Tree Risk Assessment

for

Assessment of the Queenscliff Avenue of Honour.

Prepared by

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Executive Summary

Homewood Consulting Pty Ltd has been engaged to undertake an inspection of all trees within the Queenscliff Avenue of Honour.

All trees within the dataset (121 individual specimens) were subject to a Level 1 'Limited Visual Inspection' assessment (ISA 2013). 20 trees were observed to been removed since the most recent previous inspection (during 2020).

Of the remaining 101 trees, 23 have been assigned 'Very High', 'High' or 'Moderate' priority works and were assessed using Level 2 'Basic assessment' methodology (ISA 2013).

Figure 1: Queenscliff Avenue of Honour (Trees 13-18)

The following works and priority timeframes are recommended:

Table 1: Total recommended works and priority for the sites

Priority	Completion Timeframe	Removal	Pruning	Total
Urgent	Recommended works are carried out as soon as possible	0	0	0
Very High	Recommended works are carried out within 1 month	1	0	1
High	Recommended works are carried out within 3 months	3	11	14
Moderate	Recommended works are carried out within 6-12 months	1	7	8
	Total	**5**	**18**	**23**

It is recommended all prescribed works are carried out within the specified timeframes and are undertaken by a qualified arborist in accordance with Australian Standard 4373: *Pruning Amenity Trees* (Standards Australia 2007).

Probability of Failure Range	Probability of Failure Ratio	Probability of Failure Percentage	Description
4 (Low)	1/1000 - >1/10 000	>0.01% – 0.1%	The structure of the specimen has some faults that may result in failure but failure is unlikely. The probability of failure over the next twelve months is 0.01 to 0.1%.
5 (Very low)	1/10 000 - >1/100 000	>0.001% - 0.01%	The structure of the specimen has some minor faults that may result in failure but failure is very unlikely. The probability of failure over the next twelve months is less than 0.01%.
6 (Negligible)	1/100 000 - >1/1 000 000	>0.0001% - 0.001%	The probability of failure is highly unlikely, between 0.01 to 0.001%.
7 (None)	1/1 000 000 - >1/10 000 000	>0.00001% - 0.0001%	The probability of failure can be considered none, less than 0.0001%.

2.5 Examples

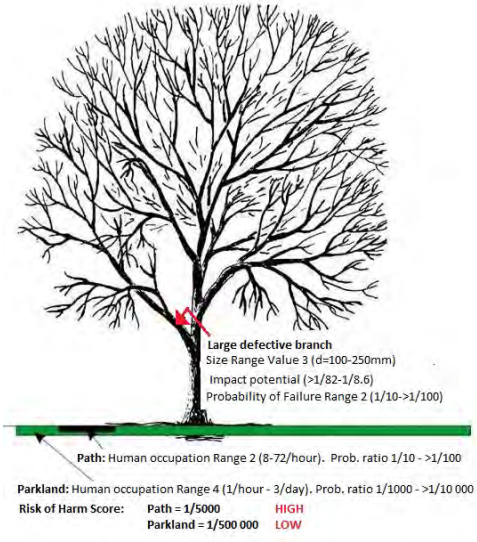

Figure 14. Risk Assessment Example 1

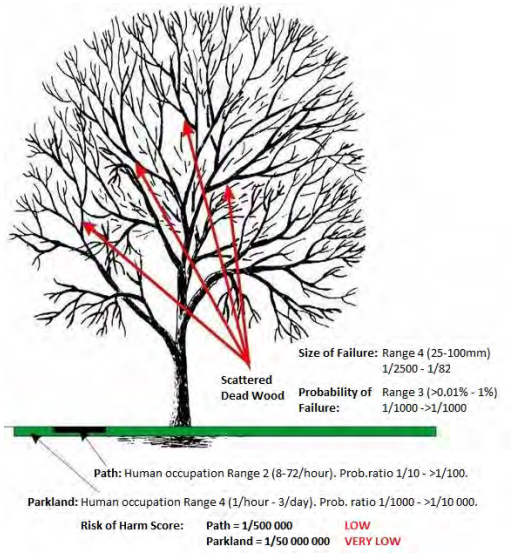

Figure 15. Risk Assessment Example 2

between the house and the car. Thus the human occupancy rate in the target zone is rare, and the car occupancy rate is frequent. This leaves two scenarios to judge:

1. The rare human occupancy rate translates to a *very low* likelihood of impacting the driver. When that is combined with a *probable* failure likelihood, the combination results in the likelihood of failure impacting the driver of *unlikely.*
2. The car occupancy rate is frequent, and there are no structures or tree parts that would deflect or impede the fall of the branch on this side of the tree. You rate the likelihood of impact *medium*. Combining the *medium* likelihood of impact with the *probable* likelihood of failure of the branch, the likelihood of failure and impact for the car becomes *somewhat likely.*

The consequences of a medium-sized dead branch striking a house would be *minor*, the consequences of that branch striking an unoccupied, new car could be *significant*, and the consequences of its impacting a person would be *severe.* These consequences are combined with the likelihood of failure and impact to determine risk ratings as follows:

- For the house, the risk of a medium-sized, dead branch with a likelihood of failure and impact rating of *unlikely* and consequences rating of *minor* would result in a risk rating of *low.*
- For the parked car, the likelihood of failure and impact is *somewhat likely* and the consequences are *significant*, so the risk is *moderate*.
- For the driver of the car, the likelihood of failure and impact is *unlikely* and the consequences *severe,* so the risk is *low.*

The highest of these three individual ratings is *moderate*, thus the overall tree risk rating would be *moderate*. Whether the clients choose to mitigate the risk depends upon their perception of risk and what level of risk they find acceptable, as well as the cost, aesthetics, and inconvenience of mitigation.

Appendix 3. Recommended Works and Priority Table

Table 8: Recommended Works and Priority

Tree ID	Botanical Name	H & W (m)	Health	Structure	ULE	Works	Priority	Comments
10	*Hesperocyparis macrocarpa*	14 x 18	Fair	Poor	5 to 10 years	Mulch rootzone, Codominant reduction	High	Large split over informal path on private property side of canopy
12	*Hesperocyparis macrocarpa*	12 x 19	Fair	Very poor	0 years	Removal	Very High	Main union splitting
13	*Hesperocyparis macrocarpa*	13 x 21	Fair	Poor	5 to 10 years	Deadwood removal, Broken branch removal, Exclude or move target	High	Multiple large failures, broken branches over lawn. Mulch and underplant to exclude dropzone from pedestrians and vehicle parking
14	*Hesperocyparis macrocarpa*	15 x 20	Fair	Poor	5 to 10 years	Deadwood removal, Exclude or move target	Moderate	Multiple large failures Mulch and underplant to exclude dropzone from pedestrians and vehicle parking
15	*Hesperocyparis macrocarpa*	15 x 22	Fair	Poor	5 to 10 years	Deadwood removal, Exclude or move target	Moderate	Mulch and underplant to exclude dropzone from pedestrians and vehicle parking
16	*Hesperocyparis macrocarpa*	13 x 18	Fair	Poor	5 to 10 years	Deadwood removal, Exclude or move target	Moderate	Large failures over road, Mulch and underplant to exclude dropzone from pedestrians and vehicle parking
17	*Hesperocyparis macrocarpa*	15 x 22	Fair	Poor	5 to 10 years	Deadwood removal, Exclude or move target	High	Several large failures, Mulch and underplant to exclude dropzone from pedestrians and vehicle parking
19	*Hesperocyparis macrocarpa*	13 x 12	Fair	Poor	Less than 5 years	Removal	Moderate	Exposed canopy, beyond correction pruning

Tree ID	Botanical Name	H & W (m)	Health	Structure	ULE	Works	Priority	Comments
42	*Hesperocyparis macrocarpa*	12 x 17	Fair	Fair	5 to 10 years	Deadwood removal	Moderate	Deadwood over road
44	*Hesperocyparis macrocarpa*	14 x 22	Fair	Poor	5 to 10 years	Broken branch removal, Deadwood removal	High	Remove dead branches over road, broken branch over driveway
46	*Hesperocyparis macrocarpa*	15 x 14	Fair	Poor	5 to 10 years	Broken branch removal	High	Broken branch, road side in upper canopy
47	*Hesperocyparis macrocarpa*	13 x 15	Fair	Poor	5 to 10 years	Broken branch removal	High	Broken branch, road side in upper canopy
48	*Hesperocyparis macrocarpa*	14 x 10	Fair	Poor	Less than 5 years	Removal	High	Trunk decay from pruning wound on main stem path side
80	*Hesperocyparis macrocarpa*	13 x 17	Fair	Fair	10 to 20 years	Broken branch removal	High	Split canopy stems over footpath
84	*Hesperocyparis macrocarpa*	12 x 14	Fair	Fair	10 to 20 years	Broken branch removal	High	Branch with large wound at base
87	*Hesperocyparis macrocarpa*	15 x 23	Fair	Poor	5 to 10 years	Weight reduction	Moderate	Clean up larger failure wounds with active splits above footpath, remove extended and exposed branch over footpath
94	*Hesperocyparis macrocarpa*	16 x 16	Poor	Very poor	0 years	Removal	High	Split in main stems, extensive clearance from powerlines, and storm damage
95	*Hesperocyparis macrocarpa*	15 x 16	Fair	Poor	5 to 10 years	Removal	High	Multiple large failures in canopy, has had more failures since 2021 storms, large hole in canopy as a result. Beyond correction pruning
96	*Hesperocyparis macrocarpa*	15 x 20	Fair	Poor	5 to 10 years	Deadwood removal, Broken branch removal	Moderate	Clean up failures

Tree ID	Botanical Name	H & W (m)	Health	Structure	ULE	Works	Priority	Comments
98	*Hesperocyparis macrocarpa*	12 x 16	Fair	Poor	5 to 10 years	Deadwood removal	Moderate	Remove dead branch to west which has a large tear out on northern side, clean up previous failures
99	*Hesperocyparis macrocarpa*	16 x 16	Fair	Poor	5 to 10 years	Deadwood removal, Broken branch removal	High	Multiple small hangers, remove dying branch over footpath with failure at base
102	*Hesperocyparis macrocarpa*	15 x 17	Fair	Fair	5 to 10 years	Codominant reduction	High	Longitudinal crack in canopy stem, reduce back
106	*Hesperocyparis macrocarpa*	14 x 13	Fair	Poor	5 to 10 years	Individual branch removal	High	Remove split canopy branch, supported by other branches. Clean up failures

Appendix 4. Tree Assessments

Tree Number: 10

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	14 x 18
DBH (cm):	185
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Mulch rootzone, Codominant reduction
Priority:	High
Failure Potential:	2. High 1/10
Failure Size:	2. 251-450mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 10,000**
QTRA Risk Threshold:	Unacceptable
Comments	Large split over informal path on private property side of canopy

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Tree Number: 12

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	12 x 19
DBH (cm):	210
Health:	Fair
Structure:	Very poor
ULE:	0 years
Works:	Removal
Priority:	Very High
Failure Potential:	2. High 1/10
Failure Size:	1. Greater 450mm
Target Occupancy:	2Car-4200 at 60kph
Risk of Harm:	**1 in 400**
QTRA Risk Threshold:	Unacceptable
Comments	Main union splitting

Tree Number: 13

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	13 x 21
DBH (cm):	290
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Deadwood removal, Broken branch removal, Exclude or move target
Priority:	High
Failure Potential:	2. High 1/10
Failure Size:	3. 101-250mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 50,000**
QTRA Risk Threshold:	Tolerable
Comments	Multiple large failures, broken branches over lawn. Mulch and underplant to exclude dropzone from pedestrians and vehicle parking

Tree Number: 14

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	15 x 20
DBH (cm):	280
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Deadwood removal, Exclude or move target
Priority:	Moderate
Failure Potential:	3. Moderate 1/100
Failure Size:	3. 101-250mm
Target Occupancy:	2Car-4200 at 60kph
Risk of Harm:	**1 in 50,000**
QTRA Risk Threshold:	Tolerable
Comments	Multiple large failures. Mulch and underplant to exclude dropzone from pedestrians and vehicle parking

Tree Number: 15

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	15 x 22
DBH (cm):	290
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Deadwood removal, Exclude or move target
Priority:	Moderate
Failure Potential:	3. Moderate 1/100
Failure Size:	3. 101-250mm
Target Occupancy:	2Car-4200 at 60kph
Risk of Harm:	**1 in 50,000**
QTRA Risk Threshold:	Tolerable
Comments	Mulch and underplant to exclude dropzone from pedestrians and vehicle parking

Tree Number: 16

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	13 x 18
DBH (cm):	260
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Deadwood removal, Exclude or move target
Priority:	Moderate
Failure Potential:	3. Moderate 1/100
Failure Size:	3. 101-250mm
Target Occupancy:	2Car-4200 at 60kph
Risk of Harm:	**1 in 50,000**
QTRA Risk Threshold:	Tolerable
Comments	Large failures over road. Mulch and underplant to exclude dropzone from pedestrians and vehicle parking

Tree Number: 17

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	15 x 22
DBH (cm):	300
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Deadwood removal, Exclude or move target
Priority:	High
Failure Potential:	3. Moderate 1/100
Failure Size:	3. 101-250mm
Target Occupancy:	2Car-4200 at 60kph
Risk of Harm:	**1 in 50,000**
QTRA Risk Threshold:	Tolerable
Comments	Several large failures. Mulch and underplant to exclude dropzone from pedestrians and vehicle parking

Tree Number: 19

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	13 x 12
DBH (cm):	190
Health:	Fair
Structure:	Poor
ULE:	Less than 5 years
Works:	Removal
Priority:	Moderate
Failure Potential:	3. Moderate 1/100
Failure Size:	2. 251-450mm
Target Occupancy:	2Car-4200 at 60kph
Risk of Harm:	**1 in 10,000**
QTRA Risk Threshold:	Unacceptable
Comments	Exposed canopy, beyond correction pruning

Tree Number: 42

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	12 x 17
DBH (cm):	145
Health:	Fair
Structure:	Fair
ULE:	5 to 10 years
Works:	Deadwood removal
Priority:	Moderate
Failure Potential:	3. Moderate 1/100
Failure Size:	3. 101-250mm
Target Occupancy:	2Car-4200 at 60kph
Risk of Harm:	**1 in 50,000**
QTRA Risk Threshold:	Tolerable
Comments	Deadwood over road

Tree Number: 44

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	14 x 22
DBH (cm):	300
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Broken branch removal, Deadwood removal
Priority:	High
Failure Potential:	2. High 1/10
Failure Size:	3. 101-250mm
Target Occupancy:	2Car-4200 at 60kph
Risk of Harm:	**1 in 5,000**
QTRA Risk Threshold:	Unacceptable
Comments	Remove dead branches over road, broken branch over driveway

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Tree Number: 46

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	15 x 14
DBH (cm):	185
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Broken branch removal
Priority:	High
Failure Potential:	2. High 1/10
Failure Size:	3. 101-250mm
Target Occupancy:	2Car-4200 at 60kph
Risk of Harm:	**1 in 5,000**
QTRA Risk Threshold:	Unacceptable
Comments	Broken branch, road side in upper canopy

Tree Number: 47

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	13 x 15
DBH (cm):	190
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Broken branch removal
Priority:	High
Failure Potential:	3. Moderate 1/100
Failure Size:	3. 101-250mm
Target Occupancy:	2Car-4200 at 60kph
Risk of Harm:	**1 in 50,000**
QTRA Risk Threshold:	Tolerable
Comments	Broken branch, road side in upper canopy

Tree Number: 48

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	14 x 10
DBH (cm):	120
Health:	Fair
Structure:	Poor
ULE:	Less than 5 years
Works:	Removal
Priority:	High
Failure Potential:	3. Moderate 1/100
Failure Size:	3. 101-250mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 500,000**
QTRA Risk Threshold:	Tolerable
Comments	Trunk decay from pruning wound on main stem path side

Tree Number: 80

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	13 x 17
DBH (cm):	190
Health:	Fair
Structure:	Fair
ULE:	10 to 20 years
Works:	Broken branch removal
Priority:	High
Failure Potential:	2. High 1/10
Failure Size:	3. 101-250mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 50,000**
QTRA Risk Threshold:	Tolerable
Comments	Split canopy stems over footpath

Tree Number: 84

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	12 x 14
DBH (cm):	120
Health:	Fair
Structure:	Fair
ULE:	10 to 20 years
Works:	Broken branch removal
Priority:	High
Failure Potential:	2. High 1/10
Failure Size:	3. 101-250mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 50,000**
QTRA Risk Threshold:	Tolerable
Comments	Branch with large wound at base

Tree Number: 87

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	15 x 23
DBH (cm):	220
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Weight reduction
Priority:	Moderate
Failure Potential:	3. Moderate 1/100
Failure Size:	2. 251-450mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 100,000**
QTRA Risk Threshold:	Tolerable
Comments	Clean up larger failure wounds with active splits above footpath, remove extended and exposed branch over footpath

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Tree Number: 94

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	16 x 16
DBH (cm):	280
Health:	Poor
Structure:	Very poor
ULE:	0 years
Works:	Removal
Priority:	High
Failure Potential:	3. Moderate 1/100
Failure Size:	2. 251-450mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 100,000**
QTRA Risk Threshold:	Tolerable
Comments	Split in main stems, extensive clearance from powerlines, and storm damage

Tree Number: 95

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	15 x 16
DBH (cm):	260
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Removal
Priority:	High
Failure Potential:	2. High 1/10
Failure Size:	3. 101-250mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 50,000**
QTRA Risk Threshold:	Tolerable
Comments	Multiple large failures in canopy, has had more failures since 2021 storms, large hole in canopy as a result. Beyond correction pruning

Tree Number: 96

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	15 x 20
DBH (cm):	275
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Deadwood removal
Priority:	Moderate
Failure Potential:	3. Moderate 1/100
Failure Size:	3. 101-250mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 500,000**
QTRA Risk Threshold:	Tolerable
Comments	Clean up failures

Tree Number: 98

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	12 x 16
DBH (cm):	285
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Deadwood removal
Priority:	Moderate
Failure Potential:	3. Moderate 1/100
Failure Size:	3. 101-250mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 500,000**
QTRA Risk Threshold:	Tolerable
Comments	Remove dead branch to west which has a large tear out on northern side, clean up previous failures

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Tree Number: 99

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	16 x 16
DBH (cm):	245
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Deadwood removal, Broken branch removal
Priority:	High
Failure Potential:	2. High 1/10
Failure Size:	4. 26-100mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 500,000**
QTRA Risk Threshold:	Tolerable
Comments	Multiple small hangers, remove dying branch over footpath with failure at base

Tree Number: 102

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	15 x 17
DBH (cm):	175
Health:	Fair
Structure:	Fair
ULE:	5 to 10 years
Works:	Codominant reduction
Priority:	High
Failure Potential:	3. Moderate 1/100
Failure Size:	2. 251-450mm
Target Occupancy:	3Ped_2-7/hr
Risk of Harm:	**1 in 100,000**
QTRA Risk Threshold:	Tolerable
Comments	Longitudinal crack in canopy stem, reduce back

Tree Number: 106

Botanical Name:	*Hesperocyparis macrocarpa*
Common Name:	Monterey Cypress
Origin:	Exotic
Height & Width (m):	14 x 13
DBH (cm):	155
Health:	Fair
Structure:	Poor
ULE:	5 to 10 years
Works:	Individual branch removal
Priority:	High
Failure Potential:	3. Moderate 1/100
Failure Size:	2. 251-450mm
Target Occupancy:	3Stationary Cars
Risk of Harm:	**1 in 100,000**
QTRA Risk Threshold:	Tolerable
Comments	Remove split canopy branch, supported by other branches. Clean up failures