POWERHOUSE PARRAMATTA
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX J
ARBORICULTURAL IMPACT ASSESSMENT

Tree IQ

NSW GOVERNMENT

Project No: MA/AS/19 Report No: PH/PA/AIA/A

ARBORICULTURAL IMPACT ASSESSMENT

Powerhouse Parramatta
34-54 & 30B Phillip Street and 338 Church Street, Parramatta

Prepared for: INFRASTRUCTURE NSW

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Revision A

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Executive Summary

This Arboricultural Impact Assessment was prepared in relation to a State Significant Development (SSD) Development Application (DA) for the development of the Powerhouse Parramatta at 34-54 & 30B Phillip Street and 338 Church Street, Parramatta. Infrastructure NSW is the proponent of the DA.

The purpose of this Arboricultural Impact Assessment is to undertake a Visual Tree Assessment (VTA), determine the impact of the proposed works on the trees, and where appropriate, recommend the use of sensitive construction methods and tree protection measures to minimise adverse impacts.

Fifty-eight (58) trees and tree groups were assessed and comprise of a mix of locally indigenous, Australian native and exotic species. Of these, four (4) trees were allocated a Retention Value of *Priority for Retention,* twenty-four (24) trees were allocated a Retention Value of *Consider for Retention,* twenty-one (21) trees were allocated a Retention Value of *Consider for Removal* and nine (9) trees were allocated a Retention Value of *Priority for Removal.*

The supplied plans show Trees/Tree Groups 2-35 and 39-58 are to be removed as part of the proposed development. The supplied plans show Trees 1 and 36-38 are to be retained as part of the proposed development. Tree 1 *Eucalyptus* sp. (Eucalypt) is a large and prominent specimen located adjacent to Lennox Bridge and Trees 36-38 *Flindersia australis* (Crow's Ash) are street trees growing within southern Phillip Street road reserve.

Replacement tree planting should be undertaken to help off-set the loss of canopy cover and amenity resultant from the tree removal. Replacement planting should be advanced-size and supplied in accordance with *Australian Standard 2303 (2015) Tree Stock for Landscape Use.*

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Contents

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1.0 INTRODUCTION

1.1 Background

1.1.1 This Arboricultural Impact Assessment was prepared in relation to a State Significant Development (SSD) Development Application (DA) for the development of the Powerhouse Parramatta at 34-54 & 30B Phillip Street and 338 Church Street, Parramatta. The Powerhouse Parramatta is a museum (information and education facility) that has a capital investment value in excess of $30 million and as such the DA is submitted to the Minister for Planning pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Infrastructure NSW is the proponent of the DA.

1.1.2 The Powerhouse is Australia's contemporary museum for excellence and innovation in applied arts and sciences. The museum was established in 1879 in the Garden Palace which emerged from a history of 19th Century grand exhibition halls, including the Grand Palais. It currently encompasses the Powerhouse in Ultimo, Sydney Observatory in The Rocks and the Museums Discovery Centre in Castle Hill. The Powerhouse has occupied the Ultimo site since 1988.

1.1.3 Parramatta, in the heart of Western Sydney, is entering a period of rapid growth. It was identified in 2014's *A Plan for Growing Sydney* as the metropolis' emerging second Central Business District, with the provision of supporting social and cultural infrastructure regarded as integral to its success. The strategic importance of Parramatta as an economic and social capital for Sydney has been subsequently reinforced and further emphasised through its designation as the metropolitan centre of the Central City under the *Greater Sydney Region Plan*.

1.1.4 Powerhouse Parramatta will be the first State cultural institution to be located in Western Sydney – the geographical heart of Sydney. In December 2019, the Government announced the winning design, by Moreau Kusunoki and Genton, for the Powerhouse Parramatta from an international design competition.

1.1.5 The purpose of this Arboricultural Impact Assessment is to undertake a Visual Tree Assessment (VTA), determine the impact of the proposed works on the trees, and where appropriate, recommend the use of sensitive construction methods and tree protection measures to minimise adverse impacts.

1.1.6 This Arboricultural Impact Assessment has been prepared in accordance with *Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970)*. AS-4970 describes the best practices for the planning and protection of trees on development sites and outlines the procedures for managing trees through the development process. It does not argue for or against the works, or for the retention or removal of trees. The ecological value and heritage significance of the trees has not been assessed and is beyond the scope of this Report.

Refer to Methodology **(Appendix 1)**

1.1.7 This impact assessment is based on an assessment of the following supplied documentation/plans only:

- Schematic Design – Riverwalk & Undercroft Level – prepared by McGregor Coxall, dated 30.03.20
- Schematic Design – Podium Level – – prepared by McGregor Coxall, dated 30.03.20
- Schematic Design – Rooftop Garden Level – prepared by McGregor Coxall, dated 30.03.20
- Schematic Design – Tree Retention & Removal Plan – prepared by McGregor Coxall, dated 30.03.20
- Schematic Design – Trees Proposed – prepared by McGregor Coxall, dated 30.03.20
- Existing Site Plan – prepared by Moreau Kusunoki and Genton, dated 01.04.20
- Site Demolition Plan – prepared by Moreau Kusunoki and Genton, dated 01.04.20
- Proposed Site Masterplan – prepared by Moreau Kusunoki and Genton, dated 01.04.20

Refer to Plans **(Appendix 2)**

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1.1.8 In preparing this Report, the authors have considered the objectives of the following:

- *State Environmental Planning Policy Vegetation in Non-Rural Areas (2017)*
- *Parramatta Local Environmental Plan (2011)*
- *Parramatta Council's Development Control Plan (2011) - Part 5.4 (Preservation of Trees and Vegetation)*
- *Australian Standard 4970 Protection of Trees on Development Sites (2009)*
- *Australian Standard 4373 Pruning of Amenity Trees (2007)*
- *Australian Standard 2303 Tree Stock for Landscape Use (2015)*
- *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016)*

1.2 The Proposal

1.2.1 The SSD DA seeks consent for the delivery of the Powerhouse Parramatta as a single stage, comprising:

- site preparation works, including the termination or relocation of site services and infrastructure, tree removal and the erection of site protection hoardings and fencing;
- demolition of existing buildings including the existing Riverbank Car Park, 'Willow Grove', 'St George's Terrace' and all other existing structures located on the site;
- construction of the Powerhouse Parramatta, including:
    - seven (7) major public presentation spaces for the exhibition of Powerhouse Collection;
    - front and back-of-house spaces;
    - studio, co-working and collaboration spaces comprising the 'Powerlab', supported by 40 residences (serviced apartments) for scientists, researchers, students and artists and 60 dormitory beds for school students;
    - education and community spaces for staff, researchers and the Powerlab residents, the community, and education and commercial hirers;
    - commercial kitchen comprising the 'Powerlab Kitchen' used for cultural food programs, research, education and events;
    - film, photography, and postproduction studios that will connect communities with industry and content that will interpret the Powerhouse Collection;
    - public facing research library and archive for community, industry, students and researchers to access materials; and
    - a mix of retail spaces including food and drink tenancies with outdoor dining.
- operation and use of the Powerhouse Parramatta including use of the public domain provided on the site to support programs and functions;
- maintenance of the existing vehicular access easement via Dirrabarri Lane, the removal of Oyster Lane and termination of George Khattar Lane, and the provision of a new vehicular access point to Wilde Avenue for loading;
- public domain within the site including new public open space areas, landscaping and tree planting across the site; and
- building identification signage.

1.2.2 The project does not seek consent for the carrying out of works outside of the site boundary, and in particular does not involve any alterations to the existing edge of the formed concrete edge of the Parramatta River or to the waterway itself.

2.0 RESULTS

2.1 The Site

2.1.1 The site is located at the northern edge of the Parramatta CBD on the southern bank of the Parramatta River. It occupies an area of approximately 2.5 hectares and has extensive frontages to Phillip Street, Wilde Avenue and the Parramatta River. A small portion of the site extends along the foreshore of the Parramatta River to the west, close to the Lennox Street Bridge on Church Street. The site excludes the GE Office Building at 32 Phillip Street.

Refer to **Figures 1 & 2**

Figure 1: Showing aerial photograph of the site and its context

2.1.2 The site is currently occupied by a number of buildings and structures, including:

- Riverbank Car Park – a four-level public car park
- Willow Grove – a two-storey villa of Victorian Italianate style constructed in the 1870s
- St George's Terrace – a two-storey terrace of seven (7) houses fronting Phillip Street constructed in the 1880s
- 36 Phillip Street – a two-storey building comprising retail and business premises
- 40 Phillip Street – a two-storey building comprising retail and business premises
- 42 Phillip Street – a substation building set back from the street

2.1.3 The immediate context of the site comprises a range of land uses including office premises, retail premises, hotel, serviced apartments and residential apartments. To the north is the Parramatta River and open space corridor, beyond which are predominately residential uses. The Riverside Theatre is located to the north-west across the Parramatta River.

Figure 2: Showing site boundary, key existing features, and immediate local context
Source: Ethos Urban

2.2 The Trees

2.2.1 Fifty-eight (58) trees and tree groups were assessed using the Visual Tree Assessment[1] (VTA) criteria and notes, and comprise of a mix of locally indigenous, Australian native and exotic species. Twenty-seven (27) species are represented.

2.2.2 Trees 1-19 are located on the southern riverbank, Trees 20-24 and 53-55 are located adjacent to the multi-storey carpark, Trees 25-31 and 33-35 are located within the at-grade carpark and Tree 32 is located to the rear of the multi-storey commercial building (32 Phillip Street). Trees 36-39 are street trees located within the northern road reserve of Phillip Street and Trees 40-58 are located within Willow Grove.

2.2.3 Archival and historical aerial images of the site were reviewed in preparation of this Report to assist with determining tree age and significance. However, it is not possible to definitively identify those trees which may have been planted at the time of construction of Willow Gove or was pre-existing vegetation.

2.2.4 A search of the BioNet Atlas of NSW Wildlife Database was undertaken in April 2020. No individual threatened tree species listed within this database for the locality were identified during the field investigations of the site.[2]

[1] Mattheck & Breloer (2003)
[2] NSW Office of Environment and Heritage (2011)

2.2.5 As required by Clause 2.3.2 of *Australian Standard 4970 Protection of Trees on Development Sites (2009)*, each of the trees assessed has been allocated a Retention Value. TreeiQ allocates one of four Retention Value categories based on a combination of Landscape Significance and Useful Life Expectancy (ULE). The assessment of Landscape Significance and ULE involves a degree of subjectivity and there will be a range of tree quality and value within each of the Retention Value categories. The Retention Values do not consider any proposed development works and are not a schedule for tree retention or removal. The trees have been allocated one of the following Retention Values:

- Priority for Retention
- Consider for Retention
- Consider for Removal
- Priority for Removal

Refer to Tree Assessment Schedule **(Appendix 3)**

3.0 ARBORICULTURAL IMPACT ASSESSMENT

3.1 Tree 1

3.1.1 Tree 1 is a *Eucalyptus* sp. (Eucalyptus), possibly *E.saligna x E.botryoides* (Wollongong Wolleybutt), however no fruit was available to identify the tree to species level. The tree is located on the southern riverbank adjacent to Lennox Bridge. The tree is in fair health and structural condition with a reduced crown density and small (<25mmø) and medium (25-75mm) epicormic growth in moderate volumes present in its crown. The limited basal flare at the base of the trunk indicates that ground levels within the tree's root zone have been raised, possibly as part of previous bridge and/or landscape works. These works may have contributed to the reduction in tree health. Tree 1 is of high Landscape Significance and has been allocated a Retention Value of *Priority for Retention.*

3.1.2 Aerial images of the site from 1943 show a concentration of mature vegetation adjacent to Lennox Bridge.[3] It is not possible to determine the exact age of Tree 1 however it may be a component of this stand of trees.

3.1.3 The supplied plans show the existing pathway adjacent to Parramatta River and within the Tree Protection Zone (TPZ) of Tree 1 is to be demolished and rebuilt. The design is schematic at present.

3.1.4 Future landscape works within the TPZ of Tree 1 should be undertaken using tree sensitive methods. The tree is of significant age and in fair health, and will less tolerant of construction impacts than younger, more vigorous trees. The new pathway within the TPZ should be installed above grade using tree sensitive design and construction methods (e.g. permeable surface finishes and sub-base layers/slabs) with only very minimal compaction of the sub-grade.

3.1.5 If possible, no grading works, over-excavation or benching/battering should be undertaken within the TPZ and mechanical cultivation should be avoided. Underground services should be routed outside of the TPZ. Where this is not possible, trenches will need to be excavated using tree sensitive methods.

3.1.6 The placement of seating below the crown of Tree 1 should be avoided as it is expected the tree will produce deadwood in increasing volumes as its ages.

[3] NSW Government Spatial Services (2016); Parramatta Heritage Centre (2014)

3.2 Tree 2

3.2.1 Tree 2 was identified as *Casuarina glauca* (Swamp She Oak) and is located on the southern riverbank. The tree is in fair health and good structural condition with small (<25mmø) and medium (25-75mmø) deadwood in moderate volumes present within its crown. Previous works on the riverbank may have contributed to the reduction in tree health. Tree 2 is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.*

3.2.2 *Casuarina glauca* (Swamp She Oak) is a locally indigenous species. Aerial images of the site from 1943 show a tree in this location.[4] Despite its relatively small size, it is possible this is the tree in the 1943 aerial image.

3.2.3 The supplied plans show Tree 2 is to be removed as part of the proposed landscape treatment.

3.3 Tree 3

3.3.1 Tree 3 was identified as *Jacaranda mimosifolia* (Jacaranda) and is located on the southern riverbank. The tree is in fair health and structural condition. A depressed seam of tissue is present on the lower trunk which has the appearance of a partially grafted bark inclusion. Tree 3 has a medium (15-40 years) Useful Life Expectancy (ULE) although it is estimated to fall within the lower end of this range. If retained, internal diagnostic testing (i.e. Resistograph or Tomograph) should be undertaken to assess the internal structural condition of the tree's trunk. The tree is of high Landscape Significance and has been allocated a Retention Value of *Priority for Retention.*

3.3.2 Aerial images of the site from 1943 show a tree in this location.[5] *Jacaranda mimosifolia* (Jacaranda) was a common ornamental planting in the Victorian period. Tree 3 may have been planted and formed part the broader landscape of Willow Grove, prior to its subdivision in 1952.[6]

3.3.3 The supplied plans show Tree 3 is to be removed as part of the proposed landscape treatment.

3.4 Trees 4 & 8

3.4.1 Trees 4 and 8 were identified as *Corymbia maculata* (Spotted Gum) and are located on the southern riverbank. The trees are of moderate Landscape Significance and have been allocated a Retention Value of *Consider for Retention.*

3.4.2 The supplied plans show Trees 4 and 8 are to be removed as part of the proposed landscape treatment.

3.5 Trees 5-7 & 9-14

3.5.1 Trees 5-7 and 9-14 were identified as *Eucalyptus tereticornis* (Forest Red Gum) and are located on the southern riverbank. In general, the trees are in fair health and fair to poor structural condition with reduced crown densities and the presence of large wounds with decay. The limited basal flare at the base of the trunks indicates that ground levels within the trees' root zones have been raised, possibly as part of recent landscaping works. These works may have contributed to the reduction in tree health.

[4] NSW Government Spatial Services (2016)
[5] NSW Government Spatial Services (2016)
[6] Form Architects (2017)

3.5.2 Trees 5, 7 and 13 are of low Landscape Significance and Trees 6, 9-12 and 14 are of moderate Landscape Significance. Trees 6 and 14 have been allocated a Retention Value of *Consider for Retention* and Trees 5, 7 and 9-13 have been allocated Retention Values of either *Consider for Removal* or *Priority for Removal.*

3.5.3 *Eucalyptus tereticornis* (Forest Red Gum) are a locally indigenous species. Based on their age, location and planting arrangement, it is assumed the trees were planted as part of, or after, construction of the multi-storey carpark.

3.5.4 The supplied plans show Trees 5-7 and 9-14 are to be removed to accommodate the proposed building footprint and landscape treatment.

3.6 Tree 15

3.6.1 Tree 15 was identified as *Corymbia maculata* (Spotted Gum) and is located on the southern riverbank. The tree is of fair health and structural condition with small (<25mmø) deadwood and epicormic growth in moderate volumes present within its crown. A large wound is located on the tree's trunk from 4m above grade. Tree 15 is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.*

3.6.2 The supplied plans show Tree 15 is to be removed as part of the proposed landscape treatment.

3.7 Trees 16-23

3.7.1 Trees 16-21 were identified as *Eucalyptus saligna* (Sydney Blue Gum), Tree 22 was identified as *Corymbia citriodora* (Lemon Scented Gum) and Tree 23 was identified as *Corymbia citriodora* (Lemon Scented Gum). The trees are located to the east of the multi-storey carpark.

3.7.2 Trees 16-21 appear to have been impacted by a sap sucking insect which has caused discolouration of the foliage and a degree of premature leaf shedding. Trees 16-21 and 23 are of moderate Landscape Significance and have been allocated a Retention Value of *Consider for Retention.*

3.7.3 Tree 22 is a heavily suppressed specimen which is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.*

3.7.4 The supplied plans show Trees 16-23 are to be removed to accommodate the proposed building footprint and landscape treatment.

3.8 Tree 24

3.8.1 Tree 24 was identified as *Eucalyptus robusta* (Swamp Mahogany) and is located to the east of the multi-storey carpark. The tree is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.*

3.8.2 The supplied plans show Tree 24 is to be removed to accommodate the proposed building footprint.

3.9 Trees 25-27

3.9.1 Trees 25-27 were identified as *Livistonia australis* (Cabbage Tree Palm) and are located within the north-eastern corner of the at-grade carpark. The trees are of low Landscape Significance and have been allocated a Retention Value of *Consider for Removal.*

3.9.2 The supplied plans show Trees 25-27 are to be removed to accommodate the proposed building footprint.

3.10 Tree 28 & Tree Group 56

3.10.1 Tree 28 and Tree Group 56 were identified as *Populus nigra* 'Italica' (Lombardy Poplar) and are located within Willow Grove, adjacent to the boundary of the at-grade carpark. The trees are in fair health and fair to poor structural condition. Tree 28 has a large trunk wound with advanced stages of decay. Poplar species are generally recognised as having soft timber which decays readily and the presence of cavities in older trees is not uncommon.

3.10.2 Tree 28 is of moderate Landscape Significance and has been allocated a Retention Value of *Priority for Removal.* Tree Group 56 is of low Landscape Significance has been allocated a Retention Value of *Consider for Removal.*

3.10.3 It is not possible to determine if Tree 28 and Tree Group 56 are original plantings associated with Willow Grove. None of the trees are particularly large, and as this species has a tendency to produce prolific root suckers, it is possible that the trees could have developed from the root systems of previous specimens.

3.10.4 *Populus nigra* 'Italica' (Lombardy Poplar) is listed as exempt species within Part 5.4 Preservation of Trees and Vegetation (Table 5.4.3.1) of the *Parramatta Development Control Plan (2011)*.[7] However, consent for tree pruning/removal is required from Council due to their location within the heritage-listed Willow Grove.

3.10.5 The supplied plans show Tree 28 and Tree Group 56 are to be removed to accommodate the proposed building footprint.

3.11 Tree 29

3.12.1 Tree 29 was identified as *Harpullia pendula* (Tulipwood) and is located on the eastern boundary of the at-grade carpark. The tree is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.*

3.12.2 The supplied plans show Tree 29 is to be removed to accommodate the proposed building footprint.

3.12 Tree 30

3.12.1 Tree 30 was identified as *Corymbia gummifera* (Bloodwood) and is located on the eastern boundary of the at-grade carpark. The tree has a short (5-15 years) ULE due the development of a bark inclusion between co-dominant stems at the tree's base. The defect is not considered a significant hazard in the short term however the likelihood of branch failure will increase over the medium to long term as branches develop in size, weight and sail area. Tree 30 is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.*

3.12.2 The supplied plans show Tree 30 is to be removed to accommodate the proposed building footprint.

3.13 Tree 31

3.13.1 Tree 31 was identified as *Schinus molle* var. *areira* (Peppercorn Tree) and is located on the boundary of the at-grade carpark and Willow Grove. The tree is in fair health and poor structural condition with the base of the trunk overgrowing and displacing the adjacent section of kerb which is likely providing a degree of support to the tree. A cavity which inevitably extends into a column of internal decay is also present on the trunk. Tree 31 is of moderate Landscape Significance and has been allocated a Retention Value of *Priority for Removal.*

3.13.2 The supplied plans show Tree 31 is to be removed to accommodate the proposed building footprint.

[7] Parramatta Council (2011)

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3.14 Tree 32

3.14.1 Tree 32 was identified as *Jacaranda mimosifolia* (Jacaranda) and is located on the boundary of the at-grade carpark and behind the multi-storey commercial building (32 Phillip St). The tree has developed a poor crown form from suppression from the adjacent building and poor pruning practices. The tree is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.*

3.14.2 The supplied plans show Tree 32 is to be removed to accommodate the proposed building footprint.

3.15 Trees 33-35

3.15.1 Tree 33 was identified as *Lophostemon confertus* (Brush Box), Tree 34 was identified as *Corymbia ficifolia* (Red Flowering Gum) and Tree 35 was identified as *Eucalyptus* sp. (Eucalyptus). They are located in a garden bed within the at-grade carpark. Trees 33 and 35 are of moderate Landscape Significance and have been allocated a Retention Value of *Consider for Retention.* Tree 34 is a heavily suppressed specimen which is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.*

3.15.2 The supplied plans show Trees 33-35 are to be removed to accommodate the proposed building footprint.

3.16 Tree 36-39

3.16.1 Tree 36-39 were identified as *Flindersia australis* (Crow's Ash) and are located within southern Phillip Street road reserve.

3.16.2 Tree 36 has a short (5-15 years) ULE due the development of a bark inclusion between co-dominant stems and a large trunk wound. These defects are not considered a significant hazard in the short term however the likelihood of branch failure will increase in the medium to long term as the branches develop in size, weight and sail area. Tree 36 is of moderate Landscape Significance and have been allocated a Retention Value of *Consider for Retention.*

3.16.3 Trees 37-39 are semi-mature specimens which are of low Landscape Significance and have been allocated a Retention Value of *Consider for Removal.*

3.16.4 The supplied plans show Tree 36-38 are to be retained and no works are proposed within their TPZ areas. Tree 39 is to be removed to accommodate the proposed bus bay.

3.17 Tree 40

3.17.1 Tree 40 was identified as *Cupressus macrocarpa* (Monterey Cypress) and is located within the front garden area of Willow Grove. A small raised garden bed has been constructed around the base of the trunk which has buried the tree's root collar. The tree is of high Landscape Significance and has been allocated a Retention Value of *Priority for Retention*.

3.17.2 Tree 40 can be seen as a semi-mature specimen in archival photos from circa 1890s and was most likely planted as part of the original Willow Grove landscape.[8]

3.17.3 The supplied plans show Tree 40 is to be removed to accommodate the proposed building footprint.

[8] Form Architects (2017)

3.18 Trees 41, 43 & 50

3.18.1 Trees 41, 43 and 50 were identified as *Cinnamomum camphora* (Camphor Laurel). Trees 41 and 43 and are located adjacent to the western boundary of Willow Grove and Tree 50 is located on the eastern boundary. Tree 50 is growing in a narrow garden bed between the timber boundary fence and a low brick wall. The expansion of the trunk has cracked and is displacing a section of the wall. The trees are of moderate Landscape Significance. Trees 41 and 43 have been allocated a Retention Value of *Consider for Retention* and Tree 50 has been allocated a Retention Value of *Priority for Removal.*

3.18.2 Aerial images of the site from 1943 show a group of mature trees in the location of Trees 41 and 43.[9] This species has a tendency to produce prolific root sucker and may have developed from the root systems of previous specimens. The trees have an etiolated form which would suggest that they were subject to shading during their development into maturity, possibly from the construction of the adjacent multi-storey building circa 1980s.[10] Therefore, the trees may not be landscape plantings associated with the development of Willow Grove.

3.18.3 *Cinnamomum camphora* (Camphor Laurel) are generally considered environmental weed species due to their propensity self-seed. The trees are protected by the tree management controls within the *Parramatta Development Control Plan (2011)* and consent for tree pruning/removal is required from Council.[11]

3.18.4 The supplied plans show Trees 40, 41 and 50 are to be removed to accommodate the proposed building footprint.

3.19 Tree 42

3.19.1 Tree 42 was identified as *Castanospermum australe* (Black Bean) and is located adjacent to the western boundary of Willow Grove. The tree is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention*.

3.19.2 Aerial images of the site from 1943 show a group of mature trees in the location of Tree 42.[12] It is not possible to determine if this tree forms part of the 1943 stand or if the tree was a landscape planting associated with the development of Willow Grove.

3.19.3 The supplied plans show Tree 42 is to be removed to accommodate the proposed building footprint.

3.20 Trees 44-46

3.20.1 Trees 44 and 45 were identified as *Jacaranda mimosifolia* (Jacaranda) and Tree 46 was identified as *Flindersia australis* (Crow's Ash). The trees are located in the front garden area of Willow Grove.

3.20.2 Trees 44 and 46 are semi-mature specimens which are of low Landscape Significance and have been allocated a Retention Value of *Consider for Removal.*

3.20.3 Tree 45 is in fair structural condition with a cavity in a short, first order branch stub on the lower trunk. This cavity may to extend as a column of decay in the heartwood tissue of the trunk. Tree 45 has a medium (15-40 years) ULE although it is estimated to fall within the lower end of this range. If retained, internal diagnostic testing (i.e. Resistograph or Tomograph) should be undertaken to assess the internal structural condition of the tree's trunk. Tree 45 is of high Landscape Significance and has been allocated a Retention Value of *Priority for Retention.*

[9] NSW Government Spatial Services (2016)
[10] Form (2017)
[11] Parramatta Council (2011)
[12] NSW Government Spatial Services (2016)

3.20.4 Aerial images of the site from 1943 show a tree in the location of Tree 45.[13] *Jacaranda mimosifolia* (Jacaranda) was a common ornamental planting in the Victorian period and may have been planted as part the Willow Grove landscape.

3.20.5 The supplied plans show Trees 44-46 are to be removed to accommodate the proposed building footprint.

3.21 Tree Groups 47 & 48

3.21.1 Tree Group 47 are a row of seven (7) *Elaeocarpus reticulatus* (Blueberry Ash) and Tree Group 48 are a row of five (5) *Syzygium leuhmanni* (Small Leaf Lillypilly). The trees are located adjacent to the eastern boundary of Willow Grove. Tree Groups 47 and 48 are of low Landscape Significance and have been allocated a Retention Value of *Consider for Removal.*

3.21.2 The supplied plans show Tree Groups 47 and 48 are to be removed to accommodate the proposed building footprint.

3.22 Tree 49

3.22.1 Tree 49 was identified as *Melaleuca quinquenervia* (Broad Leaved Paperbark) and is located adjacent to the eastern boundary of Willow Grove. Tree 49 is in fair health and structural condition due to a reduced crown density and the presence of bark inclusions, typical of this species. The tree is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.*

3.22.2 The supplied plans show Tree 49 is to be removed to accommodate the proposed building footprint.

3.23 Tree Group 51 & Tree 52

3.23.1 Tree Group 51 and Tree 52 were identified as *Ailanthus altissima* (Tree of Heaven) and are located adjacent to the eastern boundary of Willow Grove. The trees are of low Landscape Significance and have been allocated a Retention Value of *Priority for Removal.*

3.23.2 *Ailanthus altissima* (Tree of Heaven) is listed as exempt species within Part 5.4 Preservation of Trees and Vegetation (Table 5.4.3.1) of the *Parramatta Development Control Plan (2011)*.[14] However, consent for tree pruning/removal is required from Council due to their location within the heritage-listed Willow Grove.

3.23.3 The supplied plans show Tree Group 51 and Tree 52 are to be removed to accommodate the proposed building footprint.

3.24 Trees 53-55

3.24.1 Tree 53-55 were identified as *Platanus xacerifolia* (London Plane Tree) and are located within the at-grade carpark to the north of St George Terraces. Trees 53 and 55 are of moderate Landscape Significance and have been allocated a Retention Value of *Consider for Retention.* Tree 54 is a heavily suppressed, semi-mature specimen of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.*

3.24.2 The supplied plans show Trees 53-55 are to be removed to accommodate the proposed building footprint.

[13] NSW Government Spatial Services (2016)
[14] Parramatta Council (2011)

3.25 Tree Groups 57 & 58

3.25.1 Tree Group 57 is a group of *Strelitzia nicolai* (Giant Bird of Paradise) located along the western boundary of Willow Grove. Tree Group 58 is a group of *Howea forsteriana* (Kentia Palm) and *Archontophoenix* spp. located along the western boundary of Willow Grove. The trees are of low Landscape Significance and have been allocated a Retention Value of *Consider for Removal*.

3.25.2 The supplied plans show Tree Groups 57 and 58 are to be removed to accommodate the proposed building footprint.

4.0 REPLACEMENT TREE PLANTING

4.1 Species Selection

4.1.1 The supplied plans show several new trees are to be installed as part of the proposed landscape treatment to help off-set the loss of canopy cover and amenity resultant from the tree removal. No species have been selected as part of the schematic design.

4.1.2 Research shows the cost benefits provided by large trees to be proportionately much greater than that of small trees due to their ability to shade, screen, absorb greater volumes of carbon dioxide and pollutants. In addition, a broad species diversity is an essential element in maintaining a healthy tree population. Current urban forestry best practice suggests a species diversity comprising of no more than 40% for any particular family, 30% for any particular genus, and 10% for any one species.[15] Most importantly, the tree species should be selected to provide the right tree for the right place.

4.2 Tree Pit Design

4.2.1 Sufficient space below ground for adequate root development is critical to ensure the trees establish successfully and thrive over the long term. The following design options should be considered to ensure optimum conditions for tree growth are provided:

- Linking tree pits and utilising the available space beneath pavement surfaces to achieve the required soil volumes.
- Using structural soil cells and structural soil mixes beneath pavements – these products maximize the available space for root development whilst providing adequate support for the pavement. Soil cells provide the greatest available soil volumes (up to 94%).[16]
- Using suspended pavements – these structures are engineered to be supported above the soil therefore eliminating the requirement for soil/sub-base compaction.
- Using pervious paving materials – these surfaces and subbase products can be used to allow water infiltration and gaseous exchange through the soil profile.

4.3 Soils Volumes & Depth

4.3.1 Limited soil volumes, particularly in paved areas and over structures, can be a major limitation to tree health and development. It is assumed that artificial soil profiles will need to be installed as some of new tree plantings will be on structure, below paving or in areas where the existing site soil is unsuitable for plant growth. Table 1 provides generic soil volumes for different tree sizes.

[15] City of Sydney (2013).
[16] Urban J (2009)

4.3.2 Table 1: Generic Soil Volumes[17]

Tree Size	Soil Volume (harsh sites)	Soil Volume (favorable sites)
Small (<7m)	$36m^3$	$25m^3$
Medium (7-10m)	$38m^3$	$27m^3$
Large (10m+)	$39m^3$	$27m^3$

4.3.3 A minimum soil depth of 750mm (excluding drainage) should be provided for new tree plantings. This minimum depth is required to ensure new trees develop a root system adequate to withstand potential, severe wind tunnel effects. Soil depths should not exceed 1.2m (excluding drainage) to ensure the maximum possible area for lateral root spread is provided.

4.4 Planting Locations

4.4.1 Adequate above ground space is required to maximise tree longevity and minimise potential conflicts with infrastructure. The following factors should be considered when selecting new tree planting locations:

- Shadowing from adjacent structures
- Conflict with adjacent structures and infrastructure
- Pedestrian and vehicular clearance
- Sight lines, vistas and view corridors
- Planting distances from other trees

4.5 Stock Selection & Procurement

4.5.1 Selecting a healthy and structurally sound tree with traits appropriate to site constraints can help to prevent future problems. Poorly grown stock will greatly reduce a tree's potential and is likely to have greater maintenance costs over its lifetime. *Australian Standard 2303: Tree Stock for Landscape Use (2015)* provides recommendations and specifications for the production of quality nursery stock. Newly planted trees should meet these standards as a minimum.

4.5.2 Forward-ordering and contract growing from specialised tree nurseries should be undertaken to ensure availability of species and numbers. Additional trees should be ordered to allow for the rejection of individual trees which are of insufficient quality or as replacements for any trees which fail to establish.

4.5.3 Lead times for growing trees will vary greatly between species (i.e growth rates) and starter stock available (i.e. what is either currently in production or able to be outsourced to grow-on). Table 2 provides generic estimations based on expected growth rates of fast, medium and slow growing species. Once species have been selected, more accurate projections can be determined based on growth rates for the individual species and starter stock available.

4.5.4 Table 2: Generic Growth Rates[18]

Growth Rate	Start	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Fast	25L	100L	250L	500L	800L	1200L	1500L	2000L
Medium	25L	45L	100L	200L	400L	700L	900L	1200L
Slow	25L	45L	100L	150L	250L	350L	450L	600L

[17] City of Sydney (2015)
[18] Trees Impact (2017)

6.0 LIMITATIONS & DISCLAIMER

TreeiQ takes care to obtain information from reliable sources. However, TreeiQ can neither guarantee nor be responsible for the accuracy of information provided by others. Plans, diagrams, graphs and photographs in this Arboricultural Report are visual aids only and are not necessarily to scale. This Report provides recommendations relating to tree management only. Advice should be sought from appropriately qualified consultants regarding design/construction/ecological/heritage etc issues.

This Report has been prepared for exclusive use by the client. This Report shall not be viewed by others or for any other reason outside its intended target or without the prior written consent of TreeiQ. Unauthorised alteration or separate use of any section of the Report invalidates the Report.

Many factors may contribute to tree failure and cannot always be predicted. TreeiQ takes care to accurately assess tree health and structural condition. However, a tree's internal structural condition may not always correlate to visible external indicators. There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the trees or site may not arise in the future. Information contained in this report covers only the trees assessed and reflects the condition of the trees at the time of inspection. Additional information regarding the methodology used in the preparation of this Report is attached as Appendix 1. A comprehensive tree risk assessment and management plan for the trees is beyond the scope of this Report.

Reference should be made to any relevant legislation including Tree Management Controls. All recommendations contained within this Report are subject to approval from the relevant Consent Authority.

7.0 BIBLIOGRAPHY & REFERENCES

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Department of Primary Industries (2017), *NSW Weedwise*

Form Architects (2017), *Conservation Management Plan for Willow Grove*

Mattheck & Breloer (2003), *The Body Language of Trees: A Handbook for Failure Analysis*, The Stationary Office, London

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Office of Environment and Heritage (2011), *BioNet Atlas of NSW Wildlife*

Parramatta City Council (2011), *Parramatta Development Control Plan 2011 (Section 5.4 Preservation of Trees or Vegetation)*.

Safe Work Australia (2016), *Guide for Managing Risks of Tree Trimming and Removal Work*

Standards Australia (2009), *Protection of Trees on Development Sites AS-4970*

Standards Australia (2015), *Tree Stock for Landscape Use AS-2303*

8.0 APPENDICES

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Appendix 1: Methodology

1.1 **Site Inspection**: This report was determined as a result of a comprehensive site inspection during October 2019.

1.2 **Visual Tree Assessment (VTA)**: The subject tree(s) was assessed using the Visual Tree Assessment criteria and notes as described in *The Body Language of Trees – A Handbook for Failure Analysis.*[19] The inspection was limited to a visual examination of the subject tree(s) from ground level only. No internal diagnostic or tissue testing was undertaken as part of this assessment. Trees outside the subject site were assessed from the property boundaries only.

1.3 **Tree Dimensions**: The dimensions of the subject tree(s) are approximate only.

1.4 **Tree Locations:** The location of the subject tree(s) was determined from the supplied plans. Trees not shown on the supplied plans have been plotted in their **approximate location only.**

1.5 **Trees & Development**: Tree Protection Zones, Tree Protection Measures and Sensitive Construction Methods for the subject tree were based on methods outlined in *Australian Standard 4970-2009 Protection of Trees on Development Sites*.

The *Tree Protection Zone* (TPZ) is described in AS-4970 as a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

The *Structural Root Zone* (SRZ) is described in AS-4970 as the area around the base of a tree required for the tree's stability in the ground. Severance of structural roots within the SRZ is not recommended as it may lead to the destabilisation and/or demise of the tree.

In some cases it may be possible to encroach into or make variations to the theoretical TPZ. A *Minor Encroachment* is less than 10% of the area of the TPZ and is outside the SRZ. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. A *Major Encroachment* is greater than 10% of the TPZ or inside the SRZ. In this situation the Project Arborist must demonstrate that the tree would remain viable. This may require root investigation by non-destructive methods or the use of sensitive construction methods.

1.6 **Tree Health**: The health of the subject tree(s) was rated as *Good*, *Fair* or *Poor* based on an assessment of the following factors:

I. Foliage size and colour
II. Pest and disease infestation
III. Extension growth
IV. Crown density
V. Deadwood size and volume
VI. Presence of epicormic growth

1.7 **Tree Structural Condition**: The structural condition of the subject tree(s) was rated as *Good*, *Fair* or *Poor* based on an assessment of the following factors:

I. Assessment of branching structure
(i.e. co-dominant/bark inclusions, crossing branches, branch taper, terminal loading, previous branch failures)
II. Visible evidence of structural defects or instability
(i.e. root plate movement, wounds, decay, cavities, fungal brackets, adaptive growth)
III. Evidence of previous pruning or physical damage
(root severance/damage, lopping, flush-cutting, lions tailing, mechanical damage)

1.8 **Useful Life Expectancy (ULE)**: The ULE is an estimate of the longevity of the subject tree(s) in its growing environment. The ULE is modified where necessary to take in consideration tree(s) health, structural condition and site suitability. The tree(s) has been allocated one of the following ULE categories (Modified from Barrell, 2001):

I. 40 years +
II. 15-40 years
III. 5-15 years
IV. Less than 5 years

[19] Mattheck & Breloer (2003)

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1.9 **Landscape Significance**: Landscape Significance was determined by assessing the combination of the cultural, environmental and aesthetic values of the subject tree(s). Whilst these values are subjective, a rating of high, moderate, low or insignificant has been allocated to the tree(s). This provides a relative value of the tree's Landscape Significance which may aid in determining its Retention Value. If the tree(s) can be categorized into more than one value, the higher value has been allocated.

Landscape Significance	Description
Very High	The subject tree is listed as a Heritage Item under the *Local Environmental Plan* with a local or state level of significance.
	The subject tree is listed on Council's Significant Tree Register or meets the criteria for significance assessment of trees and/or landscapes by a suitably qualified professional. The criteria are based on general principles outlines in the Burra Charter and on criteria from the Register of the National Estate.
High	The subject tree creates a 'sense of place' or is considered 'landmark' tree.
	The subject tree is of cultural or historical importance or is widely known.
	The subject tree is a prominent specimen which forms part of the curtilage of a heritage item with a known or documented association with that item.
	The subject tree has been identified by a suitably qualified professional as a species scheduled as a Threatened or Vulnerable Species for the site defined under the provisions of the NSW *Biodiversity Conservation Act (2016)* or the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (1999).
	The subject tree is known to contain nesting hollows to a species scheduled as a Threatened or Vulnerable Species for the site as defined under the provisions of the NSW *Biodiversity Conservation Act (2016)* or the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (1999).
	The subject tree is an excellent representative of the species in terms of aesthetic value.
	The subject tree is of significant size, scale or makes a significant contribution to the canopy cover of the locality.
Moderate	The subject tree makes a positive contribution to the visual character or amenity of the area.
	The subject tree provides a specific function such as screening or minimising the scale of a building.
	The subject tree is a good representative of the species in terms of aesthetic value.
Low	The subject tree is a known environmental weed species or is exempt under the provisions of the local Council's Tree Management Controls
	The subject tree makes little or no contribution to the amenity of the locality.
	The subject tree is a poor representative of the species in terms of aesthetic value.

1.10 **Retention Value**: Retention Value was based on the subject tree's Useful Life Expectancy and Landscape Significance. The Retention Value was modified where necessary to take in consideration the subject tree's health, structural condition and site suitability. The subject tree(s) has been allocated one of the following Retention Values:

I. Priority for Retention
II. Consider for Retention
III. Consider for Removal
IV. Priority for Removal

<table>
<tr><th>ULE</th><th></th><th colspan="4">Landscape Significance</th></tr>
<tr><td></td><td>Very High</td><td>High</td><td>Moderate</td><td>Low</td><td>Insignificant</td></tr>
<tr><td>40 years +</td><td rowspan="3">Priority for Retention</td><td colspan="2">Priority for Retention</td><td rowspan="3">Consider for Removal</td><td rowspan="3">Priority for Removal</td></tr>
<tr><td>15-40 years</td><td>Priority for Retention</td><td>Consider for Retention</td></tr>
<tr><td>5-15 years</td><td colspan="2">Consider for Retention</td></tr>
<tr><td>Less than 5 years</td><td>Consider for Removal</td><td colspan="4">Priority for Removal</td></tr>
</table>

The above table has been modified from the Footprint Green Tree Significance and Retention Value Matrix.

Appendix 2: Plans

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Client
Infrastructure NSW & Powerhouse

Project Team
MOREAU KUSUNOKI
GENTON

Project Name
Powerhouse Parramatta

Project No.
0824BRS

Address
Parramatta

Key Plan

Issue Log

Rev	Revision Description	By / Checked	Date
A	Draft SSDA Issue WIP		30/3/20
B	For SSDA Application	PA/PH/MC	01/04/2020
C	For SSDA Application	PA/PH/MC	02/04/2020

Scale
1: 500 @ A1
0 5 10 15 20 25 M

All dimensions are in millimetres unless otherwise noted.
Do not scale from this drawing.

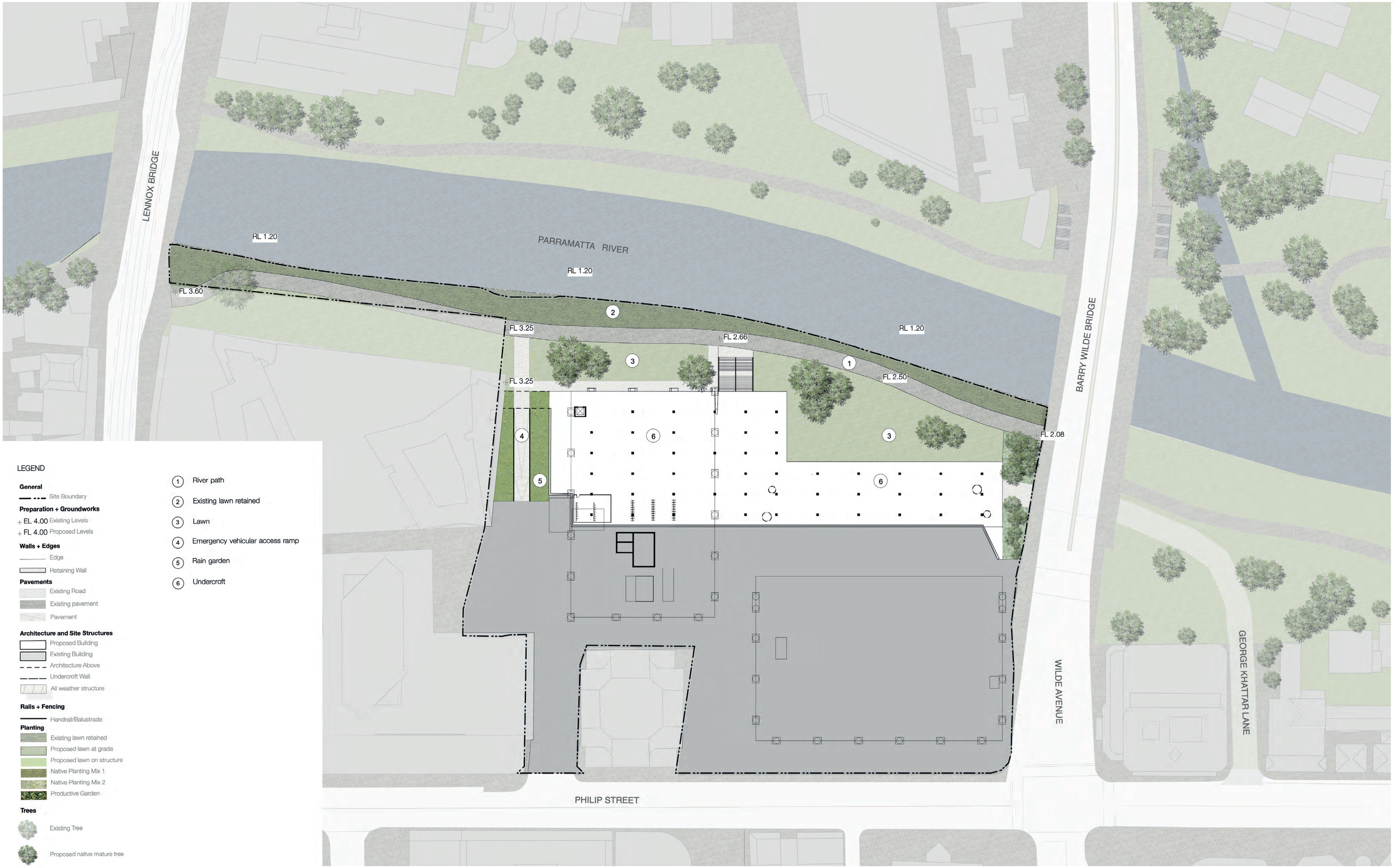
North

Phase
Schematic Design

Sheet Title
Tree Retention and Removal Plan

Sheet No.
LD_DA_30-03

Rev
C



LEGEND

General
- Site Boundary

Preparation + Groundworks
- EL 4.00 Existing Levels
- FL 4.00 Proposed Levels

Walls + Edges
- Edge
- Retaining Wall

Pavements
- Existing Road
- Existing pavement
- Pavement

Architecture and Site Structures
- Proposed Building
- Existing Building
- Architecture Above
- Undercroft Wall
- All weather structure

Rails + Fencing
- Handrail/Balustrade

Planting
- Existing lawn retained
- Proposed lawn at grade
- Proposed lawn on structure
- Native Planting Mix 1
- Native Planting Mix 2
- Productive Garden

Trees
- Existing Tree
- Proposed native mature tree

1. River path
2. Existing lawn retained
3. Lawn
4. Emergency vehicular access ramp
5. Rain garden
6. Undercroft

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Scale
1: 500 @ A1

0 5 10 15 20 25 M

All dimensions are in millimetres unless otherwise noted.
Do not scale from this drawing.

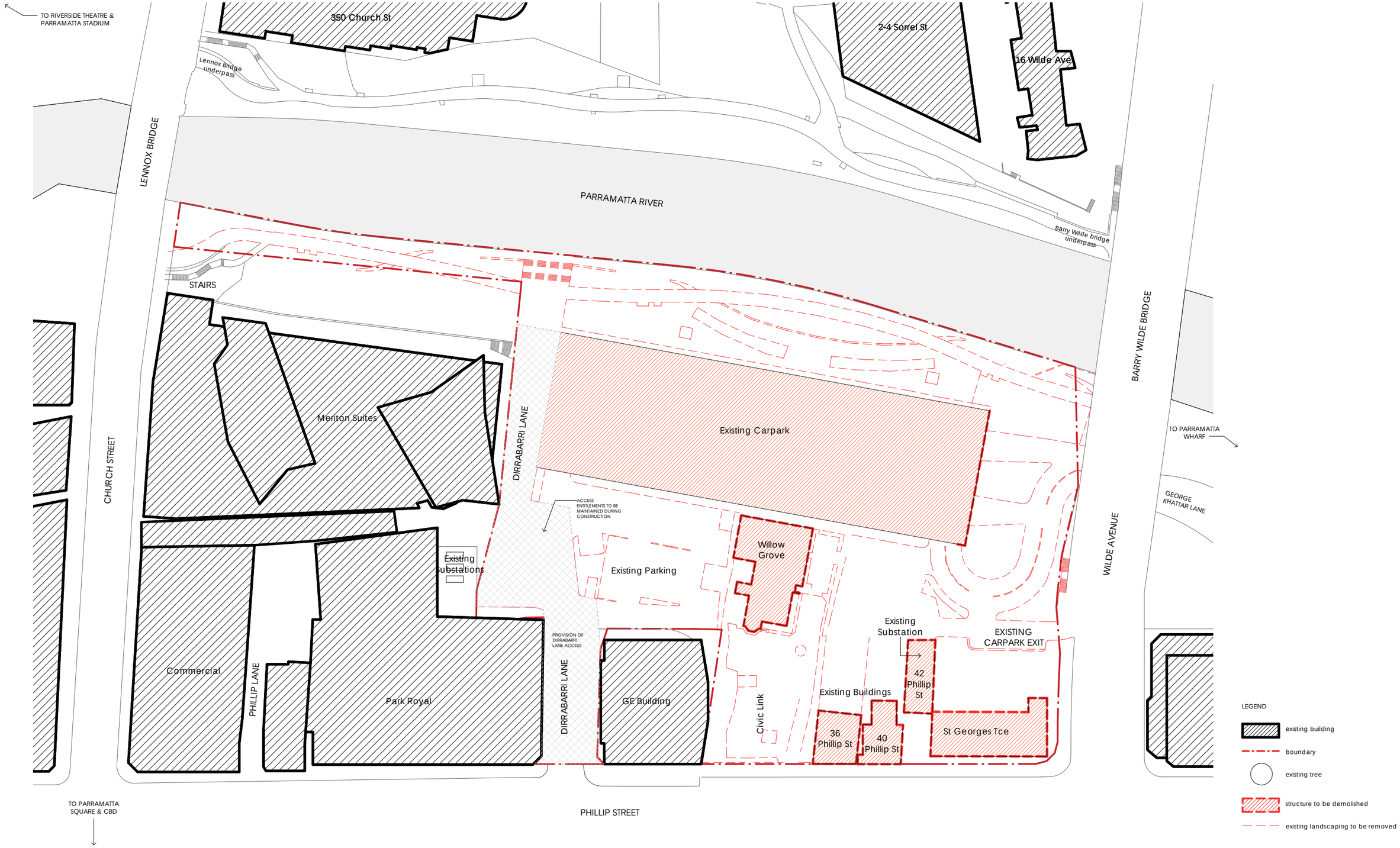
North

Phase
Schematic Design

Sheet Title
River Walk and Undercroft Level

Sheet No.
LD_DA_00-01

Rev
C



ARCHITECTS

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GENTON
71 YORK ST SYDNEY NSW 2000 AUSTRALIA

PROJECT

POWERHOUSE PARRAMATTA

TITLE

Site Demolition Plan

SCALE

1 : 500 @ A1

0 0 0 0 0 0 mm 1 : 500

NORTH

REVISION HISTORY

No	Date	Description
1	27/03/20	For Information
2	27/03/20	Draft SSDA Issue
3	31/03/20	For Information
4	01/04/20	For Information

DATE

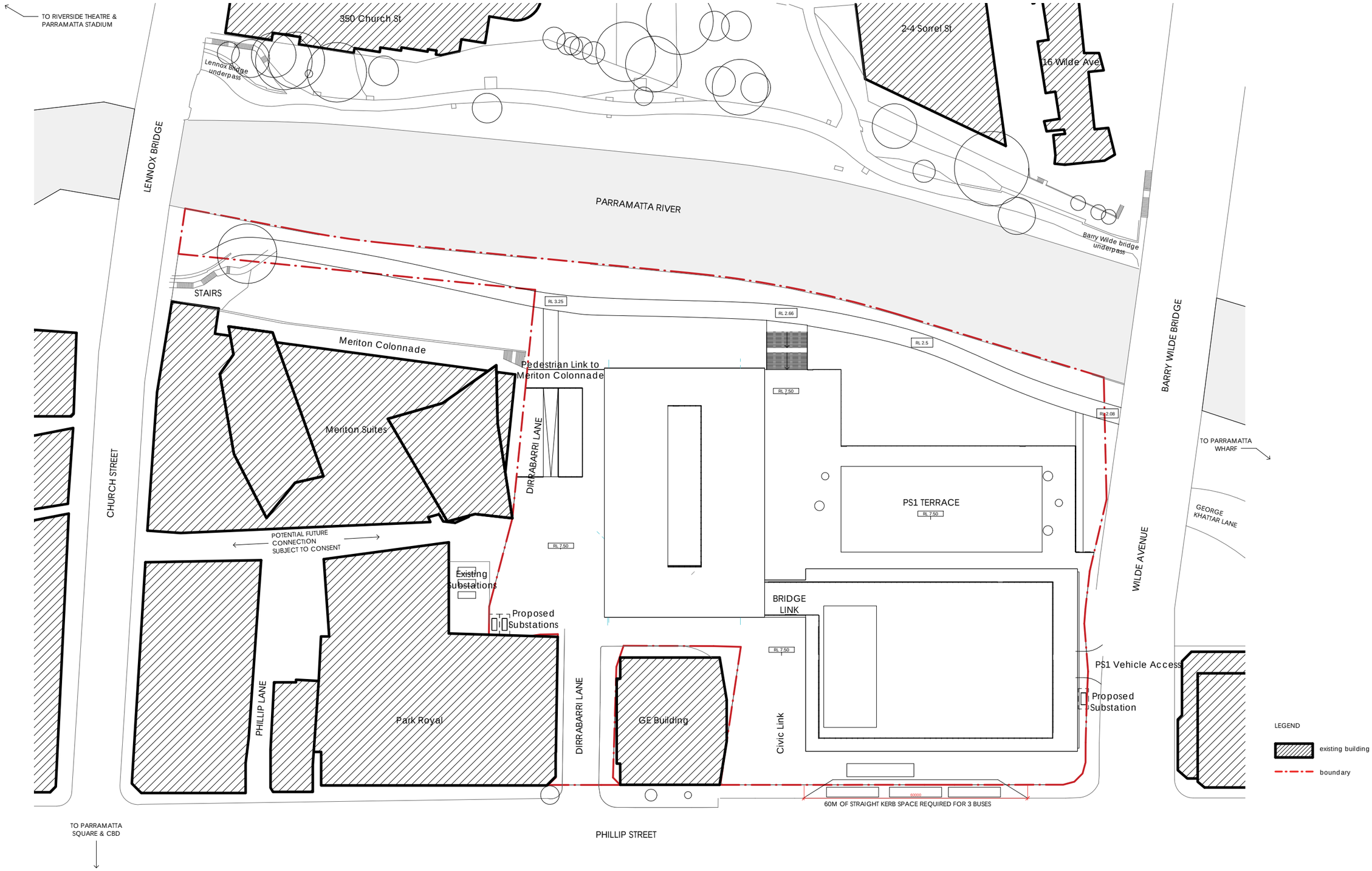
01/04/20

NUMBER

DA061

REVISION

4



ARCHITECTS		PROJECT	TITLE	SCALE	NORTH	REVISION HISTORY			DATE	NUMBER	REVISION
MOREAU KUSUNOKI 5 RUE DE NEMOURS 75011 PARIS FRANCE	**GENTON** 71 YORK ST SYDNEY NSW 2000 AUSTRALIA	**POWERHOUSE PARRAMATTA**	**Proposed Site Master Plan**	1 : 500 @ A1 0 0 0 0 0 0 mm 1 : 500		No	Date	Description	01/04/20	**DA062**	**3**
						1	27/03/20	Draft SSDA Issue			
						2	31/03/20	For Information			
						3	01/04/20	For Information			

Appendix 3: Tree Assessment Schedule

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)
1	*Eucalyptus* sp. (Eucalypt) possibly *E.saligna* x *E.botryoides* intergrade	1250	15	15	Fair	Fair	No fruit available to identify to species level. Canker-like lesions throughout crown. Crown density 75-95%. Small (<25mmø) and medium (25-75mm) epicormic growth in moderate volumes. Storm damage. Grade alteration, fill. Telstra pit.	Late Mature	15-40	High	Priority for Retention	2.0	1.5
2	*Casuarina glauca* (Swamp She Oak)	750	15	10	Fair	Good	Small (<25mmø) & medium (25-75mmø) deadwood in moderate volumes. Mechanical damage to exposed surface roots. Wound(s)(s), various stages of decay.	Late Mature	5-15	Moderate	Consider for Retention	9.0	3.1
3	*Jacaranda mimosifolia* (Jacaranda)	1000	15	15	Fair	Fair	Not in full leaf at time of assessment. Bike tube in crown. Bark inclusion(s), major - appear to be grafted. Storm damage. Wound(s), various stage of decay.	Late Mature	15-40	High	Priority for Retention	12.0	3.4
4	*Corymbia maculata* (Spotted Gum)	885	17	12	Good	Good	Mechanical damage to exposed surface roots. Pruned for building clearance.	Mature	15-40	Moderate	Consider for Retention	10.6	3.3
5	*Eucalyptus tereticornis* (Forest Red Gum)	200	6	3	Fair	Fair	Heavily suppressed. Wound(s), various stages of decay.	Mature	5-15	Low	Consider for Removal	2.4	1.8
6	*Eucalyptus tereticornis* (Forest Red Gum)	300	10	6	Fair	Fair	Crown density 50-75%. Wound(s), various stages of decay. Large basal wound.	Mature	5-15	Moderate	Consider for Retention	3.6	2.1
7	*Eucalyptus tereticornis* (Forest Red Gum)	300	9	10	Fair	Fair	Small (<25mmø) & medium (25-75mmø) deadwood in high volumes. Heavily suppressed. Wound(s), various stages of decay.	Mature	5-15	Low	Consider for Removal	3.6	2.1
8	*Corymbia maculata* (Spotted Gum)	650	15	12	Good	Good		Mature	15-40	Moderate	Consider for Retention	7.8	2.9

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)
9	*Eucalyptus tereticornis* (Forest Red Gum)	500	16	10	Fair	Poor	Crown density 75-95%. Co-dominant inclusion, major at crown break. Wound(s), various stages of decay.	Mature	<5	Moderate	Priority for Removal	6.0	2.6
10	*Eucalyptus tereticornis* (Forest Red Gum)	400	14	8	Fair	Poor	Crown density 75-95%. Co-dominant inclusions, major with wounds. Wound(s), various stages of decay.	Mature	<5	Moderate	Priority for Removal	4.8	2.3
11	*Eucalyptus tereticornis* (Forest Red Gum)	300	11	8	Poor	Good	Crown density 0-25%. Small (<25mmø) & medium (25-75mmø) deadwood in moderate volumes. Wound(s), various stages of decay.	Mature	<5	Moderate	Priority for Removal	3.6	2.1
12	*Eucalyptus tereticornis* (Forest Red Gum)	500	15	8	Fair	Poor	Crown density 50-75%. Large trunk wounds x2. Storm damage. Wound(s), various stages of decay.	Mature	<5	Moderate	Priority for Removal	6.0	2.6
13	*Eucalyptus tereticornis* (Forest Red Gum)	400	12	10	Fair	Good	Heavily suppressed. Wound(s), various stages of decay.	Mature	5-15	Low	Consider for Removal	4.8	2.3
14	*Eucalyptus tereticornis* (Forest Red Gum)	600	14	11	Fair	Good	Crown density 75-95%. Small (<25mmø) & medium (25-75mmø) deadwood in low volumes. Storm damage. Wound(s), various stages of decay.	Mature	5-15	Moderate	Consider for Retention	7.2	2.8
15	*Corymbia maculata* (Spotted Gum)	600	16	10	Fair	Fair	Small (<25mmø) & large (>75mmø) deadwood in moderate volumes. Small (<25mmø) epicormic growth in moderate volumes. Wound(s), various stages of decay.	Mature	5-15	Moderate	Consider for Retention	7.2	2.8
16	*Eucalyptus saligna* (Sydney Blue Gum)	450	17	10	Fair	Fair	Crown density 75-95%. Sap sucking leaf damage.	Mature	5-15	Moderate	Consider for Retention	5.4	2.5
17	*Eucalyptus saligna* (Sydney Blue Gum)	400	18	10	Fair	Fair	Crown density 75-95%. Large (>75mmø) deadwood in low volumes. Wound(s), advanced stages of decay. Fungal bracket. Hanger(s). Sap sucking leaf damage.	Mature	5-15	Moderate	Consider for Retention	4.8	2.3

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)
18	*Eucalyptus saligna* (Sydney Blue Gum)	400	16	8	Fair	Good	Crown density 50-75%. Small (<25mmø) deadwood in low volumes. Partially suppressed. Sap sucking leaf damage.	Mature	5-15	Moderate	Consider for Retention	4.8	2.3
19	*Eucalyptus saligna* (Sydney Blue Gum)	500	17	10	Fair	Good	Crown density 50-75%. Small (<25mmø) deadwood in low volumes. Small (<25mmø) epicormic growth in low volumes. Sap sucking leaf damage.	Mature	5-15	Moderate	Consider for Retention	6.0	2.6
20	*Eucalyptus saligna* (Sydney Blue Gum)	600	20	8	Good	Good	Asymmetrical crown spread. Crown density 75-95%. Small (<25mmø), medium (25-75mmø) & large (>75mmø) deadwood in low volumes. Storm damage.	Mature	15-40	Moderate	Consider for Retention	7.2	2.8
21	*Eucalyptus saligna* (Sydney Blue Gum)	600	18	10	Good	Good	Asymmetrical crown spread. Adjacent tree removed. Small (<25mmø), medium (25-75mmø) & large (>75mmø) deadwood in low volumes. Partially suppressed.	Mature	15-40	Moderate	Consider for Retention	7.2	2.8
22	*Corymbia citriodora* (Lemon Scented Gum)	300	9	12	Good	Good	Heavily suppressed.	Mature	5-15	Low	Consider for Removal	3.6	2.1
23	*Corymbia citriodora* (Lemon Scented Gum)	600	16	10	Good	Good	Small (<25mmø) & medium (25-75mmø) deadwood in low volumes. Partially suppressed.	Mature	15-40	Moderate	Consider for Retention	7.2	2.8
24	*Eucalyptus robusta* (Swamp Mahogany)	800	16	10	Good	Good	Small (<25mmø) deadwood in low volumes. Small (<25mmø) epicormic growth in moderate volumes. Lopped. Sap sucking leaf damage.	Mature	15-40	Moderate	Consider for Retention	9.6	3.1
25	*Livistonia australis* (Cabbage Tree Palm)	500	15	3	Good	Good		Mature	15-40	Low	Consider for Removal	4.0	n/a
26	*Livistonia australis* (Cabbage Tree Palm)	400	6	3	Good	Good	Partially suppressed.	Mature	15-40	Low	Consider for Removal	4.0	n/a

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)
27	*Livistonia australis* (Cabbage Tree Palm)	500	9	3	Good	Good		Mature	15-40	Low	Consider for Removal	4.0	n/a
28	*Populus nigra* 'Italica' (Lombardy Poplar)	500	17	4	Fair	Poor	Not in leaf at time of assessment. Large (>75mmø) deadwood in low volumes. Small (<25mmø) epicormic growth in moderate volumes. Wound(s), advanced stages of decay. Mechanical damage and decay to exposed surface roots.	Mature	<5	Moderate	Priority for Removal	6.0	2.6
29	*Harpullia pendula* (Tulipwood)	350	8	6	Good	Good	Small (<25mmø) epicormic growth in low volumes. Partially suppressed.	Mature	15-40	Low	Consider for Removal	4.2	2.2
30	*Corymbia gummifera* (Bloodwood)	612	17	5	Good	Poor	Small (<25mmø) deadwood in low volumes. Co-dominant inclusions, major.	Mature	5-15	Moderate	Consider for Retention	7.3	2.8
31	*Schinus molle* var. *areira* (Peppercorn Tree)	600	16	10	Fair	Poor	Crown density 50-75%. Small (<25mmø) deadwood in moderate volumes. Wound(s), various stages of decay. Basal decay. Occluding adjacent fence.	Mature	<5	Moderate	Priority for Removal	7.2	2.8
32	*Jacaranda mimosifolia* (Jacaranda)	566	16	10	Fair	Fair	Small (<25mmø) & large (>75mmø) epicormic growth in moderate volumes. Heavily suppressed. Lopped. Poor form.	Mature	5-15	Low	Consider for Removal	6.8	2.7
33	*Lophostemon confertus* (Brush Box)	400	8	6	Good	Good		Mature	15-40	Moderate	Consider for Retention	4.8	2.3
34	*Corymbia ficifolia* (Red Flowering Gum)	200	4	4	Good	Good	Heavily suppressed.	Early mature	5-15	Low	Consider for Removal	2.4	1.8
35	*Eucalyptus* sp. (Eucalypt)	400	17	4	Good	Good	No fruit available to identify to species level. Storm damage. Hanger.	Mature	15-40	Moderate	Consider for Retention	4.8	2.3

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)
36	*Flindersia australis* (Crow's Ash)	361	9	4	Good	Poor	Lopped. Rubbing branches. Co-dominant inclusions, major. Wound(s), early signs of decay.	Early mature	5-15	Moderate	Consider for Retention	4.3	2.2
37	*Flindersia australis* (Crow's Ash)	200	7	4	Good	Fair	Adaptive growth.	Semi mature	5-15	Low	Consider for Removal	2.4	1.8
38	*Flindersia australis* (Crow's Ash)	150	5	2	Good	Good	Wound(s), no visible sign of decay.	Semi mature	15-40	Low	Consider for Removal	2.0	1.6
39	*Flindersia australis* (Crow's Ash)	100	5	2	Good	Good	Chlorotic foliage.	Semi mature	15-40	Low	Consider for Removal	2.0	1.5
40	*Cupressus macrocarpa* (Monterey Cypress)	1000	15	10	Good	Good	Located in raised garden bed. Crown density 75-95%. Small (<25mmø) deadwood in low volumes. Partially suppressed. Wound(s), early signs of decay.	Late Mature	15-40	High	Priority for Retention	12.0	3.4
41	*Cinnamomum camphora* (Camphor Laurel)	600	17	6	Good	Good	Partially suppressed.	Mature	15-40	Moderate	Consider for Retention	7.2	2.8
42	*Castanospermum australe* (Black Bean)	539	14	5	Good	Fair	Partially suppressed. Bark inclusions, major. Rubbing branches.	Mature	5-15	Moderate	Consider for Retention	6.5	2.7
43	*Cinnamomum camphora* (Camphor Laurel)	849	17	6	Good	Good	Crown conflict with adjacent building. Partially suppressed.	Mature	5-15	Moderate	Consider for Retention	10.2	3.2
44	*Jacaranda mimosifolia* (Jacaranda)	150	5	3	Good	Good	Located in raised garden bed.	Semi mature	15-40	Low	Consider for Removal	2.0	1.6

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)
45	*Jacaranda mimosifolia* (Jacaranda)	700	12	10	Good	Fair	Not in leaf at time of assessment. Small (<25mmø), medium (25-75mmø) & large (>75mmø) deadwood in low volumes. Wound(s), various stages of decay. Trunk cavity(s), major. Internal diagnostic testing recommended.	Late Mature	15-40	High	Priority for Retention	8.4	3.0
46	*Flindersia australis* (Crow's Ash)	200	10	3	Good	Good	Crossing branches.	Semi mature	15-40	Low	Consider for Removal	2.4	1.8
47	*Elaeocarpus reticulatus* (Blueberry Ash)	100 max	4-7m	1	Good	Good	Group of 7.	Semi mature	5-15	Low	Consider for Removal	2.0	1.5
48	*Syzygium leuhmanni* (Small Leaf Lillypilly)	200 max	3-6m	2	Good	Good	Group of 5.	Mature	5-15	Low	Consider for Removal	2.4	1.8
49	*Melaleuca quinquenervia* (Broad Leaved Paperbark)	450	16	5	Fair	Fair	Crown density 75-95%. Small (<25mmø) deadwood in moderate volumes. Co-dominant inclusions, major. Bark inclusion(s), typical of species.	Mature	5-15	Moderate	Consider for Retention	5.4	2.5
50	*Cinnamomum camphora* (Camphor Laurel)	616	15	10	Good	Poor	Located on top of retaining wall.	Mature	<5	Moderate	Priority for Removal	7.4	2.8
51	*Ailanthus altissima* (Tree of Heaven)	200 max	4	3	Fair	Fair	Group of 2. Not in leaf at time of assessment.	Mature	<5	Low	Priority for Removal	2.4	1.8
52	*Ailanthus altissima* (Tree of Heaven)	300	6	4	Poor	Fair	Not in leaf at time of assessment. Climber in crown. Crown density 0-25%.	Mature	<5	Low	Priority for Removal	3.6	2.1
53	*Platanus xacerifolia* (London Plane Tree)	800	16	8	Good	Good	Not in leaf at time of assessment. Kerb displacement at base. Mechanical damage to exposed surface roots. Wound(s), various stage of decay.	Mature	15-40	Moderate	Consider for Retention	9.6	3.1

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)
54	*Platanus xacerifolia* (London Plane Tree)	250	8	6	Good	Good	Not in leaf at time of assessment. Heavily suppressed.	Semi mature	5-15	Low	Consider for Removal	3.0	1.9
55	*Platanus xacerifolia* (London Plane Tree)	650	13	5	Good	Good	Not in leaf at time of assessment. Co-dominant inclusions, minor. Rubbing branches.	Mature	15-40	Moderate	Consider for Retention	7.8	2.9
56	*Populus nigra* 'Italica' (Lombardy Poplar)	500 max	16	4	Fair	Fair	Group of 5. Not in leaf at time of assessment. Small (<25mmø) deadwood in moderate volumes. Small (<25mmø) epicormic growth in moderate volumes. Wound(s), various stages of decay. Terminal leader missing from one specimen.	Mature	5-15	Low	Consider for Removal	6.0	2.6
57	*Strelitzia nicolai* (Giant Bird of Paradise)	500 max	10	4			Large group.	Mature	15-40	Low	Consider for Removal	5.0	n/a
58	*Howea forsteriana* (Kentia Palm) *Archontophoenix* spp. (Palm)	300 max	8	3			Large group.	Semi mature - Mature	15-40	Low	Consider for Removal	4.0	n/a

Appendix 4: Plates

Plate 1: Showing Tree 1

Plate 2: Showing Tree 2 (r) and Tree 3 (l)

Plate 3: Showing Trees 5-14

Plate 4: Showing Trees 16-23

Plate 5: Showing Trees 25-35 & Tree Group 58

Plate 6: Showing Trees 36 (r) to 38

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Plate 7: Showing Tree 40

Plate 8: Showing Tree 41-46

Plate 9: Showing Tree 45, Tree Group 47 & Tree Group 48

Plate 10: Showing Trees 49-52

Plate 11: Showing Trees 53-55

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