Birds Tree Consultancy

Consulting Arborist AQF5 • Horticultural Consultancy • Project Management • Resistograph Testing

ARBORICULTURAL DEVELOPMENT IMPACT ASSESSMENT REPORT

Liverpool Civic Place

22nd of November 2019

Prepared for
Built

Prepared by

Birds Tree Consultancy
Glenn Bird Dip. Hort (Arboriculture) (AQF5)
PO Box 6048 DURAL NSW 2158
PH 0438 892 634
glenn@birdstrees.com.au
www.birdstrees.com.au
ABN 31 105 006 657

MEMBER OF INSTITUTE OF AUSTRALIAN CONSULTING ARBORICULTURISTS

Executive Summary

This Arboricultural Development Impact Assessment Report has been commissioned by Built to report on trees within the site of Liverpool Civic Place. It has been commissioned to outline the health, condition and stability of these trees as well as their viability for retention. The scope of this report includes all trees within areas that may be impacted by the proposed development.

The subject trees are preserved by Liverpool Council Development Control Plan 2008.

The subject trees are in good health and condition however trees 5 to 13 are showing symptoms of drought stress. Trees 29, 32 and 33 have moderate apical dieback.

The Tree Protection Zones of Trees 5, 6, 7, 9 and 10 are encroached by the proposed construction and required earthworks by a major or total encroachment as defined by *AS4970-2009 Protection of Trees on Development Sites.* These trees will not be viable to be retained and will be required to be removed due to the proposed development.

The Tree Protection Zone of Tree 28 is totally encroached by the proposed driveway access to the proposed Loading Dock and will not be able to be retained due to the proposed development.

Tree 8 is located within a planter that is not proposed to be altered under the development however based on client advice that this area will be required for construction access and accordingly this tree will be totally encroached by this construction access.

The viability of the retention of trees 29, 30, 31, 33 and 34 will be required to be reassessed based on complete construction drawings including the details of proposed hoardings in this location.

All other trees are viable to be retained and are to be protected as defined below.

Recommendations for tree retention or removal are summarised as follows:

Tree no.	Species	Recommendations	Comments
1.	*Lagerstroemia indica*	Retain	
2.	*Lagerstroemia indica*	Retain	
3.	*Lagerstroemia indica*	Retain	
4.	*Lagerstroemia indica*	Retain	
5.	*Pyrus calleryana*	Remove	Not viable to be retained due to encroachment of the proposed development.
6.	*Pyrus calleryana*	Remove	Not viable to be retained due to encroachment of the proposed development.
7.	*Pyrus calleryana*	Remove	Not viable to be retained due to encroachment of the proposed development.

8.	*Pyrus calleryana*	Remove	Not viable to be retained due to encroachment of the proposed development.
9.	*Lagerstroemia indica*	Remove	Not viable to be retained due to encroachment of the proposed development.
10.	*Lagerstroemia indica*	Remove	Not viable to be retained due to encroachment of the proposed development.
11.	*Pyrus calleryana*	Retain	Symptoms of drought stress
12.	*Pyrus calleryana*	Retain	Symptoms of drought stress
13.	*Pyrus calleryana*	Retain	Symptoms of drought stress
14.	*Pyrus calleryana*	Retain	
15.	*Pyrus calleryana*	Retain	
16.	*Pyrus calleryana*	Retain	
17.	*Pyrus calleryana*	Retain	Symptoms of drought stress
18.	*Pyrus calleryana*	Retain	
19.	*Magnolia 'Little Gem'*	Retain	
20.	*Magnolia 'Little Gem'*	Retain	
21.	*Waterhousia floribunda*	Retain	
22.	*Waterhousia floribunda*	Retain	
23.	*Waterhousia floribunda*	Retain	
24.	*Waterhousia floribunda*	Retain	
25.	*Waterhousia floribunda*	Retain	
26.	*Waterhousia floribunda*	Retain	
27.	*Waterhousia floribunda*	Retain	
28.	*Populus deltoides*	Remove	Not viable to be retained due to encroachment of the proposed development.
29.	*Populus deltoides*	Retain	Moderate apical dieback
30.	*Populus deltoides*	Retain	
31.	*Populus deltoides*	Retain	
32.	*Populus deltoides*	Retain	Moderate apical dieback
33.	*Populus deltoides*	Retain	Some apical dieback
34.	*Populus deltoides*	Retain	
35.	*Populus deltoides*	Retain	
36.	*Cupressus sempervirens 'Stricta'*	Retain	
37.	*Cupressus sempervirens 'Stricta'*	Retain	
38.	*Cupressus sempervirens 'Stricta'*	Retain	
39.	*Cupressus sempervirens 'Stricta'*	Retain	

40.	*Cupressus sempervirens 'Stricta'*	Retain	
41.	*Cupressus sempervirens 'Stricta'*	Retain	

Contents

1.0 Project Introduction

This Arboricultural Development Impact Assessment Report is submitted to Liverpool City Council (Council) as part of a Development Application (DA) for site preparation and early works at 52 Scott Street, Liverpool (the site) also known as the Liverpool Civic Place site. Specifically, the DA seeks approval for:

- Demolition of all existing structures and site improvements; and
- Bulk earth works to a depth of RL 10.35 including shoring through the use of piles.

The proposal relates to the broader Liverpool Civic Place site redevelopment plan which is detailed within the Concept DA (DA/485/2019) submitted to Council on 17 September 2019. Specifically, the Concept Proposal seeks approval for various uses within proposed building envelopes, including:

- A building envelope with a maximum height of RL 43.45 for the purpose of an information and education facility (public library) use.
- A building envelope with a maximum height of RL 84.25 for the purpose of a public administration building use, and either (or a combination of) commercial premises or child-care centre uses.
- A building envelope with a maximum height of RL 118.85 which will accommodate either (or a combination of) commercial premises, educational establishments, tourist and visitor accommodation or boarding house (student accommodation) uses.
- A landscaping and public domain concept including the provision of a public through-site link running north to south through the site, connecting Scott Street to the north through to Terminus Street to the south; and
- A building envelope for a three-level shared basement car park across the entire site to accommodate parking for all future uses (approximately 413 spaces, to be determined as part of future detailed DAs) and accommodating a public car park to be owned by Council.

The detailed design of the Liverpool Civic Place will be subject of separate Stage 2 DA(s). The benefits of this approach would allow the expedited local assessment and determination of an application for these additional 'early works', which are key to ensuring the development can be delivered in a timely manner.

Figure 1: Indicative Photomontage of the Concept Proposal

Source: FJMT

Site Analysis

Site Location and Context

The Liverpool Civic Place site is located at 52 Scott Street and 306-310 Macquarie Street, Liverpool within the Liverpool City Council Local Government Area. However, the site to which the proposed works will occur, does not include the site at 306-310 Macquarie Street.
The site is located approximately 300m south west of Liverpool Railway Station and is also in the vicinity of a number of regionally significant land uses and features including Liverpool Hospital, Westfield Liverpool, Western Sydney University Liverpool Campus, the Georges River and Biggie Park public open space as illustrated at **Figure 2** below.

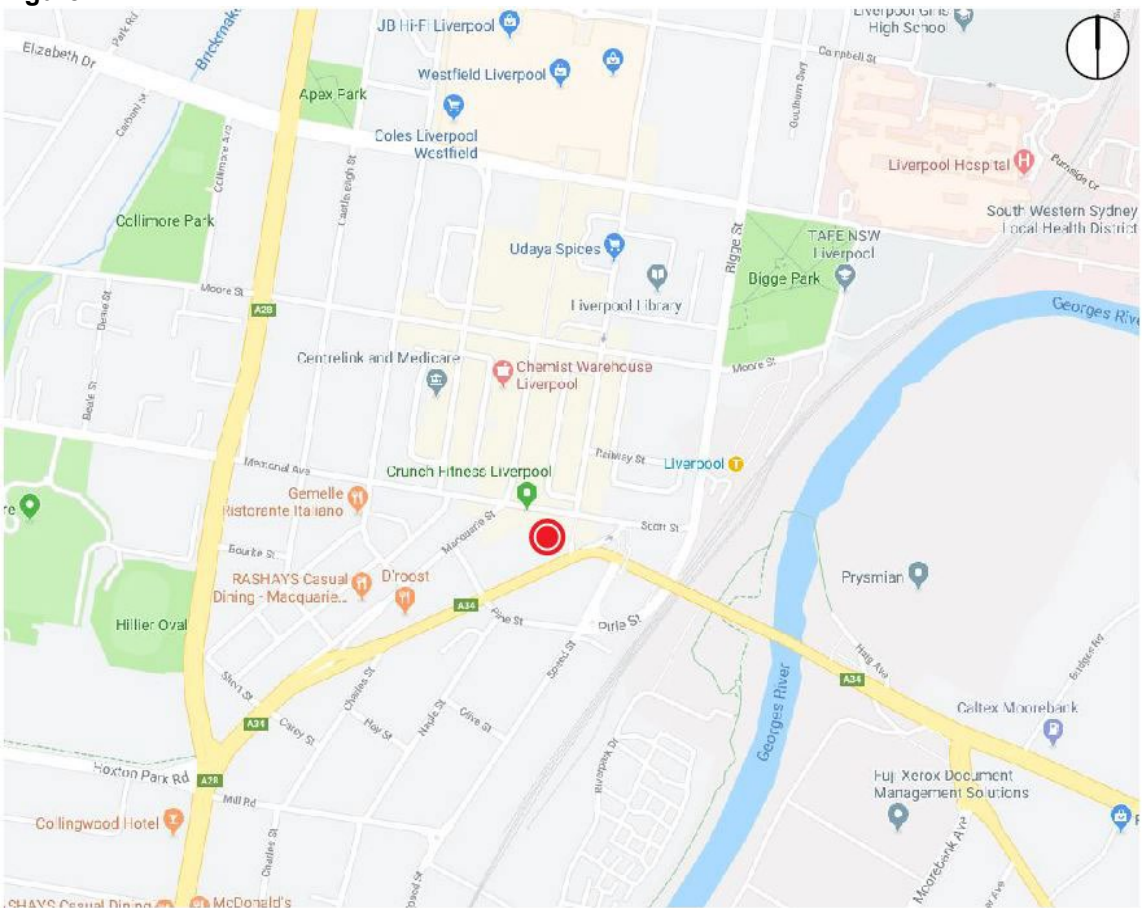

Figure 2: Site Location

Source: Google Maps and Ethos Urban

Site Description

This site is irregular in shape and is comprised of 11 lots, legally described below:

- Lot 1 in DP 514817;
- Lot 2 in DP 229979;
- Lot 17 in DP 81842;
- Lot 3 in DP 229979;
- Lot 11 in DP 522284;
- Lot 100 in DP 877435;
- Lot 12 in DP 657056;
- Lot 1 in DP 507070;
- Lot 22 in DP 441010;
- Lot 23 in DP 441010; and
- Lot 1 in DP 229979.

The site has a total area of 7190.4m2 and has three primary road frontages including a primary frontage to Scott Street (98m frontage) to the north, George Lane (40m frontage) to the east and

Terminus Street (115m frontage) to the south. An aerial photo of the site is shown in **Figure 3** below.

A Site Survey has been prepared and this illustrates that the site slopes to north with a fall of approximately 3.5m from its Terminus Street frontage (RL 25.95) to its Scott Street frontage (RL 22.74). The site is largely free of vegetation, with scattered grass cover present within the eastern vacant lots and street trees lining the Terminus Street boundary.

The site is largely occupied by a two-storey commercial building with a large frontage to Scott Street (**Figure 4** and **Figure 5**). The commercial building is provided with an above ground car parking structure at the rear with a frontage to Terminus Street (**Figure 6**). The eastern portion of the site is occupied by a two storey retail building (**Figure 7**) with an adjoining car park at the rear (**Figure 8**). The two existing buildings are divided by a central vacant lot.

Figure 3: Site Aerial

Source: Near Maps and Ethos Urban

Figure 4: Commercial building occupiying the site as viewed from Scott Street (north east)

Figure 5: Commercial building occupying the site as viewed from Scott Street (north west)

Figure 6: Above ground car parking structure as viewed from Terminus Street (south east)

Figure 7: Commercial building occupying the site as viewed from Scott Street (north east)

Figure 8: Rear car park of the commercial building as viewed from Terminus Street (south east)

Access and Connectivity

Vehicular Access and Parking

The site has three street frontages, with Scott Street and Terminus Street being the primary street frontages. Scott Street functions as a collector road connecting Memorial Avenue through to Bigge Street and is aligned in an east-west direction. Scott Street is a two-way, two lane road within a 12m wide carriageway with no vehicle access points to the site. Terminus Street is a classified RMS road including a two-way, two lane road within a 13m carriageway. The site is currently provided with two left in/left out vehicle access points off Terminus Street (**Figure 9** and **Figure 10**).

Figure 9: Existing development from the south

Figure 10: Existing development from the south east

Pedestrian Access

Scott Street, Terminus Street and Macquarie Street are well-established pedestrian routes, with Liverpool Railway Station and the Liverpool retail precinct to the north being major generators of footfall traffic around the site. The site's eastern boundary fronts the George Street pedestrian access way which links Scott Street to Terminus Street.

Heritage

The subject site does not contain a heritage item nor is it located in a heritage conservation area. The broader Liverpool Civic Place site (Lot 201 DP 1224084, 306-310 Macquarie Street) contains a heritage item, being the Memorial School of Arts building (I99). No site preparation or early works are proposed on this lot. The site is in the vicinity of several heritage items identified within the Liverpool LEP 2008. Notable amongst these heritage items includes:

- I89 – Plan of Town of Liverpool (Early town centre street layout – Hoddle 1827);
- I91 – Commercial Building (formerly Rural bank and State bank);
- I92 – Boer War Memorial, including memorial to Private A.E Smith;
- I93 – Macquarie Monument;
- I94 – Row of 3 palm trees; and
- I109 – Liverpool Fire Station.

Surrounding Development

The Liverpool CBD is a growing strategic centre within Greater Western Sydney, comprising a true mixed use character. The Liverpool CBD is currently presented with opportunities for renewal and urban transformation which reflects the precinct's strategic positioning between Parramatta as Sydney's Central CBD and the future Badgerys Creek Aerotropolis. The site's immediate surrounding context is outlined below.

North

Development to the north of the site, on the opposite side of Scott Street, includes retail and commercial buildings of two to three storeys, primarily containing retail and commercial uses (**Figure 11**). To the north east, the street block contains higher density commercial and service apartment uses (**Figure 12**). Further north, this development transitions into the Liverpool civic and retail centre bound by Macquarie Street (**Figure 13**) and George Street (**Figure 14**).

Figure 11: Retail and commercial buildings to the north

Figure 12: Higher density development to the north east

Figure 13: Macquarie Street to the north

Figure 14: George Street to the north

East

Development to the east of the site, on the opposite side of the eastern through site link, is a two storey commercial building (**Figure 15**). This building is not listed as a heritage significant item. To the east of this building is a larger two storey commercial building (**Figure 16**), which extends to the Scott Street and Terminus Street intersection. The Georges River and Liverpool Railway Station are a further 300m from the site and effectively mark the eastern boundary of the Liverpool CBD.

Figure 15: Two storey commercial building to the east of the George Street through site link

Figure 16: Two storey commercial building at the intersection of Scott and Terminus Street

South

To the south of the site, and on the opposite side of Terminus Street, is the Telstra Exchange building that has a height of approximately four storeys (**Figure 17**). As well as this, various retail stores front Terminus Street. Further south of the commercial Terminus Street strip the area transitions to a residential character with a number of four to five storey residential flat buildings (**Figure 18**).

Figure 17: Telstra Exchange building and adjoining retail tenancies to the south

Figure 18: Retail and medium density residential uses fronting Terminus Street to the south

West

Immediately to the west includes the heritage listed Memorial Arts Building and surrounding public domain
(**Figure 19**). To the rear of this building is a nine-storey mixed use development at 300 Macquarie Street
(Figure 20). The mixed-use building presents a partial blank party wall to the site at the rear (**Figure 21**) and contains ground floor retail uses which are set back from the Memorial Arts Building and Macquarie Street. This adjoins a consolidation of low scale automotive service tenancies to the west (**Figure 22**).

Figure 19: Memorial Arts Building

Figure 20: Nine storey mixed use residential building to the west

Figure 21: Rear party wall presented to the site

Figure 22: Consolidated automotive service tenancies to the west

2.0 Scope of Works

This Arboricultural Development Impact Assessment Report has been commissioned by Built to report on trees within the site of Liverpool Civic Place. It has been commissioned to outline the health, condition and stability of these trees as well as their viability for retention within the context of the proposed development. The scope of this report includes all trees within areas that may be impacted by the proposed development.

On the 22nd of November 2019, Glenn Bird of Birds Tree Consultancy attended site and inspected the subject trees from the ground. There was no aerial inspection carried out. A Visual Tree Assessment was undertaken in accordance with Visual Tree Assessment (VTA) guidelines (Mattheck and Breloer, 1994). Tree heights were measured using a Nikon Forestry 550 Heightmeter.

3.0 Site Analysis

2.1 Site

The subject site is Liverpool Civic Place and is bounded by Scott Street, Macquarie Street, Pirie Street and Terminus Street Liverpool. The subject trees are located within or adjacent to the boundaries of this site. The site is currently multi-use commercial properties.

2.2 Topography

The existing trees are located within developed commercial properties in close proximity to concrete walls and pavements. Refer to detailed surveys for greater detail of levels.

2.3 Identification

Trees are as identified in the attached inspection forms in Appendix C and shown in Tree location Plan A01 in Appendix D.

2.4 Soils

Soil material and horizons were not tested for this report.

4.0 Existing Trees

The following trees were inspected from the ground and the following items identified. Please refer also to the attached inspection data in Appendix A.

3.1. Tree 1. *Lagerstroemia indica*

This semi-mature tree is approximately 4m tall with a canopy spread of 3m. It has a single trunk with a diameter at breast height (DBH) of 100mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.2. Tree 2. ***Lagerstroemia indica***

This semi-mature tree is approximately 4m tall with a canopy spread of 2m. It has a single trunk with a DBH of 100mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.3. Tree 3. ***Lagerstroemia indica***

This semi-mature tree is approximately 4m tall with a canopy spread of 2m. It has a single trunk with a DBH of 100mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.4. Tree 4. ***Lagerstroemia indica***

This semi-mature tree is approximately 4m tall with a canopy spread of 3m. It has a single trunk with a DBH of 100mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.5. Tree 5. ***Pyrus calleryana***

This semi-mature tree is approximately 4m tall with a canopy spread of 2m. It has a single trunk with a DBH of 120mm. This tree is in poor health and condition with minimal deadwood and epicormic growth. There is evidence of symptoms of drought stress.

3.6. Tree 6. ***Pyrus calleryana***

This semi-mature tree is approximately 4m tall with a canopy spread of 3m. It has a single trunk with a DBH of 110mm. This tree is in poor health and condition with minimal deadwood and epicormic growth. There is evidence of symptoms of drought stress.

3.7. Tree 7. ***Pyrus calleryana***

This semi-mature tree is approximately 4m tall with a canopy spread of 2m. It has a single trunk with a DBH of 110mm. This tree is in poor health and condition with minimal deadwood and epicormic growth. There is evidence of symptoms of drought stress.

3.8. Tree 8. ***Pyrus calleryana***

This semi-mature tree is approximately 5m tall with a canopy spread of 4m. It has a single trunk with a DBH of 120mm. This tree is in poor health and condition with minimal deadwood and epicormic growth. There is evidence of symptoms of drought stress.

3.9. Tree 9. ***Lagerstroemia indica***

This semi-mature tree is approximately 5m tall with a canopy spread of 3m. It has a single trunk with a DBH of 120mm. This tree is in poor health and condition with minimal deadwood and epicormic growth. There is evidence of symptoms of drought stress.

3.10. Tree 10. ***Lagerstroemia indica***

This semi-mature tree is approximately 5m tall with a canopy spread of 3m. It has a single trunk with a DBH of 110mm. This tree is in poor health and condition with minimal deadwood and epicormic growth. There is evidence of symptoms of drought stress.

3.11. Tree 11. ***Pyrus calleryana***

This semi-mature tree is approximately 4m tall with a canopy spread of 3m. It has a single trunk with a DBH of 110mm. This tree is in poor health and condition with minimal deadwood and epicormic growth. There is evidence of symptoms of drought stress.

3.12. Tree 12. ***Pyrus calleryana***

This semi-mature tree is approximately 4m tall with a canopy spread of 2m. It has a single trunk with a DBH of 120mm. This tree is in poor health and condition with minimal deadwood and epicormic growth. There is evidence of symptoms of drought stress.

3.13. Tree 13. ***Pyrus calleryana***

This mature tree is approximately 4m tall with a canopy spread of 3m. It has a single trunk with a DBH of 100mm. This tree is in good poor and condition with minimal deadwood and epicormic growth. There is evidence of symptoms of drought stress.

3.14. Tree 14. ***Pyrus calleryana***

This semi-mature tree is approximately 4m tall with a canopy spread of 3m. It has a single trunk with a DBH of 120mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.15. Tree 15. ***Pyrus calleryana***

This semi-mature tree is approximately 4m tall with a canopy spread of 2m. It has a single trunk with a DBH of 110mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.16. Tree 16. ***Pyrus calleryana***

This semi-mature tree is approximately 4m tall with a canopy spread of 2m. It has a single trunk with a DBH of 100mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.17. Tree 17. ***Pyrus calleryana***

This semi-mature tree is approximately 4m tall with a canopy spread of 2m. It has a single trunk with a DBH of 110mm. This tree is in fair health and condition with minimal deadwood and epicormic growth. There is evidence of symptoms of drought stress.

3.18. Tree 18. ***Pyrus calleryana***

This semi-mature tree is approximately 4m tall with a canopy spread of 3m. It has a single trunk with a DBH of 110mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.19. Tree 19. ***Magnolia 'Little Gem'***

This semi-mature tree is approximately 3.5m tall with a canopy spread of 2m. It has a single trunk with a DBH of 100mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.20. Tree 20. *Magnolia 'Little Gem'*

This semi-mature tree is approximately 3m tall with a canopy spread of 2m. It has twin co-dominant trunks from 1m above the base with an aggregate DBH of 100mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.21. Tree 21. *Waterhousia floribunda*

This mature tree is approximately 5m tall with a canopy spread of 5m. It has twin co-dominant trunks from 1m above the base with an aggregate DBH of 230mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.22. Tree 22. *Waterhousia floribunda*

This mature tree is approximately 5m tall with a canopy spread of 4m. It has a single trunk with a DBH of 170mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.23. Tree 23. *Waterhousia floribunda*

This mature tree is approximately 5m tall with a canopy spread of 4m. It has a single trunk with a DBH of 160mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.24. Tree 24. *Waterhousia floribunda*

This mature tree is approximately 5m tall with a canopy spread of 4m. It has a single trunk with a DBH of 140mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.25. Tree 25. *Waterhousia floribunda*

This mature tree is approximately 5m tall with a canopy spread of 4m. It has twin co-dominant trunks from 1m above the base with an aggregate DBH of 210mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.26. Tree 26. *Waterhousia floribunda*

This mature tree is approximately 5m tall with a canopy spread of 4m. It has a single trunk with a DBH of 220mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.27. Tree 27. *Waterhousia floribunda*

This mature tree is approximately 5m tall with a canopy spread of 4m. It has multiple co-dominant trunks from the base with an aggregate DBH of 250mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.28. Tree 28. *Populus deltoides*

This mature tree is approximately 13m tall with a canopy spread of 10m. It has a single trunk with a DBH of 390mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.29. Tree 29. ***Populus deltoides***

This mature tree is approximately 13m tall with a canopy spread of 8m. It has a single trunk with a DBH of 360mm. This tree is in fair health and condition with moderate deadwood, minimal epicormic growth and moderate apical dieback.

3.30. Tree 30. ***Populus deltoides***

This mature tree is approximately 13m tall with a canopy spread of 10m. It has a single trunk with a DBH of 420mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.31. Tree 31. ***Populus deltoides***

This mature tree is approximately 11m tall with a canopy spread of 12m. It has a single trunk with a DBH of 350mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.32. Tree 32. ***Populus deltoides***

This mature tree is approximately 13m tall with a canopy spread of 9m. It has a single trunk with a DBH of 380mm. This tree is in fair health and condition with moderate deadwood, minimal epicormic growth and moderate apical dieback.

3.33. Tree 33. ***Populus deltoides***

This mature tree is approximately 12m tall with a canopy spread of 9m. It has a single trunk with a DBH of 360mm. This tree is in fair health and condition with moderate deadwood, minimal epicormic growth and some apical dieback.

3.34. Tree 34. ***Populus deltoides***

This mature tree is approximately 12m tall with a canopy spread of 8m. It has a single trunk with a DBH of 300mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.35. Tree 35. ***Populus deltoides***

This mature tree is approximately 13m tall with a canopy spread of 9m. It has a single trunk with a DBH of 380mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.36. Tree 36. ***Cupressus sempervirens 'Stricta'***

This mature tree is approximately 5m tall with a canopy spread of 1m. It has a single trunk with a DBH of 150mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.37. Tree 37. ***Cupressus sempervirens 'Stricta'***

This mature tree is approximately 5m tall with a canopy spread of 1m. It has a single trunk with a DBH of 150mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.38. Tree 38. ***Cupressus sempervirens 'Stricta'***

This mature tree is approximately 4m tall with a canopy spread of 1m. It has a single trunk with a DBH of 150mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.39. Tree 39. ***Cupressus sempervirens 'Stricta'***

This mature tree is approximately 5m tall with a canopy spread of 1m. It has a single trunk with a DBH of 150mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.40. Tree 40. ***Cupressus sempervirens 'Stricta'***

This mature tree is approximately 5m tall with a canopy spread of 1m. It has a single trunk with a DBH of 150mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

3.41. Tree 41. ***Cupressus sempervirens 'Stricta'***

This mature tree is approximately 4m tall with a canopy spread of 1m. It has a single trunk with a DBH of 150mm. This tree is in good health and condition with minimal deadwood and epicormic growth.

4.0 Landscape Significance of Trees

4.1 Landscape Significance

The significance of a tree within the landscape is a factor of the health and condition of the tree, vitality, the form of the tree, environmental, cultural, amenity and heritage value.

4.2 Methodology of Determining Landscape Significance

For the purpose of this report, the Significance of a Tree, Assessment Rating System (STARS) as developed by the Institute of Australian Consulting Arborists (IACA) has been implemented. Please refer to Appendix A for greater detail of this assessment system. This system defines Landscape Significance for individual trees as High, Medium or Low Significance.

4.3 Landscape Significance of Subject Trees

Based on our assessment of the subject trees and implementation of the IACA Significance of a Tree, Assessment Rating System, the Landscape Significance of the Subject Trees was determined as shown in Table 1.

Tree no.	Species	Landscape Significance
1.	*Lagerstroemia indica*	Moderate
2.	*Lagerstroemia indica*	Moderate
3.	*Lagerstroemia indica*	Moderate
4.	*Lagerstroemia indica*	Moderate
5.	*Pyrus calleryana*	Moderate
6.	*Pyrus calleryana*	Moderate

7.	*Pyrus calleryana*	Moderate
8.	*Pyrus calleryana*	Moderate
9.	*Lagerstroemia indica*	Moderate
10.	*Lagerstroemia indica*	Moderate
11.	*Pyrus calleryana*	Moderate
12.	*Pyrus calleryana*	Moderate
13.	*Pyrus calleryana*	Moderate
14.	*Pyrus calleryana*	Moderate
15.	*Pyrus calleryana*	Moderate
16.	*Pyrus calleryana*	Moderate
17.	*Pyrus calleryana*	Moderate
18.	*Pyrus calleryana*	Moderate
19.	*Magnolia 'Little Gem'*	Moderate
20.	*Magnolia 'Little Gem'*	Moderate
21.	*Waterhousia floribunda*	Moderate
22.	*Waterhousia floribunda*	Moderate
23.	*Waterhousia floribunda*	Moderate
24.	*Waterhousia floribunda*	Moderate
25.	*Waterhousia floribunda*	Moderate
26.	*Waterhousia floribunda*	Moderate
27.	*Waterhousia floribunda*	Moderate
28.	*Populus deltoides*	Moderate
29.	*Populus deltoides*	Moderate
30.	*Populus deltoides*	Moderate
31.	*Populus deltoides*	Moderate
32.	*Populus deltoides*	Moderate
33.	*Populus deltoides*	Moderate
34.	*Populus deltoides*	Moderate
35.	*Populus deltoides*	Moderate
36.	*Cupressus sempervirens 'Stricta'*	Moderate
37.	*Cupressus sempervirens 'Stricta'*	Moderate
38.	*Cupressus sempervirens 'Stricta'*	Moderate
39.	*Cupressus sempervirens 'Stricta'*	Moderate
40.	*Cupressus sempervirens 'Stricta'*	Moderate
41.	*Cupressus sempervirens 'Stricta'*	Moderate

Table 1 - Landscape Significance

5.0 Subject Tree Retention Value

5.1 Tree Retention Value Methodology

For the purpose of this report, the Tree Retention Values have been assessed by incorporating Landscape Significance Values as determined in 4.0 with the Useful Life Expectancy of the subject trees and assessing the retention values based on the Tree Retention Value Priority Matrix as developed by the Institute of Australian Consulting Arborists (IACA). Please refer to Appendix B for greater detail of this Tree Retention Value Priority Matrix. This matrix defines Landscape Significance for individual trees as High, Medium or Low Retention Value as well as Priority for Removal.

5.2 Retention Value of Subject Trees

Based on our assessment of the subject trees and implementation of the IACA Tree Retention Value Priority Matrix, the Retention Values of the Subject Trees were determined as shown in Table 2.

Tree no.	Species	Retention Value
1.	*Lagerstroemia indica*	Moderate
2.	*Lagerstroemia indica*	Moderate
3.	*Lagerstroemia indica*	Moderate
4.	*Lagerstroemia indica*	Moderate
5.	*Pyrus calleryana*	Moderate
6.	*Pyrus calleryana*	Moderate
7.	*Pyrus calleryana*	Moderate
8.	*Pyrus calleryana*	Moderate
9.	*Lagerstroemia indica*	Moderate
10.	*Lagerstroemia indica*	Moderate
11.	*Pyrus calleryana*	Moderate
12.	*Pyrus calleryana*	Moderate
13.	*Pyrus calleryana*	Moderate
14.	*Pyrus calleryana*	Moderate
15.	*Pyrus calleryana*	Moderate
16.	*Pyrus calleryana*	Moderate
17.	*Pyrus calleryana*	Moderate
18.	*Pyrus calleryana*	Moderate
19.	*Magnolia 'Little Gem'*	Moderate
20.	*Magnolia 'Little Gem'*	Moderate
21.	*Waterhousia floribunda*	Moderate
22.	*Waterhousia floribunda*	Moderate
23.	*Waterhousia floribunda*	Moderate
24.	*Waterhousia floribunda*	Moderate
25.	*Waterhousia floribunda*	Moderate
26.	*Waterhousia floribunda*	Moderate
27.	*Waterhousia floribunda*	Moderate

28.	*Populus deltoides*	Moderate
29.	*Populus deltoides*	Moderate
30.	*Populus deltoides*	Moderate
31.	*Populus deltoides*	Moderate
32.	*Populus deltoides*	Moderate
33.	*Populus deltoides*	Moderate
34.	*Populus deltoides*	Moderate
35.	*Populus deltoides*	Moderate
36.	*Cupressus sempervirens 'Stricta'*	Moderate
37.	*Cupressus sempervirens 'Stricta'*	Moderate
38.	*Cupressus sempervirens 'Stricta'*	Moderate
39.	*Cupressus sempervirens 'Stricta'*	Moderate
40.	*Cupressus sempervirens 'Stricta'*	Moderate
41.	*Cupressus sempervirens 'Stricta'*	Moderate

Table 2 – Tree Retention Value

6.0 Impact of Development

6.1 Tree Protection Zone

Tree Protection Zones (TPZs) have been defined for the subject trees in order to define the encroachment of the proposed development in accordance with *AS4970-2009*. The TPZs required have been taken as a circular area with a radius 12 x the diameter at breast height of the tree. This requirement is in line with Australian Standard AS 4970-2009 Protection of Trees on Development Sites. This standard defines a maximum of 10% encroachment to be minimal encroachment. Any encroachment over 10% requires the site arborist to give consideration as to the viability of the tree due to the proposed development.

Tree no.	Species	TPZ Radius (m)	Encroachment (%)
1.	*Lagerstroemia indica*	2	0
2.	*Lagerstroemia indica*	2	0
3.	*Lagerstroemia indica*	2	0
4.	*Lagerstroemia indica*	2	0
5.	*Pyrus calleryana*	2	100
6.	*Pyrus calleryana*	2	100
7.	*Pyrus calleryana*	2	100
8.	*Pyrus calleryana*	2	100
9.	*Lagerstroemia indica*	2	100
10.	*Lagerstroemia indica*	2	100
11.	*Pyrus calleryana*	2	0
12.	*Pyrus calleryana*	2	0
13.	*Pyrus calleryana*	2	0
14.	*Pyrus calleryana*	2	0

15.	*Pyrus calleryana*	2	0
16.	*Pyrus calleryana*	2	0
17.	*Pyrus calleryana*	2	0
18.	*Pyrus calleryana*	2	0
19.	*Magnolia 'Little Gem'*	2	0
20.	*Magnolia 'Little Gem'*	2	0
21.	*Waterhousia floribunda*	2.76	0
22.	*Waterhousia floribunda*	2.04	0
23.	*Waterhousia floribunda*	2	0
24.	*Waterhousia floribunda*	2	0
25.	*Waterhousia floribunda*	2.52	0
26.	*Waterhousia floribunda*	2.64	0
27.	*Waterhousia floribunda*	3	0
28.	*Populus deltoides*	4.68	100
29.	*Populus deltoides*	4.32	0
30.	*Populus deltoides*	5.04	0
31.	*Populus deltoides*	4.2	10
32.	*Populus deltoides*	4.56	0
33.	*Populus deltoides*	4.32	0
34.	*Populus deltoides*	3.6	0
35.	*Populus deltoides*	4.56	0
36.	*Cupressus sempervirens 'Stricta'*	2	0
37.	*Cupressus sempervirens 'Stricta'*	2	0
38.	*Cupressus sempervirens 'Stricta'*	2	0
39.	*Cupressus sempervirens 'Stricta'*	2	0
40.	*Cupressus sempervirens 'Stricta'*	2	0
41.	*Cupressus sempervirens 'Stricta'*	2	0

6.2 Development Impact

6.2.1. Tree 1. *Lagerstroemia indica*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.2. Tree 2. *Lagerstroemia indica*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be

further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.3. Tree 3. *Lagerstroemia indica*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.4. Tree 4. *Lagerstroemia indica*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.5. Tree 5. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.

6.2.6. Tree 6. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.

6.2.7. Tree 7. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.

6.2.8. Tree 8. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.

6.2.9. Tree 9. *Lagerstroemia indica*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.

6.2.10. Tree 10. *Lagerstroemia indica*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.

6.2.11. Tree 11. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.12. Tree 12. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.13. Tree 13. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.14. Tree 14. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.15. Tree 15. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.16. Tree 16. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.17. Tree 17. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.18. Tree 18. *Pyrus calleryana*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.19. Tree 19. *Magnolia 'Little Gem'*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.20. Tree 20. *Magnolia 'Little Gem'*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.21. Tree 21. *Waterhousia floribunda*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.22. Tree 22. *Waterhousia floribunda*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.23. Tree 23. *Waterhousia floribunda*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.24. Tree 24. *Waterhousia floribunda*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.25. Tree 25. *Waterhousia floribunda*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.26. Tree 26. *Waterhousia floribunda*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.27. Tree 27. *Waterhousia floribunda*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.28. Tree 28. *Populus deltoides*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will be totally encroached by the proposed development. This tree will not be viable to be retained under the proposed development.

6.2.29. Tree 29. *Populus deltoides*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.30. Tree 30. *Populus deltoides*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.31. Tree 31. *Populus deltoides*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will be encroached by the proposed development by 10% which is equal to the minor encroachment as defined by AS 4970-2009. This tree will be viable to be retained under the proposed development.

6.2.32. Tree 32. *Populus deltoides*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.33. Tree 33. *Populus deltoides*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.34. Tree 34. *Populus deltoides*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.35. Tree 35. *Populus deltoides*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.36. Tree 36. *Cupressus sempervirens 'Stricta'*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.37. Tree 37. *Cupressus sempervirens 'Stricta'*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.38. Tree 38. *Cupressus sempervirens 'Stricta'*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.39. Tree 39. *Cupressus sempervirens 'Stricta'*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.40. Tree 40. *Cupressus sempervirens 'Stricta'*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

6.2.41. Tree 41. *Cupressus sempervirens 'Stricta'*

The Tree Protection Zone (TPZ) of this tree in accordance with *AS 4970-2009 Protection of Trees on Development Sites* will not be further encroached by the proposed development. This tree will be viable to be retained under the proposed development.

7.0 Recommendations

The subject trees are preserved by Liverpool Council Development Control Plan 2008.

The subject trees are in good health and condition however trees 5 to 13 are showing symptoms of drought stress. Trees 29, 32 and 33 have moderate apical dieback.

The Tree Protection Zones of Trees 5, 6, 7, 9 and 10 are encroached by the proposed construction and required earthworks by a major or total encroachment as defined by *AS4970-2009 Protection of Trees on Development Sites.* These trees will not be viable to be retained and will be required to be removed due to the proposed development.

The Tree Protection Zone of Tree 28 is totally encroached by the proposed driveway access to the proposed Loading Dock and will not be able to be retained due to the proposed development.

Tree 8 is located within a planter that is not proposed to be altered under the development however based on client advice that this area will be required for construction access and accordingly this tree will be totally encroached by this construction access.

The viability of the retention of trees 29, 30, 31, 33 and 34 will be required to be reassessed based on complete construction drawings including the details of proposed hoardings in this location.

Recommendations for tree retention or removal are summarised as follows:

Tree no.	Species	Recommendations	Comments
1.	*Lagerstroemia indica*	Retain	
2.	*Lagerstroemia indica*	Retain	
3.	*Lagerstroemia indica*	Retain	
4.	*Lagerstroemia indica*	Retain	
5.	*Pyrus calleryana*	Remove	Not viable to be retained due to encroachment of the proposed development.
6.	*Pyrus calleryana*	Remove	Not viable to be retained due to encroachment of the proposed development.
7.	*Pyrus calleryana*	Remove	Not viable to be retained due to encroachment of the proposed development.
8.	*Pyrus calleryana*	Remove	Not viable to be retained due to encroachment of the proposed development.
9.	*Lagerstroemia indica*	Remove	Not viable to be retained due to encroachment of the proposed development.

10.	*Lagerstroemia indica*	Remove	Not viable to be retained due to encroachment of the proposed development.
11.	*Pyrus calleryana*	Retain	Symptoms of drought stress
12.	*Pyrus calleryana*	Retain	Symptoms of drought stress
13.	*Pyrus calleryana*	Retain	Symptoms of drought stress
14.	*Pyrus calleryana*	Retain	
15.	*Pyrus calleryana*	Retain	
16.	*Pyrus calleryana*	Retain	
17.	*Pyrus calleryana*	Retain	Symptoms of drought stress
18.	*Pyrus calleryana*	Retain	
19.	*Magnolia 'Little Gem'*	Retain	
20.	*Magnolia 'Little Gem'*	Retain	
21.	*Waterhousia floribunda*	Retain	
22.	*Waterhousia floribunda*	Retain	
23.	*Waterhousia floribunda*	Retain	
24.	*Waterhousia floribunda*	Retain	
25.	*Waterhousia floribunda*	Retain	
26.	*Waterhousia floribunda*	Retain	
27.	*Waterhousia floribunda*	Retain	
28.	*Populus deltoides*	Remove	Not viable to be retained due to encroachment of the proposed development.
29.	*Populus deltoides*	Retain	Moderate apical dieback
30.	*Populus deltoides*	Retain	
31.	*Populus deltoides*	Retain	
32.	*Populus deltoides*	Retain	Moderate apical dieback
33.	*Populus deltoides*	Retain	Some apical dieback
34.	*Populus deltoides*	Retain	
35.	*Populus deltoides*	Retain	
36.	*Cupressus sempervirens 'Stricta'*	Retain	
37.	*Cupressus sempervirens 'Stricta'*	Retain	
38.	*Cupressus sempervirens 'Stricta'*	Retain	
39.	*Cupressus sempervirens 'Stricta'*	Retain	
40.	*Cupressus sempervirens 'Stricta'*	Retain	
41.	*Cupressus sempervirens 'Stricta'*	Retain	

8.0 Pre-Construction Tree Protection Measures

8.1 General

All tree protection works shall be carried out before excavation, grading and site works commence. Tree protection works shall be inspected and approved by a Consulting Arborist meeting AQF Level 5 prior to construction works commencing.

Storage of materials, mixing of materials, vehicle parking, disposal of liquids, machinery repairs and refueling, site office and sheds, and the lighting of fires, stockpiling of soil, rubble or any debris shall not be carried out within the TPZ of existing trees. No backfilling shall occur within the TPZ of existing trees. Trees shall not be removed or lopped unless specific instruction is given in writing by the Superintendent.

8.2 Identification

All trees to be protected shall be clearly identified and all TPZs surveyed.

8.3 Protective Fence

Fencing is to be erected around existing trees to be retained. In addition to this protective fencing within the site, Protective Fencing is to be installed to the full extent of the TPZs within the site. This fencing is to be erected prior to any materials being brought on site or before any site, civil works or construction works commence. The fence shall enclose a sufficient area so as to prevent damage to the TPZ as defined on Appendix D Tree Protection Plan and as defined in 5.1 above. Fence to comprise 1800mm high chain wire mesh fixed to 50mm diameter Galvanised steel posts. Panels should be securely fixed top and bottom to avoid separation. No storage of building materials, tools, paint, fuel or contaminants and the like shall occur within the fenced area.

8.4 Mulching

Install mulch to the extent of all tree protection fencing. Use a leaf mulch conforming to AS 4454 which is free of deleterious and extraneous matter such as soil, weeds, sticks and stones and consisting of a minimum of 90% recycled content compliant with AS 4454 (1999) and AS 4419 (1998). All trees marked as to be removed on the proposed development are to be chipped and reused for this purpose. Place mulch evenly and to a depth of 100mm.

8.5 Signage

Prior to works commencing, tree protection signage is to be attached to each tree protection zone, displayed in a prominent position and the sign repeated at 10 metres intervals or closer where the fence changes direction. Each sign shall contain in a clearly legible form, the following information:
Tree protection zone.

- This fence has been installed to prevent damage to the trees and their growing environment both above and below ground and access is restricted.
- No Access within Tree Protection Zone
- The name, address, and telephone number of the developer.

The name and telephone number of the Site Arborist.

9.0 Site Management Issues

9.1 Soil Compaction

Plant and pedestrian traffic during the construction period will cause significant soil compaction. This will be exacerbated by increased water expected on these soils as result of adjacent construction and weather. Compaction of the soil within the TPZ will reduce the voids between soil peds or particles therefore will reduce the gaseous exchange capacity of the root system which will slow critical metabolic processes such as respiration which produces Adenosine Triphosphate (ATP) which provides energy for the photosynthesis, which in turn provides photosynthates such as glucose. These photosynthates provide the carbohydrates required for tree extension growth, girth expansion, reproduction and pest and disease resistance. No pedestrian or plant access is permissible to the TPZ.

9.2 Site Access

Sufficient access is required to enable efficient construction. It is essential to delineate access zones or corridors which will provide suitable access without damaging the existing trees to be retained or causing compaction to the root zone.

9.3 Excavation within Tree Protection Area

No excavation is to be carried out within the TPZs of retained trees without the permission and supervision of the site arborist (AQF5)

9.4 Possible Contamination / Storage of Materials

The construction site will require the use of many chemicals and materials that are possible contaminants which if not managed will pose a risk to the existing trees. These possible contaminants include fuels, herbicides, solvents and the like. A site specific Environmental Management Plan shall be provided and this specific risk identified and addressed.

10.0 Tree Protection Measures During Construction

10.1 Maintenance of Pre-Construction Tree Protection Measures

The Pre-Construction Tree Protection Measures identified in 5.0 above are to be maintained in good and serviceable condition throughout the construction period.

10.2 Possible Contaminants

Do not store or otherwise place bulk materials and harmful materials under or near trees. Do not place spoil from excavations within the TPZs. Prevent wind-blown materials such as cement from harming trees. All possible contaminants are to be stored in a designated and appropriate area with secure chemical spill measures such as a bund in place.

10.3 Physical Damage

Prevent damage to tree. Do not attach stays, guys and the like to trees. No personnel, plant, machinery or materials are to be allowed within the tree protection fencing.

10.4 Compaction

No filling or compaction shall occur over tree roots zones within tree protection fenced areas. Where construction occurs close to or the TPZ of trees to be retained it shall be necessary to install protection to avoid compaction of the ground surface. This protection is to be planks supported clear of the ground fixed to scaffolding.

10.5 Trenching

No Trenching should be necessary within the TPZs or within tree protection fencing. No further trenching is to be carried out without the approval of the Superintendent. Should any further trenching be required within the TPZs identified, this work is to be carried out by hand and under the supervision of a qualified Arborist.

10.6 Irrigation/Watering

Contractor is to ensure that soil moisture levels are adequately maintained. Apply water at an appropriate rate suitable for the species during periods of little or no rainfall.

10.7 Site Sheds / Amenities/ Storage

Site sheds, site amenities, ablutions and site storage shall be in the area clear of all TPZ. Chemicals and potential contaminants are to be stored appropriately and this storage area is to be enclosed by a chemical spill bund to prevent the potential run off of contaminants in the event of a spillage or accident.

11.0 Environmental / Heritage/ Legislative Considerations

None of the subject trees are identified as threatened species or elements of endangered ecological communities within the Threatened Species Conservation Act 1995.

12.0 References

Mattheck, C. Breloer, K. 1993, The Body Language of Trees: A Handbook for Failure Analysis, 12th Impression 2010 The Stationery Office.
AS4970-2009 Protection of Trees on Development Sites: Standards Australia

13.0 Disclaimer

This Appraisal has been prepared for the exclusive use of the Client and Birds Tree Consultancy.
Birds Tree Consultancy accepts no responsibility for its use by other persons. The Client acknowledges that this Appraisal, and any opinions, advice or recommendations expressed or given in it, are based on the information supplied by the Client and on the data inspections, measurements and analysis carried out or obtained Birds Tree Consultancy and referred to in the Appraisal. The Client should rely on the Appraisal, and on its contents, only to that extent.

Every effort has been made in this report to include, assess and address all defects, structural weaknesses, instabilities and the like 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 report.

Appendix A Landscape Significance

IACA Significance of a Tree, Assessment Rating System (STARS) ©
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In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined.

Tree Significance - Assessment Criteria

1. High Significance in landscape

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

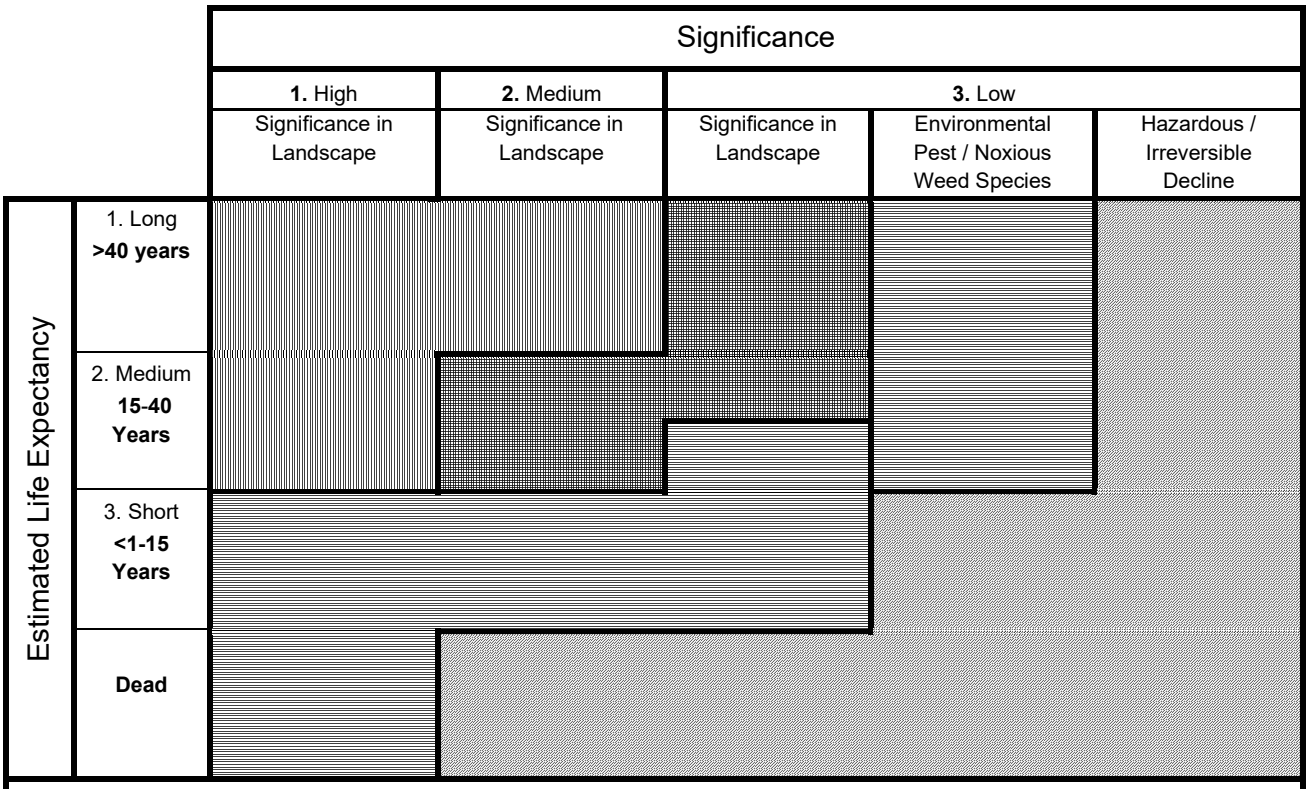
Hazardous/Irreversible Decline

- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

Appendix B Tree Retention Values



Legend for Matrix Assessment

	Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 *Protection of trees on development sites*. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.
	Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

REFERENCES

Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia

Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

Appendix C - Tree Inspection Data

Birds Tree Consultancy

Consulting Arborist• Project Management • Horticultural Consultancy • Landscape Management

Inspection Data 22-Nov-19

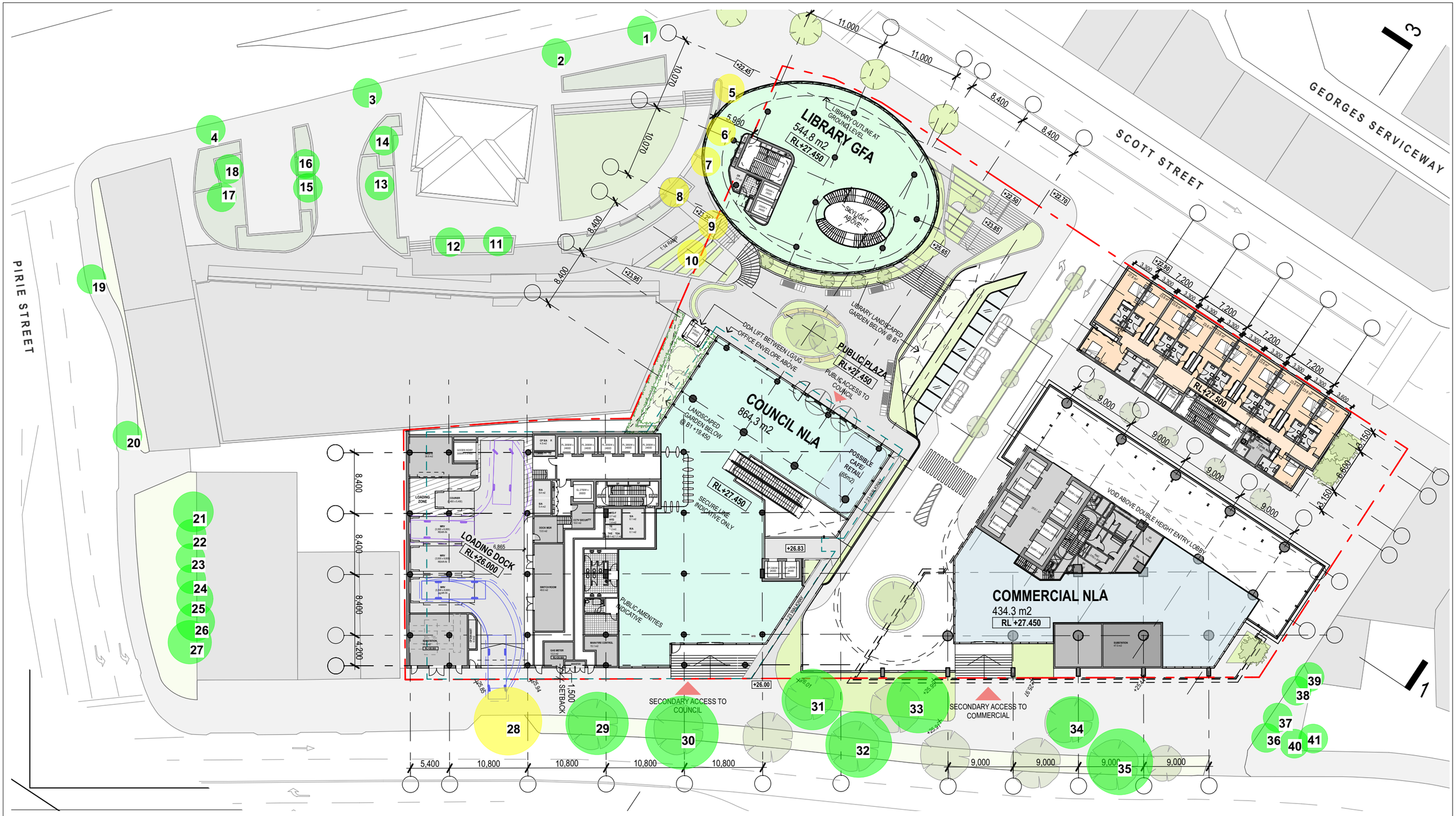
Liverpool Civic Centre

Tree no.	Species	Height (m)	Spread(m)	DBH (mm)	TPZ radius (m)	Maturity	Trunk (single, twin, multiple @)	Trunk lean	Form/Crown shape	Branching Habit	Crown Distribution	Stability	Branching Structure	Pruning History	Defects	Damage	Overall Health & Vigour	Canopy Density	Foliage	Deadwood	Epicormic Growth	Pest Infestation	Disease	Life expectancy	Env. & Landcape significance	Retention Value	Notes/Comments
1	Lagerstroemia indica	4	3	100	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
2	Lagerstroemia indica	4	2	100	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
3	Lagerstroemia indica	4	2	100	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
4	Lagerstroemia indica	4	3	100	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
5	Pyrus calleryana	4	2	120	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Poor	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Symptoms of drought stress
6	Pyrus calleryana	4	3	110	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Poor	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Symptoms of drought stress
7	Pyrus calleryana	4	2	110	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Poor	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Symptoms of drought stress
8	Pyrus calleryana	5	4	120	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Poor	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Symptoms of drought stress
9	Lagerstroemia indica	5	3	120	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Poor	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Symptoms of drought stress
10	Lagerstroemia indica	5	3	110	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Poor	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Symptoms of drought stress
11	Pyrus calleryana	4	3	110	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Poor	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Symptoms of drought stress
12	Pyrus calleryana	4	2	120	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Poor	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Symptoms of drought stress
13	Pyrus calleryana	4	3	100	2	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Poor	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Symptoms of drought stress
14	Pyrus calleryana	4	3	120	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
15	Pyrus calleryana	4	2	110	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
16	Pyrus calleryana	4	2	100	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
17	Pyrus calleryana	4	2	110	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Fair	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Symptoms of drought stress
18	Pyrus calleryana	4	3	110	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
19	Magnolia 'Little Gem'	3.5	2	100	2	Semi-mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
20	Magnolia 'Little Gem'	3	2	100	2	Semi-mature	Twin @ 1m	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
21	Waterhousia floribunda	5	5	230	2.76	Mature	Twin @ 1m	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
22	Waterhousia floribunda	5	4	170	2.04	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
23	Waterhousia floribunda	5	4	160	2	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
24	Waterhousia floribunda	5	4	140	2	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
25	Waterhousia floribunda	5	4	210	2.52	Mature	Twin @ 1m	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
26	Waterhousia floribunda	5	4	220	2.64	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
27	Waterhousia floribunda	5	4	250	3	Mature	Multiple @ base	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
28	Populus deltoides	13	10	390	4.68	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
29	Populus deltoides	13	8	360	4.32	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Fair	Normal	Normal	25%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Moderate apical dieback
30	Populus deltoides	13	10	420	5.04	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	

Tree no.	Species	Height (m)	Spread(m)	DBH (mm)	TPZ radius (m)	Maturity	Trunk (single, twin, multiple @)	Trunk lean	Form/Crown shape	Branching Habit	Crown Distribution	Stability	Branching Structure	Pruning History	Defects	Damage	Overall Health & Vigour	Canopy Density	Foliage	Deadwood	Epicormic Growth	Pest Infestation	Disease	Life expectancy	Env. & Landcape significance	Retention Value	Notes/Comments
31	Populus deltoides	11	12	350	4.2	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
32	Populus deltoides	13	9	380	4.56	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Fair	Normal	Normal	20%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Moderate apical dieback
33	Populus deltoides	12	9	360	4.32	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Fair	Normal	Normal	10%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	Some apical dieback
34	Populus deltoides	12	8	300	3.6	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
35	Populus deltoides	13	9	380	4.56	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
36	Cupressus sempervirens 'Stricta'	5	1	150	2	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
37	Cupressus sempervirens 'Stricta'	5	1	150	2	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
38	Cupressus sempervirens 'Stricta'	4	1	150	2	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
39	Cupressus sempervirens 'Stricta'	5	1	150	2	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
40	Cupressus sempervirens 'Stricta'	5	1	150	2	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	
41	Cupressus sempervirens 'Stricta'	4	1	150	2	Mature	Single	NIL	Normal	Normal	Balanced	Stable	Stable	No evidence	Nil	Nil	Good	Normal	Normal	<5%	<5%	No evidence	No evidence	15-40y	Moderate	Moderate	

Appendix D Tree Location Plans

Tree Protection Plans

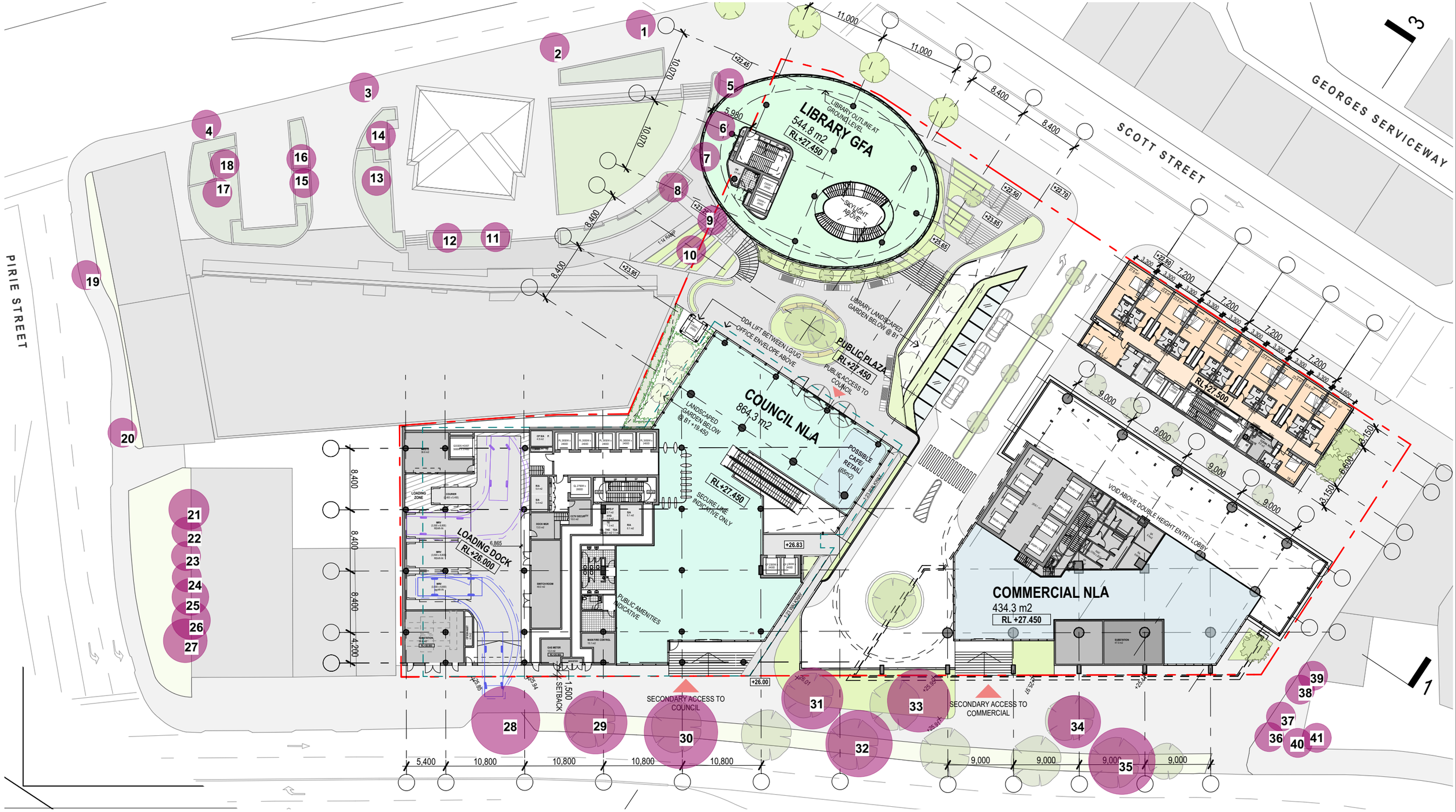


Legend

- Tree to be Retained and Protected
- Tree not viable to be retained due to proposed development
- Tree to be Removed or Exempt from Liverpool DCP 2008
- Tree Protection Zone (TPZ) in accordance with AS4970-2009

Birds Tree Consultancy
0438 892 634
glenn@birdstrees.com.au
www.birdstrees.com.au

Project: Liverpool Civic
Client: Built
DWG: A01 REV A
Plan: Tree Location Plan
Date: 27 Nov 2019 Scale : 1:500 @ A3



Legend

- Tree to be Retained and Protected
- Tree not viable to be retained due to proposed development
- Tree to be Removed or Exempt from Liverpool DCP 2008
- Tree Protection Zone (TPZ) in accordance with AS4970-2009

Birds Tree Consultancy
0438 892 634
glenn@birdstrees.com.au
www.birdstrees.com.au

Project: Liverpool Civic
Client: Built
DWG: A02 REV A
Plan: Tree Protection Zone Plan
Date: 27 Nov 2019 Scale : 1:500 @ A3