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Waste Management Facility, 2-4 Hale St, Botany

Landscape Concept Design Report

Prepared for
Coombes Property Group

Reference	15146
Issue date	20/12/2024
Version	P3

CJ Arms acknowledge the Traditional Custodians of the lands, waters and skies that this project is situated on, the Dharawal and Dharug people of the Eora Nation. We pay deep respects to Elders past and present. CJ Arms commit to supporting the health and wellbeing of Country, by respecting, valuing and being guided by First Nations people

Document control

Version	Description	Prepared by	Checked by
P1	Concept Design Report	DH	BW
P2	Concept Design Report	DH	BW
P3	Concept Design Report	DH	BW

Contents

CJ ARMS

1.0 Response to Comments

DPHI COMMENT	RESPONSE	ADRESSED ON PAGE:
Inconsistencies The Landscape Concept Design prepared by CJ Arms dated 19 April 2024 includes inconsistencies with respect to the number of semi-mature Casuarina glauca (She Oaks) to be removed, in some places it says four trees will be removed, and in others it indicates five trees will be removed. Recommendations: The Landscape Concept Design must be revised to confirm the total number of trees to be removed as a result of the development.	We confirm these inconsistencies have been rectified. Five trees will be removed as indicated on the Existing and Demolition Landscape Plan, and the Landscape Plan.	6.0 Existing and Demolition Landscape Plan. PG 8 7.0 Landscape Plan. PG 9

COUNCIL COMMENT	RESPONSE	ADRESSED ON PAGE:
The landscape concept plan identifies areas of the side and rear setbacks as contributing to the landscaped area. It includes these areas in the calculation of the total landscaped area on the site. However, the plans indicate these side and rear setbacks are to be entirely “compacted gravel”. It is not considered that a plain compacted gravel surface satisfies the intention, functions and definition of landscaped area.	We have introduced a planting buffer along the western and northern landscaped areas. This buffer will be planted around the perimeter of the site with the area between the planting and building to be finished with a 2m wide permeable crushed granite or gravel to allow maintenance access for the fence, building and landscape.	7.0 Landscape Plan. PG 9
The final Landscape Plan should be prepared by a qualified Landscape Architect who is a member of the AILA or is eligible for membership. The Landscape Plan should meet the requirements of the Bayside DCP 2022 and the Bayside Landscaping Technical Specification.	The final Landscape Plan has been prepared by a qualified Landscape Architect who is eligible for membership to the AILA. The Landscape Plan meets the requirements of the Bayside DCP 2022 and the Bayside Landscaping Technical Specification. Lead Landscape Architect CJ Arms: Simon Taylor B.LA RMIT 1990 Senior Landscape Architect CJ Arms: Milica Milunovic B.Sc (Hons) M.LA State University of NY 2008 We have updated the two key drawings in the report for clarity: Drawing 01 (6.0 Landscape Analysis Plan will become Existing & Demolition Plan) Drawing 02 (7.0 Landscape Concept Master Plan will become Landscape Plan)	6.0 Existing and Demolition Landscape Plan. PG 8 7.0 Landscape Plan. PG 9
The proposal should identify the species of all trees on the landscape plan, including proposed removals and new plantings prior to determination. The tree replacement rate is 3:1, i.e. for each tree removed there should be three new trees planted.	The Landscape Planting Strategy and Palette identifies the species of all proposed trees. The Existing & Demolition Plan identifies all proposed removals, noting there are no existing trees onsite. To facilitate access to the development we are required to remove 5 street trees. We are proposing to install up to 15 new small to medium trees as part of the development - to achieve maximum practical canopy coverage of the carpark.	6.0 Existing and Demolition Landscape Plan. PG 8 10.0 Landscape Planting Strategy and Palette. PG 12
The Landscape Plan should incorporate and show the WSUD details as set out in the Integrated Water Management Report.	The Landscape Plan incorporates and shows the WSUD details as set out in the Integrated Water Management Report.	7.0 Landscape Plan. PG 9 8.0 WSUD Details. PG 10
The proposal does not identify any improvements to the Hale Street public domain. The determination should include a requirement for landscaping improvements to be made to the street.	Hale street public domain improvement/revegetation will be provided to the section of nature strip indicated in the Landscape Plan.	7.0 Landscape Plan. PG 9
It appears that no outdoor space for staff is provided. The Bayside DCP 2022 (6.4: C.6) requires that staff are provided with an outdoor area for recreation, being at least 16m2 in size, with a minimum dimension of 3 metres. At least 6m2 of the area should receive direct sunlight for the hours between 10am and 2pm in mid-winter and be shaded in summer. The recreation area should not be in the landscaped setbacks.	We have created a 16 sqm space (4m X 4m) to achieve this requirement in the revised architectural masterplan.	7.0 Landscape Plan. PG 9
It appears that the car park could be further landscaped. The Bayside DCP 2022 at 3.7.5 requires that at-grade carparks have generous landscaping and tree canopy planting, including:	We have proposed a reconfiguration of the carparking area to maximise canopy coverage in the carpark.	7.0 Landscape Plan. PG 9
1 Tree per 5 car spaces to achieve 50% canopy coverage at maturity to combat urban heat impacts.	There are a minimum of 3 trees (100L pots) proposed within the carpark area (15 car spaces)	7.0 Landscape Plan. PG 9
The car park should feature areas of landscaping to break up functional areas of the car park including pedestrian crossings and entry areas. Contrasting materials should be used to help define these elements visually.	The architectural masterplan and associated Landscape Plan have been updated to address these concerns.	7.0 Landscape Plan. PG 9
Tree pits should provide adequate dimensions to cater for tree roots, future tree growth and to provide adequate moisture penetration and aeration of the root zone.	Noted	
The minimum pot size for trees in the parking area is 100 litres	Noted	
Further details are set out in the Bayside Landscaping Technical Specification.	Noted	

2.0 Introduction

2.1 An Overview

Coombes Property Group (CPG) and KLF Group (KLF) is proposing to develop a construction and demolition (C&D) waste management facility at 2-4 Hale Street, Botany (Lot 1 DP 562374) (the project). The facility proposes to accept up to 300,000 tonnes per annum (tpa) of C&D waste. It would propose to operate as a waste transfer station undertaking receipt and basic sorting with aggregation of material for bulk transport to Luddenham advanced resource recovery facility or another approved facility within the KLF group where more advanced sorting and recycling would be undertaken.

This landscape concept design report outlines the goals, principles and approach to the landscaping strategy for this proposed development.

2.2 The Site

The site is located approximately 8 km south of Sydney's CBD and adjacent to Sydney Airport. The site is located at 2-4 Hale Street, Botany and is identified as Lot 1 in Deposited Plan (DP) 562374 in the Bayside Local Government Area (LGA). The title comprises approximately 7,439 m2.

The site is located in an industrial area with Wanless Waste Management and Botany Scrap Metal Recycling to the east and numerous industrial developments to the south such as Australian Metal Co Pty Ltd, 2k20 Automotive and ULD Transport.

Access to the site is via Hale Street along the southern border. Hale Street is a two lane bitumen sealed road which serves the industrial area of Botany and provides a link to General Holmes Drive (M1) via Foreshore Road.

The visual amenity of the site has been significantly modified by industrial development. The surrounding area has a predominantly industrial land use, adjacent to the airport, and Sir Joseph Banks Park within the Port Botany area.

The topography of the site is primarily with an elevation of approximately 2.5 metres Australian Height Datum (AHD). Mill stream is located 30 m to the northwest and a drainage easement runs along the northern boundary of the site. Above ground sewers run adjacent to the western and northeastern boundary of the site and a high pressure Jemena gas pipeline.

1

2

1. Site location in local context
2. Existing conditions

3.0 Design Vision

Whilst there often appears to be a limited opportunity for landscape in and around industrial areas they have the potential for biodiversity and unique species.

To us it is important that we consider each and every landscape on its merits, so that it doesn't just create amenity for people, but integrates water, ecology and biodiversity and is resilient and adaptable to climate change.

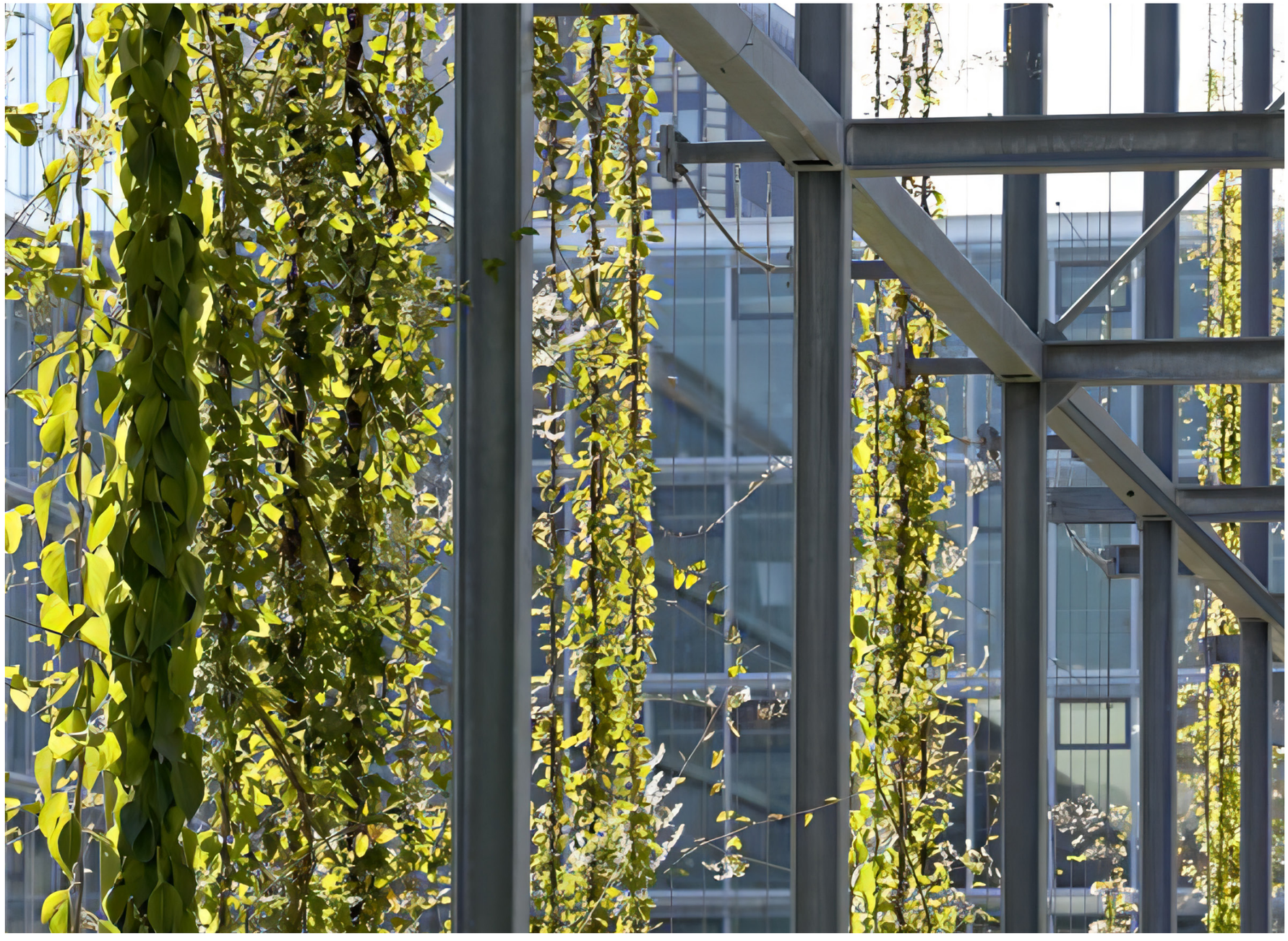
For this project we have the opportunity to use the landscape zones to create water sinks, raingardens to filter and treat water to protect the vital downstream waterway of Botany Bay. Equally, we need to consider maximising the use of harvested rainwater from the large roof to sustain and irrigate the landscape in perpetuity.

Our modelling indicates we can meet the vast majority of irrigation demand on a year-round basis with a rather modest tank. This tank has been increased in size to also offset some internal water uses in the facility such as washdown and dust suppression.

Understanding the near proximity to the Sydney Airport we must consider designing to mitigate flocking bird risk, and as such have selected species and planting palettes and configured tree and shrub spacings that do not encourage this activity.

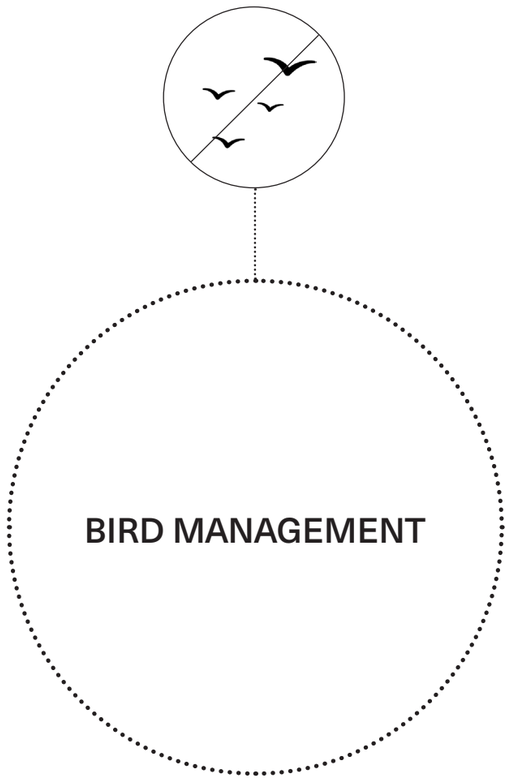
There are remaining links around the south, west and northern sides of the development where they interface with infrastructure - bridges, culverts and drains. These areas will be designed for very low maintenance and are unlikely to be accessed frequently by people.

We see these areas as opportunities not to miss, to still cater for and encourage ecology and biodiversity where possible considering the constraints and the airport requirements. The landscape we propose is configured to demonstrate our intent on delivering these elements and we are excited by the opportunity to work on them in detail during the next phase of the project.



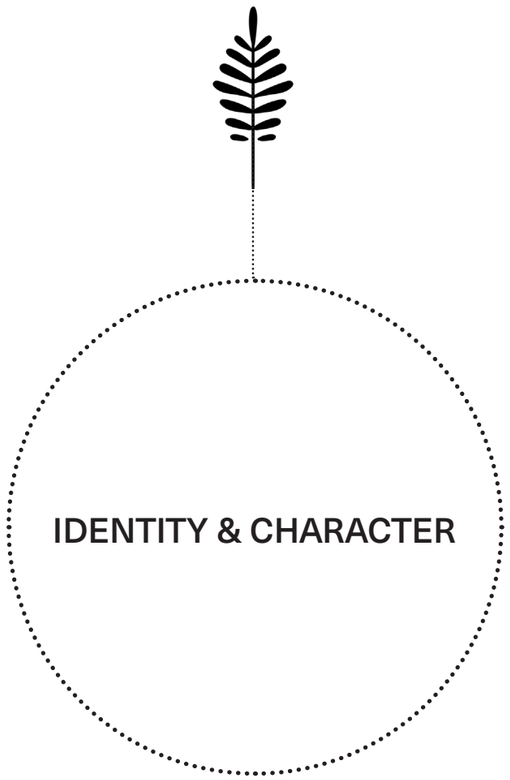
Opposite: Opportunity to grow native climbers for amenity and identity

4.0 Design Principles



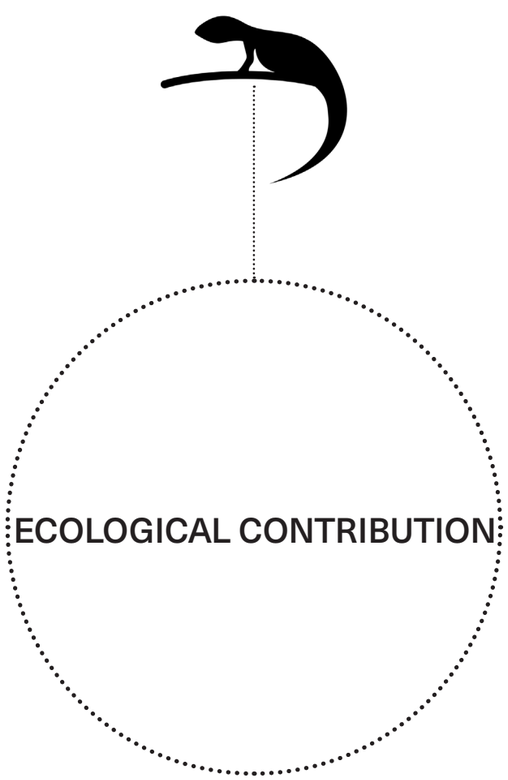
BIRD MANAGEMENT

Mitigate bird and wildlife attraction through strategic plant selection and layout



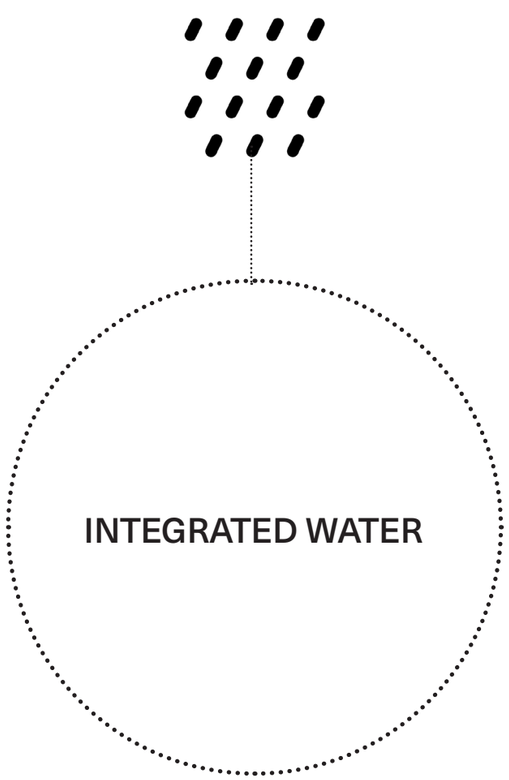
IDENTITY & CHARACTER

Integrate site-specific characteristics for authentic, iconic, and operationally responsive landscape design



ECOLOGICAL CONTRIBUTION

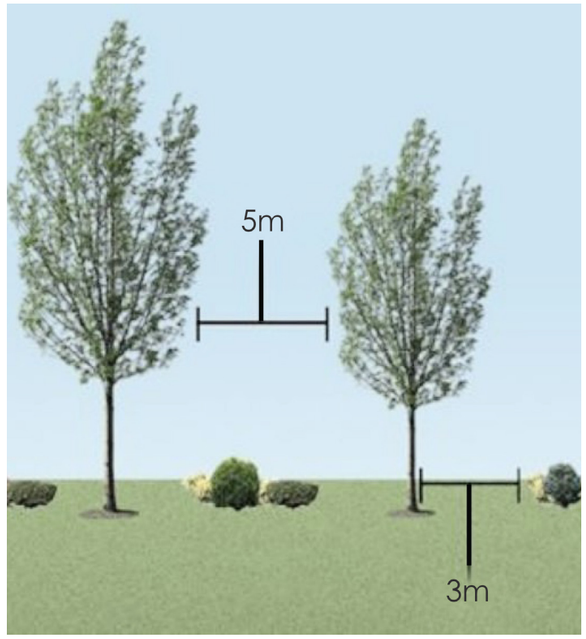
Safeguard aviation operations while creating opportunity for local ecosystems

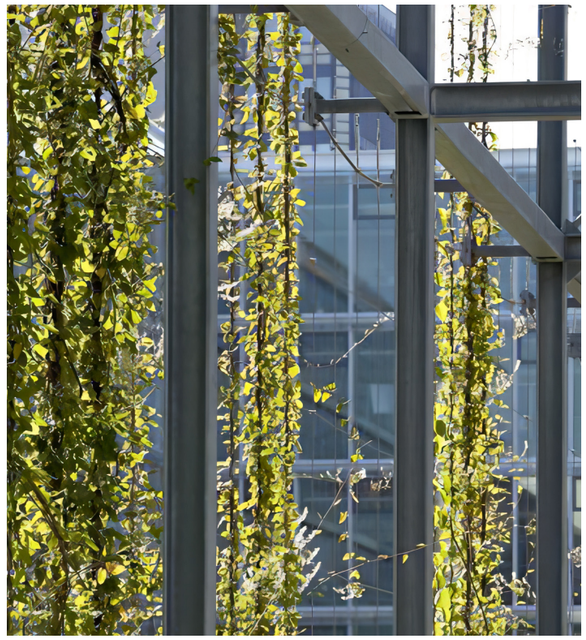


INTEGRATED WATER

Integrate sustainable water management: harnessing natural runoff and raingarden filtration for environmental health and resource conservation

5.0 Design Approach





Control Bird and Wildlife Attraction

In controlling bird and wildlife attraction, it will be vital to craft a site and planting design that minimizes their presence. We have opted for plant species with low appeal to birds and their prey. Tree planting will be arranged strategically, ensuring mature canopy structures do not overlap excessively, thus reducing bird movement between trees.

We will consider columnar tree species with vertical branching to limit nesting and perching opportunities. We will steer clear of landscape elements like totems or vertical features that could serve as perching or nesting sites. Additionally, species with abundant fruits and berries will be avoided, which may inadvertently attract more wildlife.

By implementing these measures, we will create a harmonious environment that respects nature whilst considering airport safeguarding measures.

Landscape Identity and Character

Tailoring the landscape response to the site's characteristics not only defines its identity but also ensures harmony with the local conditions. By incorporating species endemic to the area, the landscape design becomes both regionally authentic and environmentally sensitive. Furthermore, it acknowledges the needs of the airport operations, employing a language that resonates with the surroundings.

Strategic plant selection enhances the streetscape, presenting the development in an aesthetically pleasing manner while providing essential screening and buffering. Through considered landscape choices, the site becomes not just a functional space but a testament to responsible development and community integration.

Ecological Contribution

In balancing the need to mitigate bird and wildlife attraction near the airport with the desire to foster natural ecosystems, the design approach is critical. Utilising a planting palette rich in local and indigenous plant species, the design not only enhances the aesthetic appeal of the surroundings but also provides habitats for small insects and lizards.

Careful selection of vegetation minimises the potential for bird attraction while creating opportunities for biodiversity. By incorporating native flora, the design fosters a sense of place and connection to the environment while reducing the risk posed by wildlife to aircraft. This harmonious approach ensures that safety concerns are addressed without compromising the ecological integrity of the area, ultimately creating a sustainable and welcoming environment for both humans and wildlife alike.

Integrated Water Strategy

The proposed development offers opportunities to incorporate natural runoff into the landscape to promote a green and healthy environment. A raingarden positioned near the site's entrance on the Southern boundary effectively filters site water.

Additionally, runoff from paved areas will be directed to garden beds for plant irrigation where feasible. The use of a raingarden in this landscape will attenuate stormwater contamination which provides a range of supplementary benefits and reduces the annual stormwater discharge. Hydrocarbons from the surfaces of the roadways and trafficable areas will go through a filtration and adsorption process at the raingarden through the microbial activity and plant roots zone before it is discharged into storm water pipes.

Reuse water can be substituted for non-potable water used onsite including toilet flushing, irrigation, wash down, dust suppression, cooling.

6.0 Existing and Demolition Landscape Plan

A1 FILE REFERENCE 15146 - X - Landscape.dwg PLOT DATE 27-Nov-24

NOTE FOR CONTRACTORS
THE WORKS DESCRIBED ON THIS DRAWING MUST BE UNDERTAKEN BY COMPETENT CONTRACTORS WITH AN APPROPRIATE LEVEL OF EXPERIENCE WHO HAVE PREPARED APPROPRIATE METHODS OF WORK STATEMENTS (WHS) RELATING TO THESE WORKS. THE CONTRACTOR IS RESPONSIBLE FOR THE MANAGEMENT OF ALL RISKS ASSOCIATED WITH THE CONSTRUCTION ACTIVITIES STATED ON THIS DRAWING.

THIS DRAWING SHOULD NOT BE ISSUED IN PART AND MUST BE READ IN CONJUNCTION WITH ALL APPROPRIATE ARCHITECTURAL, ENGINEERS, DETAILS AND AUTHORITY DRAWINGS AS APPROPRIATE.

DIAL BEFORE YOU DIG. BEWARE OF UNDERGROUND SERVICES. THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT EXISTING SERVICES ARE SHOWN.

DEMOLITION LEGEND

SITE AREA: 7439 SQM

- SITE BOUNDARY
- EXISTING BUILDING
- TO BE DEMOLISHED
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED (x5)
  - TREE 07 *Casuarina Glauca - 12m*
  - TREE 08 *Casuarina Glauca - 12m*
  - TREE 09 *Casuarina Glauca - 12m*
  - TREE 10 *Casuarina Glauca - 12m*
  - TREE 11 *Casuarina Glauca - 12m*

0 1 2.5 5 7.5 10 15 20 25m north
1:250

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7.0 Landscape Plan

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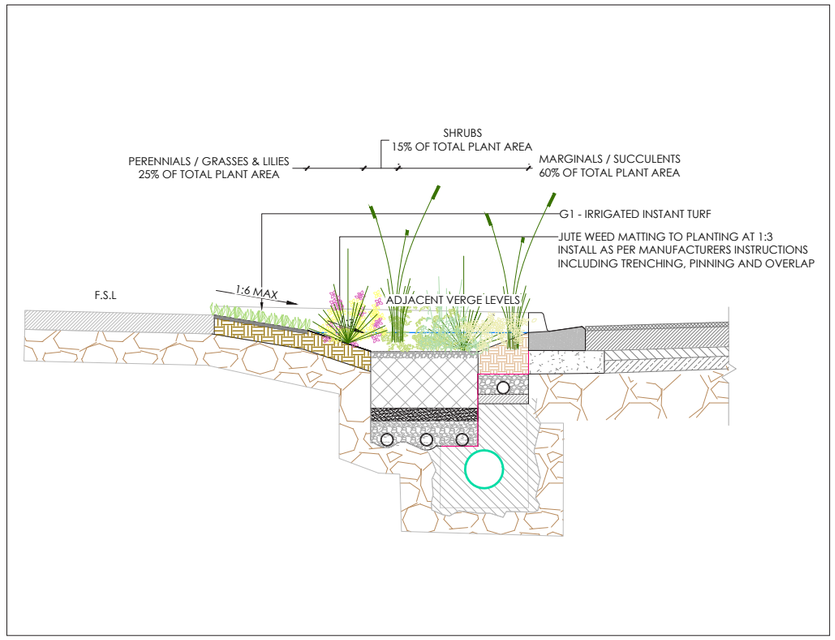
8.0 WSUD Details

A stormwater treatment train has been developed that incorporates water sensitive urban design (WSUD) techniques, including the capacity of on-site detention, measures to maximise the reuse of water, and landscape integrated treatment (raingarden). The raingarden is located at the Hale St frontage of the site and will receive rainfall runoff from the site and piped overflow from RWT.

Stormwater discharged from the new development will be treated in compliance with SEARs and local government authority requirements.

Reference image showing modest scale raingarden of hardy Indigenous plants to filter silt, nutrient & particulates before entering the storm water systems.



Typical section for raingarden planting

NOTES:

- FILTER LAYER - 400mm DEPTH OF FILTER MEDIA WITH MAX 5% ORGANIC CONTENT, ACHIEVING A SATURATED HYDRAULIC CONDUCTIVITY OF 200mm/hr, TN CONTENT OF <730mg/kg & <54mg/kg OF ORTHOPHOSPHATE CONTENT.
- TRANSITION LAYER - 100mm SAND LAYER WITH <2% FINES & 90% PARTICLE SIZE ABOVE 0.25mm (E.G VIC ROADS WASHED A3 FILTER SAND)
- DRAINAGE LAYER - 150mm CLEAN WASHED 5mm GRAVEL LAYER.
- 1.0mm HDPE IMPERMEABLE LINER IS TO BE APPLIED TO THE CARRIAGEWAY SIDE. REFER TO DETAIL.
- SUBSOIL DRAINAGE IS TO DISCHARGE TO THE PROPOSED OUTFALL ROCK CREEK BED. REFER TO LANDSCAPE PLANS.
- BASE OF TRENCH SHALL BE GRADED TO THE SOCKED AG DRAIN AT MIN 0.5% GRADE
- THE SUBSOIL DRAINAGE IS TO DISCHARGE TO THE PROPOSED PIT & PIPE NETWORK.
- PROVIDE SACRIFICIAL LAYER OF BIDIM A24 TO SURFACE OF MEDIA, PRIOR TO LANDSCAPING, TO PROTECT MEDIA FROM CLOGGING. PLANTING TO OCCUR ONCE CATCHMENT IS 90% STABILISED

9.0 Landscape Precedents

Low maintenance Indigenous Gardens

Low maintenance Indigenous Gardens

These gardens will add to the local ecology & habitat of non-avian fauna species.

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10.0 Landscape Planting Strategy and Palette

Bird And Wildlife Attraction Risk Mitigation Planting Strategies

The landscape design for 2-4 Hale Street will align with national and international requirements and guidance documents that set out strategies to reduce the risk of attracting birds and wildlife.

A recommended planting list has been prepared based on minimising the attraction to birds and wildlife. This list will be reviewed and further refined.

Trees

1.	*Angophora hispida*	Dwarf Apple Gum
2.	*Banksia serrata*	Saw Banksia
3.	*Banksia integrifolia*	Coastal Banksia
4.	*Callistemon citrinus*	Common Red Bottlebrush
5.	*Melaleuca quinquenervia*	Broad Leaved Paperbark
6.	***Cupaniopsis anacardioides***	Tuckeroo

Shrubs & Groundcovers

7.	*Macrozamia communis*	Burrawang
8.	*Leptospermum laevigatum*	Coast Tea Tree
9.	*Dodonaea triquetra*	Common Hop Bush
10.	*Correa alba*	White Correa
11.	*Lomandra longifolia*	Basket Grass
12.	*Ficinia nod osa*	Knotted Club-rush
13.	*Dianella congesta*	Flax Lily
14.	*Eleocharis sphacelata*	Tall Spike Rush

Raingarden

15.	*Juncus usitatus*	Common Rush
16.	*Gahnia filum*	Chaffy Saw-sedge

Climbers

17.	*Hardenbergia violacea*	Waraburra
18.	*Pandorea pandorana*	Wonga Wonga Vine

Trees


1


2


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6

Shrubs


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8


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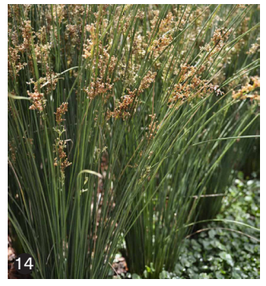
12


13

Raingarden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Climbers


16


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11.0 Landscape Maintenance and Management

The landscape response is designed to be self-sustaining. The use of indigenous plant species is such that, over time the vegetation will 'naturalise' requiring minimal maintenance, irrigation and fertilization. An appropriate maintenance regime over the initial 12-18 months will allow the vegetation to become established & ultimately thrive in this location.

The establishment period will include an appropriate eradication programme of environmental weed species that may be currently present in plant or seed form on this site.

Weed control should be mechanical and due to the proximity of wetland frog & lizard species, should absolutely exclude non-organic chemical herbicides. Rain Garden maintenance will include periodical removal of litter and probable annual/ biannual removal of silt build-up.

Objectives of the landscape and management plan

Generally, the landscape objectives for the site are:

- To provide and maintain an attractive/visually appealing and robust landscape setting to the development
- To contribute to the value of the green infrastructure on site, and helping provide links with the wider countryside
- To supplement existing trees with new tree planting to maintain the longevity of this resource and create a sense of place and different character areas within the Site
- To control invasive and undesirable species and aim to reduce cover of other non-native species to a set level
- To maintain and reinforce the landscape and ecology structure of the site
- To manage, retain and provide the opportunities to improve areas of existing ecological interest
- To increase the number and amount of native plants, improve the boundary treatments and to establish native buffer planting zones

Generally, the management objectives for the site are:

- The key objective is to improve and maintain the existing and new landscape and ecology structure in perpetuity.

Detailed maintenance specification will encompass the following:

Review Procedure

Timing and responsibility of review and method of reporting to ensure the correct communication channels are set up at the start of the project.

General Operations

The following principles will need to be established:
Working notice, reinstatement procedures, the use of any specialist firms/methods for the control of mammalian pests in line with the environmental health policy of the Local Authority and the use of rain water for irrigation means, depth required, watering times and removal of arisings as part of any operation on site. The protection of areas affected by maintenance operation and the safety of operatives and members of the general public will need to be explained in a method statement.

Semi-mature, Advanced Nursery Stock and Standard Trees

The planting, establishment, pruning and ongoing maintenance of these shrubs both generally and specifically will need to be clearly specified.

Shrub Planting

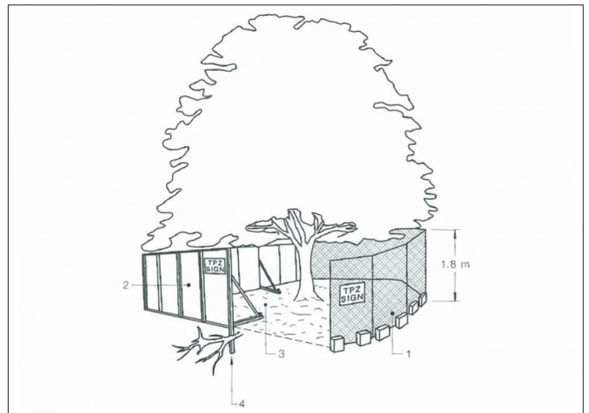
The planting, establishment, pruning and ongoing maintenance of these shrubs both generally and specifically will need to be clearly specified.

Grass and Herbaceous Planting

The planting, establishment, pruning and ongoing maintenance of the grasses will need to be clearly specified.

Grassed Areas

The planting, establishment and ongoing maintenance of grass areas and proposals for replacement will need to be clearly specified.



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.

Tree Protection

Existing vegetation that is to be retained is to be provided with adequate tree protection measures. Refer To AS 4970-2009: Protection of trees on development sites for further information and Part 2.3 Tree Preservation and Vegetation Management of the Bayside DCP 2022 for further Council requirements.

12.0 Conclusion

This report has outlined the landscaping strategy for the proposed development at 2-4 Hale Street, Botany including goals, principles, and approach. These will guide the landscape design in the project's detailed design phase. Given the site's proximity to Sydney Airport, a crucial aspect is selecting and spacing trees and plants to minimize attraction to birds and wildlife. The recommended planting list will undergo further assessment following the advice and guidelines from CASA Aviation.

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Arboricultural Impact Assessment and Management Plan

2-4 Hale Street, Botany.

Prepared For: **Coombes Property Group.**

Prepared By: **George Palmer, Botanics P/L.**

Dated: **March, 2024.**

Report Reference: **2024/0122.**

CONTENTS

1.0 INTRODUCTION

1.1 Background

1.1.1 This Arboricultural Impact Assessment and Management Plan has been prepared for the Coombs Property Group. This report has been requested to document the arboricultural significance of those trees located within and adjacent to the site and make recommendations for their preservation or removal, based on this and their location in relation to the proposed construction.

1.1.2 The site has been identified as Lot 1 in Deposition Plan 562374, or 2-4 Hale Street, Botany. This is an irregular rectangular block of 7,439 m2. The site's arboricultural amenity comes primarily from a stand of *Casuarina glauca*, or She Oaks located adjacent to the site's Hale Street, boundary.

1.1.3 The existing building footprint has been constructed adjacent to the Hale Street boundary and will have directly affected the spread and development of these tree's structural and broader root growth. Vehicular access to the site is currently via a relatively narrow asphalt driveway, adjacent to the site's southern boundary.

1.1.4 The proposed works will reconfigure the construction footprint. This is predominantly within that of the existing construction footprint and will not directly affect any of the documented trees. The proposed reconfiguration of vehicular access has been designed to better address efficient vehicular movements to the site. This portion of the works will require the removal of four (4) semi mature *Casuarina glauca*, or She oaks.

1.1.5 The Proposed Landscape Concept Design recognises a range of planting opportunities that have been proposed to significantly improve the site's horticultural and arboricultural amenity contribution, as well as manage drainage and water management.

1.1.6 The purpose of this report is to identify existing trees, assess both health and condition, determine landscape significance and safe useful life expectancy and make recommendations for preservation, removal or transplantation based on sustainability and suitability within the landscape. This report has assessed the likely impacts of the proposed development will have on the subject trees. An assessment of these impacts has been made in accordance with Australian Standard (AS) *4970 for the Protection of Trees on Development Sites.* Pruning and removal works will be based on *AS4373 for the Pruning of Amenity trees* wherever applicable. This report has considered the objectives of the Bayside 2032 Community Strategic Plan.

1.2 Methodology

1.2.1 A Visual Tree Assessment (VTA) was performed from ground level and consideration was given to the overall health of each documented tree, percentage of canopy, epicormic growth, deadwood and form for this species. The tree heights and canopy spreads have been estimated and where relevant the orientation of the canopy spread noted. The trunk diameters of each tree has been measured at breast height of 1.4 meters

(DBH) and with a diameter tape to calculate Tree Protection Zones (TPZ) and Structural Root Zone (SRZ). The site was inspected by Level 5 Consulting Arborist, George Palmer on the 21st March, 2024.

1.2.2 The impacts of the proposed works have been assessed based supplied plans. These show that the works will require the partial demolition of the existing boundary to allow for the excavation and construction of the proposed.

1.2.3 Supplied plans for Lot 1, DP 229042 include the following;

- **Reid Campbell:** Waste Management Facility- Cover Sheet/Drawing List A001.
- **Reid Campbell:** Waste Management Facility- Existing Site Condition Plan A002.
- **Reid Campbell:** Waste Management Facility- Demolition Plan A003.
- **Reid Campbell:** Waste Management Facility- Perspective A004.
- **Reid Campbell:** Waste Management Facility- Site Plan A005.
- **Reid Campbell:** Waste Management Facility- Signage Plan A006.
- **Reid Campbell:** Waste Management Facility- Warehouse Plan A101.
- **Reid Campbell:** Waste Management Facility- Roof Plan A102.
- **Reid Campbell:** Waste Management Facility- Warehouse Elevations A201.
- **Reid Campbell:** Waste Management Facility- Office Elevations A203.
- **CJ Arms:** Landscape Concept Design Landscape- Analysis Plan 8.
- **CJ Arms:** Landscape Concept Design Landscape- Concept Master Plan 9.

2.0 RESULTS

2.1 The Site

2.1.1 The site is an industrial block located on the northern side of Hale Street, Botany. The site covers an area of 7,439m2. This is relatively level with a gradual rise to the site's southwestern corner. The underlying soil profile will be a free draining sand based loam influenced by its proximity to both the Mill Pond and Mill Streams.

2.1.2 The site sits to the south of General Holmes Drive with the Foreshore Road providing its closest crossroad. Hale Street meets Foreshore Road at a right angle as to does the site's vehicular access from Hale Street.

2.2.3 An above ground sewer runs adjacent to the western and north eastern boundaries affecting vegetation here.

2.2 The Trees

2.2.1 This report focuses on those trees located within and adjacent to the site. A total of thirteen (13) trees have been assessed for the purpose of this report. These tree(s) have been assessed using Visual Tree Assessment (VTA) criteria and notes. This is a requirement of Clause 2.3.2 of the *Australian Standard 4970* (2009) for the *Protection of Trees on Development Sites,* each tree has been allocated a Retention Value based on the tree's Useful Life Expectancy and Landscape Significance with consideration to its health, structure, condition and site suitability.

2.2.2 The Retention Value does not take into account any proposed development. All trees have been allocated 1 of 4 Retention Values;

- **High Value -** Priority for Retention.
- **Moderate Value -** Consider for Retention.
- **Low Value** - Consider for Removal.
- **Remove** - Recommended for Removal Irrespective of works.

2.2.3 **Tree 1** is a well established *Phoenix canariensis,* or Canary Island Date palm located adjacent to the site's northern boundary. This is a mature example of the species that will likely have established from the site's earliest subdivision. The tree has been considered as being of Moderate Value and documented for retention.

2.2.4 **Tree 2** is a well established *Casuarina glauca,* or She Oak located on the Hale Street verge. This tree has grown to over 14m and is supported on a well structured single trunk of 51cm in diameter. High Value. Priority for Retention.

2.254 **Tree 3** is another *Casuarina glauca,* or She Oak located adjacent to Tree 2. This tree has been suppressed by the tree's upper canopy and grown to less than 8m and supported on a trunk of less than 20cm in diameter. Remove.

2.2.6 **Tree 4** is another *Casuarina glauca,* or She Oak that has had its apically dominant leader removed as part of a failure. This has affected the tree's structure and undermined its value. Removal is recommended to improve growing conditions for remaining trees. Remove.

2.2.7 **Tree 5** is another *Casuarina glauca,* or She Oak located on the Hale Street verge. This is another poorly structured example of the species partially suppressed by the neighbouring She Oak. Low Value. Consider for Removal.

2.2.8 **Tree 6** is another well established *Casuarina glauca,* or She Oak that has grown to a height of just over 14m and is supported on a trunk of over 50cm in diameter. Moderate to High Value. Retain.

2.2.9 **Trees 7 and 8** are both semi mature *Casuarina glauca,* or She Oaks located on the Hale Street front verge. Both have grown to approximately 12m and are supported on trunks of just over 30cm in diameter. Both have an exposed network of surface roots. Low Value. Consider (Required) for Removal.

2.2.10 **Trees 9, 10 and 11** are part of the stand of *Casuarina glauca,* or She Oaks located on the verge. All have grown to a height of approximately 12m and are supported on trunks of just over 40cm in diameter. All have been considered as being of Low to Moderate Value. Consider (Required) for removal.

2.2.11 **Trees 12 and 13** are another small stand of well established *Casuarina glauca,* or She Oaks located to the west of the remaining trees. These are both well established examples of the species supported on trunks of over 50cm in diameter. Moderate to High Value. Retain.

Retention Value 1 High		Retention Value 2 Moderate		Retention Value 3 Low		Retention Value 4 Remove	
Retain	Remove	Retain	Remove	Retain	Remove	Retain	Remove
1		2, 6, 12 + 13.	7, 8, 9, 10 + 11.		3, 4 + 5		
Total: 1	**Total: 0**	**Total: 4**	**Total: 5**	**Total: 0**	**Total: 3**	**Total: 0**	**Total: 0**

3.0 ARBORICULTURAL IMPACT ASSESSMENT

3.1 The proposed construction footprint has been partially set back from the Hale Street boundary and is within the existing building footprint. This construction footprint will have directly affected the spread and development of these tree's basal root development. **https://en.wikipedia.org/wiki/Abiotic_component**.

3.2 The reconfiguration of vehicular access is within the Structural (Critical) Root Zone (SRZ) and Tree Protection Zone (TPZ) of Trees 7, 8, 9, 10 and 11 and will require their removal. The additional removal recommendations for Trees 3 ,4 and 5 have been made due to poor structure and to improve the growing conditions for the remaining trees. **https://en.wikipedia.org/wiki/Silviculture**

4.0 DISCUSSION

4.1 As noted, the site's arboricultural amenity comes primarily from a stand of *Casuarina glauca,* or She Oaks located adjacent on the Hale Street verge. These are likely to have been planted following the construction of the existing building and have adapted to this over time. These trees are competing for both solar access as well as soil moisture and nutrients with their neighbours. Visible surface decay has been noted in several trees with decay spreading beyond the tree's ability to compartmentalise.

4.2 These trees remain a fraction of their biological potential and can be expected to continue to grow towards this in time. This will allow them to continue to compartmentalise smaller wounds and limit the further spread of decay. Larger wounding has resulted in columns of decay and will undermine structural integrity over time.

4.3 As noted, the vehicular access to and from the site is currently at right angles to Hale Street. This is no longer appropriate given the current and future high volumes of local traffic. While the proposed construction footprint has been set back from the existing there will be no direct impacts from the bulk of the proposed works. The reconfiguration of vehicular and pedestrian access is however required. This portion of the works will require the removal of Trees 7, 8, 9, 10 and 11, additional removal recommendations include Trees 3, 4 and 5. These have been compromised and provide limited amenity. Removal will improve the growing conditions for those remaining and proposed.

5.0 CONCLUSIONS

5.1 The reconfiguration of the proposed vehicular entrance is required to improve both pedestrian and vehicular access to the site. The affected trees are part of a stand of She oaks that appear to have been planted too close to each other. This has resulted in compromised growth and undermined the arboricultural contribution of the stand as a whole. The proposed removals will improve both growing conditions and the visual amenity of the broader stand.

5.2 Significant replanting works are proposed both here and throughout the site. These works will incorporate existing plantings and improve visual and physical access to the grounds.

6.0 RECOMMENDATIONS

6.1 It will be recommended that Trees 3, 4 and 5 be removed due to poor structure irrespective of the impacts of the proposed. Trees 7, 8, 9, 10 and 11 are recommended for removal to allow for the proposed driveway reconfiguration.

6.2 The remainder of the trees documented including Trees 1, 2, 6, 12 and 13 will all be retained and protected throughout the construction process. Construction impacts must be limited to those detailed. All works will need to be completed from within the existing or proposed construction footprints.

6.3 All permeable soil surface areas should be treated as being part of a Tree Protection Zone and allocated appropriate protection. Access will need to follow existing and remain within the current construction footprint wherever practical. All construction on site will require consideration for the preservation of topography outside the construction footprint.

6.4 Tree Protection Fencing design and locations have been detailed and should be installed prior to the commencement of site works.

6.5 All construction will require the preservation of larger diameter (30mm +) roots associated with preserved trees. All roots within the SRZ of a preserved tree will require preservation where possible. A pier and beam based construction method will limit the direct impacts of the construction to those detailed.

6.6 The remainder of the indirect construction impacts should be mitigated with the implementation of the following:

AS4970: PROTECTION of TREES on DEVELOPMENT SITES

AS.1 Appointment of Site Arborist

A site arborist shall be appointed prior to the commencement of work on site. The Site Arborist shall clearly mark out all trees to be removed and ensure that all trees documented for retention are preserved with the implementation of the following tree protection measures. The Site Arborist shall have a minimum qualification equivalent to a NSW TAFE Certificate Level 5 or above in Arboriculture.

AS.2 Inspection Points

Give 5 working days notice to allow inspections to be undertaken at the following stages;

Inspection Point	Inspection Personnel
Installation of Tree Protection Zones including Tree Protection Fencing, Silt Fencing and Signage	Site Arborist
Modification of the Tree Protection Zone	Site Arborist
Works within the Tree Protection Zone	Site Arborist
Completion of Construction Works	Site Arborist Site Supervisor.

AS.3 Education

Contractors and site workers shall receive a copy of these specifications prior to the commencement of work. Contractors and site workers undertaking any works within a TPZ shall sign the site log to confirm that they have read and understand these specifications prior to their undertaking.

AS.4 Tree Protection Zones

Where applicable, all trees to be retained through the construction process shall be protected from mechanical damage and the indirect impacts of the construction process with the installation of Tree Protection Zones. Unless otherwise stated, the following activities must not be carried out within a TPZ;

- modification of existing soil levels
- excavation or trenching
- cultivation of soil
- mechanical removal of vegetation
- movement of natural rock
- storage of materials, plant or equipment
- erection of site sheds
- affixing signage or hoarding to trees

- disposal of chemical waste or construction material
- any activity that may directly or indirectly affect the health of these or surrounding trees.

Note: If access to a TPZ is required as part of the approved development, prior authorisation is required by the Site Arborist.

AS.5 Tree Protection Fencing

Tree Protection Fencing shall be installed at the perimeter of the TPZ. As a minimum the Tree Protection Fencing shall be 1.8 meters high temporary chain supported by steel stakes. This shall be fastened and supported to prevent sideways movement. The trees woody roots shall not be damaged during the installation of this Tree Protection Fencing.This Tree Protection Fencing shall be erected prior to the commencement of works on site and shall be maintained for the duration of the construction process.

AS.6 Trunk and Branch Protection

Where TPZ fencing cannot be installed due to practical site constraints, trunk protection shall be installed around the trunk or branch to avoid mechanical damage. As a minimum, the trunk and branch protection shall consist of padding wrapped around the trunk and/or branches of affected tree. Timber panels will then need to be erected around the affected branch or trunk.

AS.7 Signage

Tree Protection Signage shall be attached the the TPZ and displayed in a prominent location. These signs shall be repeated in 10m intervals or closer where the fence changes direction. These shall be a minimum of a 72 font size and each sign at-least 600 x 500mm.

AS.8 Mulching

The area within the TPZ shall be mulched and maintained with 80mm of leaf litter mulch for the duration of the construction process. This mulch shall be spread by hand to limit the impact on underlying roots and shall be installed prior to the commencement of works on site.

AS.9 Site Arborist

The Site Arborist shall inspect and approve the TPZ including mulching. signage, Tree ProtectionFencing, Silt fencing and Signage prior to the commencement of works on site.

AS.10 Ground Protection

Wherever applicable pedestrian, vehicular and mechanical access shall be excluded from the TPZ. Where required access within the TPZ shall be restricted to areas where ground protection has been installed.

AS.11 Site Management

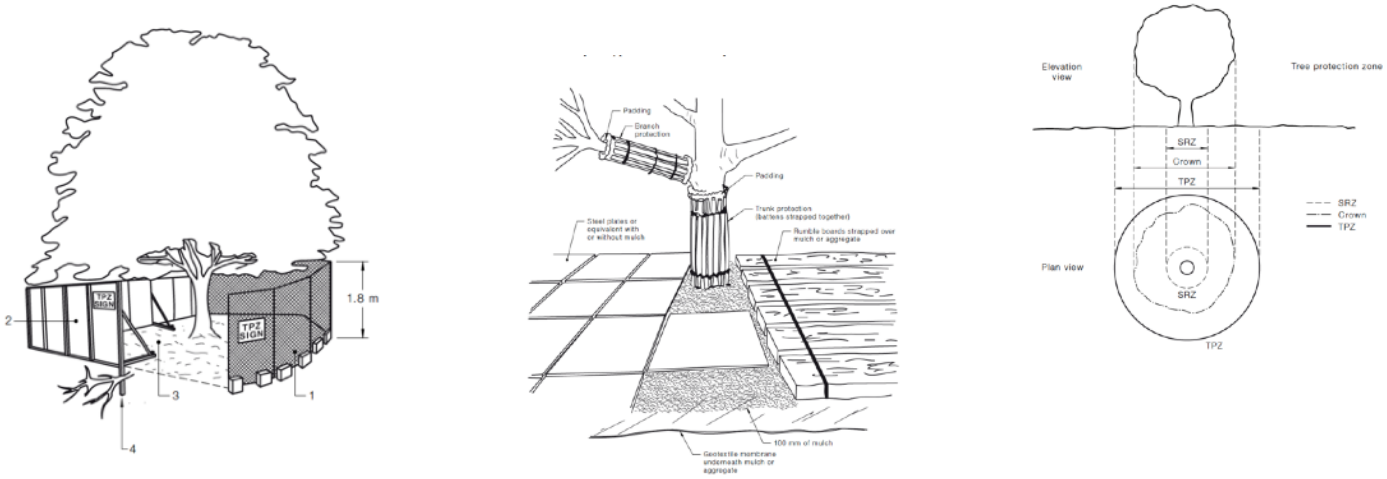
Materials and waste storage, site sheds and temporary services shall not be located within the TPZ unless specified. Storage points shall be covered when not in use and be no greater than 2m in height.

AS.12 **Works Within the TPZ**

The TPZ may need to be modified during the works to allow access between the protected tree and the proposed construction. The TPZ shall remain as specified and only those works detailed in the proposed construction undertaken.

AS.13 **Completion of Works within Specified TPZ**

Upon the completion of works within a TPZ the protective fencing shall be reinstated as specified. Where the construction of new structures does not allow for the reinstallation of fencing the TPZ shall be modified by the Site Arborist.



AS4970 Protection of Trees on Development Sites.

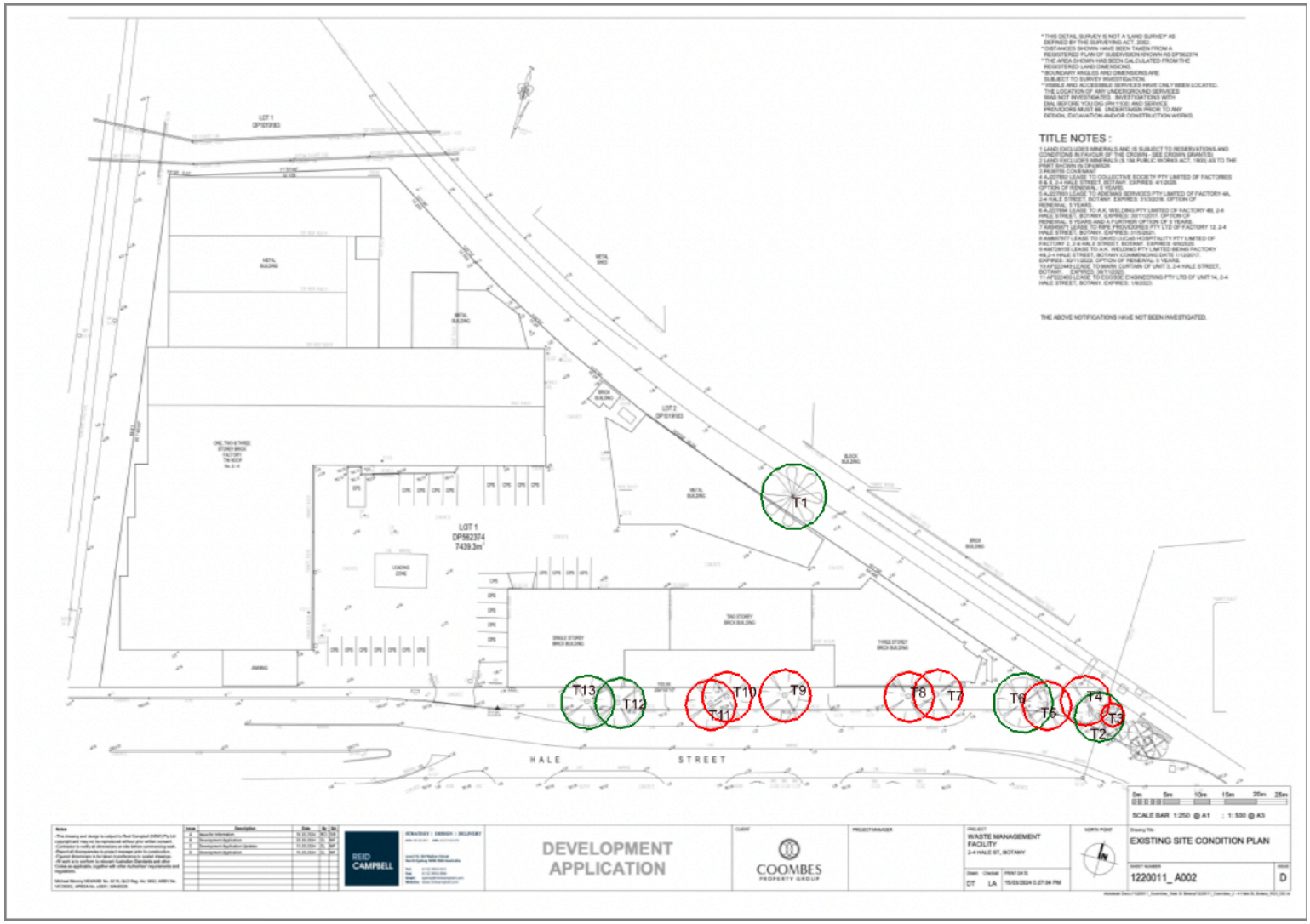


Figure 1 Shows the existing construction footprint in relation to the documented trees.

Figure 2 Shows the extent of the stand of She Oaks documented.

Figure 3 Shows part of the stand required for removal to allow vehicular access.

Figure 4 Shows the locations of Trees 12 and 13. Both documented for retention.

9.0 GLOSSARY

COMMON NAME/GENUS SPECIES CULTIVAR – Common names can vary with selected texts. Where species is unknown, “sp.” indicated after genus. Where cultivar is unknown “cv” indicated after species. The number in brackets e.g. (x9) after the species indicates the number of trees in this tree group.

DBH – Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level). Fabric diameter tape is used which assumes a circular cross section. Multiple measurements indicate multiple trunks. More than three trunks are indicated as “multi”. Where DBH measurement cannot be taken at 1.4m the height at which it has been taken is indicated in the Comments column.

CANOPY SPREAD RADIUS – Average canopy radius (widest + narrowest 2). Circular canopy depictions on Tree Plan/Survey are indicative only. Where canopy spread was significantly skewed, all four cardinal point measurements were recorded.

AGE CLASS – Immature (IM), Semi-mature (SM), Mature (M), Over-mature (OM). Assessment of the tree’s current Age. A Mature (M) tree has reached a near stable size (biomass) above and below ground. Trees can have a Mature age class for >90% of life span. Over-mature (OM) trees show symptoms of irreversible decline and decreasing biomass.

VIGOUR–Good(G),Fair(F)orPoor(P). The general appearance of the canopy/foliage of the tree at the time of inspection. Vigour can vary with the season and rainfall frequency. A tree can have Good vigour but be hazardous due to Poor condition. A tree in Good vigour has the ability to sustain its life processes. Vigour is synonymous with health.

CONDITION – Good (G), Fair (F) or Poor (P). The general form and structure of the trunk/s and branching. Trunk lean, trunk/branch structural defects, canopy skewness or other hazard features are considered.

SRZ RADIUS – Structural Root Zone. The area around a tree required for tree stability. Earthworks should be prohibited within the SRZ.. The area is calculated from the formula and graph at Figure 1 of AS4970-2009. The SRZ graph has been adapted from the work of Claus Mattheck (1994). DBH has been used instead of stem diameter above root buttress in the calculation ofSRZ. 0.1m has been added to SRZ to allow for minor increases in stem diameter.

TPZ RADIUS – Tree Protection Zone. Radial offset (m) of twelve times (12X) trunk DBH measured from centre of trunk (for trees less than 0.3 metre DBH minimum TPZ is 2.0 metres). To satisfactorily retain the tree construction activity (both soil cut and fill) must be restricted within this offset. TPZ offsets are rounded to the nearest 0.1 metre. Existing constraints to root spread can vary TPZ. Generally an area equivalent to the TPZ should be available to the tree post development. Encroachment occupying up to 10% of the TPZ area is acceptable without detailed root zone assessment. Encroachments greater than 10% require specific arboricultural assessment.

SULE – Safe Useful Life Expectancy. A systematic pre-development tree assessment procedure developed by Jeremy Barrell, Hampshire, England. The SULE method used in this assessment has been adapted for simplified use within the field. It gives a length of time that the Arborist feels a particular tree can be retained with an acceptable level of risk based on the information available at the time of the inspection. SULE ratings are Long (retainable for 40 years or more with an acceptable level of risk), Medium (retainable for 16-39 years), Short (retainable for 5-15 years) and Removal (tree requiring immediate removal due to imminent hazard or absolute unsuitability).

RECOMMENDATIONS – Retain (R), Retain Plus (R+), Transplant (T) or Remove (Rm).

COMMENTS – Comments relating to the location, surroundings and hazard potential of the trees at the time of inspection and where applicable the reason for removal.

9.0 BIBLIOGRAPHY & REFERENCES

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