CLOUSTON associates

HEALTH INFRASTRUCTURE NSW

CESSNOCK HOSPITAL REDEVELOPMENT

LANDSCAPE WORKS REF

S22-0028 R01• ISSUE D • 24/10/2024

We acknowledge Country, the cultural landscape that we work upon.

We acknowledge the Wonnarua people as the Traditional Custodians of this land and their ongoing connection that have with their surrounding environment, the knowledge that roots deep into the ground and up into the sky.

We pay our respects to Elders – past and present.

We are privileged to work across this vast Country and connect with many First Nations communities to learn, listen and grow as designers and environmental advocates. It is our collective responsibility to nurture and care for Country to work towards a healthier future.

Image: Landscape surrounding Cessnock Hospital

Cessnock Hospital Redevelopment

Landscape Works • Review of Environmental Factors (REF)

Prepared for:

NSW Health Infrastructure

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Document	Issue	Date	Status	Reviewed	Verified	Validated
S22-0028 REF 01	A	10/09/2024	Draft	MOD	-	-
S22-0028 REF 01	B	11/10/2024	Draft	SC	MOD	-
S22-0028 REF 01	C	16/10/2024	Draft	SC	-	-
S22-0028 REF 01	D	24/10/2024	Final	SC	JH	JH

Note: This document is preliminary unless validated.

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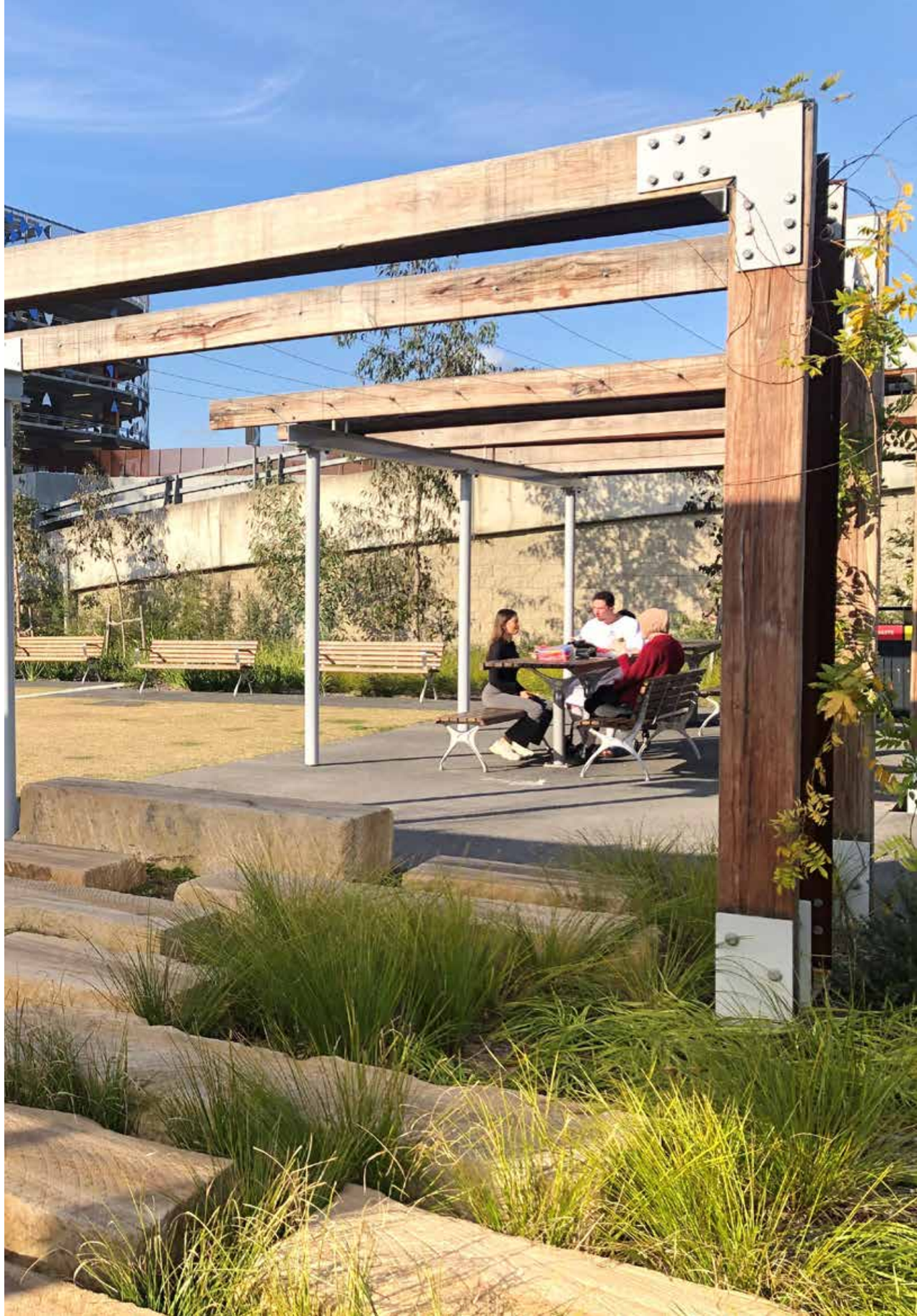


1 INTRODUCTION

Introduction

The Cessnock Hospital is a district level hospital within the Hunter New England Local Health District. It provides low acuity medical and sub-acute services to the local community and is networked with Maitland Hospital for higher acuity services, and John Hunter Hospital for Tertiary level services.

The clinical services provided by the project will be generally consistent with what is currently being provided at the Hospital, except changes in services where network efficiencies are identified.

This landscape report has been prepared by CLOUSTON Associates - A division of Beveridge Williams, on behalf of Health Infrastructure to assess the potential environmental impacts from external works that could arise from the redevelopment of the Cessnock Hospital health service at 24 View Street, Cessnock.

This report has been prepared to review the environmental factors associated with the external works and new landscape.

This report seeks approval for the construction and operation of a new two-storey clinical services building including:

- Demolition of select existing structures.
- Construction of a new hospital building on the site's northern portion.
- Realignment of internal roads and a new primary vehicular and pedestrian entrance to the hospital campus from Jurd Street.
- Refurbishment of the existing at-grade car park.
- Installation and realignment of selected services.
- Installation of ancillary development including, but not limited to, lighting and signage.
- New kerb, gutter and road resurfacing to Jurd Street
- **Landscape works (this report).**

2 LANDSCAPE WORKS

Landscape Design Intent

A Hospital in a Park

The NSW Government Architect's "Better Placed Design Guide for Health" sets the framework for best practice design of health facilities.

"Good design is fundamental to delivering effective, engaging and sustainable health facilities that provide outstanding care, create supportive working environments, and meet their potential as public places..."

Multiple lines of research spanning the last 100 years have demonstrated the healing role of landscapes in hospitals, showing that green outlooks and access to nature improve patient recovery times and offer numerous other benefits.

This redevelopment seeks to surround the hospital with extensive tree canopy and gardens.

Safe and Accessible

Hospital visits can be stressful, so reducing this stress is a primary design goal for the Hospital's redevelopment. We aim to provide:

- A simple, logical arrival sequence from drop off to the front door.
- A welcoming garden arrival space.
- An accessible landscape for patients and visitors to all spaces in the public realm.
- A safe environment that has considered Crime Prevention Through Environmental Design (CPTED).
- Is safe at night for visitors and staff.

A Place for People

Patients and staff may spend extended periods of time indoors. The landscape around the hospital is intended to provide a range of spaces and places for patients, staff, and visitors to find respite and gather, including:

- Different spaces for individual respite as well as social and family gatherings.
- Seating options, including shelters, tables, and chairs for lunch and gatherings.
- A courtyard with views northwest toward the surrounding ridgelines.

Responsive to a Future Climate

The future bioclimatic environment of Cessnock is hard to predict, but the CSIRO indicates that it will likely resemble Grafton by 2100[1]. It is also likely to experience more extremes of weather. Meaning, our design includes:

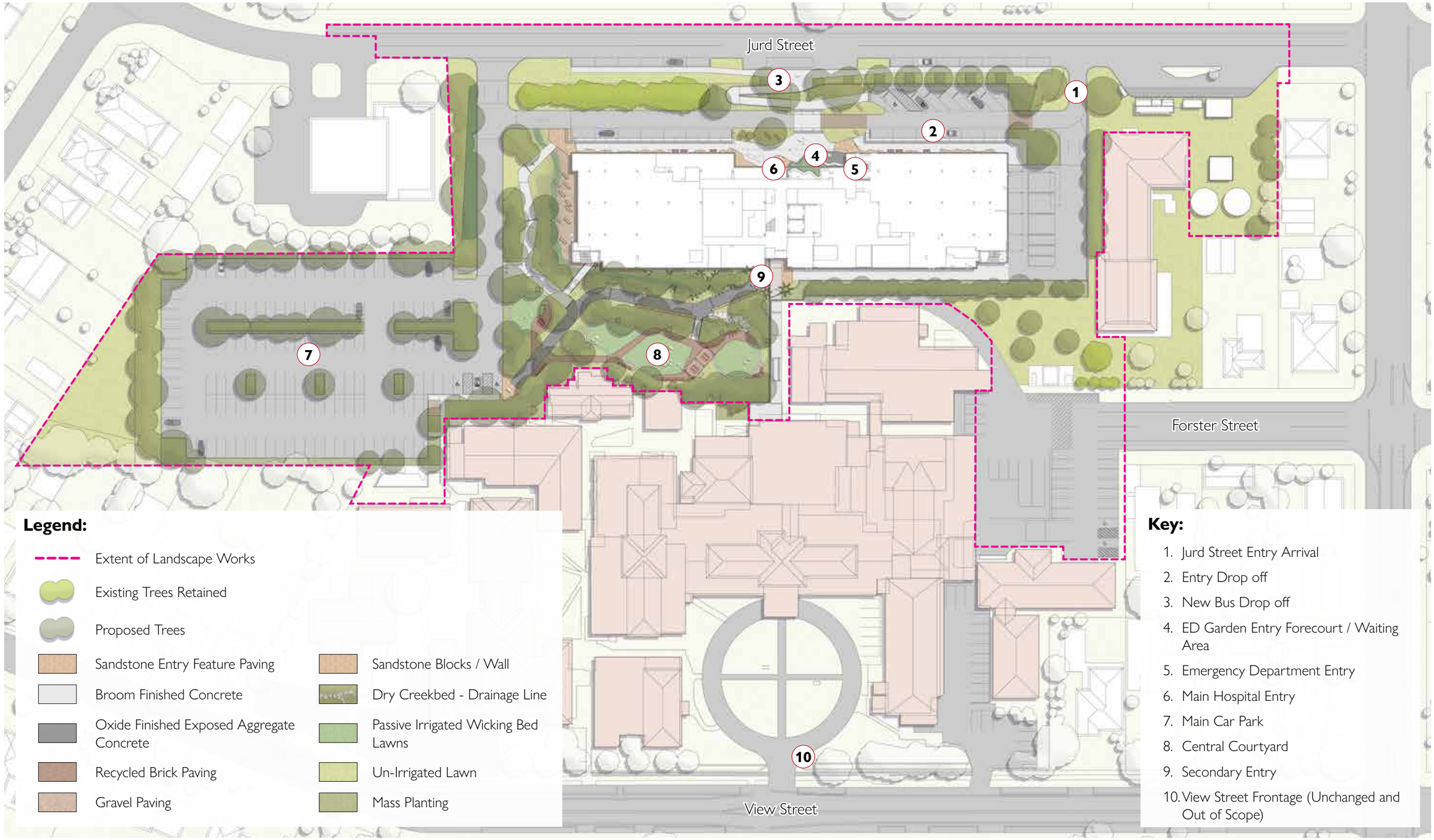
- Selecting tree species from wide climatic zones and areas north of Cessnock to maximise long term tree canopy survivability.
- Provision of shade trees in the car park to reduce the urban heat island effect.
- Gravity driven passive lawn wicking beds for turf areas, designed to promote efficient watering and support plant growth.
- Reducing embodied carbon emissions, where practical, through the use of low-carbon concrete, reuse of demolition items, and local materials to reduce transport emissions.

Robust - Indigenous Species

The hospital grounds are a living landscape that will be much valued by patients, visitors and staff. While they need to be managed and cared for, the intention is for a robust, sustainable landscape that is relatively self sustaining that includes:

- Protection and retention of trees to maximise existing tree cover.
- Providing extensive additional tree canopy for shade and habitat.
- Use of a largely indigenous species mix.
- The plan seeks to increase biodiversity and species richness beyond the existing site conditions.

Landscape Design Plan



Measures to Maximise Green Infrastructure

NSW Government Design Guidelines

The NSW Government has a number of policies aimed at increasing green cover in our cities. These include the Draft Greener Places Design Guide[2] and Landscapes for Health Guideline[3]

The Cessnock Hospital redevelopment seeks to align with these policies through:

- New green infrastructure and gardens are provided to offer patients and staff greenery and meaningful connections to the natural environment.
- Using the 'borrowed landscape' by focussing views on external tree canopy and distant ridgeline vistas from In Patient Unit (IPU) beds and the rear courtyard.
- Providing attractive outdoor environments that support social interaction and gathering.

Replacing Lawn and Asphalt with Gardens

While the new hospital building adds to the built footprint of the site, the external courtyard replaces asphalt and concrete with new green space. The contribution of this new green space is to:

- Provide greater permeability on the site for rainwater to be absorbed into the landscape.
- Provision of shade trees in the car park to help lower the urban heat island effect.
- Use of probiotic lawn fertiliser to build soil, carbon and water holding capacity.
- Provision of new ecosystems on site with higher biodiversity outcomes than the existing monoculture lawns and the non-existent biodiversity in the existing paved areas.

Maximising Urban Tree Canopy Cover

In line with the Greener Places Guide, the landscape works seek to maximise new tree growth to lift the overall canopy cover on site. The canopy cover on site is increasing from 3% to 30.77%. This fits within the better placed target of 25% for light commercial areas and 40% for suburban areas:

This increase is being made possible through:

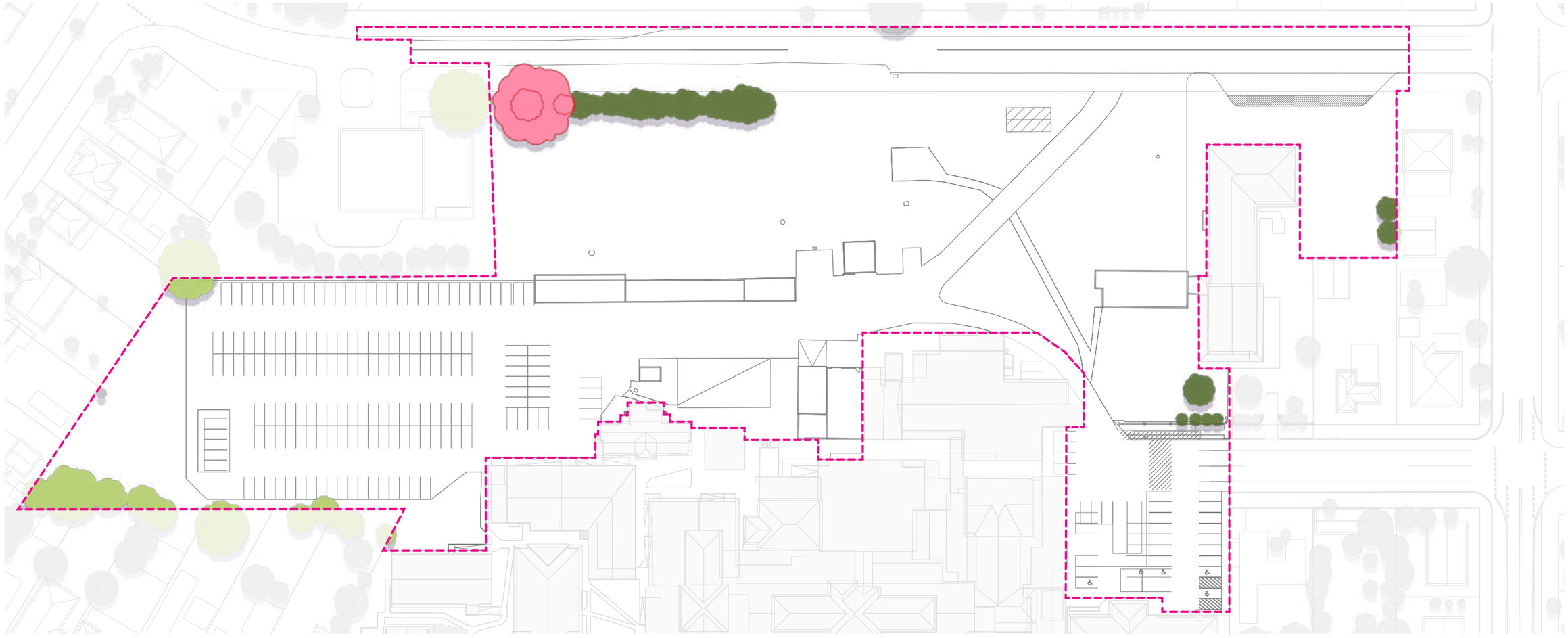
- Additional tree canopy cover across the new site.
- Maximising contiguous soil volumes for optimal tree growth.
- Dedicating entire car parking bays and a central planting trench for trees.
- Over excavating in cut areas to provide necessary soil volume for tree growth.
- Use of passive irrigation to improve soil moisture levels. See next column.

Passive Irrigation

Passive irrigation provided follows best practices from the Cooperative Research Centre for Water Sensitive Cities[4]. The types of passive irrigation measures proposed at the hospital include:

- Capturing small and medium stormwater events to top up soil moisture, including the use of wicking bed sand storage reservoirs at the bottom of the lawn profile
- The use of wicking beds across all main recreation lawn areas, receiving water from rooftop collection systems.
- Managing overland water flow to make the presence of water visible in the landscape.
- Provision of slots through kerbs to direct stormwater runoff into the landscape.
- Employing absorption trenches in car parks and tree planting areas.

Tree Canopy Cover Strategy - Trees to be Protected and Removed



OVERVIEW

Description	*Existing Condition*
Total Extent of redevelopment site	25,186m2
Total Trees Removed	3
Canopy Cover Area On Site (with removed trees)	765m2
Existing Canopy Cover % On Site	3.04%

Existing trees to be retained and protected will be managed through the use of exclusion zones and tree protection fences.

LEGEND

- Extent of Landscape Works
- Existing Trees Retained (Within Landscape Works)
- Existing Trees Retained (Adjacent Landscape Works)
- Existing Trees Removed
- Existing Trees (Outside Landscape Works)

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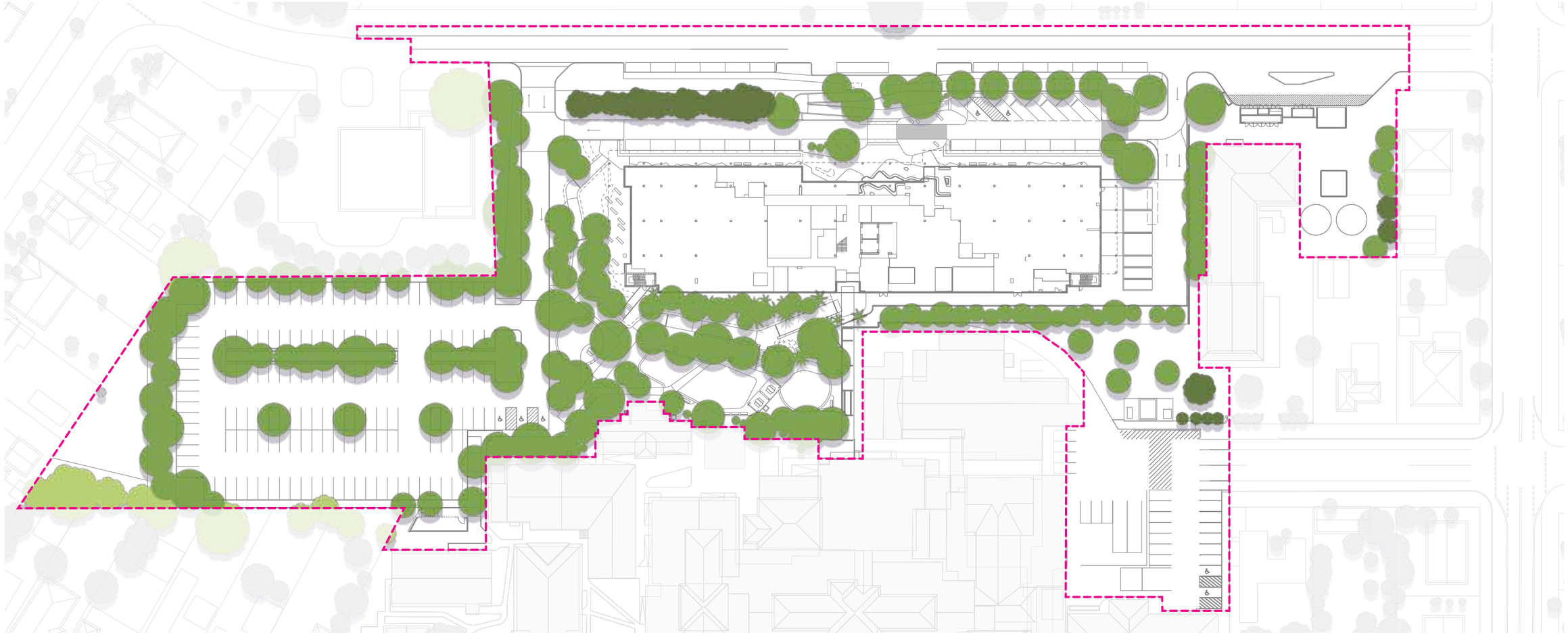
0 10 20 30 50m

Tree Canopy Cover Strategy - Replacement Tree Canopy



TREE REPLACEMENT OFFSET STRATEGY

Our landscape design includes a significant increase in tree canopy. Typically, Health Infrastructure recommends a tree replacement offset strategy at a 1:1 ratio (one tree planted for one tree removed). In our design, we are proposing a more substantial offset, with a ratio of 1:69 (69 trees planted for one tree removed).

OVERVIEW

Description	*Existing Condition*
Total Extent of redevelopment site	25,186m2
Total extent of new building works	3,350m2
Total external works areas excluding Jurd Street	18,000m2
Total Trees Proposed (including accent plants)	207
Proposed Canopy Cover Area On Site	5,539m2
Proposed Canopy Cover % On Site	30.77%

LEGEND

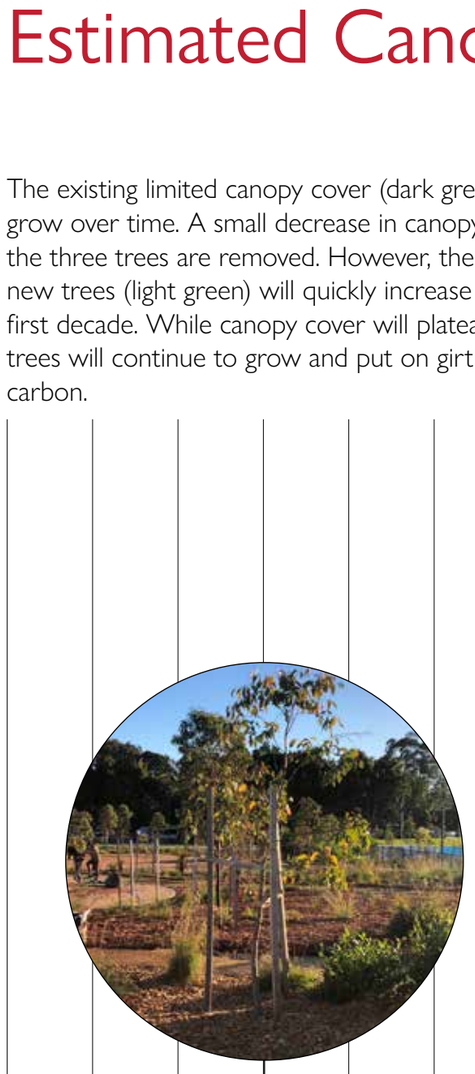
- Extent of Landscape Works
- Existing Trees Retained (Within Landscape Works)
- Existing Trees Retained (Adjacent Landscape Works)
- Proposed Trees at Maturity
- Existing Trees (Outside Landscape Works)

1:1000 @A3

0 10 20 30 50m

Estimated Canopy Cover Growth to 2050

The existing limited canopy cover (dark green) will continue to grow over time. A small decrease in canopy cover will occur when the three trees are removed. However, the addition of over 200 new trees (light green) will quickly increase canopy cover over the first decade. While canopy cover will plateau after 25 years, the trees will continue to grow and put on girth, further sequestering carbon.



One year

10 years

20 years

Indicative new canopy coverage growth

Indicative exiting canopy coverage growth

3 existing trees removed

New planting at end of construction stage

6000m2
5000m2
4000m2
3000m2
2000m2
1000m2
0m2

2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050

Statement of Significance

Based on the identification of potential landscape related issues and an assessment of the nature and extent of the impacts of the proposed development, it is determined that:

- The extent and nature of landscape potential impacts are low/ moderate and will not have significant adverse effects on the locality, community and the environment.
- Potential impacts can be appropriately mitigated or managed to ensure that there is minimal effect on the locality, community.
- There are significant improvements to biodiversity and canopy cover with existing large areas of asphalt and grass being converted to planting.

Project stage: Design (D) Construction (C) Operation (O)	**Mitigation measures**	**Relevant section of report**
D C	Existing trees to be retained and protected.	Arboricultural report
D	Canopy Cover: Minimising tree impacts and removal through establishment of no-go, no excavation zones and design and planning co-ordination.	Landscape Report. Page 11
C	Canopy Cover: Fencing off retained trees from damage during construction.	Landscape Report. Page 11
O	Canopy Cover: Implementation of passive irrigation measures to ensure stable growing conditions for new trees.	Landscape Report. Pages 10-13
D, C, O	Climate Resilience: Reduction of urban heat island impacts of existing car park through shade tree canopy planting and passive irrigation.	Landscape Report. Page 9
D, C, O	Climate Resilience: Species selection, planting conditions and ongoing maintenance for long term climate resilience.	Landscape Report. Pages 10, 15-18

Typical Species - Tree Canopy (5-12m Tall)

Botanic Name	Common Name
Angophora costata	Smooth-barked Apple
Corymbia torelliana	Cadagi Tree
Corymbia maculata	Spotted Gum
Elaeocarpus reticulatus	Blueberry Ash
Eucalyptus fibrosa	Red Ironbark
Eucalyptus punctata	Grey Gum
Livistona australis	Cabbage Palm

Angophora costata
Smooth-barked Apple

Corymbia torelliana
Cadagi Tree

Eucalyptus punctata
Grey Gum

Eucalyptus fibrosa
Red Ironbark

Corymbia maculata
Spotted gum
(non-pedestrian areas)

Livistona Australis
Cabbage Palm

Elaeocarpus reticulatus
Blueberry Ash

Notes.

- *The listed plant species are cross-referenced with the landscape plans accompanying the REF.*
- *Species selection will be further refined and consulted upon in the next stages.*

Typical Species - Decorative Biodiverse Mix

Botanic Name	Common Name
Ground Covers and Shrub Layer	
Brachycome multifida	Cut-leaf Daisy
Carpobrotus glaucescens	Pig Face
Chrysocephalum apiculatum	Yellow Buttons
Erigeron karvinskianus	Seaside Daisy
Gazania rigens 'Kiss Orange'	Kiss Orange Gazania
Gazania tomentosa	Yellow Gazania
Hardenbergia violacea	Purple Coral Pea
Scaveola albida	Purple Fan Flower
Accent Plants	
Actinotus helianthi	Flannel Flower
Anigozanthos flavidus	Tall Varieties
Dendrobium speciosum	Rock Orchid
Doryanthes excelsa	Gymea Lily
Pycnosorus globosus	Billy Buttons
Telopea speciosissima	Waratah
Xanthorrhoea latifolia	Grass Tree

Brachycome multifida
Cut-leaf Daisy

Carpobrotus glaucescens
Pig face

Chrysocephalum apiculatum
Yellow Buttons

Erigeron karvinskianus
Seaside Daisy

Gazania rigens Kiss Orange
Kiss Orange Gazania

Gazania tomentosa
Yellow Gazania

Hardenbergia violacea
Purple Coral Pea

Scaveola albida
Purple Fan Flower

Actinotus helianthi
Flannel Flower

Anigozanthos flavidus
Tall varieties

Dendrobium speciosum
Rock Orchid

Doryanthes excelsa
Gymea Lily

Pycnosorus globosus
Billy Buttons

Telopea speciosissima
Waratah

Xanthorrhoea latifolia
Grass tree

Notes.

- *The listed plant species are cross-referenced with the landscape plans accompanying the REF.*
- *Species selection will be further refined and consulted upon in the next stages.*

Typical Species - Bushland Shrubs and Grasses

Botanic Name	Common Name
Small Shrubs (1-4m)	
Acacia falcata	Sickle Leaf Wattle
Acacia longifolia	Sydney Golden Wattle
Banksia oblongifolia	Rusty Banksia
Banksia spinulosa var. collina	Hair-pin Banksia
Callistemon citrinus	Red Bottlebrush
Leptospermum polygalifolium	Common Teatree
Melaleuca thymifolia	Thyme Honeymyrtle
Westringia fruticosa	Coastal Rosemary
Grasses and Strappy Plants (1m High)	
Austrodanthonia fulva	Wallaby Grass
Dianella caerulea	Blue Flax Lily
Dichelachne micrantha	Short-Haired Plume Grass
Echinopogon caespitosus	Hedgehog Grass
Epacris pulchella	NSW Coral Heath
Imperata cylindrica	Blady Grass
Isopogon anemonifolius	Drumsticks
Lomandra longifolia	Spiny-headed Mat Rush
Microlaena stipoides	Weeping Grass
Pennisetum alopecuroides	Swamp Foxtail Grass
Poa labillardieri	Common Tussock Grass
Themeda australis	Kangaroo Grass

Notes.

- *The listed plant species are cross-referenced with the landscape plans accompanying the REF.*
- *Species selection will be further refined and consulted upon in the next stages.*

Acacia falcata
Sickle Leaf Wattle

Acacia longifolia
Sydney Golden Wattle

Banksia oblongifolia
Rusty Banksia

Banksia spinulosa var. collina
Hair-pin Banksia

Callistemon citrinus
Red Bottlebrush

Leptospermum polygalifolium
Common Teatree

Melaleuca thymifolia
Thyme Honeymyrtle

Westringia fruticosa
Coastal Rosemary

Dianella caerulea
Blue Flax Lily

Dichelachne micrantha
Short-Haired Plume Grass

Epacris pulchella
NSW Coral Heath

Imperata cylindrica
Blady Grass

Isopogon anemonifolius
Drumsticks

Lomandra longifolia
Spiny-headed Mat Rush

Pennisetum alopecuroides
Swamp Foxtail Grass

Poa labillardieri
Common Tussock Grass

Typical Species - Drainage Line and Interior Plant Species

Drainage Line Species

Botanic Name	Common Name
Wet Low Flow Area	
Crinum pedunculatum	Swamp Lily
Finicia nodosa	Knobby Club Rush
Juncus usitatus	Common Rush
Lomandra hystrix	River Mat Rush
Shade Mix	
Asplenium nidus	Birds Nest Fern
Clivia miniata	Clivia
Ophiopogon japonicus	Mondo Grass
Sphaeropteris (Cyathea) cooperi	Rough Tree Fern
Viola hederacea	Native Violet

Interior Plants

Botanic Name	Common Name
Aglaonema sp.	Chinese Evergreen
Aspidistra elatior	Cast Iron Plant
Codiaeum variegatum	Croton
Epipremnum aureum	Pothos Totem
Ficus Lyrata	Fiddle Leaf Fig
Philodendron 'Rojo Congo'	Philodendron sp.
Raphis excelsa	Lady's Fingers Palm
Sanseveira superba	Mother in Laws Tongue
Spathiphyllum sensation	Madonna Lily / Peace Lily
Spathiphyllum wallisii	Peace Lily
Strelizia nicholii	Bird Of Paradise

Notes.

- *The listed plant species are cross-referenced with the landscape plans accompanying the REF.*
- *Species selection will be further refined and consulted upon in the next stages.*

Crinum pedunculatum
Swamp Lily

Finicia nodosa
Knobby Club Rush

Juncus usitatus
Common Rush

Lomandra hystrix
River Mat Rush

Asplenium nidus
Birds Nest Fern

Clivia miniata
Clivea

Ophiopogon japonicus
Mondo Grass

Sphaeropteris (Cyathea) cooperi
Rough Tree Fern

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Aspidistra elatior
Cast Iron Plant

Codiaeum variegatum
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Epipremnum aureum
Pothos Totem

Ficus Lyrata
Fiddle Leaf Fig

Raphis excelsa
Lady's Fingers Palm

Sanseveira superba
Mother in laws Tongue

Strelizia nicholii
Bird Of Paradise

3 REFERENCES

Endnotes

1 Dowdy, A. et al. 2015, East Coast Cluster Report, Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports, eds. Ekström, M. et al., CSIRO and Bureau of Meteorology, Australia. [Internet- accessed 07/10/2024]. Available from: https://www.climatechangeinaustralia.gov.au/media/ccia/2.2/cms_page_media/168/EAST_COAST_CLUSTER_REPORT_2021updated.pdf

2 NSW Government Architect. 2020. Draft Greener Places Design Guide. Open Space for Recreation, Urban Tree Canopy, Bushland and Waterways. [Internet- accessed 07/10/2024. Available from: https://www.planning.nsw.gov.au/sites/default/files/2023-10/draft-greener-places-design-guide.pdf

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