TREE MANAGEMENT PLAN

1 - 8 Main Drive, Kew.

8 OCTOBER 2019

PREPARED BY:

Michael Rogers
Consulting Arborist
Assoc. Dip. App. Sc. (Arb)

Kylie May
Consulting Arborist
BAppSci(RurTech); GDipUrbHort

JOHN PATRICK
LANDSCAPE ARCHITECTS
ENVIRONMENTAL HORTICULTURISTS
LANDSCAPE HERITAGE CONSULTANTS
CONSULTANT ARBORISTS

JOHN PATRICK LANDSCAPE ARCHITECTS PTY LTD

324 Victoria Street, Richmond, VIC 3121, Australia
T +61 3 9429 4855 E admin@johnpatrick.com.au
F +61 3 9429 8211 W www.johnpatrick.com.au

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1 INTRODUCTION

Background

1.1 John Patrick Landscape Architects have been engaged by Kew Development Corporation Pty. Ltd. (KDC) to prepare this Tree Management Plan.

1.2 KDC is constructing a three-storey apartment building with basement carparking within the footprint of the existing 1960s former Kew Cottages Administration Building, located at 1 - 8 Main Drive, Kew.

1.3 The trees are growing in the 'island site', located between Main Drive and the Oak Walk, which surround the apartment building, in the former Kew Cottages / Willsmere Residential Service Estate.

Figure 1: Site map (Google 2018)

Most of the trees are of similar age as they were planted at the start of the 20th century, and some may even be older. Unfortunately, this suggests that many of the trees will reach senescence and decline at a similar time. Subsequently, this could result in many of the trees being removed over a relatively short period of approximately 10 years, a short time in the life of a 100+ year-old tree. This would denude the landscape and substantially diminish the heritage value of the site. It would take another 20+ years to re-establish mature trees and create a similar canopy covered parkland.

1.4 Consideration should be given to succession planting to ensure that the tree population includes a diverse range of ages and stages of maturity. This prevents the necessity to remove multiple established trees at the same time, and offers a degree of protection against severe weather events where large trees may be at particular risk of damage resulting in unpredictable and wholesale tree loss.

1.5 A proactive tree replacement plan is designed to reduce this risk. It requires the removal of existing declining or poorly structured trees that have a reduced Useful Life Expectancy (ULE) and their replacement with long-lived species appropriate to the period of heritage significance, preferably, but not necessarily, the replacement of like with like.

1.6 This approach sometimes requires the removal of live trees and can be contentious. It is therefore important to justify and explain any removals within the context of the Tree Replanting Schedule, Tree Management Plan and proposed Landscape plan.

Objective

1.7 The Heritage Council recognised these issues, and sought to ensure that 'a continuous tall tree canopy' would be maintained across the island site and be reasonably secured into the future.

1.8 To achieve this objective, the Heritage Council imposed a series of conditions to Heritage Permit P26760, which together, required the preparation and implementation of a Tree Management Plan. The Plan comprises 5 key components, which are addressed in following sections:

1. Existing Landscape Plan that locates each tree and identified its species
2. Existing Condition Report that assesses each tree's condition, and determines:
   - If it senescent, diseased or poorly structured and therefore should be replaced within the next 15 years.
   - Any required health maintenance work over the next 15 years.
   - Care prior and during the apartment building's construction.
3. Tree Replanting/Maintenance Schedule, that nominates suitable replacement trees for those to be removed, and timetables replacement and maintenance over 15 years, commencing with construction.
4. Proposed Landscape Plan that shows the trees and nominates those to be removed, with their replacement trees, and new landscaping associated with the apartment building, including paving and irrigation.
5. Construction Management Plan that details how the trees will be protected.

1.9 The relevant conditions of Heritage Permit P26760, Conditions 3 – 11 are:

Landscape Plans Required

2. Before the works begin, a complete and detailed Existing Landscape Conditions Plan, Proposed Landscape Plan and associated written Existing Condition Report on the trees and lawn within the area bounded by Main Drive and Oak Walk is to be prepared by a landscape architect with heritage expertise and an experienced consulting arborist and submitted to the Executive Director for approval.

   The Plans must be drawn to scale and the Plans and Report must be submitted to the Executive Director in PDF format. The Existing Condition Report is to identify each Heritage Registered tree with its location cross-referenced to the associated Existing Landscape Conditions Plan and Proposed Landscape Plan. The Existing Condition Report must include an assessment of the existing condition and estimated remaining healthy lifespan of each of the Heritage Registered trees. *Note: one specimen of Pinus canariensis (Canary Is/and Pine) is already in decline.* When approved, the Existing Landscape Conditions Plan, Proposed Landscape Plan and Existing Condition Report will be endorsed and will then form part of this permit.

3. The Proposed Landscape Plan must be generally in accordance with the Landscape Concept Plan prepared by MDG Landscape Architects and circulated as part of the Heritage Council proceeding, being Drawing Number 1542 B 01[d], Issue D dated 4 May 2018, and must show:

   a. All existing vegetation (including botanical names) to be retained and/or removed;

   b. A planting theme which principally comprises trees in a lawn setting;

   c. Apart from trees:

      - only plants which grow to a height of not more than approximately 0.5 metres
      - except where taller planting may be required such as to act as a security barrier near the vehicle entrance; and
      - no invasive ground cover plants including *Agapanthus sp.*;

d. A planting schedule of all trees, ground covers and bedding plants, including botanical names, common names, sizes at maturity and quantities of each plant. All species selected must be to the satisfaction of the Executive Director;

e. Details of surface finishes of pathways and the driveway; and

f. Details of an in-ground irrigation system to be provided to all landscaped areas.

Tree Management Plan Required

3. Before the works begin, a Tree Management Plan, which includes a Tree Replanting Schedule of trees of the same species as the Heritage Registered trees, or suitable alternative species that reflect the heritage significance and values of the site, is to be prepared by a landscape architect with heritage expertise and an experienced consulting arborist and submitted to the Executive Director for approval. The plan must be drawn to scale with dimensions and must be submitted to the Executive Director in PDF format. The Tree Management Plan must apply to the entire area bounded by Main Drive and Oak Walk. When approved, the plan will be endorsed and will form part of this permit.

4. The Tree Replanting Schedule must include a fifteen-year Tree Establishment Plan, including proposed replacement trees for existing senescent and diseased trees, and a removal and replacement planting program designed to achieve a continuous tall tree canopy within this 'island' section of Main Drive. Botanical names, common names, and sizes at maturity for each proposed replacement tree must be provided. The Tree Replanting Schedule must include a written explanation in relation to the principles that will apply to consideration of removal of trees and selection of species and proposed locations of all proposed new trees.

5. The permit holder must complete tree removal and replanting in accordance with the Tree Replanting Schedule prior to the Executive Director confirming that the works have been satisfactorily completed in accordance with condition 15 below.

Tree Protection During Construction

6. To ensure protection of the Heritage Registered trees within the area bounded by Main Drive and Oak Walk, all works approved by or otherwise required by this permit must be carried out in accordance with the requirements and recommendations of Australian Standard AS 4970-2009 *'Protection of Trees on Development Sites'*.

7. Before the works approved or required by this permit (including demolition works) begin, a scaled plan showing the location of Tree Protection Fences and any associated tree protection measures required under condition 7 above is to be submitted to the Executive Director for approval. Once approved, the plan will be endorsed and will then form part of this permit.

8. Except with the prior written consent of the Executive Director, within the Tree Protection Zones:

a) No vehicular or pedestrian access, trenching or soil excavation is to occur; and

b) No storage or dumping of tools, equipment or waste is to occur.

The Tree Protection Fences and associated protection measures must be erected before the works approved or required by this permit (including demolition works) begin and must remain in place until all construction works have been completed.

9. Before the development starts, the ground surface of the Tree Protection Zones must be covered by a 100mm deep layer of mulch. The Tree Protection Zones must be watered regularly to the satisfaction of the Executive Director.

10. The Tree Protection Fences and associated tree protection measures may only be removed after completion of all approved construction works to facilitate the landscape works approved by this permit. The Executive Director must be informed when the approved works have been completed.

Any pruning that is required to be done to the canopy of any Heritage Registered trees is to be done by a qualified arborist to Australian Standard - Pruning of Amenity Trees AS4373-1996. Any pruning of the root system of any Heritage Registered tree is to be done by hand by a qualified arborist.

2 EXISTING LANDSCAPE PLAN

Introduction

2.1 The Tree Maintenance and Replanting Schedule, and construction protection measures must be informed by an understanding of the existing trees on the island site. Each tree must be identified, and their size and health assessed.

2.2 The physical, cultural and heritage context of the island site will also inform how trees are cared for into the future, and the applicable regulatory controls will guide assessment and approval processes associated with removal and maintenance activities.

2.3 Finally, the potential implications for tree health and management associated with the existing Admin Building and future apartment building must be identified.

Method

2.4 On Tuesday, 4 December 2018 a tree assessment was undertaken from the ground by Michael Rogers, a suitably qualified and experienced arborist with John Patrick Landscape Architects (C.V. attached at Appendix 1).

2.5 Mr Rogers undertook a visual assessment of the trees, and completed the following steps:

- The DBH (trunk diameter) of trees was measured using a diameter tape, measured at 1.4m above ground level in accordance with AS-4970 'Protection of Trees on Development Sites'.
- Heights of trees were measured using a laser range finder.
- Widths were calculated by stepping out.
- Tree Protection Zones (TPZ's) were calculated in accordance with AS-4970.

2.6 No aerial or diagnostic testing was undertaken of the trees, or the soil in which they were growing.

2.7 Each tree was assigned an identification number for reference purposes, denoted in the Tree Data and on the Tree Location Plan which is based on the Exiting Conditions Plan (TGM, DWG No. 3332-51-01, Version 4, 26/11/2014) & Tree Identification Plan – Overall site (Walker Corp, DWG No. LA000-01.61 H, March 11). Numbers were difficult to interpret from this plan, and some new trees were not numbered. Therefore, the trees were re-numbered 1 - 47 with corresponding existing tree numbers also listed.

2.8 Trees within the island site were assessed to determine their current condition and enable calculation of their Tree Protection Zones (TPZ). This information was then used to determine the impact that the apartment building will have on the trees and inform a tree replanting and maintenance schedules discussed later in this report.

2.9 The assessment included the following;

- Botanic / Common names
- Origin
- Tree Size (Height & Width)
- DBH (Trunk Diameter)
- Tree Health & Structural Condition

- ULE (Useful Life Expectancy)
- TPZ (Tree Protection Zones)
- Arboricultural Value
- Comments and arboricultural works relating to individual trees.

2.10 An explanation of the descriptors used is at Appendix 2.

2.11 The following documentation was reviewed during preparation of this Tree Management Plan;

- Basement Floor Plan (Max Architects, DWG No. AR08-24.01 Rev T, 20.08.19)
- Ground Level Floor Plan (Max Architects, DWG No. AR08-24.02 Rev V, 31.07.19)
- Existing Conditions Plan (TGM, DWG No. 3332-51-01, Version 4, 26/11/2014)
- Tree Identification Plan – Overall site (Walker Corp, DWG No. LA000-01.61 H, March 11)
- Arborist Report - Galbraith & Assoc. 31 May 2017.
- Former Kew Cottages (Kew Residential Services) – Heritage Victoria: Database Report.
- Heritage Impact Statement (Former Kew Cottages) – Lovell Chen, June 2017.
- Planting 1850 – 1900, National Trust, 1982.

Regulatory Controls

Recommendation

2.12 It is recommended that vegetation controls be confirmed with Boroondara City Council and Heritage Victoria prior to any tree removal.

Vegetation Protection Overlay – Schedule 2 (VP02)

2.13 A search of Planning Maps Online website identifies the following Planning Overlays protecting vegetation on the site;

A permit is required to remove, destroy or lop any vegetation identified in clause 1 to this schedule.

1.0 Statement of nature and significance of vegetation to be protected

The following trees are significant because of their historic and social association with the development of Kew Residential Services:

- *The avenue plantings along Lower Drive comprising a mix of Algerian oaks and English oaks.*
- *The avenue plantings along Main Drive comprising a mix of Algerian oaks, English elms, Moreton Bay figs and Bhutan cypress.*
- *The avenue plantings along Boundary Road comprising Algerian oaks.*
- *The Central Garden Plantation comprising a pair of Algerian oaks and a Holly-leaf cherry.*
- *The Bishop pine, Lower Drive. This tree is included on the National Trust Register of Significant Trees (Victoria).*
- *The Holly-leaf cherry located near the Princess Street entry to the site.*
- *The south–west garden plantation comprising a dense planting of Norfolk Island pines, Bunya Bunya, Canary Island and Monterey pines, Deodar and Irish Strawberry trees.*

The following trees are significant because they represent remnant indigenous vegetation:

- *All the River Red-gums and in particular the large River Red-gum located in the north-east part of the site.*

Heritage Overlay Schedule (H0485)

2.14 The site is subject to a heritage overlay under the City of Boroondara Planning Scheme. Under this overlay, a permit is required to:

Remove, destroy or lop a tree if the schedule to this overlay specifies the heritage place as one where tree controls apply. This does not apply:

– To any action which is necessary to keep the whole or any part of a tree clear of an electric line provided the action is carried out in accordance with a code of practice prepared under Section 86 of the Electricity Safety Act 1998.

– If the tree presents an immediate risk of personal injury or damage to property

PS map ref	Heritage place	External paint controls apply?	Internal alteration controls apply?	Tree controls apply?	Outbuildings or fences not exempt under Clause 43.01-4	Included on the Victorian Heritage Register under the Heritage Act 2017?	Prohibited uses permitted?	Aboriginal heritage place?
HO485	*Former Kew Cottages (Kew Residential Services)*	-	-	-	-	Yes Ref No H2073	Yes	No

Figure 2: Excerpt from HO485

Council Local Law

2.15 A search of the City of Boroondara website identified the Tree Protection Local Law 2016.

(3) A person must not without a Permit:

(a) remove, Prune, Damage, kill or destroy or direct, authorise or allow to be removed, Pruned, Damaged, killed or destroyed a Significant Tree.

(b) carry out, or direct, authorise or allow to be carried out, any Works within the Tree Protection Zone of a Significant Tree.

(c) remove, Damage, kill or destroy or direct, authorise or allow to be removed, Damaged, killed or destroyed a Canopy Tree.

(d) carry out, or direct, authorise or allow to be carried out any Works within the Structural Root Zone of a Canopy Tree.1

(e) remove, Damage, kill or destroy or direct, authorise or allow to be removed, Damaged, killed or destroyed a tree required to be planted as a condition of a Permit.

Canopy trees have a circumference of:

- 110cm (35cm diameter) or more, measured at 1.5m above ground level; or
- 150cm or more at ground level.

Significant tree is a tree specimen listed on the City of Boroondara Significant Tree Register.

2.16 47 trees were assessed, of these 30 require a permit to remove under the local law.

2.17 It is expected that all trees require a permit in accordance with the VPO2.

2.18 There were no trees assessed, listed on the City of Boroondara Significant Tree Register.

Context

2.19 The site is located on the north side of Main Drive, Kew within the former Kew Cottages site. It includes a single storey brick Administration Building, constructed in the 1960s and extended in the 1980s. It is surrounded by open lawns with dense planting of specimen trees, typical of late 19th century, early 20th century tree species, predominantly conifers.

2.20 The site has historical and aesthetic significance at state level because of its association with the Lunatic Asylum, Willsmere and for its association with the prominent landscape gardener, Hugh Linaker who was appointed by the State Lunacy Department in 1913. He later became State Superintendent of Parks and Gardens from 1933, and prepared landscape plans for the Buchan Caves reserve in 1929 and the new Shrine of Remembrance in 1933.

2.21 On the north boundary of the subject site, there is a mostly intact avenue of *Quercus canariensis* – Algerian Oak, known as Oak Walk. Some specimens have recently been replaced with varying success. They are recognised for their unusual trunk deformities because they have been grafted at various heights, onto a different species of Oak, *Quercus robur* – English Oak.

2.22 Main Drive has a consistent alternate planted avenue of *Ulmus procera* – English Elm and *Ficus macrophylla* – Moreton Bay Fig, which terminates on its northern side at the subject site, though a skeletal treatment extends along the southern side of Main Drive until approximately opposite the administration building. Several trees of similar species have been planted within the subject site to reflect the southern side of Main Drive. Establishment of this vegetation has met with mixed success.

2.23 KDC is about to commence construction of a new apartment building, which will sit within the footprint of the demolished Administration Building. It will have one underground basement level, with 3 residential storeys above. Sections and elevations are at Appendix 3.

The Existing Landscape Plan

2.24 The *Existing Landscape Plan* is provided below.

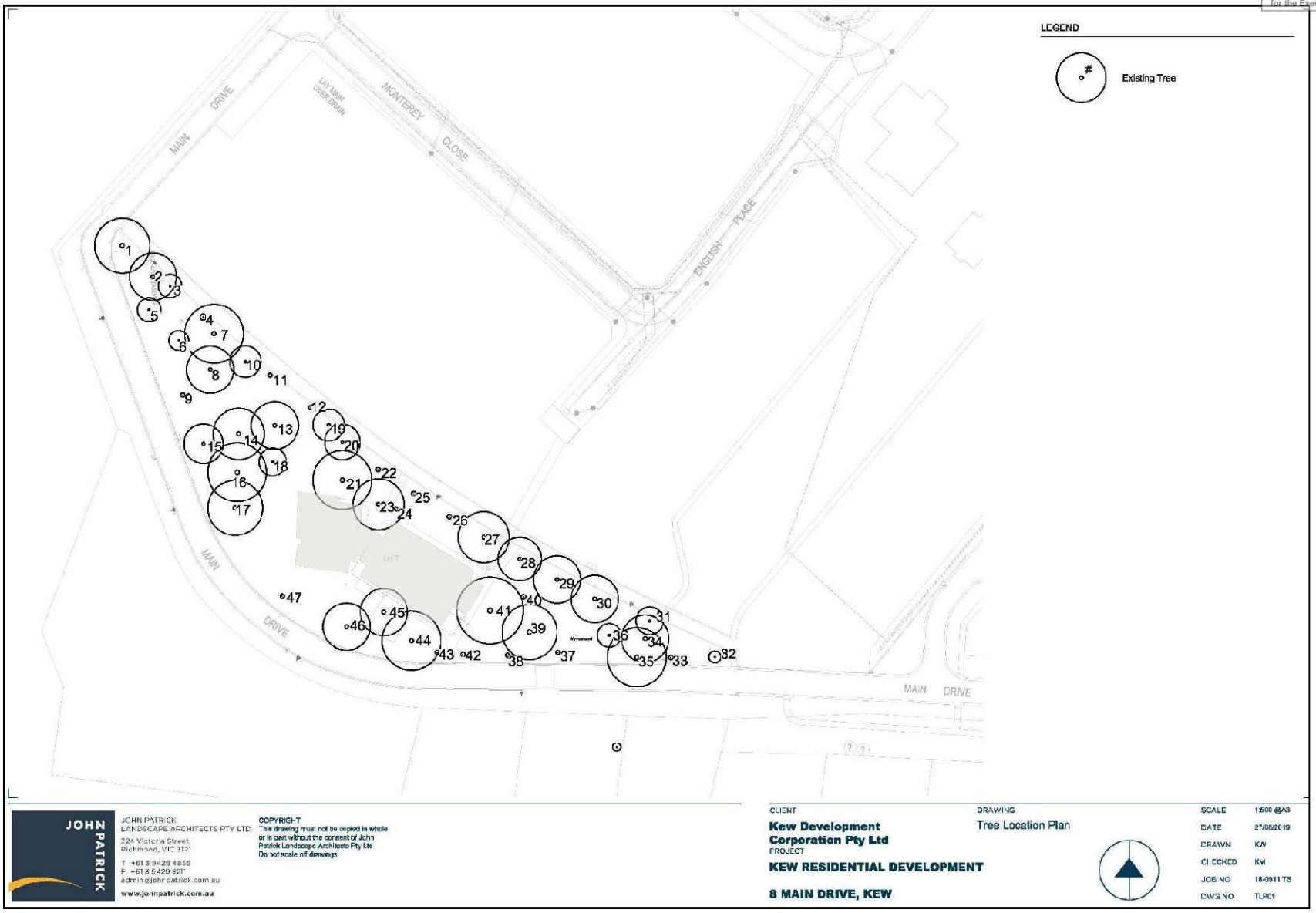

Figure 3: Existing Landscape Plan

3 EXISTING CONDITIONS REPORT

Tree Data Sheets

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**1**
Existing Tree No.:	1107
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	8 x 13
DBH (cm):	55
TPZ (m):	6.6
Age:	Mature
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	High
Comments / Works:	Check decay in main branch union.

Tree No. 1.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**2**
Existing Tree No.:	1109
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	8 x 12
DBH (cm):	36
TPZ (m):	4.3
Age:	Mature
Health:	Fair
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	Partly suppressed by 2.

Tree No. 2.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**3**
Existing Tree No.:	1111
Botanic Name:	Arbutus unedo
Common Name:	Irish Strawberry Tree
Origin:	Exotic
Size (m):	7 x 6
DBH (cm):	Multi 20
TPZ (m):	4.8
Age:	Mature
Health:	Good
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 3.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**4**
Existing Tree No.:	1113
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	2 x 1
DBH (cm):	7
TPZ (m):	2.0
Age:	Juvenile
Health:	Dead
Structure:	Poor
ULE (years):	20+
Arb. Value	Low
Comments / Works:	98% dead. Remove and replace with same species.

Tree No. 4.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**5**
Existing Tree No.:	1112
Botanic Name:	Cupressus funiberis
Common Name:	Chinese Weeping Cypress
Origin:	Exotic
Size (m):	6 x 6
DBH (cm):	Multi 10
TPZ (m):	4.8
Age:	Mature
Health:	Fair
Structure:	Fair
ULE (years):	0 – 5
Arb. Value	Medium
Comments / Works:	Remove and replace with different species

Tree No. 5.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**6**
Existing Tree No.:	197
Botanic Name:	Araucaria bidwilli
Common Name:	Bunya Pine
Origin:	Aust. Native
Size (m):	10 x 5
DBH (cm):	51
TPZ (m):	6.1
Age:	Mature
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	High
Comments / Works:	Prune off twin leader at base.

Tree No. 6.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**7**
Existing Tree No.:	1116
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	9 x 15
DBH (cm):	68
TPZ (m):	8.2
Age:	Mature
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 7.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**8**
Existing Tree No.:	1120
Botanic Name:	Cedrus deodara
Common Name:	Himalayan Cedar
Origin:	Exotic
Size (m):	15 x 12
DBH (cm):	65
TPZ (m):	7.8
Age:	Mature
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	High
Comments / Works:	Prune out minor deadwood.

Tree No. 8.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**9**
Existing Tree No.:	1120a
Botanic Name:	Agathis robusta
Common Name:	Kauri Pine
Origin:	Aust. Native
Size (m):	3 x 1
DBH (cm):	5
TPZ (m):	2.0
Age:	Juvenile
Health:	Fair
Structure:	Fair
ULE (years):	0 – 5
Arb. Value	Low
Comments / Works:	Appears to be stressed. Possibly pot bound. Soil amelioration.

Tree No. 9.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**10**
Existing Tree No.:	1119
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	8 x 8
DBH (cm):	44
TPZ (m):	5.3
Age:	Mature
Health:	Good
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 10.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**11**
Existing Tree No.:	1123
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	2 x 1
DBH (cm):	2
TPZ (m):	2.0
Age:	Juvenile
Health:	Dead
Structure:	Poor
ULE (years):	0
Arb. Value	Low
Comments / Works:	Remove and replace same species.

Tree No. 11.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**12**
Existing Tree No.:	1127a
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	2 x 1
DBH (cm):	2
TPZ (m):	2.0
Age:	Juvenile
Health:	Good
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 12.

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Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**13**
Existing Tree No.:	189
Botanic Name:	Pinus canariensis
Common Name:	Canary Island Pine
Origin:	Exotic
Size (m):	21 x 12
DBH (cm):	85
TPZ (m):	10.2
Age:	Mature
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	High
Comments / Works:	Prune out minor deadwood.

Tree No. 13.

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Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**14**
Existing Tree No.:	1125
Botanic Name:	Corymbia maculata
Common Name:	Spotted Gum
Origin:	Aust. Native
Size (m):	16 x 14
DBH (cm):	40/45
TPZ (m):	7.2
Age:	Mature
Health:	Good
Structure:	Fair
ULE (years):	10 – 20
Arb. Value	Medium
Comments / Works:	Remove and replace within 10 years.

Tree No. 14.

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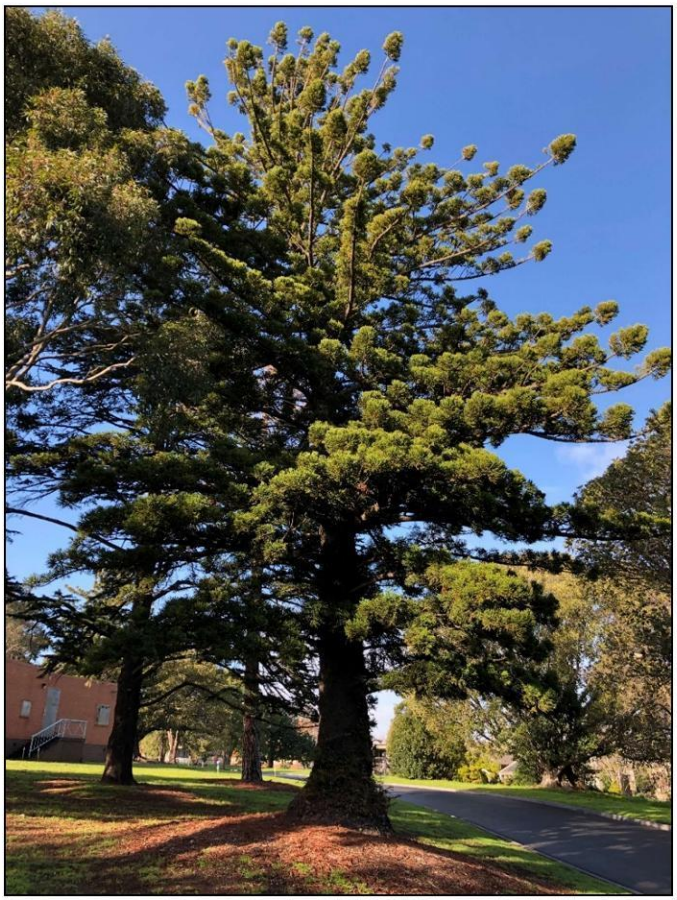
Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**15**
Existing Tree No.:	193
Botanic Name:	Araucaria cuninghamii
Common Name:	Hoop Pine
Origin:	Aust. Native
Size (m):	19 x 10
DBH (cm):	90
TPZ (m):	10.8
Age:	Mature
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	High
Comments / Works:	-



Tree No. 15.

Kew – Stage 8 Heritage Permit – P26760

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**16**
Existing Tree No.:	1126
Botanic Name:	Cedrus deodara
Common Name:	Himalayan Cedar
Origin:	Exotic
Size (m):	16 x 15
DBH (cm):	70
TPZ (m):	8.4
Age:	Mature
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 16.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**17**
Existing Tree No.:	191
Botanic Name:	Pinus canariensis
Common Name:	Canary Island Pine
Origin:	Exotic
Size (m):	20 x 14
DBH (cm):	66
TPZ (m):	7.9
Age:	Mature
Health:	Poor
Structure:	Poor
ULE (years):	0 – 5
Arb. Value	Low
Comments / Works:	In decline but showing signs of new growth after irrigating.

Tree No. 17.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**18**
Existing Tree No.:	190
Botanic Name:	Araucaria Bidwillii
Common Name:	Bunya Pine
Origin:	Aust. Native
Size (m):	17 x 7
DBH (cm):	75
TPZ (m):	9.0
Age:	Mature
Health:	Good
Structure:	Poor
ULE (years):	5 – 10
Arb. Value	Medium
Comments / Works:	Significant bifurcation. Remove and replace.

Tree No. 18.

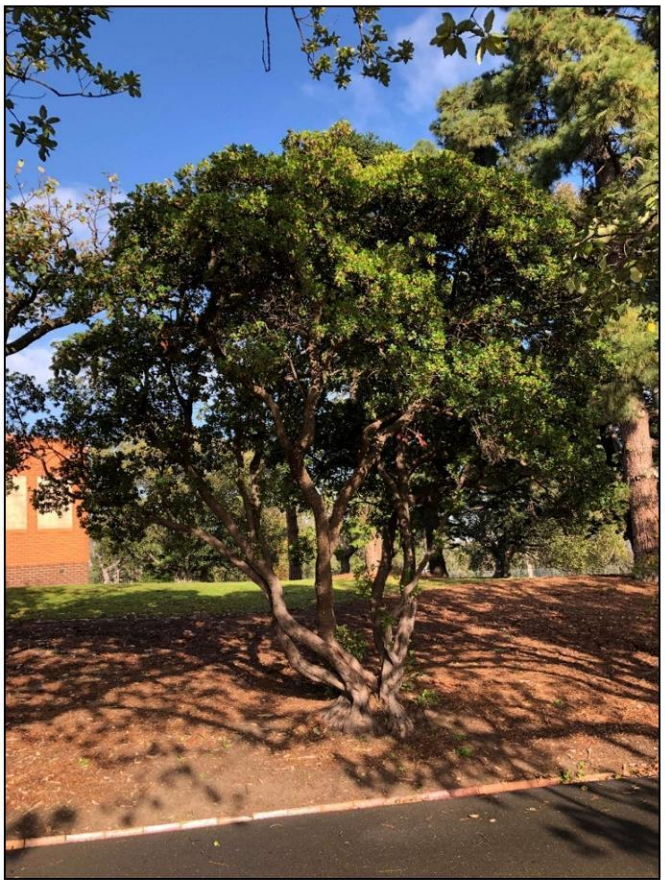
Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.	**19**
Existing Tree No.:	1127
Botanic Name:	Arbutus unedo
Common Name:	Irish Strawberry Tree
Origin:	Exotic
Size (m):	6 x 9
DBH (cm):	Multi 15
TPZ (m):	4.8
Age:	Mature
Health:	Good
Structure:	Fair
ULE (years):	20+
Arb. Value	Medium
Comments / Works:	Not consistent with avenue, not replicated other side.



Tree No. 19.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**20**
Existing Tree No.:	1131
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	8 x 9
DBH (cm):	32
TPZ (m):	3.8
Age:	Mature
Health:	Good
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 20.

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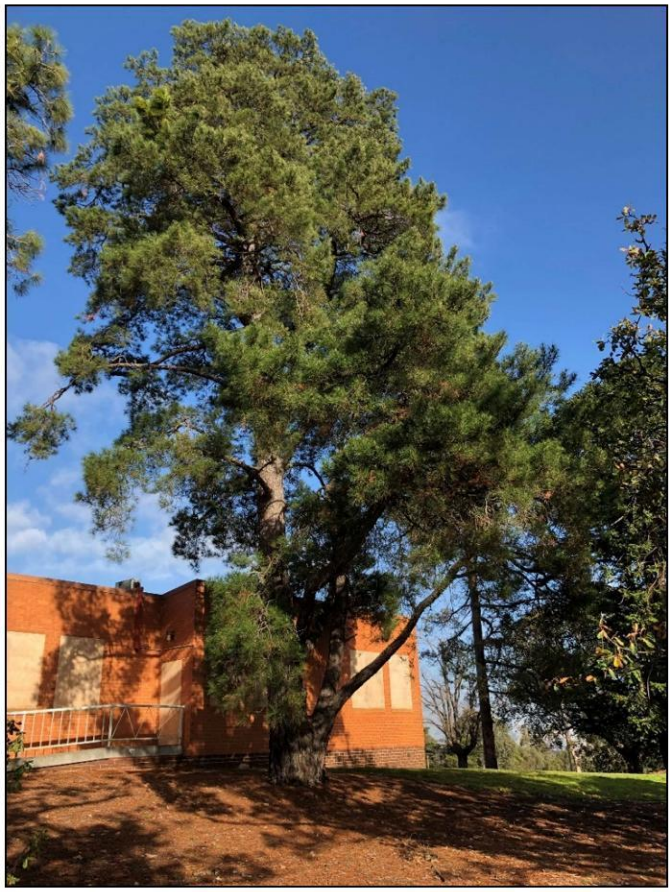
Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**21**
Existing Tree No.:	186
Botanic Name:	Pinus radiata
Common Name:	Monterey Pine
Origin:	Exotic
Size (m):	18 x 15
DBH (cm):	80
TPZ (m):	9.6
Age:	Mature
Health:	Good
Structure:	Fair
ULE (years):	5 – 10
Arb. Value	Medium
Comments / Works:	Remove within 10 years. No replacement.



Tree No. 21.

Kew – Stage 8 Heritage Permit – P26760

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**22**
Existing Tree No.:	185a
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	2 x 2
DBH (cm):	4
TPZ (m):	2.0
Age:	Juvenile
Health:	Good
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	Formative prune.

Tree No. 22.

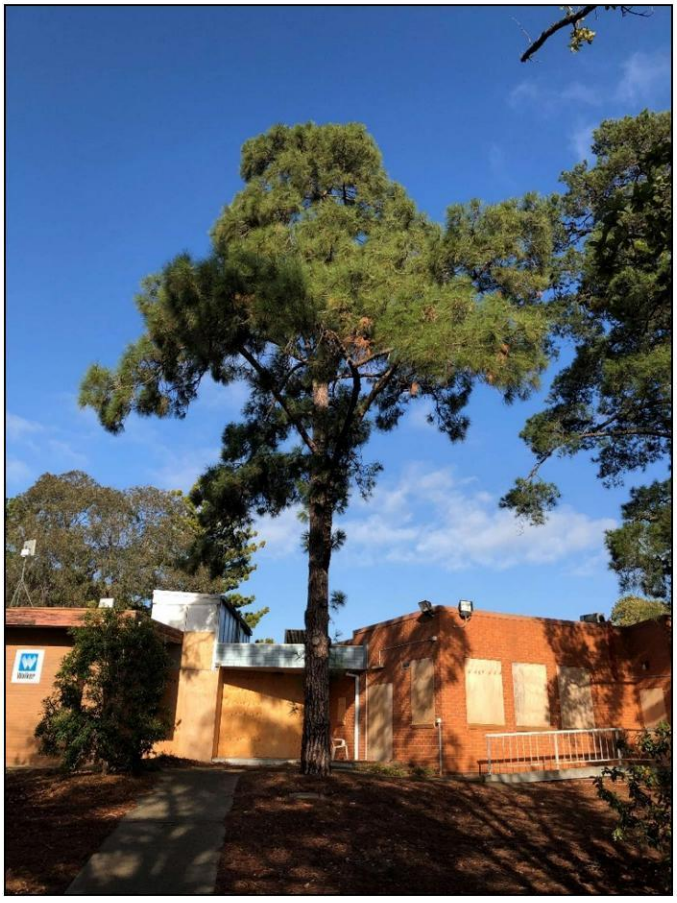
Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.	**23**
Existing Tree No.:	185
Botanic Name:	Pinus canariensis
Common Name:	Canary Island Pine
Origin:	Exotic
Size (m):	18 x 14
DBH (cm):	60
TPZ (m):	7.2
Age:	Mature
Health:	Fair
Structure:	Fair
ULE (years):	10 – 20
Arb. Value	Medium
Comments / Works:	-



Tree No. 23.

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**24**
Existing Tree No.:	185b
Botanic Name:	Tristaniopsis laurina
Common Name:	Kanooka
Origin:	Vic. Native
Size (m):	3 x 2
DBH (cm):	Multi 6
TPZ (m):	2.4
Age:	Semi mature
Health:	Good
Structure:	Poor
ULE (years):	0
Arb. Value	Low
Comments / Works:	Remove no replacement.

Tree No. 24.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**25**
Existing Tree No.:	185c
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	7 x 3
DBH (cm):	10
TPZ (m):	2.0
Age:	Mature
Health:	Fair
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 25.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**26**
Existing Tree No.:	1143a
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	5 x 3
DBH (cm):	5
TPZ (m):	2.0
Age:	Mature
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 26.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**27**
Existing Tree No.:	1143
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	11 x 13
DBH (cm):	60
TPZ (m):	7.2
Age:	Mature
Health:	Fair
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	Declined & branch tips lopped, regenerating.

Tree No. 27.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**28**
Existing Tree No.:	1151
Botanic Name:	Quercus robur
Common Name:	English Oak
Origin:	Exotic
Size (m):	10 x 10
DBH (cm):	40
TPZ (m):	4.8
Age:	Mature
Health:	Good
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 28.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**29**
Existing Tree No.:	1150
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	11 x 13
DBH (cm):	57
TPZ (m):	6.8
Age:	Mature
Health:	Good
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	Partly suppressed by tree on other side of avenue.

Tree No. 29.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**30**
Existing Tree No.:	1149
Botanic Name:	Quercus canariensis
Common Name:	Algerian Oak
Origin:	Exotic
Size (m):	11 x 14
DBH (cm):	60
TPZ (m):	7.2
Age:	Mature
Health:	Good
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 30.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**31**
Existing Tree No.:	1160
Botanic Name:	Ulmus procera
Common Name:	English Elm
Origin:	Exotic
Size (m):	10 x 8
DBH (cm):	30/20
TPZ (m):	4.3
Age:	Mature
Health:	Fair
Structure:	Poor
ULE (years):	5 – 10
Arb. Value	Medium
Comments / Works:	Suppressed by 34.

Tree No. 31.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**32**
Existing Tree No.:	149a
Botanic Name:	Ficus macrophylla
Common Name:	Moreton Bay Fig
Origin:	Aust. Native
Size (m):	4 x 3
DBH (cm):	10
TPZ (m):	2.0
Age:	Semi mature
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	High
Comments / Works:	Planted close to path, potential infrastructure damage in future.

Tree No. 32.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**33**
Existing Tree No.:	1169a
Botanic Name:	Ulmus procera
Common Name:	English Elm
Origin:	Exotic
Size (m):	1 x 0.5
DBH (cm):	2
TPZ (m):	2.0
Age:	Juvenile
Health:	Poor
Structure:	Poor
ULE (years):	0
Arb. Value	Low
Comments / Works:	New planting. Remove and replace with same species.

Tree No. 33.

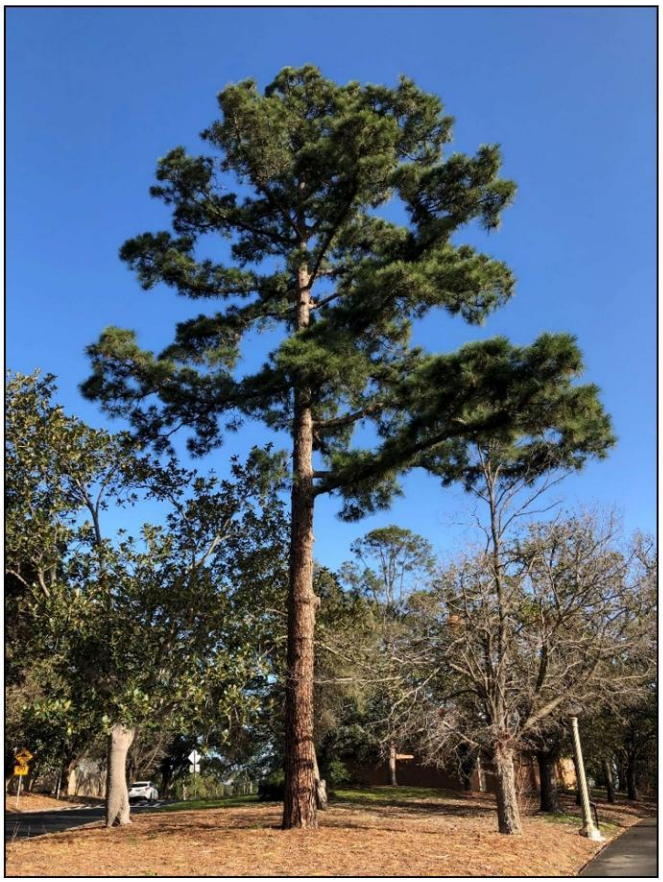
Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.	**34**
Existing Tree No.:	149
Botanic Name:	Pinus canariensis
Common Name:	Canary Island Pine
Origin:	Exotic
Size (m):	23 x 12
DBH (cm):	68
TPZ (m):	8.0
Age:	Mature
Health:	Fair
Structure:	Fair
ULE (years):	10 – 20
Arb. Value	Medium
Comments / Works:	-



Tree No. 34.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**35**
Existing Tree No.:	1159
Botanic Name:	Ficus macrophylla
Common Name:	Moreton Bay Fig
Origin:	Aust. Native
Size (m):	11 x 15
DBH (cm):	44
TPZ (m):	5.3
Age:	Mature
Health:	Fair
Structure:	Poor
ULE (years):	10 – 20
Arb. Value	Medium
Comments / Works:	No central leader.

Tree No. 35.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.	**36**
Existing Tree No.:	1149a
Botanic Name:	Cupressus funiberis
Common Name:	Chinese Weeping Cypress
Origin:	Exotic
Size (m):	8 x 7
DBH (cm):	30
TPZ (m):	3.6
Age:	Over Mature
Health:	Poor
Structure:	Poor
ULE (years):	0 – 5
Arb. Value	Low
Comments / Works:	Remove and replace with different species.

Tree No. 36.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**37**
Existing Tree No.:	1153a
Botanic Name:	Ficus macrophylla
Common Name:	Moreton Bay Fig
Origin:	Aust. Native
Size (m):	2 x 1
DBH (cm):	3
TPZ (m):	2.0
Age:	Juvenile
Health:	Good
Structure:	Fair
ULE (years):	0 – 5
Arb. Value	Low
Comments / Works:	Planted too high, replant or replace with same species.

Tree No. 37.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**38**
Existing Tree No.:	1153b
Botanic Name:	Ulmus procera
Common Name:	English Elm
Origin:	Exotic
Size (m):	3 x 0.5
DBH (cm):	2
TPZ (m):	2.0
Age:	Juvenile
Health:	Fair
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	Formative prune.

Tree No. 38.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**39**
Existing Tree No.:	1153
Botanic Name:	Cedrus atlantica `Glauca'
Common Name:	Blue Atlas Cedar
Origin:	Exotic
Size (m):	11 x 15
DBH (cm):	67
TPZ (m):	8.0
Age:	Juvenile
Health:	Good
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	Prune out minor deadwood.

Tree No. 39.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**40**
Existing Tree No.:	1152
Botanic Name:	Cupressus sempervirens
Common Name:	Pencil Pine
Origin:	Exotic
Size (m):	11 x 2
DBH (cm):	28
TPZ (m):	3.4
Age:	Mature
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 40.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**41**
Existing Tree No.:	153
Botanic Name:	Pinus canariensis
Common Name:	Canary Island Pine
Origin:	Exotic
Size (m):	18 x 17
DBH (cm):	58
TPZ (m):	7.0
Age:	Mature
Health:	Fair
Structure:	Fair
ULE (years):	10 – 20
Arb. Value	Medium
Comments / Works:	Prune back from Tree 39

Tree No. 41.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**42**
Existing Tree No.:	153a
Botanic Name:	Ficus macrophylla
Common Name:	Moreton Bay Fig
Origin:	Aust. Native
Size (m):	3 x 1
DBH (cm):	7
TPZ (m):	2.0
Age:	Juvenile
Health:	Fair
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 42.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**43**
Existing Tree No.:	156a
Botanic Name:	Ulmus procera
Common Name:	English Elm
Origin:	Exotic
Size (m):	3 x 0.5
DBH (cm):	2
TPZ (m):	2.0
Age:	Juvenile
Health:	Fair
Structure:	Fair
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 43.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**44**
Existing Tree No.:	156
Botanic Name:	Pinus radiata
Common Name:	Monterey Pine
Origin:	Exotic
Size (m):	19 x 15
DBH (cm):	96
TPZ (m):	11.5
Age:	Mature
Health:	Good
Structure:	Fair
ULE (years):	5 – 10
Arb. Value	Medium
Comments / Works:	-

Tree No. 44.

Kew – Stage 8 Heritage Permit – P26760

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Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**45**
Existing Tree No.:	157
Botanic Name:	Eucalyptus Radiata
Common Name:	Narrow Leaved Peppermint Gum
Origin:	Vic. Native
Size (m):	14 x 12
DBH (cm):	75
TPZ (m):	9.0
Age:	Mature
Health:	Good
Structure:	Fair
ULE (years):	10 – 20
Arb. Value	Medium
Comments / Works:	-

Tree No. 45.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**46**
Existing Tree No.:	158
Botanic Name:	Araucaria cunninghamii
Common Name:	Hoop Pine
Origin:	Aust. Native
Size (m):	18 x 12
DBH (cm):	90
TPZ (m):	10.8
Age:	Mature
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	High
Comments / Works:	-

Tree No. 46.

Kew – Stage 8 Heritage Permit – P26760

Approval Date: 25 September 2018

Address: 1 – 8 Main Drive, Kew

Condition 4 – Tree Management Plan – Arborist Assessment – July 2019

Tree No.:	**47**
Existing Tree No.:	160
Botanic Name:	Brachychiton poulaneus
Common Name:	Kurrajong
Origin:	Vic. Native
Size (m):	3 x 1
DBH (cm):	7
TPZ (m):	2.0
Age:	Juvenile
Health:	Good
Structure:	Good
ULE (years):	20+
Arb. Value	Low
Comments / Works:	Not appropriate species. Remove, could be replanted elsewhere.

Tree No. 47.

Discussion

3.1 Trees 21, 23, 24, 41, 44, 45 and 46 are within 7.0 metres of the apartment building's envelope. Below is a table of the TPZ encroachments of these trees, based on the 'Basement Level 01 Floor Plan', (DWG No. AR08-24.01 Rev T, 20.08.19).

Table 1: TPZ Encroachments

Tree No.	TPZ Building Encroachment %	TPZ Path Encroachment %	TOTAL TPZ ENCROACHMENT %
21	13.68	0	**13.68**
23	11.02	32.1	**43.12**
24	0.00	100.00	**100.00**
41	13.46	0	**13.06**
44	14.14	0	**14.14**
45	20.83	0	**20.83**
46	0.00	3.47	**3.47**

3.2 The Galbraith Arborist Report 2017, notes that tree roots of Trees 21, 23, 41, 44, 45 and 46 may not have grown into the footprint of the Administration Building because the footings will have acted as a root barrier, preventing the entry of roots into the proposed basement and he assumes the dry soil environment below the existing building will not be conducive to root growth. However, this must be confirmed on site during the excavation process, which must be supervised by the Project Arborist.

3.3 Tree 24 is in the alignment of the northern pedestrian path. It is less than 10 years old, not significant, in poor condition and not consistent with the planting theme. It will require removal but does not need replacing.

3.4 The TPZ encroachments include those created by the installation of pedestrian paths. The impact of these works can be mitigated by ensuring paths are constructed above existing ground levels and of permeable material. This prevents the need for excavation that can damage roots and the permeability allows moisture and air infiltration to roots. This approach should be undertaken under Project Arborist supervision so that, effectively, there is no encroachment from path construction.

3.5 Tree 45 is 4.5m from the apartment building and appears to have been planted in the 60s, when the Administration Building was constructed. It is of a species which is inconsistent with the overall species planting theme on the site.

3.6 The canopies of some of the encroached trees overhang the building envelope and will require pruning, in accordance with AS-4373 *Pruning of Amenity Trees*. This may reduce their aesthetics but is unlikely to prevent their retention.

3.7 While the existing mature trees are predominantly healthy, some new plantings have died, some older specimens are nearing the end of their natural life cycles, while others have structural faults which increases the likelihood of failure as they increase in size and age. Judicious pruning in accordance with AS4373 will assist in rectifying some structural issues, allowing for their retention but others cannot be rectified, and their removal and replacement is recommended.

4 TREE REPLANTING AND MAINTENANCE SCHEDULE

Introduction

4.1 The objective of this Tree Management Plan is to ensure that a continuous tall tree canopy over the island site is reasonably secured into the future.

4.2 In particular, the *Tree Replanting and Maintenance Schedule* intends to;

- Rejuvenate the island site and to secure the integrity and reinforcement of the heritage tree avenue, namely the Oak Walk.
- Maintain the existing landscape character of open lawn with scattered specimen trees devoid of under-storey planting which provides an open park atmosphere, typical of the late 19th century and early 20th century.

4.3 During the 15 years from commencement of construction:

- Trees must be protected and maintained. Trees within the urban environment are continually exposed to environmental stresses such as drought, pollution, soil compaction and pests and diseases. A well prepared and implemented maintenance programme will enable potential problems to be avoided or managed, resulting in stronger trees with longer useful life expectancies.
- Some diseased and senescent trees must be progressively removed.
- New trees progressively planted, which are the same species as removed trees, or which reflect the island site's heritage values and are suitable for this area, in particular, are not weed species.

4.4 The *Tree Replanting and Maintenance Schedule* applies to all the 47 trees within the island site, not just those that are recommended for replacement.

General Recommendations

4.5 All trees should be inspected by a qualified and experienced arborist, with a minimum qualification AQF 5 or equivalent, on a maximum 3-year cycle. This will determine the condition of trees and provide recommendations to undertake remedial works, such as pruning in accordance with AS-4373, soil amelioration to aerate, application of fertilisers, wetting agents, irrigation and pest and disease control as required such as Elm Leaf Beetle treatment, via soil injection. The intent is to be proactive, to undertake preventative works, to minimise the loss of trees and to increase their longevity. It is not to be simply reactive and rectify issues after the fact e.g. remove fallen branches, dead trees etc.

4.6 A company that has the resources, knowledge and experience to manage large open spaces, including tree removals and replacements should be contracted to maintain the site at its high present standard, with a broad overview of the site and recognition and understanding of the long-term intent. Ongoing tree planting, irrigation, formative pruning and other tree maintenance practices should be undertaken by appropriately qualified and experienced contractors.

4.7 To ensure the longevity of the existing landscape layout, new trees planted must be true to form and of good health and structure. The Australian Standard AS-2303 '*Tree Stock for Landscape Use*' provides guidelines for the purchasing of good tree stock, from reputable suppliers. It is recommended that all trees be of 45 -100 litre stock, a common, readily available container size often used for council street tree planting. These trees provide instant contribution to the landscape and quickly establish with appropriate maintenance.

4.8 In the first 3 years following planting, routine monthly maintenance should include effective irrigation, which may require soil wetter, mulch shaping etc; formative pruning; and weed control. Irrigation is dependent on rainfall and not generally required during late autumn – early winter. It appears that irrigation has been inadequate in the past and young trees have died. Trees need to be protected from vandalism and unintended mechanical damage from mowers/edge-trimmers by using temporary tree guards, water wells and trunk protectors for the first 5 years, after planting. See Appendix 1 for a brief summary of tree establishment and post establishment care.

4.9 All tree irrigation must be done by hand. Installation of an irrigation system within the island site would cause damage to tree roots of existing trees and should not occur.

4.10 No trenching is to occur within the island site without prior authorisation from the Responsible Authority and only under arboricultural supervision.

4.11 Trees should only be removed for justified reasons such as poor/hazardous structure, poor health that cannot be improved by intervention, or to remove a tree to allow for plantings that reflect the Oak Walk avenue. The benefit to the broader landscape by planting multiple trees takes priority over a single tree, unless the tree is of outstanding stature, rarity or exceptional condition.

4.12 The regulatory controls described in Section 2 should be confirmed with Boroondara City Council and Heritage Victoria prior to any tree removal.

Species Selection

4.13 The site consists of tree species commonly planted at the start of the 20th-century. A large proportion of these are evergreen conifers. This increases the population's susceptibility to an introduced pest or disease which could annihilate them. The chance of this occurring has increased as global warming takes effect making the Melbourne climate more favourable to a broader range of pests and diseases. Cypress canker - *Seiridium* sp., a fungal disease, is responsible for killing thousands of conifers, predominantly *Cupressus sp.* – Cypress, within the last 10 years throughout south-eastern Australia. Whereas Giant Pine Scale – *Marchalina hallenica* was first confirmed in Victoria in 2014 in Melbourne's with over 4300 trees infested in the south-east suburbs.

4.14 Trade between different countries has grown exponentially in recent years and Australia's once isolation, which protected it from introduced foreign pests and diseases, has been diminished. Diseases and pests can be introduced accidently, for example, in packaging. It is therefore advisable to broaden the palette of species to avoid potential annihilation that the use of plants from a single plant group may expose a site to. New species must be consistent with the identified heritage values of the site and, in this case, link to the broader landscape of Kew Cottages.

4.15 Where appropriate, trees are recommended to be replaced with the same species. In some instances however, there are reasons other than those discussed above, why this is either not possible or not appropriate. These include the species no longer being readily available from nurseries in Australia or the species being a recognised environmental weed. All proposed species were available from the nursery trade during the late 19th and early 20th Centuries.

Timing removals and replacements

4.16 In most cases it is difficult to determine a specific time in the future when a tree should be replaced. Factors such as weather conditions, including extreme events such as prolonged drought and storms, and the prevalence of pests or diseases can have a large influence on the health and structural stability of a tree. The aim of the following tree replanting schedule is to secure a continuous tall tree canopy within the 'island' section of Main Drive. For the reasons mentioned above, unless it is obvious that a tree requires replanting at a particular time (e.g. the tree is dead or hazardous), replanting is recommended within a 5 year period during which the tree is to be monitored to determine the best time for replanting with the aim to avoid too many removals within the one area at the same time.

Specific Recommendations

Removals and Replanting

Years 0 to 5

4.17 Of the 47 trees assessed, 9 are considered to require replacement within the next 5 years due to their inappropriateness or generally poor condition and low arboricultural value. This includes the *Pinus canariensis* – Tree 17, whose health is not anticipated to recuperate sufficiently to justify retention.

Table 2: 0 - 5 Year Tree Removals / Replacements

Tree No.	Ext. No.	Botanic Name	Arb. Value	Replacement Species	Comments / Works
4	1113	*Quercus canariensis*	Low	*Quercus canariensis*	98% dead. Remove and replace
9		*Agathis robusta*	Low	*Podocarpus elatus*	Appears to be stressed. Possibly root girdled. Replace with smaller growing species and plant an *Agathis robusta* elsewhere.
11	1123	*Quercus canariensis*	Low	*Quercus canariensis*	Remove and replace
17	191	*Pinus canariensis*	Low	*Agathis robusta*	In decline but showing signs of new growth after irrigating however is unlikely to establish good vigour. Remove and replace with *Agathis robusta*.
24		*Tristaniopsis laurina*	Low	*N/A*	Remove no replacement
33		*Ulmus procera*	Low	*Ulmus procera*	New planting. Remove and replace
36		*Cupressus funebris*	Low	*Cupressus funebris/ Callitris glaucophylla*	Remove and replace with *Cupressus funebris* or *Callitris glaucophylla* if Cypress can't be sourced.
37		*Ficus macrophylla*	Low	*Ficus macrophylla*	Poorly planted to high, replant or replace
47	160	*Brachychiton populneus*	Low	*Brachychiton roseus* 'Jerilderie Red'	Inappropriate species, weedy. Remove & replace.

4.18 Trees 4 and 11, young *Quercus canariensis*, have died during their establishment phase. They should be replaced with the same species to reinforce the Oak Walk.

4.19 Tree 9 appears to be stressed. This may be a result of poor nursery practices and it would appear to have girdled roots. The canopy of this large growing taxon (*Agathis robusta*) can reach mature widths of 10-25m. Given the size of the growing space and the surrounding trees, a smaller growing conifer such as a Plum Pine (*Podocarpus elatus*) which grows to 15m x 8m would be better suited to this location while a Kauri Pine (*Agathis robusta*) could be planted elsewhere.

4.20 Tree 17 is in advanced decline. However, it was recently irrigated and is showing signs of new growth. It is too early to determine if it will survive but it is unlikely to establish good vigour. By planting a replacement tree further to the south, the area lends itself to a large growing, stately specimen tree and here it is recommended to plant a Kauri Pine. This will increase species diversity within the area.

4.21 Tree 33, growing on Main Drive, is in poor condition. It needs replacement with the same species, *Ulmus procera*.

4.22 Tree 36 has reached senescence. This taxon is not readily available from nurseries. If the same species cannot be sourced (or contract grown), it is recommended to replace it with a White Cypress Pine (*Callitris galucophylla*), this will increase the genus diversity in the area (thus reducing the risk of pest or disease infestation) while maintaining the predominance of conifers. This species is also cited in the Heritage Victoria Statement of Significance as being used in the area.

4.23 Tree 37 is an appropriate species to reflect the planting within the Main Drive avenue but unfortunately is planted too high or is root girdled. While it is of a size where it could be lifted, its root system checked to review its condition and then, if appropriate, replanted deeper, a more practical solution may be replacing it with an advanced specimen.

4.24 Tree 47 is a relatively small, young tree. This species (*Brachychiton populneus*) can tend to be weedy. It is recommended to replace it with a less weedy species of the same taxon, *Brachychiton roseus* 'Jerilderie Red'. This species is a hybrid of *Brachychiton populneus* and *Brachychiton acerifolia* and is cited in the Heritage Victoria Statement of Significance as being used in the area (although the proposed cultivar is a more modern, improved cultivar).

Years 6 to 10

4.25 Below is a table of trees that require replacement within the next 10 years.

Table 3: 5 -10 Yr. Tree Removals / Replacements

Tree No.	Ext. No.	Botanic Name	Arb. Value	Replacement Species	Comments / Works
5	1112	*Cupressus funiberis*	Medium	*Cupressus funebris/ Cupressus cashmeriana*	Remove and replace with *Cupressus funebris* or *Cupressus cashmeriana* if Cypress can't be sourced.
14	1125	*Corymbia maculata*	Medium	*Corymbia macrulata*	Remove and replace
18	190	*Araucaria bidwillii*	Medium	*Araucaria bidwillii*	Substantial bifurcation. Remove & Replace
21	186	*Pinus radiata*	Medium	*Pinus roxburghii*	Replace with non-weedy species, further to north-west away from building
23	185	Pinus canariensis	Medium	*Pinus canariensis*	Remove and replace
31	1160	Ulmus procera	Medium	*Quercus canariensis*	Supressed by 34. Not consistent species for Oak Walk
34	149	*Pinus canariensis*	Medium	*N/A*	No Replacement. Allow replacement Tree 31 & 35 to grow without competition.

Table 3: 5 -10 Yr. Tree Removals / Replacements

Tree No.	Ext. No.	Botanic Name	Arb. Value	Replacement Species	Comments / Works
35	1159	*Ficus macrophylla*	Medium	*Ficus macrophylla*	No central leader. Remove and replace.
41	153	*Pinus canariensis*	Medium	*Pinus canariensis*	Remove and replace.
44	156	*Pinus radiata*	Medium	*Pinus roxburghii*	Remove and replace with non-weedy species.
45	157	*Eucalyptus radiata*	Medium	*Corymbia ficifolia*	Remove and replace with smaller species.

4.26 Tree 5 is coming to the end of its ULE. As discussed above for Tree 36, this taxon is not readily available from nurseries. Given the longer time frame, (6 – 10 years) it may be possible to get one contract grown, if this is not possible, it is recommended to replace it with Kashmir Cypress (*Cupressus cashmeriana*) which has a similar weeping habit.

4.27 Tree 14 is healthy but has a wide branch union that will be problematic as it increases in age and size. Its potential to fail will increase. It therefore, should be removed and replaced with the same species but of better quality. Ongoing arboricultural attention may assist in determining the time of removal and replacement.

4.28 Tree 18 has a substantial bifurcation that cannot be rectified by pruning. Its potential for failure will increase as it ages and grows larger. It should be replaced with the same species, *Araucaria bidwillii*.

4.29 Tree 21, Monterey Pine, is a recognised environmental weed which has a tendency to readily self-seed. Given the close locality of the site to Yarra Bend Park and the Yarra River, planting of recognised weeds is not encouraged. Chir Pine (*Pinus roxburghii*) has been recommended as a replacement species. This species does not have the same weedy tendencies as *P. radiata*.

4.30 Tree 31, *Ulmus procera* is in the alignment of the Oak Walk and therefore is an inconsistent species, not appropriate for its location. It is supressed by Tree 34. It should be removed and replaced with a *Quercus canariensis* consistent with the Oak Walk, but this cannot be achieved successfully until Tree 34 is removed. There is also sufficient space for a second *Quercus canariensis* to be planted to further to the east to extend the Oak Walk.

4.31 Tree 34 is a stately pine of fair condition but is suppressing Trees 31 and 35 and preventing the replanting of these trees to reinforce the significant Oak Walk and reflect the Main Drive avenue. It requires removal to allow for replacement of Trees 31 and 35. It does not require replacement as there is insufficient room and new trees of the Oak Walk and Main Drive will fill the space.

4.32 Tree 35 is growing under the canopy of Tree 34. It is of poor structure but fair health. It needs replacement but establishment of a new *Ficus macrophylla* is unlikely while Tree 34 is present, due to competition.

4.33 Tree 44, as with Tree 21, it is recommended to replace this weedy species with Chir Pine.

4.34 Tree 45, *Eucalyptus radiata*, is a large sprawling specimen of fair structure. A number of lower branches will require removal to accommodate the new building. The trees either size of this tree, Tree 44, Monterey Pine (to be replaced with Chir Pine) and Tree 46, Hoop Pine (*Araucaria cunninghamii*) both have the potential to grow in to large trees (30 x 15), it is therefore recommended to replace this tree with a smaller growing native, Red Flowering Gum (*Corymbia ficifolia*). This species is cited in the Heritage Victoria Statement of Significance as being used in the area.

4.35 Beyond 10 years, there are too many variables to recommend a tree replacement programme. Factors such as climate, pest / disease and maintenance regimes will all have a contributing factor to the longevity of individual specimens and the requirement to remove and replace trees. The trees not programmed for replacement within the next 10 years, are all expected to have ULE of 20 + years.

Species Selection

4.36 The following table comprises those trees where an alternative species has been proposed and discusses the reasons for the recommended species. All proposed species were available from the nursery trade during the late 19th and early 20th Centuries.

Table 4: Species Selection

Tree No.	Existing species	Proposed Replacement Species	Comments / Works
5	*Cupressus funebris*	*Cupressus cashmeriana*	*Cupressus funebris* is not readily available. Replace like-for-like if species can be sourced, otherwise replace with *Cupressus cashmeriana*. This species of the same genus has a similar weeping habit.
9	*Agathis robusta*	*Podocarpus elatus*	Replace with *Podocarpus elatus*. This smaller growing conifer reaches a mature size that is less likely to compete with neighbouring canopies while increasing species diversity.
17?	*Pinus canariensis*	*Agathis robusta*	Uncertain why tree has died. Replace with different genus to reduce risk of possible failure of new planting and increase species diversity in area. Replace with *Agathis robusta* (species replacement for Tree 9) but move new planting further to south. This offers a species replacement for Tree 9 but allows a greater area for canopy growth.
21	*Pinus radiata*	*Pinus roxburghii*	Recognised environmental weed therefore inappropriate species due to close proximity to Yarra Bend Park and Yarra River. *Pinus roxburghii* has a similar appearance but does not have the same weedy tendency.
31	*Ulmus procera*	*Quercus canariensis*	Incorrect species planted along Oak Walk. Replace with *Quercus canariensis* in keeping with other trees along Oak walk.
36	*Cupressus funebris*	*Callitris glaucophyllus*	If a *Cupressus funebris* cannot be sourced, replace with *Callitris glaucophyllus* to increase species diversity. This species is mentioned in the Heritage Victoria Statement of Significance for the Former Kew Cottages.
44	*Pinus radiata*	*Pinus roxburghii*	Recognised environmental weed therefore inappropriate species due to close proximity to Yarra Bend Park and Yarra River. *Pinus roxburghii* has a similar appearance but does not have the same weedy tendency.

Table 4: Species Selection

Tree No.	Existing species	Proposed Replacement Species	Comments / Works
45	*Eucalyptus radiata*	*Corymbia ficifolia*	*Corymbia ficifolia* is mentioned in the Heritage Victoria Statement of Significance for the Former Kew Cottages in the same context as *Eucalyptus nicholii* (which *Eucalyptus radiata* is often mistaken for). The canopy of this smaller growing species will complement the larger growing trees to the south of it (Tree 44, *Pinus roxburghii* and Tree 46, *Araucaria cunninghamii*)
47	*Brachychiton populneus*	*Brachychiton roseus* 'Jerilderie Red'	*Brachychiton populnea* can have a tendency for weediness. *Brachychiton roseus* is the same genus but does not tend to self-seed readily. This species is mentioned in the Heritage Victoria Statement of Significance for the Former Kew Cottages

Detailed Tree Replanting and Maintenance Schedule

4.37 The Schedule breaks down the suggested actions for each tree, for each year, over a 15 year period, commencing at construction.

4.38 It is broken into 5 year intervals that match Heritage Permit P26760 condition 14, which requires reviews at 5 year intervals prior to the progressive release of the $150,000 bond.

4.39 In the later years, actions are more generic, given the difficulty predicting tree health so far in advance. However, during the earlier years while construction is under way the actions are detailed, please see Section 6.

4.40 A full Tree Replanting and Maintenance Plan is at Appendix 5.

5 PROPOSED LANDSCAPE PLAN

Figure 4: Proposed Landscape Plan

6 CONSTRUCTION PHASE

Introduction

6.1 The first phase of works prescribed in this *Tree Management Plan* are intended to protect the trees from undue harm during demolition and construction works.

6.2 The consequences of non-compliance with this TMP are addressed in the conditions of Heritage Permit P26760, which also require provision of a security bond, that will be redeemed in the event of damage or death of trees within the island site during construction activities.

6.3 Serious damage may be inflicted on a tree during construction in several ways, and in the most severe cases this can lead to tree death or failure (e.g. falling over). Common ways in which a tree may be damaged are listed in Table 5. This does not cover all issues, but the ones that are most commonly encountered.

Table 5: – Common Causes Of Damage To Trees

Injury	Causes	Possible Impact
Root loss	- Excavation (even shallow depths) - Preparation of ground for paving or road surfacing - Trenching for service installation - Trenching for construction of footings.	Die back of canopy and foliage loss. Premature death of the tree. Undermine the stability causing potential collapse
Restriction of water and oxygen to the root zone	- Compaction for paving construction (to form a stable sub-base) - Compaction through movement of vehicles and heavy machinery. - Parking of vehicles and machinery - Storage of heavy materials	Die back of canopy and foliage loss. Premature death of the tree.
Damage to the canopy or trunk	- Poor pruning cuts (including access pruning) - Impact from machinery / equipment - Attaching of equipment or signage to the tree.	Disease & pest infection Die back of canopy and foliage loss. Decay, cavity development Premature removal
Poisoning/scorching	- Storage or disposing of chemicals, waste into the root zone. - Accidental spillage of chemicals, waste into the root zone	Die back of canopy and foliage loss. Premature death of tree.

Project Arborist

6.4 Prior to any works commencing a Project Arborist must be appointed to oversee all relevant tree works. This shall include, but not be limited to, the works prescribed in this TPP.

6.5 The Project Arborist is to be an appropriately experienced and with a minimum AQF Certificate 5 qualification (or equivalent) in arboriculture.

6.6 The Project Arborist is to oversee any works including demolition and excavation within the TPZ of the trees to be retained.

6.7 The Project Arborist may approve minor changes to the works specified in this TMP at their discretion. Approved changes are to be in accordance with Council's endorsed plans and accepted, professional arboricultural procedures.

6.8 Without the written consent form Boroondara Council and Heritage Victoria, no changes are to be made that are likely to damage or adversely impact the health or retention of trees.

Supervision Timetable

6.9 The Project Arborist will observe and have input into the supervision of the following tasks & decisions as outlined in the following table.

Table 6: – Project Arborist Inspection Schedule

Task	Timing	Liaison
Site meeting to discuss TMP & Implementation	Pre - demolition	Site manager / Project arborist
Installation of TPZ fencing and ground protection, irrigation	Pre - demolition	Site manager / Project arborist
Monitor demolition within the retained tree's TPZs	Demolition	Site manager / Project arborist / Demolition contractor
Monitor excavation of basement within TPZs	Construction	Site manager / Project arborist
Monitor excavation & installation of driveways within TPZs	Construction	Site manager / Project arborist
Monthly inspections to evaluate tree condition and TPZ maintenance	Construction	Site manager / Project arborist
Removal of TPZ fencing	Post - Construction	Site manager / Project arborist

Induction

6.10 Prior to the commencement of works on site, all workers are to be inducted into the necessity to protect surrounding trees above and below ground and made aware of the existence of the TMP and signed off on it, to ensure it has been read and understood.

General Tree Protection Requirements

6.11 All works are to be in accordance with AS4970-2009 *Protection of trees on development sites.*

6.12 Standard tree protection requirements apply within the tree protection area as follows. Deviations from these requirements will be subject to an amended TMP, which must be endorsed by Heritage Victoria in accordance with P267602.

6.13 These protection requirements apply throughout the development process:

- No heavy machinery is to enter the fenced areas of the TPZs without the express permission of the Project Arborist (emergency service vehicles excluded);
- Ground levels within TPZs are to be retained at existing levels unless approved by the Project Arborist;
- No trenching for services, gas, water, electricity, telecommunications, drainage or irrigation are to pass through the TPZ unless approved by the Project Arborist. Installation is to be either bored, hydro-vac or hand dug to allow significant roots to be retained;
- No storage or disposal of materials, waste or equipment is to occur within TPZs;
- No fixtures of any sort shall be attached to the trees;
- All machinery is to be kept clear of the tree canopy to prevent branch breakages.

TPZ Fencing & Signage

6.14 TPZ exclusion fencing is required to isolate trees from construction activities in order to protect the canopy and more importantly roots from damage and compaction.

6.15 The area outside the fenced building site will still be made available to the public therefore fencing of the entire island site is not possible.

6.16 Parking of vehicles and the storage or disposal of equipment and materials must not occur on grassed areas outside the fenced building site.

6.17 It is recommended that Trees 17 and 47 be removed prior to any works commencing and not be replaced until construction is complete. This will provide an area in the south-west corner of the construction site for access, site sheds, storing of equipment and materials etc.

6.18 The preferred location for site sheds is on the western end of the construction area shown on the Tree Protection Plan. However, due to site constrictions, an area encompassing Trees 44, 45 and 46 has been identified as a possible location for site sheds. The canopies of Trees 44 and 45 are relatively high and it is expected that sheds can be located under these without impacting the canopy. The canopy of Tree 46 is quite low. Tree protection fencing is to encompass the entire width of this tree's canopy to avoid damage. The trunks of Trees 44 and 45 are to be fenced with a ground protection system such as that discussed below to cover the area of TPZ of all three trees located within the site and not protected by fencing. Sheds can be placed on top of the ground protection system. A drip irrigation system is to be installed under the ground protection system and irrigation to be determine and monitored by the Project Arborist. Note that due to the coverage of the TPZ by sheds etc, irrigation may still be required during the winter months.

6.19 It is recommended that the project arborist review Trees 44 and 45 after the construction sheds have been in place for 18 months, and confirm that the sheds can remain in there, or if they should be relocated to an alternate position.

6.20 Fencing is to be installed to protect the full TPZ of all trees. Where this is impractical due to the need for access or approved construction within the TPZ, such as with Trees 16, 18, 21, 23, 27, 41, 44, 45, and 46, at a minimum fencing is to encompass the trunks of trees with the remainder of their TPZs covered with vegetative mulch and rumble boards placed on top (Tree Protection Plan). This will protect the soil and any underlying roots from compaction.

Figure 3: Indicative detail of ground protection - from AS-4970 Protection of Trees on Development Sites. p.17

6.21 TPZ fencing is to be constructed of temporary security fencing (or similar) minimum height of 1.8m. It needs to be securely fixed by concrete block bases or star pickets. So, it cannot be easily moved when inconvenient. It is to deter entry.

6.22 This area is to be maintained as a "No-Go" zone through the demolition and development of the site to prevent any root damage and compaction of soils within the TPZ.

6.23 The area is <u>not</u> to be used for the storing or disposal of waste, materials or equipment.

6.24 No excavation, including installation of services, or change in soil levels is to occur within the TPZ unless approved by the Project Arborist.

6.25 Tree protection fencing is to remain in place until final stages of construction. i.e. Landscaping and only removed with the approval of the Project Arborist.

6.26 At least one A3 weatherproof sign is to be attached to each side of the TPZ fencing. It is too clearly state:

Figure 5: Tree Sign

6.27 Any access into a fenced protection zone is only to take place with the express approval of the Project Arborist. Requests for access to a fenced zone are to be made directly to the Project Arborist, with access to be in accordance with any conditions the Project Arborist imposes.

6.28 Even when access to the fenced zone is granted, works restrictions may still apply. It is the responsibility of the relevant site workers to ensure that adequate notice is given to the Project Arborist so that if necessary, he or she can be present on site to supervise access. Adequate notice is a minimum of two (2) working days.

6.29 If the Project Arborist determines that the requested access may pose an unacceptable risk to a tree, he or she must notify the KDC Project Manager immediately. Prior to any access to the TPZ, the Project Manager will then determine how the construction activity can be modified or completed in a manner that protects the tree and satisfies the Project Arborist.

Mulching & Irrigation

6.30 The TPZs of Trees 16, 18, 21, 23, 27, 41, 44, 45 and 46 that extend into the fenced construction area, must be mulched with a 200mm layer of vegetative mulch on which rumble boards or equivalent are to be placed. This allows areas within the TPZ to still be accessed by workers. This retains soil moisture and helps prevent compaction. If irrigation is to be via drip lines, these are to be installed below the mulch layer.

6.31 A maintenance programme must be implemented to keep TPZ fenced areas free of weeds and any grass clippings.

6.32 During October – March mulched trees must be irrigated as required to prevent wilting and loss of foliage by use of either soaker, drip line beneath the mulch or hose from a water tanker

6.33 The Project Arborist will determine the amount and frequency of irrigation, which is to be approved by the Project Manager.

Excavation within TPZs

6.34 The Galbraith Arborist Report 2017, notes that tree roots of adjacent Trees 21, 23, 41, 44, 45 and 46 may not have grown into the footprint of the existing building because the footings will have acted as a root barrier, preventing the entry of roots into the proposed basement and he assumes the dry soil environment below the existing building will not be conducive to root growth. However, this must be confirmed on site during the excavation process, which must be supervised by the Project Arborist.

6.35 Prior to demolition a root investigation using hydro excavation or similar is to be undertaken along the basement alignment within the TPZ of these trees. This will locate any roots and it can then be determined by the Project Arborist if roots can be cut without impacting on the healthy retention of the trees.

6.36 If it is determined that roots can be cut without affecting the viable retention of the trees, they should be cut using the hydro excavation or cut during demolition, with an appropriate sharp saw, by the Project Arborist or approved contractor.

6.37 Any excavations within the TPZ are to be monitored by the Project Arborist to ensure roots are not indiscriminately damaged.

6.38 All areas within the TPZs and outside the basement are to be maintained at existing ground levels. 150mm layer of soil for top dressing lawns and gardens beds is allowed for landscaping.

6.39 Should roots within the TPZ become exposed they need to be quickly covered with soil or other material and kept damp. Dehydration of exposed roots can lead to decline in tree health.

6.40 Service installation i.e. gas, water, communications, drainage etc within in the TPZ are only allowed if boring techniques are used under the supervision of the Project Arborist. No open trenching is to be undertaken in the TPZs that results in complete severance of roots in the trench.

Pruning / Removals

6.41 Any pruning or removal of trees must be described in the Tree Replanting Schedule, which will be endorsed by Heritage Victoria in accordance with the conditions of Heritage Permit P26760.

6.42 It is anticipated that Trees 23, 41, 44 and 45, will require pruning to accommodate the 3-storey apartment building.

6.43 All pruning must be undertaken by the City of Boroondara or their approved contractor (or by a qualified arborist with the approval of City of Boroondara) in accordance with AS-4373 'Pruning of Amenity Trees' and is to retain the natural shape of the tree.

Design Changes

6.44 Any changes to the building/landscaping design which alter surface or below ground works within the TPZ of retained trees must be addressed in an amended TMP which will be submitted to Heritage Victoria for endorsement in accordance with the conditions of Heritage Permit P26760.

6.45 If the Project Arborist determines that the design changes pose an unacceptable risk to a tree, he or she must notify the KDC Project Manager immediately. Prior to any design changes, the Project Manager will determine how they can be incorporated in a manner that protects the tree and satisfies the Project Arborist.

6.46 All design changes within TPZs are to be recorded for inclusion in certification reporting by the Project Arborist in accordance with the endorsed plans.

Post Construction

6.47 Once all heavy machinery has left the site and main construction is completed and landscaping has commenced, the TPZ fencing may be removed, subject to approval of the Project Arborist.

6.48 A further assessment of the trees is to be carried out 12 months after 'signing off' the project to determine if there are any detrimental impacts to trees from the development and to implement any remedial works, e.g. aerating, watering etc.

6.49 All remedial pruning, soil amelioration etc. is to be recorded for the purposes of certification by the Project Arborist. A final certification report can then be issued

Tree Protection Plan

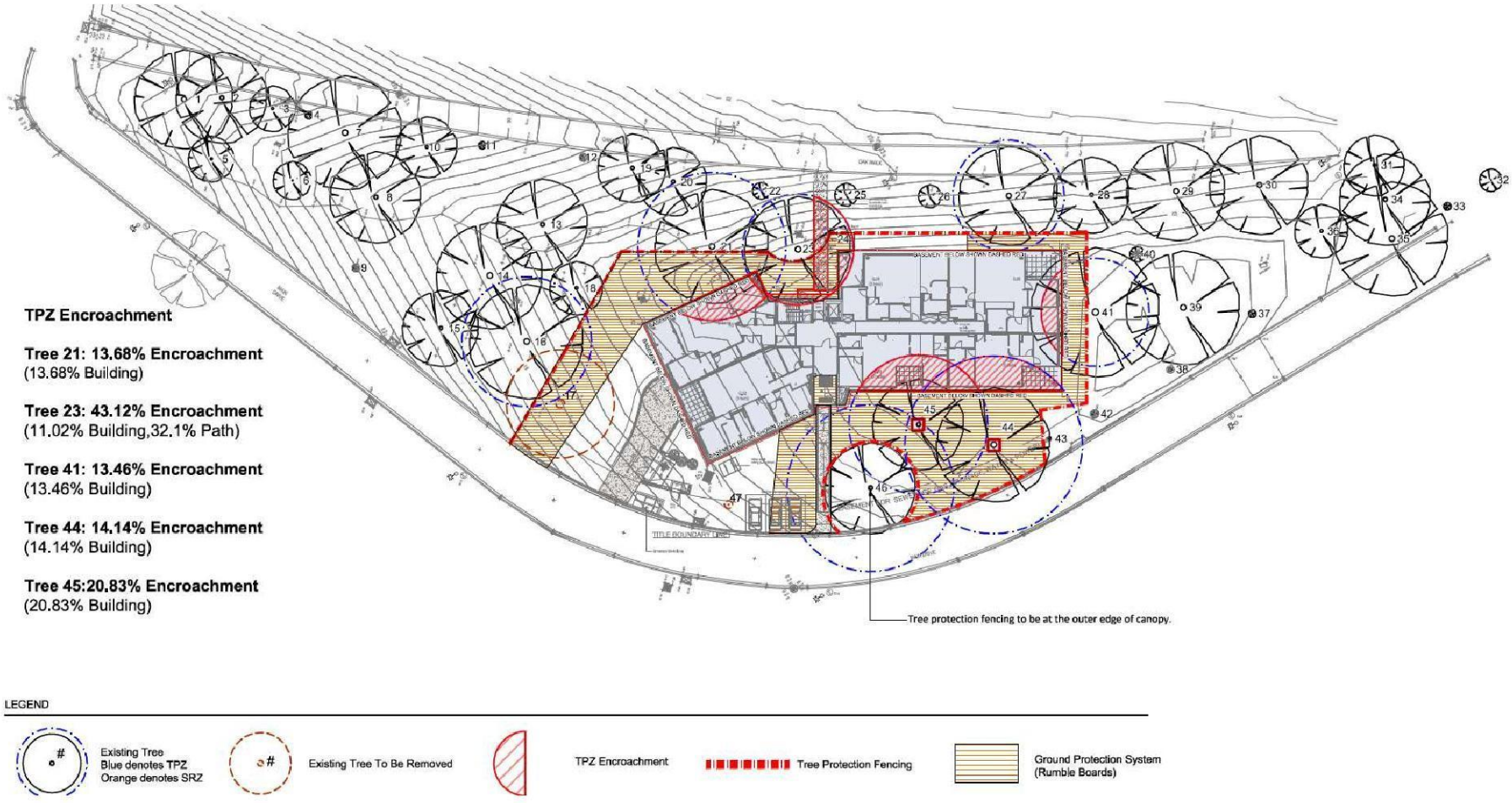


Figure 6: Construction Tree Protection Plan

APPENDIX 1: CURRICULUM VITAE

MICHAEL ROGERS
CONSULTING ARBORIST

ABOUT MICHAEL

Michael joined John Patrick Landscape Architects in 2016 as a consulting arborist.

Michael is highly experienced within the Arboriculture sector and works on a variety of projects and reports. These include tree assessment, data and managment plans.

Michael's previous experience with the City of Yarra (2001-2016) as Coordination Arborist gives him practical knowledge of the arboriculture industry which enables him to work on a variety of projects with efficiency.

QUALIFICATIONS

Assoc. Dip. Appl. Sc. (Aboriculture)-
Melbourne University 1991

Certificate IV Project Management-
Aust. Institute of Management 2012

PROFESSIONAL AFFILIATIONS

Arboriculture Australia
International Society of Arboriculture

Recent Projects

Project	Melbourne Metro Rail Link
Service	Project Site Arborist
Client	Private
Design Period	Ongoing

Project	Greenvale Tree Survey
Service	Tree Data Collection
Client	City of Hume
Design Period	2016

Project	Cutain Square Tree Management
Service	Coordination Arborist
Client	City of Yarra
Design Period	2016

CONTACT

John Patrick Landscape Architects Pty Ltd
324 Victoria Street, Richmond Victoria 3121

Email
bmclaughlin@johnpatrick.com.au

Phone
+61 3 9429 4855

APPENDIX 2: DESCRIPTORS

Tree Number:

Refers to the identification number for reference purposes, denoted on the Tree Data and Tree Survey Plan.

Botanical Name:

Botanical name of species, based on nomenclature and spelling used by Spencer in *Horticultural Flora of South Eastern Australia* (vols 1-5). Where *Eucalyptus spp.* are not found in this source, nomenclature is based on *Euclid: Eucalypts of Australia* (2006). Eucalypt subspecies information is also based on this source.

While accurate tree identification is attempted, and uncertainties are indicated, some inaccuracies in tree identification may still be present – especially in certain, difficult to determine, genera (e.g. *Cotoneaster* and *Ulmus*) and with cultivars which can have similar characteristics.

Where a doubt as to exact species is indicated, the common name and origin are based on the listed species and would change if the species were found to be incorrect.

From time to time taxonomists revise plant classification, and name changes are assigned. If it is known names have been revised post the publication of the relevant above listed source, the new nomenclature has been used.

Common Name:

Common names are based primarily on names and spelling used by Spencer in *Horticultural Flora of South Eastern Australia* (vols 1-5). The source of common names is taken in the following order:

- Single name supplied in *Horticultural Flora of South Eastern Australia*;
- First in list of names supplied in *Horticultural Flora of South Eastern Australia*, unless another name in the list is deemed more appropriate;
- As per name supplied in *Trees of Victoria and Adjoining Areas*;
- Then by best known common name if not available in either source.
- Common names are provided for thoroughness; the botanical name should be used when referring to the tree taxon.

Origin:

Exotic: Tree origin is from outside the Australian mainland, Tasmania or near islands.

Australian Native: Origin is from within the Australian mainland or near islands, but outside Victoria.

Melbourne: Origin is from within Melbourne, as defined by plants listed in the *Flora of Melbourne*.

This includes trees also found outside Melbourne, and those only within the area at the far extent of their range.

Indigenous: Tree's range includes the local area.

Type:

Deciduous: Tree seasonally loses its leaves in Victoria.
Evergreen: Tree maintains its leaves throughout the year.
Semi-deciduous: Tree may or may not lose its leaves or may only partially lose them.

Palm: Tree is a monocotyledon Palm (that is *Arecaceae*).
Palm Like: Tree is a monocotyledon but is not a palm (that is not *Arecaceae*).

Weed Potential: Trees known to show tendencies to weediness within Victoria.; refer to the Department of Primary Industries website for further information.

Age:

Juvenile: Tree has recently been planted and is still in its establishment phase. Tree currently makes little contribution to the amenity of the landscape. Trees of this age are possible candidates for relocation during development.

Semi-mature: Tree has established. It still has not developed its mature habit. It is starting to contribute to the landscape. The size of the tree would still be expected to increase considerably given no significant changes to the current situation.

Maturing: Tree has developed its mature structural habit but still has substantial potential to increase in size.

Mature: Tree has or is close to reaching its full potential and expected size. Growth has slowed, and the size of Tree is not exhibiting any major signs of health or structural weakness because of age.

Over mature: Tree is no longer actively putting out extension growth and is starting to show signs of decline in health because of age. Canopy is thinning and signs of die back in the canopy may be present

Height:

The tree's height in metres

Width:

The trees average canopy width in meters. There may be widths of the canopy that are shorter or longer depending the dissection of the canopy.

DBH:

The tree's trunk Diameter at Breast Height (1.4m above ground) In accordance with AS-4970, unless specified as having been taken lower. This can be either estimated or measured as specified in the report.

Stems of multi-stemmed trees may be listed individually, or a measurement given at a lower point where the tree still has one stem. In some cases, especially where trees are not considered worthy of retention or stems are too numerous the DBH may simply be listed as 'multi-stemmed'.

Health:

Good: Tree is not stressed and shows no obvious signs of pest or disease. It is free of wounding. Annual growth rate is what would be expected of a healthy specimen in the area. There are no signs of die back and canopy is dense. Tree maybe partially supressed by neighbouring trees.

Fair: Tree is showing signs of reduced health. It maybe drought stressed or show partial signs of pest or disease. Foliage density is less than ideal and may have minor die back. Tree is typical of its species. Remedial works could improve its health.

Poor: Tree is showing signs of stress. Has sparse canopy and possibly stunted growth. Large number of dead branches present or dieback. Likely to have pests or disease. Tree often in decline. Remedial works not expected to improve long-term health.

Dead: Tree shows no signs of life and is not growing.

Note on Deciduous Species: Assessment of deciduous species can be problematic, and results may vary depending on the time of year of assessment. Descriptor comments in relation to foliage density do not apply to deciduous trees assessed when dormant or entering or exiting dormancy. Time of leaf drop, or bud burst, and extent of bud swell may be considered in the health rating of these trees.

The ratings indicate that certain characteristics listed have or have not been observed. Inspections do not assess the whole tree in detail for each characteristic. The comments category should be referred to for further information.

Structure:

As a rule, the structure rating is based on identified faults in the tree habit that reduce trees structural integrity and may lead to part / all of the tree failing.

However, it must be noted that this is not a full hazard or failure assessment of the tree.

Good: Tree appears to have no obvious structural defects that would diminish the trees structural integrity.

Fair: The tree has at least one or more obvious structural defects. E.g. dead branches, bifurcation. However, defects are unlikely to prevent the retention of the tree. Judicious remedial intervention could remove structural defects and improve rating.

Poor: Tree has at least one or more structural defects that remedial intervention cannot rectify without significantly reducing the retention value of the tree. These defects reduce the useful life expectancy of the tree.

Hazardous: The tree shows one or more structural faults that are prone to failure and present an immediate safety concern. Judicious intervention to remove structural faults and reduce safety risk would leave a tree not worthy of retention. These trees should be removed as a high priority.

Arboricultural Value:

The Arboricultural Values shown in the table below have been calculated on the ULE of the tree which considers the tree's structure and health rating and its significance in the landscape.

The retention value assists in determining the positioning of structures and infrastructure outside the tree's identified TPZ.

ULE	Arboricultural Value			
	High	Medium	Low	Very Low
20+ yrs.	High Retention			
10-20 yrs.	Medium Retention			
5-10 yrs.				
0-5 yrs.	Low Retention			
0 yrs.	Remove			

ULE:

The Safe, Useful, Life Expectancy of the tree from a health, structure, amenity and weediness viewpoint given no significant changes to the current situation. This category is difficult to determine, and should be taken as an estimate only, in addition to this, factors not observed at the time of inspection can lead to tree decline.

- **0 yrs.:** Tree should be removed due advanced decline/ dead or hazardous.
- **0-5 yrs**. Tree is in decline and has poor health or structural that intervention cannot resolve. Often over- mature
- **5-10yrs.** Tree of fair health or structure
- **10-20.** Semi-mature, mature tree of fair health and structure
- **20+ yrs.** Juvenile, semi-mature tree or long-lived species of good health and structure.

TPZ (Tree Protection Zone)

The Tree Protection Zone of the tree, measured as a radial distance in metres from the centre of the trunk. The TPZ is calculated using the method specified in *Australian Standard AS4970-2009 Protection of trees on development sites.* 12 x DBH=TPZ

Recommendation:

For example: *Further exploratory root investigation, alterations to plan to retain trees successfully.*

Comments:

Any additional comments specific to individual tree specimens.

AS-4970

The recognised Australian Standard for the 'Protection of Trees on Development Sites'. It provides guidelines of how to protect trees and provides formulas for calculating Tree Protection Zones (TPZ's), Structural Root Zones (SRZ's) and the Diameter at Breast Height (DBH).

AS-4373

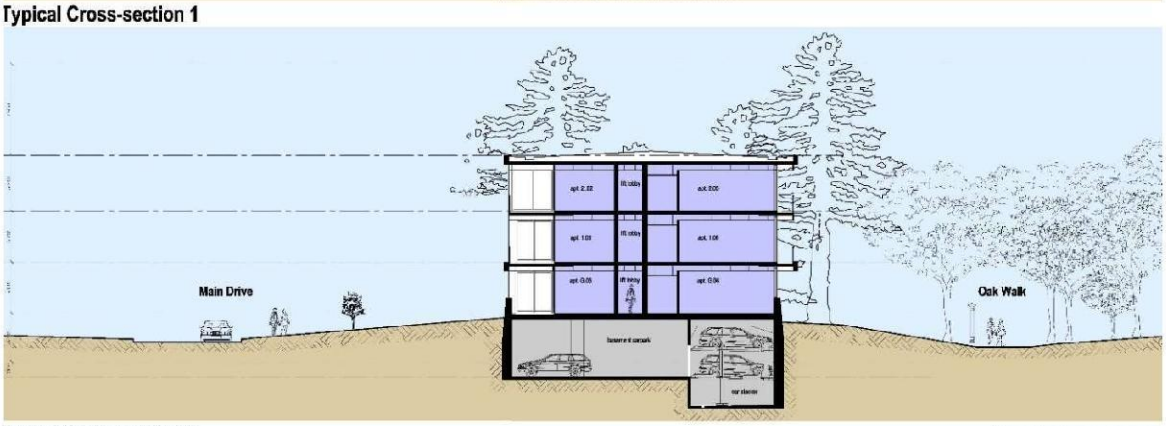
The recognised Australian Standard for the 'Pruning of Amenity Trees'. It provides guidelines on how to prune a tree to encourage good health and structure.

Ecological Vegetation Class (EVC)

A type of native vegetation classification that is described through a combination of its floristics, life form and ecological characteristics, and through an inferred fidelity to environment attributes. Each EVC includes a collection of floristic communities (i.e. lower level in the classification that is based solely on groups in the same species) that occur across a biogeographic range, and although differing in species, have similar habitat and ecological processes operating.

APPENDIX 3: NEW APARTMENT BUILDING SECTIONS AND ELEVATIONS

Typical Cross-section 1



Typical Cross-section 2

x

APPENDIX 4: TREE ESTABLISHMENT AND POST ESTABLISHMENT CARE

It is recommended that all tree planting and maintenance be undertaken by a qualified arborist or horticulturist to ensure best management practices are adhered to.

Tree Stock: Standard size trees for planting are 1.5 – 3.0 metre grown in 45 – 100 litre root balls in pots, bags or burlap. This assumes that some formative pruning has been undertaken before planting out to ensure good structure and larger trees are less susceptible to vandalism

It is preferred that all tree stock conforms to AS 2303-15 'Tree Stock for Landscape Use'. Tree stock that is of good quality but does not meet Australian Standards may be accepted at the discretion of the arborist/horticulturist. At a minimum all stock shall meet the following criteria:

- be true to form and species;
- be healthy, of typical growth, free of pest and diseases;
- consist of a single straight central Leader, with even radial symmetrical branching habit that can easily be pruned to uplift the canopy without removing substantial portions of the Tree, that will affect Tree structure or aesthetics;
- be free of structural defects, including but not limited to bifurcations, rubbing Branches and wounding, other than Pruning cuts;
- be free of root defects and root girdling;
- have established root systems in the container, preventing no more than 10% of soil to fall away. This is especially the case after re-potting;
- have an even trunk taper, which is proportionate to Tree size;
- be able to stand erect without the assistance of supportive staking;
- not have been pruned to encourage bushiness, especially the central Leader; and
- be hardened off and acclimatised to local conditions.

Trees should be audited for quality control at the time of purchase / delivery and if the required criteria for quality is not met, they should be rejected and expected to be replaced.

Hole Excavation: The size of the tree hole is to be of a diameter no less than two times the diameter of the root-ball width and a depth of equal to the tree root ball unless approved by the arborist/horticulturist. The sides shall be tapered to better accommodate the horizontal growth pattern of the tree's root system.

The sides and bottom of the hole should be fractured and scarified thoroughly before the tree is planted to encourage drainage and penetration of growing roots into the surrounding soil profile.

All foreign objects should be removed from the excavated hole including but not limited to old road base, rocks and stump grindings.

Tree Planting: Planting is to occur during the autumn-winter period, unless the soil is waterlogged, then planting is to be postponed until early summer. No tree will be planted in hydrophobic or water-logged soils. Hydrophobic soil require rectification with wetting agents and compost prior to planting.

Where heavy clay soils exist, Gypsum must be incorporated into the hole in accordance with manufacturer's recommendations to encourage the breakup of clay soils and to encourage drainage and tree establishment.

The tree should be removed from its container or bindings and any girdling roots (there should not be any) will be teased out or cut cleanly to prevent future girdling of the root system and to ensure root development into the backfill soil. This can be achieved by carefully vertically cutting the outer 100mm of root ball in 4 places when required or carefully removing offending girdling roots. If girdling is prolific the tree should not be planted but rather replaced.

Tree holes should be flooded with an approved wetting agent solution, e.g. Seasol Earthcare liquid wetting aid prior to planting. The top of the root ball, when in the hole, should be level with the surrounding soil level and 75mm below hard surfaces to allow for mulching.

Any soil that has been placed under the root ball to position the tree at the right height should be firmed to ensure that no subsidence occurs after the planting process has been completed.

Newly planted trees forming a row (avenue) shall form a straight line when viewed from either end with no deviation from the line.

Watering In: Root balls should be flooded at the time of planting to eliminate all voids that will prevent contact between tree root mass and surrounding soil, regardless of the prevailing weather conditions.

Mulching: All new tree plantings should be mulched with organic mulch spread around the entire area of the planting hole to a maximum depth of 150mm to 2 times the width of the root ball.

Mulch is not to come in contact with the stem of the young tree.

Staking and Tying: Stakes and ties should be used on all trees but are not to be used as a means of holding up sub-standard stock. Staking is a short-term measure only and is to protect, support and assist newly planted trees while establishing.

Two (2) 50mm x 50mm straight sawn, hardwood stakes are to be positioned either side of the tree . Stakes may require adjustment throughout the maintenance period to ensure the tree grows straight against prevailing winds etc.

The stakes are be driven into the soil to a depth adequate to securely support the stake at the side of the root ball and not driven into the root ball mass.

A tree tie, of no less than 50mm diameter, is to be stapled or nailed with galvanised clouts to the stake and wrapped around the trunk in a figure eight configuration.

The tie is to be of a tension that allows sufficient freedom of movement of the trunk in any direction of approximately 100mm after staking.

Guy wires are not acceptable.

Tree Maintenance & Aftercare: All newly planted trees are to be subject to a maintenance period of (3) three years after planting.

The maintenance program should include:

- provision of a detailed written schedule of tree monitoring works, watering quantities and scheduling and proposed amendments;

- pest and disease control;
- implementation of a watering program to ensure healthy vigorous tree growth. The program will avoid over-watering;
- formative Pruning of trees to encourage a structurally sound specimen of good habit, in particular for fast growing species, e.g. Eucalypts, Acacia, Pistachio etc. that can quickly develop twin leaders.
- maintenance of planting sites free of weeds and with specified depths of mulch;
- maintenance of tree ties, stakes and guards and removal of tree hoops;
- undertaking judicious pruning to remove broken damage branches or branches that are causing physical impediment;
- incorporation of wetting agents or seaweed/fish emulsions fertilisers into the watering regime if required.

Pest and Disease Control: Trees should be inspected on a regular basis for signs of pest and diseases.

Pest and disease control should avoid the use of chemicals wherever possible and use only chemicals with low environmental impact.

Watering: The quantity and frequency of watering during the maintenance period should be determined by a qualified arborist or horticulturist. Trees will need watering a minimum of once a week during October-March which may require increasing due to climatic conditions e.g. drought conditions.

The watering regime should reflect changing seasonal needs of the tree to ensure optimum soil moisture levels are maintained and growth continues unaffected by drought or soil saturation.

It is essential that prior to watering, during planting and maintenance, all trees are tested with a probe for water logging. If waterlogging is suspected, the cause of the waterlogging is to be determined and rectified as soon as possible.

Formative Pruning: It is essential that all young trees under maintenance shall be formatively pruned prior to planting if required and in the second year to encourage growth of a dominant central Leader with a series of balanced lateral branches. The planted trees are to be provided with a final formative pruning at the end of the 3-year maintenance period. Due to the age of the trees, work will be done with non-mechanical hand tools, i.e. secateurs, loppers, handsaws etc.

Prior to undertaking formative pruning, the tree must be staked straight and inspected from all sides to determine which branches, if any, will require pruning.

The following are to be pruned or removed accordingly:

- Co-dominant Stems, to encourage single dominant leader; i.e. Eucalyptus, Pyrus
- crossed over or rubbing branches;
- inward growing branches;
- broken and diseased branches;
- excessive foliage which is placing branch unions under serious strain. Weight reduction pruning is designed to reduce the opportunity for limb failure;

- removal of lower limbs, in order to encourage tree form and apical dominance;
- reduce or remove branches to keep pedestrian and vehicle access clear; and
- prune to clear branches around signage so as to allow clear and easy visibility to pedestrians, cyclists and motorists.

Pruning must not:

- remove more than 30% of canopy;
- remove the main central leader; and
- remove branches that affect long term aesthetics or undermine the tree health or structural integrity without authorisation from the Supervisor.

All Pruning is to be in accordance with the Australian Standard for the Pruning of Amenity Trees (AS-4373).

Maintenance of Mulch & Weeding: Mulch is to be kept to the required level and free of weeds and grass.

Weeds may be removed manually or through the use of herbicides used in accordance with the manufacturer's guidelines. E.g. Glyphosate

Maintenance of Stakes, Ties and Guards: Tree stakes and ties shall be re-secured or replaced as required. Ties or stakes that are injuring trees are to be adjusted or replaced.

Stakes should not be required for more than two years and will be removed at the end of the maintenance period. Trees that are not self-supporting or have not stabilised at this time should be considered for replacement.

APPENDIX 5: TREE REPLANTING AND MAINTENANCE SCHEDULE

Appendix 5 15 Year Tree Replanting and Maintenance Plan

TREE	SPECIES	NAME	YEAR										
			1 CONSTRUCTION	2 CONSTRUCTION	3 POST CONSTRUCTION	4	5	6	7	8	9	10	11 TO 15
1	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★
2	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★
3	*Arbutus unedo*	Irish Strawberry Tree	★	★	★	★	★	★	★	★	★	★	★
4	*Quercus canariensis*	Algerian Oak	Replace with new *Quercus canariensis*. Install stakes, tree guard, and water well. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Remove stakes. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	★	★	★	★	★	★	★	★
5	*Cupressus funiberis*	Chinese Weeping Cypress	★	★	★	★	★	Inspect annually and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state. If tree can no longer be kept in a healthy, safe and aesthetically pleasing state, replace with *Cupressus funebris* if species can be sourced, otherwise *Cupressus cashmeriana*. Install stakes, tree guards, and water well. Inspect monthly for three years post planting then annually and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state. Remove stakes in 2nd year of planting.				★
6	*Araucaria bidwillii*	Bunya Pine	★	★	★	★	★	★	★	★	★	★	★
7	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★
8	*Cedrus deodara*	Himalayan Cedar	★	★	★	★	★	★	★	★	★	★	★

★ Inspect and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state.

Appendix 5 15 Year Tree Replanting and Maintenance Plan

TREE	SPECIES	NAME	YEAR										
			1 CONSTRUCTION	2 CONSTRUCTION	3 POST CONSTRUCTION	4	5	6	7	8	9	10	11 TO 15
9	*Agathis robusta*	Kauri Pine	Replace with new *Podocarpus elatus*. Install stakes, tree guard, and water well. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Remove stakes. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	★	★	★	★	★	★	★	★
10	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★
11	*Quercus canariensis*	Algerian Oak	Replace with new *Quercus canariensis*. Install stakes, tree guard, and water well. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Remove stakes. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	★	★	★	★	★	★	★	★
12	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★
13	*Pinus canariensis*	Canary Island Pine	★	★	★	★	★	★	★	★	★	★	★
14	*Corymbia maculata*	Spotted Gum	★	★	★	★	★	Inspect annually and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state.					★

★ Inspect and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state.

Appendix 5 15 Year Tree Replanting and Maintenance Plan

TREE	SPECIES	NAME	YEAR										
			1 CONSTRUCTION	2 CONSTRUCTION	3 POST CONSTRUCTION	4	5	6	7	8	9	10	11 TO 15
								If tree can no longer be kept in a healthy, safe and aesthetically pleasing state, replace with *Corymbia maculata*. Install stakes, tree guards, and water well. Inspect monthly for three years post-planting then annually and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state. Remove stakes in 2nd year of planting.					
15	*Araucaria cuninghamii*	Hoop Pine	★	★	★	★	★	★	★	★	★	★	★
16	*Cedrus deodara*	Himalayan Cedar	★	★	★	★	★	★	★	★	★	★	★
17	*Pinus canariensis*	Canary Island Pine	Remove. Do not replace until construction is complete.		Once construction is complete, plant new *Agathis robusta*. Install stakes, tree guard, and water well. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Remove stakes. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	★	★	★	★	★	★
18	*Araucaria bidwillii*	Bunya Pine	★	★	★	★	★	Inspect annually and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state. If tree can no longer be kept in a healthy, safe and aesthetically pleasing state, replace with *Araucaria bidwilli*. Install stakes, tree guards, and water well. Inspect monthly for three years post-planting then annually and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state. Remove stakes in 2nd year of planting.					★
19	*Arbutus unedo*	Irish Strawberry Tree	★	★	★	★	★	★	★	★	★	★	★

★ Inspect and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state.

Appendix 5 15 Year Tree Replanting and Maintenance Plan

TREE	SPECIES	NAME	YEAR										
			1 CONSTRUCTION	2 CONSTRUCTION	3 POST CONSTRUCTION	4	5	6	7	8	9	10	11 TO 15
20	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★
21	*Pinus radiata*	Monterey Pine	★	★	★	★	★	Inspect annually and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state. If tree can no longer be kept in a healthy, safe and aesthetically pleasing state, replace with *Pinus roxburghii*. Install stakes, tree guards, and water well. Inspect monthly for three years post-planting then annually and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state. Remove stakes in 2nd year of planting.					★
22	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★
23	*Pinus canariensis*	Canary Island Pine	★	★	★	★	★	Inspect annually and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state. If tree can no longer be kept in a healthy, safe and aesthetically pleasing state, replace with *Pinus canariensis*. Install stakes, tree guards, and water well. Inspect monthly for three years post-planting then annually and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state. Remove stakes in 2nd year after planting.					★
24	*Tristaniopsis laurina*	Kanooka	Remove. Do not replace.										
25	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★
26	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★
27	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★
28	*Quercus robur*	English Oak	★	★	★	★	★	★	★	★	★	★	★
29	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★

★ Inspect and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state.

Appendix 5 15 Year Tree Replanting and Maintenance Plan

TREE	SPECIES	NAME	YEAR										
			1 CONSTRUCTION	2 CONSTRUCTION	3 POST CONSTRUCTION	4	5	6	7	8	9	10	11 TO 15
30	*Quercus canariensis*	Algerian Oak	★	★	★	★	★	★	★	★	★	★	★
31	*Ulmus procera*	English Elm	★	★	★	★	★	Inspect annually and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state. If tree can no longer be kept in a healthy, safe and aesthetically pleasing state, replace with *Quercus canariensis*. Install stakes, tree guards, and water well. Inspect monthly for three years post-planting then annually and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state. Remove stakes in 2nd year after planting.					★
32	*Ficus macrophylla*	Moreton Bay Fig	★	★	★	★	★	★	★	★	★	★	★
33	*Ulmus procera*	English Elm	Remove and replace with new *Ulmus procera*. Install stakes, tree guard, and water well. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Remove stakes. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	★	★	★	★	★	★	★	★
34	*Pinus canariensis*	Canary Island Pine	★	★	★	★	★	★	Remove when Trees 31 and 35 are replaced to remove competition for the new trees. Do not replace.				

★ Inspect and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state.

Appendix 5 15 Year Tree Replanting and Maintenance Plan

TREE	SPECIES	NAME	YEAR										
			1 CONSTRUCTION	2 CONSTRUCTION	3 POST CONSTRUCTION	4	5	6	7	8	9	10	11 TO 15
35	*Ficus macrophylla*	Moreton Bay Fig	★	★	★	★	★	Inspect annually and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state. If tree can no longer be kept in a healthy, safe and aesthetically pleasing state, replace with *Ficus macrophylla*. Install stakes, tree guards, and water well. Inspect monthly for three years post-planting then annually and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state. Remove stakes in 2nd year after planting					★
36	*Cupressus funiberis*	Chinese Weeping Cypress	If tree can no longer be kept in a healthy, safe and aesthetically pleasing state, replace with *Cupressus funebris* (if species can be sourced) or *Callitris galucophyllus*. Install stakes, tree guards, and water well. Inspect monthly for three years post-planting then annually and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state. Remove stakes in 2nd year after planting					★	★	★	★	★	★
37	*Ficus macrophylla*	Moreton Bay Fig	Remove and inspect roots. Replant if not root girdled. Otherwise replace with new *Ficus macrophylla* Install stakes, tree guard, and water well. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Remove stakes. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	★	★	★	★	★	★	★	★
38	*Ulmus procera*	English Elm	★	★	★	★	★	★	★	★	★	★	★
39	*Cedrus atlantica 'Glauca'*	Blue Atlas Cedar	★	★	★	★	★	★	★	★	★	★	★

★ Inspect and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state.

Appendix 5 15 Year Tree Replanting and Maintenance Plan

TREE	SPECIES	NAME	YEAR										
			1 CONSTRUCTION	2 CONSTRUCTION	3 POST CONSTRUCTION	4	5	6	7	8	9	10	11 TO 15
40	*Cupressus sempervirens*	Pencil Pine	★	★	★	★	★	★	★	★	★	★	★
41	*Pinus canariensis*	Canary Island Pine	★	★	★	★	★	★	★	★	★	★	★
42	*Ficus macrophylla*	Moreton Bay Fig	★	★	★	★	★	★	★	★	★	★	★
43	*Ulmus procera*	English Elm	★	★	★	★	★	★	★	★	★	★	★
44	*Pinus radiata*	Monterey Pine	★	★	★	★	★	Inspect annually and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state. If tree can no longer be kept in a healthy, safe and aesthetically pleasing state, replace with *Pinus roxberghii*. Install stakes, tree guards, and water well. Inspect monthly for three years post-planting then annually and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state. Remove stakes in 2nd year after planting					★
45	*Eucalyptus radiata*	Narrow Leaved Peppermint Gum	★	★	★	★	★	Inspect annually and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state. If tree can no longer be kept in a healthy, safe and aesthetically pleasing state, replace with *Corymbia ficifolia*. Install stakes, tree guards, and water well. Inspect monthly for three years post-planting then annually and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state. Remove stakes in 2nd year after planting					★
46	*Araucaria cuninghamii*	Hoop Pine	★	★	★	★	★	★	★	★	★	★	★

★ Inspect and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state.

Appendix 5 15 Year Tree Replanting and Maintenance Plan

TREE	SPECIES	NAME	YEAR										
			1 CONSTRUCTION	2 CONSTRUCTION	3 POST CONSTRUCTION	4	5	6	7	8	9	10	11 TO 15
47	*Brachychiton populneus*	Kurrajong	Remove. Do not replace until construction complete.		Once construction is complete, plant new *Brachychiton roseus* 'Jerilderrie Red'. Install stakes, tree guard, and water well. Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state. Remove stakes in 2nd year after planting	Inspect monthly and undertake formative pruning, irrigation, mulch shaping, weeding etc as required to maintain tree in a healthy state.	★	★	★	★	★	★
Fire Memorial Plantings	*Rosa* sp. and *Rosmarinus officinalis*	Roses And Rosemary	Inspect yearly, and undertake works as required (e.g. pruning, watering, application of soil ameliorants, pest and disease control etc.) to maintain a healthy and aesthetically pleasing state. If required, replace unhealthy specimens with healthy ones, using the same species.										

★ Inspect and undertake works as required (e.g. pruning, irrigation, application of soil ameliorants, pest and disease control etc.) to maintain tree in a healthy, safe and aesthetically pleasing state.