ArborSafe
TREE CONSULTANCY AND MANAGEMENT SYSTEMS

Arboricultural Impact Assessment

Champagnat Catholic College, Maroubra - Block B
Quinn O'Hanlon Architects Pty Ltd c/- SCS Planning and Facilities
35 Donovan Street
Maroubra NSW 2035

21 January 2020

C91546

ASSESSMENT & REPORT COMMISSIONED BY:

Tim Blackall
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ASSESSMENT & REPORT PREPARED BY:

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21 January 2020

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Re: Quinn O'Hanlon Architects Pty Ltd c/- SCS Planning and Facilities – Champagnat Catholic College, Maroubra - Block B

Arboricultural Impact Assessment for twenty-eight (28) trees located within the vicinity of proposed project type at Champagnat Catholic College and 35 Donovan Street, Maroubra.

Dear Tim,

We are pleased to provide you with the following Arboricultural Impact Assessment for twenty-eight (28) site trees within the grounds of the Champagnat Catholic College.

Complete use of this report is authorised under the conditions limiting its use as stated in Appendix A Item 7 of *"Arboricultural Reporting Assumptions and Limiting Conditions"*.

Should you have any queries relating to this report, its recommendations, or the options considered please do not hesitate to contact us on 1300 272 671.

Regards,

Kane Hollstein
Consulting Arborist
Dip. Arb., AQF Level 5

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1 Executive Summary

1.1.1 The following Arboricultural Impact Assessment (Report) regards twenty-eight (28) trees located within the grounds of Champagnat Catholic College. The subject site was identified by the Client as possessing trees that may be impacted by a proposed development.

1.1.2 In part, the project scope was to nominate subject trees that can be retained, or require removal to facilitate the development, as well as identify and reduce potential conflicts between subject trees and site development. Accurate information on the area required for tree retention and methods/techniques suitable for tree protection during construction have been provided.

1.1.3 An arborist inspection of the subject trees was undertaken on 26 July 2019, where tree data was collected.

1.1.4 Tree retention values have been determined based upon the assessment of the trees' health, structure, dimensions, age class, life expectancy, location and environmental amenity/significance in accordance with a modified version of the British Standard BS 5837–2012: *Trees in relation to design, demolition and construction*. The Tree Protection Zone (TPZ) method has been derived from Australian Standard AS 4970–2009: *Protection of Trees on Development Sites*. The TPZ is defined as a specified area above and below ground and at a given distance measured radially away from the centre of the tree's trunk and which is set aside for the protection of its roots and crown.

1.1.5 One (1) tree was of Category A retention value. Typically trees in this category were of a significant size in the landscape, possessed fair to good health and structure, a useful life expectancy (ULE) of more than 25 years, made significant amenity contributions to the landscape and high environmental contributions. Category A retention value tree is numbered 58 and has a High Retention Value.

1.1.6 Twelve (12) trees were of Category B retention value. Trees in this category were typically of a medium size, had good to fair health and good to fair structure, and a ULE of more than 15 years. Moderate Retention Value trees made moderate amenity contributions to the landscape, and made low to moderate environmental contributions. Category B retention value trees are 49, 52, 54, 56, 60, 63, 66, 67, 68, 70, 71 and 72 and have a Moderate Retention Value.

1.1.7 Thirteen (13) trees were of Category C retention value. Trees in this category were typically of small–medium size, of low significance in the landscape, may have poor health or structure, are easily replaceable and do not warrant design consideration. Category C retention value trees are 1, 2, 3, 51, 53, 55, 57, 61, 62, 69, 73, 74 and 75 and have a Low Retention Value.

1.1.8 Two (2) trees were of Category U retention value. Trees in this category were typically of poor health and/or structure, of undesirable species and are recommended for removal irrespective of site development. Category U retention value trees are 59 and 64.

1.1.9 Eleven (11) trees in total would require removal to facilitate the proposed development in its current format and consist of:

- Trees 54, 63, 60 and 66 which are of Category B retention value
- Trees 1, 2, 3, 62, 73, 74 and 75 which are of Category C retention value.

1.1.10 Nine (9) trees in total are to be retained with specific protection measures throughout the development and consist of:

- Tree 58 which is of Category A retention value
- Trees 52, 56, and 72 which are of Category B retention value
- Trees 51, 53, 55, 57 and 61 which are of Category C retention value.

1.1.11 Six (6) trees are to be retained with generic protection measures throughout the development and consist of:

- Trees 49, 67, 68, 70 and 71 which are of Category B retention value
- Tree 69 which is of Category C retention value.

1.1.12 Trees 72 and 71 will require pruning within the western portion of their crowns to facilitate works.

2 Introduction

2.1.1 ArborSafe Australia Pty Ltd was engaged by Tim Blackall on behalf of Quinn O'Hanlon Architects Pty Ltd c/- SCS Planning and Facilities (the Client) to complete an Arboricultural Impact Assessment (report) on twenty-eight (28) trees located within or adjacent to the Champagnat Catholic College at 35 Donovan Street, Maroubra.

2.1.2 The site was located within the Champagnat College grounds which included the existing Block B building and surrounding areas of open space.

2.1.3 The report has been requested as part of a Development Application (DA) that involves the demolition of the existing Block B building and construction of a new building in a similar location.

2.1.4 The report was intended to provide information on site trees and how they may be impacted upon by the proposed development. Report findings and recommendations provided are based upon guidance provided within Australian Standard AS 4970–2009: *Protection of Trees on Development Sites*.

2.1.5 Observations and recommendations provided within this report are based upon information provided by the client and an arborist site visit.

3 Scope

3.1.1 Carry out a visual examination of the nominated trees located within the vicinity of the proposed development (Figure 1).

3.1.2 Inspect the nominated trees and their growing environment in the context of the proposed development.

3.1.3 Provide an objective appraisal of the subject trees in relation to their species, estimated age, health, structural condition and viability within the landscape.

3.1.4 Based on the findings of this investigation, provide independent recommendations on the retention value of the trees.

3.1.5 Nominate subject trees that can be retained or require removal to facilitate this development.

3.1.6 Review the proposed development in the context of the Randwick City Council Development Control Plan (DCP) 2013 – Part B5.

3.1.7 Identify and reduce potential conflicts between subject trees and site development by providing accurate information on the area required for tree retention and methods/techniques suitable for tree protection during construction.

3.1.8 Provide information on restricted activities within the area nominated for tree protection, as well as suitable construction methods to be adopted during construction.

4 Methodology

4.1 Data Collection

4.1.1 Kane Hollstein and Jesse Tree of ArborSafe Australia Pty Ltd carried out a site inspection of the subject trees on 26 July 2019.

4.1.2 Trees that are the subject of this report were identified during discussions with the client and an onsite meeting with Tim Blackall, Associate, Nominated Architect of Quinn O'Hanlon Architects Pty Ltd c/- SCS Planning and Facilities on 24 July 2019.

4.1.3 The subject trees were inspected from ground level. No foliage or soil samples were taken. No aerial or internal investigations were undertaken.

4.1.4 Tree height and canopy width were estimated and have been provided to the nearest whole metre. Trunk diameter at breast height (DBH) was measured with a diameter tape and provided to the nearest centimetre.

4.1.5 Data collected on site was analysed by Kane Hollstein and Tom Axford, collated into report format, and relevant recommendations were formulated.

4.2 Tree Protection Zones

4.2.1 The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) methods have been derived from the Australian Standard AS 4970–2009: *Protection of Trees on Development Sites*.

4.2.2 The theoretical TPZ is defined as a specified area above and below ground and at a given distance measured radially away from the centre of the tree's trunk and which is set aside for the protection of its roots and crown. It is the area required to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development. The radius of the TPZ is calculated by multiplying its DBH by 12. TPZ radius = DBH × 12. (Note "Breast Height" is nominally measured as 1.4m from ground level).

4.2.3 The SRZ is the area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. SRZ radius = (D × 50)0.42 × 0.64.

4.3 Retention Values

4.3.1 Retention values were determined based upon a modified version of the British Standard BS 5837–2012: *Trees in Relation to Design, Demolition and Construction* (The British Standards Institution, 2012). This standard categorises tree retention value based upon assessment of the tree's quality (health and structure), and life expectancy. Other criteria such as its physical dimensions, age class, location and its Amenity, Heritage and Environmental significance are also considered. A breakdown of attributes required for each category can be obtained from Appendix B – Explanation of Tree Assessment Terms.

4.4 Images and Site Photographs

4.4.1 All photographs were taken at the time of the site inspection by the inspecting arborist. Photographs have been altered for brightness and/or cropped only. Other images used within this report have been sourced from ArborSite or via the internet. The source of all images has been referenced accordingly.

5 Observations

5.1 Aerial Images

Figure 1. Aerial image showing subject site. Red lines delineate the site and area containing the subject trees that are to be impacted by the proposed development. (SIX Maps, 2019).

5.2 Site Details

5.2.1 The proposed development site was located within the grounds of the Champagnat Catholic College. Specifically, the site was located in the north-eastern to eastern sections of the site.

5.2.2 The site was located within the Randwick City Council Local Government Area (LGA).

5.2.3 The site was bounded by Donovan Avenue to the north, Walsh Avenue to the east, Fitzgerald Avenue and Bunnerong Road to the south and south-west respectively, and Our Lady of the Annunciation Catholic Primary School to the west.

5.2.4 The eastern alignment of the site was bounded by an open stormwater canal.

5.2.5 Vegetation was largely concentrated along the property boundaries with a mix of existing buildings and hardstand located centrally within the property.

5.2.6 The site was situated on level ground with no discernible gradient or aspect.

5.2.7 Soils have likely been extensively disturbed and modified for urban development. The original soils of the area are typical of the Tuggerah Landscape Group (as classified in the Soil Landscapes of the Sydney 1:100,000 Sheet), consisting of loamy, loose sands in the topsoil layer extending to yellow massive sands in the deep subsoil (B horizon). The southern area of the site and beneath Fitzgerald Avenue was comprised of 'Disturbed Terrain' which may consist of 'turfed fill areas commonly capped with up to 40 cm of sandy loam or up to 60cm of compacted clay over fill or waste materials.' (State Government of NSW and Office of Environment and Heritage (OEH), 2015).

5.3 Heritage and Vegetation Significance

5.3.1 Review of relevant documentation indicated Champagnat Catholic College is not heritage listed at either a local or state level; or contains instances of mapped Critically Endangered Ecological Communities (CEEC) or Endangered Ecological Communities (EEC) (SEED - NSW Government, 2019).

5.3.2 Review of the Randwick City Council *Register of Significant Trees: Other Government authorities, Institutional, Religious and Non-government Organisations* and *Appendix I: List of Public Nominations and Assessments* indicates no existing site vegetation is listed or nominated for inclusion in this document (Randwick City Council, 2007).

5.3.3 The 1943 Aerial Image shown in Figure 2 shows the site devoid of trees or large vegetation.

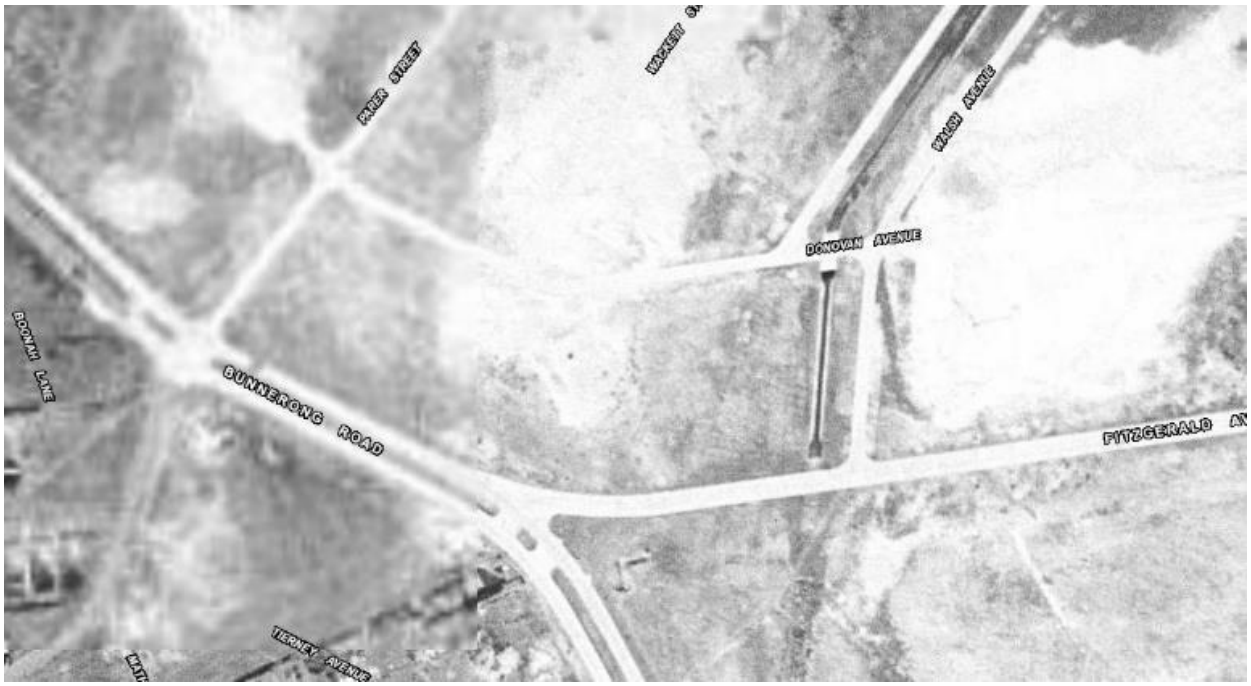


Figure 2. 1943 imagery of the subject site. (SIX Maps, 2019).

5.4 Proposed Construction

5.4.1 Plans of the existing site (Figure 3) and of the proposed development were provided to ArborSafe on 4 December 2019 include:

- Proposed Site Plan, SD1100, Issue A, Quinn O'Hanlon Architects, 25/09/2019
- First Floor Plan Block B, SD2221, Issue E, Quinn O'Hanlon Architects, 25/09/2019
- Ground Floor Plan Block B, SD2220, Issue E, Quinn O'Hanlon Architects, 25/09/2019
- Ground Floor Demolition Plan Block B, SD2200, Issue A, Quinn O'Hanlon Architects, 25/09/2019
- Site Sections, SD1550, Issue D, Quinn O'Hanlon Architects, 25/09/2019
- Second Floor Plan Block B, SD2222, Issue E, Quinn O'Hanlon Architects, 25/09/2019

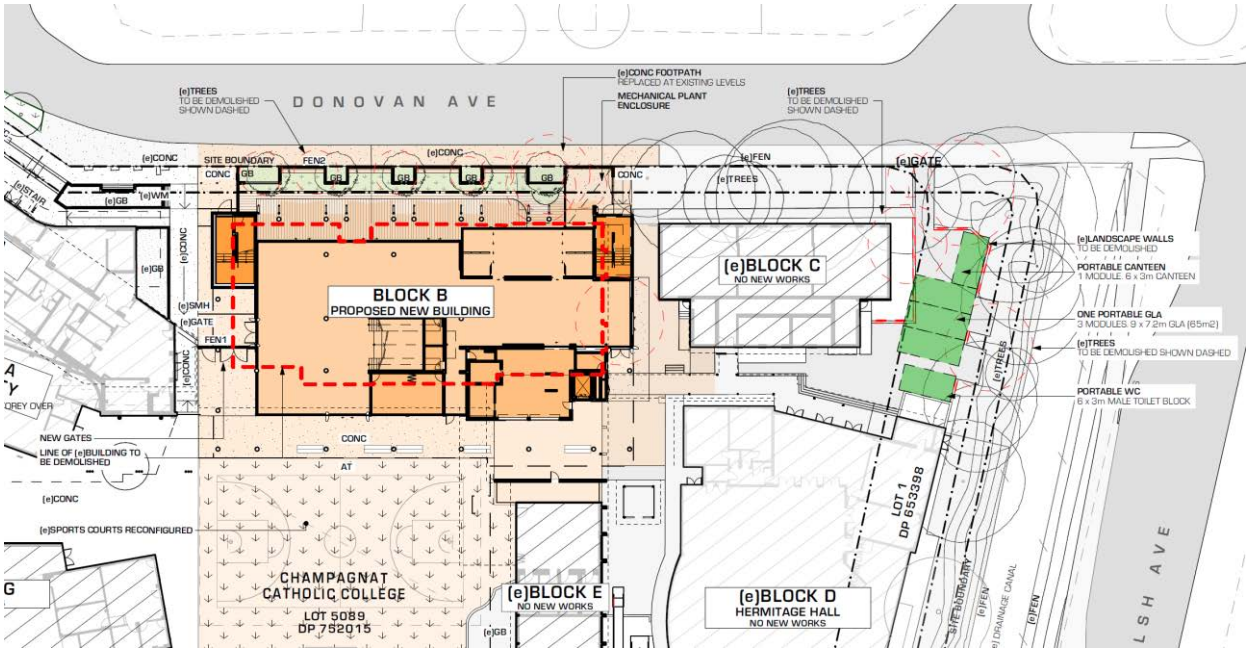


Figure 3. Proposed Site Plan, SD1100, Issue A, (Quinn O'Hanlon Architects, 25 September 2019).

5.4.2 The proposed development has been reviewed and in summary consists of demolition of the existing two-storey Block B building and construction of a new two-storey building in the existing footprint.

5.4.3 No proposed underground service locations or landscape plans have been reviewed in the preparation of this report.

5.5 Site Trees

5.5.1 Twenty-eight (28) trees were inspected and are the subject of this report. Complete attributes for each tree can be found in Appendix C – Tree Assessment Data.

5.5.2 The project scope has been used in conjunction with the Randwick City Council DCP, 2013 Part B5 to identify subject trees within the site that require inclusion into the report.

5.5.3 The subject trees form part of the existing ArborSite Tree Management System for the entire Champagnat Catholic College site and as such have been tagged, positioned on aerial imagery and visually assessed annually since 2016.

5.5.4 The subject trees have been numbered in line with the existing ArborSite tree numbering system. Trees can be identified on site using white tree tags which are typically located at approximately 2.0m from ground level on the trunk. Trees located on neighbouring properties are not tagged.

5.5.5 As the subject trees form part of a previous survey undertaken for the entire site, trees are numbered between Tree 1 and Tree 75 and are shown in Figure 4.

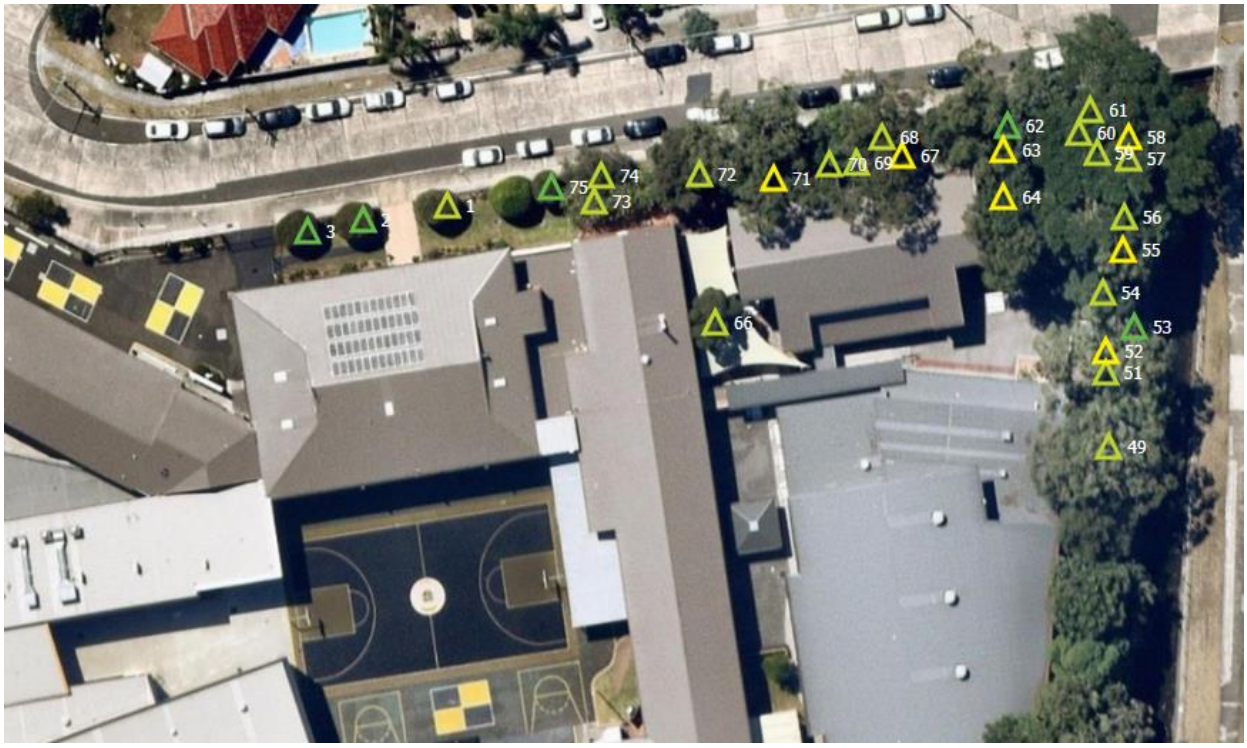


Figure 4. Site map showing subject trees. Note that icon colour indicates trees current risk rating (not Retention Value). Tree attributes are to be obtained from Appendix C – Tree Assessment Data. (ArborSite, 2019).

6 Tree Retention Values

6.1 Determining Tree Retention Values

6.1.1 Tree Retention Value has been determined based on a combination of tree attributes. Tree retention value is based on a modified version of the British Standard BS 5837–2012: *Trees in Relation to Design, Demolition and Construction*. Attributes considered when determining the retention value include tree health, structure and form, life expectancy, suitability of the tree in the context of local landscape. Arboricultural, Cultural, Environmental and Heritage significance are all also considered within the subcategories identified.

6.1.2 Collectively tree attributes are reviewed and used to categorise tree value in a development context. Additional information explaining Tree Retention Value can be found in Appendix B – Explanation of Tree Assessment Terms.

6.2 Category A Trees (High Retention Value)

6.2.1 One (1) tree was determined to be Category A Trees, its approximate location is shown in Figure 5. Typically trees in this category are of high quality with an estimated remaining life expectancy of at least 25 years and of dimensions and prominence that it cannot be readily replaced in <20 years. The tree may make significant amenity contributions to the landscape and may make high environmental contributions. In some cases, trees within this category may not meet the above criteria, however possess significant heritage or ecological value. Trees of this retention value warrant design consideration and amendment to ensure their viable retention.

6.2.2 Category A tree was numbered 58.

Figure 5. Aerial image showing location of High Retention Value Trees. Note that icon colour indicates trees current risk rating (not Retention Value). Tree attributes are to be obtained from Appendix C – Tree Assessment Data. (ArborSite, 2019).

6.2.3 Trees 58 was a mature *Ficus macrophylla* (Moreton Bay Fig) located in the north-eastern corner of the site (Figure 6).

6.2.4 Tree 58 was of good health and structure, of large physical dimensions, was visible from surrounding properties and had a ULE of greater than fifty years (>50 years).

6.2.5 The TPZ for Tree 58 was 12.4m measured at a radial distance from the centre of the trunk.

Figure 6. View to south-west of Tree 58 (Moreton Bay Fig) in its growing environment. (Kane Hollstein, 26 July 2019).

6.3 Category B Trees (Moderate Retention Value)

6.3.1 Twelve (12) trees were considered to have a Moderate Retention Value, their approximate locations are shown in Figure 7. Typically trees in this category are of moderate quality with an estimated remaining life expectancy of 15–25 years and prominence of size dimensions that cannot be readily replaced within 10 years. They may make moderate amenity contributions to the landscape and make low/moderate environmental contributions. Trees with this retention value warrant minor design consideration in an attempt to allow for their retention.

6.3.2 Category B trees are numbered 49, 52, 54, 56, 60, 63, 66, 67, 68, 70, 71 and 72.

Figure 7. Aerial image showing location of Moderate Retention Value Trees. Note that icon colour indicates trees current risk rating (not Retention Value). Tree attributes are to be obtained from Appendix C – Tree Assessment Data. (ArborSite, 2019).

6.3.3 Tree 49 was a *Eucalyptus botryoides* (Southern Mahogany) and is shown in Figure 8. The tree was located along the eastern property boundary adjacent to the stormwater canal.

6.3.4 Tree 49 as of good health and fair structure and had a ULE of 15–25 years.

6.3.5 The TPZ for Tree 49 was 6.4m measured at a radial distance from the centre of the trunk.

6.3.6 Tree 71 was also a *Eucalyptus botryoides* (Southern Mahogany) and is shown in Figure 9. The tree was located along the northern property boundary.

6.3.7 Tree 71 was of good health and fair structure and had a ULE of 15–25 years.

6.3.8 The TPZ for Tree 71 was 6.1m measured at a radial distance from the centre of the trunk.

Figure 8. View to west of Tree 49 (Southern Mahogany) in its growing environment. (Kane Hollstein, 26 July 2019).

Figure 9. View to south of Tree 71 (Southern Mahogany) in its growing environment. (Kane Hollstein, 26 July 2019).

6.4 Category C Trees (Low Retention Value)

6.4.1 Thirteen (13) trees were identified as being Category C Trees, their approximate locations are shown in Figure 10. Trees in this category are of low quality with an estimated remaining life expectancy of 5–15 years, or young trees that are easily replaceable, may have poor health and/or structure, are easily replaceable, or are of undesirable species and do not warrant design consideration.

6.4.2 Category C trees are: Trees 1, 2, 3, 51, 53, 55, 57, 61, 62, 69, 73, 74 and 75.

Figure 10. Aerial image showing location of Low Retention Value Trees. Note that icon colour indicates trees current risk rating (not Retention Value). Tree attributes are to be obtained from Appendix C – Tree Assessment Data. (ArborSite, 2019).

6.4.3 Trees 1 and 2 were *Callistemon viminalis* (Weeping Bottlebrush) located in front of the entrance to the administration building of the college (Figure 11). The trees had been pruned to retain their shape as a hedge and are therefore of small size and not true to form.

6.4.4 The TPZ for Tree 1 was 2.8m measured at a radial distance from the centre trunk.

6.4.5 The TPZ for Tree 2 was 3.1m measured at a radial distance from the centre trunk.

Figure 11. View to south of Tree 1 (left) and 2 (right) in their growing environment. (Kane Hollstein, 26 July 2019).

6.5 Category U Trees (Unsuitable for Retention)

6.5.1 Two (2) trees were found to be in such a condition that they cannot realistically be retained as viable trees in the context of the current land use for longer than five years. These trees may be dead and/or of a species recognised as a weed that resulted in them being unretainable. These trees should be removed irrespective of any future development on the site.

6.5.2 Category U Trees were 59 and 64 and location of which are shown in Figure 12.

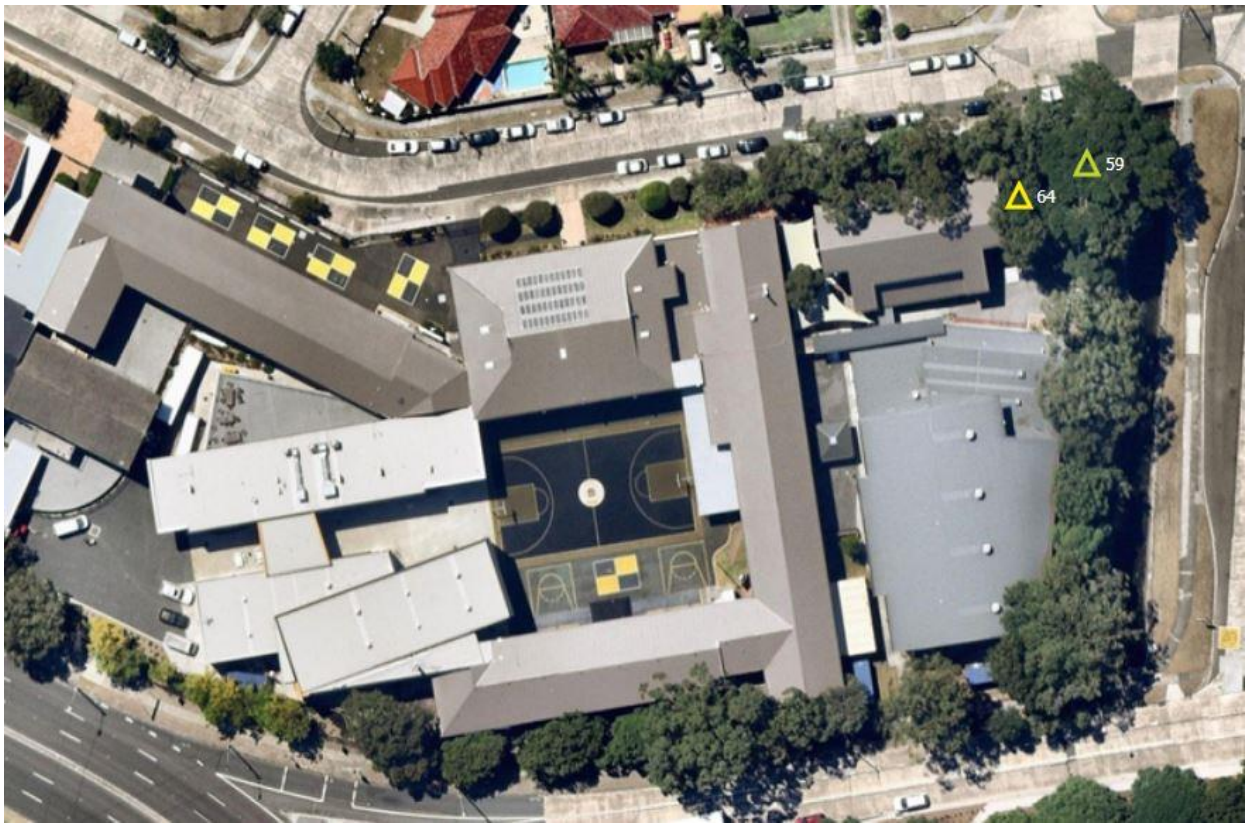


Figure 12. Aerial image showing location of Remove Retention Value Trees (Nil/No Retention Value). Note icon colour indicates trees current risk rating (not Retention Value). Tree attributes are to be obtained from the Appendix C – Preliminary Tree Assessment Data. (ArborSite, 19 December 2019).

6.5.3 Tree 59 was a semi-mature *Eucalyptus botryoides* (Southern Mahogany) which had been poorly and excessively pruned resulting in misshapen and uncharacterised form for the species. The majority of live foliage consisted of epicormic growth.

6.5.4 Tree 64 was a mature *Acacia elata* (Cedar Wattle) in advanced decline with an estimated 20% live foliage remaining. The tree was located within a courtyard to the east of the site (Figure 13).

Figure 13. View to north of Tree 64 (Cedar Wattle) in its growing environment. (Kane Hollstein, 26 July 2019).

7 Discussion

7.1 Major and Minor TPZ Encroachment

7.1.1 As per the Australian Standard AS 4970–2009: *Protection of Trees on Development Sites*, a major encroachment into the TPZ of any tree is considered to occur when it is beyond 10% of the total TPZ area. A minor encroachment is determined as being less than 10% of the total TPZ area.

7.1.2 The proposed development will significantly impact eleven (11) subject trees identified within this report. Trees will require removal if they are located within the development footprint or have major encroachment into their TPZ.

7.1.3 Trees with minor or no encroachment may be retained with specific, generic or no protection requirements throughout the construction stage.

7.1.4 For the purposes of this report trees to be removed or retained have been identified as those:

- Requiring removal due to major encroachment into their TPZ
- Retainable and requiring specific protection requirements throughout construction (i.e. generic requirements plus arborist supervision and careful construction methods within their TPZ)
- Retainable and requiring generic tree protection measures only (i.e. protective fencing and restriction of activities within the TPZ).

7.2 Impact of Proposed Development

7.2.1 Review of the proposed design has been undertaken in the context of tree retention and removal across the site. The proposal includes the demolition of the existing Block B building and construction of a new two-storey building in its place and associated enabling and landscaping works.

7.2.2 The development will also require the placement of temporary buildings and facilities which are proposed to be located within the north eastern aspect of the site.

7.2.3 The development will affect eleven (11) subject trees through encroachment via excavation into their TPZs.

7.3 TPZ Encroachment

7.3.1 Trees 1, 2, 3, 66, 73, 74 and 75 will have major encroachments into their respective TPZ due to the construction of the new Block B building. Decline in health and potential effects of tree stability have therefore deemed these trees unviable for future retention. These trees will require removal to facilitate construction of the proposed design. Aside from Tree 66 which is Category B, these trees are of Category C retention value.

7.3.2 Trees 54, 60, 62 and 63 will have major encroachments into their respective TPZ to allow placement and installation of the temporary buildings to the east of the site. Decline in health and potential effects of tree stability have therefore deemed these trees unviable for future retention. These trees will require removal to facilitate construction of the proposed design. Trees 54, 60 and 63 are of Category B retention value and Tree 62 is Category C retention value.

7.3.3 Trees 51, 52, 53, 55, 56, 57, 58 and 61 will have encroachments ranging from minor to major due to the installation of temporary buildings to the east of the site. Provided the structures are placed above existing concrete grade and no excavation is required for service connection, the impact to these trees is anticipated to be minimal.

7.3.4 Tree 72 will have a minor encroachment into the TPZ for construction of the new Block B building. Should excavation or machinery movement be required closer than a 5.7m radial distance measured from the centre of its trunk, the placement of mulch and rumble boards and trunk and branch protection will be required.

7.4 Proposed Pruning

7.4.1 Trees 72 and 71 will require pruning within the western portion of their crowns to facilitate works.

7.4.2 Trees 51, 52, 53, 55, 56, 57, 58 and 61 may require reduction and/or crown lifting pruning to allow the installation of temporary buildings/infrastructure. This should be discussed and specified in consultation with the project Arborist prior to any pruning taking place.

7.5 Additional Excavation/Trenching within TPZs

7.5.1 In the event additional excavation is required within the TPZ of any retained tree identified within this report, or any other site trees, arborist involvement will be required to ensure works are undertaken in accordance with the Australian Standard AS 4970–2009: *Protection of Trees on Development Sites.* Excavation/trenching within the TPZs of retained trees should be undertaken using sensitive construction methods such as manual excavation, hydro-vac or air spade.

8 Recommendations

8.1 Tree Removal

8.1.1 Eleven (11) trees would require removal to facilitate this proposed development. These are trees 1, 2, 3, 54, 60, 62, 63, 66, 73, 74 and 75.

8.1.2 Two (2) trees were recommended for removal irrespective of future development on the site. These are trees 59 and 64.

8.2 Tree Retention

8.2.1 Nine (9) trees, numbered 51, 52, 53, 55, 56, 57, 58, 61 and 72 were recommended for retention and require specific protection measures during construction to ensure it remains viable following the completion of works. The TPZ of these trees should be protected using rumble boards and/or track mats and trunk and branch protection as per Section 8.7.

8.2.2 Excavation within the TPZ is to be carried out only under arborist supervision. No excavation should occur within the SRZ of any retained tree. It is recommended that proposed excavations within any TPZ commence at the outer extent of the TPZ and move inwards to minimise root damage to the affected trees.

8.2.3 Works should be undertaken using techniques that are sensitive to tree roots to avoid unnecessary damage such as:

- Excavation using a high-pressure water jet and vacuum truck
- Excavation using an Air Spade with vacuum truck
- Excavation by hand.

8.2.4 Machine excavation should be prohibited within the TPZs of retained trees unless undertaken at the direct consent from the project arborist.

8.2.5 Roots discovered are to be treated with care and minor roots (<40mm in diameter) pruned with a sharp, clean handsaw or secateurs. All significant roots (>40mm in diameter) are to be recorded, photographed and reported to the project arborist.

8.2.6 Other proposed surfacing within the TPZ is to be installed above existing grade and be of a permeable nature to allow the passage of air and moisture. If the surfacing is to be load bearing, then it is suggested that a geogrid/web or similar is incorporated to ensure the rooting area below does not become compacted.

8.3 Tree Pruning

8.3.1 Trees 72 and 71 will require pruning within the western portion of their crowns to facilitate works.

8.3.2 Trees 51, 52, 53, 55, 56, 57, 58 and 61 may require reduction and/or crown lifting pruning to allow the installation of temporary facilities. This should be discussed and specified in consultation with the project arborist with approval sought from the relevant consent authority prior to any pruning taking place.

8.3.3 All pruning is to be undertaken in accordance with the Australian Standard AS 4373–2007: *Pruning of Amenity Trees* and undertaken by a suitably qualified arborist (minimum AQF 3 arborist).

8.3.4 Reduction pruning should focus on the pruning of smaller diameter terminal branches where feasible with the resulting pruning of no more than 10% of the total crown. The maximum diameter of final cuts should not exceed 50mm diameter unless specifically approved by the project arborist and relevant consent authority.

8.4 Protection and Reporting Measures During Construction

8.4.1 All trees to be retained require protection during the demolition and construction stage. Tree protection measures include a range of:

- Activities restricted within the TPZ
- Protective fencing
- Trunk and ground protection
- Tree protection signage
- Involvement from the project arborist
- Project milestones
- Compliance reporting

8.5 Activities Prohibited within the TPZ

1. Machine excavation including trenching
2. Storage
3. Preparation of chemicals, including cement products
4. Parking of vehicles and plant
5. Refuelling
6. Dumping of waste
7. Wash down and cleaning of equipment
8. Placement of fill
9. Lighting of fires
10. Soil level changes
11. Temporary or permanent installation of utilities and signs
12. Physical damage to the tree

8.6 Protective Fencing Specification

8.6.1 Protective fencing is to be installed as far as practicable from the trunk of any retained trees. Fencing should be erected as per the image below before any machinery or materials are brought to site and before commencement of works (including demolition).

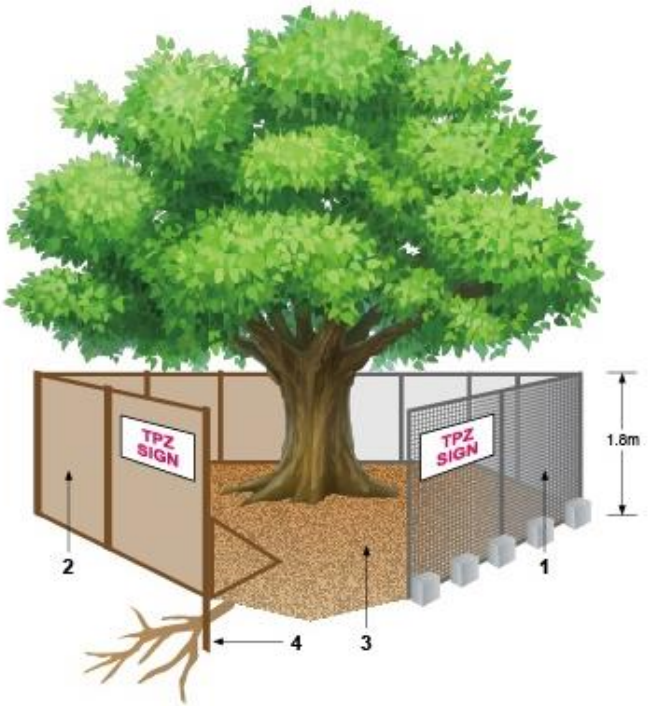
8.6.2 In some areas of the site (i.e. protection of trees on neighbouring properties) existing boundary fencing may be used as an alternative to protective fencing.

8.6.3 Once erected, protective fencing must not be removed or altered without approval from the project arborist. The TPZ fencing should be secured to restrict access.

8.6.4 TPZ fencing is to be a minimum of 1.8m high and mesh or wire between posts must be highly visible – an example is shown below. Fence posts and supports should have a diameter greater than 20mm and should ideally be freestanding, otherwise be located clear of the roots.

8.6.5 Tree protection fencing must remain intact throughout all proposed construction works and must only be dismantled after their conclusion. The temporary dismantling of tree protection fencing must only be done with the authorisation of a consulting arborist and/or the responsible authority.

8.6.6 The subject trees themselves must also not to be used as a billboard to support advertising material. Affixing nails or screws into the trunks of trees to display signs of any type is not a recommended practice in the successful retention of trees.



Legend:

1. Chain wire mesh panels with shade cloth attached (if required), held in place with concrete feet
2. Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ
3. Mulch installation across surface of TPZ (at discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage materials of any kind are permitted within the TPZ
4. Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

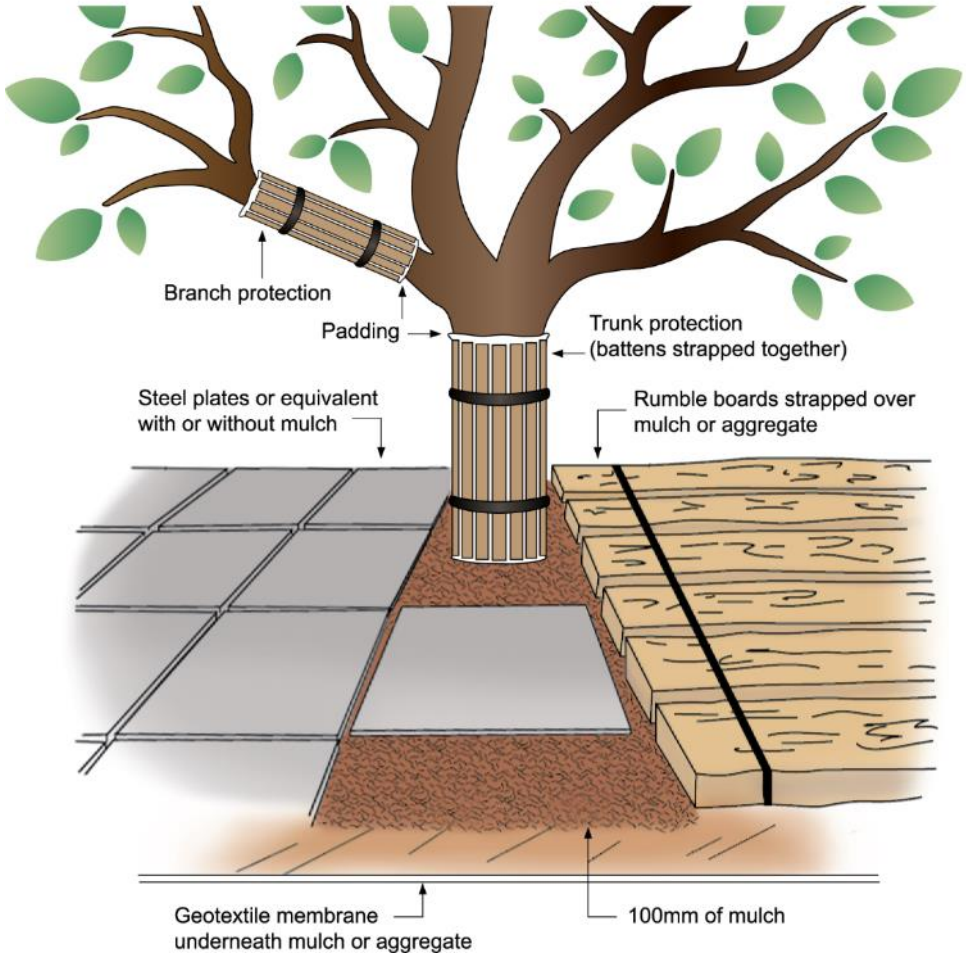
Figure 14. Depicts standard fencing techniques. (AS 4970–2009)

8.7 Trunk and Ground Protection

8.7.1 Given that proposed works are often within the TPZs of retained trees, standard protective fencing may not always be a viable method of protection. In these areas trunk protection and ground protection should be installed prior to the commencement of works and remain in place until after construction works have been completed.

8.7.2 Where construction access into the TPZ of retained trees cannot be avoided, the root zone of each tree must be protected using either steel plates or rumble board strapped over mulch/aggregate until such a time as permanent above ground surfacing (cellular confinement system or similar) is to be installed as shown in Figure 15.

8.7.3 Trunk and ground protection should be undertaken in line with the Australian Standard AS 4790–2009: *Protection of Trees on Development Sites* as per the image below:



Notes:

1. For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
2. Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

Figure 15. Depicts trunk and ground protection techniques. (AS 4970–2009).

8.8 Tree Protection Signs

8.8.1 Signs identifying the TPZ should be placed at 10m intervals around the edge of the TPZ and should be visible from within the development site. An example is shown below in Figure 16.

Figure 16. Depicts standard fencing techniques. (AS 4970–2009).

8.9 Project Arborist

8.9.1 An official "Project Arborist" must be commissioned to oversee the tree protection, any works within the TPZ's and complete regular monitoring compliance certification.

8.9.2 The project arborist must have minimum five (5) years industry experience in the field of arboriculture, horticulture with relevant demonstrated experience in tree management on construction sites, and Diploma level qualifications in arboriculture – AQF Level 5.

8.9.3 Inspections are to be conducted by the project arborist at several key points during the construction in order to ensure that protection measures are being adhered to during construction stages and decline in tree health or additional remediation measures can be identified.

8.10 Project Milestones

8.10.1 The following visits and milestones were recommended as to when on-site tree inspection by the project arborist is required:

Item	Purpose of Visit	Timing of Visit(s)	Prerequisites
1	Pre-start induction	Following sign off from Item 1. Contractor to provide a minimum of five days advance notice for this visit.	Prior to commencement of works. All parties involved in the project to attend.
2	Supervision of works in TPZ's including all regrading and excavations	Whenever there is work planned to be performed within the TPZ's. Contractor to provide a minimum of five days advance notice for such visits.	
3	Regular site inspections	Minimum frequency monthly for the duration of the project.	The checklist must be completed by the Project Arborist at each site inspection and signed by both parties.
4	Final sign off	Following completion of works.	Practical completion of works and prior to tree protection removal.

8.11 Compliance Reporting

8.11.1 Following each inspection, the project arborist shall prepare a report detailing the condition of the trees. These reports should certify whether or not the works have been completed in compliance with the consent relating to tree protection.

8.11.2 These reports should contain photographic evidence where required to demonstrate that the work has been carried out as specified.

8.11.3 Matters to be monitored and included in these reports should include tree condition, tree protection measures and impact of site works which may arise from changes to the approved plans.

8.11.4 The reports and Compliance Statements shall be submitted to the Project Manager (as well as the Clients' nominated representative) following each inspection.

8.11.5 The reports and any Non-Compliance Statements shall be submitted to the Project Manager (as well as the Clients' nominated representative) if tree protection conditions have been breached. Reports should contain clear remedial action specifications to minimise any adverse impact on any subject tree.

8.12 Offset Tree Planting

8.12.1 Offset planting should reflect the number of trees removed and the initial loss of amenity and biomass. New trees should be of long-term potential and sourced from a reputable supplier.

8.12.2 Replacement tree species must suit their location on the site in terms of their potential physical size and their tolerance(s) to the surrounding environmental conditions. To avoid unethical or unprofessional tree selection and/or their placement within the landscape, replacement tree species must be selected in consultation with a consulting arborist, who can also assist in implementing successful tree establishment techniques.

8.12.3 Replacement tree species must have the genetic potential to reach a mature size potential of those trees removed to facilitate the development. As a guide, potential height will be a minimum of 10m (or more) and produce a spreading canopy so as they may provide amenity value to the property and contribute to the tree canopy of the surrounding area in the future.

8.13 Trenching for Installation of Underground Services

8.13.1 Where excavation or trenching is required to facilitate installation of underground services within the TPZs of any site trees arborist supervision is required. Works should be undertaken using techniques that are sensitive to tree roots to avoid unnecessary damage. Such techniques include:

1. Excavation by hand
2. Excavation using a high-pressure water jet and vacuum truck
3. Excavation using an Air Spade with vacuum truck.

8.13.2 Machine excavation should be prohibited within the TPZs of retained trees unless undertaken at the direct consent from the project arborist and/or the responsible authority.

9 References

- Randwick City Council, 2007. *Register of Significant Trees,* Randwick: Randwick City Council.
- SEED - NSW Government, 2019. *SEED - Sharing and Enabling Environmental Data.* [Online] Available at: https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=en-AU
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- Standards Australia, 2007. *AS4373–2007: Pruning of Amenity Trees,* Sydney: Standards Australia.
- Standards Australia, 2009. *AS4970–2009: Protection of Trees on Development Sites,* Sydney: Standards Australia.
- State Government of NSW and Office of Environment and Heritage (OEH), 2015. *Soil Landscapes of the Sydney 1:100,000 Sheet.* [Online] Available at: https://www.environment.nsw.gov.au/eSpade2Webapp#
- The British Standards Institution, 2012. *BS5837–2012: Trees in Relation to Design, Demolition and Construction,* London: BSI Standards Limited.

10 Appendices

10.1 Appendix A – Arboricultural Reporting Assumptions and Limiting Conditions

1. Any legal description provided to the consultant is assumed to be correct. Any titles and ownership of any property are assumed to be good. No responsibility is assumed for matters legal in character.
2. It is assumed that any property/project is not in violation of any applicable codes, ordinances, statutes or other government regulations.
3. Care has been taken to obtain all information from reliable sources. All data has been verified in so far as possible, however, the consultant can neither guarantee nor be responsible for the accuracy of the information provided by others.
4. The consultant shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services.
5. Loss or alteration of any part of this report invalidates the entire report.
6. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by anyone but the person to whom it is addressed, without the prior written consent of the consultant.
7. Neither all nor any part of the contents of this report, nor any copy thereof, shall be used for any purpose by anyone but the person to whom it is addressed, without the written consent of the consultant. Nor shall it be conveyed by anyone, including the Client, to the public through advertising, public relations, news, sales or other media, without the written consent of the consultant.
8. This report and any values expressed herein represent the opinion of the consultant and the consultant's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.
9. Sketches, diagrams, graphs and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys unless expressed otherwise.
10. Information contained in this report covers only those items that were examined and reflect the condition of those items at the time of inspection.
11. Inspection is limited to visual examination of accessible components without dissection, excavation or probing. There is no warranty or guarantee expressed or implied that the problems or deficiencies of the plants or property in question may not arise in the future.

10.2 Appendix B – Explanation of Tree Assessment Terms

Tree name: Provides the botanic name, (Genus, species, sub-species, variety and cultivar where applicable) in accordance with the International Code of Botanical Nomenclature (ICBN), and an accepted common name.

Age: Refers to the life cycle of the tree

Category	Description
Young	Newly planted tree not fully established may be capable of being transplanted or easily replaced.
Juvenile	Tree is small in terms of its potential physical size and has not reached its full reproductive ability.
Semi-mature	Tree in active growth phase of life cycle and has not yet attained an expected maximum physical size for its species and/or its location.
Mature	Tree has reached an expected maximum physical size for the species and/or location and is showing a reduction in the rate of seasonal extension growth.
Senescent	Tree is approaching the end of its life cycle and is exhibiting a reduction in vigour often evidenced by natural deterioration in health and structure.

Health: Summarises the health and vigour of the tree

Category	Description
Excellent	Canopy full with dense foliage coverage throughout, leaves are entire and are of an excellent size and colour for the species with no visible pathogen damage. Excellent growth indicators, e.g. seasonal extension growth.
Good	Canopy full with minor variations in foliage density throughout, leaves are entire and are of good size and colour for the species with minimal or no visible pathogen damage. Good growth indicators.
Fair	Canopy with moderate variations in foliage density throughout, leaves not entire with reduced size and/or atypical in colour, moderate pathogen damage. Reduced growth indicators, visible amounts of deadwood/dieback, and epicormic growth.
Poor	Canopy density significantly reduced throughout, leaves are not entire, are significantly reduced in size and/or are discoloured, significant pathogen damage. Significant amounts of deadwood and/or epicormic growth, noticeable dieback of branch tips, possibly extensive.
Dead	No live plant material observed throughout the canopy, bark may be visibly delaminating from the trunk and/or branches.

Table 1. ArborSafe Structure Descriptors

Structure: Summarises the structure of the tree from roots to crown

Category	Description
Good	Good form and branching habit. Minor structural defects that are insignificant and typical or common within the species. e.g. included bark, co-dominant stems. No fungal pathogens present. No visible wounds to the trunk and/or root plate.
Fair	Moderate structural defects present that impact longevity e.g. apical leaders sharing common union(s). Minor damage to structural roots. Small wounds present where decay could begin. No fungal pathogens present. A fair representation of the species.
Poor	Significant structural defects present that have a significant impact on longevity and result in a poor representation of the species e.g. Branch/stems with included bark with failure likely within 0–5 years. Wounding evident with cavities and/or decay present. Damage to structural roots.
Hazardous	Serious structural defects with failure determined to be imminent (<12 months). Defects may include active splits and/or partial branch or root plate failures. Tree requires immediate arboricultural works to alleviate the associated risk.

Useful Life Expectancy (ULE): Useful Life Expectancy refers to an expected period of time the tree can be retained within the landscape before its amenity value declines to a point where it may detract from the appearance of the landscape and/or becomes potentially hazardous to people and/or property. ULE values consider tree species, current age, health, structure and location. ULE values are based on the tree at the time of assessment and do not consider future changes to the tree's location and environment which may influence the ULE value.

Category:
0–5 Years
5–10 Years
10–20 Years
20–30 Years
30–50 Years
>50 Years

Tree Retention Value: (based upon BS 5837–2012: *Trees in Relation to Design, Demolition and Construction* – recommendations)

Category and definition	Criteria (including sub-categories where appropriate)		
Category U			
Trees in such a condition that they cannot realistically be retained as viable trees in the context of the current land use for longer than 5 years.	• Trees that have a severe structural defect that are not remediable such that their failure is expected within 12 months. • Trees that will become unviable after removal of other Category U trees (e.g. where for whatever reason the loss of companion shelter cannot be mitigated by pruning). • Trees that are dead or are showing signs of significant, immediate and irreversible overall decline. • Trees infected with pathogens of significance to the health and or safety of other trees nearby • Low quality trees suppressing adjacent trees of better quality. • Noxious weeds or species categorised as weeds within the local area. **Note:** Category U trees can have existing or potential conservation value* which might make it desirable to preserve.		
	1. Arboricultural Qualities	**2. Landscape qualities**	**3. Cultural and environmental values**
Category A			
Trees of High Quality with an estimated remaining life expectancy of at least 25 years and of dimensions and prominence that it cannot be readily replaced in <20 years.	Trees that are particularly good examples of their species, especially if rare or unusual (in the wild or under cultivation); or those that are important components of groups or avenues.	Trees or groups of significant visual importance as arboricultural and/or landscape features. (e.g. feature and landmark trees).	Trees, groups or plant communities of significant conservation, historical, commemorative or other value (e.g. remnant trees, aboriginal scar trees, critically endangered plant communities, trees listed specifically within a Heritage statement of significance).
Category B			
Trees of Moderate Quality with an estimated remaining life expectancy of 15–25 years and of dimensions and prominence that cannot be readily replaced within 10 years.	Trees that might be included within Category A but are downgraded because of diminished condition such that they are unlikely to be suitable for retention beyond 25 years.	Trees that are visible from surrounding properties and/or the street but make little visual contribution to the wider locality.	Trees with conservation or other cultural value (trees within conservation areas or landscapes described within a statement of significance, locally indigenous species).
Category C			
Trees of Low Quality with an estimated remaining life expectancy of 5–15 years, or young trees that are easily replaceable.	Trees of very limited value or such impaired condition that they do not qualify in higher categories.	Trees offering low or only temporary/transient landscape benefits.	Trees with no material conservation or other cultural value.

**Where trees would otherwise be categorised as U, B or C but have significant identifiable conservation, heritage or landscape value even though only for the short term, they may be upgraded, although they might be suitable for retention only.*

Table 2. Tree Quality

		Health**			
		Excellent/ Good	Fair	Poor	Dead
Structure	Good	A	B	C	U
	Fair	B	B	C	U
	Poor	C	C	U	U
	Hazard*	U	U	U	U

**Structural hazard that cannot be remediated through mitigation works to enable safe retention.*

*** Trees of short term reduced health that can be remediated via basic, low cost plant health care works (e.g. mulching, irrigation etc.) may be designated in a higher health rating to ensure correct retention value nomination.*

10.3 Appendix C – Tree Assessment Data

Tree no.	*Botanical Name*	Common Name	Trees in group	DBH Total (cm)	DRB (cm)	Radial TPZ (m)	TPZ area (m2)	Radial SRZ (m)	Tree Height (m)	Canopy (m)	Health	Structure	Age	TLE (Yrs.)	Defects	Significance	Action (irrespective of development)	Arborist comments	Tree Quality Score	Tree Retention value subcategory	Environmental Conservation Status	Recommendation
1	*Callistemon viminalis*	Weeping Bottlebrush	1	23	36	2.8	24.88	2.2	<5	5-10	Good	Good	Semi-Mature	15-25	Co-dominant stems, Epicormic growth, Poor pruning, Wound(s)	Attractive landscape feature		- 24-07-2019 : kaneasafe : Tree assessed.	C	12	Non-threatened species of component of CEEC/EEC	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
2	*Callistemon viminalis*	Weeping Bottlebrush	1	26	33	3.1	29.81	2.1	<5	5-10	Good	Good	Semi-Mature	15-25	Co-dominant stems, Epicormic growth, Poor pruning, Wound(s)	Attractive landscape feature		- 24-07-2019 : kaneasafe : Tree assessed.	C	12	Non-threatened species of component of CEEC/EEC	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
3	*Callistemon viminalis*	Weeping Bottlebrush	1	27	31	3.3	33.48	2.0	5-10	5-10	Good	Good	Semi-Mature	15-25	Co-dominant stems, Epicormic growth, Poor pruning, Wound(s)	Attractive landscape feature		- 24-07-2019 : kaneasafe : Tree assessed.	C	12	Non-threatened species of component of CEEC/EEC	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
49	*Eucalyptus botryoides*	Southern Mahogany	1	53	60	6.4	127.08	2.7	15-20	10-15	Good	Fair	Mature	15-25	Co-dominant stems, Deadwood/stubs > 30mm, Dieback, Epicormic growth, Wound(s)	Amenity value/shade		- 26-07-2019 : kaneasafe : Tree assessed. - 15-05-2018 : lukeasafe : Tree assessed. Trunk wounds developing good response growth along margins.	B	2	Non-threatened species of component of CEEC/EEC	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
51	*Eucalyptus botryoides*	Southern Mahogany	1	33	31	4.0	49.63	2.0	5-10	5-10	Good	Fair	Mature	15-25	Co-dominant stems, Deadwood/stubs > 30mm, Dieback, Mechanical damage, Previous failure(s), Suppressed, Wound(s)	Amenity value/shade	Remove all deadwood/stubs	- 24-07-2019 : kaneasafe : Tree assessed. - 12-05-2016 : lukescse : 2016 May Tree assessed. Medium diameter (2-10cm dia.) deadwood over garden bed.	C	12	Non-threatened species of component of CEEC/EEC	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
52	*Eucalyptus botryoides*	Southern Mahogany	1	50	47	5.9	111.20	2.4	10-15	10-15	Good	Fair	Mature	15-25	Co-dominant stems, Deadwood/stubs < 30mm, Epicormic growth, Wound(s)	Amenity value/shade		- 24-07-2019 : kaneasafe : Tree assessed.	B	2	Non-threatened species of component of CEEC/EEC	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
53	*Acacia decurrens*	Green Wattle	1	12	18	2.0	12.57	1.6	5-10	<5	Good	Good	Juvenile	15-25	Wound(s)	Commemorative tree, Attractive landscape feature		- 24-07-2019 : kaneasafe : Tree assessed. - 12-05-2016 : lukescse : 2016 May Tree assessed. Commemorative tree planted 2015 as ANZAC memorial.	C	12	Non-threatened species of component of CEEC/EEC	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
54	*Lophostemon confertus*	Queensland Box	1	32	43	3.8	45.24	2.3	5-10	5-10	Good	Good	Semi-Mature	25-50	Co-dominant stems, Epicormic growth, Wound(s)	Amenity value/shade		- 24-07-2019 : kaneasafe : Tree assessed.	B	2	Non-threatened species of component of CEEC/EEC	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
55	*Acacia elata*	Cedar Wattle	1	65	67	7.8	191.13	2.8	10-15	5-10	Fair	Poor	Mature	5-10	Borers/termites, Co-dominant stems, Deadwood/stubs < 30mm, Epicormic growth, Included bark, Wound(s)	Amenity value/shade		- 24-07-2019 : kaneasafe : Tree assessed.	C	12	Non-threatened species of component of CEEC/EEC	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
56	*Lophostemon confertus*	Queensland Box	1	41	52	4.9	76.05	2.5	10-15	5-10	Good	Good	Semi-Mature	25-50	Co-dominant stems, Deadwood/stubs > 30mm, Suppressed, Wound(s)	Amenity value/shade	Remove deadwood/stubs > 30mm, Weed control	- 24-07-2019 : kaneasafe : Tree assessed. - 12-05-2016 : lukescse : 2016 May Tree assessed. Medium diameter (2-10cm dia.) deadwood over garden bed. Remove Phoenix Palm at base.	B	2	Non-threatened species of component of CEEC/EEC	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
57	*Lophostemon confertus*	Queensland Box	1	29	37	3.5	38.05	2.2	10-15	5-10	Good	Good	Semi-Mature	15-25	Co-dominant stems, Deadwood/stubs < 30mm, Suppressed, Wound(s)	Amenity value/shade		- 24-07-2019 : kaneasafe : Tree assessed.	C	12	Non-threatened species of component of CEEC/EEC	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
58	*Ficus macrophylla*	Moreton Bay Fig	1	103	151	12.4	479.94	3.9	15-20	15-20	Good	Good	Mature	>50	Deadwood/stubs > 30mm, Mechanical damage to root(s), Previous failure(s), Resin exudation/Kino, Wound(s)	Amenity value/shade, Attractive landscape feature, Significant due to age/size, Dominant landscape feature	Remove deadwood/stubs > 30mm	- 24-07-2019 : kaneasafe : Tree assessed.	A	1	Non-threatened species of component of CEEC/EEC	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
59	*Eucalyptus botryoides*	Southern Mahogany	1	27	39	3.2	32.98	2.2	10-15	<5	Fair	Poor	Semi-Mature	<5	Deadwood/stubs > 30mm, Dieback, Epicormic growth, Poor pruning, Previous failure(s), Suppressed, Wound(s), Uncharacteristic form	Amenity value/shade	Consider removing	- 24-07-2019 : kaneasafe : Tree assessed. - 12-05-2016 : lukescse : 2016 May Tree assessed.Tree excessively pruned in the past resulting in poor structure. Remaining foliage is all epicormic growth. Tree of limited future potential.	U		Non-threatened species of component of CEEC/EEC	Remove tree irrespective of future development.
60	*Eucalyptus botryoides*	Southern Mahogany	1	38	46	4.6	65.33	2.4	10-15	5-10	Fair	Fair	Semi-Mature	15-25	Deadwood/stubs < 30mm, Dieback, Suppressed, Wound(s)	Amenity value/shade		- 24-07-2019 : kaneasafe : Tree assessed.	B	2	Non-threatened species of component of CEEC/EEC	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
61	*Lophostemon confertus*	Queensland Box	1	31	44	3.8	44.52	2.3	5-10	5-10	Good	Fair	Semi-Mature	15-25	Co-dominant stems, Deadwood/stubs < 30mm, Dieback, Epicormic growth, Hanger(s), Poor pruning, Suppressed, Wound(s)	Attractive landscape feature	Remove deadwood/stubs > 30mm, Remove hanging limb(s), Remove selective branches	- 24-07-2019 : kaneasafe : Tree assessed. Hanger in central crown at ~5m. - 12-05-2016 : lukescse : 2016 May Tree assessed. Reduction prune and selectively thin lower crown to improve branch structure.	C	2	Non-threatened species of component of CEEC/EEC	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
62	*Lophostemon confertus*	Queensland Box	1	22	32	2.6	21.90	2.1	5-10	5-10	Fair	Fair	Semi-Mature	15-25	Dieback, Previous failure(s), Suppressed, Wound(s)	Attractive landscape feature		- 24-07-2019 : kaneasafe : Tree assessed.	C	2	Non-threatened species of component of CEEC/EEC	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
63	*Eucalyptus botryoides*	Southern Mahogany	1	49	61	5.9	108.62	2.7	15-20	10-15	Fair	Fair	Mature	15-25	Deadwood/stubs > 30mm, Dieback, Epicormic growth, Wound(s)	Amenity value/shade	Remove all deadwood/stubs	- 24-07-2019 : kaneasafe : Tree assessed.	B	12	Non-threatened species of component of CEEC/EEC	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
64	*Acacia elata*	Cedar Wattle	1	45	60	5.4	91.61	2.7	15-20	5-10	Poor	Fair	Mature	<5	Deadwood/stubs > 100mm, Dieback, Excessive thinning, Wound(s)	Amenity value/shade	Removal	- 24-07-2019 : kaneasafe : Tree assessed. Tree reaching end of life with a third of the crown having recently died off. Remove and replace.	U		Non-threatened species of component of CEEC/EEC	Remove tree irrespective of future development.
66	*Melaleuca quinquenervia*	Broad-leaved Paperbark	1	34	45	4.1	52.30	2.4	10-15	5-10	Good	Good	Semi-Mature	25-50	Co-dominant stems, Damaging infrastructure, Deadwood/stubs < 30mm, Mechanical damage to root(s), Wound(s)	Amenity value/shade	Attend pavement displacement, Mulching	- 24-07-2019 : kaneasafe : Tree assessed. - 15-05-2018 : lukeasafe : Tree assessed. Consider replacing area of damaged pavers with mulched garden bed to improve growing conditions.	B	2	Non-threatened species of component of CEEC/EEC	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
67	*Eucalyptus botryoides*	Southern Mahogany	1	51	64	6.1	117.67	2.7	15-20	10-15	Good	Fair	Mature	15-25	Co-dominant stems, Deadwood/stubs < 30mm, Dieback, Wound(s)	Amenity value/shade		- 26-07-2019 : kaneasafe : Tree assessed.	B	12	Non-threatened species of component of CEEC/EEC	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
68	*Lophostemon confertus*	Queensland Box	1	34	44	4.1	52.30	2.3	10-15	5-10	Good	Fair	Semi-Mature	25-50	Co-dominant stems, Crossing/rubbing branches, Deadwood/stubs > 30mm, Suppressed, Wound(s)	Amenity value/shade	Remove deadwood/stubs > 30mm, Remove selective branches	- 26-07-2019 : kaneasafe : Tree assessed. - 15-05-2018 : lukeasafe : Tree assessed. Remove deadwood and crossing branches at 4m.	B	2	Non-threatened species of component of CEEC/EEC	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
69	*Eucalyptus botryoides*	Southern Mahogany	1	22	25	2.6	21.90	1.8	10-15	5-10	Fair	Fair	Semi-Mature	15-25	Co-dominant stems, Epicormic growth, Poor pruning, Wound(s)	Amenity value/shade		- 26-07-2019 : kaneasafe : Tree assessed. - 12-05-2016 : lukescse : 2016 May Tree assessed. Tree has been 'lion's tailed' resulting in foliage at branch tips only increasing probability of failure.	C	12	Non-threatened species of component of CEEC/EEC	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
70	*Banksia integrifolia*	Coast Banksia	1	45	92	5.4	92.65	3.2	5-10	5-10	Good	Fair	Mature	15-25	Co-dominant stems, Crossing/rubbing branches, Deadwood/stubs < 30mm, Decay, Dieback, Previous failure(s), Suppressed, Wound(s)	Amenity value/shade		- 26-07-2019 : kaneasafe : Tree assessed.	B	12	Non-threatened species of component of CEEC/EEC	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).

Tree no.	*Botanical Name*	Common Name	Trees in group	DBH Total (cm)	DRB (cm)	Radial TPZ (m)	TPZ area (m2)	Radial SRZ (m)	Tree Height (m)	Canopy (m)	Health	Structure	Age	TLE (Yrs.)	Defects	Significance	Action (irrespective of development)	Arborist comments	Tree Quality Score	Tree Retention value subcategory	Environmental Conservation Status	Recommendation
71	*Eucalyptus botryoides*	Southern Mahogany	1	51	63	**6.1**	117.67	**2.7**	15-20	10-15	Good	Fair	Mature	15-25	Co-dominant stems, Epicormic growth, Poor pruning, Previous failure(s), Wound(s)	Amenity value/shade	Monitor	- 26-07-2019 : kaneasafe : Tree assessed. - 15-05-2018 : lukeasafe : Tree assessed. No significant further branch failures observed post branch failure in 2017. Subsequent pruning has reduced branch weight over road. Monitor growth response and consider further reduction pruning at time of future inspections if deemed appropriate. - 18-01-2017 : marcscse : 2017 Jan. Tree failure has occurred since the initial assessment. ArborSafe re-inspection of the subject tree undertaken 17.1.2017 by consulting Arborist Marc Fisher. Northern most central stem failure occurred below location of defect (wound). Minor damage to fence as a result of the failure. Initial risk assigned remains appropriate and therefore unchanged. Retention of the subject tree is considered viable. The tree will require review at the time of the next site assessment and post any major storm or strong wind events. Any further failures are to be recorded and reported to the site manager.	B	12	Non-threatened species of component of CEEC/EEC	Retain tree with generic protection requirements (i.e. protective fencing and restriction of activities within the TPZ).
72	*Melaleuca quinquenervia*	Broad-leaved Paperbark	1	69	72	**8.3**	214.66	**2.9**	5-10	10-15	Good	Fair	Mature	25-50	Co-dominant stems, Deadwood/stubs < 30mm, Included bark, Wound(s)	Amenity value/shade		- 26-07-2019 : kaneasafe : Tree assessed.	B	2	Non-threatened species of component of CEEC/EEC	Retain tree with specific protection requirements (i.e. Generic measures plus supervision of works within the TPZ and/or use of root sensitive construction techniques).
73	*Hibiscus sp.*	Hibiscus	2	25	65	**3.0**	28.36	**2.8**	5-10	5-10	Good	Fair	Mature	15-25	Co-dominant stems, Crossing/rubbing branches, Epicormic growth, Poor pruning, Wound(s)	Attractive landscape feature		- 26-07-2019 : kaneasafe : Tree assessed.	C	2	Non-threatened species of component of CEEC/EEC	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
74	*Agonis flexuosa*	Willow Myrtle/Peppermint	1	34	62	**4.1**	53.02	**2.7**	5-10	5-10	Good	Fair	Semi-Mature	10-15	Co-dominant stems, Crossing/rubbing branches, Epicormic growth, Suppressed, Wound(s)	Attractive landscape feature	Formative pruning, Remove epicormic growth, Shape from infrastructure	- 26-07-2019 : kaneasafe : Tree assessed. - 12-05-2016 : lukescse : 2016 May Tree assessed. Reduction prune and selectively thin crown to improve branch structure and provide clearance from fence. Remove epicormic growth on lower trunk.	C	2	Non-threatened species of component of CEEC/EEC	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.
75	*Callistemon viminalis*	Weeping Bottlebrush	1	24	27	**2.9**	26.96	**1.9**	5-10	5-10	Good	Good	Semi-Mature	15-25	Co-dominant stems, Epicormic growth, Poor pruning, Previous failure(s), Wound(s)	Attractive landscape feature		- 26-07-2019 : kaneasafe : Tree assessed.	C	12	Non-threatened species of component of CEEC/EEC	Remove - tree located within proposed development footprint or has major encroachment into its TPZ.