

DEPARTMENT OF PLANNING, LANDS
AND HERITAGE

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Western Australian
Planning Commission

APPROVED

01-Nov-2021 SDAU-027-20

Waterford Student Accommodation

Landscape Masterplan/Concept Design

Development Application - REVISED

Date: September 2021

Project: Waterford Student Accommodation
Client: Exal Group
Date: 09/11/2020
Revision: D

Document Issue:		
Issue for:	Revision:	Date:
DRAFT DA	A	30/10/2020
For revision	B	06/11/2020
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DA - REVISION	D	07/09/2021
DA - REVISION	E	22/09/2021

Prepared by:





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5.0 Deep soil

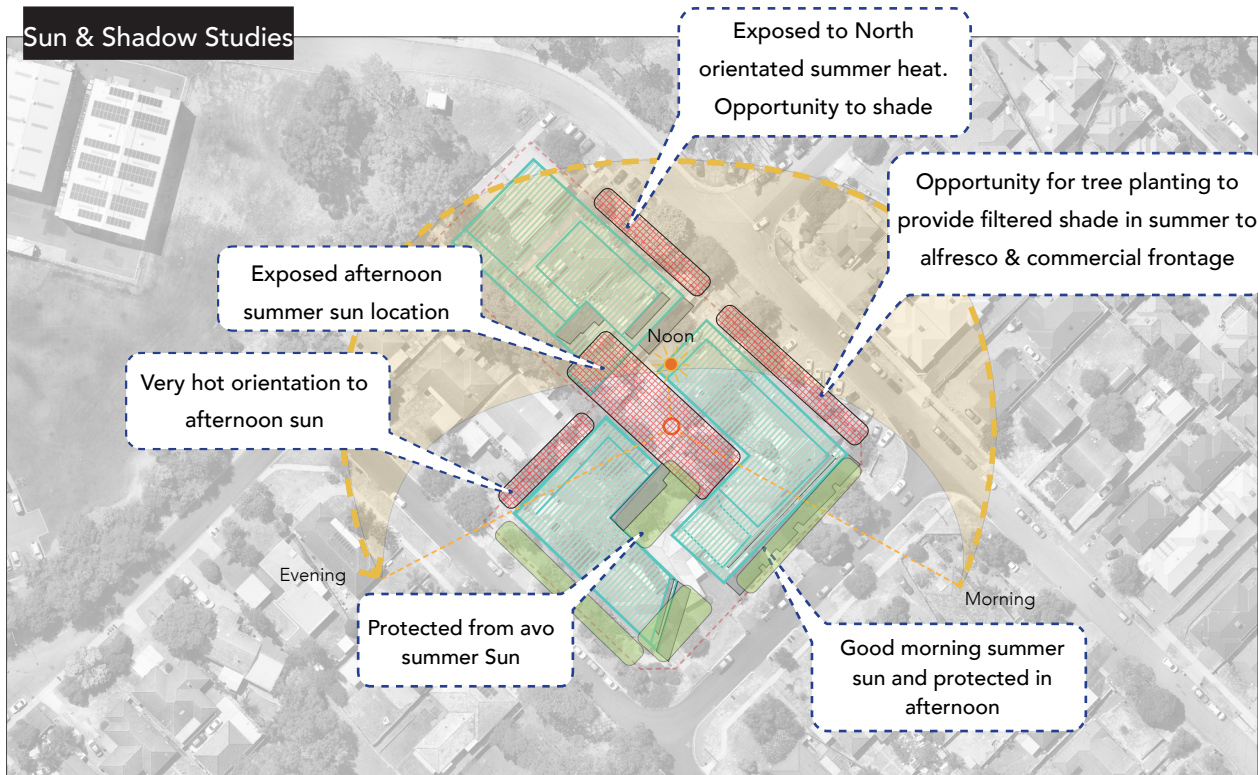
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1.1 Analysis

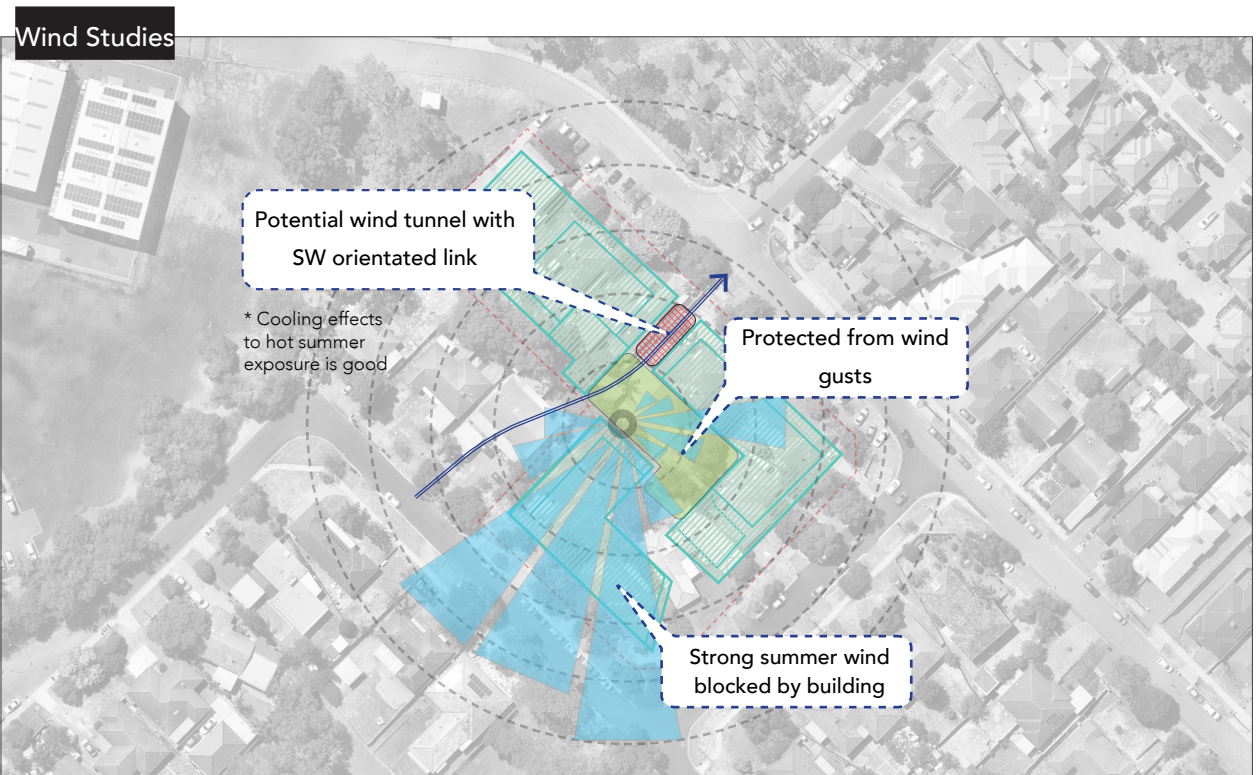
Environmental Conditions

* University environments are used mainly between February - November (over cooler months)

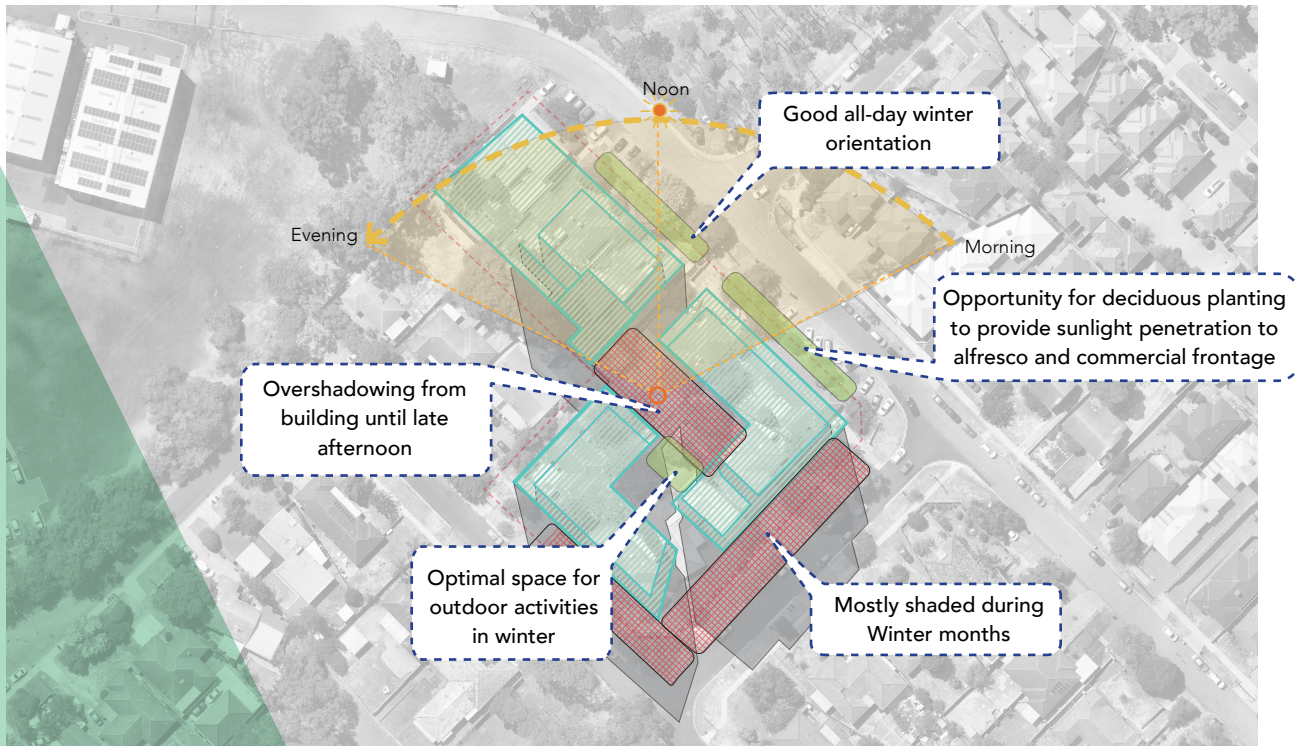
- Good conditions
- Problematic conditions



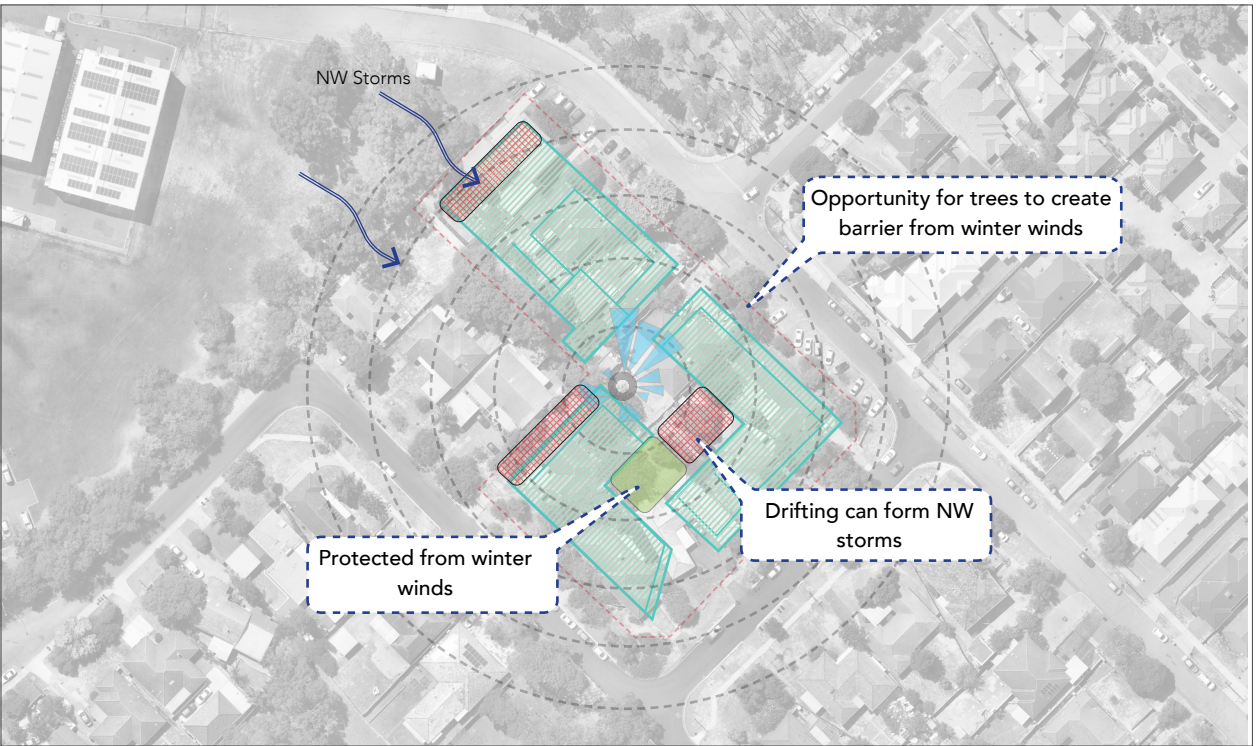
Summer 21st Dec 12p.m.



Summer 21st Dec



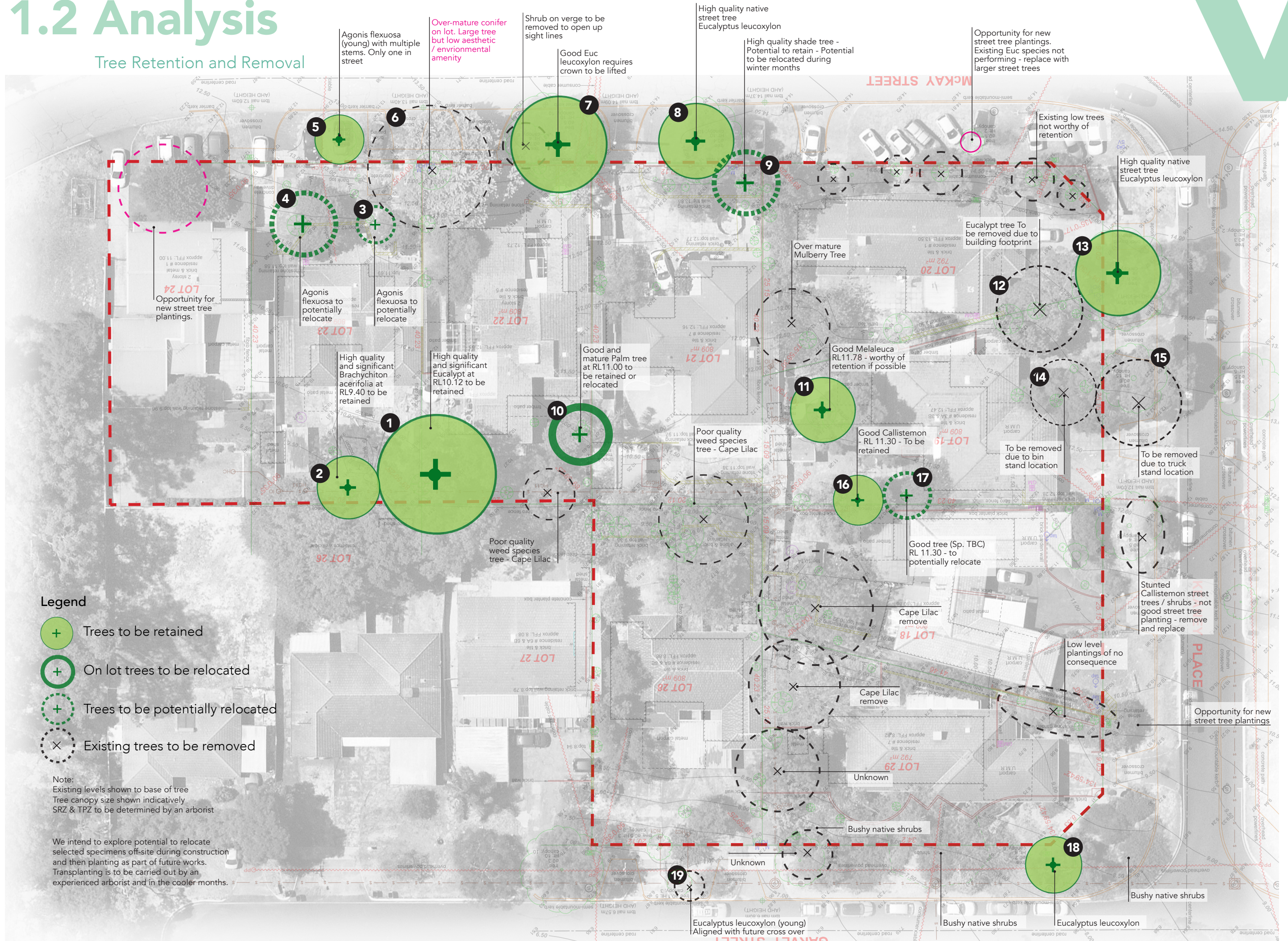
Winter 21st June 12p.m.



Winter 21st June

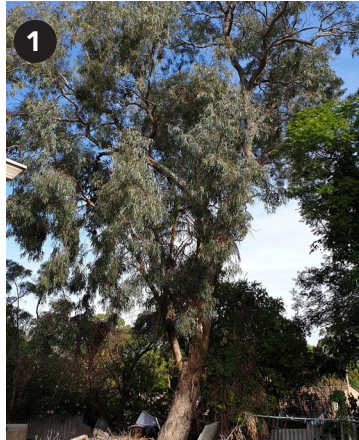
1.2 Analysis

Tree Retention and Removal



1.3 Analysis

Existing Tree Images



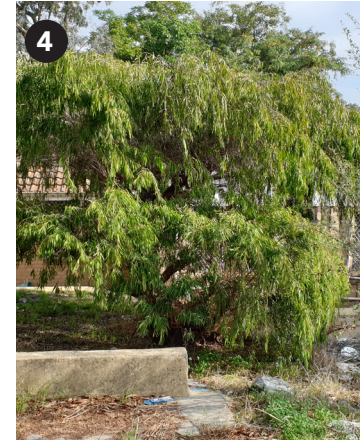
Location: On Lot
Tree: *Eucalypt sp.*
Action: Retain



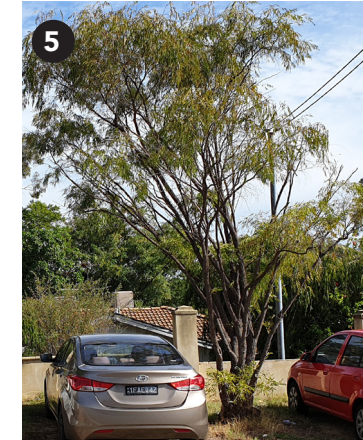
Location: On Lot
Tree: *Brachychiton Acerifolia*
Action: Retain



Location: On Lot
Tree: *Agonis flexuosa*
Action: Relocate if possible



Location: On Lot
Tree: *Agonis flexuosa*
Action: Relocate if possible



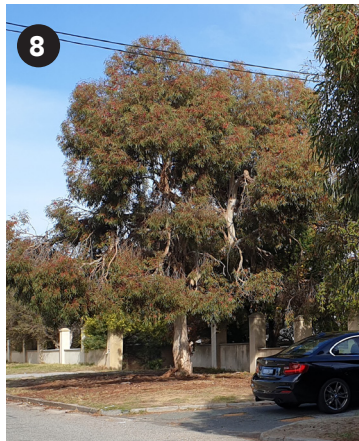
Location: Street Verge
Tree: *Agonis flexuosa*
Action: Retain



Location: On Lot
Tree: *Conifer sp.*
Action: Remove over-mature large tree with low aesthetic value / environmental amenity



Location: Street Verge
Tree: *Eucalyptus leucoxylon*
Action: Retain



Location: Street Verge
Tree: *Eucalyptus leucoxylon*
Action: Retain



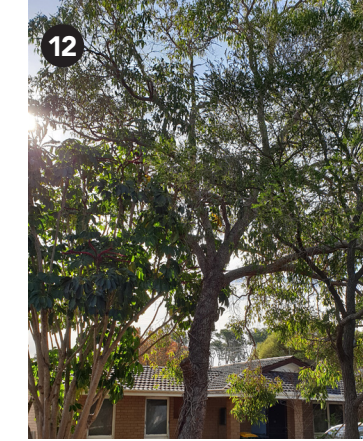
Location: On Lot
Tree: *Liquidambar styraciflua*
Action: Potential to retain or relocate



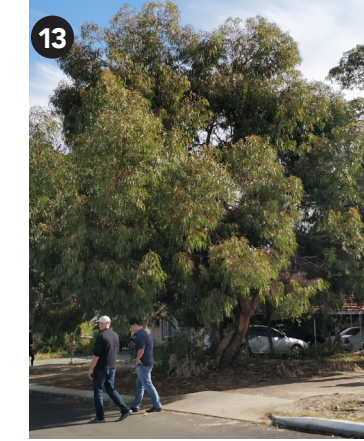
Location: On Lot
Tree: *Palm Arecastrum Romanzoffianum*
Action: Potential to retain or relocate



Location: On Lot
Tree: *Melaleuca styphelioides*
Action: Retain



Location: On Lot
Tree: *Eucalypt sp.*
Action: Remove due to building footprint



Location: Street Verge
Tree: *Eucalyptus leucoxylon*
Action: Retain



Location: On Lot
Tree: *Eucalyptus sp.*
Action: Reconfigure basement to retain



Location: Street Verge
Tree: *Eucalyptus sp.*
Action: To be removed due to truck stand location



Location: On Lot
Tree: *Callistemon*
Action: Retain



Location: On Lot
Tree: *Unknown*
Action: Potentially relocate & retain if possible



Location: Street Verge
Tree: *Eucalyptus leucoxylon*
Action: Retain



Location: Street Verge
Tree: *Eucalyptus leucoxylon*
Action: Remove due to future crossover

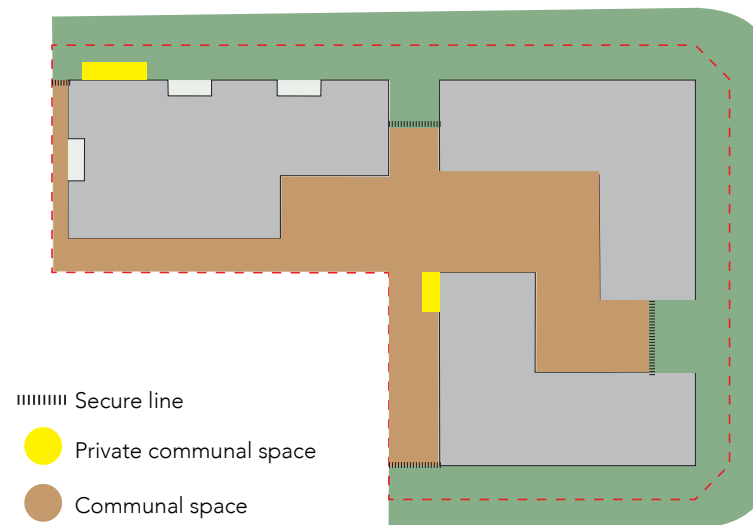


Trees requiring further consideration and architectural response

2.0 Courtyard strategy

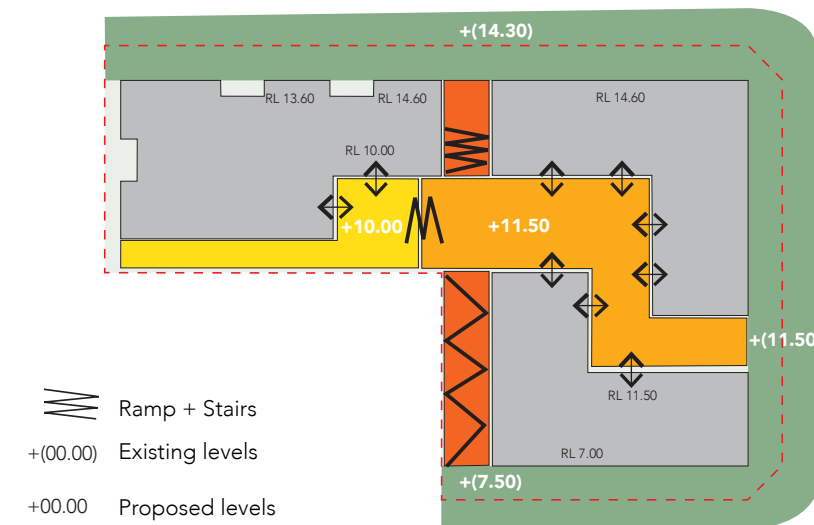
Courtyard Strategy - Access & Security

Objective: Create clear points of entry to courtyards whilst maintaining security.



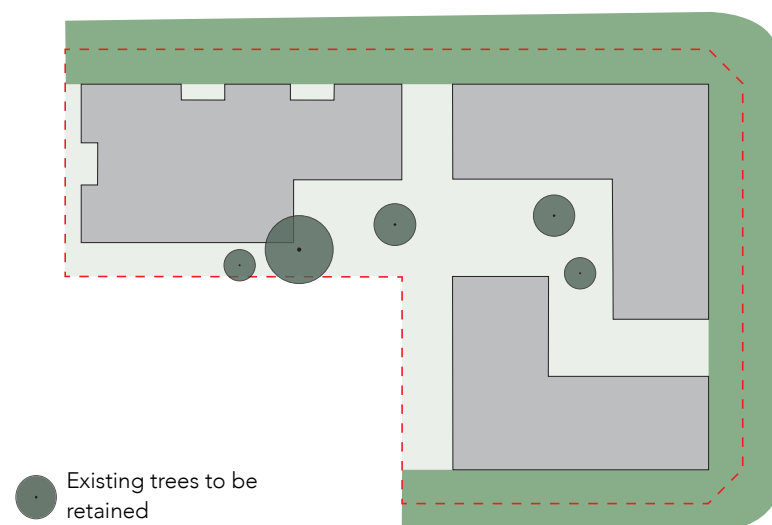
Courtyard Strategy - Levels Management

Objective: Manage levels whilst creating a unified courtyard space.



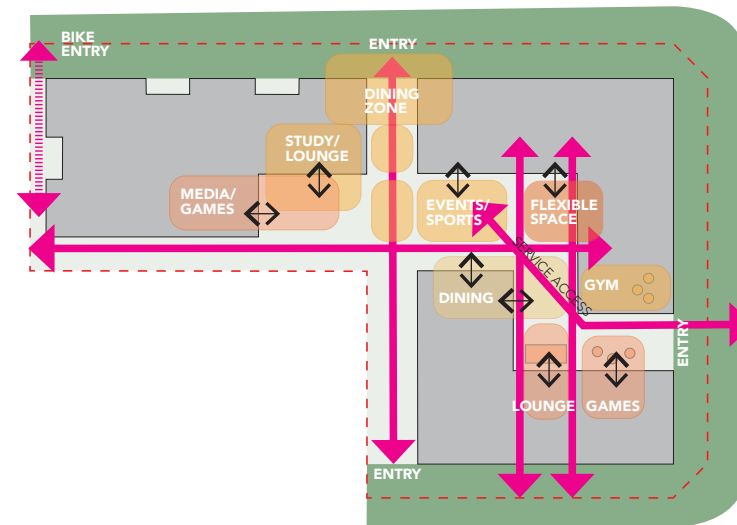
Courtyard Strategy - Trees

Objective: Retain existing trees and associated soil levels within new highly modified environments.



Courtyard Strategy - Program

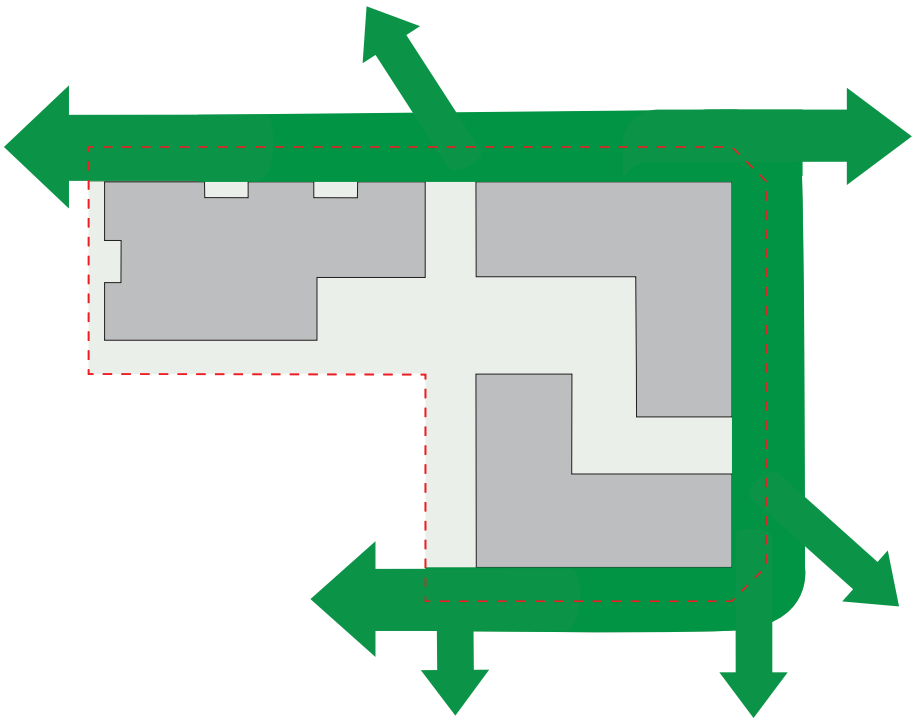
Objective: Extending the landscape to blend indoor and outdoor environments.



2.1 Verge strategy

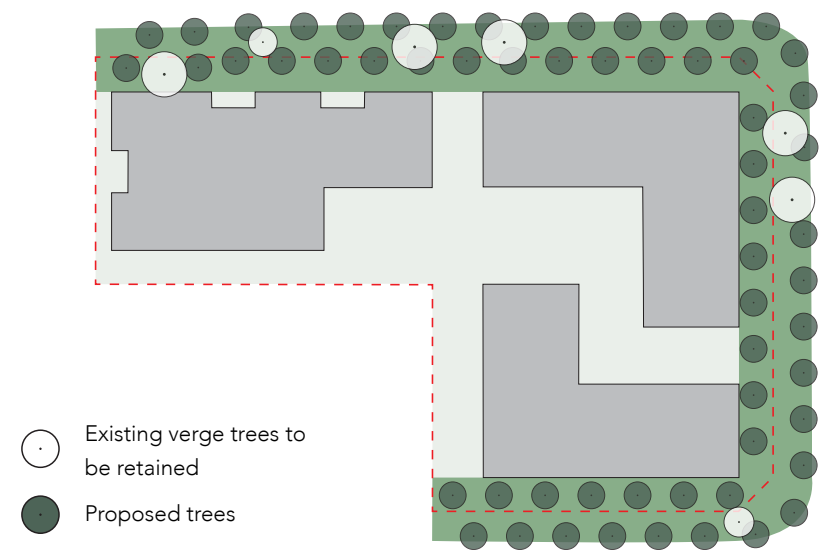
Verge Strategy - Green Frame

Objective: Establish ecological framework in 12m landscape verge.



Verge Strategy - Street Tree Canopy

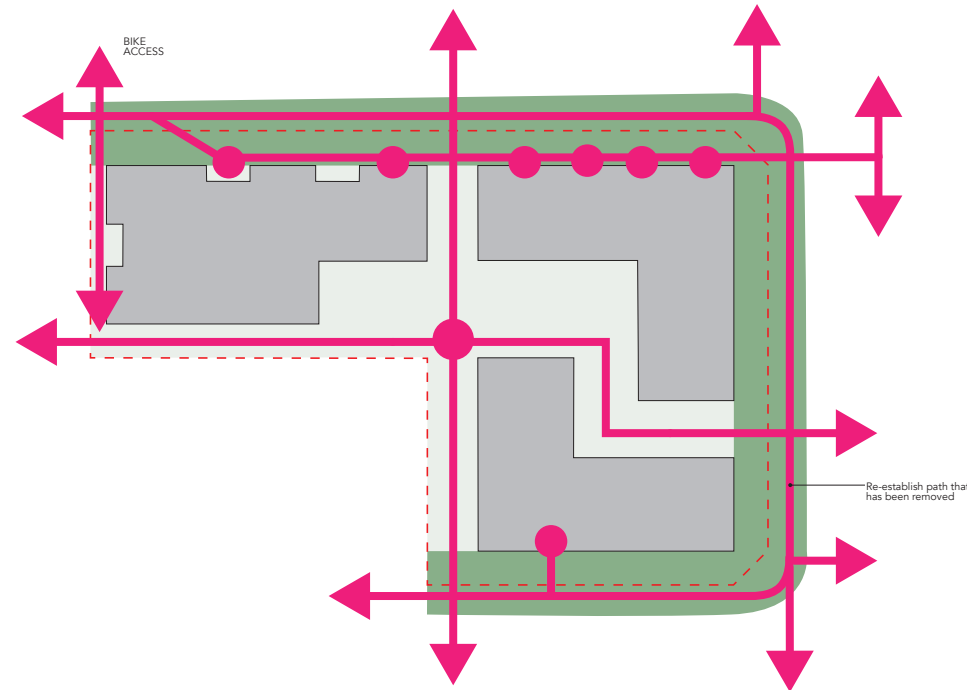
Objective: Bolster existing street trees with 2 layers of tree canopy (on verge and on lot).



2.1 Verge strategy

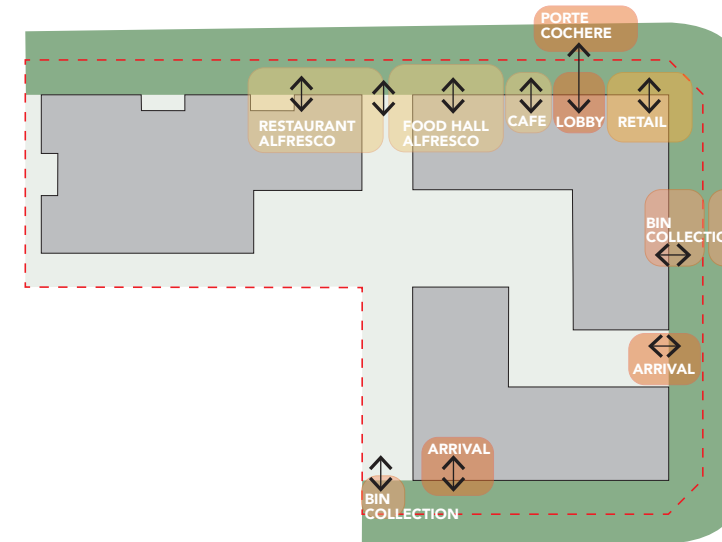
Verge Strategy - Movement

Objective: Re-establish pedestrian links & create new pedestrian paths and provide clear pedestrian entries.



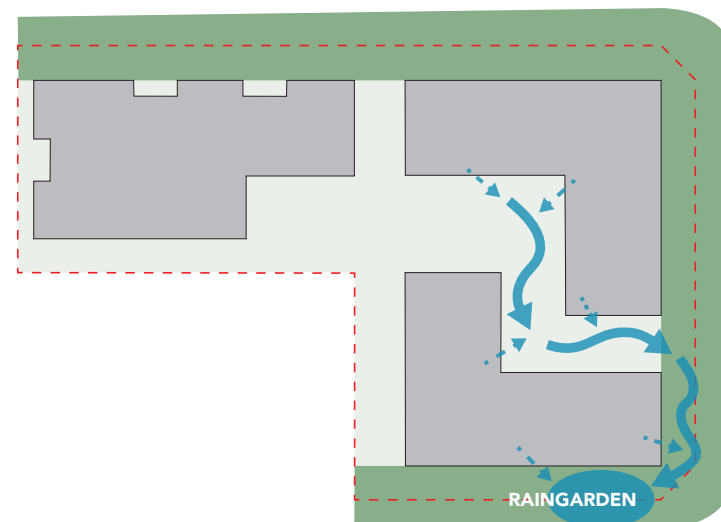
Verge Strategy - Program

Objective: Extending the landscape to blend indoor and outdoor environments and managing operational uses within the verge.



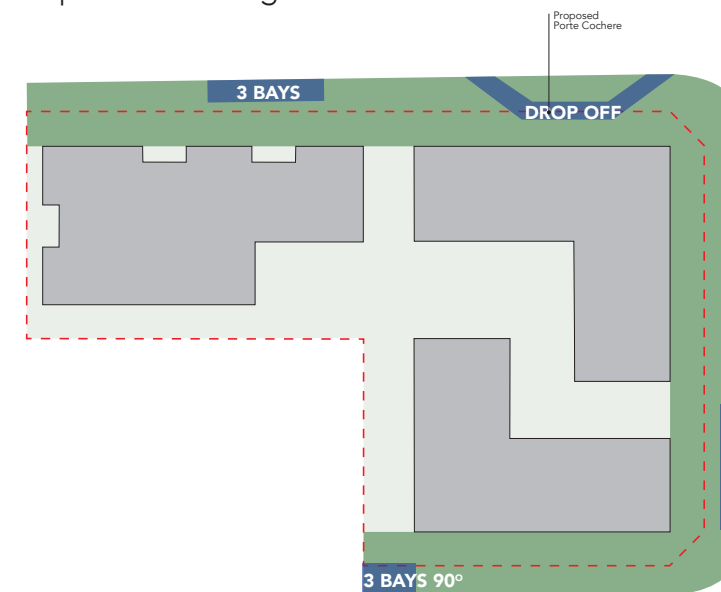
Verge Strategy - Water Strategy

Objective: Create a drainage swale (via a series of rain-gardens) through the eastern courtyard to collect stormwater and direct winter rains via a living-stream down the south eastern frontage collecting in a final raingarden/soak.



Verge Strategy - Street Parking + Activation (Commercial and Courtyard)

Objectives: Formalise distributed visitor parking & dropoff within verge.



2.0 Concept design

Site Plan





28 No. SHAVE BRUSHES BY CHERRY PORTAL FRAME - 100% PROPRIOETARY SYSTEM FOR SHAVE BRUSHES - INCREASED SPACING @ 300mm ECL 1000mm LONG

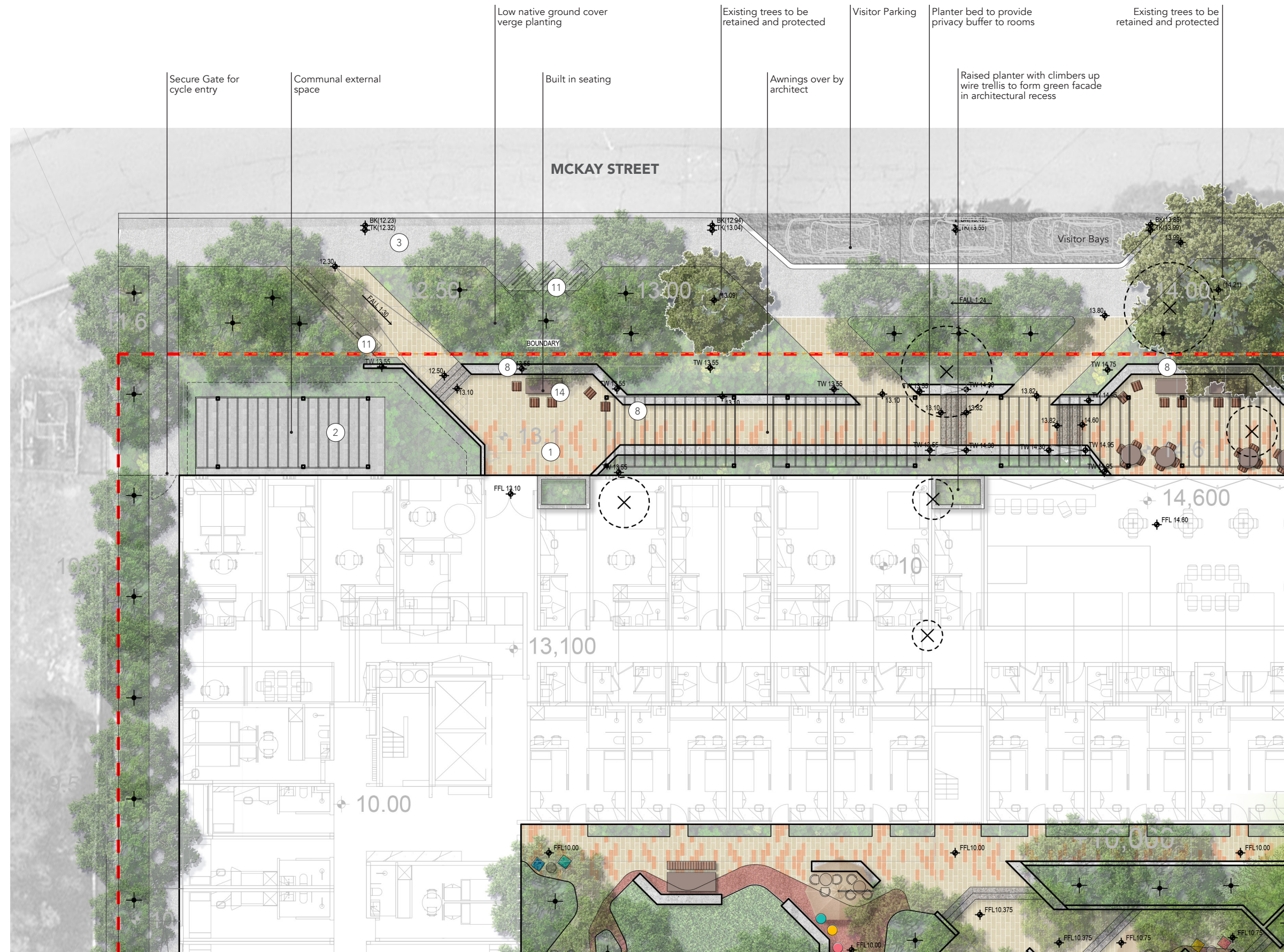
14 No. SECURE BINE STORAGE LONG MED KELLY PINKS ON ORIGINAL STEEL FRAME ON MASONRY WALL WITH GREEN ROOF OVER AT 8.50 APL



3.1 Concept

North/West Frontage Design

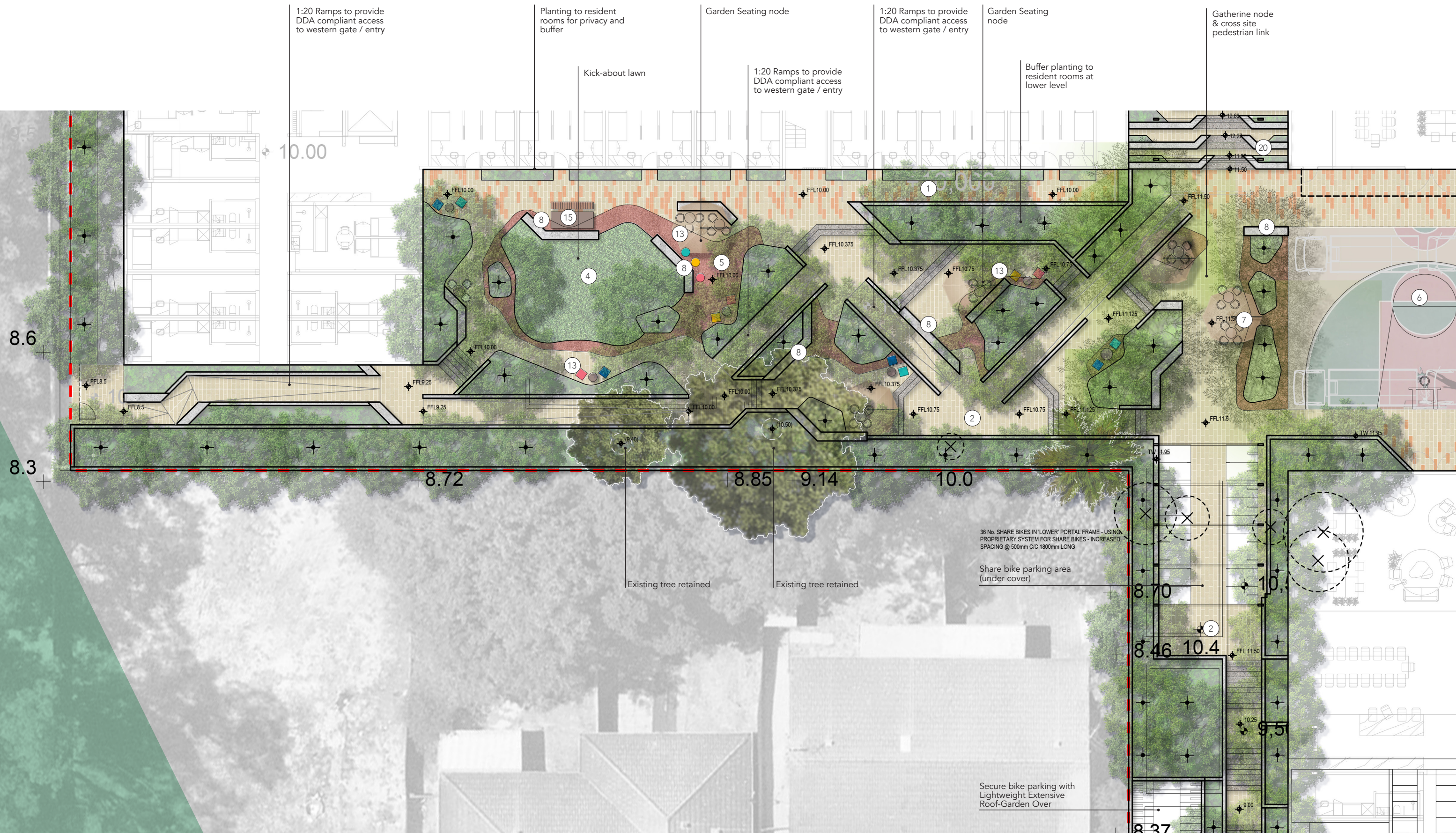
- 1 Concrete unit pavers with feature pattern
- 2 Concrete unit paver
- 3 Verge pavements - Insitu Concrete
- 4 Turf
- 5 Red stabilised gravel to low points
- 6 Plexipave to Basketball court
- 7 Composite Decking
- 8 Insitu concrete seating wall
- 9 Strip lighting - seating
- 10 Feature Lighting (Festoon)
- 11 Bike Racks
- 12 Drinking Fountain
- 13 Stools
- 14 Outdoor Lounge Areas
- 15 Outdoor picnic table stools & umbrellas
- 16 Hammock
- 17 Beanbags
- 18 Outdoor table tennis table
- 19 Round concrete planters on structure
- 20 Insitu Concrete Planters on Stairs
- 21 Living Stream element

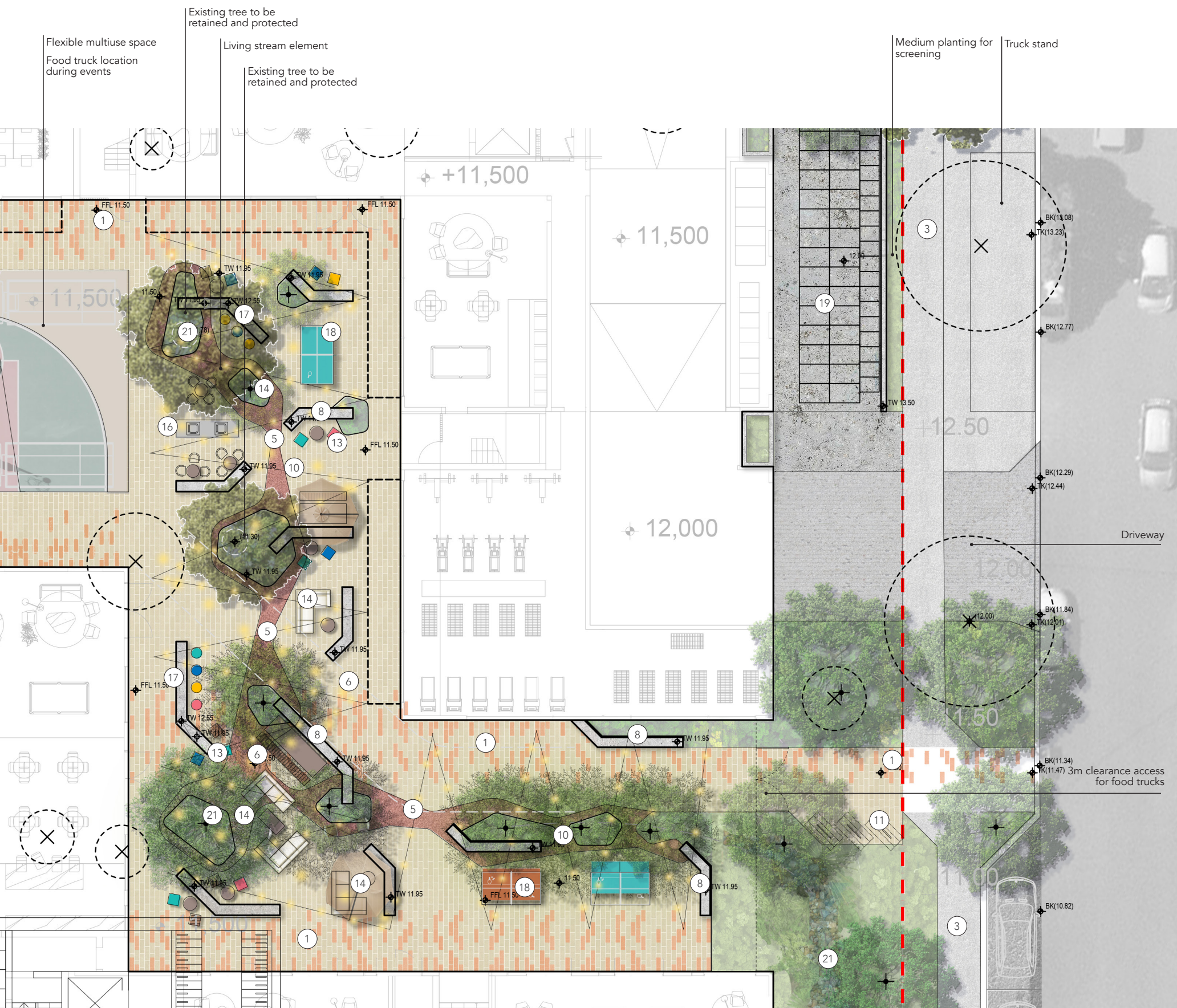


3.1 Concept

North/West Courtyard Design

PASSIVE GARDEN SPACE ←

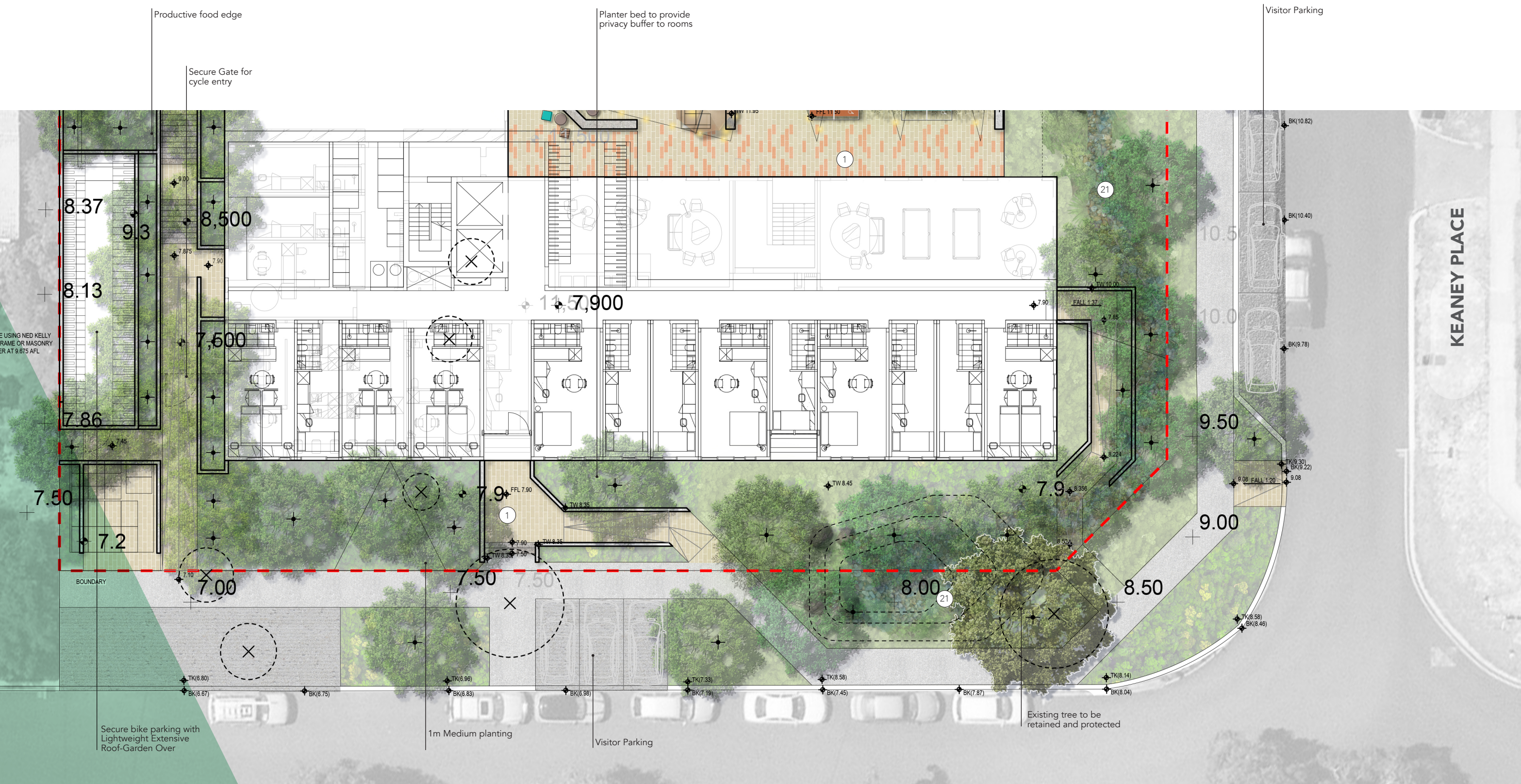




- ① Concrete unit pavers with feature pattern
- ② Concrete unit paver
- ③ Verge pavements - Insitu Concrete
- ④ Turf
- ⑤ Red stabilised gravel to low points
- ⑥ Plexipave to Basketball court
- ⑦ Composite Decking
- ⑧ Insitu concrete seating wall
- ⑨ Strip lighting - seating
- ⑩ Feature Lighting (Festoon)
- ⑪ Bike Racks
- ⑫ Drinking Fountain
- ⑬ Stools
- ⑭ Outdoor Lounge Areas
- ⑮ Outdoor picnic table stools & umbrellas
- ⑯ BBQ
- ⑰ Breakfast Bar
- ⑱ Outdoor table tennis table
- ⑲ Bin pad location
- ⑳ Insitu Concrete Planters on Stairs
- ㉑ Living Stream element

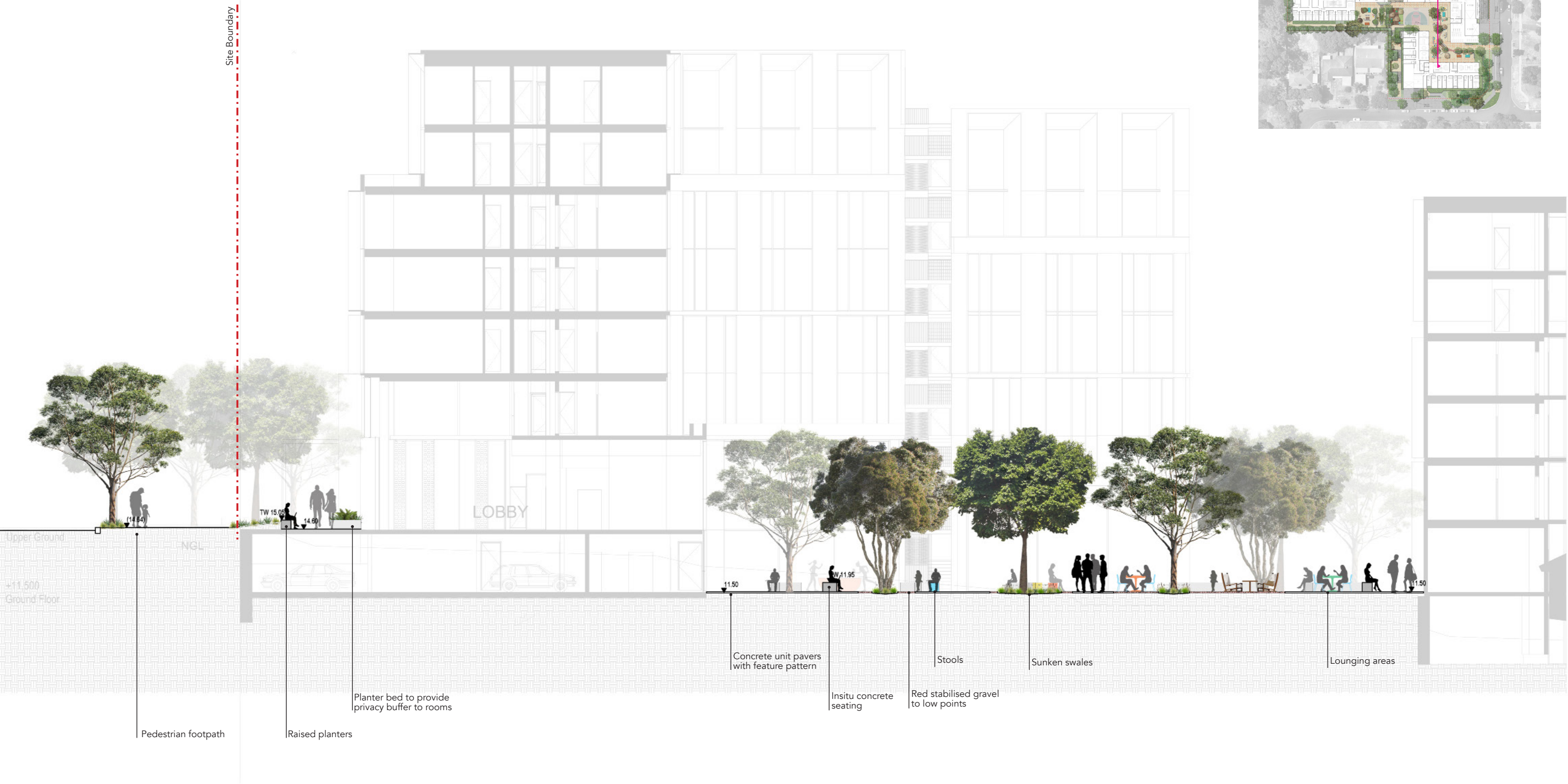
3.1 Concept

Southern Design



3.2 Internal courtyard - section

Living stream element



4.1 Material Character

Pavement



Concrete unit pavers with feature pattern associated with east west building frontages



Plexipave to Basketball court



Turf cell & Turf to Informal seating Courtyard

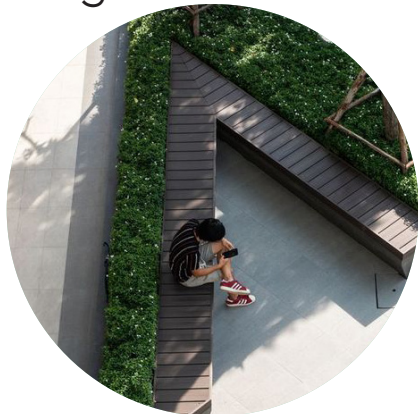


Red stabilized gravel to low points in Courtyard



Livnig stream - Swale

Seating



Composite Timber Seating



Stools



Concrete seatings



Breakfast bar

Lighting



Strip lighting - seating



Lighting on terraced landscape



Uplights in garden beds



Festoon lights

4.1 Material Character

Furniture



Bike Racks



Outdoor Lounges



Drinking Fountains



Bins



Outdoor picnic table stools and umbrellas



Hammock self standing



Beanbags

Planters

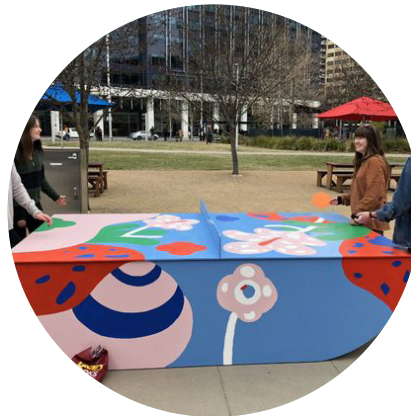


Insitu Concrete Planters on Stairs



Round Concrete planters on Structure to north eastern address over basement car parking

Play Elements



Outdoor table tennis table

4.2 Bicycle Parking Landscape Treatment

Bicycle On-Demand Rental Area



- 36 bicycle racks
- Shared bicycle bays
- Provided by the operator for on-demand rental
- Architecturally treated by extending the Public Art design of the entry harbour to read as one contiguous element

Green Roof Bicycle Storage Facility



- 74 bicycle racks
- Storage facility to cater for private bicycles
- Easily accessible by students at entry point to Garvey Street
- Green roof and architecturally treated walls to integrate with the landscape intent

Integrated Landscape Bicycle Parking



- 20 bicycle racks
- Integrated into the fabric of the landscape design
- Playful features that predominantly caters for visitors

4.2 Green Roof Bicycle Storage Landscape Treatment



Green Roof Treatment



Appropriate Soil Depth on Structure to provide for adequate plant growth



Spilling groundcovers to soften infrastructure



Integrated landscape and architectural materiality

Integrated Wall Condition



Climbing Trellis Structure



Espalier



Planting to Soften Base



Integrating Roof Structure into Trellis

Performative Landscape



Food Source for Wildlife



Habitat Provison



'Bug' Hotels / Design Element



Potential Rooftop Honey

4.3 Tree strategy

Site Plan



4.4 Planting Character

Verge Planting

CAD Code	Botanic Name	Common Name	Mature Height (m)	Ma-ture	Spacing (m)	Pot Size
Australian Native Trees						
AGO fle	Agonis flexuosa	WA Peppermint	7	8	N/A	200Lt
EUC lex	Eucalyptus leucoxylon	Yellow Gum	15	8	N/A	500Lt
MEL pre	Melaleuca preissiana	Moonah	10	5	N/A	100Lt
Australian Native Shrubs						
CAL qlr	Calothamnus quadrifidus 'Little Ripper'	One Sided Bottlebrush	0.6	1	0.8	130mm
COR ref	Correa reflexa	Native Fuchsia	1	1	0.8	130mm
DAR cit	Darwinia citriodora	Lemon-scented darwinia	0.4	0.4	0.3	130mm
DIP dam	Diplolaena dampieri	Southern Diplolaena			0.0	130mm
GRE pgs	Grevillea preissii 'Green Seaspray'	Green Seaspray PBR	1.2	1.2	0.9	130mm
LEP gla	Lepidosperma gladiatum	Coastal Sword Sedge	1	0.6	0.5	130mm
OLE axi	Olearia axillaris	Little Smokie PBR	1	1	0.8	130mm
WES fru	Westringia fruticosa	Coastal/Native Rosemary	0.8	1	0.8	130mm
Australian Native Ground Covers						
ADE ccc	Adenanthos cuneatus 'Coral Carpet'	Coral Carpet	0.4	0.8	0.6	130mm
CON acu	Conostylis aculeata	Prickly Conostylis	0.4	0.3	0.2	130mm
CON can	Conostylis candicans	Grey Cottonheads	0.3	0.3	0.2	130mm
ERE gkc	Eremophila glabra 'Kalbarri Carpet'	Tar Bush	0.2	2	1.6	130mm
GRE ggg	Grevillea obtusifolia 'Gingin Gem'	Gingin Gem	0.4	2	1.6	130mm



Agonis flexuosa
Burgundy Weeping Peppermint
Verge and Courtyard



Melaleuca preissiana
Modong, Moonah



Eucalyptus leucoxylon



Olearia axillaris
Little Smokie PBR



Westringia fruticosa
Coastal/Native Rosemary



Darwinia citriodora
Lemon-scented darwinia



Conostylis aculeata
Prickly Conostylis



Adenanthos cuneatus
'Coral Carpet'
Coral Carpet



Eremophila glabra
'Kalbarri Carpet'
Tar Bush

4.4 Planting Character

Swale Planting

CAD Code	Botanic Name	Common Name	Mature Height (m)	Ma-ture	Spacing (m)	Pot Size
Australian Native Trees						
AGO fle	Agonis flexuosa	WA Peppermint	7	5	N/A	200Lt
MEL qui	Melaleuca quinquenervia	Broaf Leaf Paperbark	10	8	N/A	200Lt
Australian Native Shrubs						
ACA cog	Acacia cognata	Limelight'	1	1	0.8	130mm
COR ref	Correa reflexa	Native Fuchsia	1	1	0.8	130mm
DAR cit	Darwinia citriodora	Lemon-scented darwinia	0.4	0.4	0.3	130mm
DOR exc	Doryanthes excelsa	Gymea Lily	3	1.6	1.2	5Lt
FIC nod	Ficinia nodosa	Knotted Club Rush	0.6	0.4	0.3	130mm
GRE cri	Grevillea crithmifolia (prostate form)	Green carpet	0.5	3	2.4	130mm
GRE pgs	Grevillea preissii 'Green Seaspray'	Green Seaspray PBR	1.2	1.2	0.9	130mm
LEP gla	Lepidosperma gladiatum	Coastal Sword Sedge	1	0.6	0.5	130mm
LOM lon	Lomandra longifolia 'Lime Tuff' PBR	Lime Tuff Mat-Rush	0.5	0.5	0.2	130mm
LOM ltn	Lomandra longifolia 'Tanika'	Spiny-heathed Mat-rush	0.6	0.65	0.5	130mm
PIT muf	Pittosporum 'Miss Muffet'	Dwarf Pittosporum	0.8	0.6	0.4	130mm
WES fru	Westringia fruticosa	Coastal/Native Rosemary	0.8	1	0.8	130mm
Exotic Shrubs						
PHO ten	Phormium tenax	New Zealand Flax	1.2	1.2	0.0	5Lt
Australian Native Ground Covers						
DAM div	Dampiera diversifolia	Creeping Dampiera	0.3	0.8	0.6	130mm
DIC rep	Dichondra repens	Kidney weed	0.1	0.3	0.2	130mm
KEN pro	Kennedia prostrata	Running Postman	0.2	1	0.8	130mm
VIO hed	Viola hederacea	Native Violet	0.1	0.4	0.4	130mm
Exotic Ground Covers						
LIR jus	Liriope muscari 'Just Right'	Just Right	0.4	0.3	0.2	130mm
OPH jap	Ophiopogon japonicas nana	Dwarf mondo	0.1	0.1	0.1	Plug



Agonis flexuosa
Burgundy Weeping Peppermint
Verge and Courtyard



Melaleuca quinquenervia
Broad-leaved Paperbark



Acacia cognata Waterfall
"Waterfall" - River Wattle



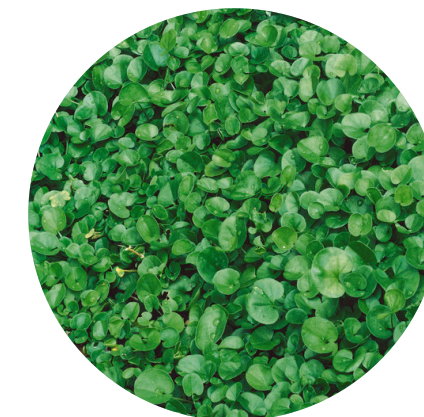
Ficinia nodosa
Knotted Club Rush



Lomandra longifolia
'Tanika'
Spiny-heathed Mat-rush



Conostylis aculeata
Prickly Conostylis



Dichondra repens
Kidney weed



Viola hederacea
Native Violet

4.4 Planting Character

Internal Courtyard Planting

CAD Code	Botanic Name	Common Name	Mature Height (m)	Ma-ture	Spacing (m)	Pot Size
Exotic Trees						
GLE tri	Gleditsia triacanthos 'Sunburst'	Honey Locust 'Sunburst'	8	8	N/A	500Lt
CAE fer	Caesalpinia ferrea	Leopard Tree	7	5	N/A	200Lt
Australian Native Shrubs						
ACA cog	Acacia cognata	Limelight'	1	1	0.8	130mm
COR ref	Correa reflexa	Native Fuchsia	1	1	0.8	130mm
DAR cit	Darwinia citriodora	Lemon-scented darwinia	0.4	0.4	0.3	130mm
PIT muf	Pittosporum 'Miss Muffet'	Dwarf Pittosporum	0.8	0.6	0.4	130mm
WES fru	Westringia fruticosa	Coastal/Native Rosemary	0.8	1	0.8	130mm
Australian Native Ground Covers						
DIC rep	Dichondra repens	Kidney weed	0.1	0.3	0.2	130mm
Exotic Ground Covers						
LIR jus	Liriope muscari 'Just Right'	Just Right	0.4	0.3	0.2	130mm
TRA jas	Trachelospermum jasminoides	Star Jasmine	0.3	1.5	0.2	130mm



Gleditsia triacanthos 'Sunburst'
Honey Locust 'Sunburst'



Caesalpinia ferrea
Leopard Tree



Acacia cognata
'Limelight'



Correa reflexa
Native Fuchsia



Pittosporum 'Miss Muffet'
Dwarf Pittosporum



Dichondra repens
Kidney weed



Liriope muscari 'Just Right'
Just Right



Trachelospermum jasminoides
Star Jasmine

4.4 Planting Character

Productive edge Planting

CAD Code	Botanic Name	Common Name	Mature Height (m)	Ma-ture	Spacing (m)	Pot Size
Exotic Trees						
CIT lim	Citrus x limon	Lemon	4	4	N/A	100Lt
OLE eur	Olea europea 'Fruitless Variety'	Olive - Fruitless	8	8	N/A	100Lt
Australian Native Shrubs						
LEU bro	Leucophyta brownii	Cushion Bush	0.5	0.5	0.2	130mm
LOM lon	Lomandra longifolia 'Lime Tuff' PBR	Lime Tuff Mat-Rush	0.5	0.5	0.2	130mm
PIT muf	Pittosporum 'Miss Muffet'	Dwarf Pittosporum	0.8	0.8	0.2	130mm
Exotic Shrubs						
AGA att	Agave attenuata	Lion's Tail	1.0	1	1.5	5Lt
COT orv	Cotyledon oriculata 'Silver Waves'	Cotyledon 'Silver Waves'	0.3	0.5	0.4	5Lt
CYM amb	Cymbopogon citratus	Lemongrass	1	1	1.2	130mm
FES gla	Festuca glauca	Blue Fescue	0.3	0.3	0.2	130mm
LAV den	Lavendula dentata	French Lavender	0.6	0.5	0.2	130mm
NEP faa	Nepeta faassenii	Catmint	0.3	0.3	0.2	130mm
ORI maj	Origanum majorana	Marjoram	0.3	0.3	0.2	130mm
ROS off	Rosmarinus officinalis	Rosemary	0.8	0.8	0.2	130mm
SAL off	Salvia officinalis	Sage	0.2	0.3	0.2	130mm
Australian Native Ground Covers						
DIC arg	Dichondra argentea 'Silver Falls'	Silver Falls	0.1	0.3	0.2	130mm
Exotic Groundcovers						
ORI vul	Origanum vulgare	Oregano	0.2	0.4	0.2	130mm
SEN man	Senecio mandraliscae 'Dwarf'	Dwarf Blue Chalk Sticks	0.2	1	0.25	130mm
THY vul	Thymus vulgaris	Common Thyme	0.2	0.4	0.2	130mm
TRA jas	Trachelospermum jasminoides	Star Jasmine	0.3	1.5	1.5	130mm



Citrus x limon
Lemon



Olea europea 'Fruitless Variety'
Olive - Fruitless



Cymbopogon citratus
Lemongrass



Lavendula dentata
French Lavender



Rosmarinus officinalis
Rosemary



Origanum vulgare
Oregano



Thymus vulgaris
Common Thyme



Senecio mandraliscae 'Dwarf'
Dwarf Blue Chalk Sticks

5.0 Deep Soil & Tree Requirements

DESIGN WA DEEP SOIL AREA (DSA) MINIMUM REQUIREMENTS	
SITE AREA	7248.30 sqm
REQUIRED DEEP SOIL PLANTING (7% site area)	507.38 sqm

GROUND FLOOR DSA	
DEEP SOIL AREA	1015.51 sqm
PERMEABLE PAVING - 20% ALLOWANCE (TOTAL: 134.45 sqm)	134.45 sqm
TOTAL DSA ON GROUND	1149.96 sqm

ADDITIONAL PLANTING ON STRUCTURE	
GROUND	254.22 sqm
LEVEL 1 - 5 PLANTER BOXES	70 sqm
LEVEL 6 ROOF GARDENS	89.75 sqm
TOTAL ON STRUCTURE PLANTING	413.97 sqm

TOTAL PLANTING	
TOTAL DSA + PLANTING ON STRUCTURE	1563.93 sqm

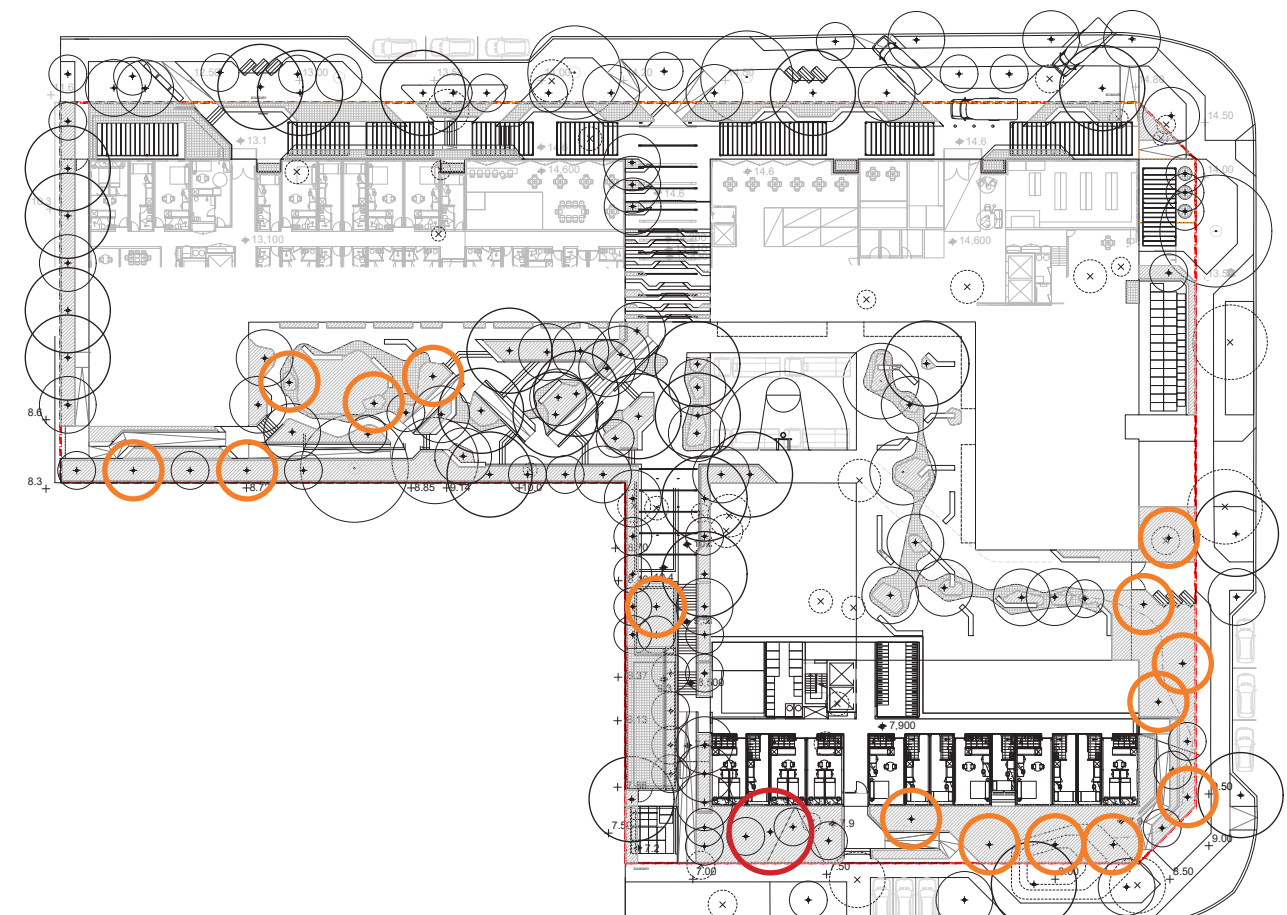
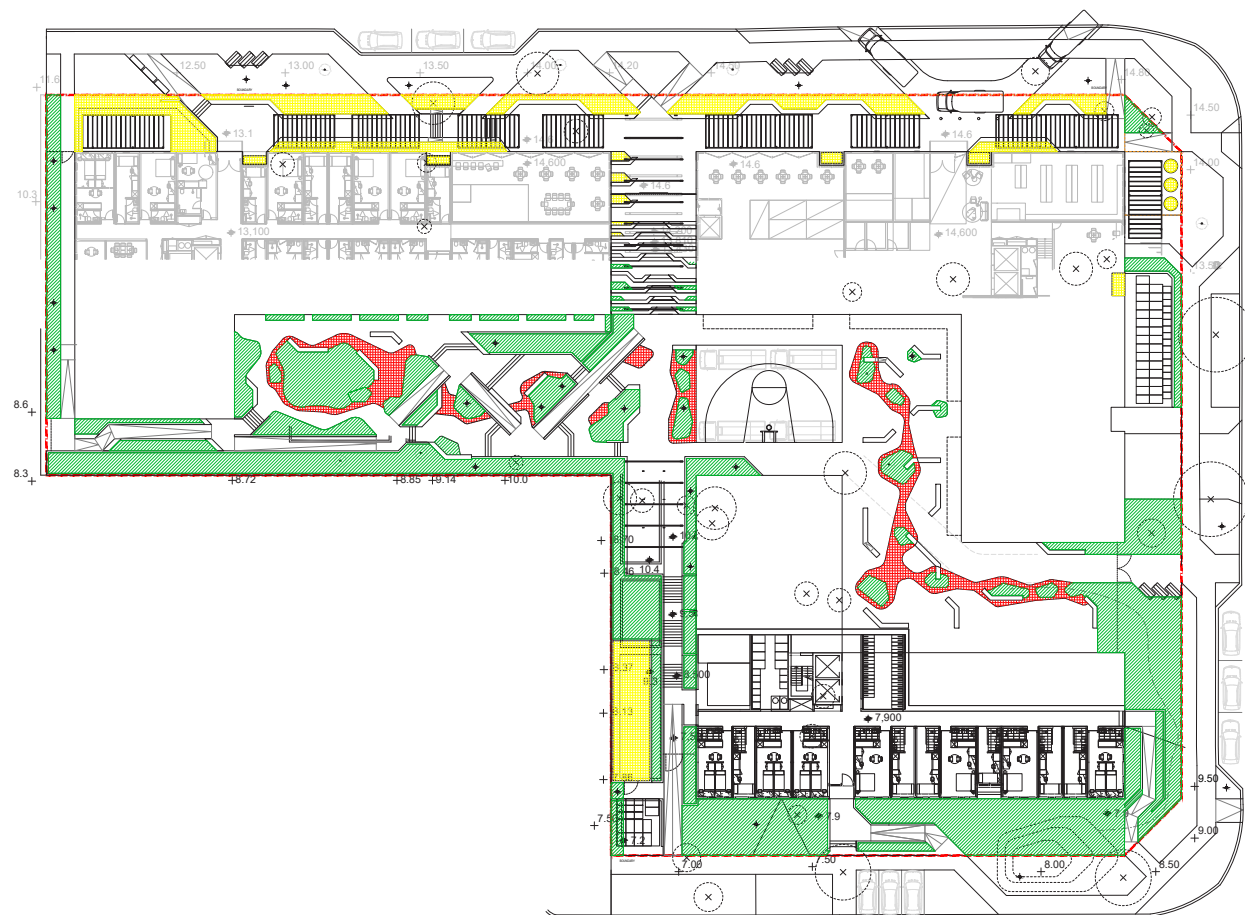
DESIGN WA MINIMUM TREE REQUIREMENT		
LOT AREA 7,224.16 sqm	1 large tree and 1 medium tree for each additional 400m2 in excess of 1000m2	SITE REQUIRES: 1 large tree + 15 medium trees
	OR 1 large tree for each additional 900m2 in excess of 1000m2 and small trees to suit area	OR 6 large trees (63m2) + small trees to suit area

ON LOT TREE PLANTING	
LARGE	1x Conforming Large Tree and an additional 19x Non-Conforming Large Trees
MEDIUM	15x Conforming Medium Trees and an additional 30x Non-Conforming Medium Trees
SMALL	15x Conforming Small Trees and an additional 19x Non-Conforming Small Trees




n.b. For On-Lot trees to be considered conforming to Residential Design Codes Vol. 2 (Refer Table 3.3b) they must achieve the minimum stipulated criteria in each of the following categories:

1. Indicative Canopy Diameter at Maturity
2. Nominal Height at Maturity
3. Required DSA per Tree (DSA per Large and Medium Trees may contain partial overlap in area with Small trees only)
4. Recommended Minimum DSA Width,
5. Indicative Pot Size at Planting

OFF LOT TREE PLANTING (VERGE)	
LARGE	8x Large Trees (Non-Conforming)
MEDIUM	12x Medium Trees (6x Conforming)
SMALL	12x Small Trees (10x Conforming)



PLANTING ZONES

-  Deep Soil Planting
-  Permeable Paving
-  On Structure Planting

ON-LOT PROPOSED TREES (CONFORMING LARGE & MEDIUM)

-  Large Tree
-  Medium Tree



LEGEND

- 1 Productive edge / buffer planting
- 2 Vehicular access
- 3 Pedestrian access
- 4 Bin pad location
- 5 Bin truck stand
- 6 Living stream element
- 7 Visitors parking bay
- 8 Food truck clearance entrance
- 9 Basketball court - Food truck area
- 10 Outdoor flexible space
- 11 Terraced stairs with portal frame over
- 12 Outdoor Lounge Areas
- 13 Port Cochere
- 14 Secure Gate entry
- 15 Alfresco Dining
- 16 Arbour structure over by architect
- 17 Shared bike parking area (under cover)
- 18 Secure Bicycle Parking (with light weight extensive roof garden over)