



## Assessment of a Canary Island Pine at Kew Cottages

# Health and Condition

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**1 April 2020**

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## 1. Introduction

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C&R Ryder Consulting has been engaged to assess the potential cause of death of a Canary Island Pine *Pinus canariensis*. Samples were taken to test for the presence of *Phytophthora* in the soil around the subject tree and several surrounding trees. This report will provide:

- the findings of the assessment
- *Phytophthora* test results

## 2. Methodology

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Cameron Ryder and Albert Worsley inspected the trees on Monday, 17 February 2020. The following data was collected for the trees:

- Unique ID
- Image of tree
- Botanic and common name
- Tree dimensions (Height x Width)
- Diameter at breast height (DBH)
- Diameter at base (DAB)
- Health
- Structure
- Useful life expectancy (ULE)
- Tree significance
- Retention value
- Comments

The trees were assessed from ground level, heights and widths were estimated and trunks measured with a diameter tape. No invasive tests were conducted or samples taken and any assessments of decay are qualitative only.

For all tree assessment descriptors, see Appendix 1.

*Phytophthora* testing was completed taking 1kg samples of soil from around each tree being:

- a Bunya Pine *Araucaria bidwillii*,
- an Atlantic Cedar *Cedrus Atlantica*
- a Hoop Pine *Araucaria cunninghamii*.

All equipment was sterilised with isopropyl alcohol in between samples and put into zip lock bags and labelled. All testing was completed by Crop Health Services, Bundoora.

All samples were collected and delivered to the laboratory on the same day.

### 3. Site Map



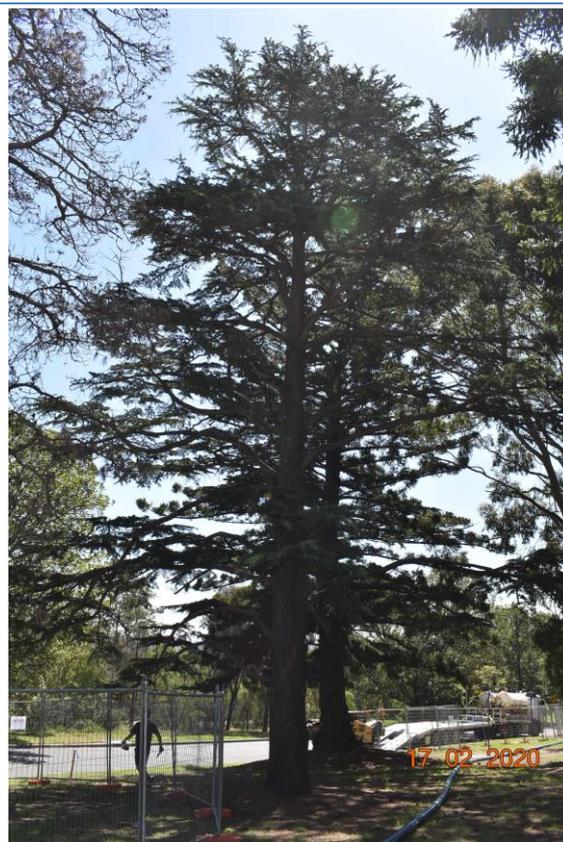
Figure 1: Aerial image of all trees

## 4. Tree Details

<b>Tree Number</b>	1	
<b>Botanic Name</b>	<i>Pinus canariensis</i>	
<b>Common Name</b>	Canary Island Pine	
<b>Origin</b>	Exotic	
<b>Tree dimensions</b>	20m x 13m	
<b>DBH/DAB</b>	66cm / 80cm	
<b>TPZr/SRZr</b>	7.92m / 3m	
<b>Health</b>	Dead	
<b>Structure</b>	Poor	
<b>ULE</b>	0 years	
<b>Significance</b>	Significant (before decline)	
<b>Retention Value</b>	None	
<b>Comments</b>	Lower trunk decay Large sections of delaminated bark Large historic deadwood Resin exuded from lesions Borer damage	

<b>Tree Number</b>	2	
<b>Botanic Name</b>	<i>Araucaria bidwillii</i>	
<b>Common Name</b>	Bunya Bunya Pine	
<b>Origin</b>	Native	
<b>Tree dimensions</b>	18m x 8m	
<b>DBH/DAB</b>	49cm 48cm / 80cm	
<b>TPZr/SRZr</b>	8.2 / 3m	
<b>Health</b>	Good	
<b>Structure</b>	Poor	
<b>ULE</b>	20+ years	
<b>Significance</b>	Significant	
<b>Retention Value</b>	High	
<b>Comments</b>	Codominant leaders acute union	

<b>Tree Number</b>	3
<b>Botanic Name</b>	<i>Cedrus atlantica</i>
<b>Common Name</b>	Atlantic Cedar
<b>Origin</b>	Exotic
<b>Tree dimensions</b>	17m x 13m
<b>DBH/DAB</b>	71cm / 87cm
<b>TPZr/SRZr</b>	8.5m / 3.1m
<b>Health</b>	Fair
<b>Structure</b>	Good
<b>ULE</b>	20+ years
<b>Significance</b>	Significant
<b>Retention Value</b>	High
<b>Comments</b>	



<b>Tree Number</b>	4
<b>Botanic Name</b>	<i>Araucaria cunninghamii</i>
<b>Common Name</b>	Hoop Pine
<b>Origin</b>	Native
<b>Tree dimensions</b>	22m x 12m
<b>DBH/DAB</b>	90cm / 151cm
<b>TPZr/SRZr</b>	10.8m / 3.9m
<b>Health</b>	Good
<b>Structure</b>	Good
<b>ULE</b>	20+ years
<b>Significance</b>	Significant
<b>Retention Value</b>	High
<b>Comments</b>	



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## 5. Discussion

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### 5.1 The Site

The site is on the grounds of Kew Cottages a former government institution established for intellectually handicapped children in Australia. Kew cottages are located in the grounds of The Kew Lunatic Asylum (Willsmere), as such the area is extensively planted with mature trees. In the 1880s the grounds were planted with many conifers and large growing trees, oaks, elms and Moreton Bay Figs, and trees indigenous to the area, River Red Gum, Yellow Box and Lightwood were retained in the landscape (Heritage Council Victoria).

### 5.2 The Trees

The trees are all mature conifers, two of which are exotic two of which are native. Trees 2 & 3 present generally with good health and good structure. (section 4 Tree Details).

#### Tree 1

The subject tree is a *Pinus canariensis* (Canary Island Pine), a narrow to broad-crowned evergreen conifer, native to the Canary Islands and capable of growing to 20-45 metres tall (Spencer 1995). The bark is red to orange-brown and thickly cut into irregular plates, with the bright dark-green needle-like leaves crowded and grouped in threes. Broadly ovoid to conical cones can be solitary or clustered and are usually 150-250x75mm (Burnley plant directory 2002).

The subject tree died in ~2019 and soils samples were taken for analysis at Crop Health Services, Bundoora to determine if *Phytophthora* had been the cause. At the time of inspection, the tree presented with poor structure, sections of the trunk had decayed. Plates of bark were removed, this revealed that large areas of the cambium had died over several years, with the tree producing wound wood to compartmentalise the decay (Figure 2).

The tree had multiple lesions exuding resin throughout the main trunk. Large pieces of pre-existing deadwood were evident throughout the canopy, suggesting the tree had been in decline for some time (Figure 3). Borers were evident throughout the trunk. No root flare was evident suggesting possible historic grade changes. Adventitious roots were present behind sheets of removed bark (Figure 4).

### Phytophthora diagnostic testing results

The results of the diagnostic tests that have been undertaken on the submitted soil samples are as follows:

1. Canary Island Pine – *Phytophthora* was not detected
2. Bunya Pine - *Phytophthora* was not detected
3. Cedar - *Phytophthora* was not detected
4. Hoop Pine - *Phytophthora* was not detected

For full details of the report see Appendix 2



Figure 2: Attempted compartmentalisation of decay



Figure 3: Large branches within the crown had been dead for some years



Figure 4: Borer damage & no evident root flare

Historic aerial photography shows the decline of the tree over the last 8 years. Extensive drainage works within the subject tree's TPZ took place during October to November 2011. Before and during the works the tree presented in good health (Figure 5). In 2016 the tree presented in fair health showing signs of chlorosis (Figure 6). By February 2019 the tree had lost most of its needles presenting in very poor health (Figure 7), by the end of 2019 the tree was deceased (Figure 8).



Figure 5: Subject tree in Good health - 18/10/11



Figure 6: Subject tree in Fair health 20/03/16



Figure 7: Subject tree in Very Poor health - 23/02/19



Figure 8: Subject tree Dead - 17/12/19

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## 6. Conclusion

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C&R Ryder Consulting was engaged to assess a mature *Pinus canariensis* located within the historic grounds of Kew cottages, Main Drive Kew. This subject tree died in ~2019.

Soils samples were taken for analysis by Crop Health Services, Bundoora to determine if *Phytophthora* had been the cause. The test results came back negative for the subject tree and the three neighbouring conifers, see Appendix 2.

Historical aerial photography shows the decline of the tree took place over 8 years with the possible catalyst being drainage works within the trees TPZ during 2011 (Figure 8).

## 7. References

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Spencer R. 1995, *Horticultural flora of south eastern Australia*; Vol. 1, Ferns, Conifers and their Allies, University of New South Wales Press, Sydney, NSW.

The Burnley plant directory 2002, *A guide to the selection & recognition of landscape plants for south-eastern Australia*, CDROM version 2.16, The University of Melbourne, Burnley College, Richmond, Victoria.

Heritage Council Victoria, *FORMER KEW COTTAGES (KEW RESIDENTIAL SERVICES)*, viewed 08/04/20, <https://vhd.heritagecouncil.vic.gov.au/places/12309>

## Appendix 1. Tree Assessment Descriptors

### 1.1 Image of tree

Digital image captured on the day of assessments.

### 1.2 Botanic Name/Common Name

The tree identified to genus and species level as well as the generally accepted common name for the tree.

### 1.3 Tree Dimensions

The height and width of the tree as estimated by the arborist in whole metres.

### 1.4 Diameter at Breast Height

The trunk diameter of the tree measured with a diameter tape at 1.4m above ground level.

### 1.5 Diameter at Base

The trunk diameter of the tree measured with a diameter tape above the root flare.

### 1.6 Health

<b>Very Good</b>	The tree is demonstrating exceptional growth for the species, has a full, dense canopy and there is no sign of any pest or disease.
<b>Good</b>	The tree is demonstrating good growth for the species in its location with respect to its location and broader context. The canopy is full and complete and there are no signs of pest or disease.
<b>Fair</b>	The tree may have shown a reduction in optimal growth and/or there may be some twiggy deadwood within the canopy. There may be the presence of some pests or diseases that are not causing a significant decline in the tree
<b>Poor</b>	The tree is in decline with little growth. There may be sections of the canopy missing and pests or diseases may be prevalent
<b>Very Poor</b>	The tree is in significant decline, with large sections of the canopy dead. This tree is very unlikely to recover.
<b>Dead</b>	The tree is dead

### 1.7 Structure

<b>Good</b>	The tree's structure is typical of the species with no significant hazards such as included bark, trunk decay, splits or tears. In general there will be a single trunk with scaffold and/or subordinate branches that display good attachments
<b>Fair</b>	There may be minor defects in the canopy, but the overall tree is still relatively free of significant issues. The tree may need minor pruning to fix minor defects. The canopy will be mostly symmetrical and typical of the species.
<b>Poor</b>	The tree will have 1 or more significant defect that may be able to be remedied with pruning. This tree is likely to have an atypical canopy and may contain defects such as included bark or codominant stems.
<b>Very Poor</b>	The tree has substantial defects associated with its primary trunk and scaffold structure that cannot be remedied with pruning or other measures. It is likely that this tree will require removal in the short term.
<b>Hazardous</b>	The tree has major defects and is likely to fail. It should be removed as soon as possible.

## 1.8 Useful Life Expectancy

<b>20+</b>	The tree is a healthy specimen in good condition. It is expected to provide a degree of safety and contribution to the landscape for at least another 20 years with an appropriate level of management.
<b>10-20 years</b>	The tree is a reasonably healthy specimen in good or fair condition. It is expected to provide a degree of safety and contribution to the landscape for 10-20 years with an appropriate level of management.
<b>5-10 years</b>	The tree is in fair condition or a short lived species. It is likely to provide contribution to the landscape for 5-10 years with an appropriate level of management at which point removal may need to be considered.
<b>1-5 years</b>	The tree is a poor specimen in decline and is likely to require removal within 1-5 years.
<b>0 years</b>	The tree is either dead or has substantial defects requiring its removal in the short term.

## 1.9 Tree Significance

<b>Highly Significant</b>	The tree is a large, mature example of the species, generally in fair to good condition. It may be a remnant specimen or have substantial habitat value. The tree may have specific landscape context or be very prominent in the broader environment. This tree may be suitable for inclusion on a significant tree register at local or state government level. Significant efforts should be made to retain this tree.
<b>Significant</b>	The tree is a mature example of the species in good condition and/or have particular prominence in the landscape. There may be evidence of the tree being used as a habitat tree by local fauna and/or it may be a remnant specimen. It has a long ULE and should be considered for retention. The loss of the tree may have a significant impact on the surrounding landscape.
<b>Moderately Significant</b>	The tree is a semi mature to mature example of the species in good condition, may be well sited in the landscape and/or may have habitat value. The removal of this tree would be noticed in the landscape.
<b>Low</b>	The tree is generally a smaller specimen or may be in decline. It is not located in a prominent position and its removal would have little impact on the broader landscape.
<b>None</b>	The tree is considered insignificant and its loss would go unnoticed.

## 1.10 Tree Retention

<b>Very High</b>	The tree is an outstanding example of the species and it should be retained at all costs.
<b>High</b>	The tree is a mature specimen in fair to good condition with a ULE of at least 10 years, is suitable to the site and should be retained in a new development.
<b>Moderate</b>	The tree is a semi-mature or mature specimen, in fair to good condition that is suitable for retention; however, is located such that its loss would not have a significant impact on the landscape.
<b>Low</b>	The tree is likely to be juvenile or in decline and could be retained; however design changes are not considered worthwhile to retain a tree in this category.
<b>None</b>	The tree should be removed irrespective of a design as it is in severe decline, hazardous or dead.
<b>Third Party Tree</b>	This tree is located off the subject property and is owned by a third party. The assessment of health and structure is considered irrelevant as the tree must be retained.

## Appendix 2. Phytophthora Diagnostic Testing Final Report

### Crop Health Services

#### Diagnostic Testing Final Report

Report Date: 24-Mar-2020  
Submission ID: 20-00644  
Report Number: 26284



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Reported By: Dr. Ramez Aldaoud

(Diagnostician)

#### SUBMISSION DETAILS

Date Received: 17-Feb-2020  
Number of Samples: Submitted Samples: 4

#### SUBMISSION REASON General Diagnosis

Soil samples submitted for phytophthora testing.  
4 soil samples for phytophthora testing. Samples from Main Drive, Kew. Canary Island Palm, Bunya Pine, Cedar and Hoop Pine.  
Reference: Kew.

#### DIAGNOSIS

The results of the diagnostic tests that have been undertaken on your submitted samples of soil, to check for the presence of *Phytophthora*, are as follows:

1. Canary Island S1: *Phytophthora* was not detected.
2. Bunya Pine S2: *Phytophthora* was not detected.
3. Cedar S3: *Phytophthora* was not detected.
4. Hope Pine S4: *Phytophthora* was not detected.

Please feel free to contact us if you wish to discuss this report any further, or should you have any other queries.

#### TESTING DETAILS

##### Diagnostics : Fungal Identification by Baiting

Sample ID	Result
0001-Canary Island S1 (Soil) <i>Phytophthora</i> not detected.	Test Date: 24/03/2020
0002-Bunya Pine S2 (Soil) <i>Phytophthora</i> not detected.	Test Date: 24/03/2020

**Note: Where information on chemicals is provided, the product should ALWAYS be used according to the directions on the label.**  
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Test results apply only to the sample(s) submitted for analysis

Crop Health Services  
Diagnostic Testing Final Report

Submission ID: 20-00644  
Report Number: 26284

**Diagnostics : Fungal Identification by Baiting**

Sample ID	Result
0003-Cedar S3 (Soil) <i>Phytophthora</i> not detected.	Test Date: 24/03/2020
0004-Hoop Pine S4 (Soil) <i>Phytophthora</i> not detected.	Test Date: 24/03/2020

Fungal Identification by Baiting: NATA accreditation does not cover the performance of this service

**METHOD REFERENCES**

The sample(s) referred to in this report were analysed by the following method(s):

Analysis	Method	Accreditation
Fungal Identification by Baiting	M/FUN06 - Pear Baiting For Phytophthora Recovery and Identification - Soil & Water Methods	

**END OF REPORT**

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