



Avenue of Honour Tree Management and Replacement Plan: Executive Summary

Prepared by

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150 Junction Road
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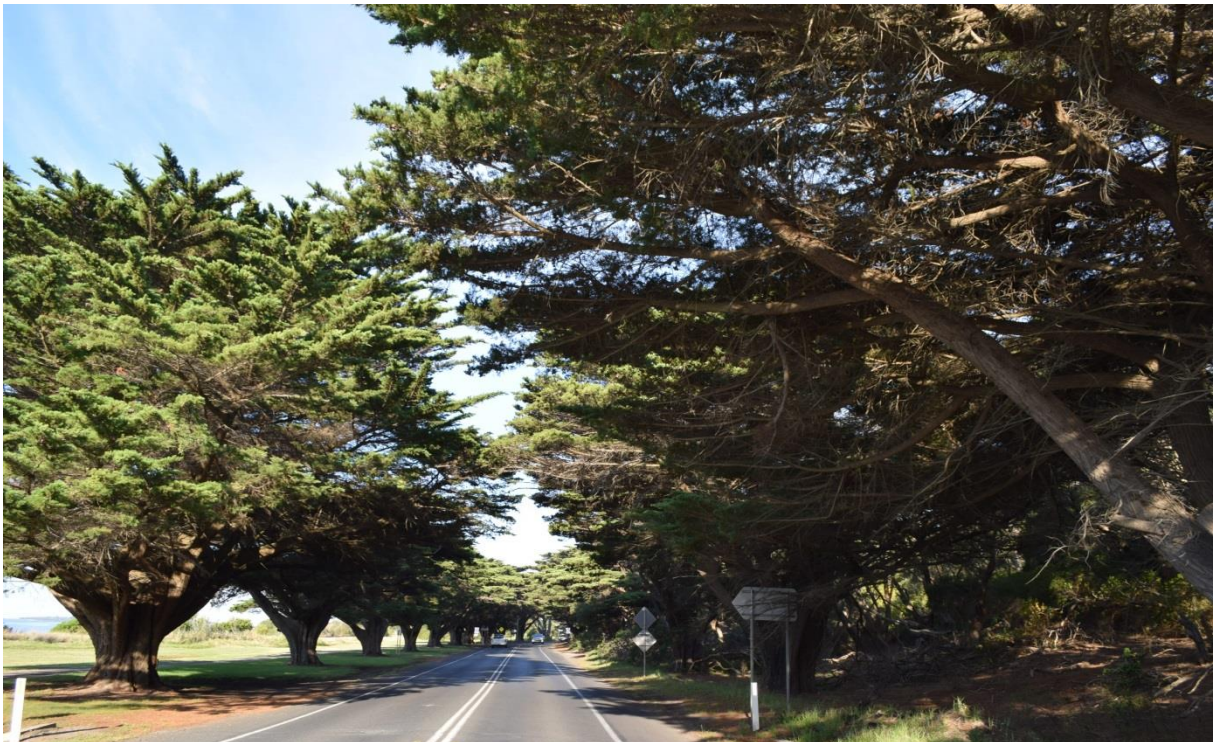
1. Introduction

The Queenscliff Avenue of Honour is an avenue of mature Monterey Cypress (*Hesperocyparis macrocarpa* syn. *Cupressus macrocarpa*) trees planted on the Bellarine Highway at the entrance to Queenscliff. The Avenue of Honour was planted in 1918 in recognition of local soldiers who lost their lives in World War I. It is one of a number of Monterey Cypress rows and avenues that define Queenscliff's public open spaces, dominating the streetscapes and harnessing the uniformity of the individual trees to create a dramatic visual effect.

Homewood Consulting Pty Ltd has been engaged to provide a Tree Management and Replacement Plan for the significant rows and avenues of Monterey Cypress within the Borough of Queenscliffe. The primary aims of the Tree Management Plan are to:

- Undertake an audit on the existing trees and develop a maintenance plan
- Determine future tree species
- Provide a time-framed, strategic program for the progressive replacement of existing trees.

This report summarises the results of the tree assessments and is the first step in preparing a tree replacement plan. It is recommended that extensive community consultation be undertaken before finalising a tree replacement plan. This is discussed further in sections 5 and 6 of the report.



The Queenscliff Avenue of Honour is a living tribute to the servicemen associated with the Borough of Queenscliffe who sacrificed their lives during World War I.

Since the initial planting in 1918, tree removal and selective replacement planting within the Borough's cypress avenues has been undertaken on an ad hoc basis. In its present state the Avenue of Honour is in poor condition, with many of the original trees approaching 100

years old. These trees and many of the other trees assessed have surpassed their peak aesthetic value and are nearing the end of their Useful Life Expectancy.

2. Historical Context

The Queenscliff Avenue of Honour was planted on 24 July, 1918, to commemorate the district soldiers who were killed in World War I. 50 Monterey Cypress trees were planted by relatives of the soldiers and local school boys with each tree dedicated to the memory of an individual fallen district soldier.

The Avenue of Honour was important to the local community and at the time of planting, half of the trees had been paid for by the local residents. The trees were protected by a wooden guard and later a copper nameplate of the fallen soldier was fixed to the tree guard.

Hundreds of avenues of honour were planted in Australia between 1917 and 1921 to commemorate those who served in the Great War. The planting of these memorial trees was intensely personal and for many towns across Australia, they acted as a focus of remembrance for a grieving community.

QUEENSCLIFF.	R. A. G. A.
William Farrell	Major McDonald
Clifford Keath	Capt Balfe
Neville Keath	Lieut Watts
Geo Grace	Lieut Thompson
Oliver Woolford	Gr Flood
Charles Caithness	Bdr Barker
Jack Smyth	Gr Hndson
Claud Ward	Gr Grant
Claude Priddle	Gr Dunne
Bert Pirdon	Gr Hope
E. J. Hood	Gr Roden
Robert Collish	Bdr Garrett
Bert Devlin	Corp Schroeder
John Lawrence	Gr Hendra
S. H. Stonely	Gr Bickers
Reuben Zula	Gr Hebbend
Edward Spriggins	Gr Morgau
David Gaff	
M. Olsen	R. A. E.
Roy Locke	Lieut Bage
A. W. Cooke	Sgt Dunkinson
A. W. Hope	Sapper Powell
Eric Keddel	Sapper Rochester
	Sapper McGregor
	Sapper Odgers



The nameplate of Private Charles Percival Yule Caithness of the 46th Australian Infantry Battalion, on display in the Queenscliff Historical Museum.

Excerpt from the 1918 Sentinel Newspaper article about the Avenue of Honour planting ceremony, listing the fallen soldiers.

3. Current threats to the Cypress avenues in the Borough

3.1 Age and natural senescence

Trees have a finite life span and all trees go through a natural life-cycle of establishment, growth, maturity and decline. Senescence is the process of decline that a tree experiences following maturity. This process often takes a number of years and produces symptoms including:

- the shedding of small and large limbs
- a reduction of foliage density
- an increased volume of deadwood throughout the canopy
- the discolouration of foliage
- a reduced ability to cope with disease and insect infestation
- a reduced ability to cope with decay (Van Gelderen and Hoey Smith 1996).

In its natural setting, naturalists estimate Monterey Cypress can live to 200-300 years old (Peattie 1991). This biological life span for the species far exceeds its Useful Life Expectancy in an urban environment. Useful Life Expectancy is the period of time over which the species can satisfy the aesthetic or functional roles for which they were originally selected (Hitchmough 1994) and includes considerations of tree health and structure, ongoing maintenance costs and risk to public safety. Anecdotally it is generally accepted that the Useful Life Expectancy of Monterey Cypress in an urban environment rarely exceeds 100 years (University of Melbourne, 2002). The Avenue of Honour trees are now approaching 100 years old.

3.2 Seiridium Canker

Foliage samples were collected from a number of trees throughout the assessment area and sent to the Department of Environment, Land, Water and Planning for pathogen testing. The foliage samples tested positive for Seiridium Canker, a disease caused by fungi which is the most significant of the pathogens currently affecting exotic conifers in Victoria (DEPI 2014).

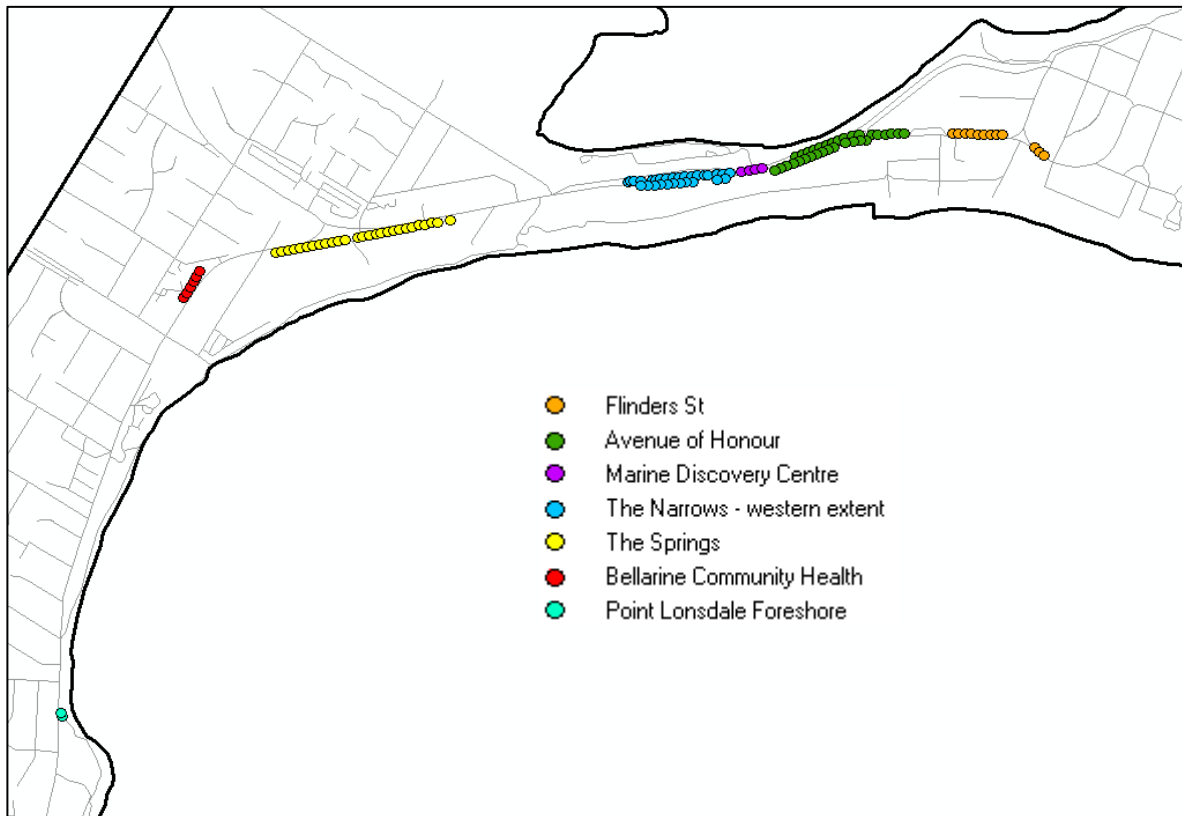
The fungus infects plants through spores which are carried by wind, in water droplets or by insects. Conifers planted in avenues or rows tend to be more affected by the disease due to spread through rain splash. The fungus interferes with the sap-conducting system of the tree, eventually causing death of the branch or main trunk above the wound. Older trees are usually more susceptible but any tree is susceptible when environmental conditions have placed them under stress.

At present it appears that the disease is progressing slowly through the mature trees in Queenscliff, with most trees just beginning to 'brown off'. This is due to a combination of factors which are favouring disease resilience including site conditions and the generally mild climate experienced in Queenscliff. The effects of climate change are likely to favour the progression of the disease through the mature trees, with increases in mean temperature and increased frequency of climatic extremes exposing the trees to stress and potentially proving favourable conditions for fungal growth and spread.

Unfortunately there is no proven cure for this disease and the only long term management option is to replace affected trees with known tolerant cypress species or unrelated plant species (DEPI 2014).

4. Existing Tree Audit and Maintenance Plan

An inspection of the major Monterey Cypress avenues and rows within the Borough of Queenscliffe was undertaken in January 2015, with 112 trees assessed in total. The rows and avenues have been separated into discrete management units based on their location and time of planting as below.



The location of the assessed trees and management units within the Borough of Queenscliffe.

Each tree has been assessed to determine its current health and condition. Works have been recommended for the maintenance of individual trees and the avenues as a whole to ensure public safety, and to extend the lifespan of trees where possible. A table of recommended works and a plan showing the location of each tree is included in the rear of this document.

A summary of the tree assessments for each management area follows.

4.1 Flinders Street Commemorative Plantings

Historical aerial photography show that the 12 trees on the northern side of Flinders Street, between Swanton Street and Smith Street were planted circa 1945 and this is supported by local testimony. The trees are therefore approximately 70 years old. While not part of the 1918 World War I Avenue of Honour, the remains of concrete bases for nameplates at the foot of some of these trees suggest they were commemorative plantings, possibly for World War II soldiers. There were originally 29 trees planted on both sides of Flinders Street.



Three of the twelve Flinders Street trees, looking south-east towards Swanston St.

Nine of the twelve Flinders Street trees, looking east towards Henry St.

The majority of the Flinders Street trees are currently in fair condition for their age and location in the landscape but are showing the initial signs of decline and *Seiridium* Canker with a thinning canopy and discoloration of foliage. Minor pruning works are recommended for 2 trees, and 1 tree is recommended for removal in the next 5 years.

The trees are suffering from the effects of soil compaction from adjacent road construction and upgrades, informal gravel parking areas and residential driveways and footpaths across the root plates. In general, the trees are expected to substantially decline over the next 10 years. Due to the age, location, and the presence of *Seiridium* spp. in the trees, there is little opportunity to modify or improve site conditions in order to extend their Useful Life Expectancy.

The Flinders Street trees are of aesthetic, historic and cultural significance and it is recommended that a tree replacement plan is developed and implemented for these trees.

The site conditions at Flinders Street have changed dramatically since the initial plantings around 1945. The subdivision of land north of Flinders Street, with crossover points providing access to residential properties, and the presence of High Voltage power lines along the southern side of Flinders Street limit the space for trees. These site conditions will ultimately dictate the selection of suitable replacement trees.

4.2 WWI Avenue of Honour

Historical photographs and records show that 50 trees were originally planted in the 1918 World War I Avenue of Honour, of which 32 trees remain today. Sections of the Avenue have been removed on both sides of the Bellarine Highway and Flinders Street due to conflict with existing or proposed infrastructure as well as individual trees that have presumably been removed due to safety concerns. The Avenue of Honour trees are now approaching 100 years of age.



The majority of the Avenue of Honour trees (approximately 60%) are currently in fair condition for their age and location in the landscape and have a Useful Life Expectancy of 10-20 years.

The trees are showing the initial signs of Seiridium infection, with a thinning canopy and discoloration of foliage. There is moderate to heavy deadwood in the crowns however this is typical for the species at this age.

The Avenue of Honour is of aesthetic, historic and cultural significance.

40% of the Avenue of Honour trees exhibit fair health but show poor structure, mostly due to extensive pruning. The canopies have been heavily uplifted, resulting in large, extended and end-weighted limbs. Some trees have been heavily pruned for power line clearance and there is evidence of moderate to large branch failure in many of the trees. These trees have a Useful Life Expectancy of 5-10 years.

Minor pruning works are recommended for 2 trees, and 1 tree is recommended for removal in the next 5 years. In order to ensure the trees reach their maximum Useful Life Expectancy, it is recommended that parking beneath the canopies is excluded wherever possible, and the tree root zones are mulched to improve moisture retention, reduce soil compaction and minimise damage to roots.

The Avenue of Honour trees are of aesthetic, historic and cultural significance and it is recommended that a tree replacement plan is developed and implemented for these trees.

Current site conditions are now restrictive with respect to establishing replacement trees with overhead power lines, residential crossovers, existing Willow Myrtle street trees and the WWI memorial park/ bus stop impacting the ability to replant trees in the same location as the original 50 commemorative trees.

4.3 Marine Discovery Centre



The 4 trees at the entrance to the Marine Discovery Centre.

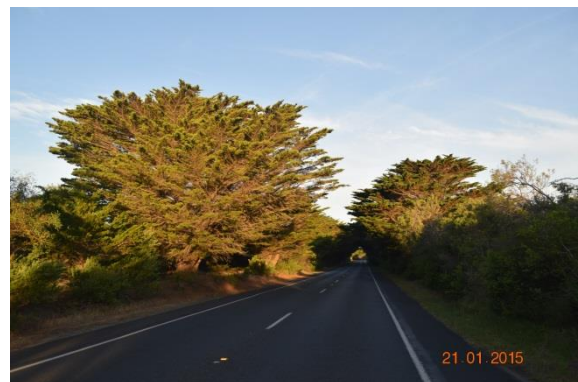
The 4 trees near the Marine Discovery Centre are estimated to have been planted between 1945 and 1950. There were 5 trees in total planted in this location at the time. There are currently no remains of concrete bases at the foot of these trees and any historical associations are unknown.

These trees are currently in fair health for their age and location; however 3 of the 4 trees have poor structure. 1 tree is recommended for removal in the next 4 years due to structural defects and the remaining trees are expected to substantially decline over the next 10 years.

4.4 The Narrows – western extent

29 trees form an avenue through The Narrows, south of the Marine Discovery Centre, and are the youngest group of plantings assessed. Historical aerial photos suggest the majority of these trees were planted between 1965 and 1975, with the trees likely to be 40-50 years old. It is unknown if these trees have historic commemorative connections, but they are a dominant feature of the local landscape and are of aesthetic significance.

The trees are currently in fair health and have fair or good structure. At present these trees require very little work with regard to public safety. The majority of these trees have a Useful Life Expectancy of 20-40 years. These trees can be safely retained in the landscape in the short to medium term and a tree replacement plan is not required at this time.



The trees at the western end of The Narrows create a bold visual statement for road users.

4.5 The Springs

The 27 trees in a single row on the southern side of Point Lonsdale Road and the Bellarine Highway are estimated to have been planted between 1950 and 1960. It is unknown if these trees have historic commemorative planting connections, but they are a dominant feature of the local landscape.

Over two-thirds of the trees require moderate or high priority works to reduce the risk of part of whole tree failure. Recommended works include risk reduction pruning of overextended limbs, deadwood removal and broken and hanging branch removal.

Approximately 60% of these trees are in fair condition with a Useful Life Expectancy of 10-20 years. 30% of the trees exhibit fair health but are structurally poor and are expected to substantially decline over the next 10 years. 3 trees are recommended for removal within the next 2 years due to structural faults.



The single row of trees at The Springs, at the intersection of Point Lonsdale Road and the Bellarine Highway.

The row of trees at The Springs is of aesthetic significance and it is recommended that a tree replacement plan is developed and implemented for these trees.

The site conditions at The Springs have not been significantly altered since the row of Monterey Cypress were planted c. 1950-60. High Voltage power lines have been installed to the north of the trees along the entire row, however the Coastal Moonah Woodland south of the trees remains undeveloped and there should be sufficient space to allow trees to be replanted. The adaptability of the trees to pruning around power lines will be an important consideration when replanting.

4.6 Bellarine Community Centre



The row of 6 trees outside the Bellarine Community Centre on Point Lonsdale Road.

A single row of 6 Monterey Cypress is located on the western side of Point Lonsdale Road, Point Lonsdale, outside of the Bellarine Community Centre. These trees are estimated to be 55-65 years old, with aerial photos suggesting they were planted between 1950 and 1960. Historic photographs show that these trees are the remnants of 1 or 2 extensive rows of cypresses in the area however there is little evidence to suggest that these trees have historic commemorative planting connections.

In general, these trees are of fair health and structure and appear typical examples of the species at maturity. All of these trees contain a moderate amount of deadwood in the canopy and there is evidence of small and moderate sized branch failures. Broken branch removal and risk reduction is recommended for one tree with defective branches above a park bench and an informal gravel path.

3 trees have a Useful Life Expectancy of 10-20 years and 3 trees have a Useful Life Expectancy of 5-10 years.

4.7 Point Lonsdale Foreshore

The 2 trees on the Point Lonsdale foreshore are of fair health and structure and appear typical examples of the species at maturity. The canopies of both trees are thinning and this is most likely due to soil compaction of the root zone, with heavy vehicle and pedestrian traffic around both of the trees. These trees have a Useful Life Expectancy of 10-20 years. It is unknown if these trees have historic connections.

The removal and replacement of trees on the Point Lonsdale foreshore is addressed in the Point Lonsdale Foreshore Draft Tree Plan, part of the Master Plan for the foreshore revitalisation.



The 2 trees on the Point Lonsdale foreshore.

5. Tree Selection

The Avenue of Honour trees are nearing the end of their Useful Life Expectancy and many within the local community have voiced their desire to see the Avenue continued in the future. An integral part of the ultimate success of any replacement planting will be species selection.

The preference of the majority (64%) of the local community to replant with the same species is respectfully acknowledged, however, if Monterey Cypress is used to replant trees in Avenue of Honour, there is strong evidence to suggest that the trees will not be ultimately successful.

While there are some advantages in the continued use of Monterey Cypress to replace the significant Cypress avenues and rows within the Borough, the single strongest argument against the continued use of Monterey Cypress is the presence of Seiridium Canker in the trees. At present, there is no proven cure for Seiridium Canker.

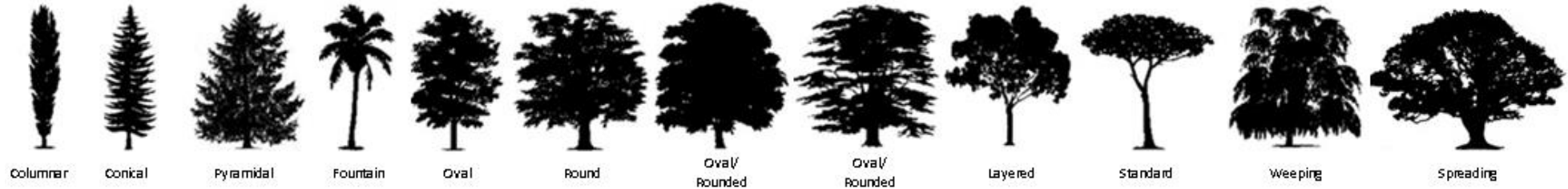
It is recommended that in consultation with the community, the Borough select alternative species to replant the historical avenues and rows of Monterey Cypress at Flinders Street, the Avenue of Honour and The Springs.

The sense of drama created by a mature avenue of trees is often due to the uniformity of the individual trees and their eventual size and stature. The uniqueness of an avenue can be created by selecting factors such as the canopy shape, foliage density and light/shadow cast, and aesthetic features (e.g. bark, flowers). While Monterey Cypress has been a defining landscape feature throughout the Borough of Queenscliffe for the past 100 years, the opportunity now exists for the community to define the future landscape and character of the Borough.

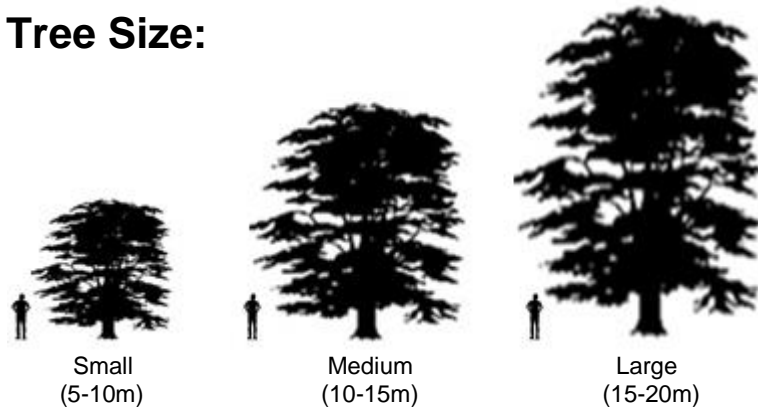
The species selected to replant the Avenues and rows will need to be tolerant of the coastal and climatic conditions present in Queenscliffe. In order to select the most appropriate species, the desired look and feel of the mature Avenue needs to also be considered. The following page provides schematic diagrams designed to assist the community to consider alternative tree characteristics. More than simply choosing a tree species, the community will be influencing and defining the statement that the entrance to Queenscliffe will present for future generations to come.

In order to consider how the avenue may look in the future, the information contained on the following page should be considered in terms of possible tree shape, size, foliage, shade, longevity and flowering.

Tree Shape:



Tree Size:



Foliage:

Evergreen (leaves year round)	Deciduous (loses leaves in winter)
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Shade:

Dappled Shade (open canopy)	Solid Shade (dense canopy)
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Longevity:

Short lived/ (fast growth rate)	Long lived/ (slow to mod growth rate)
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Flowers:

Flowering	Non-flowering
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6. Recommended Works

Works have been recommended to reduce hazard and/or promote tree longevity. At least one fully qualified arborist must be present on-site at all times during pruning operations for significant trees.

The minimum qualification should be:

- An Advanced Certificate of Arboriculture.
- A National Certificate in Horticulture (Arboriculture) Level 3.

All pruning should conform to the Australian Standard Pruning of Amenity Trees (AS 4373-2007). Pruning should preferably be done in winter or following dry weather, when *Seiridium* spores are less likely to infect pruning wounds. All pruning tools should be sterilised before and after use with either alcohol or dilute bleach (DEPI 2014).

6.1 Works Priority

Recommended works for the assessed trees were given a priority based on when the works should be undertaken.

Of the 112 trees assessed, 20 trees were assessed as requiring high priority works, 16 trees were assessed as requiring moderate priority works and 3 trees were assessed as requiring low priority works.

Category	Definition	No of trees
High	Recommended works should be carried out within the next 12 months.	20
Moderate	Recommended works should be carried out within the next 2 years.	16
Low	Recommended works should be carried out within 2-4 years.	3

The following table lists the recommended works for the trees assessed. 73 trees did not require any remedial works at the time of inspection, these trees are not listed in the table.

Two maps are included before the table indicating location of trees by number.





Tree No.	Canopy Dimensions	DBH (cm)	Health	Structure	ULE	Location	Recommended Works	Works Priority
2	12m x 18m	193	Fair	Poor	5-10 years	Flinders Street	Individual branch removal	Moderate
7	13m x 18m	153	Fair	Poor	1-5 years	Flinders Street	Removal	Low
12	11m x 18m	185	Fair	Poor	10-20 years	Flinders Street	Individual branch removal	Moderate
19	13m x 20m	219	Fair	Poor	1-5 years	Avenue of Honour	Removal	Low
20	11m x 15m	186	Fair	Fair	10-20 years	Avenue of Honour	Exclude target, Mulch required	High
21	10m x 15m	151	Fair	Fair	10-20 years	Avenue of Honour	Exclude target, Mulch required	High
22	11m x 15m	166	Fair	Fair	10-20 years	Avenue of Honour	Exclude target, Mulch required	High
23	10m x 16m	168	Fair	Fair	10-20 years	Avenue of Honour	Exclude target, Mulch required	High
24	9m x 18m	153	Fair	Fair	10-20 years	Avenue of Honour	Exclude target, Mulch required	High
25	9m x 14m	136	Fair	Fair	10-20 years	Avenue of Honour	Exclude target, Mulch required	High
26	9m x 14m	108	Fair	Fair	10-20 years	Avenue of Honour	Exclude target, Mulch required	High
27	9m x 15m	122	Fair	Fair	10-20 years	Avenue of Honour	Exclude target, Mulch required	High
28	9m x 13m	133	Fair	Fair	10-20 years	Avenue of Honour	Exclude target, Mulch required	High
29	11m x 19m	197	Fair	Fair	10-20 years	Avenue of Honour	Exclude target, Mulch required, Individual branch removal	High
40	11m x 19m	192	Fair	Poor	5-10 years	Avenue of Honour	Risk reduction pruning	Moderate
45	13m x 18m	174	Fair	Fair	5-10 years	Marine Discovery Centre	Broken/hanging branch removal	Moderate
48	13m x 12m	169	Fair	Poor	1-5 years	Marine Discovery Centre	Removal	Low
57	11m x 16m	137	Fair	Fair	20-40 years	The Narrows - western extent	Individual branch removal	Moderate
65	4m x 8m	22	Fair	Fair	20-40 years	The Narrows - western extent	Remove rope/tie from trunk	Moderate
79	11m x 17m	185	Fair	Fair	10-20 years	The Springs	Broken/hanging branch removal	High

80	12m x 18m	167	Fair	Fair	10-20 years	The Springs	Broken/hanging branch removal	High
81	10m x 16m	154	Fair	Fair	10-20 years	The Springs	Broken/hanging branch removal	High
83	10m x 17m	184	Fair	Very Poor	0 years	The Springs	Removal	Moderate
84	12m x 14m	137	Fair	Fair	10-20 years	The Springs	Broken/hanging branch removal	High
85	10m x 18m	171	Fair	Fair	10-20 years	The Springs	Risk reduction pruning	Moderate
86	11m x 16m	185	Fair	Poor	5-10 years	The Springs	Broken/hanging branch removal	High
87	11m x 16m	210	Fair	Poor	5-10 years	The Springs	Broken/hanging branch removal	High
88	12m x 15m	214	Fair	Fair	10-20 years	The Springs	Risk reduction pruning, Broken/hanging branch removal	Moderate
89	12m x 14m	187	Fair	Fair	10-20 years	The Springs	Risk reduction pruning	Moderate
90	12m x 14m	219	Fair	Poor	10-20 years	The Springs	Risk reduction pruning	Moderate
92	12m x 15m	236	Fair	Poor	5-10 years	The Springs	Risk reduction pruning	High
94	12m x 17m	261	Fair	Very Poor	0 years	The Springs	Removal	Moderate
95	12m x 15m	237	Fair	Fair	10-20 years	The Springs	Deadwood removal, Risk reduction pruning	Moderate
96	11m x 16m	237	Fair	Fair	10-20 years	The Springs	Risk reduction pruning, Deadwood removal, Broken/hanging branch removal	Moderate
97	12m x 15m	231	Fair	Fair	10-20 years	The Springs	Risk reduction pruning, Deadwood removal, Broken/hanging branch removal	High
100	12m x 16m	164	Fair	Poor	5-10 years	The Springs	Broken/hanging branch removal	Moderate
103	12m x 17m	208	Fair	Poor	5-10 years	The Springs	Broken/hanging branch removal	Moderate
104	11m x 17m	219	Poor	Poor	0 years	The Springs	Removal	High
107	12m x 19m	187	Fair	Fair	10-20 years	Bellarine Community Health	Risk reduction pruning, Broken/hanging branch removal	High

7. References

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Tree shapes adapted from Merriam-Webster Visual Dictionary Online

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