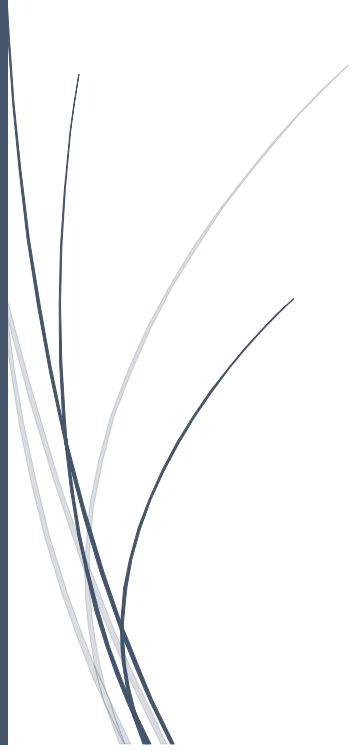
11/6/2020

Arboricultural Impact Assessment

29 – 57 Christie Street, St Leonards



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1.Introduction

At the request of Arrow Capital Partners, Lee Hancock Consulting Arborist AQF Level 5 was commissioned to prepare an Arboricultural Impact Assessment for the proposed development of a multi storey building at 29 – 57 Christie Street, St Leonards also known as Lot 1 DP 773862 in the Local Government Area (LGA) Lane Cove Council.

Please Refer: Arcadia Landscape Plan for full size plan of numbered trees, tree protection zones and structural root zones.

1.1 The Proposal

The applicant seeks permission to demolish part of the community centre buildings flanking Oxley and Nicholson Street, St Leonards. The design shows a triangular configuration of two buildings known as Building A and B. Building A 9 Storey building, Building B 11 storeys, with 3 level basement car parks.

2.Aim

The purpose of this report is to detail the condition of the trees on site. Trees to be removed and identifies impacts on trees onsite and offsite to be retained. The AIA includes recommendations to minimise any adverse impacts, that the demolition and construction activities may have on the trees to be retained and trees off site. In preparing this report the author is aware of and will comply with the determining authorities Lane Cove Council Local Environmental Plan (LEP)2010 Development Control Plan (DCP) 2010 .Clause 5.9 of Lane Cove Local Environmental Plan 2009 (NSW).

Table 1. Documents Provided

PLAN/DOCUMENT	PREPARED BY	DWG/REF NO	DATED
Architectural Drawings	Fitzpatrick Partners	DA06- 59	September 2020
Arcadia Landscape	B. Michel	101-126	September 2020 Issue C
Survey	Veris	DETL-001/A	12.12.2019

Limitations: Survey has not included all trees onsite. The avenue planting of *Platanus acerifolius* (London Plane Tree) 9, 10 and 11 were not plotted on survey. O1A not shown on Survey Plan

Casuarina cunninghamiana (River She-Oak) numbered and tagged 52, 53, 54 and 55 were not plotted on Survey.

Street Treenumbered O1A Oxley Street Tristaniopsis laurina

3. Site Analysis

The site consists of buildings identified as Buildings A & B functioning as a Community and Childcare Centre, there is a stand of trees on the north east boundary which slopes steeply towards Childcare centre. Both A & B buildings are proposed to be removed. Building C is to remain. The existing vegetation consists of an avenue of *Platanus acerifolia* (London Plane Tree) accessed from Christie Street, the north east site supports a stand of *Casuarina* trees. Orange line indicates buildings for demolition.

4. Discussion

An assessment of each tree was made using the Visual Tree Assessment (VTA) procedure. The prescribed trees were assessed from the ground. No aerial inspection or diagnostic testing has been undertaken as part of this assessment. Each tree has been tagged and should assist in locating trees to be impacted upon.

4.1. The initial point of reference in assessing the impacts of the proposed development is AS4970 (2009) *'Protection of trees on development sites.* This discussion will focus primarily on the trees that will experience conflicts with the proposed development.

1A Street Tree *Eucalyptus siderophloia* (Grey Ironbark)

Street tree positioned at end of Christie adjacent to 29 Christie Street, tree appears structurally stable, in good form and vigour, rated as high landscape significance amenity and ecological value. Councils asset shall be protected throughout all stages of the proposed development.

Tree 1. *Platanus acerifolius* (London Plane Tree)

Large mature tree positioned in small seating area of in good form and vigour, rated as high landscape significance, amenity, and ecological value. The supplied plans show tree will spatially conflict with the proposed development. Rated as moderate `landscape significance, amenity, and ecological value. Low retention value.

Tree 2. *Eucalyptus saligna* (Sydney BlueGum)

Large mature tree in good form and vigour, appears structurally stable, rated as high landscape significance amenity and ecological value. The supplied plans show tree will spatially conflict with the proposed development. Rated as moderate `landscape significance, amenity, and ecological value. Low retention value.

Tree 3. *Platanus acerifolius* (London Plane Tree)

Positioned in an Avenue planting of Plane Trees tree is a semi mature tree, in good form and vigour, rated as high landscape significance, amenity value. High retention value.

Tree 4. *Platanus acerifolius* (London Plane Tree)

Positioned in an Avenue planting of Plane Trees tree is a semi mature tree, in good form and vigour, rated as high landscape significance, amenity value. High retention value.

Tree 5. *Platanus acerifolius* (London Plane Tree)

Positioned in an Avenue planting of Plane Trees tree is a semi mature tree, in good form and vigour, rated as high landscape significance, amenity value. High retention value.

Tree 6. *Platanus acerifolius* (London Plane Tree)

Positioned in an Avenue planting of Plane Trees tree is a semi mature tree, in good form and vigour, rated as high landscape significance, amenity value. High retention value.

Tree 7. *Platanus acerifolius* (London Plane Tree)

Positioned in an Avenue planting of Plane Trees tree is a semi mature tree, in good form and vigour, rated as high landscape significance, amenity value. High retention value

Tree 8. *Platanus acerifolius* (London Plane Tree)

Positioned in an Avenue planting of Plane Trees tree is a semi mature tree, in good form and vigour, rated as high landscape significance, amenity value. High retention value.

Tree 9. *Platanus acerifolius* (London Plane Tree) (NOT SHOWN ON SURVEY)

Positioned in an Avenue planting of Plane Trees tree is a semi mature tree, in good form and vigour, rated as high landscape significance, amenity value. High retention value.

Tree 10. *Platanus acerifolius* (London Plane Tree) (NOT SHOWN ON SURVEY)

Positioned in an Avenue planting of Plane Trees tree is a semi mature tree, in good form and vigour, rated as high landscape significance, amenity value. High retention value.

Tree 11. Tree 10. *Platanus acerifolius* (London Plane Tree) (NOT SHOWN ON SURVEY)

Positioned in an Avenue planting of Plane Trees tree is a semi mature tree, in good form and vigour, rated as high landscape significance, amenity value. High retention value.

The existing soil surface, of the 11 subject trees are growing in very compacted soil, likely from pedestrian foot traffic. *Soil compaction is a major cause of tree decline in urban areas. Compaction occurs when a force, such as feet, vehicles, and even water from some sprinkler systems, creates pressure on the soil surface and compresses the soil particles. This force causes the soil aggregates to break into smaller particles, reducing the amount of pore space in the soil and increasing the bulk density. The reduced pore space hinders aeration, water infiltration, and root penetration. A lack of soil oxygen and poor water drainage retard root growth, jeopardizing the health of the tree.*

Tree 12. *Banksia serrata* (Old Man Banksia)

Mature tree positioned entrance to Fitness First in fair form and vigour, rated as moderate landscape significance amenity and ecological value. Tree is not considered worthy of any special measures for its preservation. Recommend removal.

Tree 13. *Casuarina cunninghamiana* (River She-Oak)

Mature tree positioned on retaining wall street level to basement car park, tree appears in good form and vigour, rated as moderate landscape significance amenity and ecological value. The supplied plans show tree will spatially conflict the proposed new crossover from Oxley street. Low retention value.

Tree 14. *Casuarina cunninghamiana* (River She-Oak)

Mature tree positioned on retaining wall street level to basement car park, tree appears in good form and vigour, rated as moderate landscape significance amenity and ecological value. The supplied plans show tree will experience an incursion greater than 10% into TPZ and SRZ unacceptable incursion as stated in AS4970. By the proposed new crossover from Oxley Street. Low retention value.

Tree 15. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in fair form and vigour, positioned on retaining wall street level to basement car park, tree rated as moderate landscape significance amenity and ecological value. The supplied plans show tree an incursion greater than 10% into TPZ and SRZ unacceptable incursion as stated in AS4970 by the proposed new crossover from Oxley Street. Low retention value.

Tree 16. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree appears in good form and vigour, rated as moderate landscape significance amenity and ecological value. The supplied plans show tree will be adversely impact by the proposed new boundary line. Low retention value.

Group A. ***Casuarina cunninghamiana* (River She-Oak)**

A stand of 5 Street Trees identified as Casuarinas positioned on Oxley Street , the current supplied plans show the extension of Oxley street boundary to accommodate basement car park, will spatially conflict with the stand. It is not feasible to retain Group A. Rated as high landscape significance, amenity. Low retention value.

Tree 17. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree appears in good form and vigour, rated as moderate landscape significance amenity and ecological value. The supplied plans show tree will be adversely impact by the proposed new boundary line. Low retention value.

Tree 18. ***Casuarina cunninghamiana*** **(River She-Oak)**

Mature tree positioned on retaining wall street level to basement car park, tree appears in good form and vigour, rated as moderate landscape significance amenity and ecological value. The supplied plans show tree will be adversely impact by the proposed new boundary line. Low retention value.

Tree 19. ***Casuarina cunninghamiana*** **(River She-Oak)**

Semi mature tree in good form and vigour, appears structurally stable, positioned on retaining wall street level to existing basement car park. rated as moderate landscape significance amenity and ecological value. The supplied plans show tree will be adversely impact by the proposed new boundary line. Low retention value.

Tree 20. ***Casuarina cunninghamiana*** **(River She-Oak)**

Positioned at gate entrance to Childcare Centre, tree is a mature specimen, that appears structurally stable in good form and vigour, the supplied plans show tree The supplied plans show tree will be adversely impact by the proposed new boundary line. Low retention value. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 21 ***Casuarina cunninghamiana*** **(River She-Oak) (Not Shown in Survey Plan)**

Tree was not included in supplied survey, tree is in good form and vigour, the supplied plans show tree will be adversely impacted upon by the proposed building footprint. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Hedge ***Syzygium australe*** **(Lilly Pilly) (Not Shown in Survey Plan)**

Positioned in retaining wall to basement car park entrance, an informal hedge of Lilly Pillys, young trees appear in good form and vigour, the supplied plans show the existing basement will be demolished, not feasible to retain trees. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 20 A ***Eucalyptus saligna*** **(Sydney Blue Gum) Council Asset**

Street tree positioned corner of Oxley and Nicholson Street, in good form and vigour, appears structurally stable, will form part of the proposed landscape plan. High landscape significance, amenity, and ecological value. High retention value. The supplied plans show tree will be retained and form part of the supplied Arcadia landscape plan. It is proposed, elevated decking will be constructed around trunk, when tree sensitive construction methodologies are applied, tree will not be adversely impacted upon.

Refer: Section 6. Recommendation & Section 10 Tree Protection Specifications

Tree 21B *Eucalyptus paniculata* (Grey Iron bark) Council Asset

Large mature tree positioned opposite 69 Nicholson Street, in good form and vigour, appears structurally stable, will form part of the proposed landscape plan. High landscape significance, amenity, and ecological value. High retention value. The supplied plans show tree will be retained and form part of the supplied Arcadia landscape plan. It is proposed, elevated decking will be constructed around trunk, when tree sensitive construction methodologies are applied, tree will not be adversely impacted upon.

Refer: Section 6. Recommendation & Section 10 Tree Protection Specifications

Tree 22 *Casuarina cunninghamiana* (River She-Oak)

Mature tree in close proximity to existing boundary fence, in good form and vigour, appears structurally stable, the supplied plan show tree will be adversely impacted upon by the proposed new boundary line, not feasible to retain under current plans. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 23. *Casuarina cunninghamiana* (River She-Oak)

Large mature tree showing a branch bark inclusion 1.4m between two stems, *A bark inclusion indicates a weak connection. These two trunks are physically pushing against each other as they both continue to expand in diameter. This pushing resulting from growth combined with the increase in height and weight of each stem over time can cause this union to fail.* In fair health and vigour, rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 24. *Casuarina cunninghamiana* (River She-Oak)

Young tree in good form and vigour, appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 25. *Casuarina cunninghamiana* (River She-Oak)

Mature tree in good form and vigour, appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 26. *Casuarina cunninghamiana* (River She-Oak)

Mature tree showing bark inclusion 8m from base of tree, *the two trunks are physically pushing against each other as they both continue to expand in diameter. This pushing resulting from growth combined with the increase in height and weight of each stem over time can cause this union to fail.* In fair health and vigour,

the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 27. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in good form and vigour, appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 28. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in good form and vigour, appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 29. *Castonospermum austral* (Bean Tree)

Young tree positioned upper level of site near Nicholson Street, tree is in good form and vigour, appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 30. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in poor form and condition, the removal of this tree is therefore recommended regardless of the implications of any proposed development. Rated as low landscape significance, amenity value. Low retention value.

Tree 31. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in good form and vigour, appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance and amenity value. Low retention value.

Tree 32. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in fair form and vigour, appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance and amenity value. Low retention value.

Tree 33. *Casuarina cunninghamiana* (River She-Oak)

Young tree in fair form and vigour, , appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance and amenity value. Low retention value.

Tree 34. *Casuarina cunninghamiana* (River She-Oak)

Young tree in good form and vigour, appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance and amenity value. Low retention value.

Tree 35. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree appears in good from and vigour, structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance and amenity value. Low retention value.

Tree 36. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree with two stems arising from trunk, is not co-dominant, structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance and amenity value. Low retention value.

Tree 37. *Casuarina cunninghamiana* (River She-Oak)

Young tree in good form and vigour, appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as rated as moderate landscape significance and amenity value. Low retention value.

Tree 38. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree showing branch bark inclusion 4m up from ground level, *these two trunks are physically pushing against each other as they both continue to expand in diameter. This pushing resulting from growth combined with the increase in height and weight of each stem over time can cause this union to fail.* In fair health and vigour, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 39. *Casuarina cunninghamiana* (River She-Oak)

Mature tree appears in good form and vigour structurally stable, *although mistletoe is photosynthetic, it is an obligate, semi parasitic evergreen plant that infects host plants to derive support, water, and essential elements (Scharpf and Hawksworth 1974; Coder 2004). In urban environments, they are considered a nuisance because of their appearance in deciduous trees during the winter. When colonization is extensive in individual trees, mistletoe can adversely affect tree health and cause decline and death of trees (Paine and Harrison 1992)* rated as moderate landscape significance amenity and ecological value. the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. Low retention value.

Tree 40. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in fair form and vigour, appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 41. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in fair form and vigour, base of trunk has multiple occlusions round base of trunk, possibly occlusions have formed from mechanical damage for example whipper snippers and mowers. ***occlusion***. The continued radial growth of new wood, including wound wood, which gradually grows over wounds to the woody parts of *trees*. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 42. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in fair form and vigour, appears structurally stable. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 43. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree, showing branch bark inclusion 6m from ground level, *the two stems are physically pushing against each other as they both continue to expand in diameter. This pushing resulting from growth combined with the increase in height and weight of each stem over time can cause this union to fail.* In fair health and vigour. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 44. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in fair form and vigour, appears structurally stable, the supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as rated as moderate landscape significance and amenity value. Low retention value.

Tree 45. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in fair form and vigour, appears structurally stable. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as rated as moderate landscape significance and amenity value. Low retention value.

Tree 46. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in fair form and vigour, appears structurally stable. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as rated as moderate landscape significance and amenity value. Low retention value.

Tree 47. *Casuarina cunninghamiana* (River She-Oak)

Semi mature tree in fair form and vigour, appears structurally stable, presence of Mistletoe *Although mistletoe is photosynthetic, it is an obligate, semi parasitic evergreen plant that infects host plants to derive support, water, and essential elements (Scharpf and Hawksworth 1974; Coder 2004). In urban environments, they are considered a nuisance because of their appearance in deciduous trees during the winter. When colonization is extensive in individual trees, mistletoe can adversely affect tree health and cause decline and death of trees (Paine and Harrison 1992)*. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 48. *Casuarina cunninghamiana* (River She-Oak)

Young tree positioned on lower slope overlooking Child Care Centre, appears structurally stable and in good form and vigour. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 49. *Casuarina cunninghamiana* (River She-Oak)

Young tree positioned upper slope of site in fair form and vigour, appears structurally stable, rated as moderate landscape significance amenity and ecological value. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. Low retention value.

Tree 50. *Casuarina cunninghamiana* (River She-Oak)

Young tree in fair form and vigour appears structurally stable. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 51. *Casuarina cunninghamiana* (River She-Oak)

Positioned lower facing Child Care Centre in good form and vigour, appears structurally stable. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 52. *Casuarina cunninghamiana* (River She-Oak) (Not shown on Survey Plan)

Young tree in good form and vigour, appears structurally stable. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 53. *Casuarina cunninghamiana* (River She-Oak) (Not shown on Survey Plan)

Positioned lower level facing Child Care Centre, mature tree in good form and vigour, appears structurally stable. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 54. *Casuarina cunninghamiana* (River She-Oak) (Not shown on Survey Plan)

Mature tree in poor form and vigour, overlooking Child Care Centre, appears structurally stable. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 55. *Casuarina cunninghamiana* (River She-Oak) (Not shown on Survey Plan)

Large mature tree in good form and vigour, positioned overlooking Child Care Centre, appears structurally stable. The supplied plans show tree will be adversely impacted upon by the proposed new building footprint, not feasible to retain under current plans Rated as moderate landscape significance amenity and ecological value. Low retention value.

Street Trees Council Assets

The boundaries of the proposed development support Street trees positioned on Christie, Oxley, and Nicholson Streets. To aid in identification trees are numbered as the first letter of the street names, Oxley street trees are identified as 01,01A, 02 and 03 and 04, Group A. Stand of 5 *Casuarina cunninghamiana* (River She-Oak). Trees on Oxley are nominated for removal.

Nicholson Street trees are identified as N1,N2, (21B) N3 & N4 SHALL BE RETAINED

Street trees retained will require trunk and ground protection prior to site establishment.

Refer: Section 10. Tree Protection Specifications

Table 2. Tree Health and Retention Value

Tree	Genus & Species	Height	DBH/ DAGL	Crown Spread	Maturity	Health	Landscape significance	Useful Life Expectancy	Retention value
1A Street Tree	*Eucalyptus siderophlia* (Grey Ironbark)	12m	450/520 mm	25m2	Semi mature	Good	High	Long greater than 25 Years	High
1	*Platanus acerifolius* (London Plane Tree)	20m	480/540 mm	30m2	Semi mature	Good	High	Long greater than 25 Years	Low
2	*Eucalyptus saligna* (Sydney Blue Gum)	22m	570/ 650mm	40m2	Mature	Good	High	Long greater than 25 Years	Low
3	*Platanus acerifolius* (London Plane Tree)	12m	360/ 380mm	20m2	Semi Mature	Good	High	Long greater than 40 Years	High
4	*Platanus acerifolius* (London Plane Tree)	12m	280/ 290mm	20m2	Semi Mature	Good	High	Long greater than 40 Years	High
5	*Platanus acerifolius* (London Plane Tree)	12m	390/ 370mm	20m2	Semi Mature	Good	High	Long greater than 40 Years	High
6	*Platanus acerifolius* (London Plane Tree)	12m	330/ 340mm	20m2	Semi Mature	Good	High	Long greater than 40 Years	High
7	*Platanus acerifolius* (London Plane Tree)	12m	410/ 380mm	30m2	Semi Mature	Good	High	Long greater than 40 Years	High
8	*Platanus acerifolius* (London Plane Tree)	13m	460/ 440mm	30m2	Semi Mature	Good	High	Long greater than 40 Years	High
9	*Platanus acerifolius* (London Plane Tree)	14m	470/ 470mm	30m2	Semi Mature	Good	High	Long greater than 40 Years	High
10	*Platanus acerifolius* (London Plane tree)	12m	230/ 270mm	15m2	Semi Mature	Good	High	Long greater than 40 Years	High

Tree	Genus & Species	Height	DBH/ DAGL	Crown Spread	Maturity	Health	Landscape significance	Useful Life Expectancy	Retention value
11	*Platanus acerifolius* (London Plane Tree)	15m	280/ 330mm	15m2	Semi mature	Good	High	Long greater than 40 Years	High
12	*Banksia serrata* (Old Man Banksia)	5m	240/ 290mm	15m2	Semi mature	Good	Moderate	Long greater than 40 Years	Low
13	*Casuarina cunninghamiana* (River She-Oak)	22m	640/ 700mm	25m2	Mature	Good	Moderate	Long greater than 40 Years	Low
14	*Casuarina cunninghamiana* (River She-Oak)	22m	440/ 550mm	25m2	Mature	Good	Moderate	Long greater than 40 Years	Low
15	*Casuarina cunninghamiana* (River She-Oak)	20m	440/ 550mm	25m2	Mature	Fair	Moderate	Long greater than 40 Years	Low
16	*Casuarina cunninghamiana* (River She-Oak)	21m	330/ 450mm	25m2	Mature	Good	Moderate	Long greater than 40 Years	Low
17	*Casuarina cunninghamiana* (River She-Oak)	18m	260/ 320mm	20m2	Semi mature	Good	Moderate	Long greater than 40 Years	Low
18	*Casuarina cunninghamiana* (River She-Oak)	25m	310/ 430mm	20m2	Semi mature	Good	Moderate	Long greater than 40 Years	Low
19	*Casuarina cunninghamiana* (River She-Oak)	15m	220/ 290mm	15m2	Young	Good	Moderate	Long greater than 40 Years	Low
20	*Casuarina cunninghamiana* (River She-Oak)	15m	350/ 430mm	15m2	Semi mature	Good	Moderate	Long greater than 40 Years	Low
21	Informal hedge *Syzygium australe* (Lilly Pilly)	9m	280/ 320mm	60m2	Semi mature	Good	Moderate	Long greater than 40 years	Low
20A Street Tree	*Eucalyptus saligna* (Sydney Blue Gum)	17m	420/ 520mm	20m2	Semi mature	Good	High	Long greater than 40 Years	High

21B Street Tree	*Eucalyptus paniculata* (Grey Ironbark)	17m	450/ 590 mm	30m2	Mature	Good	High	Long greater than 40 Years	High

Tree	Genus & Species	Height	DBH/ DAGL	Crown Spread	Maturity	Health	Landscape significance	Useful Life Expectancy	Retention value
22	*Casuarina cunninghamiana* (River She-Oak)	12m	350/480 mm	20m2	Mature	Good	Moderate	Long greater than 40 Years	Low
23	*Casuarina cunninghamiana* (River She-Oak)	15m	510/ 540mm	30m2	Mature	Poor	Moderate	Long greater than 40 Years	Low
24	*Casuarina cunninghamiana* (River She-Oak)	7m	140/ 180mm	15m2	Young	Fair	Moderate	Long greater than 40 Years	Low
25	*Casuarina cunninghamiana* (River She-Oak)	12m	380/ 500mm	15m2	Semi mature	Good	Moderate	Long greater than 40 Years	Low
26	*Casuarina cunninghamiana* (River She-Oak)	12m	360/ 440mm	20m2	Semi mature	Fair	Moderate	Long greater than 40 Years	Low
27	*Casuarina cunninghamiana* (River She-Oak)	10m	300/ 350mm	20m2	Semi mature	Good	Moderate	Long greater than 40 Years	Low
28	*Casuarina cunninghamiana* (River She-Oak)	12m	350/ 470mm	20m2	Semi mature	Good	Moderate	Long greater than 40 Years	Low
29	*Castonospermum australe* (Bean Tree)	6m	200/ 240mm	15m2	Young	Good	Moderate	Long greater than 40 Years	Low
30	*Casuarina cunninghamiana* (River She-Oak)	10m	280/ 380mm	15m2	Semi mature	Poor	Moderate	Long greater than 40 Years	Low
31	*Casuarina cunninghamiana* (River She-Oak)	20m	400/ 490mm	20m2	Semi mature	Good	Moderate	Long greater than 40 Years	Low
32	*Casuarina cunninghamiana* (River She-Oak)	16m	350/ 480mm	20m2	Semi mature	Fair	Moderate	Long greater than 40 Years	Low
33	*Casuarina cunninghamiana* (River She-Oak)	10m	260/ 330mm	15m2	Young	Fair	Moderate	Long greater than 40 Years	Low

Tree	Genus & Species	Height	DBH/ DAGL	Crown Spread	Maturity	Health	Landscape significance	Useful Life Expectancy	Retention value
34	*Casuarina cunninghamiana* (River She-Oak)	7m	170/ 240mm	10m2	Young	Good	Moderate	Long greater than 40 years	Low
35	*Casuarina cunninghamiana* (River She-Oak)	8m	240/ 310mm	15m2	Semi mature	Good	Moderate	Long greater than 40 years	Low
36	*Casuarina cunninghamiana* (River She-Oak)	12m	190x220/ 430mm	20m2	Semi mature	Good	Moderate	Long greater than 40 years	Low
37	*Casuarina cunninghamiana* (River She-Oak)	11m	210/ 280mm	15m2	Young	Good	Moderate	Long greater than 40 years	Low
38	*Casuarina cunninghamiana* (River She-Oak)	16m	240/ 330mm	20m2	Semi mature	Fair	Moderate	Long greater than 40 years	Low
39	*Casuarina cunninghamiana* (River She-Oak)	18m	510/ 560mm	20m2	Mature	Fair	Moderate	Long greater than 40 years	Low
40	*Casuarina cunninghamiana* (River She-Oak)	15m	290/ 370mm	20m2	Semi mature	Fair	Moderate	Long greater than 40 years	Low
41	*Casuarina cunninghamiana* (River She-Oak)	12m	220/ 370mm	20m2	Semi mature	Fair	Moderate	Long greater than 40 years	Low
42	*Casuarina cunninghamiana* (River She-Oak)	12m	280/ 350mm	20m2	Semi mature	Good	Moderate	Long greater than 40 years	Low
43	*Casuarina cunninghamiana* (River She-Oak)	12m	320/ 420mm	20m2	Semi mature	Fair	Moderate	Long greater than 40 years	Low
44	*Casuarina cunninghamiana* (River She-Oak)	10m	280/ 330mm	15m2	Semi mature	Fair	Moderate	Long greater than 40 years	Low
45	*Casuarina cunninghamiana* (River She-Oak)	9m	230/ 330mm	15m2	Semi mature	Good	Moderate	Long greater than 40 years	Low
46	*Casuarina cunninghamiana* (River She-Oak)	9m	230/ 300mm	15m2	Semi mature	Good	Moderate	Long greater than 40 years	Low

Tree	Genus & Species	Height	DBH/ DAGL	Crown Spread	Maturity	Health	Landscape significance	Useful Life Expectancy	Retention value
47	*Casuarina cunninghamiana* (River She-Oak)	8m	260/ 330mm	15m2	Young	Fair	Moderate	Long greater than 40 years	Low
48	*Casuarina cunninghamiana* (River She-Oak)	6m	200/ 250mm	15m2	Young	Good	Moderate	Long greater than 40 years	Low
49	*Casuarina cunninghamiana* (River She-Oak)	7m	150/ 210mm	10m2	Young	Fair	Moderate	Long greater than 40 years	Low
50	*Casuarina cunninghamiana* (River She-Oak)	12m	280/ 350mm	20m2	Semi mature	Fair	Moderate	Long greater than 40 years	Low
51	*Casuarina cunninghamiana* (River She-Oak)	8m	210/ 280mm	15m2	Young	Good	Moderate	Long greater than 40 years	Low
52	*Casuarina cunninghamiana* (River She-Oak)	7m	170/ 240mm	15m2	Young	Good	Moderate	Long greater than 40 years	Low
53	*Casuarina cunninghamiana* (River She-Oak)	12m	350/ 410mm	20m2	Mature	Good	Moderate	Long greater than 40 years	Low
54	*Casuarina cunninghamiana* (River She-Oak)	6m	120/ 180mm	10m2	Young	Poor	Moderate	Long greater than 40 years	Low
55	*Casuarina cunninghamiana* (River She-Oak)	17m	370/ 580mm	20m2	Mature	Good	Moderate	Long greater than 40 years	Low

Tree Health and Retention Value Oxley Street Trees

Tree	Genus & Species	Height	DBH/ DAGL	Crown Spread	Maturity	Health	Landscape significance	Useful Life Expectancy	Retention value
01	*Eucalyptus scoparia* (Wallangarra White Gum)	8m	270/ 320mm	20m2	Mature	Poor	Moderate	Short 5-15 Years	Low
02	*Eucalyptus scoparia* (Wallangarra White Gum)	8m	330/ 410mm	20m2	Mature	Good	High	Long greater than 40 years	Low
Group A	*Casuarina cunninghamiana* (River Oak)	15m	450/ 530mm	30m2	Mature	Good	High	Long greater than 40 years	Low
Group A	*Casuarina cunninghamiana* (River Oak)	10m	320/ 410mm	25m2	Mature	Good	High	Long greater than 40 years	Low
Group A	*Casuarina cunninghamiana* (River Oak)	12m	300/ 400mm	20m2	Mature	Good	High	Long greater than 40 years	Low
Group A	*Casuarina cunninghamiana* (River Oak)	16m	460/ 580mm	30m2	Mature	Good	High	Long greater than 40 years	Low
03	*Eucalyptus scoparia* (Wallangarra White Gum)	8m	300/ 350mm	20m2	Mature	Good	High	Long greater than 40 years	Low
04	*Eucalyptus scoparia* (Wallangarra White Gum)	9m	310/ 430mm	20m2	Mature	Good	High	Long greater than 40 years	Low

Nicholson Street Trees Tree Health and Retention Values

Tree	Genus & Species	Height	DBH/ DAGL	Crown Spread	Maturity	Health	Landscape significance	Useful Life Expectancy	Retention value
20A	*Eucalyptus saligna* (Sydney Blue Gum)	17m	420/ 520mm	20m2	Mature	Good	High	Long greater than 40 years	High
N1	*Eucalyptus scoparia* (Wallangarra White Gum)	8m	310/ 370mm	20m2	Mature	Fair	High	Medium 15-25 Years	High
N2	*Eucalyptus scoparia* (Wallangarra White Gum)	7m	310/ 380mm	20m2	Mature	Fair	High	Medium 15-25 Years	High
21B	*Eucalyptus paniculata* (Grey Ironbark)	14m	370/ 410mm	30m2	Mature	Good	High	Long greater than 40 years	High
N3	*Eucalyptus scoparia* (Wallangarra White Gum)	8m	310/ 380mm	20m2	Mature	Good	High	Long greater than 40 years	High
N4	*Eucalyptus scoparia* (Wallangarra White Gum)	7m	310/ 380mm	15m2	Mature	Good	High	Long greater than 40 years	High

5. Conclusion

To summarise the Arboricultural Impact Assessment (AIA) has collected all relevant data in assessing the condition of **63** trees on survey. There are **4** trees not on survey, bringing the total number of trees to **67** trees onsite.

5.1 Of the 16 street trees, on Christie, Oxley, and Nicholson Streets, 01A, 01,02, 03 & 04. Group A. Stand of 4 *Casuarina cunninghamiana* (River She-Oak) and O1 are nominated for removal the supplied plans show an adverse impact upon the trees.

5.2 An assessment of their health and vigour, estimated life expectancy and their significance in the landscape and amenity value have been recorded.

6. Recommendation

The proposed development will necessitate the **removal** of trees tagged and numbered as 1,2,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45 46,47,48,49,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55 subject trees for the proposed development. They have been rated as moderate landscape significance amenity and ecological value. If these trees must be removed, replacement planting should be considered in accordance with Council's Tree Replacement Policy to compensate for loss of amenity. Lane Cove Councils Development Control Plan (DCP) tree replacement policy is 1:1 replacement. Please Refer: Acardia Landscape Plan.

Approved tree removal work shall be carried out by an experienced Certified AQF Level 3 Arborist in accordance with Safe Work Australia Code of Practice 'Guide to Managing Risks of Tree Trimming and Removal Work'.

6.1 Trees numbered 3 – 11. Onsite *Platanus acerifolius* (London Plane Tree) are nominated for retention. All 8 *Platanus acerifolius* (London Plane Tree) retained south west boundary may require pruning to minimise any mitigating issues with potential branch damage during site establishment and the construction stage. **Refer Figure 3. Protection of Trees above and below ground parts**

6.1.1 The boundaries of the proposed development support Street trees positioned on Christie, Oxley, and Nicholson Streets. To aid in identification trees are numbered as the first letter of the street names,

Oxley street trees are identified as 01A, 01,02, 03 & 04. Group A. Stand of 4 *Casuarina cunninghamiana* (River She-Oak). **NOMINATED FOR REMOVAL**

Nicholson Street trees are identified as N1,N2, (21B) N3 & N4 SHALL BE RETAINED. **NOMINATED FOR RETENTION**

6.2

Arcadia Landscape plans show the retention of trees 20A and N1 positioned Nicholson Street, the landscape plan proposes elevated seating around tree trunks. It is recommended the elevated seating footings are installed outside the SRZ of both trees. This will minimise any adverse impact to the below ground parts of the trees. Footings shall be hand dug to minimise any root severance. Where any woody roots greater than 50mm are encountered the footings shall be offset to allow for future root growth. Where any woody roots encountered are less than 50mm may be severed with a sharp pruning implement.

6.3 **PRE – CONSTRUCTION TREATMENT RETAINED TREES**

Prior to approved construction a number of activities may be implemented to invigorate the trees and increase their tolerance to construction impacts.

The goal is to maximise stored carbohydrates and the effectiveness of growth regulators in the tree. To quickly produce new, root shoot and adaptive growth and to compartmentalise wounds. Appropriate treatments well before construction begins such as irrigation, fertilisation, required pruning and dead wooding.

- Decompaction of their compacted surface soil will improve drainage, oxygen to roots.
- Fertilisation and the addition of good quality organic mulch.
- Supplementary irrigation or deep infrequent watering.
- Pruning should be performed to clean the crown of deadwood, diseased, crossing, weak attachments to provide adequate clearance for equipment and construction. Pruning works undertaken by AQF (Australian Qualification Framework) Level 3 Arborist and as specified in AS 4373 'Pruning of Amenity Trees'.

7. Images

Tree 1. *Eucalyptus siderophlia* (Grey Ironbark) 29 CHRISTIE STREET **TO BE RETAINED AND PROTECTED**

Trees 3 - 11 *Platanus acerifolius* (London Plane Tree) **TO BE RETAINED AND PROTECTED**

GROUP A. OXLEY STREET TREES **NOMINATED FOR REMOVAL**

Trees north east boundary **NOMINATED TO BE REMOVED** to accommodate proposed development.

8. References

AS 4970 *'Protection of trees on development sites.* (2009)

Harris, R.W., Clark, J.R and Matheny, N.P. (2004), *Arboriculture: Integrated Management of Landscape Trees, Shrubs, and Vines.* 4th Edition, Prentice Hall, New Jersey.

Mattheck, C. & Breloer, H. (1994) *The Body Language of Trees.*

Morton, A. Earthscape Horticultural Services -Tree Retention Values

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www.lanecove.nsw.gov.au

Disclaimer

The author, Lee Hancock Consulting Arborist takes no responsibility for actions taken and their consequences, contrary to those expert and professional instructions given as recommendations pertaining to safety by way of exercising our responsibility to our client and the public as our duty of care commitment to mitigate or prevent hazards from arising, from a failure moment in full or part, from a structurally deficient or unsound tree or a tree likely to be rendered thus by its retention and subsequent modifications to its growing environment either above or below ground contrary to our advice.

This report is a recommendation only. In no way does it guarantee any particular actions by the determining authorities.

9. Methodologies

9.1 Visual Tree Assessment (VTA)

A visual tree assessment technique developed by (Mattheck & Breloer) was carried out on the subject tree from the ground. The technique involves, identification of the Genus and Species of trees on the site. The Diameter at Breast Height (DBH) 1.4m above ground level determined from the circumference of the trunk divided by *pi* (π). Tree height (m) Diameter at Ground Level (DAGL), Canopy spread (m) in four cardinal points (north, south, east, west) Structural integrity, Amenity value, Indigenous/ Endemic value, Health and vigor of trees.

9.2 Useful Life Expectancy (ULE)

An assessment procedure has been developed by (Barrell, J.D.) 1993 'by which trees on a site are accurately recorded and designated according to their suitability for retention in the short, medium or long term'. This methodology is a measure of the "sustainability" of the remaining contribution in years that the tree can provide in the context of the site.

9.3 Landscape Significance

The significance of trees in the landscape is assessed in determining their retention values in 3 categories. Heritage Value reflects Historical significance, Ecological Value maintains biodiversity values and Amenity value contributes to the character of the landscape.

9.4 Tree Retention Values

A rating was given to each tree on site; the information gathered was then processed by evaluating the health and vigour, the remaining useful life expectancy (ULE), plus their significance in the landscape. A retention value for each tree was then evaluated ranging from High, Moderate, Low and Very Low.

9.5 Structural Root Zone (SRZ)

SRZ is the measurement of the area around the base of the tree. Measurements are taken at the centre of the trunk; a radial measurement is calculated in meters. This process determines the trees structural stability. The formula is SRZ radius = (D x 50) x 0.64 D = trunk diameter, in meters.

9.5.1 Determining Structural Root Zones

As defined in AS 4970 Section 1.4.5 the SRZ is '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 area has been calculated as specified in Section 3.3.5 of AS 4970.

9.6 Tree Protection Zone (TPZ)

This area is specified above and below the ground at a given distance from the trunk to protect tree roots and canopy to protect the viability and stability of a tree retained on site where there is a potential for the tree to be damaged by development

9.6.1 Determining Tree Protection Zones

As defined in AS 4970 Section 1.4.7 the TPZ is 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 (canopy) to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development'. The TPZ is the root zone/canopy area required for vigour and long-term viability. The TPZ area has been calculated as specified in Section 3.2 of AS 4970.

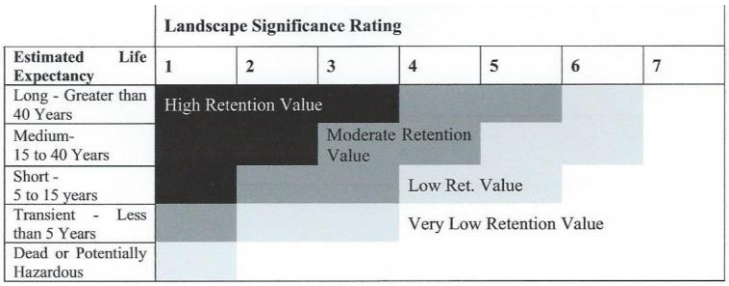
9.7 Variations to the TPZ – Minor

If there are no other options a minor encroachment (≤10%) into the TPZ area may be acceptable provided the incursion does not impact the SRZ. Examples of how minor encroachments can be configured are given in Appendix X. Refer to Section 3.3.2 of AS 4970 for additional details relating to minor encroachments. AS 4970 states that the area lost to the encroachment must be compensated for elsewhere and must be contiguous with the TPZ.

9.8 Variation to the TPZ – Major

Should major encroachments (> 10%) of the TPZ be proposed it must be demonstrated by The Project Arborist that the tree will remain viable into the long term. Demonstration of viability may include non - destructive methods of root investigation and should be made in consideration of the following factors as listed in Section 3.3.4 of AS 4970:

Retention Values.



Retention Value Methodology

RETENTION VALUE	RECOMMENDED ACTION
"High"	1. These trees considered worthy of preservation as such careful consideration should be given to their retention as a priority. 2. Proposed site design and placement of buildings and infrastructure should consider lessening any mitigating issues in relation to trees. 3. In addition, the extent of the canopy (canopy dripline) should also be considered, particularly in relation to high rise developments. Significant pruning of the trees to accommodate the building envelope or temporary scaffolding is generally not acceptable.
"Moderate"	4. These trees should be retained as part of any potential development if possible however they trees are considered less critical for retention. 5. If these trees must be removed, replacement planting should be considered in accordance with Council's Tree Replacement Policy to compensate for loss of amenity.
"Low"	6. These trees are not considered to worthy of any special measures to ensure their preservation, due to current health, condition, or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their ULE. 7. These trees should not be considered as a constraint to the potential development of the site.
"Very Low"	8. These trees are considered potentially hazardous or very poor specimens or may be environmental or noxious weeds. 9. The removal of these trees is therefore recommended regardless of the implications of any proposed development.

10. Tree Protection Specifications

The tree protection measures included in this plan, are to be implemented prior to, during and after the construction phase, including landscape construction of the project to ensure the long - term survival of the trees. The project arborist will monitor the impacts of demolition, bulk earth works, installation of temporary infrastructure including bunding, sediment control and drainage works.

The intention is to ensure that construction related issues and conflicts (with tree retention) are resolved prior to the commencement of this project. The aim is to ensure that specifications site specific and that the whole Tree Management Plan can be required to be implemented as part of the conditions of consent.

10.1 Certification Reporting

Following each stage, Site establishment, Construction Stage and Landscape Construction. The Project Arborist shall prepare a statement of compliance certifying whether the works have been completed in compliance with this plan and the conditions of development consent Lane Cove Council relating to Tree Protection. If conditions have been breached, remedial action shall be recommended to minimise any further adverse effect on the tree's health.

10.2 Appointment of a Project Arborist

An Arborist with an AQF Level 5 Diploma in Arboriculture with experience in tree protection on construction sites should be engaged prior to the commencement of work on the site. If conditions have been breached, remedial action shall be recommended to minimise any further adverse effect on the tree's health.

Hold Point: PRE-CONSTRUCTION - Prior to Site Clearance
Project Arborist to inspect Tree Protection Measures are compliant with *AS4970 Protection of Trees on Development Sites.*

Compliance certificate will then be issued to the Principal Certifier by the Project Arboris

Table 3 Impact Assessment schedule

Tree	Genus Species	SRZ	TPZ	Recommendation
29 Christie Street Tree 1A	*Eucalyptus sideropholia* (Grey Ironbark)	2.5mR	5.4mR	Trunk Protection installed prior to site establishment.
1	*Platanus acerifolius* (London Plane Tree)	2.6mR	5.76mR	Spatially conflicts with proposed building footprint.
2	*Eucalyptus saligna* (Sydney Blue Gum)	2.8mR	6.8mR	Spatially conflicts with proposed building footprint.
3	*Platanus acerifolius* (London Plane Tree)	2.2mR	4.3mR	Tree Protection fence installed prior to site establishment. Minor pruning to allow clearance for building footprint. Refer
4	*Platanus acerifolius* (London Plane Tree)	2.0mR	3.3mR	Tree Protection fence installed prior to site establishment. Minor pruning to allow clearance for building footprint
5	*Platanus acerifolius* (London Plane Tree)	2.2mR	4.6mR	Tree Protection fence installed prior to site establishment. Minor pruning to allow clearance for building footprint
6	*Platanus acerifolius* (London Plane Tree)	2.1mR	3.9mR	Tree Protection fence installed prior to site establishment. Minor pruning to allow clearance for building footprint
7	*Platanus acerifolius* (London Plane Tree)	2.2mR	4.9mR	Tree Protection fence installed prior to site establishment. Minor pruning to allow clearance for building footprint
8	*Platanus acerifolius* (London Plane Tree)	2.3mR	5.5mR	Tree Protection fence installed prior to site establishment. Minor pruning to allow clearance for building footprint Minor pruning to allow clearance for building footprint
9	*Platanus acerifolius* (London Plane Tree)	2.4mR	5.6mR	Tree Protection fence installed prior to site establishment. Minor pruning to allow clearance for building footprint
10	*Platanus acerifolius* (London Plane Tree)	1.9mR	2.7mR	Tree Protection fence installed prior to site establishment. Minor pruning to allow clearance for building footprint
11	*Platanus acerifolius* (London Plane Tree)	2.1mR	3.3mR	Tree Protection fence installed prior to site establishment. Minor pruning to allow clearance for building footprint

Table 3 Impact Assessment Schedule

Tree	Genus Species	SRZ	TPZ	Recommendation
12	*Banksia serrata* (Old Man Banksia)	2.0mR	2.8mR	Adverse impact from proposed building footprint removal is recommended.
13	*Casuarina cunninghamiana* (River Oak)	2.8mR	7.6mR	Unacceptable incursion into SRZ & TPZ AS4970 Removal is recommended
14	*Casuarina cunninghamiana* (River Oak)	2.6mR	5.2mR	Unacceptable incursion 60% into SRZ & TPZ AS4970 Removal is recommended
15	*Casuarina cunninghamiana* (River Oak)	2.6mR	5.2mR	Unacceptable incursion 50% into SRZ & TPZ AS4970 Removal is recommended
16	*Casuarina cunninghamiana* (River Oak)	2.4mR	3.1mR	Unacceptable incursion 60% into SRZ & TPZ AS4970 Removal is recommended
17	*Casuarina cunninghamiana* (River Oak)	2.1mR	3.1mR	Unacceptable incursion 75% into SRZ & TPZ AS4970 Removal is recommended
18	*Casuarina cunninghamiana* (River Oak)	2.3mR	3.7mR	Positioned Footprint of proposed building Removal is recommended
19	*Casuarina cunninghamiana* (River Oak)	2.0mR	2.6mR	Positioned footprint of proposed basement Oxley Street boundary Removal is recommended
20	*Casuarina cunninghamiana* (River Oak)	2.3mR	4.2mR	Positioned footprint of proposed basement Oxley Onsite Oxley street boundary Removal is recommended
21 Hedge	*Syzygium australe* (Lilly Pilly)	No access	No access	Positioned retaining wall entrance to basement not feasible to retain Removal is recommended
20A	*Eucalyptus saligna* (Sydney Blue Gum)	2.5mR	5.0mR	Retain and protect refer: Section 6 Recommendation & Section 10 Tree Protection Specifications
21B	*Eucalyptus paniculata* (Grey Ironbark)	2.3mR	4.4mR	Retain and protect refer: Section 6 Recommendation & Section 10 Tree Protection Specifications
22	*Casuarina cunninghamiana* (River Oak	2.4mR	4.2mR	Inside proposed building footprint Onsite Oxley Street boundary Removal is recommended

Table 3 Impact Assessment Schedule

Tree	Genus Species	SRZ	TPZ	Recommendation
23	*Casuarina cunninghamiana* (River Oak	2.6mR	6.1 mR	Inside proposed building footprint Onsite Oxley Street boundary Removal is recommended
24	*Casuarina cunninghamiana* (River Oak	1.6mR	1.68mR	Inside proposed building footprint Onsite Oxley Street boundary Removal is recommended
25	*Casuarina cunninghamiana* (River Oak	2.5mR	4.5mR	Inside proposed building footprint Onsite Oxley Street boundary Removal is recommended
26	*Casuarina cunninghamiana* (River Oak	2.3mR	4.3mR	Inside proposed building footprint Removal is recommended
27	*Casuarina cunninghamiana* (River Oak	2.1mR	3.6mR	Inside proposed building footprint Onsite Oxley Street boundary Removal is recommended
28	*Casuarina cunninghamiana* (River Oak	2.4mR	4.2mR	Inside proposed building footprint Onsite Oxley Street boundary Removal is recommended
29	*Castonospermum australe* (Bean Tree)	1.8mR	2.4mR	Inside proposed building footprint Removal is recommended
30	*Casuarina cunninghamiana* (River Oak	2.1mR	3.3mR	Inside proposed building footprint Removal is recommended
31	*Casuarina cunninghamiana* (River Oak	2.5mR	4.8mR	Inside proposed building footprint Removal is recommended
32	*Casuarina cunninghamiana* (River Oak	2.4mR	4.2mR	Inside proposed building footprint Removal is recommended
33	*Casuarina cunninghamiana* (River Oak	2.1mR	3.1mR	Adverse impact from proposed building footprint Onsite Nicholson St Boundary Removal is recommended
34	*Casuarina cunninghamiana* (River Oak	1.8mR	2.0mR	Adverse impact from proposed building footprint Onsite Nicholson St Boundary Removal is recommended
35	*Casuarina cunninghamiana* (River Oak	2.0mR	2.8mR	Adverse impact from proposed building footprint Onsite Nicholson St Boundary Removal is recommended
36	*Casuarina cunninghamiana* (River Oak	2.3mR	2.6mR	Adverse impact from proposed building footprint Removal is recommended
37	*Casuarina cunninghamiana* (River Oak	1.9mR	2.5mR	Adverse impact from proposed building footprint Removal is recommended

Table 3 Impact Assessment Schedule

Tree	Genus Species	SRZ	TPZ	Recommendation
38	*Casuarina cunninghamiana* (River Oak	2.1mR	2.8mR	Adverse impact from proposed building footprint Removal is recommended
39	*Casuarina cunninghamiana* (River Oak	2.6mR	6.1mR	Adverse impact from proposed building footprint Removal is recommended
40	*Casuarina cunninghamiana* (River Oak	2.2mR	3.4mR	Adverse impact from proposed building footprint Removal is recommended
41	*Casuarina cunninghamiana* (River Oak	2.2mR	2.6mR	Adverse impact from proposed building footprint Removal is recommended
42	*Casuarina cunninghamiana* (River Oak	2.1mR	3.36Mr	Adverse impact from proposed building footprint
43	*Casuarina cunninghamiana* (River Oak)	2.3mR	3.8mR	Inside proposed building footprint Removal is recommended
44	*Casuarina cunninghamiana* (River Oak)	2.1mR	3.3mR	Inside proposed building footprint Removal is recommended
45	*Casuarina cunninghamiana* (River Oak)	2.1mR	2.7mR	Inside proposed building footprint Removal is recommended
46	*Casuarina cunninghamiana* (River Oak)	2.0mR	2.7mR	Inside proposed building footprint Removal is recommended
47	*Casuarina cunninghamiana* (River Oak)	2.1mR	3.1mR	Inside proposed building footprint Removal is recommended
48	*Casuarina cunninghamiana* (River Oak)	1.8mR	2.4mR	Inside proposed building footprint Removal is recommended
49	*Casuarina cunninghamiana* (River Oak)	1.7mR	1.8mR	Inside proposed building footprint Removal is recommended
50	*Casuarina cunninghamiana* (River Oak)	2.1mR	3.3mR	Inside proposed building footprint Removal is recommended
51	*Casuarina cunninghamiana* (River Oak)	1.9mR	2.5mR	Inside proposed building footprint Removal is recommended
52	*Casuarina cunninghamiana* (River Oak)	1.8mR	2.0mR	Inside proposed building footprint Removal is recommended
53	*Casuarina cunninghamiana* (River Oak)	2.3mR	4.2mR	Inside proposed building footprint Removal is recommended
54	*Casuarina cunninghamiana* (River Oak)	1.6mR	1.4mR	Inside proposed building footprint Removal is recommended
55	*Casuarina cunninghamiana* (River Oak)	2.6mR	4.4mR	Inside proposed building footprint Removal is recommended

Table 4 Oxley Street Tree Impact Assessment

Tree	Genus Species	SRZ	TPZ	Recommendation
Oxley Street Tree O1A	*Tristaniopsis laurina* (Water Gum)	2.0mR	3.1mR	Street Tree in footprint of proposed new crossover. Not feasible to retain.
O1	*Eucalyptus scoparia* (Wallangarra White Gum)	2.1mR	3.2mR	Early stages of senescence Removal is recommended
02	*Eucalyptus scoparia* (Wallangarra White Gum)	2.3mR	4.0mR	In Footprint of extended boundary removal is recommended
Group A	*Casuarina cunninghamiana* (River Oak)	2.5mR	5.0mR	In Footprint of extended boundary removal is recommended
Group A	*Casuarina cunninghamiana* (River Oak)	2.3mR	3.6mR	In Footprint of extended boundary removal is recommended
Group A	*Casuarina cunninghamiana* (River Oak)	2.4mR	4.3mR	In Footprint of extended boundary removal is recommended
Group A	*Casuarina cunninghamiana* (River Oak)	2.6mR	5.5mR	In Footprint of extended boundary removal is recommended
Group A	*Casuarina cunninghamiana* (River Oak)	2.3mR	3.6mR	In Footprint of extended boundary removal is recommended
03	*Eucalyptus scoparia* (Wallangarra White Gum)	2.1mR	3.6mR	In Footprint of extended boundary removal is recommended
04	*Eucalyptus scoparia* (Wallangarra White Gum)	2.3mR	3.6mR	
Street Tree 20A	*Eucalyptus saligna* (Sydney Blue Gum)	2.5mR	5.0mR	Establish trunk and ground protection Refer: Refer Figure 3. Section 10 Tree Protection Specifications
Street Tree 21B	*Eucalyptus paniculata* (Grey Ironbark)	2.7mR	5.4mR	Establish trunk and ground protection Refer: Refer Figure 3. & Section 10 Tree Protection Specifications

Table 5.Nicholson Street Tree Impact Assessment

Tree	Genus Species	SRZ	TPZ	Recommendation
N1	*Eucalyptus scoparia* (Wallangarra White Gum)	2.2Mr	3.7mR	Retain and protect Refer Section 10 Tree Protection Specifications
N2	*Eucalyptus scoparia* (Wallangarra White Gum)	2.2mR	3.7mR	Retain and protect Refer Section 10 Tree Protection Specifications
N3	*Eucalyptus scoparia* (Wallangarra White Gum	2.2mR	3.7mR	Retain and protect Refer Figure 1 & Section 10 Tree Protection Specifications
N4	*Eucalyptus scoparia* (Wallangarra White Gum	2.3mR	3.6mR	Retain and protect Refer Figure 1 & Section 10 Tree Protection Specifications
Street Tree 20A	*Eucalyptus saligna* (Sydney Blue Gum)	2.5mR	5.0mR	Establish trunk and ground protection Refer: Refer Figure 3. Section 10 Tree Protection Specifications
Street Tree 21B	*Eucalyptus paniculata* (Grey Ironbark)	2.7mR	5.4mR	Establish trunk and ground protection Refer: Refer Figure 3. & Section 10 Tree Protection Specifications

Figure 1. Indicative Trunk protection

10.2.1 Trunk Protection Street Trees

Trunk Protection by way of Timber planks (50mmx 100mm or similar) shall be placed around tree trunks.The timber planks shall be spaced at 100mm intervals, and must be fixed against the trunk secured together with 2mm galvanised wire. These shall be strapped around the trunk (not fixed in anyway) to avoid mechanical injury or damage. Trunk protection should be installed prior to any site works and maintained in good condition for the duration of the construction period. The hessian and timber planks must not be fixed to the tree in any instance or in any fashion.

10.2.2 Tree Protection Fence (TPZ)

Tree protection fencing shall be installed the width of the site to protect retained trees numbered 3-11 in the area known as the 'Civic Green' The Tree protection fence will be 1.8m wire mesh panels held in place with concrete feet.

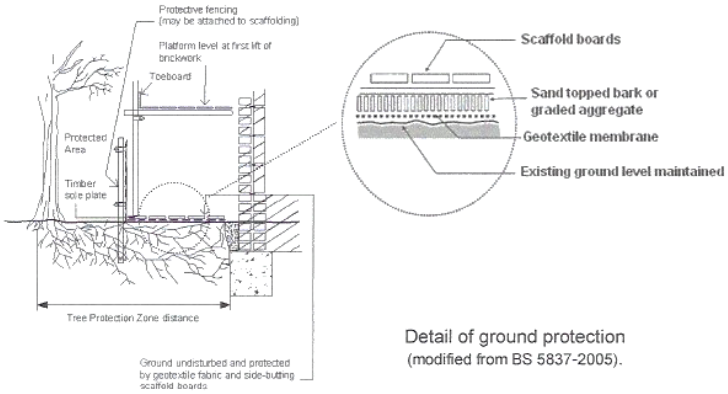
10.2.3 Scaffolding

Where scaffolding is required it should be erected outside the TPZ. Where it is essential for scaffolding to be erected within the TPZ, branch removal should be minmised. Where access is required within the TPZ boards shall be placed over a layer of mulch and impervious sheeting to prevent soil contamination.

Figure 2. Protection of the above and below ground parts of Trees

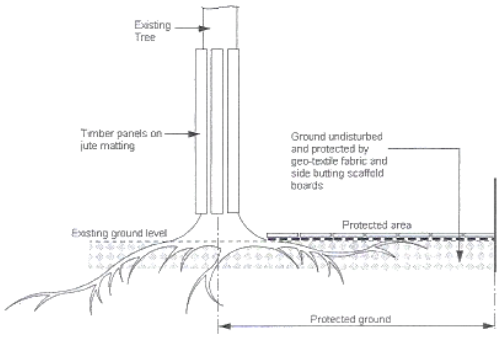
Root zone and trunk protection - Illustrative specification

Root zone protection: Where necessary, access through the TPZ can be achieved by laying aggregate and timber boards (or similar) over the root zone to protect roots. The ground beneath the boarding should be left undisturbed and should be protected with a porous geo-textile fabric covered with sand or mulch.



Detail of ground protection
(modified from BS 5837-2005).

Trunk protection: Where fencing cannot be installed, the vertical trunk of exposed trees shall be protected by the placement of 3.6m lengths of 50 x 100mm hardwood timbers, spaced vertically, at 150mm centres and secured by 2mm wire at 300mm wide spacing over suitable protective padding material e.g. Jute Matting. The trunk protection shall be maintained intact until the completion of all work on site.



Detail of trunk protection.

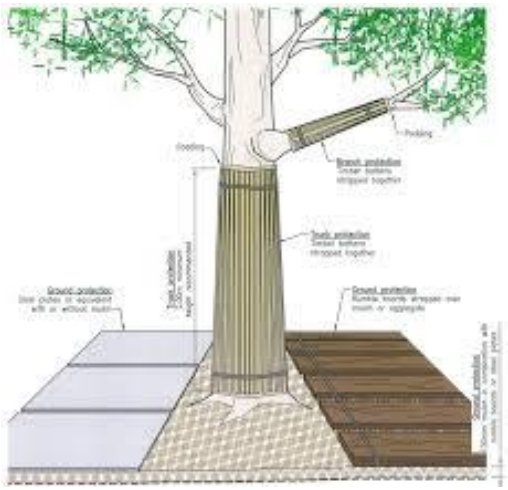
10.3 Signage - Tree Protection Zone

To be displayed around the edge of all TPZ fenced off areas and visible within the development site. To remind construction workers and sub-contractors Tree Protection Zone area is out of bonds.

10.4 Mulch

To be applied in TPZ minimum 75 -100mm using material that complies with Australian Standard® 4454-2003 *Composts, soil conditioners and mulches.*

Figure 3. Indicative Ground protection trunk and branch protection



10.5 Tree Protection Plan Construction Phase.

The following Tree protection measures are to be implemented during the construction phase of development.

10.5.1 Temporary Infrastructure

Site sheds, Waste disposal and Stock piling areas to be placed as outside the Tree Protection Zone.

10.5.2 Haul Route vehicles accessing site.

Haul route usage entry from Oxley Street and Nicholson Streets

10.5.3 Plant and Equipment

Light weight plant equipment such as small rubber tracked excavators and the demolition material for excavations removed to stockpiling area using small tipper trucks (2-3 tonne maximum), within 2 metres of a retained tree trunk.

10.5.4 Root Protection

Where roots within the TPZ are exposed by excavation, temporary root protection should be installed to prevent them drying out. This may include jute mesh or hessian sheeting as multiple layers over exposed roots and excavated soil profile, extending to the full depth of the root zone. Root protection sheeting should be pegged in place and kept moist during the period that the root zone is exposed.

10.5.5 Fill Material

Placement of fill material within the Tree Protection Zone of trees to be retained should be avoided where possible. Where placement fill is unavoidable, the material should be a well-drained friable material, equivalent in texture to the existing site topsoil material (heavy clay or subsoil material is unacceptable). The fill should be free from rocks vegetation and other unsuitable materials. Fill shall be compliant with AS 4419:2003 (*Soils for Landscape and Garden Use*).

Hold Point: Project Arborist inspection of Construction Phase.

10.6 Landscape Construction

The landscape plan to be checked for compliance with the tree protection plan. Project Arborist to approve the staged removal of protection measures required to allow for landscape works. This includes the installation of paving, irrigation, installing and planting.

10.6.1 Irrigation

Landscape Contractor to install above ground dripline system during prolonged dry periods or where excavation is nearby, especially up slope, leads to drying out of a soil profile, deep watering at least twice a week is to be undertaken.

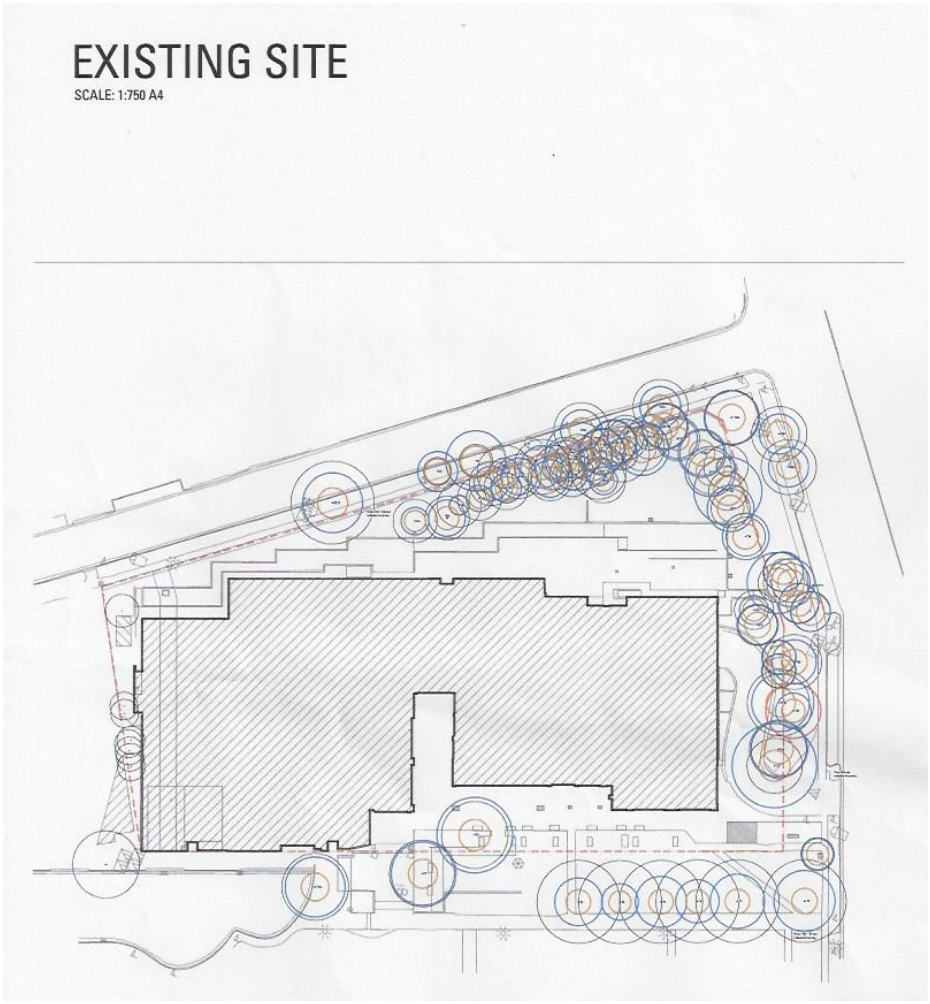
10.6.2 Planting

Mattocks and similar digging instruments must not be used within the TPZ of the tree. Planting holes shall be dug carefully by hand with a garden trowel. If planting is proposed within the SRZ it must consist of tube stock only.

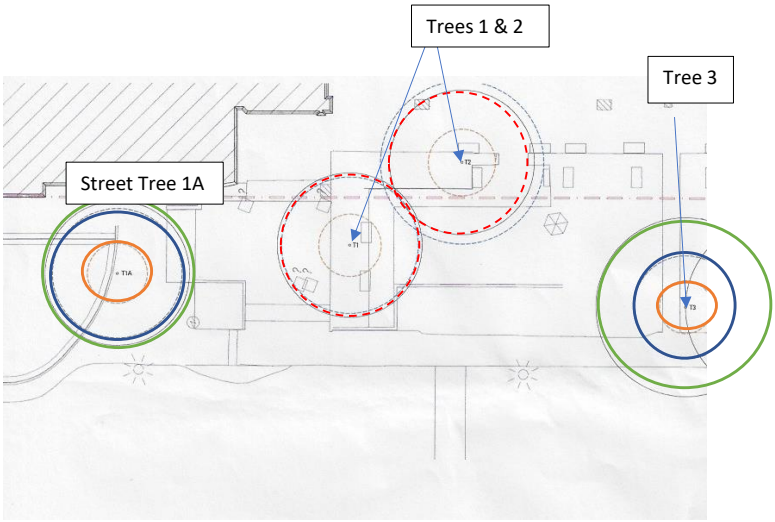
10.7

On completion of construction and landscaping works. Project Arborist to assess tree condition and provide certification of tree protection. Following final inspection Project Arborist should certify that the completed works have been carried out in compliance with the approved plans and specification


PROPOSED SITE
SCALE: 1:750 A4


EXISTING SITE
SCALE: 1:750 A4

Appendix A Tree Location Plan Trees 1A,1,2 & 3



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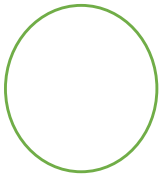
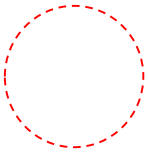
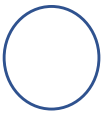
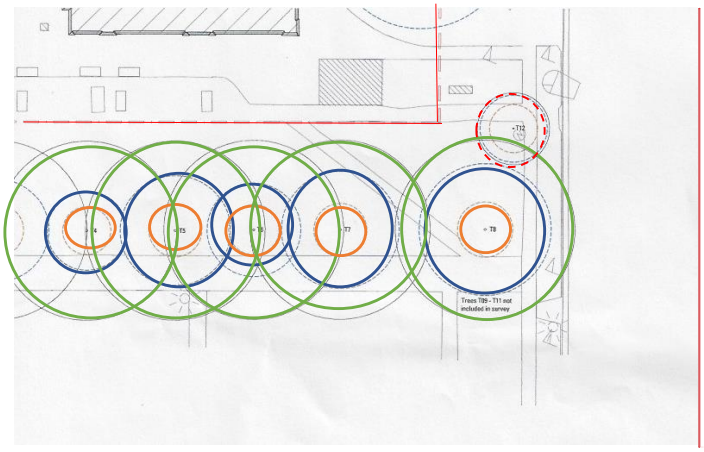
Retain 

Remove 

SRZ 

TPZ 

Appendix A Tree Location Plan Trees 4-12



Commented [LH1]:

NOTE: TREES 9,10 AND 11 NOT SHOWN ON SURVEY

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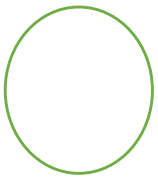
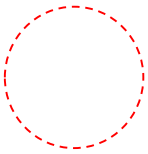
Retain 

Remove 

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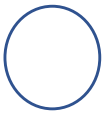
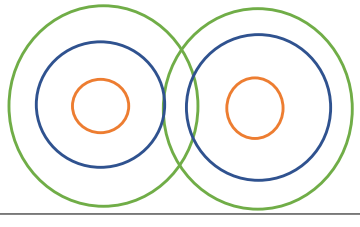
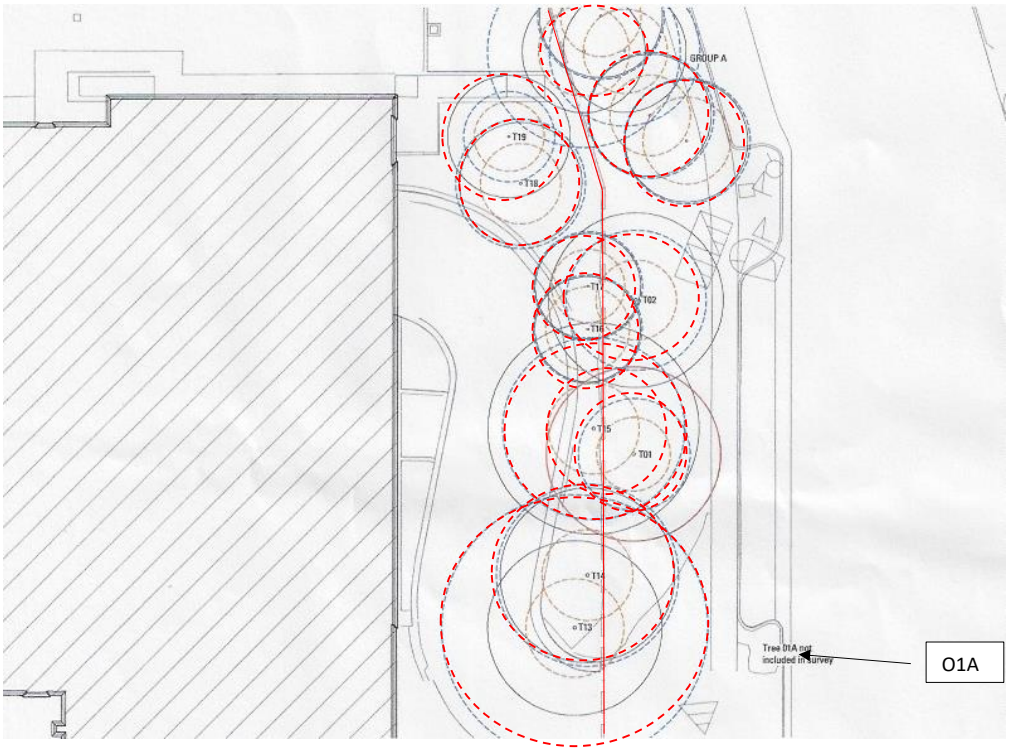
TPZ 

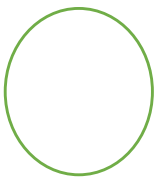


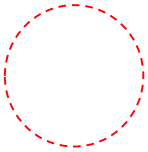
Appendix A Tree Location Plan Trees 13 - 19



Note: Tree O1A (Oxley Street Tree) NOT SHOWN ON SURVEY

LEGEND:

Retain 

Remove 

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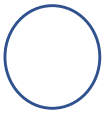
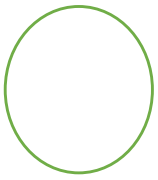
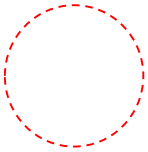
TPZ 

Appendix A Tree Location Plan Trees 20 – 37 Oxley and Nicholson Streets

Retain Tree 20A N1

LEGEND:

Retain 

Remove 

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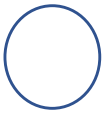
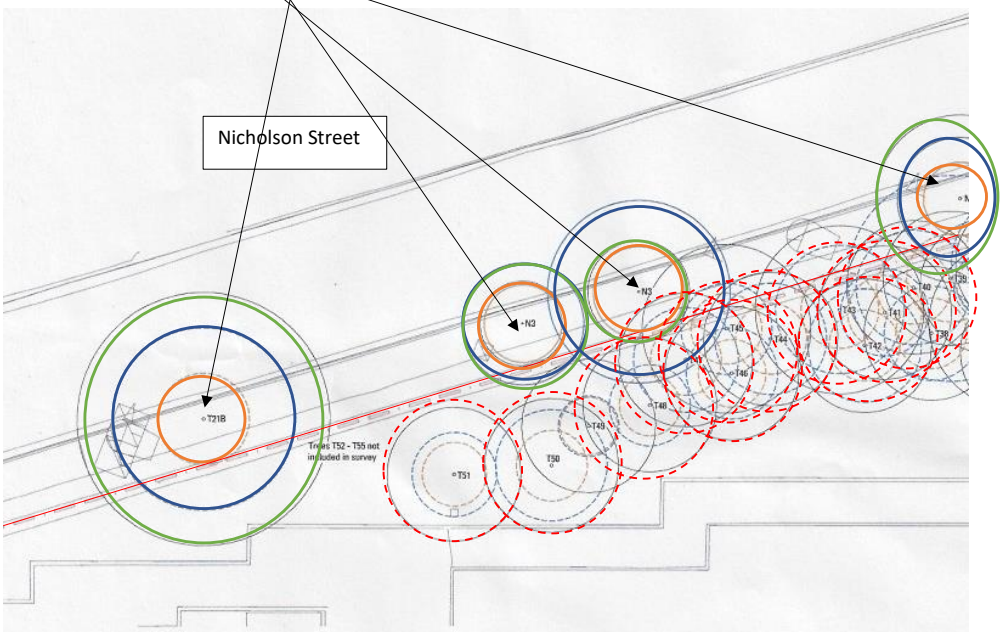
TPZ 

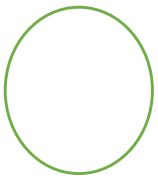
Appendix A Tree Location Plan Trees 37 – 51 Nicholson Street

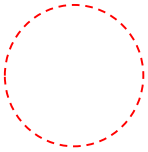
Retain Street Trees N2, N3, N4 & 21B



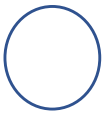
Note: Trees 52 – 55 NOT SHOWN ON SURVEY

LEGEND:

Retain 

Remove 

SRZ 

TPZ 

Appendix B. Tree Retention Management Plan

This Tree Protection Plan outlines and provides guidance on the principles of tree protection measures, to assist in protecting Trees on site throughout all stages of the development. This information follows the Standards Australia AS4970-2009 *Protection of Trees on Development Sites.*

PRE-CONSTRUCTION	**MATERIALS**
Trees- Before site establishment • Pre- Construction Treatments on retained trees 3-11, Street trees 20A & N1 • Approved tree removal nominated trees • Establish trunk protection Street Trees • Establish rumble boards and ground protection inside TPZ • Mulch installation inside TPZ • Education for Sub-contractors entering site.	• Tree Protection fence to be installed prior to any site works and maintained in good condition for the duration of the development. • Trunk Protection by way of Timber planks (50mmx 100mm or similar) shall be placed around tree trunks.The timber planks shall be spaced at 100mm intervals, and must be fixed against the trunk secured together with 2mm galvanised wire. These shall be strapped around the trunk (not fixed in anyway) • Signage identifying TPZ • Mulch installation across surface of TPZ. Eucy Mulch 75-100mm thick. • Geo textile fabric to cover expose roots. • Irrigation equipment
CONSTRUCTION / EXCAVATION PHASE	**COMPLIANCE**
Project Arborist to supervise tree removal, pruning if required.	Compliance statement issued
Final Inspection of completed works	**COMPLIANCE** Compliance statement issued