

9 Hickson Circuit Harrington Park NSW 2567 M: 0425 308 275 E: scott@hortmanagement.com.au

ARBORICULTURAL IMPACT ASSESSMENT



PROPOSED CHILD CARE DEVELOPMENT APPLICATION

187-189 ADELAIDE STREET ST MARYS, NSW

Report prepared for:

Report prepared by:

Janssen Designs Pty Ltd PO Box 41 Kenthurst NSW 2156

Scott Freeman - Principal Horticultural Management Services Diploma of Arboriculture (AQF L5) ISA Tree Risk Assessment (TRAQ) Certified Diploma of Horticulture Diploma of Conservation and Land Management

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Horticultural Consultancy . Arborist Assessments . Environmental Assessments . Project, Site & Vegetation Management

This report has been prepared in accordance with the scope of services described in agreement between Horticultural Management Services and the client.

This report relies upon data, surveys and site inspections results taken at or under the particular time and or conditions specified herein.

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Every effort has been made in this report to include, assess, and address all defects, structural weaknesses, and instabilities of the subject trees. All inspections were made from ground level using only visual means and no intrusive or destructive means of inspection were used. For many structural defects such as decay and inclusions, internal inspection is required by means of resistograph or similar. No such investigation has been made in this case. Trees are living organisms and are subject to failure through a variety of causes not able to be identified by means of this inspection and assessment.

Information contained in this report covers only the subject tree that was assessed and reflects the condition of the subject tree at the time of inspection. Any finding, conclusion or recommendations only apply to the aforementioned and no greater reliance should be assumed or drawn by the Client.

There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the subject trees or the subject site may not arise in the future.

Furthermore, this report has been prepared solely for the use by the Client. The Client acknowledges that this assessment, and any opinions, advice or recommendations expressed or given in it, are based on the information supplied by the Client, and based on the data observations, measurements and analysis carried out or obtained by Horticultural Management Services and referred to in the assessment.

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1.0 INTRODUCTION

Horticultural Management Services were engaged to conduct an Arboriculture Impact Assessment for 187-189 Adelaide Street, St Marys NSW. It is understood that this report is to form part of a Development Application for a proposed Childcare development, which includes the demolition of existing dwelling and structures, basement excavations, TPO Exempt shrub and approved site tree removal, construction of Childcare facility, new driveway, and associated landscaping as per APPENDIX A Proposed Development Layout.

The purpose of this report is to identify the trees within and or adjoining the site, provide information on their individual current health and condition, determine their remaining life expectancy and significance in the landscape, and assess their suitability for retention/preservation or removal. The scope of this report includes the allocation of SULE ratings (Safe Useful Life Expectancy), and identification of arboricultural work required.

The potential impact of the proposed development has also been assessed, together with recommendations for amendments to the design or construction to ensure the retention of tress considered worthy of preservation.

A site investigation was undertaken on Monday 13th December 2021 to assess the trees onsite and those adjoining which may be affected by the proposed design.

Information contained in this report covers only the subject trees that were assessed and reflects the condition of the subject trees on site at the time of inspection.

This assessment has been conducted with consideration of the Biodiversity Conservation Act 2016, Biosecurity Act 2015, and Penrith Development Control Plan - Part C2 Vegetation Management.

2.0 AIMS

To detail the condition of the trees and consider the location and condition of such in relation to their surrounds.

To complete the following:

- Inspect the subject trees within and adjacent to the site/s and site conditions,
- Assess the condition of the subject tree(s),
- Observe and describe the trees and other vegetation on the subject site,
- Discuss the trees within their current landscape,
- Determine the subject trees' Landscape Significance including cultural, environmental, and aesthetic values,
- Consider the benefits of retention or removal of the trees for the medium to long-term benefit of the trees and on-going public safety,
- Provide recommendations for Tree Management, if or as required, within the context of a development application, and
- Prepare site specific tree protection specifications for trees recommended for retention.



3.0 SITE DESCRIPTION AND OBSERVATIONS

The site is identified as 187-189 Adelaide Street, St Marys NSW.

Relevant site plans and/or documents reviewed prior to undertaking the Arborist Assessment include:

- Janssen Architecture, Basement Floor Plan, Drawing Number A000, Issus A, date 7th Nov 2021,
- Janssen Architecture, Ground Floor Plan, Drawing Number A000, Issus A, date 7th Nov 2021,

No hydraulic or stormwater plans were viewed.

Included within this report is a site plan showing the locations of the site trees based on the proposed development layout.

Site observations noted a mixture of introduced (planted) exotic and native planted vegetation. The herbaceous or grass vegetation consists of a mixture of introduced pastoral grasses/weed species due to the site's location within a residential precinct.

3.1 HERITAGE SIGNIFICANCE

There are no trees within the site that have been identified as Heritage Items under Council Planning Instrument or identified within a Significant Tree Register.

3.2 TREES ON ADJOINING LAND

In accordance with Council's requirements, trees adjoining the development have been assessed as part of this report.

There are no trees on adjoining properties that will be affected by this development.



3.3 SITE LOCATION



Figure 1 Shows the location of the site. Source where is.com.au

3.4 AERIAL SITE LOCATION



Figure 2 Shows an aerial location of the site. Source Nearmaps.com



4.0 METHODOLOGY

This report is the result of a comprehensive site inspection undertaken on Monday 13th December 2021 by Horticultural Management Services (HMS).

The following tree assessment was undertaken using criteria based on the Tree Risk Assessment Guidelines by the International Society of Arboriculture. A Level 2 Visual Tree Assessment (VTA) was used as described in 'The Body language of trees – A handbook for Failure Analysis'. This involves inspection from ground height and includes only the external features of the trees. Trees on adjoining sites were assessed from within the site boundaries only and only within 5m of the site boundaries.

For reference throughout the report, each tree has been allocated an identification number listed in the Tree Assessment Summary table and identified on the tree location site plan.

Assessment of individual trees includes the following:

- Species identification (botanical and common),
- Height and form,
- Observations made including an evaluation of the tree's health and vigour using Crown spread and cover, foliage size, colour, extension growth, presence of disease or pest infestation, canopy density, presence of deadwood, dieback and epicormic growth as indicators,
- Condition, using visible evidence of structural defects, instability, evidence of previous pruning and physical damage as indicators,
- Suitability of the tree to the site and its existing location; in consideration of damage or potential damage to services or structures, available space for future development and nuisance issues,
- Likely future amenity based on a visual assessment,
- The trees tolerance to development impacts based on surface observations,
- Significance -specific heritage, cultural or intrinsic importance,
- Amenity value -as shade, windbreak etc or subjective, aesthetic values,
- Habitat value -both as an individual tree and as part of an ecological community,
- Observations of soil conditions and likely root spread,
- Overall condition assessment and suitability,
- Hazard/failure potential of tree to damage property or result in death,
- Safe Useful Life Expectancy (SULE) after Barrell (1995),

Retention Value was based on the subject tree's Remaining Life Expectancy Range and Landscape Significance. The Retention Value was modified where necessary to take in consideration the subject tree's health, structure, and site suitability.

Landscape Significance was determined by assessing the combination of the cultural, environmental, and aesthetic values of the subject trees. A subjective rating of high, moderate, low, or nil has been allocated to the trees. This provides a relative value of the trees' Landscape Significance which may aid in determining their Retention Value. A more detailed explanation is outlined Appendix B.7.

Tree height and canopy spread, were estimated only. Diameter at Breast Height (DBH) was determined by measuring the main stem at 1.4m above ground. Photos were taken of the subject trees and subject site for the inclusion in this tabled report.

The components of **tree risk assessment** include the trees failure potential or in the case of the proposed, an environment conductive to tree failure.



5.0 IMPACT ASSESSMENT

A summary of each tree identified within the site is outlined in section 6.0 TREE ASSESSMENT SUMMARY.

The assessment in each case has considered the following:

- Structural Root Zones (SRZ),
- Building works or footprint within TPZ or SRZ,
- Optimum Tree Protection Zones (TPZ) and Structural Root Zones (SRZ),
- SULE Rating for value of the tree assessed,
- Assessment of the likely impact of the proposed works,
- Recommendations for retention, management, or removal.

The components of tree risk assessment include the trees failure potential or in the case of land clearing/management, an environment conductive to tree failure.

Other factors are also considered related to the site, such as potential development or land use, soil condition and prevailing winds must be considered in conjunction when assessing the potential of failure for any tree.



6.0 TREE ASSESSMENT SUMMARY

<u>Risk</u> Matri	Catastrophic Urgent- Tree requires immediate removal due to WH&S concerns.			e to T	Major Tree requires removal as part of development application.				Moderate TPO Exempt due to species, height requirements and or approved to be removed by Council.			height Tree to noved monito	Low Tree to be retained, protected, and monitored		
Tree Number	Tree Species Common Name Botanical name	Height (m)	DBH @ 1.4m	DAB (mm)	SRZ Required (m)	TPZ Required (m)	Tree Age * Young * Semi Mature * Mature * Over Mature	Tree Health * Good * Fair * Poor * Dead	Tree Structure * Good * Fair * Poor	SULE Rating	Ecological Significance * High * Medium * Low * Nil	Landscape Visual Significance * High * Moderate * Low * Nil	Retention Value * H 40yrs + * M 15 - 40yrs * L 5 to 15ys * Nil Less 5ys * Dead	To Be Retained	
	Jacaranda Jacaranda mimosifolia	8	460 500 400	740	N/A	N/A	Mature	Good	Good to Fair	3	Nil	Low	Low	No	
1	Comments: Based on the plans p removed and replaced in the lan	orovide dscape	d, the Ja master	acaranc plan.	las loca	tion to	the basement dr	iveway and	d within the pro	posed	basement exca	avation area, it	Low N Irea, it is recommended to o Medium N erate	l to be	
	Broad-leaved red ironbark Eucalyptus fibrosa	12	500	520	N/A	N/A	Mature	Good	Good to Fair	3	Low	Low to Moderate	Medium	No	
2	Comments: Based on the site ins is removal. It is recommended to	pection be rep	n, this tr	ee is re the la	quired ndscape	to be re e maste	emoved due to its er plan upon com	location v pletion.	vithin the propo	bsed ch	ildcare develop	bment and site	modifications th	at support	
	Broad-leaved red ironbark Eucalyptus fibrosa	14	900	920	N/A	N/A	Mature	Good	Good to Fair	3	Low	Low to Moderate	Medium	No	
3	Comments: Based on the site ins is removal. It is recommended to	pection be rep	h, this tr blaced ir	ee is re n the la	quired ndscap	to be re e maste	emoved due to its er plan upon com	location v pletion.	vithin the propo	osed ch	ildcare develop	oment and site	modifications th	at support	



Tree Number	Tree Species Common Name Botanical name	Height (m)	DBH @ 1.4m	DAB (mm)	SRZ Required (m)	TPZ Required (m)	Tree Age * Young * Semi Mature * Mature * Over Mature	Tree Health * Good * Fair * Poor * Dead	Tree Structure * Good * Fair * Poor	SULE Rating	Ecological Significance * High * Medium * Low * Nil	Landscape Visual Significance * High * Moderate * Low * Nil	Retention Value * H 40yrs + * M 15 - 40yrs * L 5 to 15ys * Nil Less 5ys * Dead	To Be Retained
	Jacaranda Jacaranda mimosifolia	8	220 240	380	N/A	N/A	Mature	Good	Good	3	Nil	Low	Low	No
4	Comments: Based on the site inspire is removal. It is recommended to	bection be rep	, this tr laced ir	ee is re n the lai	quired ndscap	to be re e maste	emoved due to its er plan upon comp	location wit pletion.	thin the propo	sed ch	ildcare develop	ment and site r	Retention Value * H 40yrs + * M 15 - 40yrs * L 5 to 15ys * Nil Less 5ys * Dead Low nodifications that Medium odifications that Nil Nil Nil sed on the plans ape master plan	at support
	White Feather Honeymyrtle Melaleuca decora	10	600	640	N/A	N/A	Mature	Good	Good	3	Low	Low to Moderate	Medium	No
5	Comments: Based on the site ins removal. It is recommended to be	pectior e replac	n, this ti ced in t	ree is re he land	equired scape r	to be i master	removed due to it plan upon comple	s location w	ithin the prop	osed c	hildcare develc	pment and mo	Retention I Value I * H 40yrs + I * M 15 - 40yrs I * L 5 to 15ys I * Nil Less 5ys Dead Low I odifications that I Medium I ifications that s I Nil I opment and be I Nil I I I I I I I I I Nil I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I <t< td=""><td>support is</td></t<>	support is
	Canary Island Date Palm Phoenix canariensis	6	370	400	N/A	N/A	Mature	Good	Good	3B	Nil	Nil	Nil	No
6	Comments: This minor ornament in the landscape master plan.	al palm	n tree is	recom	mende	d this t	ree be removed d	ue to its loc	ation within th	ne prop	oosed childcare	basement deve	Retention /alue /alue /alue <t< td=""><td>e replaced</td></t<>	e replaced
7	Dead Unknown species	4	200	220	N/A	N/A	Dead	Dead	Dead	4C	Nil	Nil	Nil	No
4 5 6 7 8	Comments: This minor tree is dead and may be removed without further consideration													
8	Cocos palm Syagrus romanzoffiana	9	270	290	N/A	N/A	Mature	Good	Good	3B	Nil	Nil	Nil	No
	Comments: This minor TPO Exem the palm trees location within the	npt nuis e propo	sance w osed ba	veed sp sement	ecies p excava	alm tre ation ar	e may be remove nd loss of stability,	d without fu , it is recom	urther conside mended to be	ration remov	or approval, fu ved and replace	rthermore, bas d in the landsc	Retention Value * H 40yrs + * M 15 - 40yrs * L 5 to 15ys * Nil Less 5ys * Dead Low odifications that Medium ifications that s Nil opment and be Nil Nil d on the plans pe master plan.	provided,



Tree Number	Tree Species Common Name Botanical name	Height (m)	DBH @ 1.4m	DAB (mm)	SRZ Required (m)	TPZ Required (m)	Tree Age * Young * Semi Mature * Mature * Over Mature	Tree Health * Good * Fair * Poor * Dead	Tree Structure * Good * Fair * Poor	SULE Rating	Ecological Significance * High * Medium * Low * Nil	Landscape Visual Significance * High * Moderate * Low * Nil	Retention Value * H 40yrs + * M 15 - 40yrs * L 5 to 15ys * Nil Less 5ys * Dead	To Be Retained
	Cocos palm Syagrus romanzoffiana	9	270	290	N/A	N/A	Mature	Good	Good	3B	Nil	Nil	Nil	No
9	Comments: This minor TPO Exem the palm trees location within the	pt nuis e propo	ance w osed bas	eed spo sement	ecies pa excava	alm tre ation ar	e may be remove nd loss of stability,	d without fu , it is recomr	irther conside mended to be	ration remov	or approval, fu ed and replace	rthermore, bas d in the landsca	Nil	provided,
10	Mexican fan palm Washingtonia robusta	10	290	320	N/A	N/A	Mature	Good	Good	3	Nil	Low	Low	No
10	Comments: Based on the plans provided, the palm trees location within the proposed basement excavation and loss of stability, it is recommended to be removed and replaced in the landscape master plan.											d replaced		
	White Cedar Melia azedarach	5	M/T	250	N/A	N/A	Mature	Good	Good	3B	Nil	Nil	Nil	No
11	Comments: This minor self-seeded tree is a "Hazardous Tree" as listed in the NSW Dept of Ed EFSG (Educational Facilities Standards and Guidelines) 92.08 due to be a "Toxic" plant. It is recommended this tree be removed due to its location within the proposed childcare development and be replaced in the landscape master plan.													

Key. Multi trunk (M/T)

Table 1: Shows a list of trees observed and assessed in relation to this development application by a Qualified Horticulturist and AQF Level 5 Arborist (Dip Arb).





7.0 TREE LOCATION BASED ON PROPOSED DEVELOPMENT LOCATION

Figure 5 Shows the site trees location based on the Childcare development layout.





8.0 TREES PROPOSED TO BE REMOVED BASED ON DEVELOPMENT LOCATION

Figure 6 Shows the trees in RED to be removed or TPO Exempt in YELLOW based on the plans provided.





Figure 6 Shows looking at the site from the roadway.



Figure 7 Shows Tree 1 to be removed as it is located within the proposed driveway envelope.





Figure 8 Shows Trees 1, 2 and 3 from a distance to be removed and replaced.



Figure 9 Shows Tree 4 with deadwood, and declining canopy required to be removed.





Figure 10 Shows Tree 5 from a distance that is required to be removed due to site modifications and proposed building envelope and scope of works.



Figure 11 Shows minor palm Tree 6 that is required to be removed.





Figure 12 Shows Castor oil, privet, and dead Tree 4 to be removed.



Figure 13 Shows palm Trees 8, 9 and 10 from a distance required to be removed.



10.0 CONCLUSION

The trees which are subject of this report are protected under Penrith Development Control Plan - Part C2 Vegetation Management (Tree Preservation Order).

Consideration of retaining mature significant vegetation to the area was paramount. After close visual and physical investigation of the various trees condition the results from field investigations are as follows.

Subject to Council or equivalent process, approval is recommended for the removal of Eleven (11) trees numbered 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 including minor TPO Exempt shrubs, based on their location within the Childcare basement and building envelope, construction, landscaping and considered scope of works within the development.

Whilst some ranged from good to fair health, density, and structural condition they are required to be removed due to the required basement excavation/site levelling and childcare envelope and construction works tabled.

All considerations, options regarding their individual retention was considered based on the proposed design tabled, access requirements, considered construction requirements within the trees present location and site modifications that would result in the long term modifications to these trees natural environment (TPZ/SRZ) through but not limited to; surface root and soil compaction, loss of anchorage roots, natural water table redirection through the required cut and fill levels that would result in the decline of the tree's health and overall stability in the long term.

No roosting or habitat hollows were observed in any of the site trees proposed to be removed.

The removal of these tree will not have an adverse effect on the environment or Section 5A "<u>Significant</u> <u>effects on threatened species, populations or ecological communities, or their habitats</u>" as defined under the Environmental Planning and Assessment Act (1979) as indicated whether a viable local population of a species or an endangered ecological community will be placed at risk of extinction as a result of the proposal or whether a significant area of known habitat will be modified or removed.

As stated, this tabled report is a snapshot of the existing trees structural condition, health, and condition at that particular point in time on site and should be used as a guide when assessing this tree removal application.

In summary, no objections to these trees' removal are raised, subject to appropriate environmental safeguards and relevant replacement plantings where appropriate.



11.0 RECOMMENDATIONS

After close visual and physical investigation of the trees condition (VTA), results from the field investigations indicated the following:

- Subject to Council or equivalent process, approval is recommended for the removal of Eleven (11) trees numbered 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 including minor TPO Exempt shrubs, based on their location within the Childcare basement and building envelope, construction, landscaping and considered scope of works within the development.
- The applicant considers choosing plant species indigenous to the area, and thus would help to increase flora and fauna habitat and greater diversity of the area,
- Tree planting should take into consideration the high priority of the visual residential element,
- The tree should be programmed to be removed whilst it is upright and intact,
- The trees prior to removal shall be fully investigated for any nesting or roosting fauna,
- Tree removal should be undertaken by a qualified tree surgeon, being AQF L3 Arborist as minimum.

Tree removal work is specialised, and in order to be undertaken safely and to ensure the works carried out are not detrimental to the survival of adjoining trees or surrounding vegetation, all works should be undertaken by a qualified Arborist with appropriate competencies recognised within the Australian Qualification frame work (Level 3 Arborist), with a minimum of 5 years of continual experience within the industry of operational amenity arboriculture, and covered by appropriate and current types of insurance to undertake such works.













B.1 TREE PROTECTION ZONE CALCULATION

A Tree Protection Zone (TPZ) is a radial distance measured from the centre of the trunk of the tree. The intention of the TPZ is to minimise incursions to the root system and canopy to ensure the long-term health and stability of the tree.

A commonly used delineation for the TPZ is the dripline (extent of the crown spread projected to the ground plane). However, this may not provide adequate protection for trees that have prominent leans or distorted imbalanced or narrow crowns. A more appropriate guideline is the trunk diameter.

The Tree trunk measurement is recorded and known as the Diameter at Breast Height (DBH) at 1.4 metres from ground level using a metric tape measure. The TPZ area is then calculated by DBH x 12.

The TPZ incorporates the Structural Root Zone (SRZ). The SRZ is the area required for tree stability and has a standard calculation formula. The SRZ calculation is only used when a major encroachment into a TPZ is proposed.

B.2 TREE AGE TERMINOLOGY

Rating	Description
Juvenile	Less than 20% of the life expectancy for the species
Semi-mature	Middle age trees, 20% to 50% of life expectancy
Mature	Greater than 50 – 80% of the life expectancy for the species
Over-mature	Greater than 80% of the life expectancy for the species, senescent tree, or those
	declining irreversibly to death

B.3 DEFINITION OF ASSESSED HEALTH AND CONDITION OF TREE

The condition of each tree has been rated in overall terms as one of the following:

Rating	Description
Good	The tree is generally healthy, vigorous, and free from the presence of major disease,
	obvious structural weaknesses, and fungal or insect infestation. It is expected to continue
	to live in the same condition as at the time of the inspection. Only small
	recommendations may be required to help continue the trees longevity.
Fair	The tree is generally vigorous but has some indication of decline possibly due to the early
	effects of disease, fungal or insect infestation, affected by physical (storm damage) or
	mechanical damage (Vandalism or involved in an accident by a vehicle), or is faltering
	due to the modification of the tree's environment essential for its survival. This tree
	group may recover with remedial work undertaken by a Qualified Arborist where
	appropriate or without intervention and may regain some vigour and stabilise over time.
	Medium recommendations are required to bring this tree up to a satisfactory standard.
Poor	The tree is exhibiting symptoms of advanced and irreversible decline due to possible
	factors such as fungal infestation, termite damage, ring barking of the tree's trunk due
	to borer infestation. Symptoms observed can include major die-back in branches, foliage
	thinning in the crown, and epicormic growth throughout the inner canopy. This tree
	group will normally decline further to death regardless of remedial works or
	modifications undertaken.
Dead	The tree is no longer alive and is in poor structural condition, that may cause damage to
	people or property and removal is strongly recommended.



B.4 ASSESSED STRUCTURAL CONDITION

This refers to the tree's form and growth habit, modified by its environment, including the state of the trunk and main structural branches. It considers the presence of defects such as decay, weak branch junctions and other visible abnormalities. Although some trees without defects fail in major storms, the presence of any defect will increase the chances of failure.

Rating	Description
Good	Trees with a single dominant trunk along which evenly spaced branches are spread.
	Branches have properly formed collars which provide strong attachment to the trunk
	and are about 25% of the trunk diameter. Minor structural defects may be present
	with low failure potentials.
Average	Trees with structural defects with low failure potential.
Fair	Trees with structural defects with medium failure potentials and require monitoring on
	an annual basis.
Poor	Trees with defects which have failed, or have a high risk of failing soon, and corrective
	action must be taken soon as possible.



B.5 SAFE USEFUL LIFE EXPECTANCY (SULE)

The remaining Safe Useful Life Expectancy of a tree is an estimate of the sustainability of the tree within the site/landscape, calculated based on an estimate of the average age of the species in an urban area, compared with its estimated current age. SULE ratings are estimated in line with the following table:

	1 LONG 401 yrs	2 MEDILIM 15 to 40 yrs	3 SHOPT E to 15 yrs		5 MOVED OR BERLACED
	LONG - 40+ yrs	WEDIOW - 15 to 40 yrs	SHOKT- 5 to 15 yrs	REIVIOVAL - < 5 yrs	WOVED OK REPLACED
	Likely to be useful for over 40 years with acceptable risk and assuming reasonable maintenance	Likely to be useful for 15-40 years with acceptable risk and assuming reasonable maintenance	Trees that appeared to be retainable at the time of assessment for 5 to 15 years with acceptable level of risk.	Tree to be removed within the next 5 years	Tree which can be reliably moved or replaced.
A	Structurally sound trees growing in positions that can accommodate future growth	Trees which may only live 15-40 years	Trees that may only live between 5 and 15 more years.	Dead, dying, suppressed or declining trees through disease or inhospitable conditions.	Small tree less than 5m in height.
В	Trees which could be made suitable for long term retention by further care	Trees which may live for more than 40 years but which would be removed for safety or nuisance reasons	Trees which may live for more than 15 years but which would be removed for safety or nuisance reasons	Dangerous trees through instability or recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in height.
с	Trees of special significance for history, commemorative or rarity reasons that warrant extraordinary efforts to secure their long-term future	Trees that may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting	Trees that may live for more than 15 years but should be removed to prevent interference with more suitable individuals or to provide space for new plantings	Dangerous trees through structural defects including cavities, decay included bark, wounds, or poor form.	Trees that have been pruned to artificially control growth.
D		Trees which could be made suitable for medium term retention by remedial care	Trees which require substantial remediation tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
E				Trees that may live for more than 5 years but should be removed to prevent interference with more suitable individuals or to provide space for new plantings	
F				Trees damaging Or which may cause damage to existing structures within the next 5 years	
G				Trees that will become dangerous after removal of other tress for reasons given in A) to F)	

SULE table adapted from Barrell (1995).

NOTE: No tree is "safe" i.e. entirely without hazard potential. The SULE rating given to any tree in this report assumes that reasonable maintenance will be provided by & qualified arborist using correct and acknowledged techniques. Retained trees are to have a reasonable setback and be protected from root damage. Incorrect practices can significantly accelerate tree decline and increase hazard potential.



B.6 ECOLOGICAL SIGNIFICANCE

These categories are based upon the criteria used in the Thyer Tree Valuation Method (1996) to evaluate a tree's ecological benefit.

Rating	Description
None	Weed species
Low	Restricts desirable plants or of little benefit to fauna.
Medium	Beneficial to flora & fauna provides food source and/or shelter.
High	Remnant /indigenous species of native vegetation.
Very High	Indigenous species being an integral part of a natural ecosystem.

B.7 LANDSCAPE SIGNIFICANCE

The site's **Landscape Significance** is a subjective value determined by assessing a combination of cultural, environmental, and aesthetic values of the subject trees. This may aid in determining their overall retention value. Generally, the Landscape Significance of the subject trees has been determined using the following criteria:

RATING	DESCRIPTION										
HIGH	The subject tree is listed as a Heritage Item under the Local Environmental Plan with a local										
	or state level of significance.										
	The subject tree forms part of the curtilage of a heritage item.										
	The subject tree creates a 'sense of place' or is considered 'landmark' tree.										
	The subject tree is of local, cultural, or historical importance or is widely known.										
	The subject tree is listed on Council's Significance Tree Register.										
	The subject tree is scheduled as a Threatened Species or Threatened Plant Community										
	under replaced by the Biodiversity Conservation Act (2016)										
	The subject tree is a remnant tree.										
	The subject tree is a locally indigenous species and is representative of the original										
	vegetation of the area.										
	The subject tree provides habitat to a threatened species.										
	The subject tree is an excellent representative of the species in terms of aesthetic value.										
MODERATE	The subject tree makes a positive contribution to the visual character or amenity of the										
	area.										
	The subject tree provides a specific function such as screening or minimising the scale of a										
	building.										
	The subject tree has a known habitat value.										
	The subject tree is a good representative of the species in terms of aesthetic value.										
LOW	The subject tree is an environmental pest species or is exempt under the provisions of the										
	local Council's Tree Preservation Order.										
	The subject tree makes little or no contribution to the amenity of the locality.										
	The subject tree is a poor representative of the species in terms of aesthetic value.										
NIL	The subject tree is declared a Noxious Weed under the Biosecurity Act (2015)										

*NOTE: If the tree can be categorised into more than one value, the higher value should be allocated.



B.8 RETENTION VALUE WITHIN THE LANDSCAPE

The Retention Values of the trees have been determined based on the estimated longevity of the individual tree with consideration of its landscape significance rating. Together with recommendations contained within this report, the information should be used to determine the most appropriate action for trees considered for either retention or removal.

Retention Value Rating		Landscape/Environmental Significance									
Estimated Life	1- Very	2- Very	3- High to	4 -	5-	6- Low	7- Nil				
Expectancy	High	High to High	Moderate	Moderate	Moderate to Low						
HIGH – (H)	High				•						
Greater than 40	Retention										
Years	Value										
MEDIUM - (M) 15			Moderate								
to 40 Years			Retention								
			Value								
LOW – (L)				Low							
5 to 15 years				Retention							
				Value							
Less than 5											
Years											
Dead or											
Hazardous											



APPENDIX C: TERMINOLOGY

CO-DOMINANT STEMS: The term 'co-dominant' is used to describe two or more stems or leaders that are approximately the same diameter and emerge from the same location on the main trunk. The junction where the two stems meet is a common location of above ground tree failure (Harris, Clark & Matheny, 1999).

CONDITION: An evaluation of the structural status of the tree including defects that may affect the useful life of an otherwise healthy specimen. Influencing factors include cavities and decay, weak unions between scaffolds {major branches} or trunks and faults of form or habit.

DBH: Acronym for trunk diameter at breast height (1 4m from ground level).

DEADWOOD: Deadwood is a normal function for plant growth and development. The safety of the target, namely pedestrians, is considered the primary basis for deadwood removal. As deadwood has an ecological value, the removal of deadwood is usually only carried where it is a potential hazard to site users. Dead wooding a tree does not increase its life expectancy.

DIEBACK: Dieback is the progressive death of branches or shoots originating from the tips. Dieback and decline are parts of a disease complex that have similar causal agents. Crown dieback is a recognizable, visible symptom of the early stages of decline and potential tree death.

DOMINANT: Trees with crowns above the upper layer of the canopy and generally receiving light from above and the sides.

EDGE: Trees located on the edge of a more dominant canopy of trees, and frequently possessing asymmetrical crowns, (heavier on the open side) and trunks that may be distorted due to competing with others for valuable nutrients i.e. soil air, water, light.

EPICORMIC GROWTH: Epicormic growth comes from dormant buds held in the cambium. Under normal growth conditions, these buds are held in a dormant state by hormones produced in the canopy. These shoots are often produced by the tree in response to injury or environmental stress. Epicormic growth has implications for tree structure as the attachment of an epicormic shoot is much weaker than that of a 'naturally' developed branch.

FOREST: Trees that have grown in a forest setting and only have about 1/3 of their canopy located on tall straight trunks.

INCLUDED BRANCH JUNCTIONS: Included branch junctions often form when two branches or trunks grow together at sharply acute angles, producing a wedge of inward-rolling bark. Junctions with included bark form weak attachments, as there is little connective tissue between the two stems.

INTERMEDIATE: Trees that have been overtopped, and become part of the understorey canopy

MYCORRHIZAE: Mycorrhizae are fungi that grow in symbiotic association with tree roots (especially the fine root hairs) and are attributed with increasing the uptake of nutrients, particularly phosphorus, and reducing infection from soil borne pathogens. They greatly increase the surface area of a tree's root system. Mycorrhizae require aerobic soil conditions and are reduced in number by compaction, waterlogging and over-use of soil fertilisers. Forest litter or similar mulch provides ideal conditions for the proliferation of mycorrhizae.

NON-WOODY ROOTS: Extending from the woody root system, a mass of non-woody, fine feeder roots develop. These non-woody roots are active in water and nutrient uptake, are fine in structure, typically less than 0.5mm diameter, and include mycrorrhizal associations with some soil fungi.



PROJECT ARBORIST: The person responsible for carrying out the tree assessment, report preparation, consultation with designers, specifying tree protection measures, monitoring and certification. The project arborist will be suitably experienced and competent in arboriculture, having acquired through training, qualification (minimum Australian Qualification Framework (AQF) Level 5, Diploma of Horticulture (Arboriculture)) and/or equivalent experience, the knowledge and skills enabling that person to perform the tasks required by this Standard.

ROOT PLATE: This forms the main structural woody roots which provides overall anchorage for the tree. It is this central part of the root-system (large root mass with sub-soil normally attached) which may tilt over or rotates in storm events.

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

TREE HAZARD POTENTIAL: An assessment of the risks associated in retaining a tree in its existing or proposed surrounds. Factors to consider are the growth characteristics of the species, tree vitality, condition and the frequency and type of potential targets. The impact the proposed works may have on tree vitality can only be assumed.

TREE PROTECTION ZONE (TPZ): A specified area above and below ground, and at a given distance from the trunk, set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained.

TREE: Long lived woody perennial plant greater than (or usually greater than) 3 m in height with one or relatively few main stems or trunks (or as defined by the determining authority).

VIGOUR: Ability of a tree to sustain its life processes. The term 'vigour' in this document is synonymous with commonly used terms such as 'health' and 'vitality'.

VITALITY: Indicates the energy reserves of the tree and is determined by the observed crown colour and density, the percentage of dead / dying branches and epicormic growth. The vitality of the canopy and that of the root system is interdependent. Root damage or heavy pruning draws on a tree's energy reserves. The tree's ability to initiate internal defence systems (compartmentalisation of damage) is reduced and it can also become predisposed to attack by insects and pathogens.

WOODY ROOTS: Beyond the root plate the root system rapidly subdivides into smaller diameter woody roots (hydrotropic) which conduct water and nutrients from the non-woody roots.

WORK: Any physical activity in relation to land that is specified by the determining authority.

WOUNDING: Wounding may be the result of mechanical injury from construction equipment; branch failure, splitting or cracking during high wind events. The long-term effects of tree wounding are the potential development of decay and loss of wood strength.



APPENDIX D: REFERENCES

American Society of Consulting Arborists (1995), A *Guide to Report Writing for Consulting Arborists*, International Society of Arboriculture, USA.

Australian Standard, 4970; 2009 – Protection of Trees on Development Sites, Australia

Barrell, J., (1993) 'Pre-planning Tree Surveys: Safe Useful Life Expectancy (SULE) is the Natural Progression' Arboricultural Journal Vol. 17, pp 33-46, AB Academic Publishers, Great Britain.

Barrell, J., (2001) 'Safe Useful Life Expectancy Categories updated 4/01' from Management of Mature Trees, proceeding of the 4th NAAA Tree Management Seminar, National Arborists Association of Australia, Sydney, Australia, Appendix 3.

Bradshaw, Hunt & Walmsley (1995), Trees in the Urban Landscape, E & FN Spon, London.

Dunster, J. A., Smiley, E. T., Matheny, N. P., & Lilly, S. (2017). Tree Risk Assessment Manual. International Society of Arboriculture.

Hadlington & Johnston (1988), Australian Trees: Their Care & Repair, UNSW Press, Sydney.

Harris, Clark & Matheny (1999), Arboriculture: Integrated Management of Landscape Trees.

Heatwole, H. & Lawman, M. (1986) 'Dieback. death of an Australian landscape' Reed Books Pry Ltd. Frenchs Forest, NSW

Matheny & Clark (1994), A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas, International Society of Arboriculture, USA

Mattheck & Breloer (1994), The Body Language of Trees: A Handbook for Failure Analysis, The Stationary Office, London.

Thyer, P. (1996) 'Thyer Tree Valuation Method'

www.whereis.com.au.

www.Nearmaps.com.

Penrith Development Control Plan - Part C2 Vegetation Management.



APPENDIX E: CERTIFICATION

I certify that the enclosed "Arboricultural Impact Assessment" for the proposed Child Care Development Application at 187-189 Adelaide Street, St Marys NSW has been prepared by Horticultural Management Services.

To the best of my knowledge and professional integrity, it is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

Qualifications:

- Diploma of Arboriculture (AQF L5)
- International Society of Arboriculture (ISA) Tree Risk Assessment TRAQ Certified
- Diploma of Horticulture
- Diploma of Conservation and Land Management

Scott Freeman Principal Horticultural Management Services

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