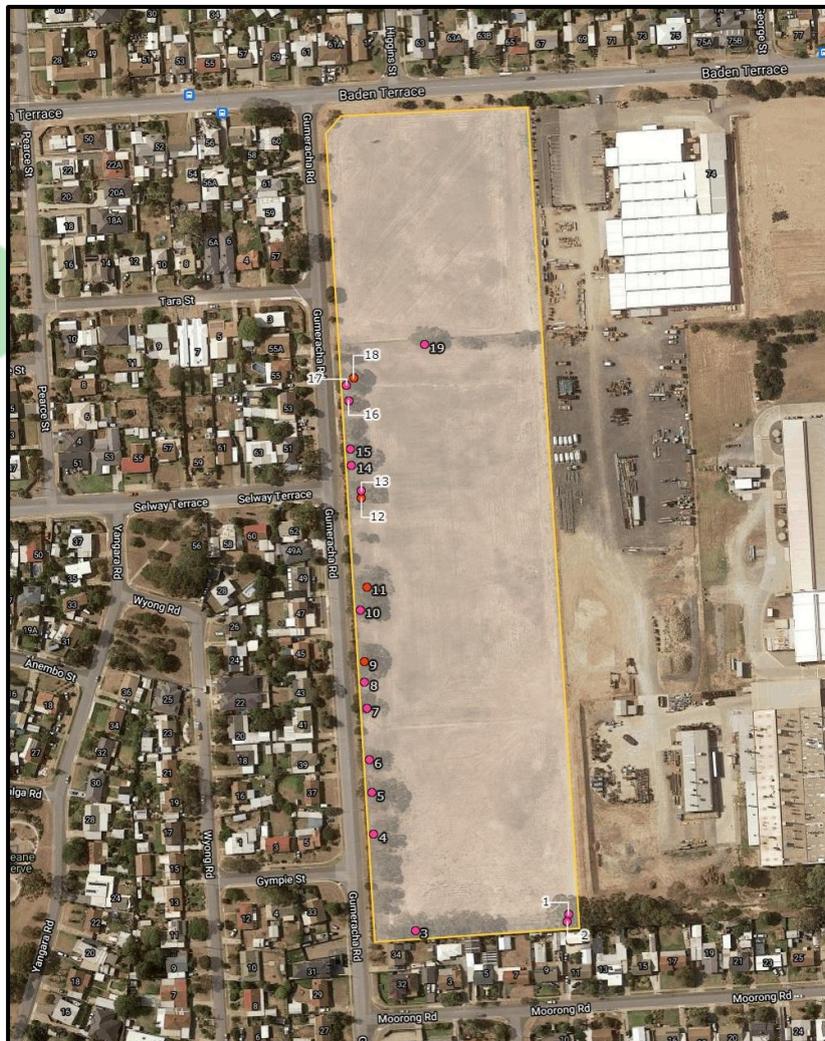


Document: # - RJ000233-GumRdVsp
Prepared for OBS Pty Ltd
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Pre-Development Tree Assessment Report

Cnr Gumeracha Road & Baden Terrace, O'Sullivan Beach



Prepared for
OBS Pty Ltd
John Kefalianos

Compiled by
Gary Moran
Adelaide Arb Consultants

Executive Summary

Data collection and assessment of various trees was conducted within the survey area located adjacent to the corner of Gumeracha Road and Baden Terrace, O'Sullivan Beach. A total of 19 trees within the survey area achieved a trunk circumference/sum of trunk circumferences when measured at 1.0 metre above ground level greater than 2.0 metres deeming them to be controlled as regulated or significant trees under the *Planning, Development & Infrastructure Act 2016*.

Trees throughout the survey area are a mixture of locally indigenous and introduced Australian native species. All trees within the survey area are part of a landscape planting and therefore are not protected under the *Native Vegetation Act 1991*. No significant habitat value was identified within any of the trees.

A proportion of the population assessed display health compromises from the salt laden coastal winds. Of these, various trees are also multi-stemmed specimens possessing structural faults such as included bark unions and/or a history of branch and stem failure.

Of the 19 tree assets, seven trees within the data set may be retained if suitable within the development proposal plan. These trees do not provide significant aesthetic or environmental contribution to the local area and therefore should not restrict reasonable development.

The remaining 12 tree assets display health decline, structural deficiencies or poor form and therefore are not suitable for retention within the proposed development. These trees are recommended to be removed during development activities. The removal of regulated or significant trees will require approval from the City of Onkaparinga.

Trees which are to be retained within the development are recommended to be protected using guidelines outlined within the Tree Protection Plan within this report which conform to Australian Standard AS4970-2009 *Protection of trees on development sites*.

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Brief

Adelaide Arb Consultants were commissioned by John Kefalianos, of OSB Pty Ltd to conduct a pre-development survey and tree assessment of trees within the identified survey area which are controlled as Regulated or Significant Trees under the *Planning, Development & Infrastructure Act 2016*. The survey area is located within the suburb of O'Sullivan Beach and is bound by Baden Terrace to the north, Gumeracha Road to the west, residential properties of Moorong Road to the south and industrial properties to the east. The assessment focused on tree sustainability, legislative control, and contribution to the current local environment and following the completion of development of the area.

The aim of such an assessment is to enable appropriate tree retention during development activities without the requirement of substantial tree clearance in addition to providing suitable scope for land usage to be achievable.

The assessment criteria included the following attributes for each tree:

- The health, structure, sustainability, and aesthetic and environmental contribution within current environmental conditions.
- The legislative control under the current provisions of South Australian legislation.
- Tree protection zones required during development should such activities occur.
- Tree retention ratings based upon individual tree attributes to enable appropriate designs to be generated within a sustainable landscape.
- Other factors relevant to tree management in the situation.

Assessments have been conducted with reference to the requirements of the *Planning, Development & Infrastructure Act 2016* as well as Australian Standard AS 4970-2009 *Protection of trees on development sites*.

Data Collection Criteria

The data collection process occurred during July 2021 using the TreePlotter™ Data Logger Platform. This device enabled the collection of visual tree assessment data, as well as GIS location data.

The data collected indicates that there are **19 tree assets** within the allotment. These trees vary substantially in condition and sustainability within their environment. A proportion of the tree population displays health compromises from what appears to be environmental stresses from the salt laden winds. Of these, various trees are also multi-stemmed specimens which possess structural faults such as included bark unions or a history of branch and stem failure.

The assessment and collection of Data included the following attributes:

All Trees – Conducted by Gary Moran (Adelaide Arb Consultants)

The collection of data throughout the survey area included all specimens which achieved a trunk circumference/sum of the combined trunk circumference greater than 2.0 metres when measured at 1.0 metre above ground level. These trees were assessed against the following criteria.

- **Tree Number**
- **Location (plotted onto the various plans)**
- **Botanical Name, Common Name and Origin**
- **Crown size (height x spread)**
- **Trunk diameter (DBH) and circumference (at 1m)**
- **Tree Health**

A visual assessment of tree health is determined by considering the foliage density and colour, the presence of any pests or disease and the proportion of deadwood within areas of the crown. The situation of deadwood within the crown is also considered, i.e., terminal deadwood is likely a better indication of health decline opposed to internal deadwood where natural crown shading leading to poor photosynthetic success may be the cause of such decline and is therefore not a health concern.

- **Structure**

A visual assessment of the primary and secondary structure will enable the calculation of the trees ULE, potential for failure and risk score. Consideration to specific structural flaws will be given such as but not limited to poor/unstable root buttressing, trunk defects, and included bark unions.

- **Tree Condition**

- **Useful Life Expectancy**
- **Tree Protection Zone (TPZ radius (m))**

The principal means of providing protection for trees during development and includes both root development areas as well as crown projection. This area should be isolated from construction works of any kind; however alterations may be made by the project arborist in certain circumstances. This is expressed as a radius from the centre of the trunk in metres.

- **Tree Age**

Tree age will range between young and senescent with the following criteria considered.

***Young** – newly planted, unestablished trees.*

***Immature** – established trees within the first 20% of the trees ULE.*

***Mature** – established trees that have developed their full crown potential. These trees may range between 20-70% of their ULE.*

***Over-Mature** – established trees that have developed their full crown potential and have started health and structural decline. These trees may range between 70 and 95% of their ULE.*

***Senescent** – Trees nearing the end of their ULE and generally past 95% of this parameter.*

- **Landscape Contribution**
- **Individual Significance**
- **Retention Value**
- **Legislative Control**

- *Planning, Development and Infrastructure Act 2016*

Additional comments relevant to the individual assessment

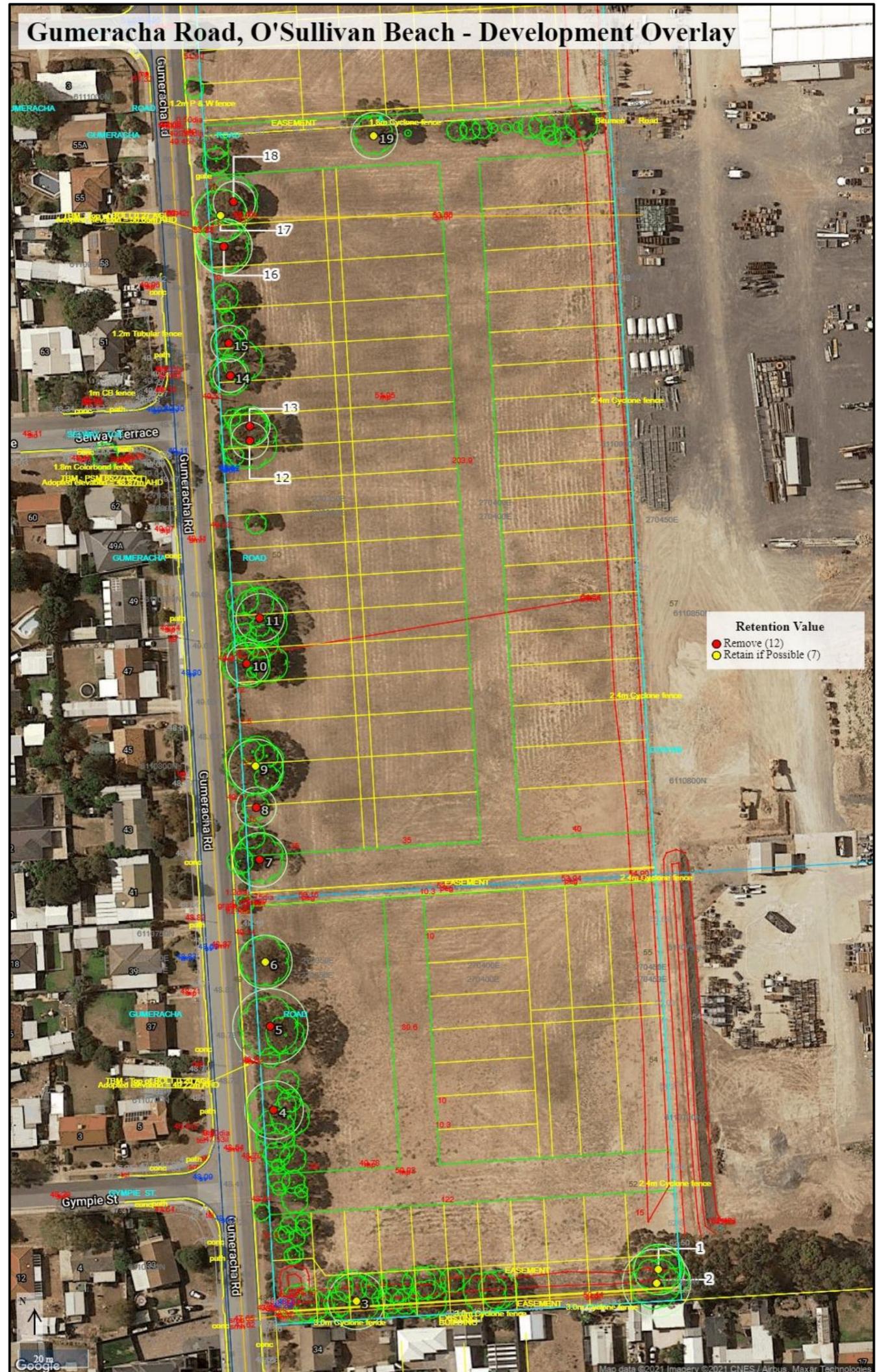
Tree Survey Area

The following plan illustrates the locations where tree assessments were conducted to determine tree sustainability, control status and protection requirements during development.



Development Proposal

The following plan shows the subject trees with the concept development plan overlaid. This is aimed at providing a visual aid to locations where potential tree and development conflicts exist.



Legislative Control and Site Plan

The following map imagery illustrates the locations of trees identified using GIS data collected during the assessment process. Aerial Imagery has been collected from TreePlotter using Google base imagery (circa 2019) and all GIS editing was conducted by Gary Moran during July 2021.

The legend at the centre of the right-hand border of the image to the right shows which trees are controlled by the *Planning, Development & Infrastructure Act 2016* [PDI Act 2016] as regulated or significant trees-

All trees within the survey area are part of a landscape planting. The trees are therefore not controlled under *The Native Vegetation Act 1991*.



Tree Retention Plan

The following map imagery illustrates the locations of trees identified using GIS data collected during the assessment process. Aerial Imagery has been collected from TreePlotter using Google base imagery (circa 2019) and all GIS editing was conducted by Gary Moran during July 2021.

The **yellow markers** are indicative of the location of trees that provide moderate aesthetic and/or environmental value to the local area. These trees are noted to be sustainable within the environment during development activities however retention of these trees is not essential, subject to approval from the City of Onkaparinga.

The **red markers** indicate the locations of trees that are not suitable for retention during development due to health decline and/or structural deficiencies. Approval from the City of Onkaparinga must be obtained prior to tree removal works being conducted on controlled trees.



The tabled data on the following pages provides clear indication of tree retention value and Legislative Control under both the *Planning, Development & Infrastructure Act 2016*. No trees within this survey are controlled by the *Native Vegetation Act 1991*.

Of the 19 tree assets, seven trees display sustainable attributes indicating they may be retained if suitable within the development proposal plan. These trees do not provide significant aesthetic or environmental contribution to the local area and therefore should not restrict reasonable development.

The remaining 12 tree assets display health decline or structural deficiencies and are not suitable for retention during development. These trees are recommended to be removed during development activities.

The four plans located on the preceding pages are as follows:

- Tree Survey Area located on page 7 shows the assessment area.
- Development Proposal located on page 8 shows the tree locations with the development concept plan overlaid. This is aimed at providing a visual aid to locations where potential tree and development conflicts exist.
- Legislative Control and Site Plan located on page 9 shows the locations of the regulated trees and significant trees.
- Tree Retention Plan located on page 10 shows the locations of the trees which could be retained within the development if possible. This plan also shows the locations of trees which do not warrant retention and therefore are recommended for removal.

Appendix A - Individual Tree Data & Imagery provides detailed information relating to the trees taken at the time of the assessment.

Thank you for the opportunity to provide you with this advice, should you have any queries or concerns regarding the management recommendations or aspects of the assessment, please feel free to contact Adelaide Arb Consultants for further information.

Kind regards,



GARY MORAN
Consulting Arboriculturist
Certificate IV Arboriculture
REGISTERED ISA (TRAQ)

Tabled Tree Data

Tree Number	Botanic Name	Common Name	Age	Health	Structure	Tree Condition	ULE	Tree Height	Crown Spread	DBH [cm]	TPZ Radius [m]	Total Circ [cm]	Legislative Control Status	Observation Comments	Retention Value
1	<i>Eucalyptus cladocalyx</i>	Sugar Gum	Mature	Good	Fair	Fair	>20 years	8-13m	8-13m	63	7.56	202	PDI Act 2016 (regulated tree)	None noted.	Retain if Possible
2	<i>Eucalyptus cladocalyx</i>	Sugar Gum	Mature	Good	Fair	Good	>20 years	14-20m	14-20m	85	10.2	269	PDI Act 2016 (regulated tree)	This tree has a minor history of branch failure.	Retain if Possible
3	<i>Eucalyptus sideroxylon</i>	Red Ironbark	Mature	Fair	Fair	Fair	10-20 years	8-13m	8-13m	71	8.52	231	PDI Act 2016 (regulated tree)	None noted.	Retain if Possible
4	<i>Eucalyptus sp.</i>	Gum	Mature	Fair	Failed	Failed	0 years	8-13m	8-13m	73	8.76	233	PDI Act 2016 (regulated tree)	The dominant stem has failed.	Remove
5	<i>Eucalyptus sp.</i>	Gum	Mature	Fair	Poor	Good	0 years	8-13m	8-13m	94	11.28	295	PDI Act 2016 (regulated tree)	The main union has partially failed.	Remove
6	<i>Eucalyptus sideroxylon</i>	Red Ironbark	Mature	Fair	Fair	Fair	10-20 years	8-13m	8-13m	67	8.04	222	PDI Act 2016 (regulated tree)	None noted.	Retain if Possible
7	<i>Eucalyptus Torwood</i>	Torwood	Mature	Poor	Poor	Fair	0 years	8-13m	8-13m	68	8.15	239	PDI Act 2016 (regulated tree)	The main union has partially failed. Substantial dieback is present within the western stem.	Remove
8	<i>Eucalyptus leucoxydon</i>	South Australian Blue Gum	Semi Mature	Fair	Fair	Poor	5-10 years	8-13m	8-13m	50	6.02	218	PDI Act 2016 (regulated tree)	This tree is of poor sprawling form.	Remove

Tree Number	Botanic Name	Common Name	Age	Health	Structure	Tree Condition	ULE	Tree Height	Crown Spread	DBH [cm]	TPZ Radius [m]	Total Circ [cm]	Legislative Control Status	Observation Comments	Retention Value
9	<i>Eucalyptus gomphocephala</i>	Tuart	Mature	Good	Fair	Fair	10-20 years	8-13m	8-13m	68	8.16	307	PDI Act 2016 (significant tree)	None noted.	Retain if Possible
10	<i>Eucalyptus platypus</i>	Platypus Gum	Mature	Fair	Fair	Poor	5-10 years	4-7m	4-7m	53	6.33	295	PDI Act 2016 (regulated tree)	Three central stems have been removed resulting in poor form.	Remove
11	<i>Eucalyptus spathulata</i>	Swamp Mallet	Mature	Poor	Fair	Fair	5-10 years	8-13m	8-13m	60	7.22	437	PDI Act 2016 (significant tree)	Substantial dieback is evident within the crown.	Remove
12	<i>Eucalyptus spathulata</i>	Swamp Mallet	Mature	Fair	Good	Poor	5-10 years	8-13m	8-13m	47	5.58	303	PDI Act 2016 (significant tree)	A stem failure has previously occurred. A canker is present on the eastern stem.	Remove
13	<i>Eucalyptus spathulata</i>	Swamp Mallet	Mature	Poor	Poor	Fair	5-10 years	8-13m	8-13m	50	5.94	261	PDI Act 2016 (regulated tree)	Multiple unstable included bark unions are present. Substantial dieback is evident within the crown.	Remove
14	<i>Eucalyptus spathulata</i>	Swamp Mallet	Mature	Poor	Poor	Fair	5-10 years	8-13m	4-7m	42	5.03	244	PDI Act 2016 (regulated tree)	An unstable included bark union is present within the primary structure. Substantial dieback is evident within the crown.	Remove
15	<i>Eucalyptus spathulata</i>	Swamp Mallet	Mature	Poor	Poor	Poor	5-10 years	8-13m	4-7m	46	5.46	249	PDI Act 2016 (regulated tree)	This tree has a substantial history of branch failure.	Remove
16	<i>Eucalyptus leucoxydon</i>	South Australian Blue Gum	Mature	Dead	Poor	Fair	1-5 years	8-13m	8-13m	70	8.4	221	PDI Act 2016 (regulated tree)	Substantial health and structural decline are evident within the north-western stem.	Remove

Tree Number	Botanic Name	Common Name	Age	Health	Structure	Tree Condition	ULE	Tree Height	Crown Spread	DBH [cm]	TPZ Radius [m]	Total Circ [cm]	Legislative Control Status	Observation Comments	Retention Value
17	<i>Eucalyptus sideroxylon</i>	Red Ironbark	Mature	Good	Fair	Fair	10-20 years	8-13m	8-13m	66	7.92	208	PDI Act 2016 (regulated tree)	None noted.	Retain if Possible
18	<i>Eucalyptus spathulata</i>	Swamp Mallet	Mature	Fair	Poor	Fair	5-10 years	8-13m	8-13m	53	6.32	324	PDI Act 2016 (significant tree)	Multiple unstable included bark unions are present within the primary structure.	Remove
19	<i>Eucalyptus sp.</i>	Gum	Mature	Fair	Fair	Fair	10-20 years	14-20m	8-13m	58	7	266	PDI Act 2016 (regulated tree)	None noted.	Retain if Possible

Tree Protection Requirements

As identified throughout the assessment, seven trees are suitable for retention during development and therefore could be retained where the development proposal layout can reasonably accommodate them. A total of 12 trees have been recommended to be removed due to poor structure, poor health or poor form. Any tree removal is subject to approval from the City of Onkaparinga (with the exception of non-controlled trees).

Where trees are to be retained on site, they require a range of tree protection measures to ensure their long-term sustainability. A range of these tree protection measures are set out below. These tree protection measures are outlined within AS 4970 *Protection of trees on development sites*.

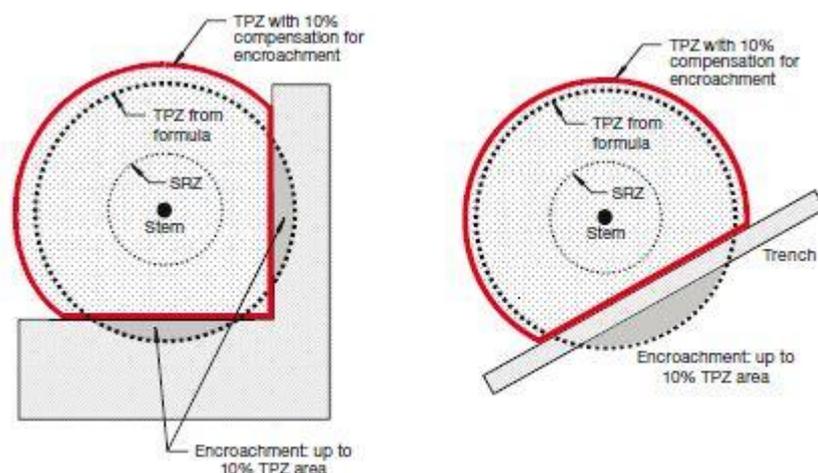
The following tree protection measures must be considered during all of the following stages of the proposed development:

- **Refinement of the land division layout.**
 - Land allotment layout – ensuring sufficient land is available for building construction, ancillary structures, driveways/crossovers, service trenches, earthworks, landscaping, and tree protection zones.
 - Major infrastructure configuration, including drainage.
 - Location of road reserves and associated infrastructure
 - Location of public reserves
 - Anticipated bulk earthworks, retaining walls and batter formation.
- **Subsequent site establishment**
 - Establishment of construction compounds, site huts, access routes, delivery and storage areas, parking areas, waste management areas etc.
 - Bulk earthworks and retaining walls.
 - Construction of roads and associated infrastructure
 - Drainage works.
- **Development of individual sites**
 - The protection of trees on or adjacent to land allotments is likely to be the responsibility of the final landowner, provided the land allotment layout has been well considered. The guidelines set out below should be made available to prospective landowners to ensure they are well informed in the land purchase process and any subsequent development of their land.

Land division refinement

The current land division layout should be refined with consideration to the Tree Protection Zone (TPZ) requirements for each tree. The following design parameters should be considered to preserve and protect suitable trees.

- Development activities should be kept as far as practicable outside of Tree Protection Zones. It is acknowledged however that this is not always achievable and that some encroachment within Tree Protection Zones will occur for a variety of reasons. Australian Standard AS 4970-2009 *Protection of trees on development sites* provides scope for such encroachments to occur without the need for extensive tree management and protection requirements to be implemented. Encroachment parameters are defined in the following categories.
 - **Minor encroachment** - If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. Variations must be made by the project arborist considering relevant factors listed in Clause 3.3.4. The figures below demonstrate some examples of possible encroachment into the TPZ up to 10% of the area.
 - **Major encroachment** - If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ (see Clause 3.3.5), the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors listed in Clause 3.3.4.



NOTE: Less than 10% TPZ area and outside SRZ. Any loss of TPZ compensated for elsewhere.

Above: Extract from Australian Standard AS 4970-2009 *Protection of trees on development sites* illustrating minor encroachments and offset root zones.

- Land allotments and road reserve alignments should be configured to ensure that the impact on suitable trees is within acceptable limits. The level of encroachment from the total of combined activities should not form major encroachment.
- Road reserves (and their associated infrastructure) should be aligned to minimise the impacts on trees. Some strategies may include:
 - Realign the roadway to ensure minor encroachment into their Tree Protection Zones.
 - Install underground services trenches on the opposite side of a roadway from a tree or tree grouping.
 - Direct drainage swales and settlement ponds away from tree protection zones. Trees generally do not tolerate prolonged flooding.
- Land allotments should be configured so that they can be reasonably developed without impacting trees or requiring complex or expensive tree sensitive building design solutions. Sufficient area within each allotment should be made available to accommodate a dwelling, ancillary buildings, bulk earthworks/retaining walls/batter formation, driveways and crossovers, underground services and any other activity that may impact on the tree. A Tree Protection Zone/s should not occupy more than ~30% of land within an allotment.
- Where a Tree Protection Zone occupies two or more properties (including a road reserve), then the combined development activities listed above should not form major encroachment.
- Where any tree (or tree grouping) presents a moderate constrain to the development of an allotment, consideration should be given to reasonable adjustments to accommodate the tree. This may include one or more of the following strategies:
 - Realign the allotment boundaries so the Tree Protection Zone is spread more evenly across sites.
 - Reconfigure an allotment to allow greater width or depth to accommodate a Tree Protection Zone on one side, and development activities on the other.
 - Minimise large tree protection zones (or groups of tree protection zones) occupying the entire front boundaries of an allotment, as this creates difficulties in installing driveways/crossovers and trenches for underground services.
- Where any tree (or tree grouping) presents a significant constrain to the development of an allotment, consideration should be given to creating a public reserve to accommodate the tree or tree grouping.
- Trees that are recommended to be removed may allow for sites to be developed with greater ease.

-
- Where trees or tree groupings cannot be reasonably accommodated, then tree removals may be necessary, subject to approval from the relevant determining authority.

Potential design conflicts

A review of the provided land division layout provides the following breakdown for the seven trees warranting consideration for retention:

- Trees 1 – 3 are located within the southern easement and appear to be sustainable.
- Trees 6, 9 and 17 appear to be sustainable as they are located in the ‘front’ portion of the proposed allotments. There appears to be reasonable scope for development of these allotments including driveways and services.
- Tree 19 is in direct conflict with the proposed roadway and therefore is not sustainable should the road location be maintained as shown within the provided plans.

Tree Protection Plan

The following Tree Protection Zone information provides a wide range of guidelines that are commonly required on development sites, including large scale land divisions, right down to individual residential developments.

This guidance is appropriate during the initial construction phase of the development as the major land division and infrastructure installation works occur. The guidance is also relevant to future landowners when considering their land purchase and future building works.

General

To protect suitable trees during the development process, a range of tree protection activities and structures are required. The tree protection zone is usually a restricted area delineated by fencing.

The following activities are restricted within the TPZ. Some of these works may be permitted by the determining authority and must be supervised by the project arboristⁱ.

- a) machine excavation including trenching;
- b) excavation for silt fencing;
- c) cultivation;
- d) storage;
- e) preparation of chemicals, including preparation of cement products;
- f) parking of vehicles and plant;
- g) refuelling;
- h) dumping of waste;
- i) wash down and cleaning of equipment;
- j) placement of fill;
- k) lighting of fires;
- l) soil level changes;
- m) temporary or permanent installation of utilities and signs, and
- n) physical damage to the tree.

Prior to any site works commencing, the site/project manager and relevant sub-contractors should meet on site with the project arborist to review work procedures, access routes, storage areas, parking areas and tree protection measures.

Tree removal, retention and management

Approved tree removal and pruning should be carried out before the installation of tree protection measures. The removal of regulated and significant trees cannot occur without development approval from the City of Onkaparinga. Failure to do so may constitute tree damaging activityⁱⁱ.

Where trees are to be retained on site, pruning works may be required to maintain acceptable levels of risk, or to provide suitable clearances over buildings, roadways, driveways etc. Specific pruning needs for each tree should be determined once final development activities around such trees is known and confirmed. Pruning works should follow these guidelines to enable their sustainable retention.

- All pruning must conform to the Australian Standard AS 4373–2007 *Pruning of amenity trees*.
- All pruning should be carried out or supervised by qualified arboristsⁱⁱⁱ.

In addition to pruning works, the following may also be beneficial to improve growing conditions for each tree.

- **Irrigation**

Drip irrigation systems are an effective way of applying water to the root zone of trees. Install in-line dripper hose that emits ~3L of water per drip emitter per hour. Connect the system to a reliable water source, preferably using a battery-operated programmable timer. A parallel row pattern or a spiral pattern are simple installation methods to use with lines installed at 0.5m – 1.0m spacing. Use pressure reducers and relief valves as required. Irrigation should be applied during hotter months by providing one good soaking per week. Less water can be applied during cooler and wetter months. Alternative irrigation systems may be used to suit the site in consultation with the project arborist.

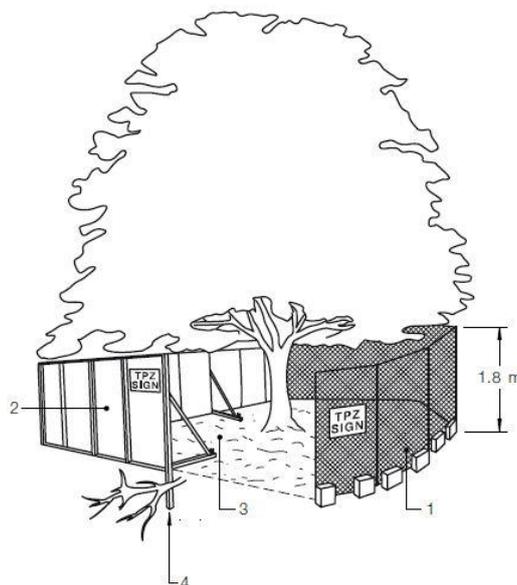
- **Mulching**

Apply mulch around trees. Mulches should be organic in origin, semi composted and contain a mixture of coarse and fine particle. Mulches should be 75-100mm thick and applied out to the Tree Protection Zone fencing (or further if possible), without coming into contact with the trunk.

Tree Protection Zone establishment

Fencing should be erected before any machinery or materials are brought onto the site and before the commencement of works including bulk earthworks. Once erected, protective fencing must not be removed or altered without approval by the project arborist. The TPZ should be secured to restrict access. The Tree Protection Zone should be established and managed as follows.

- Identify the tree/s within (and adjacent to) the subject allotment that are to be retained and protected during the development process. This may include trees on adjoining land and street trees.
- The Tree Protection Zone radius is to be equivalent to that calculated and noted in the Individual Tree Data and Imagery.
- Identify and mark the alignment of protective fencing. This may vary from the actual TPZ radius after considering areas of acceptable encroachment (determined in consultation with the project arborist) and site access requirements. Fencing is only required within the subject allotment (provided boundary fencing is in place).
- Erect/construct protective fencing as indicated in the image below. AS 4687 *Temporary fencing and hoardings* specifies applicable fencing requirements. Shade cloth or similar should be attached to reduce the transport of dust, other particulate matter, and liquids into the protected area.



LEGEND:

- 1 Chain wire mesh panels with shade cloth (if required) attached, 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 the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
- 4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

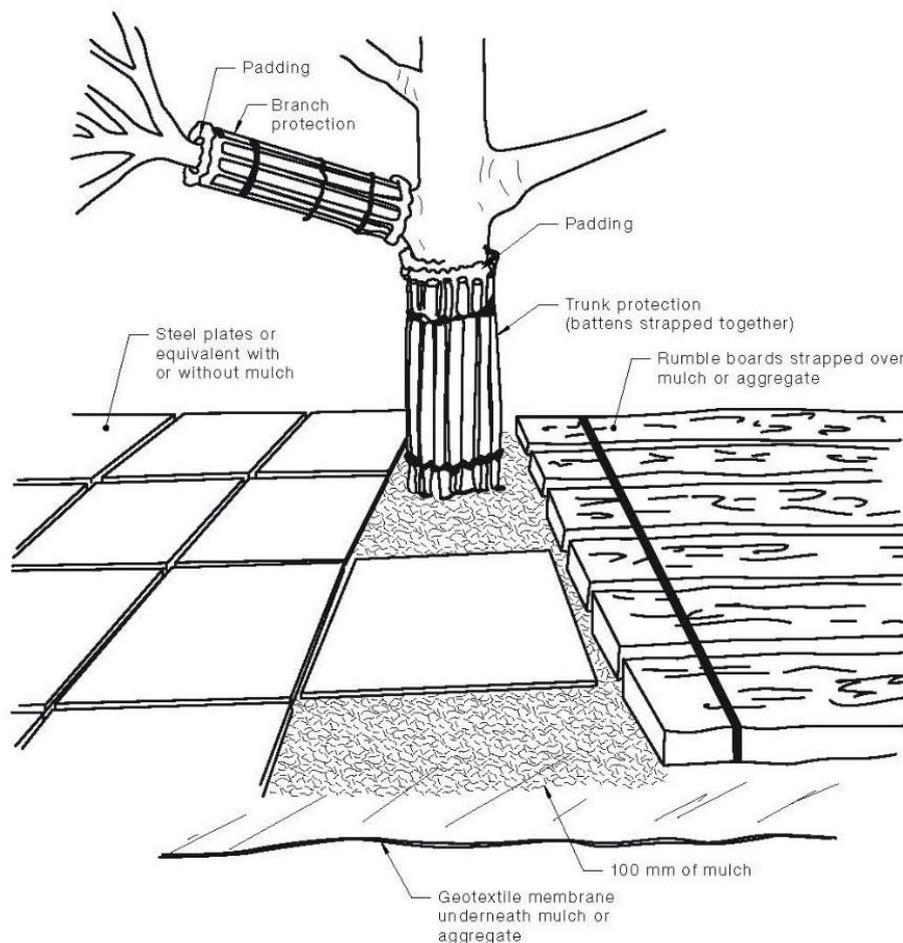
- Right: Australian Standard AS 4970-2009 *Protection of trees on development sites*, p16.

FIGURE 3 PROTECTIVE FENCING

- All visible faces of the Tree Protection Zones to the construction area must be signed with appropriate Tree Protection Zone signage as shown below.
- Where fencing has been reduced from the full TPZ radius to facilitate low impact construction works, ground protection suitable for construction personnel and scaffolding will be required as follows. This is required to minimise soil compaction and to capture any building material spills/waste that may contaminate soils.
 - Install ground protection as indicated on the Tree Protection Plan.
 - Install a layer of geotextile fabric on top of the natural ground.
 - Cover the geotextile with a 100mm thick layer of mulch or coarse gravel/ballast.
 - Install ground protection mats on top of the mulch to make walking/wheelbarrowing easier if required.
- Where fencing has been reduced from the full TPZ radius to facilitate vehicle/machinery access, heavy-duty ground protection will be required. This heavy-duty ground protection will be required for essential vehicle access, excavator access, crane access, pier drilling machinery access, hydro-excavation trucks etc.
 - Install vehicle access ground protection as indicated on the Tree Protection Plan.
 - Install a layer of geotextile fabric on top of the natural ground.
 - Cover the geotextile with a 100mm thick layer of organic mulch.
 - Install ground protection mats (e.g., BogMat <https://www.bogmat.com.au/>).
 - Excavations for piers are to be conducted through the mulch. Excavate by hand, or drill the holes using machinery that stands off the TPZ or an area with suitable ground protection.



- Where construction activities or vehicle access is in close proximity to any tree, install protection to the trunk and branches of trees as shown in the figure below. A minimum height of 2 m is recommended. Ground protection (as described above) will also be required in this situation.
 - Install breathable padding or hessian around the trunk of the tree.
 - Instal closely spaced timber battens around the trunk, with the top edge protecting the trunk/bark by the padding/hessian. Secure with strapping.



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 4 EXAMPLES OF TRUNK, BRANCH AND GROUND PROTECTION

Site establishment

The establishment of the site should occur in conjunction with the establishment of the Tree Protection Zone structures and features. This may include site access, storage areas, construction huts, waste management areas etc.

1. Refer to the previous section on Tree Protection Zone establishment which outlines some of the essential Tree Protection Zone requirements.
2. All ancillary zones required for construction purposes should be located outside the Tree Protection Zone. This includes, but is not limited to:
 - Site access routes for various vehicles and machinery.
 - Areas to receive and store construction materials.
 - Areas for skip bins and waste management.
 - Wash out areas.
 - Site huts and toilets.
 - Storage of chemicals.
 - Car parking areas.
3. Where site constraints prevent this, and any of these activities are necessary within a Tree Protection Zone, suitable ground protection measures are required set out in the previous section on Tree Protection Zone establishment.

Earthworks and trenching

Earthworks required to establish the land division and each individual site may include, excavation, cut and fill, levelling, footing preparation, batter formation, construction of retaining walls and trenching activities. These activities have the potential to damage to tree trunks, branches, and the root zone. To minimise the impacts of these activities on the trees to be retained on site, the following precautions are required.

1. Ensure Tree Protection Zone fencing and other tree protection measures are in place prior to earthworks commencing.
2. Excavation works can only proceed as approved by the relevant determining authority.
3. The project arborist should be on site during any earthworks works within a Tree Protection Zone.
4. All excavation machinery must be kept outside the Tree Protection Zone to avoid soil compaction, or suitable ground protection measures must be in place as outlined in the section on Tree Protection Zone establishment.
5. Excavation machinery must not come into contact with the trunk, branches or roots within the Tree Protection Zone. Consider using a spotter to supervise, and/or use a smaller machine.
6. No earthworks are permitted within the Structural Root Zone without approvals. Seek direction from the project arborist.
7. No stockpiling of soil, debris, or any other material within the Tree Protection Zone. These materials are to be removed from the site immediately or stockpiled outside the area for.
8. **Cut and fill.**
 - No lowering of grade (cut) within a Tree Protection Zone. The soil surface can be skimmed by removing loose organic matter, turf or old gravel surfaces carefully using hand tools or with a trimming bucket of an excavator standing outside the Tree Protection Zone (or on suitable ground protection). Skimming of the surface should cease when fine tree roots are encountered and should not exceed 50-80mm below the original level.
 - Deep excavations adjacent to or within a Tree Protection Zone may require a batter or terraced levels. These may encroach further into the TPZ and may require approval. If this is required, please consult with the project arborist before proceeding.
 - There shall be no addition of additional material (fill) within a Tree Protection Zone without approval.
 - In some cases, fill material within a Tree Protection Zone may be permitted. If approved, the fill must consist of graded material that allows air and moisture movement. Suitable materials include single graded, no-fines gravel, washed single grade aggregate or similar.

9. Batter formation and retaining walls.

- Batter formation may result in cut or fill within a tree protection zone. Such batter formation must not form major encroachment into a tree protection zone.
- Where there is a risk of major encroachment into a Tree Protection Zone from batter formation, the use of a retaining wall should be considered.
- Retaining walls can significantly reduce the level of encroachment into a Tree Protection Zone.
- Retaining walls that utilise isolated excavations are preferred to those that use continuous excavation. For example, the use of steel I-beams with concrete sleepers installed between them (at or above grade), is preferable to a masonry retaining wall that requires excavations for a continuous reinforced strip footing.

10. Footing preparation.

- Excavations for footings must not occur within a Tree Protection Zone unless approved by Council and the project arborist.
- Excavation machinery should stand outside the Tree Protection Zone to avoid soil compaction, or suitable ground protection measures must be in place as outlined in the section on Tree Protection Zone establishment.

11. Piers/screw piles

- When installing piers or within a TPZ, the following precautions are required.
- The smallest diameter hole should be used.
- Mini piling rigs should be used in these areas to avoid damage to tree branches.
- Suitable vehicle ground protection is required where piling vehicles enter a TPZ.
- The project arborist should be on site to supervise these activities within any TPZ.

12. Root pruning

- Woody roots are not to be pulled out by excavation machinery.
- Roots smaller than 50mm \emptyset may be pruned back (preferably to a side branching root) using sharp pruning tools (such as secateurs or tree pruning handsaws).
- Roots larger than 50mm \emptyset should only be pruned after consultation with the project arborist.

Construction activities

Construction activities may include (but are not limited to); installation of building footings, concrete slabs, frame construction, installing brickwork or other wall cladding materials, crane lifting operations, scaffolding, roofing, interior fitting, waste disposal etc. If these activities are not appropriately managed within a tree protection zone, there may be adverse impacts for the trees and their growing environment. Construction activities must be well supervised and adhere to the following guidelines.

1. Ensure Tree Protection Zone fencing and other tree protection measures are in place prior to construction works commencing.
2. Tree Protection Fencing shall not be removed or repositioned to facilitate construction activities. Consult with the project arborist if access to a Tree Protection Zone is required.
3. Ensure the ancillary construction zones are established prior to construction works commencing. This may include site access, storage areas, parking areas, construction huts, waste management areas etc. Refer to the previous section on Site Establishment.
4. Scaffolding for construction activities and crane operations should not interfere with trees to be retained on site.
 - Minor pruning may be permitted to facilitate the installation of scaffolding.
 - Any required pruning works should be confirmed with the project arborist and performed by qualified arborists, not building staff.

Installation of underground services

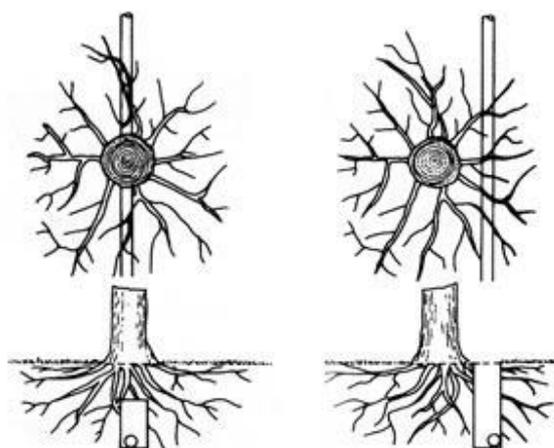
A range of underground services may be required to service a new development. These may include but are not limited to:

- Gas supply
- Electricity supply
- Water supply
- Sewer drainage
- Septic tank connections
- Stormwater drainage
- Irrigation pipes
- Telephone and communication cables
- Fire mains

Open trenching to install these services within a Tree Protection Zone has the potential to sever roots which can adversely affect tree health and stability. Unless otherwise approved, underground services should be installed according to the following guidelines.

1. All services should be routed outside the Tree Protection Zone where possible. If underground services must pass through a Tree Protection Zone, consult with the project arborist. These services should be installed by directional drilling or in manually excavated trenches.
2. Directional drilling.
 - The directional drilling bore should be at least 600 mm deep. The project arborist should assess the likely impacts of boring and bore pits on retained trees.
 - Entry, exit points, connection points and inspection points should be located outside the Tree Protection Zone where possible.
3. Manual excavation
 - For manual excavation of trenches the project arborist should advise on roots to be retained and should monitor the works. Manual excavation may include the use of pneumatic and hydraulic tools.
 - Excavate the soil using hand tools and hydro excavation down to the required depth for the entire length of the service required within the TPZ.
 - Use the lowest pressure possible to carry out the excavations whilst avoiding damage to the outer bark on tree roots.
 - When tree roots are encountered, the operator should avoid damaging the protective layer by directing high pressure water away from tree roots.

- Smaller tree roots (<20mm in diameter) may be damaged by the process, as this is generally unavoidable.
 - Tree roots greater than 30mm in diameter shall left intact and undamaged.
4. Root pruning:
- Retain as many roots as possible extending across the trench.
 - Any root pruning should be carried out in consultation with the project arborist.
 - Roots smaller than 50mmØ may be pruned back (preferably to a side branching root) using sharp pruning tools (such as secateurs or tree pruning handsaws).
 - Roots larger than 50mmØ should only be pruned after consultation with the project arborist.
5. Insert the underground service into the trench by weaving between exposed tree roots.
6. Backfill the trench as soon as possible after the service is installed to avoid root desiccation. If a trench is to remain exposed for more than 2 hours, the exposed roots and surrounding soil must be kept moist by hand irrigation and/or use of shading materials (hessian or boards). These roots must not be allowed to dry out.



Less damage is done to tree roots if utilities are tunneled under a tree (left, top and bottom) rather than across the roots (right, top and bottom).



Examples of directional drilling (left) and manual excavation with hydro-excavation (right).

Paving within a Tree Protection Zone

Paving treatments and other hard surfaces include concrete paths and driveways, unit pavers, bitumen etc. Paving within a Tree Protection Zone can create an impervious surface, limiting air and water infiltration into the root zone, and may adversely affecting tree health. In addition, compaction works can increase soil density, impairing root development and growth. There is also a risk of root damage from grade changes when preparing for paving works. To ensure paving works do not adversely affect trees to be retained on site, the following guidelines should be followed.

1. The following guidelines are indicative only and may require consultation with permeable paving specialists and civil engineers.
2. Paving and surface sealing should be excluded from the Tree Protection Zone where possible. Surface sealing of the root zone should not exceed 20% of the Tree Protection Zone area^{iv}.
3. If hard surfaces are required within a Tree Protection Zone, paving materials and methods should aim to avoid damage to the root system and use permeable materials.
4. Consider the finished paving levels in relation to the levels of surrounding structures in the design phase of the project. Adjust finished floor levels to ensure paving works do not lower grade by more than 50-80mm.
5. Tree root investigations may be required prior to designing and installing paver systems.
6. Consider future growth of tree roots and how they may impact on the paved surface. Paving works should remain outside the Structural Root Zone to reduce the likelihood of surface disruption in the future.
7. The project arborist should supervise any pavement installation work within a Tree Protection Zone.
8. Grade changes
 - No lowering of grade (cut) within a Tree Protection Zone for paving works without approval. The soil surface can be skimmed by removing loose organic matter, turf or old gravel surfaces carefully using hand tools or with a straight edge trimming bucket of an excavator standing outside the Tree Protection Zone (or on suitable ground protection). Skimming of the surface should cease when fine tree roots are encountered and should not exceed 50-80mm below the original level.
 - Any increase in grade (fill) must use permeable base layers that allow air and water to infiltrate.
9. Root damage
 - Damage to woody tree roots is not permitted. If woody tree roots are encountered, consult with the project arborist.

10. The natural soil structure and density within the Tree Protection Zone should be maintained when installing hard surfaces. The natural soils below paved surfaces should not be compacted unless absolutely necessary (e.g., trafficable loads). Compaction of natural soils should not be necessary for pedestrian or light traffic paving applications.

11. Base layer

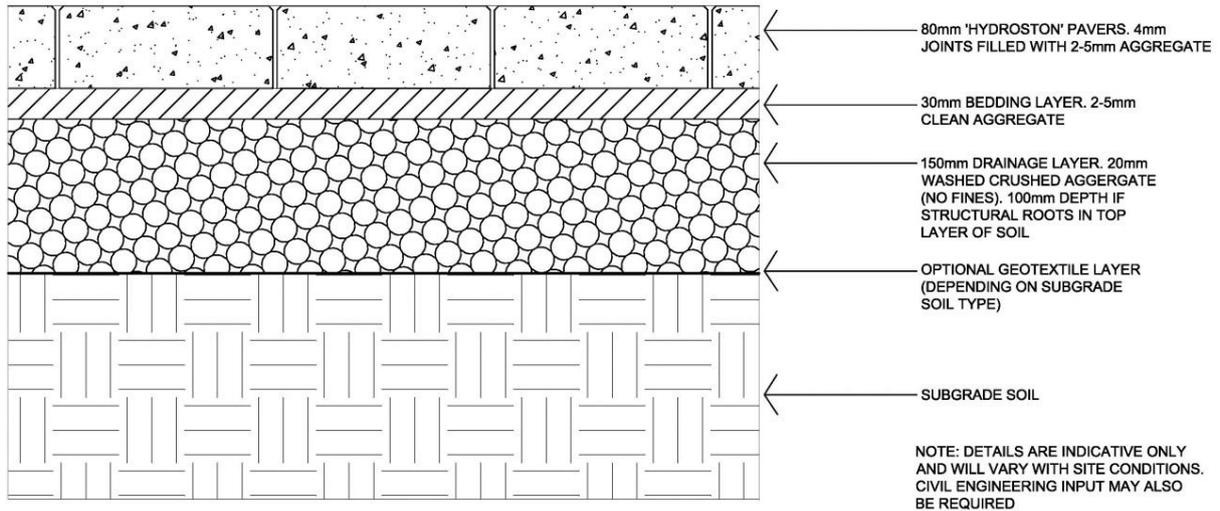
- The depth of the base layer will vary depending on the intended load. Trafficable areas will require a deeper preparation while pedestrian areas can be shallower.
- Base layer materials should allow air and water to infiltrate and consist of a graded material with no fines, such as 2-5mm graded particle size.
- Sand should not be used in the paving system due to its high clogging potential.
- A geotextile layer can be used between the base layer and subgrade to prevent fine particles migrating up from below.
- A three-dimensional cellular confinement system (such as 'EcoCell' or 'Geoweb') can be used for the base layer where required. This is a system of cells into which the base material is placed.
- The base layer material can then be compacted. Compaction should be to the minimum level required to support the intended load.

12. Bedding layer

- The bedding layer should be applied directly on top of the base layer.
- The bedding layer should use a single-graded material to provide good porosity and permeability.
- Regular paving sand is not recommended for this application.

13. Surface treatments

- Final surface treatments should allow air and water to infiltrate into the root zone. There are two main types of permeable surface treatments:
- Systems in which the unit pavers are impervious but contain permeable joints where air and water can pass between pavers (e.g., Ecotrihex, Hydrapave).
- Systems in which the paver material is porous, and air and water can pass through the paver (e.g., HydroSTONE).
- The unit pavers should have a single-graded aggregate swept in to fill in the gaps between pavers to allow air and water to infiltrate. Regular paving sand is not suitable for this application.



An example of a permeable paving system (Dr Martin Ely)

Landscaping around established trees

Care is required when landscaping around established trees. Damage can occur from a range of activities, including soil compaction, soil contamination, physical damage to the tree during landscaping works, damage to the root system from trenching and level changes, root disturbance from paving works and lawn installation etc. The following guidelines should be followed when landscaping around established trees.

To minimise the possible adverse impacts from these activities during landscaping activities, a tree protection zone (TPZ) is required. The TPZ roughly equates to the drip line of the tree but is accurately calculated in the body of the tree report. All potentially adverse activities must not occur within this zone or must be modified to minimise the impacts.

Landscaping guidelines

1. The landscape design should be reviewed by the project arborist prior to being finalised.
2. Landscaping contractors should observe the guidelines set out in the previous sections on Tree Protection Zone establishment and Site Establishment.
3. The growing environment for mature trees should be optimised with the use of mulches. Mulches should be organic in origin, semi composted and contain a mixture of coarse and fine particles. Mulches should be 75-100mm thick and applied out to the drip line of trees or further if possible, without coming into contact with the trunk. Mulches should be topped up every 1-2 years as required.
4. Irrigation systems around established trees should be set up as follows.
 - Drip irrigation systems are an effective way of applying water to the root zone of trees.
 - Connect the system to a reliable water source, preferably using a battery-operated programmable timer.
 - Use pressure reducers and relief valves as required.
 - Irrigation main lines should be radially arranged in relation to the root system rather than traversing the root system. Deep trenching across the drip line of trees must be avoided.
 - Install in-line dripper hose that emits ~3L of water per drip emitter per hour.
 - A parallel row pattern or a spiral pattern are simple installation methods to use with lines installed at 0.5m – 1.0m apart.
 - Irrigation should be applied during hotter months by providing one good soaking per week (2-3 hours at a time). Less water can be applied during cooler and wetter months.
 - Irrigate in the early morning. Avoid watering during the middle of the day.
 - Irrigation requirements should be adjusted according to species, soil type and climatic conditions.

5. Paving works should be kept to a minimum within a Tree Protection Zone. If paving must occur, it must utilize a no dig method, use permeable base preparations to minimum soil compaction requirements and utilise permeable unit pavers. Refer to the previous section on paving within a Tree Protection Zone.
6. Use caution when applying herbicides in the vicinity of established trees. Target the unwanted plants carefully and follow manufacturer's recommendations.
7. Pruning of established trees should be carried out by qualified arborists.
8. Retaining wall should not be installed within the Tree Protection Zone. If required, consult with the project arborist.
9. Fences on the boundaries of the property must be installed without damaging the root system of established trees.
 - Fencing must not use continuous strip footings.
 - Lightweight fencing panels attached to concrete pads and posts are recommended.
 - Concrete pads should be located outside the Structural Root Zone.
 - Grade changes (cut and fill) must be avoided during fence installation.

Other planting considerations

- Care is required when planting new vegetation within the drip line of established trees. Cultivation of the area under the tree should be kept to a minimum and undertaken with hand tools.
- Grade changes (cut or fill) within the drip line of established trees should be avoided. Do not build up soil levels by more than 100mm.
- The use of competitive plants should be kept to a minimum. Minimise the use of turf, and dense groundcovers etc.
- The mature size of larger plants and trees should be considered. Plants should be well spaced to allow them to reach their mature size.
- Select the largest trees for the size available. Larger trees provide greater benefits than smaller trees.
- Provide adequate growing area for the trees to grow in. Small openings in paved areas are usually inadequate for healthy tree growth.
- Species diversity is important a sustainable garden (and urban forest). While monoculture plantings may provide a desired aesthetic, they are generally more vulnerable to pest and disease outbreaks.
- Consider when to use shade trees or deciduous trees in relation to building orientation, the movement of the sun and the placement of windows.
- The use of locally indigenous vegetation should be considered for their habitat, biodiversity, and wildlife corridor value.

Development Monitoring and Certification

Through various stages of development, compliance certification provided in writing by a suitably qualified AQF Level 5 Arboriculturist is required.

These are outlined as follows with compliance recommended to be supplied to council as a condition of Development Approval:

Indicative Stages in Development and the Tree Management Process		
Stage in development	Tree management process	
	Matters for consideration	Actions and certification
Planning (AS 4970-2009 Section 2 and 3)		
Site acquisition	Legal constraints	
Detail surveys	Council plans and policies Planning instruments and controls Heritage Threatened species	Existing trees accurately plotted on survey plan
Preliminary tree assessment	Hazards/risks Tree retention value	Evaluate trees suitable for retention and mark on plan Provide preliminary arboricultural report and indicative TPZs to guide development layout
Preliminary development design	Condition of trees Proximity to buildings Location of services Roads Level changes Building operations space Long-term management	Planning selection of trees for retention Design review by proponent Design modifications to minimise impact to trees
Development submission	Identify trees for retention through comprehensive Arboricultural impact assessment of proposed construction Determine tree protection measures Landscape design	Provide Arboricultural impact assessment including tree protection plan (drawing) and specification
Development approval	Development controls Conditions of consent	Review consent conditions relating to trees

Preconstruction (AS 4970-2009 Section 4 and 5)		
Initial site preparation	<p>State based OHS requirements for tree work</p> <p>Approved retention/removal</p> <p>Refer to AS 4373 for the requirements on the pruning of amenity trees</p> <p>Specifications for tree protection measures</p>	<p>Compliance with conditions of consent</p> <p>Tree removal/tree retention/transplanting</p> <p>Tree pruning</p> <p>Certification of tree removal and pruning</p> <p>Establish/delineate TPZ</p> <p>Install protective measures</p> <p>Certification of tree protection measures</p>
Site establishment	<p>Temporary infrastructure</p> <p>Demolition, bulk earthworks, hydrology</p>	<p>Locate temporary infrastructure to minimize impact on retained trees</p> <p>Maintain protective measures</p> <p>Certification of tree protection measures</p>
Construction work	<p>Liaison with site manager, compliance</p> <p>Deviation from approved plan</p>	<p>Maintain or amend protective measures</p> <p>Supervision and monitoring</p>
Implement hard and soft landscape works	<p>Installation of irrigation services</p> <p>Control of compaction work</p> <p>Installation of pavement and retaining walls</p>	<p>Remove selected protective measures as necessary</p> <p>Remedial tree works</p> <p>Supervision and monitoring</p>
Practical completion	<p>Tree vigour and structure</p>	<p>Remove all remaining tree protection measures</p> <p>Certification of tree protection</p>
Post construction (AS 4970-2009 Section 5)		
Defects liability / maintenance period	<p>Tree vigour and structure</p>	<p>Maintenance and monitoring</p> <p>Final remedial tree works</p> <p>Final certification of tree condition</p>

Endnotes

ⁱ **Project arborist** - The person responsible for carrying out the tree assessment, report preparation, consultation with designers, specifying tree protection measures, monitoring and certification. The project arborist will be suitably experienced and competent in arboriculture, having acquired through training, qualification (minimum Australian Qualification Framework (AQF) Level 5, Diploma of Horticulture (Arboriculture)) and/or equivalent experience, the knowledge and skills enabling that person to perform the tasks required by this Standard.
(AS 4970 – 2009 *Protection of trees on development sites*)

ⁱⁱ **Tree damaging activity meaning.**

Planning, Development and Infrastructure Act 2016

Part 1 – Preliminary

Section 3 – Interpretation

tree-damaging activity means

- (a) the killing or destruction of a tree; or
- (b) the removal of a tree; or
- (c) the severing of branches, limbs, stems or trunk of a tree; or
- (d) the ringbarking, topping or lopping of a tree; or
- (e) any other substantial damage to a tree,

and includes any other act or activity that causes any of the foregoing to occur but does not include maintenance pruning that is not likely to affect adversely the general health and appearance of a tree or that is excluded by regulation from the ambit of this definition;

Planning, Development and Infrastructure (General) Regulations 2017

Section 3F (6)

For the purposes of the definition of tree damaging activity in section 3(1) of the Act, pruning—

- (a) that does not remove more than 30% of the crown of the tree; and
- (b) that is required to remove—
 - (i) dead or diseased wood; or
 - (ii) branches that pose a material risk to a building; or
 - (iii) branches to a tree that is located in an area frequently used by people and the branches pose a material risk to such people,

is excluded from the ambit of that definition.

ⁱⁱⁱ **Certificate Level 3 in Arboriculture** The person with training to AQF Level 3 in Arboriculture, or above, or equivalent recognized and relevant experience that enables the person to perform the tasks required by AS 4373 – 2007 *Pruning of amenity trees*.

Certificate Level 5 (Diploma of Arboriculture) The person responsible for carrying out the tree assessment, report preparation, consultation with designers, specifying tree protection measures, monitoring and certification. The project arborist will be suitably experienced and competent in arboriculture, having acquired through training, qualification (minimum Australian Qualification Framework (AQF) Level 5, Diploma of Horticulture (Arboriculture)) and/or equivalent experience, the knowledge and skills enabling that person to perform the tasks required by AS 4970-2009 *Protection of trees on development sites*.

^{iv} British Standards – BS 5837 – 2005 *Trees in Relation to Construction – Recommendations*

Document: # - RJ000233-GumRdVsp – Appendix A
Prepared for OBS Pty Ltd
Attn: John Kefalianos
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Norwood SA 5067
Date: 3rd August 2021



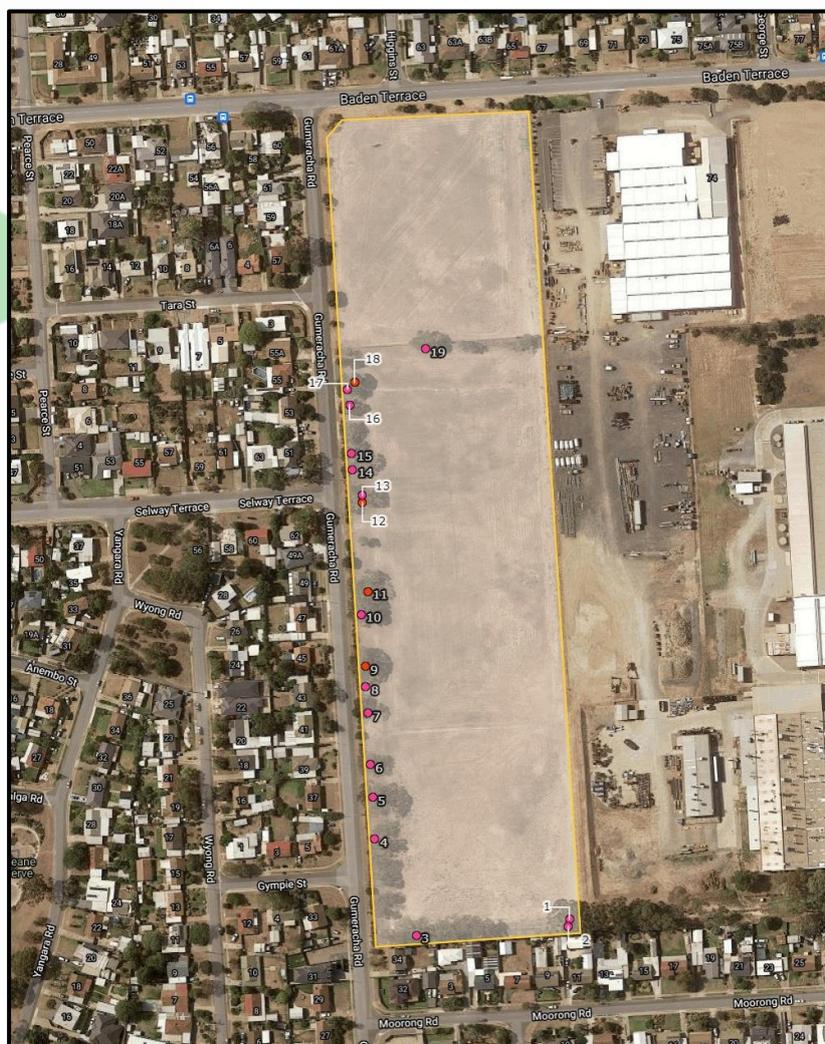
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Ph. 08 8351 4849

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Pre-Development Tree Assessment Report

Appendix A

Cnr Gumeracha Road & Baden Terrace, O'Sullivan Beach



Prepared for
OBS Pty Ltd
John Kefalianos

Compiled by
Gary Moran
Adelaide Arb Consultants

TreePlotter ID

1

Species ID

Eucalyptus cladocalyx - Sugar Gum

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Good	Fair	Fair

Useful Life Expectancy	Trunk Circumference
>20 years	202 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Branch	Possible
Targets within Failure Target Zone	Likelihood Target Impact
	Very Low
Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

None noted.

Tree Retention Recommendation

Retain if Possible - Protect as per AS4970-2009



TreePlotter ID

2

Species ID

Eucalyptus cladocalyx - Sugar Gum

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
14-20m	14-20m	Mature

Health	Structure	Form
Good	Fair	Good

Useful Life Expectancy	Trunk Circumference
>20 years	269 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Branch	Possible
Targets within Failure Target Zone	Likelihood Target Impact
	Very Low
Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

This tree has a minor history of branch failure.

Tree Retention Recommendation

Retain if Possible - Protect as per AS4970-2009



TreePlotter ID

3

Species ID

Eucalyptus sideroxylon - Red Ironbark

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Fair	Fair	Fair

Useful Life Expectancy	Trunk Circumference
10-20 years	231 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Branch	Possible

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

None noted.

Tree Retention Recommendation

Retain if Possible - Protect as per AS4970-2009



TreePlotter ID

4

Species ID

Eucalyptus sp. - Gum

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Fair	Failed	Failed

Useful Life Expectancy	Trunk Circumference
0 years	233 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Trunk	Imminent

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Severe

TRAQ Risk Rating

Low

Comments

The dominant stem has failed.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

5

Species ID

Eucalyptus sp. - Gum

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Fair	Poor	Good

Useful Life Expectancy	Trunk Circumference
0 years	295 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Trunk	Imminent

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Severe

TRAQ Risk Rating

Low

Comments

The main union has partially failed.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

6

Species ID

Eucalyptus sideroxylon - Red Ironbark

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Fair	Fair	Fair

Useful Life Expectancy	Trunk Circumference
10-20 years	222 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Branch	Possible
Targets within Failure Target Zone	Likelihood Target Impact
	Very Low
Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

None noted.

Tree Retention Recommendation

Retain if Possible - Protect as per AS4970-2009



TreePlotter ID

7

Species ID

Eucalyptus Torwood - Torwood

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Poor	Poor	Fair

Useful Life Expectancy	Trunk Circumference
0 years	239 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Trunk	Imminent

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

The main union has partially failed. Substantial dieback is present within the western stem.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

8

Species ID

Eucalyptus leucoxylon - South Australian Blue Gum

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Semi Mature

Health	Structure	Form
Fair	Fair	Poor

Useful Life Expectancy	Trunk Circumference
5-10 years	218 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Branch	Possible

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Minor

TRAQ Risk Rating

Low

Comments

This tree is of poor sprawling form.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

9

Species ID

Eucalyptus gomphocephala - Tuart

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Good	Fair	Fair

Useful Life Expectancy	Trunk Circumference
10-20 years	307 cm

Legislative Control Status

PDI Act 2016 (significant tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Trunk	Possible

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Severe

TRAQ Risk Rating

Low

Comments

None noted.

Tree Retention Recommendation

Retain if Possible - Protect as per AS4970-2009



TreePlotter ID

10

Species ID

Eucalyptus platypus - Platypus Gum

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
4-8m	4-7m	Mature

Health	Structure	Form
Fair	Fair	Poor

Useful Life Expectancy	Trunk Circumference
5-10 years	295 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Branch	Possible

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Minor

TRAQ Risk Rating

Low

Comments

Three central stems have been removed resulting in poor form.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

11

Species ID

Eucalyptus spathulata - Swamp Mallet

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Poor	Fair	Fair

Useful Life Expectancy	Trunk Circumference
5-10 years	437 cm

Legislative Control Status

PDI Act 2016 (significant tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Branch (Deadwood)	Probable

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Minor

TRAQ Risk Rating

Low

Comments

Substantial dieback is evident within the crown.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

12

Species ID

Eucalyptus spathulata - Swamp Mallet

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Fair	Good	Poor

Useful Life Expectancy	Trunk Circumference
5-10 years	303 cm

Legislative Control Status

PDI Act 2016 (significant tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Trunk	Probable

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

A stem failure has previously occurred. A canker is present on the eastern stem.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

13

Species ID

Eucalyptus spathulata - Swamp Mallet

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Poor	Poor	Fair

Useful Life Expectancy	Trunk Circumference
5-10 years	261 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Trunk	Probable

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

Multiple unstable included bark unions are present. Substantial dieback is evident within the crown.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

14

Species ID

Eucalyptus spathulata - Swamp Mallet

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	4-7m	Mature

Health	Structure	Form
Poor	Poor	Fair

Useful Life Expectancy	Trunk Circumference
5-10 years	244 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Trunk	Probable

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

An unstable included bark union is present within the primary structure. Substantial dieback is evident within the crown.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

15

Species ID

Eucalyptus spathulata - Swamp Mallet

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	4-7m	Mature

Health	Structure	Form
Poor	Poor	Poor

Useful Life Expectancy	Trunk Circumference
5-10 years	249 cm

Legislative Control Status

PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Trunk	Probable

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

This tree has a substantial history of branch failure.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

16

Species ID

Eucalyptus leucoxylon - South Australian Blue Gum

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Dead	Poor	Fair

Useful Life Expectancy	Trunk Circumference
1-5 years	221 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Branch	Probable

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

Substantial health and structural decline are evident within the northwestern stem.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

17

Species ID

Eucalyptus sideroxylon - Red Ironbark

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Good	Fair	Fair

Useful Life Expectancy	Trunk Circumference
10-20 years	208 cm

Legislative Control Status

PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Branch	Possible

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

None noted.

Tree Retention Recommendation

Retain if Possible - Protect as per AS4970-2009



TreePlotter ID

18

Species ID

Eucalyptus spathulata - Swamp Mallet

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
8-13m	8-13m	Mature

Health	Structure	Form
Fair	Poor	Fair

Useful Life Expectancy	Trunk Circumference
5-10 years	324 cm

Legislative Control Status

PDI Act 2016 (significant tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Trunk	Probable

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

Multiple unstable included bark unions are present within the primary structure.

Tree Retention Recommendation

Remove - Tree is not sustainable during development.



TreePlotter ID

19

Species ID

Eucalyptus sp. - Gum

Date Assessed

13th July 2021

Height [m]	Spread [m]	Age
14-20m	8-13m	Mature

Health	Structure	Form
Fair	Fair	Fair

Useful Life Expectancy	Trunk Circumference
10-20 years	266 cm

Legislative Control Status
PDI Act 2016 (regulated tree)

Tree Risk Assessment Qualification Assessment

Tree Part Assessed	Likelihood of Failure
Branch	Possible

Targets within Failure Target Zone	Likelihood Target Impact
	Very Low

Likelihood of Failure & Impact	Consequence of Failure & Impact
Unlikely	Significant

TRAQ Risk Rating

Low

Comments

None noted.

Tree Retention Recommendation

Retain if Possible - Protect as per AS4970-2009

