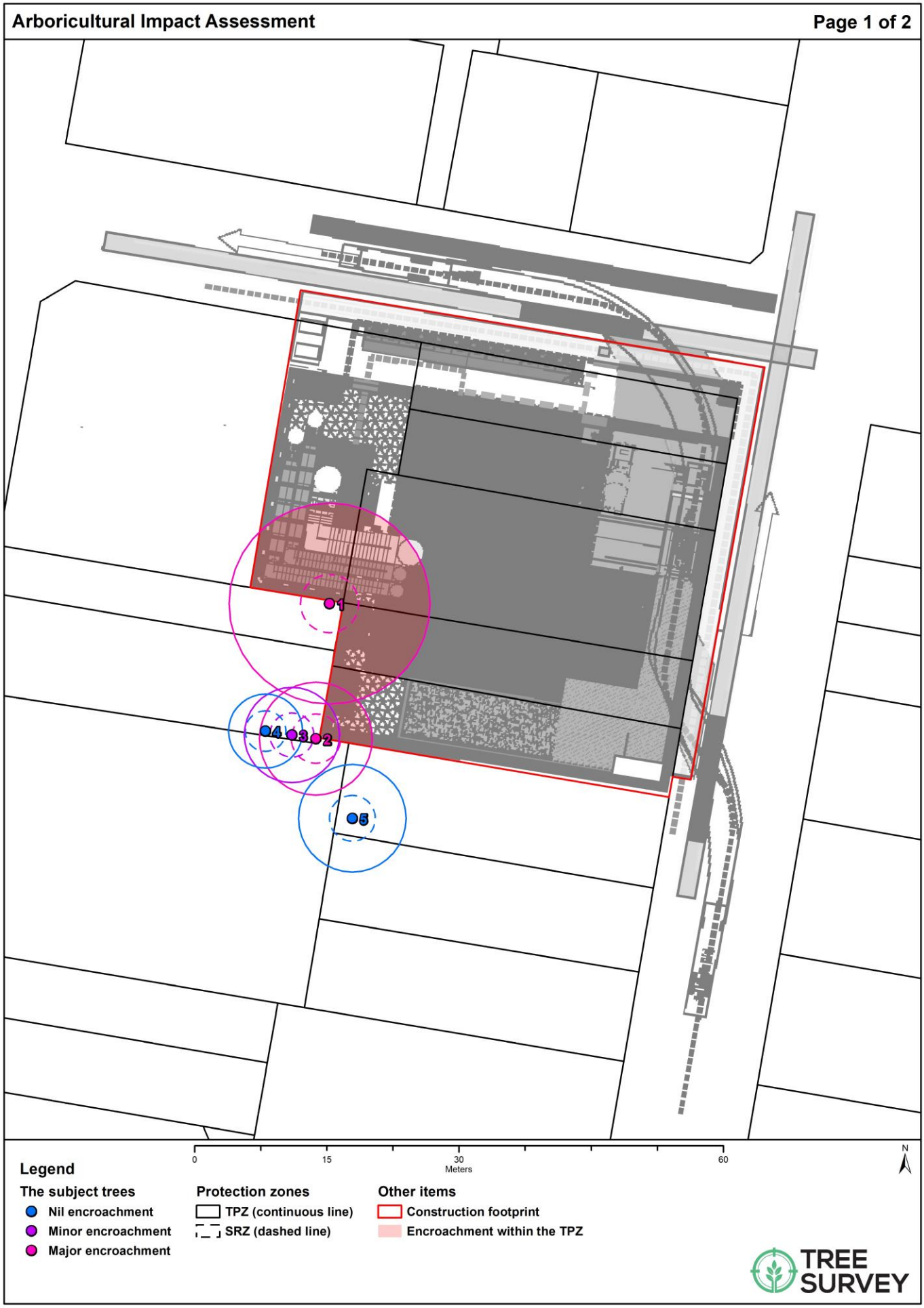
A total of **2** trees will be subject to a major encroachment of greater than 10% within the TPZ:

- **Retain:** No trees within the category of “major encroachment” are proposed to be retained.
- **Remove:** A total of **2** 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[2]). 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.

[2] Costello, L., Watson, G. and Smiley, E., 2017. Root Management. International Society of Arboriculture.

Table 3: 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	*Corymbia maculata*	28	26	Good	Good	Mature	High	Medium	High	950	-	-	950	1000	11.4	3.3	**Major**	**68%**	The subject tree is located 1.5m from rear boundary	**Remove**
2	*Radermachera sinica*	18	12	Good	Good	Mature	Medium	Medium	Medium	350	350	200	530	700	6.4	2.8	**Major**	**24%**	-	**Remove**
3	*Corymbia maculata*	26	16	Good	Good	Mature	High	Medium	High	450	-	-	450	500	5.4	2.5	**Minor**	**7%**	The subject tree is located 3.1m from rear boundary	**Retain**
4	*Corymbia maculata*	16	14	Fair	Poor	Semi-mature	Medium	Medium	Medium	350	-	-	350	400	4.2	2.3	**Nil**	**0%**	Tree has a suppressed canopy and phototropic lean	**Retain**
5	*Jacaranda mimosifolia*	14	16	Good	Good	Mature	Medium	Medium	Medium	450	250	-	510	550	6.1	2.6	**Nil**	**0%**	Minor canopy pruning (up to 5%) may be required for foliage overhanging fence	**Retain**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Major encroachment
Protection zones
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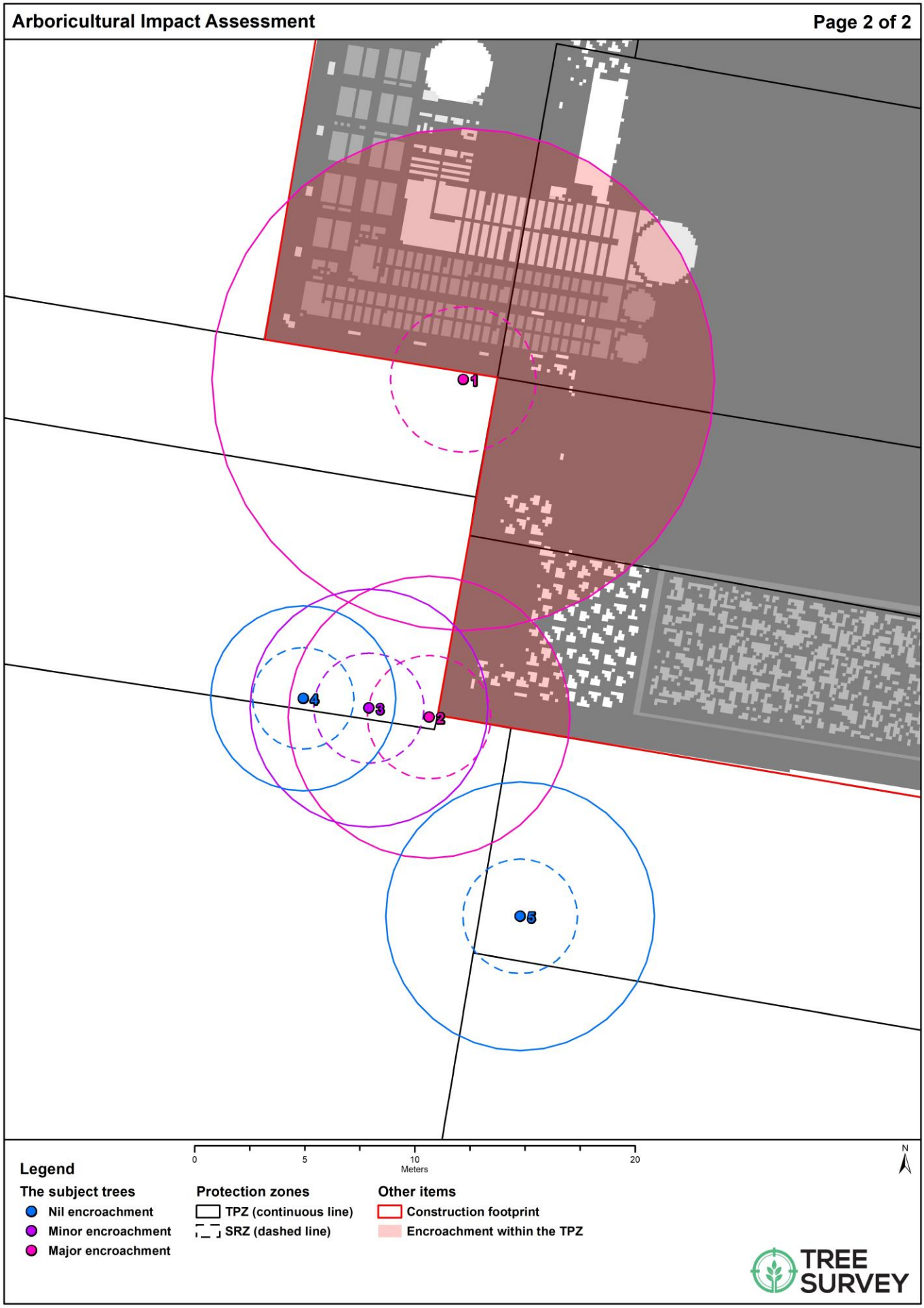
SRZ (dashed line)
Other items
Construction footprint
Encroachment within the TPZ
TREE SURVEY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The subject trees
Nil encroachment
Minor encroachment
Major encroachment
Protection zones
TPZ (continuous line)
SRZ (dashed line)
Other items
Construction footprint
Encroachment within the TPZ
TREE SURVEY

5 Tree Protection Plan (TPP)

5.1 Tree removal and retention

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

- **Retain:** A total of **3** trees are proposed for retention.
- **Remove:** A total of **2** trees are proposed for removal.

5.2 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.

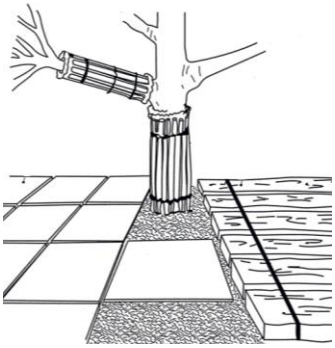
5.3 Restricted activities within the TPZ

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.

5.4 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.

5.5 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.

5.6 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.

5.7 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 (see **Tree Protection Plan**). These methods may include:

- **Manual excavation:** Use of hand tools such as spades, trowels, brushes.
- **Air spade:** Use of a pressurised air device that blows the soil away and leaves roots intact.
- **Hydro-vacuum excavation:** Use of pressurised water to remove soil from around roots.

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

- **Continuous strip footings:** Manual excavation, air spade, or hydro-vacuum is utilised excavation lines within the TPZ prior to the commencement of mechanical excavation. 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, air spade, or hydro-vacuum 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.

5.8 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.

5.9 Root pruning

Any conflicting roots (<50mm in diameter) identified during the supervised excavations 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.

5.10 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 and following the installation of tree protection.
- During any excavations, and any other activities carried out within the TPZ of any tree to be retained & protected.
- A minimum of once per 8 weeks (every 2 months) during the construction phase for trees with a major encroachment within the TPZ.
- 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 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 every 8 weeks (2 months) 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.

5.11 Vegetation pruning

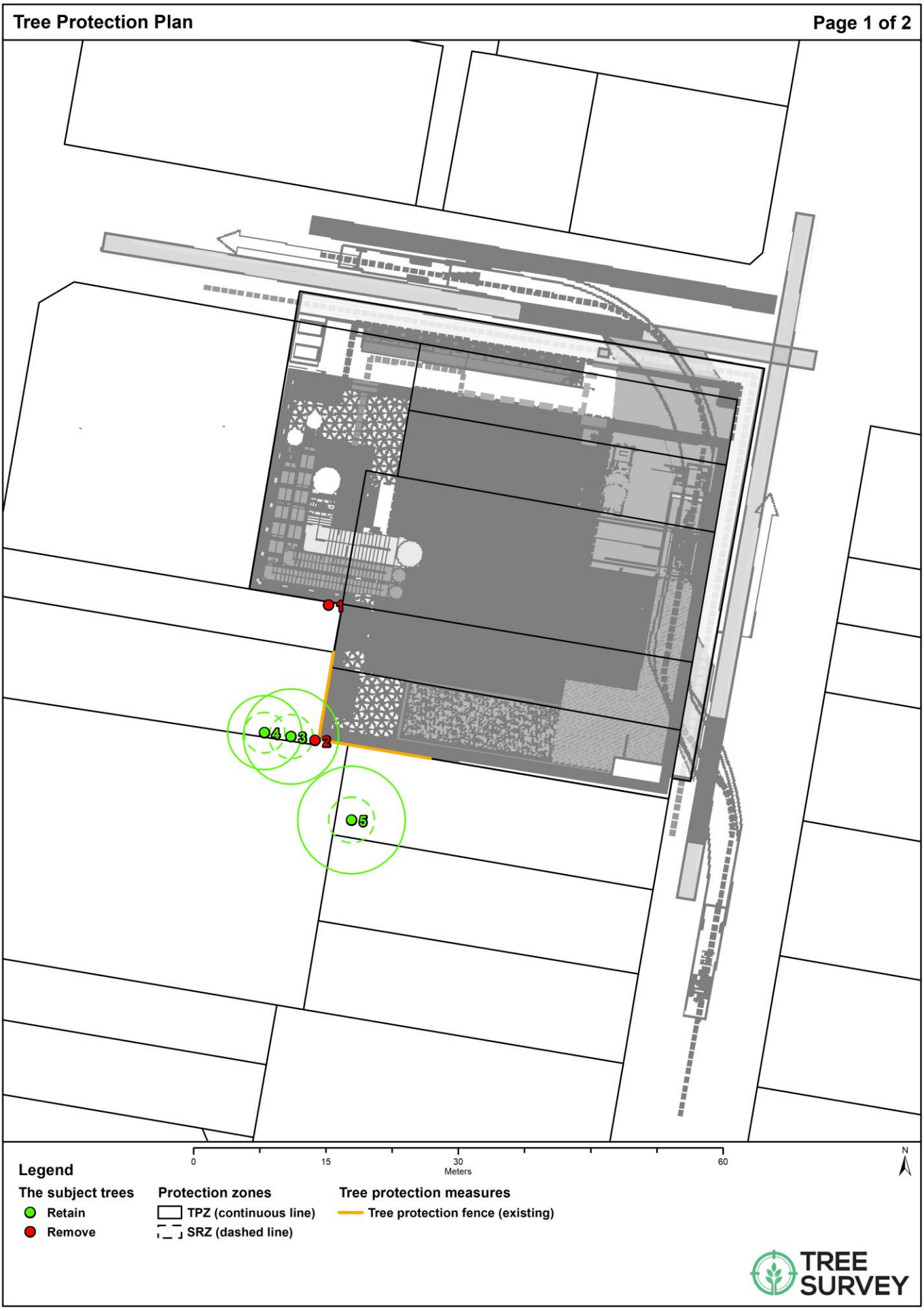
Minor vegetation trimming may be required to accommodate site access and construction clearances. Pruning specifications for these areas are outlined below:

- Pruning must not exceed 10% of the overall canopy volume.
- No limbs greater than 150mm in diameter are to be removed.
- The final pruning cut shall be at the branch collar in accordance with AS4373-2007.
- All tree 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, and the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).

If proposed vegetation trimming does not meet the specifications outlined above, the project arborist must undertake an assessment of impacts on a case-by-case basis.

5.12 Tree removal

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.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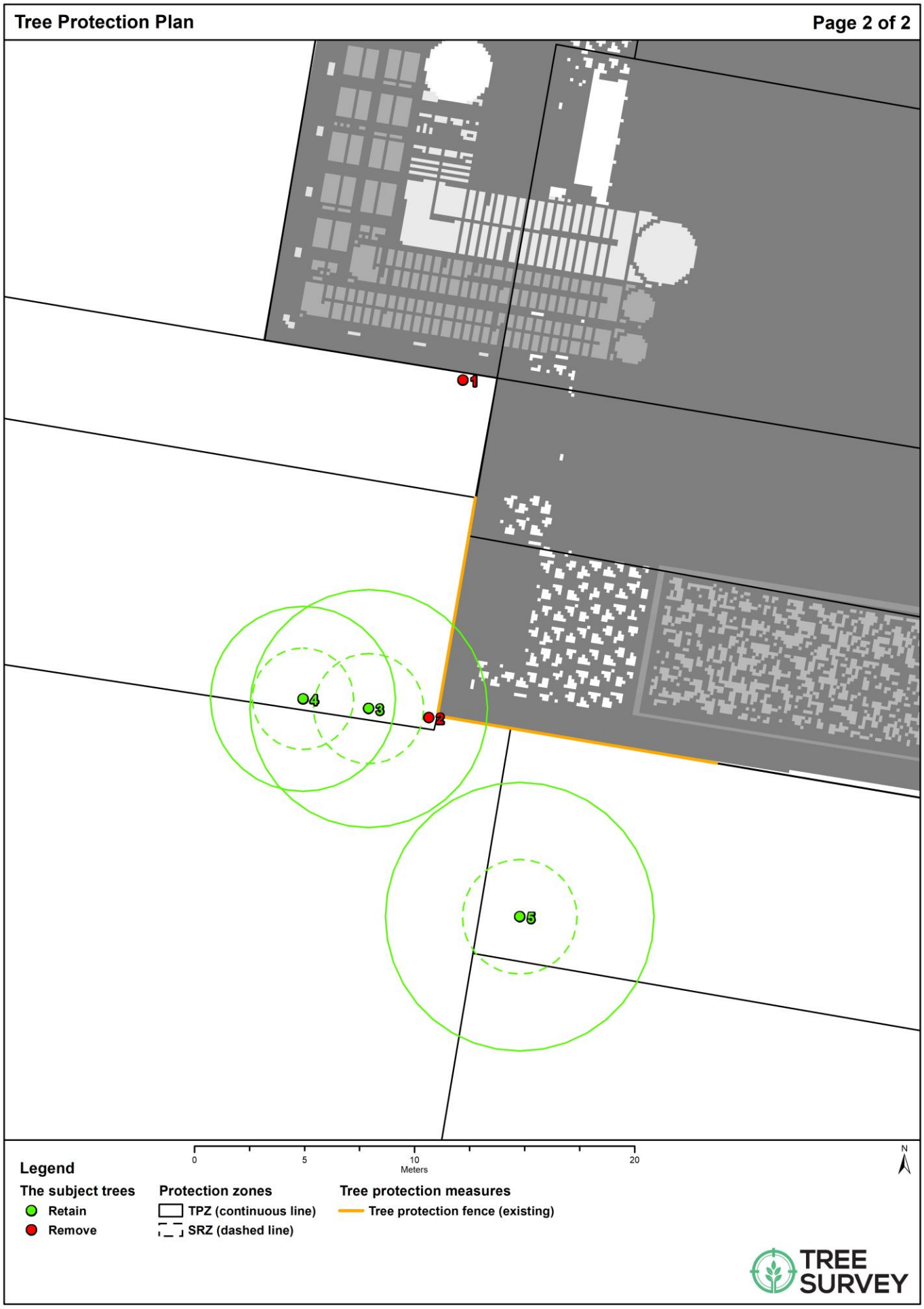
Tree protection measures
Tree protection fence (existing)
TREE SURVEY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Tree protection fence (existing)
TREE SURVEY

6 References

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

Australian Standard, AS 4373-2007, Pruning of Amenity Trees.

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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)
Institute of Australian Consulting Arboriculturists
Australia, www.iaca.org.au