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GURNER AVENUE AUSTRAL

MASTER PLAN AND URBAN DESIGN REPORT

4 August 2022

NSW GOVERNMENT

LANDCOM

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URBAN DESIGN REPORT

August 4, 2022

Prepared by e8urban pty ltd for Landcom & The Office for Strategic Lands

LANDCOM

NSW GOVERNMENT

Issue	Revision	Purpose	By	Date
DA SUBMISSION	06	UPDATE	JA/JR/VX	August 4, 2022 6:03 PM

Acknowledgment of the professional consulting team, who's work has informed the production of this report and been incorporated into the text, diagrams and content presented.

Landscape design	Scape Design
Designing with Country	Fellingham Consultancy and Design
Bushfire and Ecology	Eco Logical Australia
Civil Engineer	Calibre Group
Quantity Surveyor	MBMpl
Statutory Planning	GLN Planning
Surveyor	Project Surveyors
Traffic and Transport	SCT Consulting

Warramee mittigar goorrum burruk. Teeart-ti murra daruga pemel. Teeart-ti murra ya pemel ngalaringi bubbuna. Mittigar gurrung burruck gneene da daraga pemel.

We would like to Acknowledge the Traditional owners of the lands of Austral and the Surrounds, the Darug

We acknowledge and honor the Ancestors and Elders of the Past, Honoring the Elders of the Present, and Those Emerging Elders of the Future. We Acknowledge the stories and traditions of the Darug nation, And we will create with the blessing over the Lands, Waters, Sky, and winds that surround, with heart to ensure to create beautiful outcomes for generations to come.

Uncle James Carroll, Darug Man, Elder and traditional kinship to Darug Country

Content

Executive Summary

Landcom and the Office of Strategic Land (OSL) are partner developers for a 48.77 hectare site (the Site) located in Austral, within the Liverpool City Council Local Government Area.

This project (the Austral Project) is a key urban land development project that is the first undertaking in a strategic programme known as the OSL Programme.

The OSL Programme

For more than 60 years, the OSL has worked with local councils and other partners within the Greater Sydney region to secure land for regional open space, important biodiversity corridors and natural conservation areas. The OSL has used its unique position to acquire and hold sites to enable government to protect land in future growth areas, accommodate population growth and new infrastructure and deliver future planning projects.

Landcom acts as the NSW Government's land and property development organisation. Landcom works with government and the private and not-for-profit sectors to deliver exemplary housing projects that provide social and economic benefits to the people of NSW.

Landcom helps the NSW Government achieve its urban management objectives by taking a lead role in improving the supply, diversity and affordability of new housing.

Landcom's mission is to create more affordable and sustainable communities.

Key Objectives for Austral

The shared partner objectives of Landcom and OSL for this programme of work is to:

- Create a mix of low-rise medium density housing based on the "missing middle" typology;
- Provide affordable housing consistent with Landcom's target;
- Demonstrate excellence in urban design that can be replicated by other developers in greenfield locations;
- Contribute to a more liveable city by exploring how streets and place making contribute to community connectivity.;
- Responsive to the needs and aspirations of changing household demographics;
- Inviting use and habitation, interaction, productivity and enjoyment, and;
- Healthy for all members of our communities, promoting physical activity, social cohesion, and community safety and security to support people's wellbeing.

Report Purpose

This urban design report is an explanatory document that accompanies the Public Domain submission for the project. It provides content for the project and expands upon the design moves and intended urban design outcomes.

The Austral Site

Gurner Avenue Austral (the Site) is a greenfield site known as DP1223501,

Location

The Site is located in Austral NSW in an area undergoing a transformation from market gardens and agriculture to small lot housing.

Area

The Site comprises of land owned by OSL located at 75 Gurner Avenue, Austral in the Liverpool Local Government Area. The site is an irregular shape with a long access handle to Gurner Avenue and comprises an area of approximately 48.77 hectares. The Site is located on the northern side of Gurner Avenue, and part of the Site on the southern boundary has direct frontage to Gurner Avenue.

East and West

Austral is split into two developable areas - east and west - divided by Kemps Creek in the centre of the Site.

Interfaces

The surrounding locality of the site varies greatly.

North

To the north of the site is land zoned for urban development separated by a band of rural transition land generally following the alignment of the high voltage power lines owned and managed by TransGrid. Further to the north is the major Kemps Creek Substation and Kemps Creek Nature Reserve which is part of the Western Sydney Parklands.

South

Land to the south comprises properties on the northern side of Gurner Avenue progressively being redeveloped for urban purposes, with a recent sub-division along Seoul Avenue in the south-east being typical of surrounding development..

East

Western Sydney Parklands is located to the east of the Site, with a major gas easement located on the eastern boundary of the Site.

West

To the west of the site is land within a residential zone and identified for electricity transmission purposes, and is earmarked for the future Snowy Hydro 2 project.

Figure 1: The Austral Site

Methodology

This work is the second phase in a process with the ultimate aim of allowing OSL to provide subdivision development lots to the market. The anticipated sequence of project work is identified below:

- Phase 1 - Due Diligence
- **Phase 2 - Preparation and Obtaining Development consent**
- Phase 3 - Detailed Design and Tender Documents
- Phase 4 - Construction

Summary of Work Undertaken to Date

e8urban have developed this urban design report as part of a multidisciplinary team including:

- Landscape Architects and Public Domain
- Built Form Testing (DKO Architects)
- Designing with Country (Fellingham Consultancy and Design)
- Civil Engineers (Calibre);
- Statutory and Urban Planners (BCC);
- Geotech and Contamination (Douglas Partners);
- Ecology (Ecological Australia)
- Surveyor (Project Surveyors);
- Traffic and Transport (SCT Consulting);
- Quantity Surveyor (MBMpl)

Working with our client the consultant team we have developed this urban design report to provide a future vision for the site, a Master Plan, public domain framework and indicative building typologies.

The tasks undertaken to date have included:

- Site inspections;
- Background document reviews;
- Precedent research;
- Site analysis and mapping;
- Identification of opportunities and constraints;
- Development of a vision for the Site, and;
- Options development, testing and evaluation.

Constraints and Opportunities Addressed

The key issues that the urban design address are:

- Facilitating a new residential sub-division in a recognised growth precinct ;
- Aligning with the Austral and Leppington Indicative Layout Plan (ILP);
- Linking open space, and contributing top the Sydney Green Grid;
- Addressing interfaces with surrounding land, some of which is yet to be developed;
- Master planning adjoining restricted ecological areas and major service easements;
- Delivering housing diversity;
- Creating a high quality public domain;
- Creation of high quality active transport links;
- Mitigating local climatic challenges, and;
- Responding to the local character and desired future character of the area.

Compliance with Planning Controls

State Environmental Planning Policy (Sydney Region Growth Centres) 2006

State Environmental Planning Policy (SEPP) 2006 is the principal planning instrument applying to the site.

This instrument establishes land use zones applying to the site and key development standards. It is supported by Liverpool City Council Growth Centre Precincts Development Control Plan including Schedule 1 – Austral and Leppington North Precincts.

Figure 2: Photos, the Austral Site

Project Vision and Outcomes

The Changing Context for Development

The Austral and Leppington North Precincts ILP was developed over ten years ago. Since this time Significant shifts have occurred that demand a rethink of how suburban communities are planned and developed.

In particular, the following changes support a new approach for the Austral Project:

Major infrastructure Investment

- Badgerys Creek Airport
- Bradfield CBD
- Metro South West
- M12 and Future Sydney Orbital

Climate Change and Environment

- A focus on Country as the starting point for design
- The acknowledgement of Urban Heat Island Impact
- A commitment to NetZero for 2050
- Electric Vehicles and development in Batteries
- The Greening our City Premier's Priority aims to increase the tree canopy and green cover across Greater Sydney by planting one million trees by 2022. This is part of a broader commitment to plant five million trees by 2030.

In addition to these influences, rising housing costs and a trend towards smaller lots are also key drivers for the project.

These facts have changed the spatial, contextual and social and economic framework in which this project should be considered, and our design team have responded to this new context with an exciting design that we believe can be a model for future residential developments across the regional, nationally and internationally.

Vision

A new community that sets a benchmark for the sustainable design of human-centred suburbs

Central to the project vision are the streets that knit the new community together.

We are proposing an innovative public domain where low-speed streets provide the principle forum for interactions between residents.

Key Project Facts

The adjacent info graphic highlights some of the key outcomes of our urban design, and demonstrates the social, environmental and economic benefits that will be delivered.

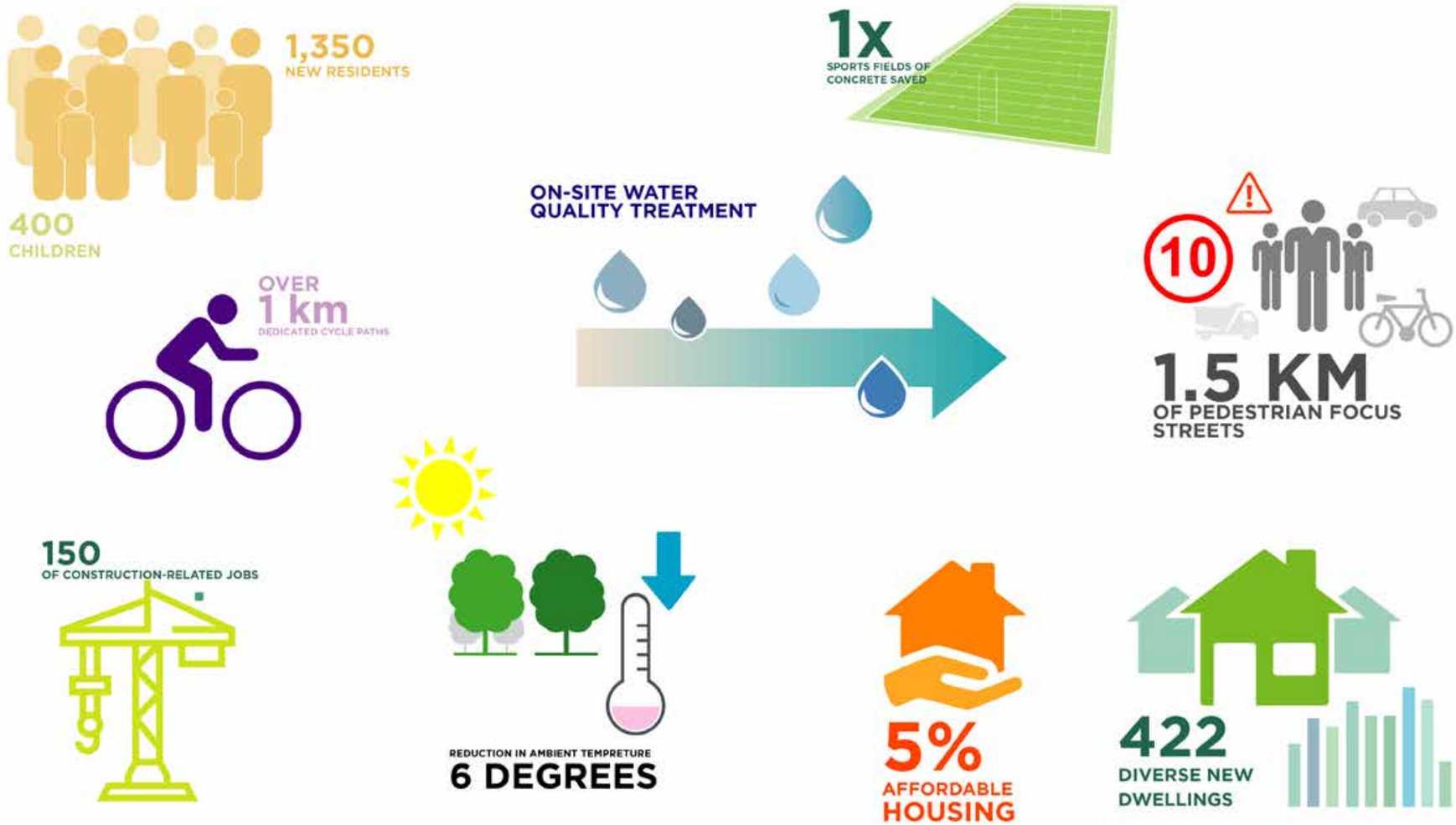

Figure 3: Austral Info Graphic

The Master Plan

The Master Plan promotes an exciting spatial vision. It embodies the OSL / Landcom Project Objectives for delivering high quality urban design, considered place making and innovation above and beyond the current market expectations.

The Master Plan would provide up to 417 new dwellings in a range of formats reflecting the diversity and needs of the local community.

The adjacent diagram presents the Master Plan in axonometric form, viewed from the south west. The graphic clearly shows Austral West in the foreground with Kemps Creek forming a heavily vegetated separation with Austral East.

Features of The Master Plan

The adjacent sketch highlights some of the features of the urban design for Gurner Avenue, Austral, these include:

1. Entry and arrival statement on Edmondson Avenue as an extension of the ILP Collector Road, that evokes a native forest with flowering gum trees and wide verges
2. An east west green link with verges and extensive street tree planting to provide shade and opportunities for WSUD
3. An extensive network of low speed shared zones streets totalling 2.4 kilometres
4. Themed landscape parklets within the shared zone network that provide open space and activation nodes
5. A mix of smaller lot sizes and housing type
6. Large lot housing in the east of the Site with a public road and cycle path to Western Sydney Parklands
7. A landscaped overland flow path in the east of the site
8. Landscape interfaces with planned stormwater basins and infrastructure
10. A local park with a blend of active and passive open space
11. Opportunities for a childcare centre and a small scale local shop
12. Potential for a future walkway connecting the east and west sides of the development

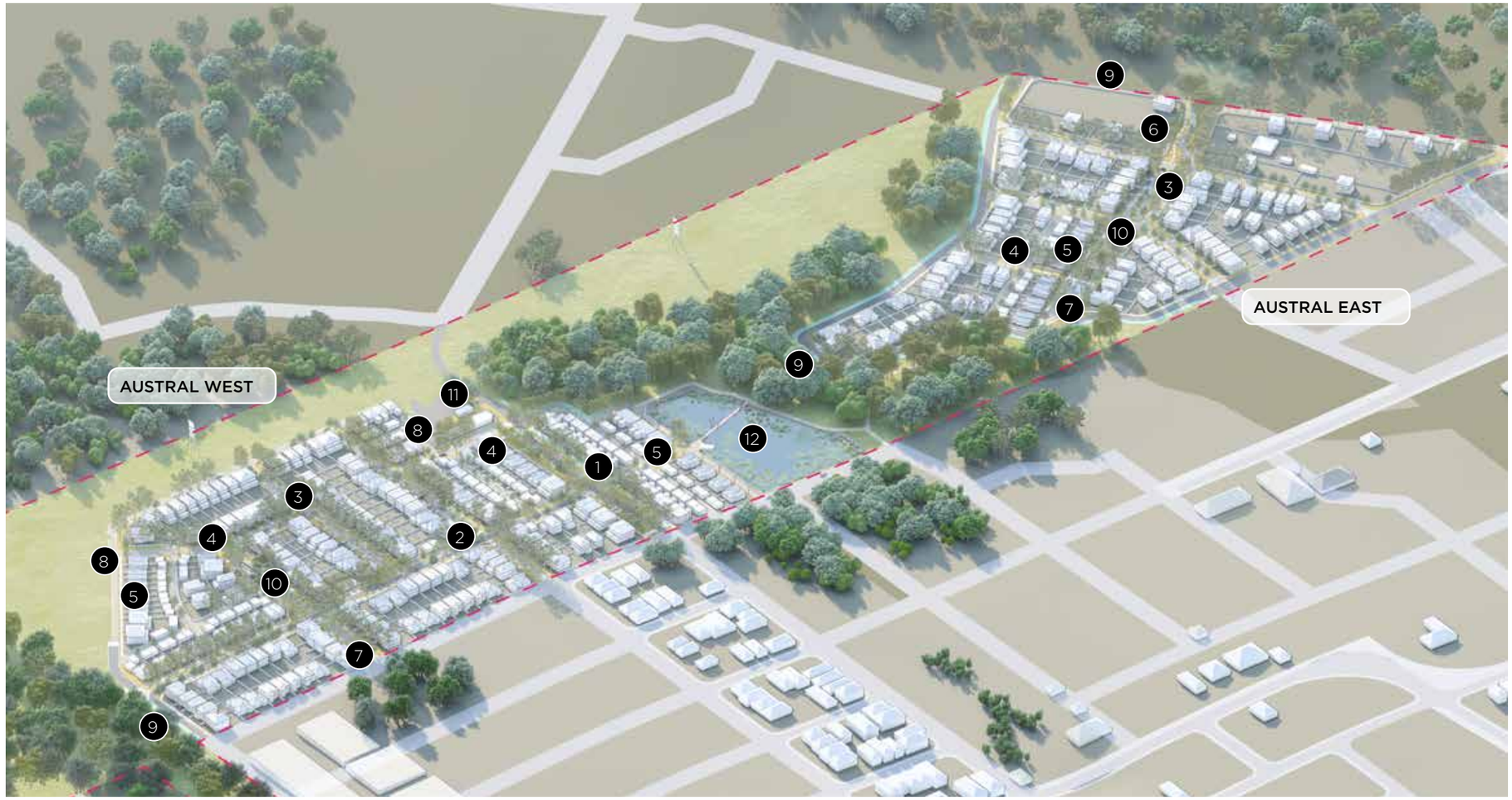

Figure 4: Axonometric of the Site from the south west

Figure 5: Conceptual render of the local park and shared zone streets

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Project Stages

The project staging has been developed to address the unique features of the site and the delivery of public infrastructure.

Site Boundary

Austral West
123 Residential lots and 22 residue lots

Austral East
92 Residential lots

Future Stages
Allows for development of the reminder of the Site

Figure 6: Indicative project stages

1.0 The Site and Context

1.1 Site Context

The Greater Sydney Region Plan, A Metropolis of Three Cities is built on a vision of three cities where most residents live within 30 minutes of their jobs, education and health facilities, services and great places. This is consistent with the 10 Directions in Directions for a Greater Sydney which establish the aspirations for the region over the next 40 years and are a core component of the vision and a measure of the Plan's performance.

To meet the needs of a growing and changing population the vision seeks to transform Greater Sydney into a metropolis of three cities[1]:

- The Western Parkland City
- The Central River City
- The Eastern Harbour City

The Site is located in the Western Parkland City. The Greater Sydney Green Grid will be a core element of the amenity of the Western Parkland City, which is adjacent to the Site.

Regional Open Space

The Site is adjacent to the Western Sydney Parklands which extends some 27km and covers more than 5,280 hectares of land in Sydney's west, with the area adjoining site as being developed in the future as an area for sport and structured recreation.

Regional Transport

The Site is located approximately 4.8km north of Leppington Train Station on the T2 Inner West and Leppington Line and T5 Cumberland Line. Approximately 2.8km south east of the site is the junction with Cowpasture Road which provides access to the M7 motorway in all directions (north-south).

South West District

In acknowledging that green space is a key hallmark of liveability, the Government Architect NSW (GANSW) proposed a network of high-quality green space that connects village centres, public transport hubs, and major residential areas. This network, known as the "Sydney Green Grid", is an integral part of the Greater Sydney Region and District Plans.

The objective of the "Sydney Green Grid" is to deliver an interconnecting network of public open space that will keep the city cool, encourage healthy living, enhance biodiversity and ensure ecological resilience.

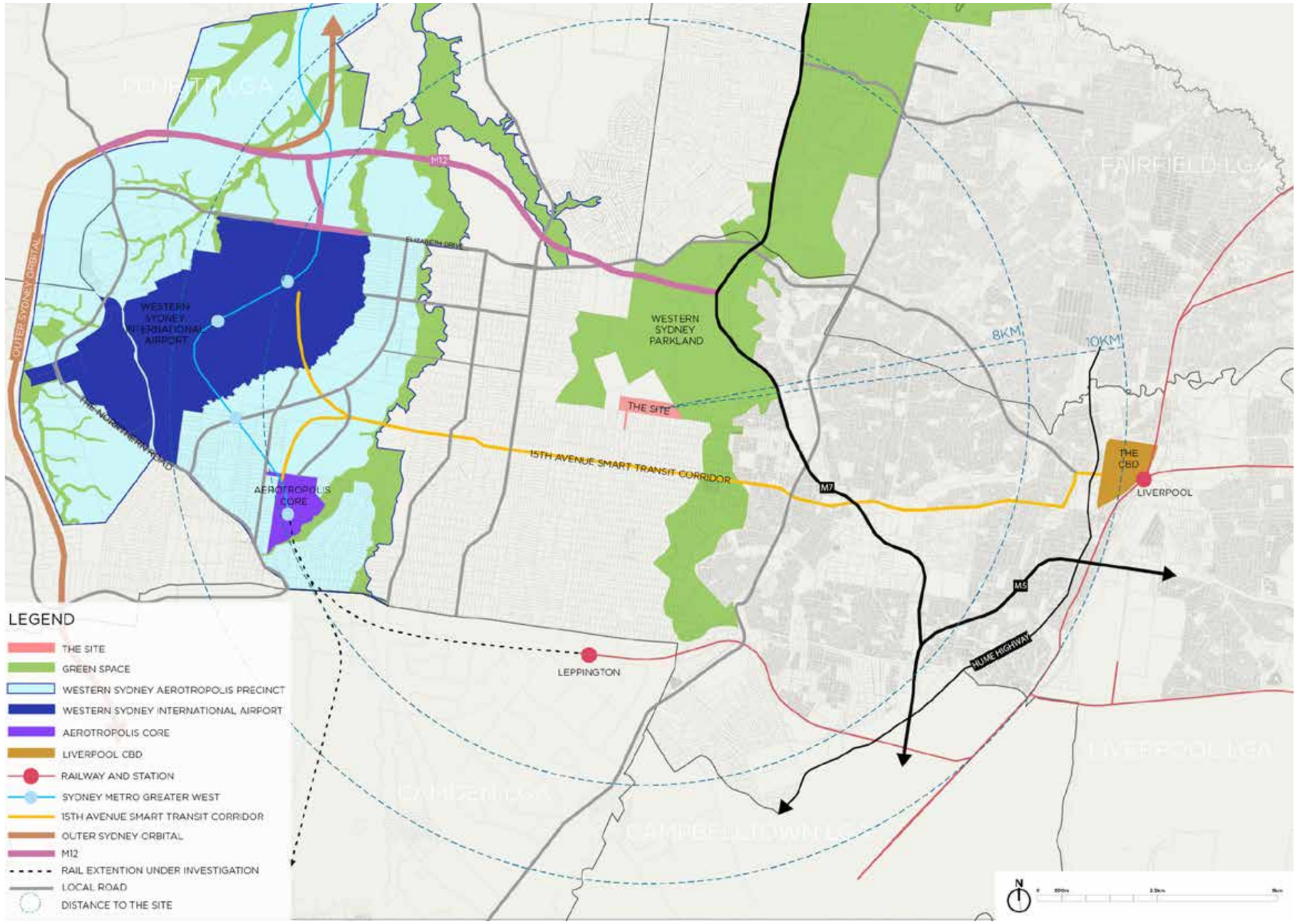


Figure 7: Sub-regional urban context

1 https://www.greater.sydney/metropolis-of-three-cities/vision-of-metropolis-of-three-cities/western-parkland-city-vision

Linkages between public open spaces are fostered within the wider public realm through enhancing creek corridors, transport routes, suburban streets, footpaths and cycle ways.

The South West District Plan provides an overview of regional public open space opportunities and potential projects that will link existing public open space areas to each other.

The projects and opportunities that are relevant to the Precinct are as follows:

- Kemps Creek and
- Nature Reserve

The Site is located within a greenfields development area rapidly transitioning from rural and semi-rural uses to urban uses.

The majority of new development around the Site is low density residential homes.

The site is within the northern portion of the Austral Leppington North Precinct. The site adjoins Western Sydney Parklands, that span from Quakers Hill in the north down to Bringelly Road, Leppington in the south.

The Site has large ecological areas associated with creeks that run through the Site from the south to the north.

Austral and Leppington North Precinct

This Precinct was rezoned in March 2013 and has been reported to have the capacity to deliver 17,350 homes which equates to about 54,000 in population.

The Precinct is to deliver:

- Leppington Major Centre with regional shopping, employment, cultural and community facilities
- 3 neighbourhood centres
- 220 hectares of employment land
- 135 hectares of open space and recreation areas
- Upgrades to major roads
- New primary and high schools
- Protection of 116 hectares of significant vegetation, and major creek corridors
- New pedestrian and cycle links The Sydney Green Grid

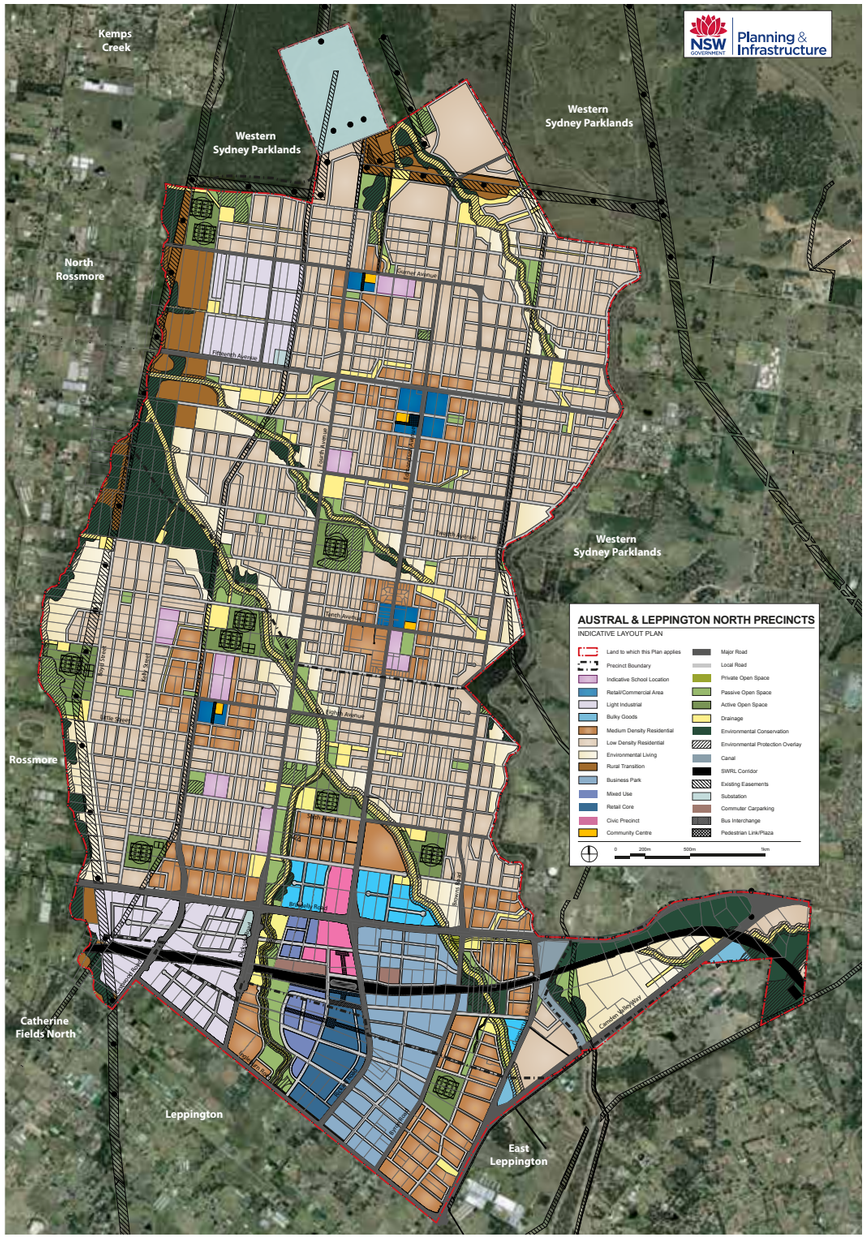


Figure 8: Austral and Leppington Indicative Layout Plan (Source DPIE)

1.2 The Site

The Site is cleared land with the exception of the riparian areas which retain remnant vegetation.

To the south of the Site, the land is transitioning from rural residential to small lots with the informal rural roads being upgraded and complemented with a new finer-grain street network serving new small lot housing development.

The land directly adjoining the Site on the southern boundary has been sub-divided providing a new access point from an extension of Edmondson Avenue - formed as a half road.

All these recent changes are reflective of the future character anticipated in the Austral ILP.

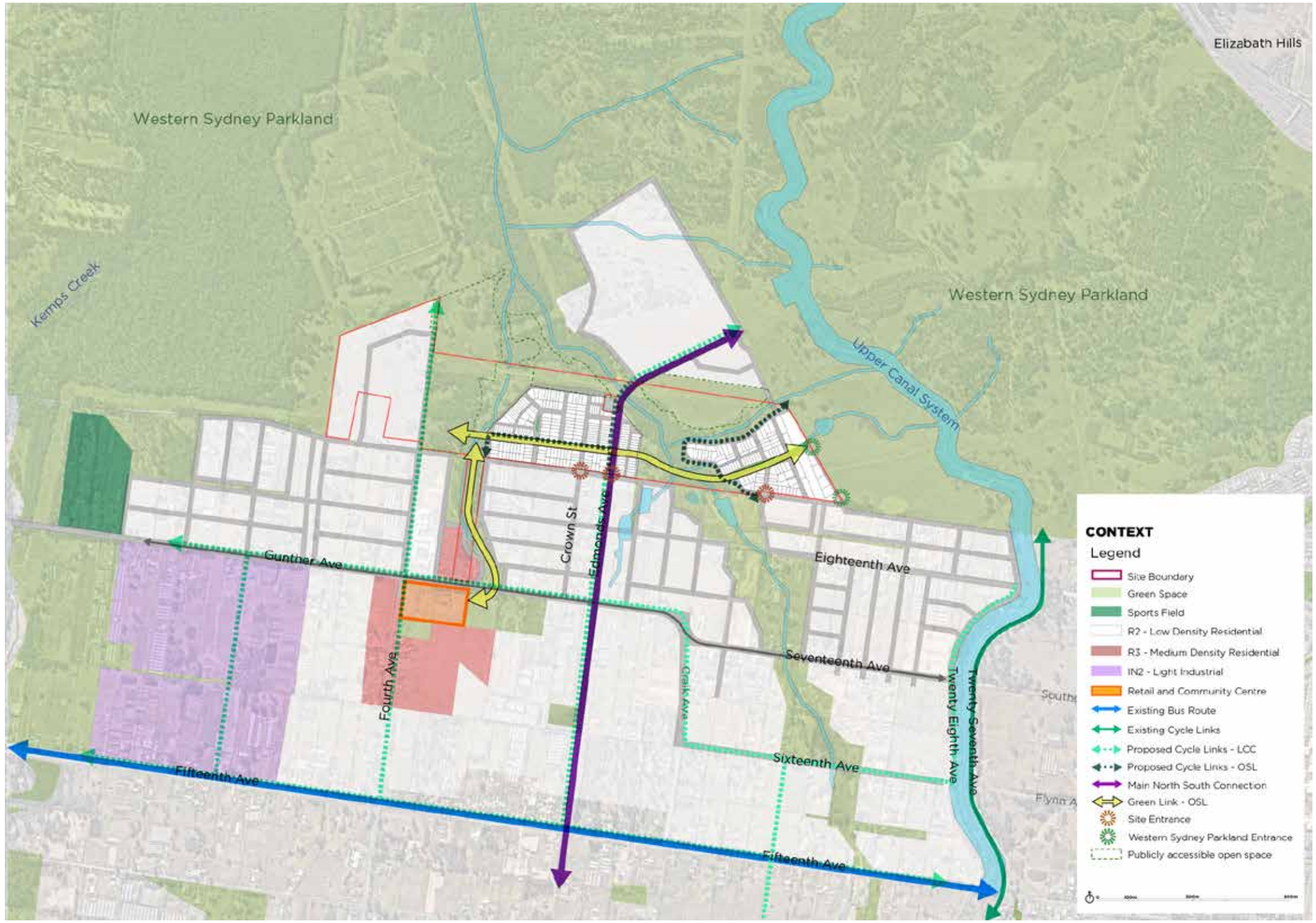


Figure 9: Austral site context

Figure 10 defines a number of distinct character areas around the Site including:

Small Lot Residential

Recent small lot subdivisions up to two storeys on new suburban streets

Rural Residential

Small rural residential with market gardens or small scale argi-business

Education Institute

Buildings up to two storey providing education and community uses

Open Farmland

Semi-rural open grazing land. Mostly cleared with patches of remnant vegetation

Creek Corridors and Drainage Lines

Remnant vegetation along ephemeral streams and creeks.

Infrastructure

Plant and services building comprising of a pump house

The photographs on the following page provide a visual narrative of this context.

Figure 10: Local character areas

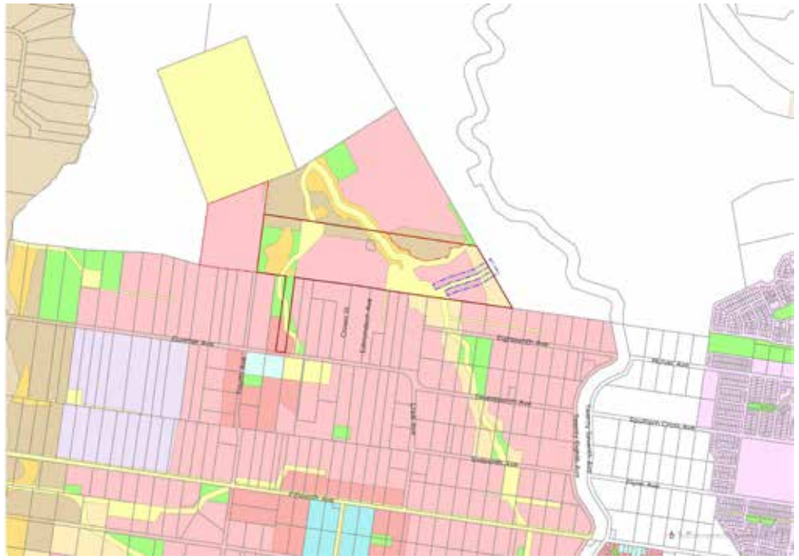
1.3 Statutory controls

State Environmental Planning Policy (Sydney Region Growth Centres) 2006

The plans on this page highlight the LEP controls for Land Use Zoning, Height of Buildings and Heritage.

A key outcome for the Master Plan will be to develop a plan that is shovel-ready and doesn't require changes to the LEP[1].

1 FINAL DRAFT Gurner Avenue - Planning Investigation Report. September 2019



Land Use Zoning

The site comprises land made up of six different land use zones under the Growth Centres SEPP, being:

- RU6 – Transition
- R2 – Low Density Residential;
- R3 – Medium Density Residential;
- SP2 – Local Drainage;
- E2 - Environmental Conservation; and
- E4 – Environmental Living.

Figure 11: Land Use Zoning

Height of Building

The Site, except for the parts zoned SP2, RE1 and E2 is subject to a maximum building height of 9 metres.

Figure 12: Height of Buildings

Lot Size

Minimum Subdivision Lot Size

Clause 4.1 sets minimum lot sizes for subdivision on that part of the site zoned RU6 and E4. The minimum lot size for land zoned RU6 is 20,000m2 (2 hectares) and for land zoned E4 is 1,000 m2.

Subdivision with building envelopes

The SEPP allows for subdivision resulting in lots between 225–300m2 on land in Zone R2 Low Density Residential and Zone R3 Medium Density Residential. Development consent maybe granted to the subdivision of land resulting in the creation of a lot that has an area of less than 300m2 (but not less than 225m2) if the consent authority is satisfied that the lot will contain a sufficient building envelope to enable the erection of a dwelling house on the lot.

Figure 13: Minimum Lot Size

2.0 Site Analysis

This section of the report consolidates the know spatial constraints to developments and the opportunities that the Master Plan can leverage off to create a unique new community and memorable series of public spaces.

2.1 Constraints

The Master Plan will have to address the following constraints:

The Site

Residual land

Riparian vegetation

Riparian vegetation has ecological value and will is to be retained and enhanced.

APZ and bushfire

Development will need to be offset in these locations

Collector road

The alignment and location of the proposed Collector road is defined in the ILP.

ILP layout

Residential development must be located within ILP zones.

Storm water basins

Stormwater basins required within locations identified in ILP..

Gas pipeline

Restriction on development adjoining Jemena gas pipeline and vents.

Native vegetation

Extensive areas of native vegetation along creek corridors need to be retained along with suitable buffers.

Sydney Water pump station

Pump station lot and associated access to be incorporated into urban design..

Infrastructure easements

Restrictions on development and interfaces with service easements.

Limited access to east

Access in east dependant on development of adjoining land.

Gas pipe exclusion area

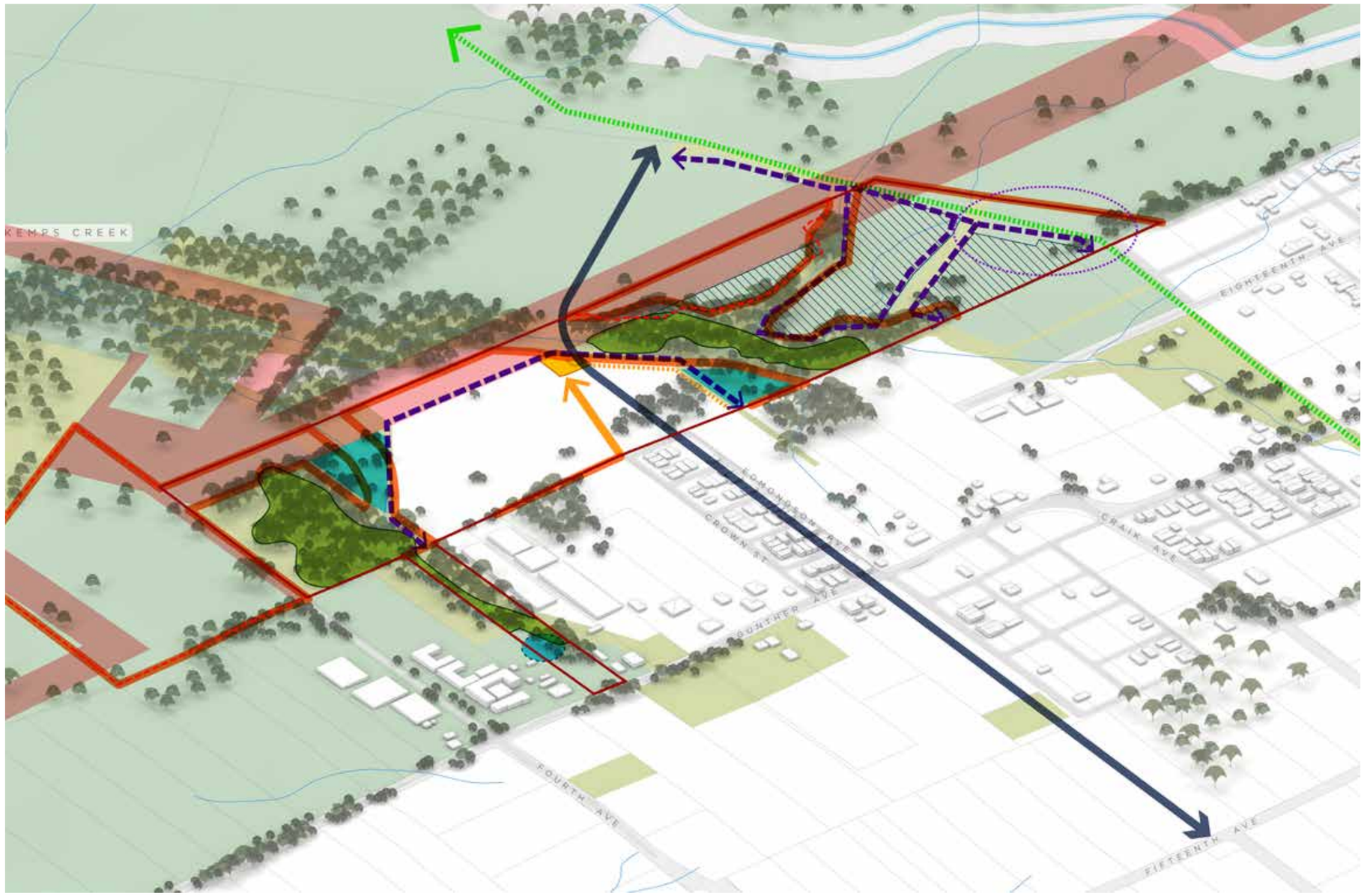


Figure 14: Spatial constraints to address through the Master Plan

2.2 Opportunities

Not withstanding opportunities for best practice urban design and placemaking, there are a number of opportunities in and around the Site that the Master Plan can address and incorporate.

The opportunities include:

The Site

Residual land

Ecological edge

The interface with native vegetation has the potential to add value to new development fronting it

Linking open space

The Site has the potential to create new connections between open space with high quality pedestrian links

Access points

Established site access allows for development of the main Site area

Arrival point

The main arrival point into the Site from Edmondson Avenue has the potential to be enhanced through a new streetscape and entry experience

New active transport link

A new cycle and pedestrian link between the Site and the wider ILP area.

Consolidated development area

The central area of the Site offers a large consolidated development zone

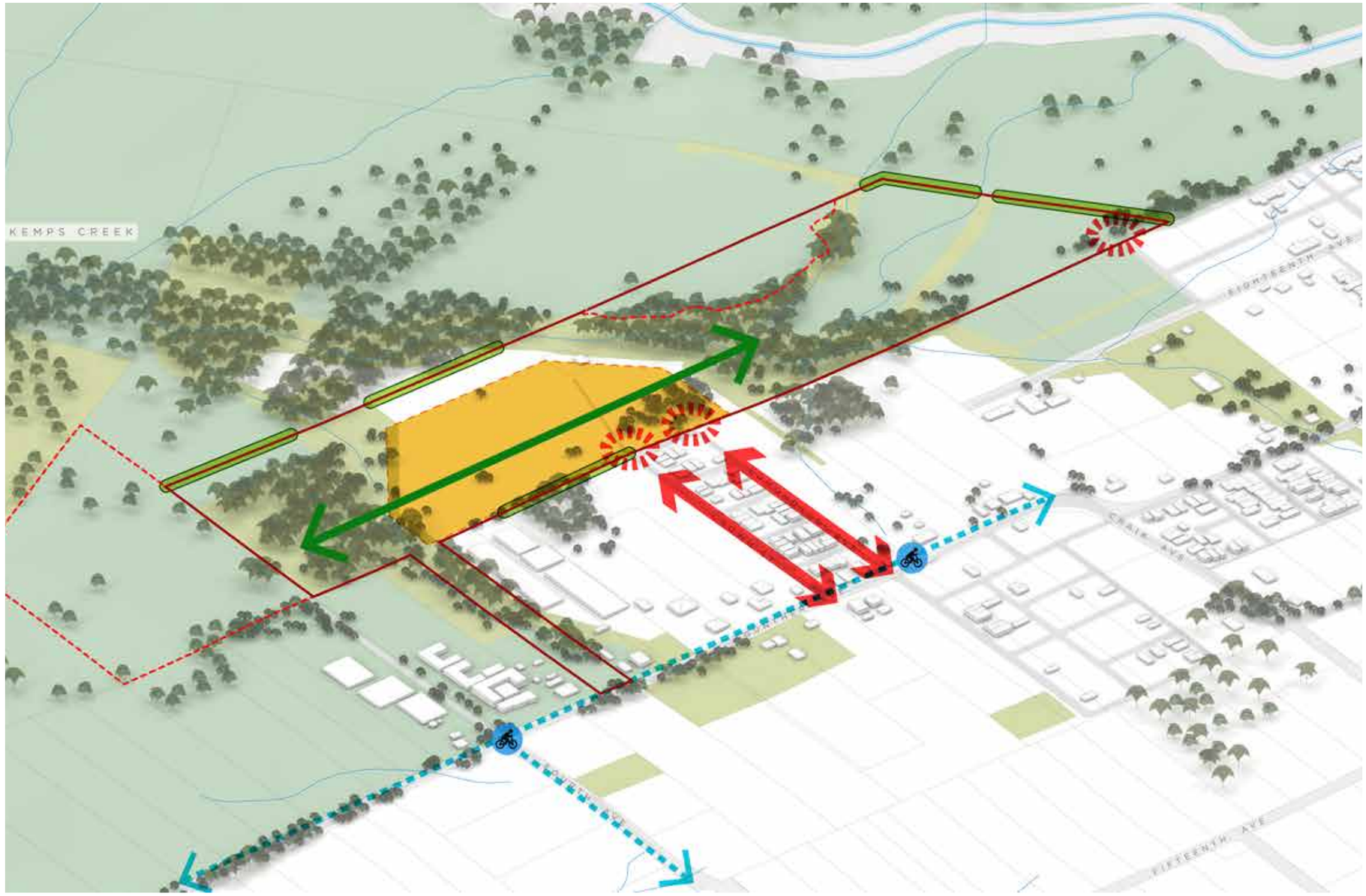


Figure 15: Spatial opportunities to incorporate into the Master Plan

3.0 Design Strategies

We are working on Darug Country, the land of rolling hills and running creeks.

3.1 Connecting with Country

The ambition of Connecting with Country is that everyone who is involved in delivering government projects will adopt the following commitment:

Through our projects, we commit to helping support the health and wellbeing of Country by valuing, respecting, and being guided by Aboriginal people, who know that if we care for Country – it will care for us.

- The ambition of the commitment to improving health and wellbeing of Country is to help realise three long-term strategic goals:
- Reduce the impacts of natural events such as fire, drought, and flooding through sustainable land and water use practices
- Value and respect Aboriginal cultural knowledge with Aboriginal people co-leading design and development of all NSW infrastructure projects
- Ensure Country is cared for appropriately and sensitive sites are protected by Aboriginal people having access to their homelands to continue their cultural practices.

Opportunities at Austral

Along with aligning with the three strategic goals above we are currently working to further enhance and integrate a deep and rich connection to Country at Austral.

The response may include:

- Edible gardens pave the streets, allowing the touch, smell, taste and feel of country. Flora of the Darug with edible gardens
- A strategy to invite Fauna back into the Site
- To walk and experience country, as the Darug have for Millennia
- To link contemporary connections between community with traditional connections
- Public Art
- Wayfinding

The Bidgiwong – Lizard (water monitor Lizard) in its natural habitat, foot prints of the local totems can be placed into paving, art and wayfinding for exploratory play. Allowing children to adventure on the lands of the Darug

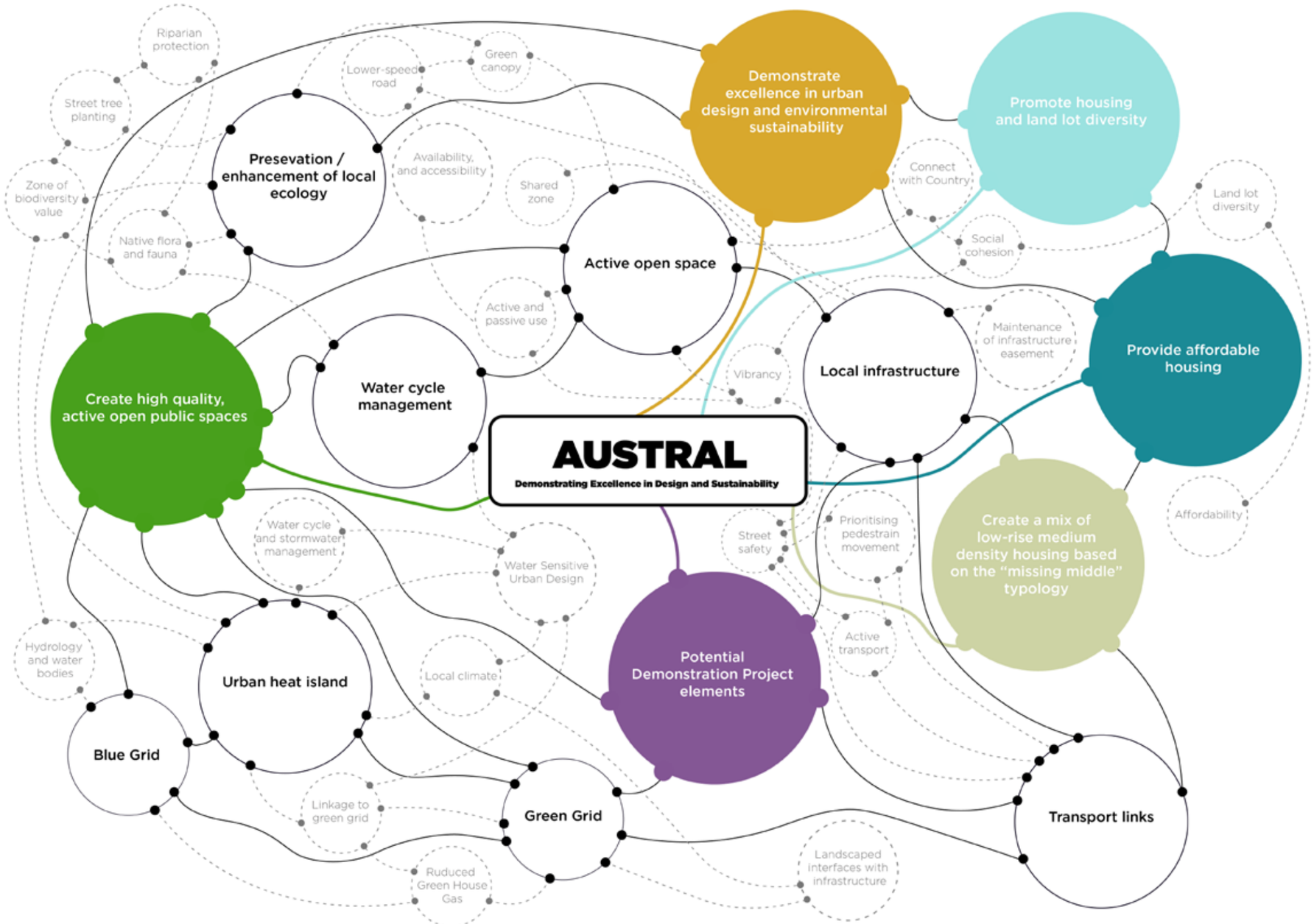
3.2 Considerations

To create an affordable new community on the edge of Western Sydney Parklands, with great landscaped streets and a diverse range of housing.

3.3 Design Objectives

The diagram on this page illustrates the relationship between the Principles and the Strategies that support their implementation in the spatial Master Plan.

The design strategies are overarching design moves that are articulated on the Site through a series of key Site Organisation Principles which are highlighted in the following page.



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3.4 Urban Design Principles

The spatial Site Organisation Principles that will guide the urban design outcomes for the Site are presented on this page as a series of diagrams.

Developable Area

- Area left are easements, ecological areas and other restrictions are considered

Consolidate development in the East

- Create a more efficient overland flow path to allow for consolidation of the developable area in the east of the Site

ILP Connections and Links

- Retain key roads and links through the developable area
- Create a finer-grain street network and smaller superlots linked to the key ILP connections

Link Open Space

- Create open space connections through the development areas

Create Open Space Activity Nodes

- Create a series of linked nodes with programming to provide a diverse open space experience

Diverse Housing Offer

- Provide a mix of housing types that respond to the unique character within the Site

4.0 The Master Plan

4.1 The Master Plan

The Master Plan is an distinct vision based on a simple street pattern and framework informed by the unique qualities of the Site, local landform and opportunity to create a lasting legacy for the local area.

It articulates the Vision, Design Strategies and Site Organisation Principles to provide a new residential community with connected open spaces, innovative streets and a varied and diverse housing offering.

The Master Plan is a long-term vision for the Site and has been carefully developed to allow for future flexibility in the housing outcomes. It is also however deliverable within the existing Statutory Planning controls for the Site.

The Master Plan also allows for the future integration of the wider ILP layout on surrounding lands.

Key features of the Master Plan are highlighted on the adjacent plan.

1. Entry and arrival statement on Edmondson Avenue as an extension of the ILP Collector Road, that evokes a native forest with flowering gum trees and wide verges
2. An east west green link with verges and extensive street tree planting to provide shade and opportunities for WSUD
3. An extensive network of low speed shared zones streets totalling 2.4 kilometres
4. Themed landscape parklet within the shared zone network that provide open space and activation nodes
5. A mix of smaller lot sizes and housing type
6. Large lot housing in the east of the Site with a public road and cycle path to Western Sydney Parklands
7. A landscaped overland flow path in the east of the site
8. Landscape interfaces with planned stormwater basins and infrastructure
10. A local park with a blend of active and passive open space
11. Opportunities for a childcare centre and a small scale local shop
12. Potential for a future walkway connecting the east and west sides of the development

Figure 16: The Master Plan

4.2 Austral West

Figure 17 provides detail of the western portion of the site. It highlights the overall public domain design and indicative small lot subdivision pattern.

Figure 17: Western detail of the Site - plan view

Figure 18: Western detail of the Site - axonometric view

4.3 Austral East

Figure 19 provides further detail of the western portion of the site. It highlights the overall public domain design and indicative small lot subdivision pattern.

Figure 19: Eastern detail of the Site - plan view

Figure 20: Eastern detail of the Site - axonometric view

5.0 Proposed Public Domain

5.1 Green and blue grid - regional scale

In acknowledging that green space is a key hallmark of liveability, the Government Architect NSW (GANSW) proposed a network of high-quality green space that connects village centres, public transport hubs, and major residential areas. This network, known as the "Sydney Green Grid", is an integral part of the Greater Sydney Region and District Plans.

The objective of the "Sydney Green Grid" is to deliver an interconnecting network of public open space that will keep the city cool, encourage healthy living, enhance biodiversity and ensure ecological resilience. Linkages between public open spaces are fostered within the wider public realm through enhancing creek corridors, transport routes, suburban streets, footpaths and cycleways

Gurner Avenue, Austral is adjacent to the Western Sydney Parklands which extends some 27km and covers more than 5,280 hectares of land in Sydney's west, with the area adjoining site being developed in the future as an area for sport and structured recreation.

The redevelopment of the site should therefore integrate into the overall Green Grid network of south western Sydney.

Figure 21 highlights how the new open space network will integrate with the broader regional open space network of Western Sydney Parklands and Kemps Creek Nature Reserve.

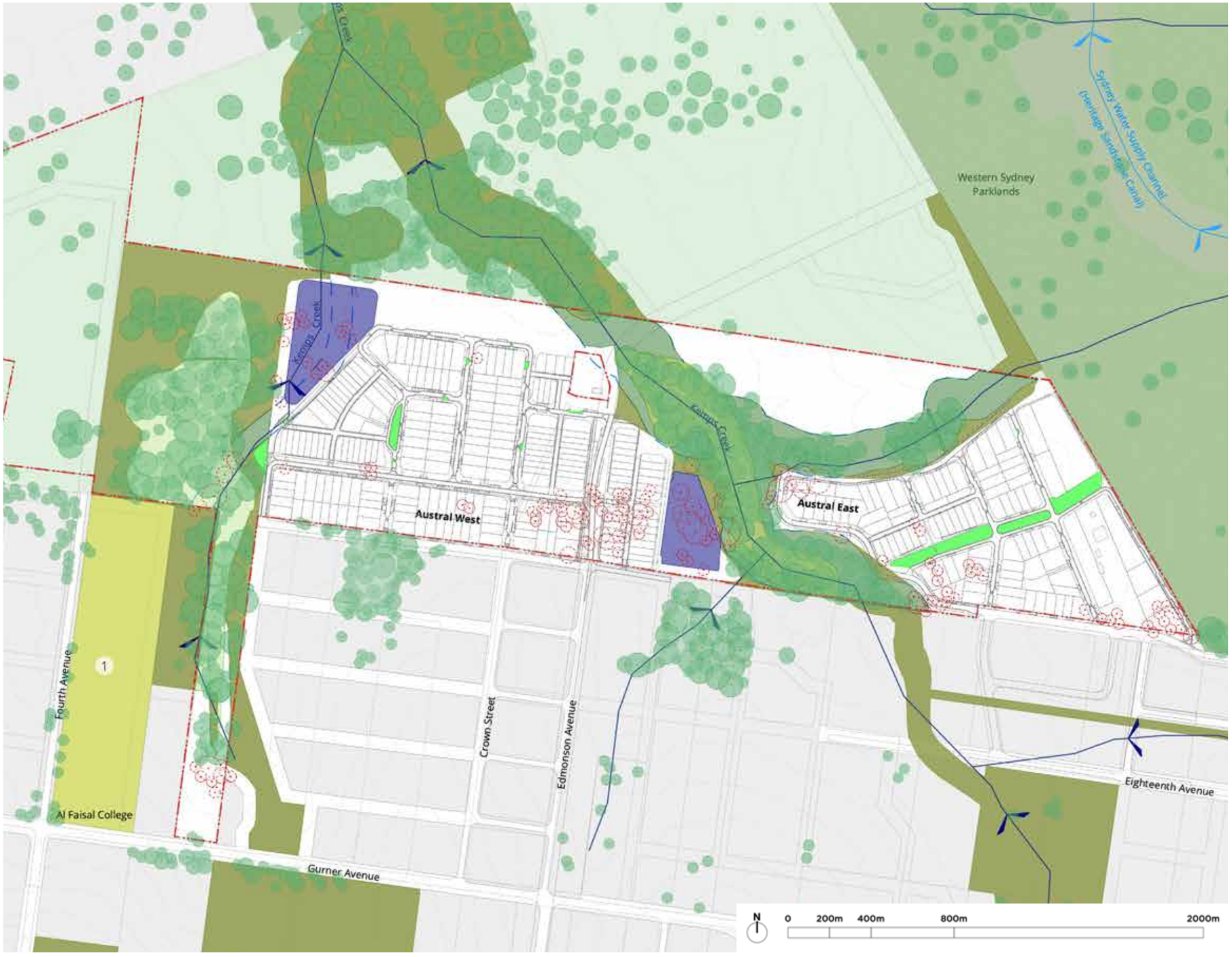

Figure 21: Green and blue grid - regional scale

5.2 Proposed Public Domain Strategy

Figure 22 on this page identifies the variety of open space typologies proposed in the Master Plan.

The Master Plan envisages a number of park typologies.

These park typologies include a local park, and a series of ecological areas and high quality green streets

The intended character, materials, elements and programming for the public open space within the Site are illustrated in Section 7.0.

The diagrams on the following two pages zoom in the East and West showing the details of those landscape initiatives.

Figure 22: Public Domain Strategy diagram

Figure 23 shows the our public domain consideration and initiatives in the western of the Site.

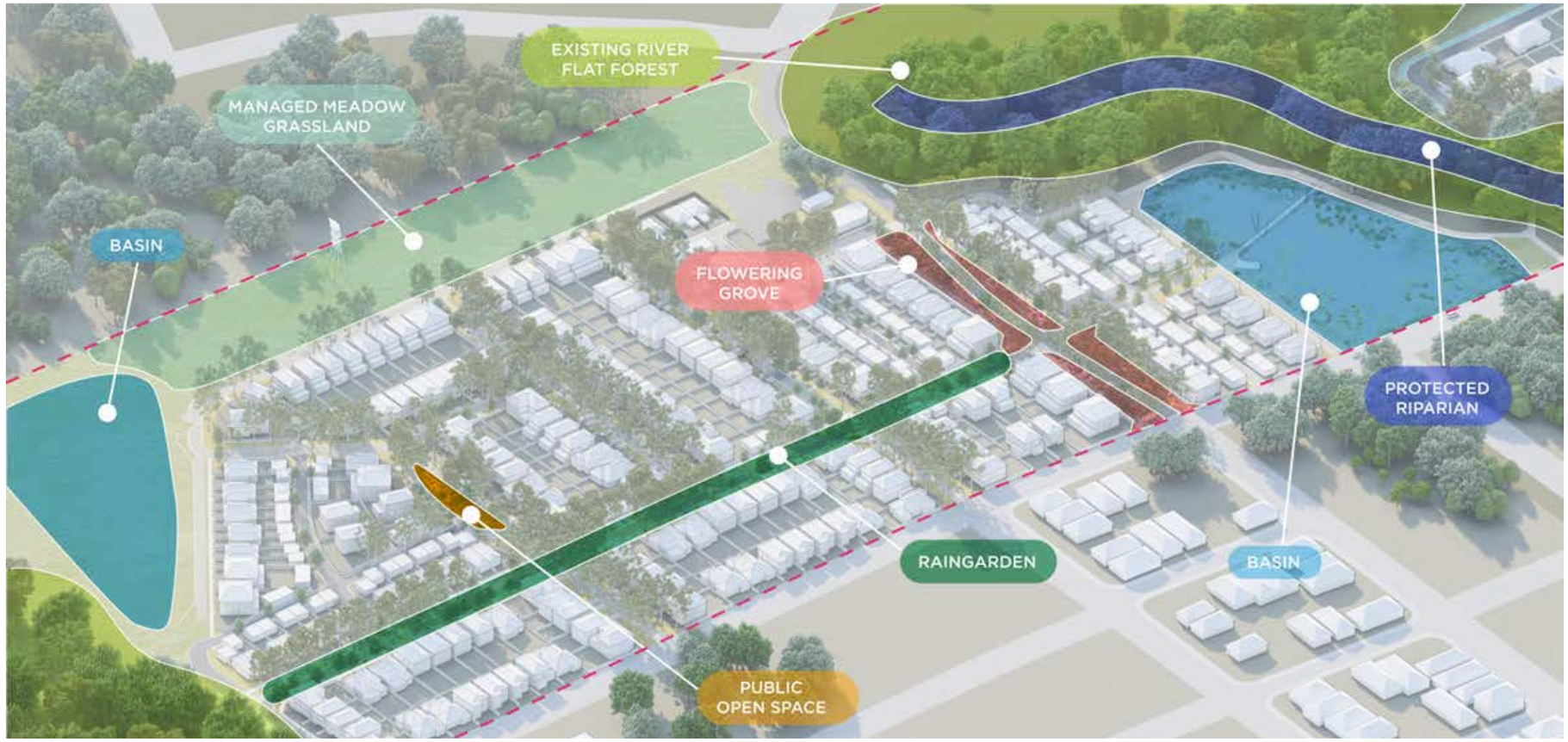

Figure 23: Public Domain Strategy diagram - west

Figure 24 gives an overview of our consideration on the public domain and initiatives in the eastern of the Site.

Figure 24: Public Domain Strategy diagram - east

5.3 Proposed Open space Programming

The Master Plan envisages a de-centralised open space network, with parklets and set-piece open space elements located within the streetscape.

The objective of the strategy is to promote social interactions and create distinct character areas within the development.

Cycleways, public art and walking trails add to the diversity of recreation elements, these are all highlighted on Figure 25.

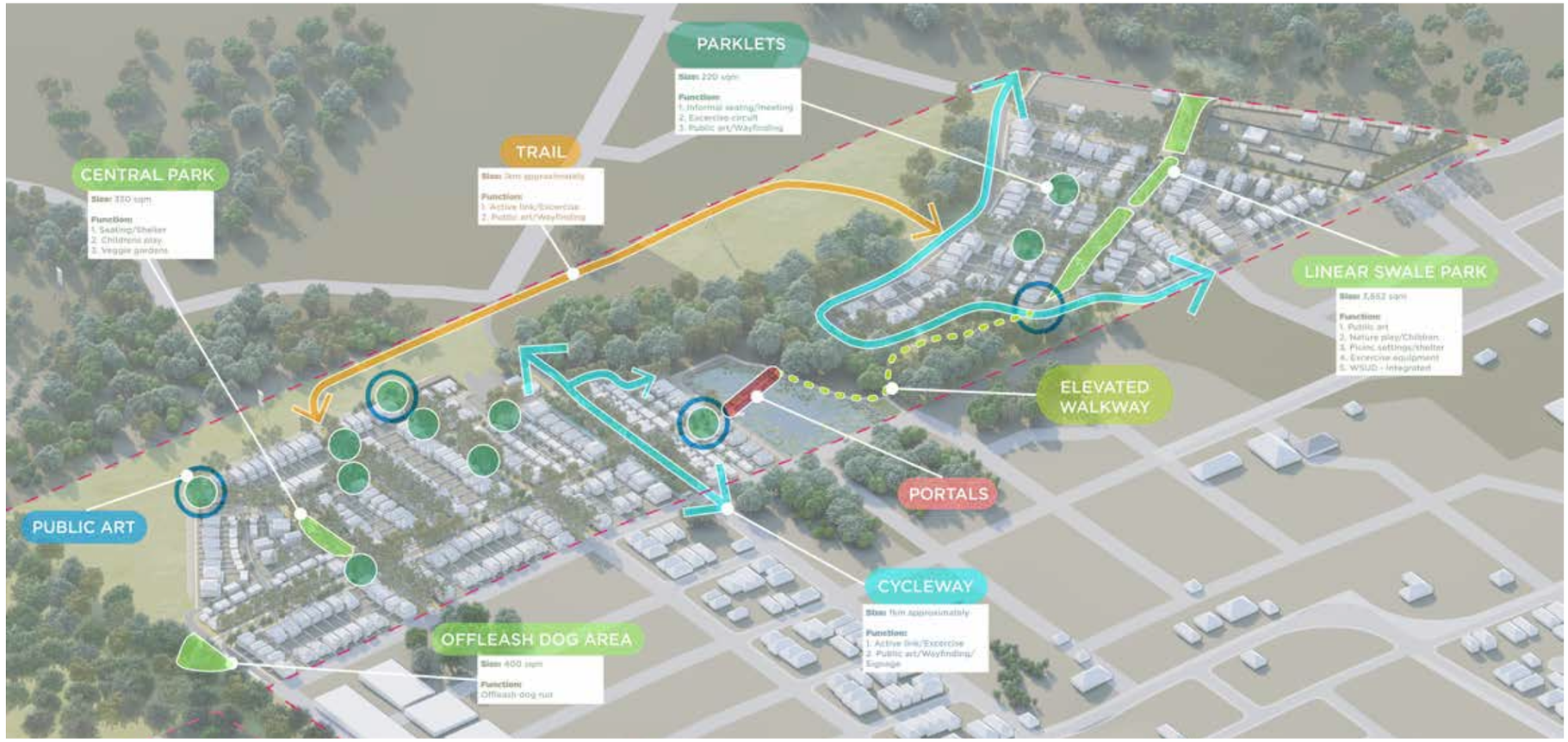

Figure 25: Open Space Programming

5.4 Street Hierarchy and Circulation

Figure 26 illustrates the street hierarchy for the Site.

- The Site
- Bushfire hazard zone

Road hierarchy:

- Collector
- Perimeter (Bushfire Access)
- Local
- Shared Zone
- Shared Zone one way loop
- Laneway
- Trafficable Path (Bushfire Access)

The street hierarchy has been developed to provide a logical network for pedestrians and drivers, that gives easy access to the wider road network and meet requirements for potential bushfire fire fighting access.

The location of Shared Zones has been carefully considered to avoid rat-runs.

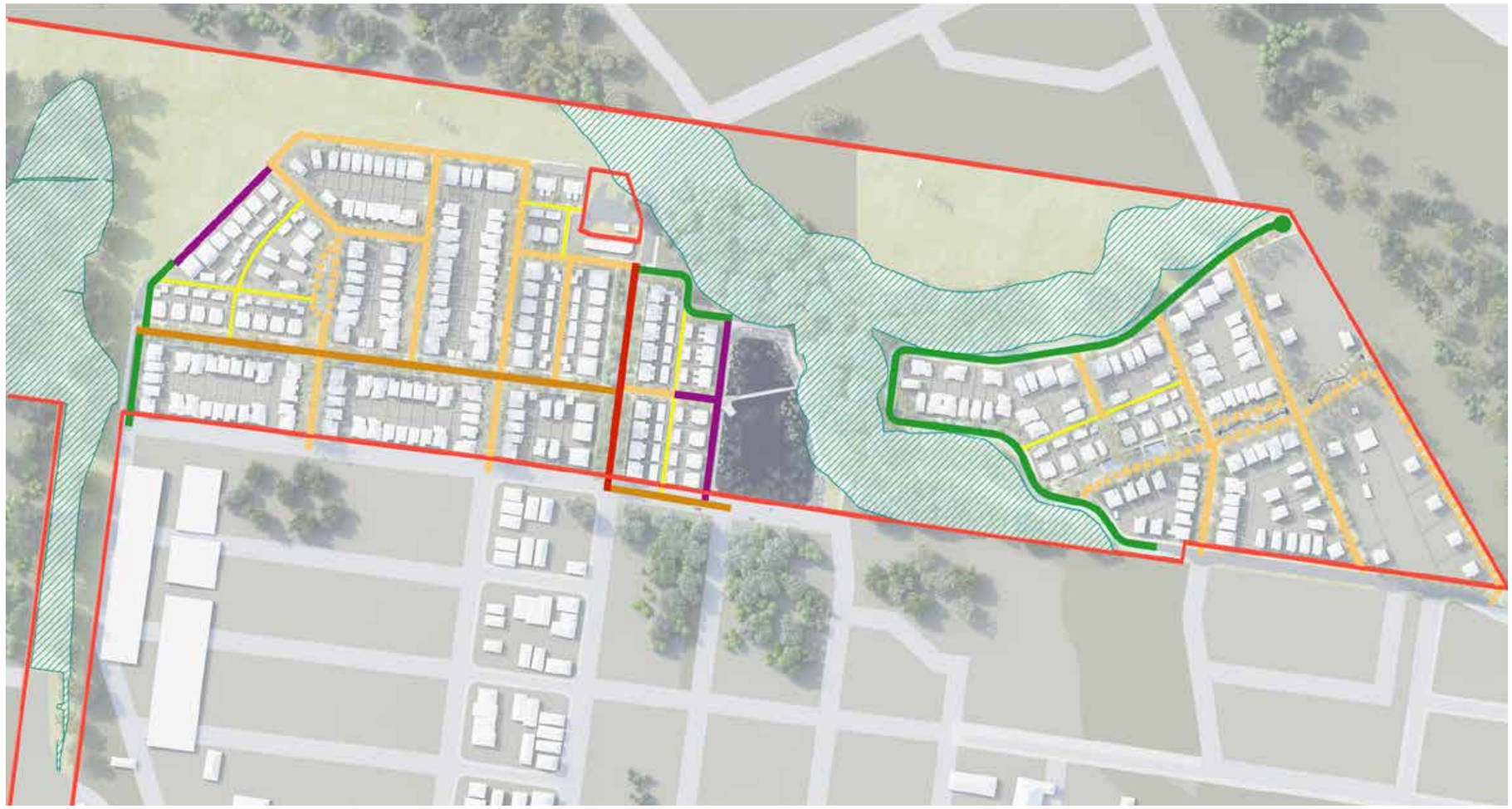

Figure 26: Street hierarchy diagram

5.5 Streets as Social Spaces

Austral – Streets as Shared Zones

The Austral Site provides an ideal opportunity to demonstrate a different way of planning and designing streets as Shared Zones, putting pedestrians first by demanding that drivers move at very low speeds, typically 10 km.

This approach is based on the Western Sydney Street Design Guidelines (2020), developed by the Western Sydney planning Partnership, and endorsed by Liverpool City Council.

A 10 km/h behavioural speed

We have designed over 2.4 kilometres as dedicated Shared Zones, streets where users mix at very low speeds. These streets have been designed in line with RMS Technical Directions. The street design, materials, street features and geometry aim to keep speeds low and safe for pedestrians and cyclists in shared travel zones.

International Precedents

Our approach draws heavily on the 'Woonerf' or Living Street, a Dutch urban planning concept that places emphasis on the overall quality of life, and the 'Home Zone', a British interpretation of the Woonerf that was devised to reduce the potential for traffic accidents and personal injury.

The concepts of a Shared Zone and Woonerf are not new and have been successfully implemented in Australia, Europe and North America. The images adjacent provide a visual indication of the charter and design of Shared Zones.

The core objectives are:

1. Reducing driving speeds and increasing levels of safety. By incorporating different traffic calming measures into the street, residents feel more confident using the streets for different activities.
2. Creating more efficient use of space, where street design balances the need of street space for vehicles with the provision of space for other users, activities, street trees, planting and WSUD. Since the street does not make distinction between travel lanes, children play across the whole width of the environment, turning the streets into a valued public space, and not just a channel for vehicles.

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3. Increasing opportunities for socialisation and activities.
4. Creating a more attractive street with lower traffic volumes and the absence of cut–through traffic and areas for play, socialisation and urban canopy.
5. Increasing natural surveillance, which deters casual crime.
6. Enable the elderly and others with limited mobility to have better access and mobility within in their own street environment.
7. Improving the environmental quality of urban streets, helping to increase urban canopy, WSUD and ecology.

Austral as an Ideal Location for Shared Zones

It's location in the broader planned street network - as Defined by the Austral Indicative Layout Plan – and proposed master plan layout offers the following benefits:

- It only has one street designed to provide through traffic, Gurner Avenue, defined as a Collector Road
- It has no major local destinations that would generate visitation
- It does not present the opportunity for rat runs

Figure 27: Shortest Route Analysis - Master Plan

Figure 28: Shortest Route Analysis - Master Plan and future ILP

– It can be reasonably assumed, that the majority of vehicle trips are from residents who live within the Site.

We have undertaken the following analysis:

To support this Shared Zone strategy we have undertaken analysis of the proposed street pattern that shows:

Shortest route analysis – current situation and ILP

– None of the nominated Shared Zones would provide the shortest route to a major road - Gurner Avenue - from other destinations within the Master Plan for more than 90 vehicles. This is important as a Shared Zone should not have over 100 vehicle movements an hour. Figure 29 and 30 show this analysis.

Street Length

– The maximum street length of the Shared Zones is 194 metres, however the Shared Zones are broken into maximum stretches of 50 metres with traffic calming mechanisms employed to maintain low speeds. This is shown in Figure 29

Travel time to a non-shared zone

– The maximum travel time to a standard street is 2 minutes, see Figure 30. This is less time that is commonly spent circulating through a multi storey car park at a comparable low speed

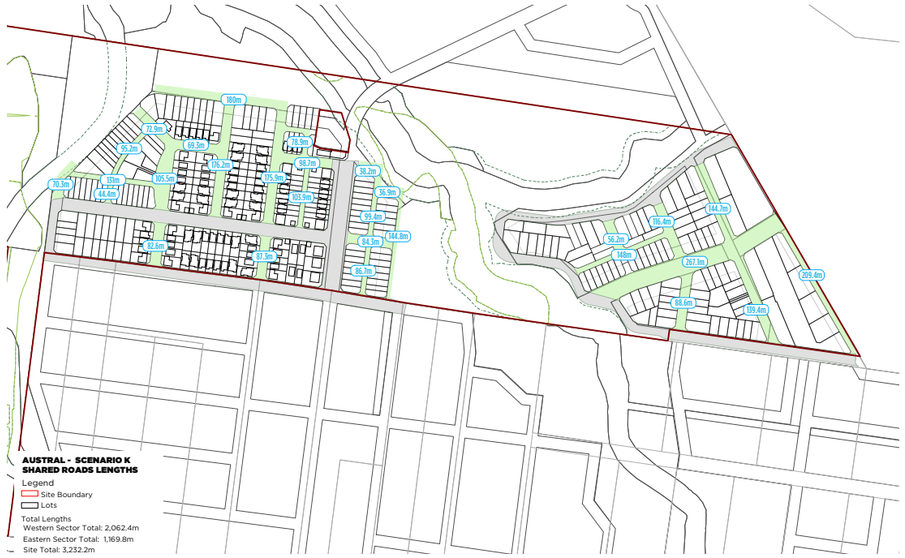

Figure 29: Shared Zone Street Length

Figure 30: Travel time to 'standard street'

Typical Design Features of the Austral Shared Zones

– A clear and distinct entrance so people going into the street will know that this area is not a typical neighbourhood.

– Incorporation of gateway features such as trees and planters, kerb extensions to make the carriageway narrow, and a ramp up to the shared surface.

– Signage indicating the traffic status. Exits should therefore also include a sign indicating the end of the status.

– Use of different colours or textures in pavement material for guiding the users of the street within the carriageway.

– The use traffic calming measures - the design of the streets include slight curves to break up the sight lines of a driver and also introduce physical and visual features that will encourage people to drive slowly and with greater caution.

– Use of chicanes, speed bumps and cushions, narrow travel lanes, small corner radii, different pavement treatments.

– Incorporation of elements such as street trees, bollards and furniture that contribute to traffic calming - These measures will be an obstacle for emergency responders.

– Provision of on-street parking, spaced intermittently rather than continuously so the car is not the predominant element in the street.

– In areas in which parking is permitted is indicated by physical elements (e.g., Bollards) and/or different pavement material, the parking arrangements are also be used as a mechanism to calm traffic.

– Incorporate outdoor furnishings and landscaping: Street trees and planters to make the street look more attractive as well as calm traffic.

– Carefully coordinated tree planting and seating to encourage people to use and stay in the street for other activities. These seating areas are be protected from cars, using bollards or other physical barriers.

The Shared Zones in Austral have been design with an appreciation of the needs of infrequent large vehicle movements such as garbage trucks, removal and heavy vehicles.

5.6 Canopy

Greening our city

It is a Premiers Priority to increase the tree canopy and green cover across Greater Sydney by planting 1 million trees by 2022.

Trees play an important role in creating great places for our communities, enhancing outdoor recreation and exercise opportunities and making the places we live and work greener, cooler and more connected. Green canopy enhances the amenity of local parks and streets and is crucial in providing vital shade that reduces ambient temperatures and mitigates the urban heat island effect.

Trees improve local character and enhance property values. They extend habitat, increasing the biodiversity of cities serving as a home for animals and birds. Air quality is improved by removing fine particles from the air and trees mitigate the impact of climate change, acting as a storehouse for carbon dioxide.

Master Plan Canopy Cover

The NSW Government has set a target to increase tree canopy cover across Greater Sydney to 40 per cent.

The Master Plan achieves canopy cover on the streets of up to 50%, with approximately 620 new trees. This metric is achieved through widened verges and the proposed Shred Zones which provide large areas for street trees and planting.

Legend

GENERAL

- Boundary - study area
- Proposed public domain extent of works
- Proposed mature canopy cover
- Public domain area

WEST

Area	Size
Proposed public domain	36,947 sqm
Proposed mature canopy	18,220 sqm

Percentage cover

49.31%

EAST

Area	Size
Proposed public domain	25740 sqm
Proposed mature canopy	10,693 sqm

Percentage cover

41.54%

Figure 31: Green canopy diagram

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5.7 Reduction of Urban Heat Island

We have undertaken an analysis of ambient temperature that compares typical street typologies as defined by the Austral DCP and our proposed model of Shares Zones.

Our analysis shows that we can achieve a 6 degree reduction in ambient temperature during summer with Shared Zones and the associated mass street tree planting.

Analysis Methodology

The thermophysiological effects of the atmospheric environment can be assessed using the UTCI (Universal Thermal Climate Index). This helps determine outdoor comfort, measuring and averaging the air temperature of a specific location in combination with the built form, ground materials and the cooling provided by any vegetation that provides shade.

This analysis was performed using the Ladybug and Honeybee tools in Grasshopper. Weather data is acquired from EnergyPlus -an energy simulation program- to simulate the temperature of the Sydney area.

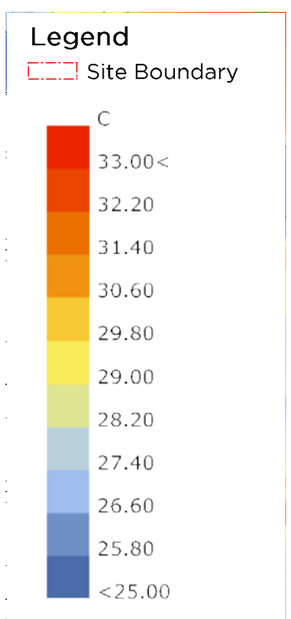
For this thermal analysis, the extreme hot week of the year provided by EnergyPlus (February the 2nd to the 9th) was simulated and averaged into a colour gradient that ranges from 25 to 33 degrees Celsius.

Two different scenarios have been simulated and compared in order to understand how an increased canopy and larger verge areas can help mitigate the Urban Heat Island phenomenon. The assumed built form and driveways are kept consistent between the two scenarios. However, the main differences between these scenarios are the width of the road reserves and the components inside of them. Another difference is the kerb radius (10m in the DCP scenario and 7.5m in the Western Sydney Street Design Guide scenario).

The tree spacing is a determining factor in this analysis. In the Western Sydney Street Design Guide scenario, the spacing between trees ranges from 4m to 8m, whereas the DCP scenario uses the current tree spacing that can be found in different neighbouring areas of Austral. It ranges between 12m and 15m, and some examples can be found in Robey Ave, Hargrave Ave and Starfire Ave. Follow the link below to see the current tree spacing in Austral:

Figure 32: Ambient temperature - ILP street section

Figure 33: Ambient temperature - proposed street types



5.8 Urban Cooling Strategy

Extreme temperature rises associated with climate change is a clear and pressing issue for Western Sydney.

The projected rise in extremely hot days because of global warming presents a serious risk to the health and wellbeing of the Western Sydney community. Due to its geography and built environment, Western Sydney already experiences temperatures6–10 degrees higher than Eastern Sydney during extreme heat events.

At temperatures above 35 degrees, the human body's ability to cool itself reduces,making it a common benchmark temperature for occupational health and safety experts, academic and government researchers.

The number of days per year over 35 degrees in Western Sydney has increased from an average of 9.5 days per year in the 1970s to 15.4 days per year in the last decade.

By 2090, days over 35 degrees could more than triple to a projected 52 days

HeatWatch Extreme heat in Western Sydney the Australian Institute 2018

The Austral Master Plan aims to address these issues though a series of short, medium and long term spatial initiatives. The Design Team is currently working with experts form the School of Social Sciences at Western Sydney University to develop a suite of place based counter-measures to extreme heat this may include:

- Canopy Cover and tree species selection
- Retention of mature trees
- Increase soft land scape areas
- Increased garden areas to promote an urban cool
- Shade structures
- Reduction of hard landscape
- Material selection for the public domain
- White roof mandate
- Increased and targeted irrigation
- Cool portals' at development entry points to deflect warm wind
- Retention of water in the public domain

The adjacent diagram highlights the emerging thinking in this area, which is subject to ongoing development and testing.

Figure 34: Spatial Urban Cooling elements

5.9 Water Sensitive Urban Design

Landcom and OSI are committed to being industry leaders in the application of best practice WSUD and stormwater management.

Along with a requirement to provide for two regional stormwater quality basins within Austral, the LCC DCP identifies the requirement for in-street WSUD infrastructure.

The Urban Design and Public Domain design allows for a number of rain-gardens within streets to address stormwater quality, at this stage provision has been made for locations based on catchments, site grading and the streetscape composition.

The detailed locations, sizes and final design strategy will be developed in close consultation with LCC.

Austral West

There are four sub-catchments in Austral West. In the west the majority of the rain gardens will be within the streets, a online water quality basin is located in the north west of the site, and a 'wet' off-line basin is located in the east.

Austral East

The majority of the water quality treatment will be undertaken along the Swale Street running east to west in the centre of Austral East. This provides an opportunity to create a active interface with the vegetated water course being a identifying and character forming element within the public domain.

Figures 35 and 36 set out the current thinking on rain garden locations.

Figure 35: Austral West WSUD

Figure 36: Austral East WSUD

5.10 Active Transport

The Master Plan promotes pedestrian and cycle access through the Site linking local destinations and the regional cycle network.

The range, sizes and distribution of active transport connections have been designed to cater for all members of the community with opportunities for active transport both in and out of the site.

Key features of the active transport connections across the site include:

- New dedicated cycleways, shared paths and cycle friendly Shared Zones
- Trail based connections linking local open space and environmental corridors

The site is located approximately 4.8km north of Leppington Train Station on the T2 Inner West and Leppington Line and T5 Cumberland Line. Approximately 2.8km south east of the site is the junction with Cowpasture Road which provides access to the M7 motorway in all directions (north-south).

The planning of improved active transport and public transport connections to the surrounding key centres and employment areas will continue to improve accessibility of future residents' to services and jobs via sustainable mode of transport and reduce their reliance on private vehicles.

The 1 km of dedicated cycle paths and 400 metres of shared path are identified on Figure 37.

- Proposed separated cycle path
- Proposed shared way
- Proposed cycle-friendly Shared Zones
- Proposed Trails and oaths

Figure 37: Active transport network

5.11 Proposed Street Types

The street types proposed in the Master Plan have been developed to meet key performance requirements set out in relevant SEPP and Liverpool DCP. In particular the critical dimensions for road carriageways and service vehicle requirements have been incorporated.

Within this framework a series of street types have been developed to provide a high quality public domain system that:

- Provide safe streets with high pedestrian amenity;
- Prioritise pedestrians over cars;
- Respond to the particular built form interfaces;
- Address to climate and the need for shade.
- Create a legible and safe environment;
- Allow for parking access;
- Provide ample on-street parking;
- Incorporate opportunities for WSUD, and;
- Reflect the character and heritage of the local area.

Figure 38 highlights tom location of the following street types.

The Site

Bushfire hazard zone

Future ILP Collector Road - varies

Other ILP Streets - varies

Standard Streets

A - Entry Street - 26.9m

B - East West WSUD Spine - 18m

E - Edge Street - 12-13.5m

Shared Zone Streets

C1 - Shared Zone - 13.6m

C2- Shared Zone - 12m

C3- Shared Zone - varies

D - Shared Zone - 8.9m

F - Laneway 1 - 7m

G - Laneway 2 - 7m

H - Swale Street 1 - 25m

I - Swale Street 2 - 25m

J - WSP Street - 6.2m

K - Trafficable Path 5m

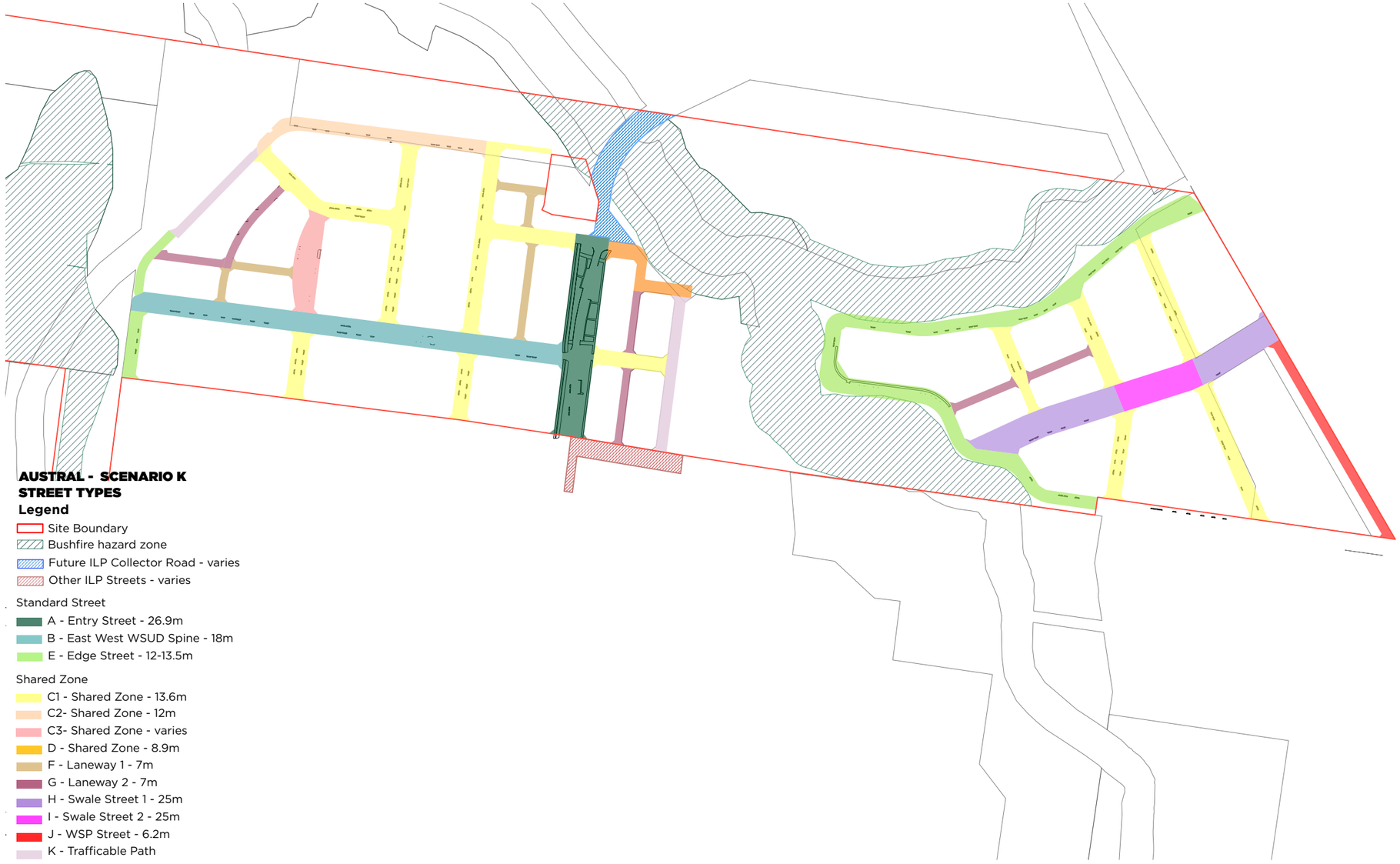


Figure 38: Street Typology Diagram

5.12 Street Design - Materials and Elements

PLANTING

AMENITY

FURNITURE

MATERIALITY

STREET FURNITURE

ChillOUT Hubs feature public WiFi, device charging, lighting and can run via solar power all the while providing a shaded area within the public domain.
ChillOUT Hubs also feature sensors that monitor user numbers, the micro climate and utility usage.

Using a smart sensor the E-Bin allows for remote fill monitoring and provides alerts if bin is on fire or requires to be emptied.

SMART POSTS

Smart posts combine street lighting with customisable modules to bring new services into their environments, such as WiFi, surveillance cameras, loudspeakers, emergency buttons and EV chargers. SHUFFLE is a completely energy-efficient yet affordable smart city solution that requires very low maintenance.

WSUD

PowerMe Tables charge phones and laptops in the public domain. The tough standalone unit is strong and waterproof. Each multifunctional side table features a dual wireless charging pad and heavy-duty power outlet with GPO and USB ports.

Post pandemic drinking fountains and bottle refill stations which counter cross-contamination with silver-ion antibacterial nossels and optional sensor fit-outs, allowing for hands free use.

Subsurface cell structures & soaker pits made of recycled plastics can assist with root development and overall health and vigour of street trees

Permeable paving reduces surface runoff in comparison to traditional pavement surfaces. The permeability recharges groundwater tables and also allows for air and moisture to filter into the soils preventing the need for control joints in pavements.

Slotted or permeable kerbing allow for passive overland flow and infiltration of water into swales and raingardens.

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5.13 Street Sections and Plans

A - Entry Street - 26.9m

The Entry Street is an ILP collector road that serves to move traffic from local streets to arterial roads.

The curved alignment of the Entry Street ha=s been developed to meet particular spatial site constraints , these being the fact that Edmondson Avenue is currently a half road at the southern Site Boundary, and that Sydney Water have constructed a Sewage Pump Station within the ILP Collector road Reservation.

But snaking the street through the site, we not only address these constraints but also create a unique entry experience

Under the Master Plan it terminates in Austral West, but allowance has been made for it to continue through the Site to terminate at the Western Sydney Parklands to the north.

Figure 39 shows the design requirements and intent.

Reservation	26.9m
Type	Collector road
Behavioural Speed	– 50km
Active Transport	– Dedicated two-way cycle path on eastern verge
Landscape	– Mature trees in with understorey planting
WSUD	– Incorporated into parking bay zone
Parking	– Integrated into road reserve
Finishes	– Dark tones used to create contrast with the main concrete colour – Broom Finish with steel trowel margins – Permeable threshold feature paving – Concrete and asphalt transport corridors
Furniture	– Light posts (by others) – Bus stop with shelter/seating
Traffic Calming	– Thresholds at intersections with Shared Zones

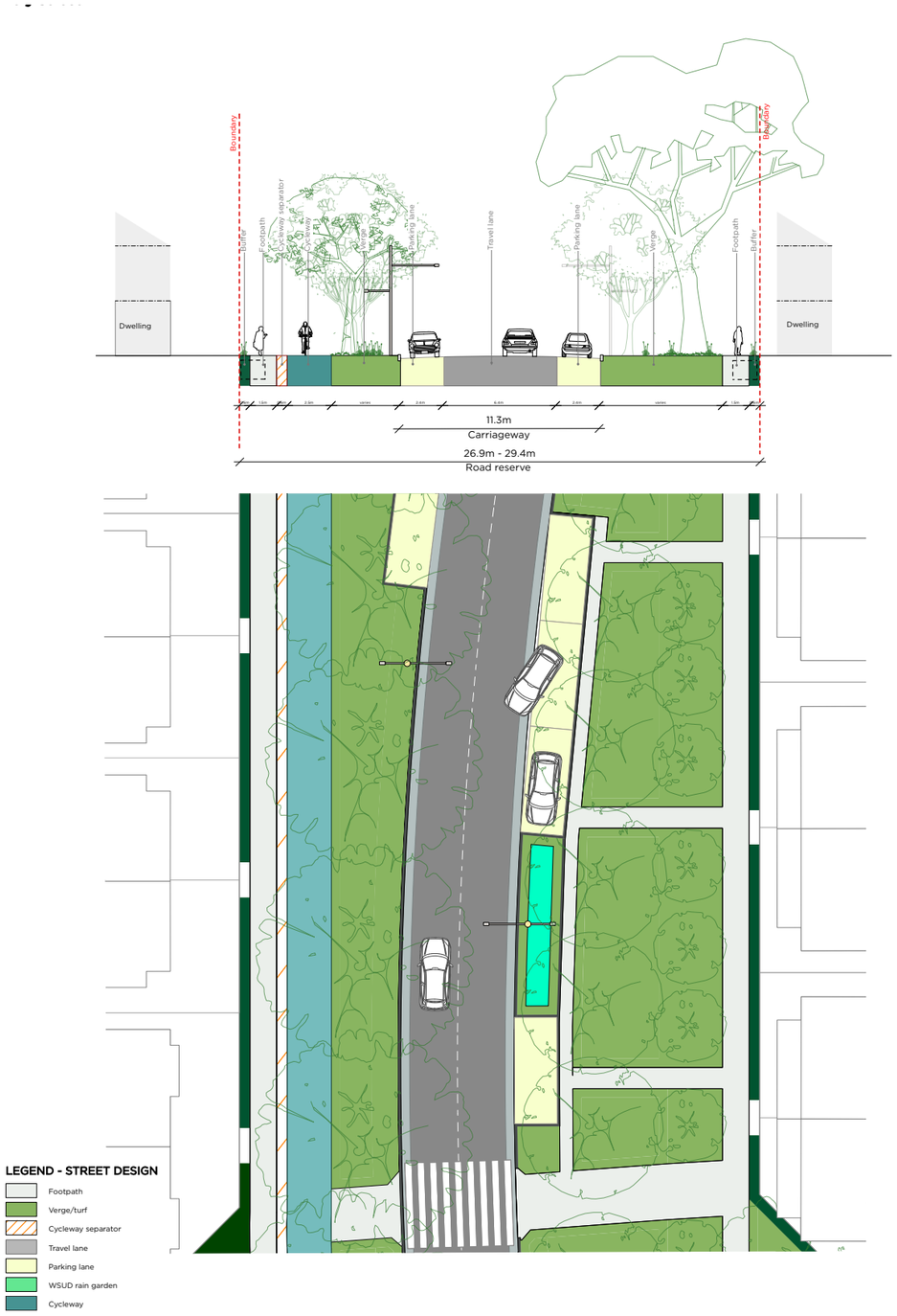


Figure 39: Entry Street - section and plan

Key Features - Entry Street

1. Large verge with feature trees
2. Dedicated two-way cycle path
3. Pedestrian crossings at intersections
4. Rear loaded development to reduce driveway cross-overs
5. On-street parking bays
6. WSUD in rain-gardens with slotted kerbs

Figure 40: Entry Street - axonometric character diagram

Figure 41: View north along the Entry Street

Figure 42: View north along the Entry Street

Figure 43: View on Entry Street towards the west

B - East West WSUD Spine - 18m

A local street with a wide verge or setback can be found centrally within Austral West. Running east to west it connects open space areas and sits on the longer-term axis that connects the two portions of the development.

Its purpose is to form a green spine between the two existing vegetation communities within the site.

The street is to have a dedicated parking lane with footpaths on both sides of the road reserve, one being a widened shared path to encourage active transport.

Street verges are to include mature trees on either side of the footpath with complementary understorey planting to act as a buffer for residential buildings.

Figure 44 show the individual design requirements for this streets.

Reservation	26.9m
Type	Local road
Behavioural Speed	– 40km
Active Transport	– Shared path along northern verge
Landscape	– Mature trees in with understorey planting
WSUD	– Incorporated into parking bay zone
Parking	– Integrated into road reserve
Finishes	– Dark tones used to create contrast with the main concrete colour – Broom Finish with steel trowel margins – Permeable threshold feature paving – Concrete and asphalt transport corridors
Furniture	– Light posts (by others)
Traffic Calming	– Thresholds at intersections with Shared Zones

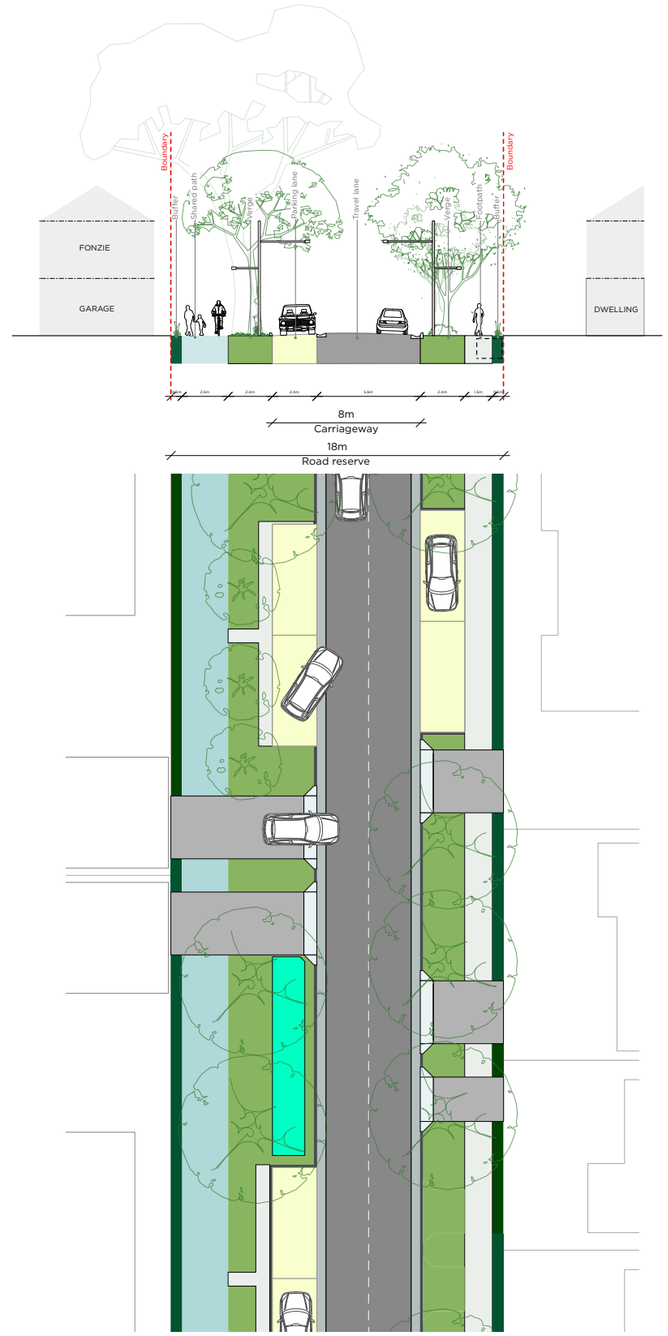


Figure 44: East West WSUD Spine - section and plan

Key Features - East West WSUD Spine

1. Large verge with feature trees
2. Shared path
3. Pedestrian crossings at intersections
4. Side-street orientated development on northern edge to reduce driveway cross-overs
5. On-street parking bays
6. WSUD in rain-gardens with slotted kerbs
7. Potential for Fonzie Flats to activate northern street edge

Figure 45: East West WSUD Spine - axonometric character diagram

Figure 46: View east along the Entry Street

Figure 47: View looking north west along the WSUD Spine

E - Edge Street - 12-13.5m

The Edge Street has been developed to incorporate a wider carriageway for Bushfire Access.

Planning for Bushfire legislation requires a 8 metre clear road carriageway adjacent to vegetation that is deemed a bushfire hazard.

In order to avoid the poor urban design outcomes that a road with an 8 metre carriageway would result in, we have introduced a bi-directional cycle path on a raised shoulder that adjoins a 5.5 metre carriageway but is separated by a raised mountable kerb.

This provides for an effective 8 metre carriageway if required in the rare instance if an emergency, while providing amenity and safety day to day in normal circumstances.

Reservation	12-13.5m
Type	Local road
Behavioural Speed	– 40km
Active Transport	– Dedicated two-way cycle path separated from carriageway on mountable barrier
Landscape	– Mature trees in with understorey planting
WSUD	– None
Parking	– Integrated into road reserve
Finishes	– Dark tones used to create contrast with the main concrete colour – Broom Finish with steel trowel margins – Permeable threshold feature paving – Concrete and asphalt transport corridors
Furniture	– Light posts (by others)
Traffic Calming	– Thresholds at intersections with Shared Zones

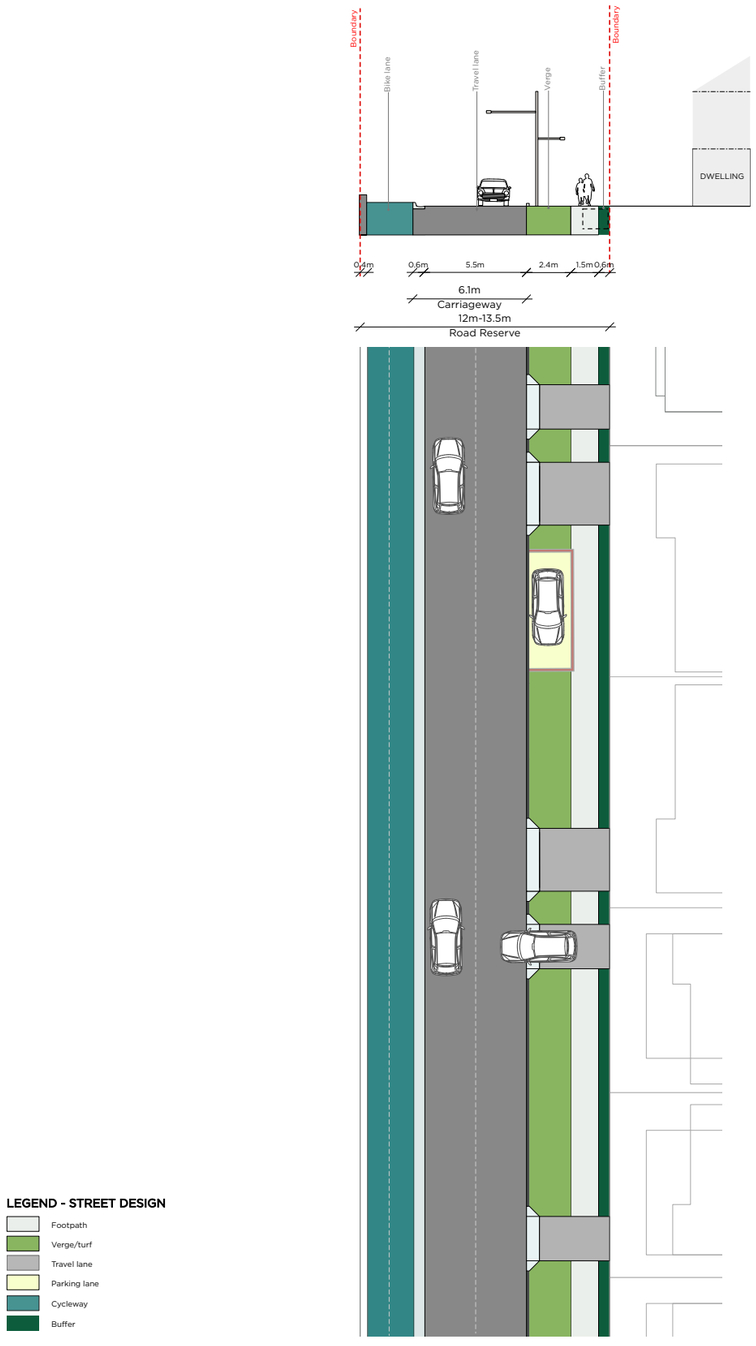


Figure 48: Edge Street - section and plan

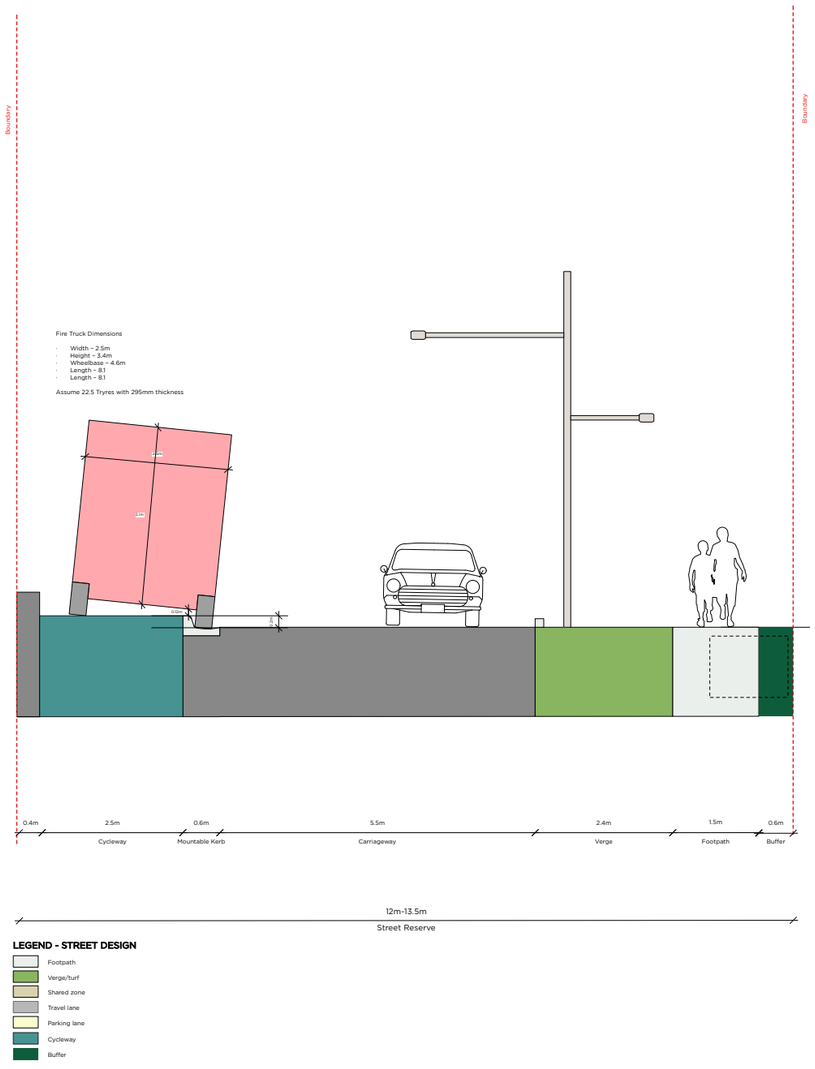


Figure 49: Edge Street - details

Key Features - Shared Zone D

1. Vegetation interface
2. Standard carriageway
3. Raised cycle path separated from carriageway by mountable kerb
4. On-street parking outside of carriageway zone

Figure 50: East West WSUD Spine - axonometric character diagram

Figure 51: View looking along Edge Street within austral East

C1 - Shared Zone - 13.6m

Shared Zones make up the majority of the public streets within Austral.

These streets have been carefully designed in the context of a low-density suburb.

The Shared Zones incorporate driveways, on-street parking as well as large areas of verge and social spaces that promote community interactions.

Individual parklets have also been incorporated into the design to offer dedicated sheltered spaces for community interactions and informal children's play.

A number of traffic calming strategies have also been deployed including, road narrowing, changes in horizontal road alignment and give-way pinch point.

These measures have been employed so as no section of road is longer than 50 metres long.

Reservation	13.6m
Type	Shared Zone
Behavioural Speed	– 10km
Active Transport	– Mixed in Shared Zone
Landscape	– Mature trees in with understorey planting
WSUD	– Incorporated into verges
Parking	– Integrated into road reserve
Finishes	– Paving sets or varied colours to break up surface and visually delineate spatial changes
Furniture	– Light posts (by others) – Seating, play equipment and social areas incorporated as parklets throughout the development
Traffic Calming	– Speed cushions – Narrowing of carriageway – Changes in horizontal alignment

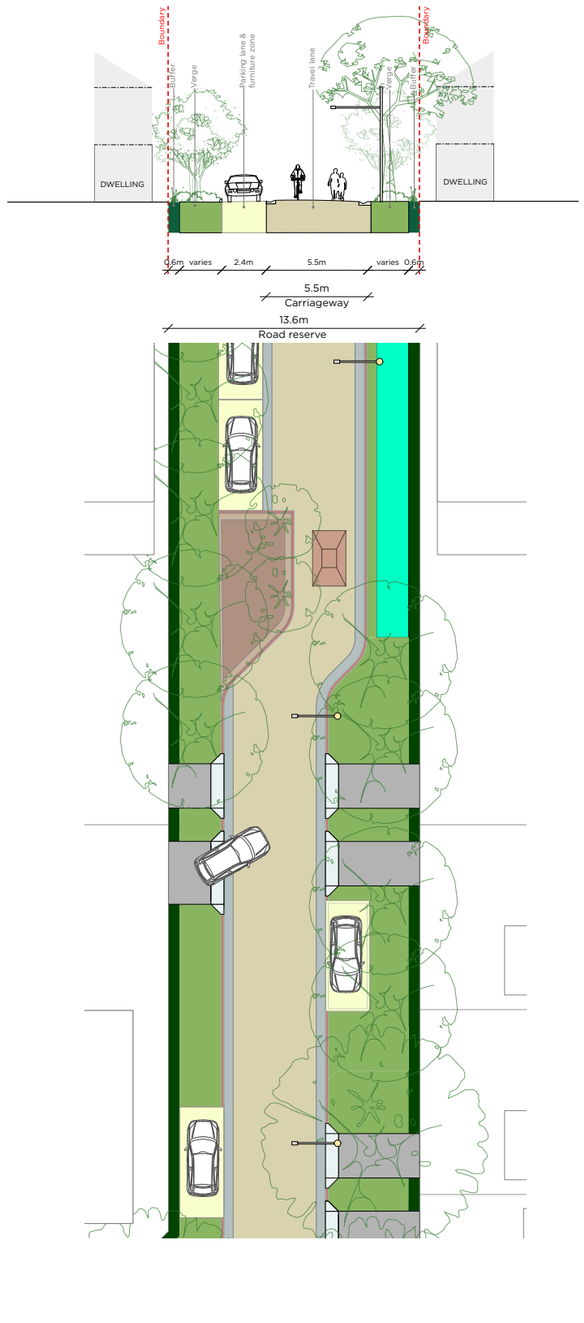


Figure 52: Shared Zone C1 - section and plan

Key Features - Shared Zone C1

1. Large verge with feature trees
2. Shared Zone
3. Pinch-point with speed cushion
4. Driveway cross-overs
5. 600mm no-planting zone against lots to allow for access and maintenance
6. Parklet with street furniture to encourage social interactions
7. On-street parking

Figure 53: Shared Zone C1 - axonometric character diagram

Figure 54: View along typical Shared Zone - Parklet space in the foreground

Figure 55: View along typical Shared Zone - Parklet space in the foreground

C2 - Shared Zone - 12m

This Shared Zone typology runs along the northern interface with the TransGrid Easement in the north of Austral West.

Reservation	12m
Type	Shared Zone
Behavioural Speed	– 10km
Active Transport	– Mixed in Shared Zone
Landscape	– Mature trees in with understorey planting
WSUD	– Incorporated into verges
Parking	– Integrated into road reserve
Finishes	– Paving sets or varied colours to break up surface and visually delineate spatial changes
Furniture	– Light posts (by others) – Seating, play equipment and social areas incorporated as parklets throughout the development
Traffic Calming	– Speed cushions – Narrowing of carriageway – Changes in horizontal alignment

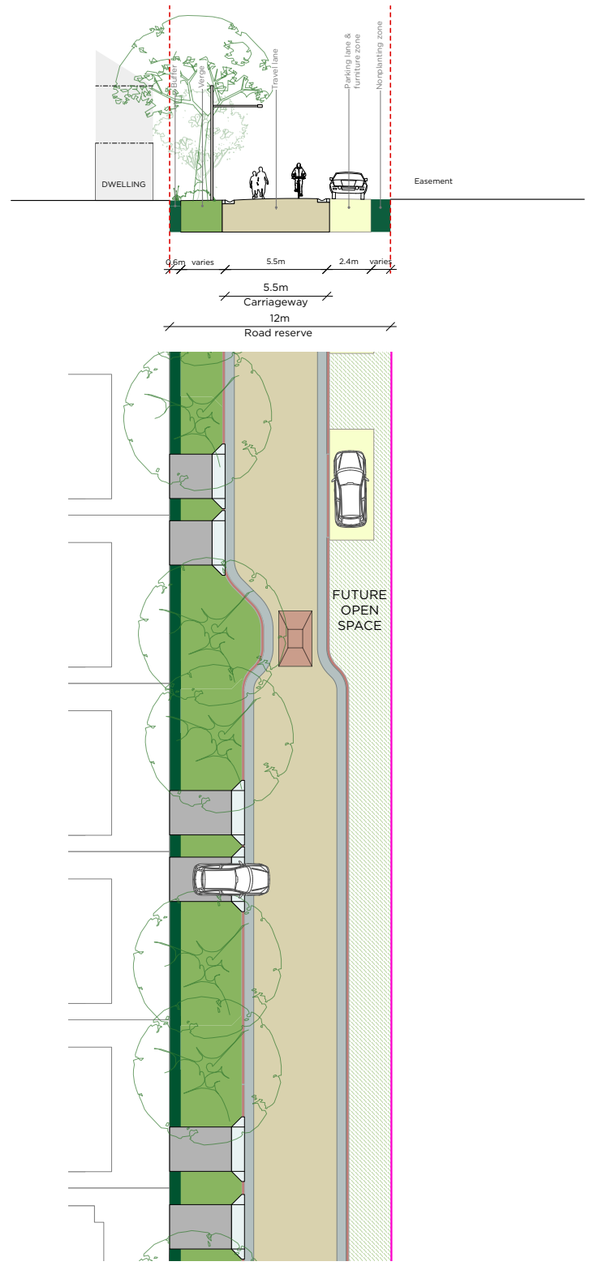


Figure 56: Shared Zone C2 - section and plan

Key Features - Shared Zone C2

1. Large verge with feature trees
2. Shared Zone
3. Pinch-point with speed cushion
4. Driveway cross-overs
5. 600mm no-planting zone against lots to allow for access and maintenance
6. Potential Future Open Space Meadow with walking trails
7. On-street parking

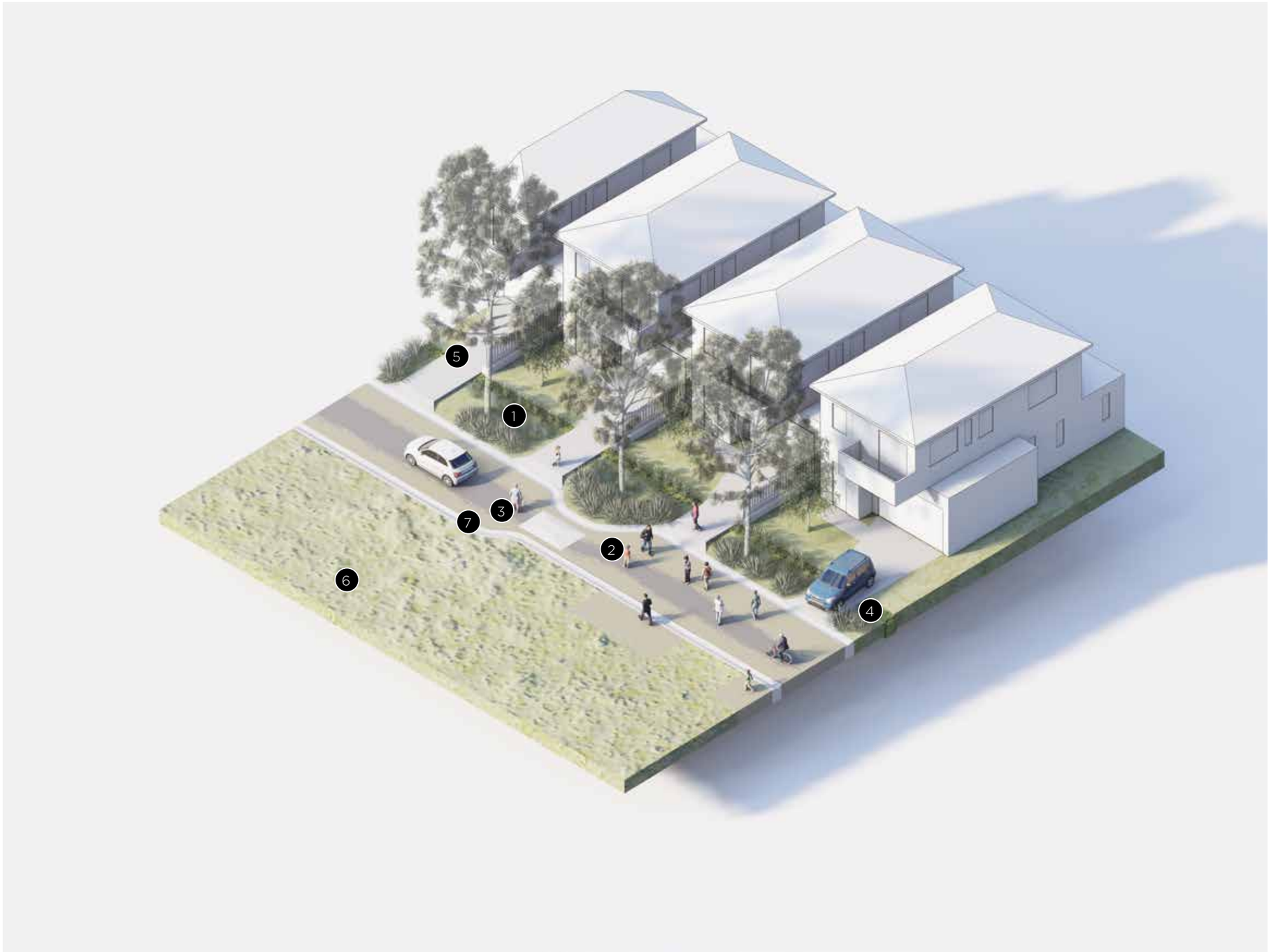


Figure 57: Shared Zone C2 - axonometric character diagram

Figure 58: View along Shared Zone C2 - with open space to the left

C3 - Shared Zone - Varies

Shared Zones C3 is unique in that it incorporates a local play area in a widened verge that split traffic in a one-way loop.

This allows the space to be programmed with activity zones that incorporate social and play spaces for residents.

Low-level fences and mass planting would provide a separation and staggered gates would stop conflict between pedestrians and drivers at the access points.

Reservation	Varies
Type	Shared Zone
Behavioural Speed	– 10km
Active Transport	– Mixed in Shared Zone
Landscape	– Mature trees in with understorey planting
WSUD	– Incorporated into verges
Parking	– Integrated into road reserve
Finishes	– Paving sets or varied colours to break up surface and visually delineate spatial changes
Furniture	– Light posts (by others) – See Parklet Design in the later section of this report
Traffic Calming	– Speed cushions – Narrowing of carriageway – Changes in horizontal alignment

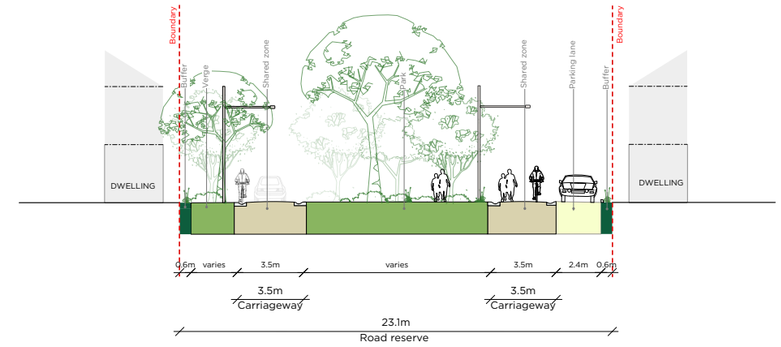


Figure 59: Shared Zone C3 - section and plan

Key Features - Shared Zone C3

1. Large verge with feature trees
2. Shared Zone as one-way loop around active open space
3. Pinch-point with speed cushion
4. Driveway cross-overs
5. 600mm no-planting zone against lots to allow for access and maintenance
6. Local open space with programmed play and social spaces
7. On-street parking

Figure 60: Shared Zone C3 - axonometric character diagram

Figure 61: View into the active view within Shared Zone C3

D - Shared Zone - 8.9m

Shared Zones D has been developed to incorporate a wider carriageway for Bushfire Access.

Planning for Bushfire legislation requires a 8 metre clear road carriageway adjacent to vegetation that is deemed a bushfire hazard.

In order to avoid the poor urban design outcomes that a road with an 8 metre carriageway would result in, we have introduced a bi-directional cycle path on a raised shoulder that adjoins a 5.5 metre carriageway but is separated by a raised mountable kerb.

This provides for an effective 8 metre carriageway if required in the rare instance if an emergency, while providing amenity and safety day to day in normal circumstances.

Reservation	Varies
Type	Shared Zone
Behavioural Speed	– 10km
Active Transport	– On raised bi-directional cycle path
Landscape	– Mature trees in with understorey planting
WSUD	– None
Parking	– Integrated into road reserve - outside 8 metre carriageway
Finishes	– Paving sets or varied colours to break up surface and visually delineate spatial changes
Furniture	– Light posts (by others)
Traffic Calming	– Speed cushions – Narrowing of carriageway – Changes in horizontal alignment

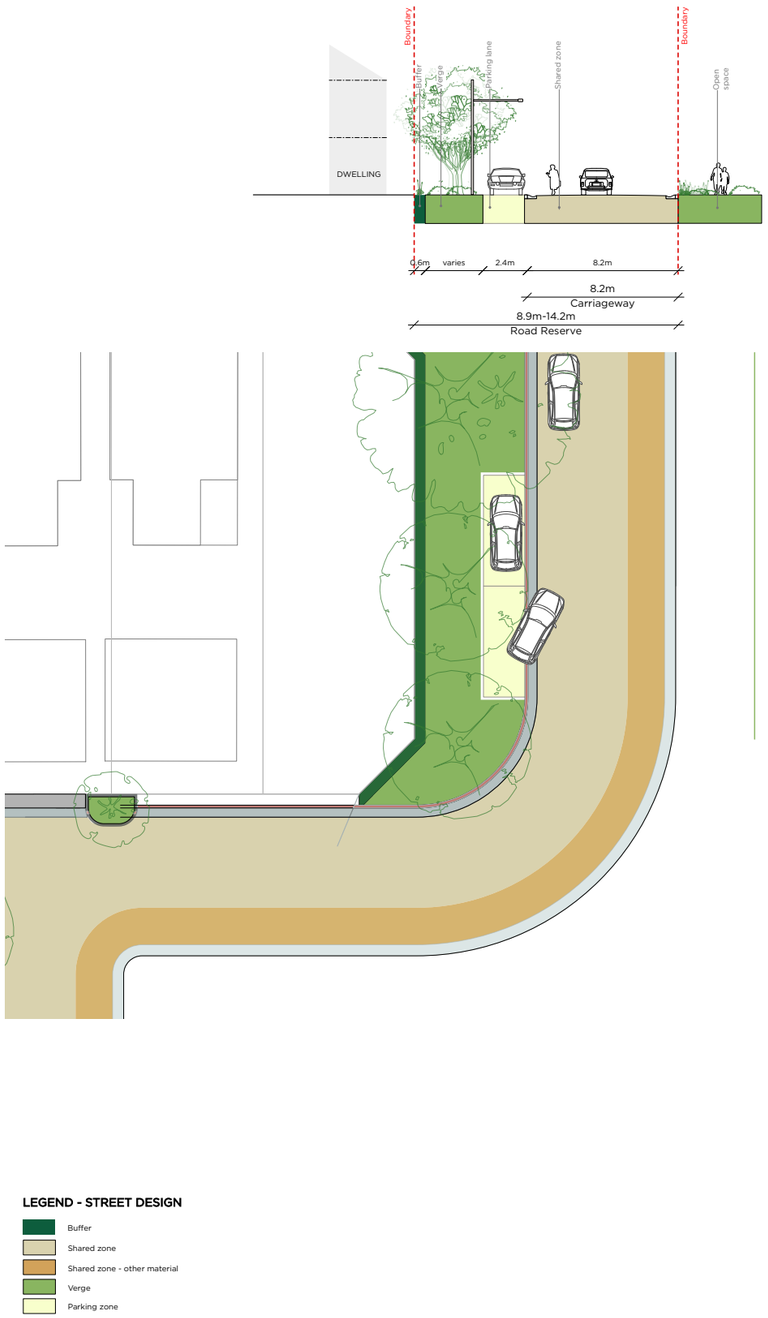


Figure 62: Shared Zone D - section and plan

Figure 63: View into the active view within Shared Zone D

G&F - Laneway - 7m

Laneways provide both parking and servicing access to rear-loaded dwellings within Austral and a secondary circulate access for pedestrians.

Reservation	7m
Type	Shared Zone
Behavioural Speed	– 10km
Active Transport	– Mixed in Shared Zone
Landscape	– Mature trees in tree pits
WSUD	– None
Parking	– Integrated into road reserve
Finishes	– Paving sets or varied colours to break up surface and visually delineate spatial changes
Furniture	– Light posts (by others)
Traffic Calming	– Narrowing of carriageway – Threshold treatment

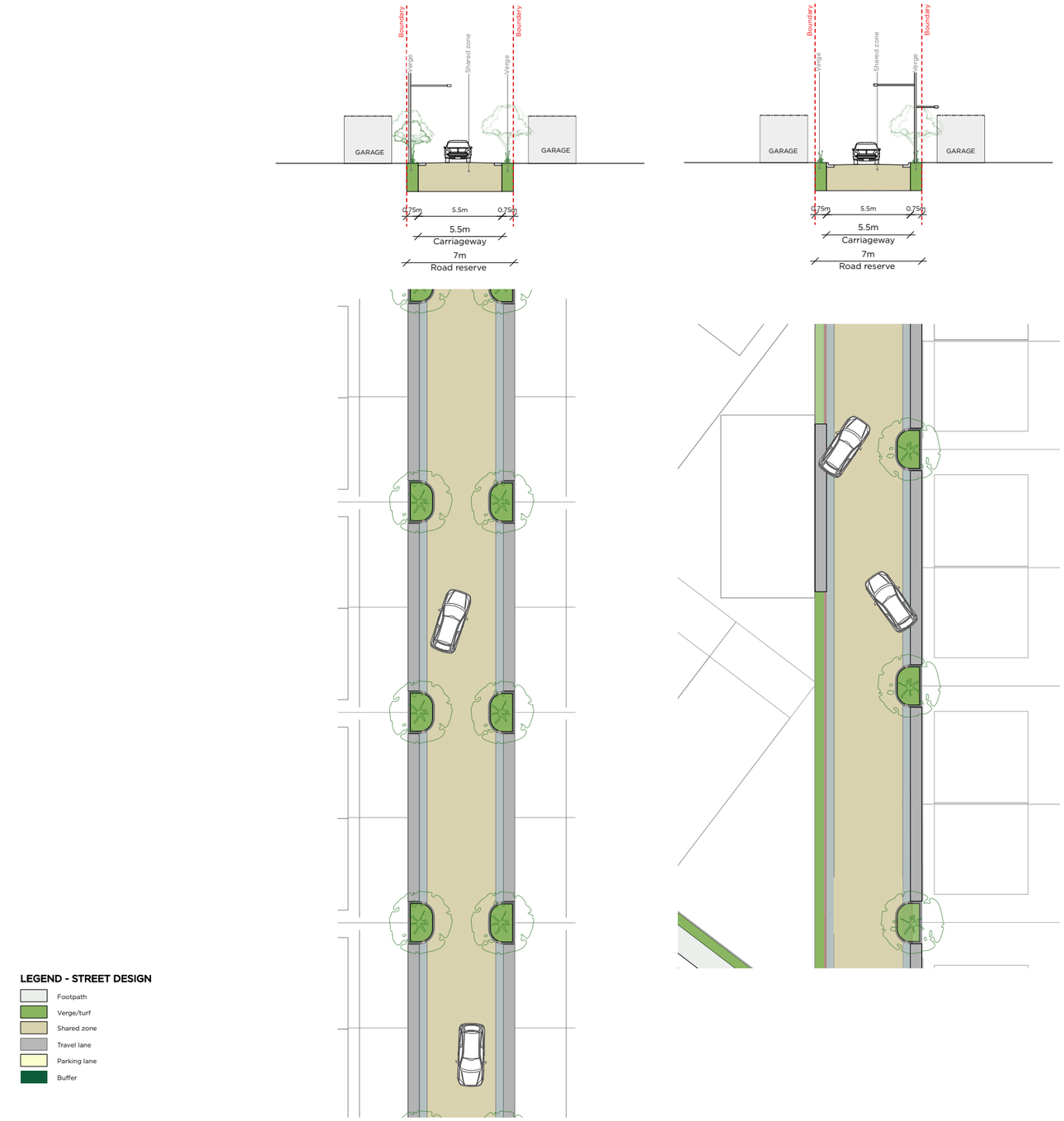


Figure 64: Laneways - section and plan

H&I - Swale Street Zone - 25m

The Swale Streets are located in Austral East.

This street typology has been developed to accommodate an overland flow path from the east draining to Kemps Creek.

It is anticipated that this will generally be a dry-overland flow path, however it has been designed to also allow for WSUD to treat run-0off from the local streets.

The landscaped verge area will also accommodate a local park with play and social activation opportunities.

Details of the park design and programming can be found in the later sections of this report.

Reservation	Varies
Type	Shared Zone
Behavioural Speed	– 10km
Active Transport	– Mixed in Shared Zone
Landscape	– Mature trees in with understorey planting
WSUD	– Within swale area
Parking	– Integrated into road reserve - outside carriageway
Finishes	– Paving sets or varied colours to break up surface and visually delineate spatial changes
Furniture	– Light posts (by others) – Parklet design detailed in later section
Traffic Calming	– Speed cushions – Narrowing of carriageway – Changes in horizontal alignment

Figure 65: Swale Street H - section and plan

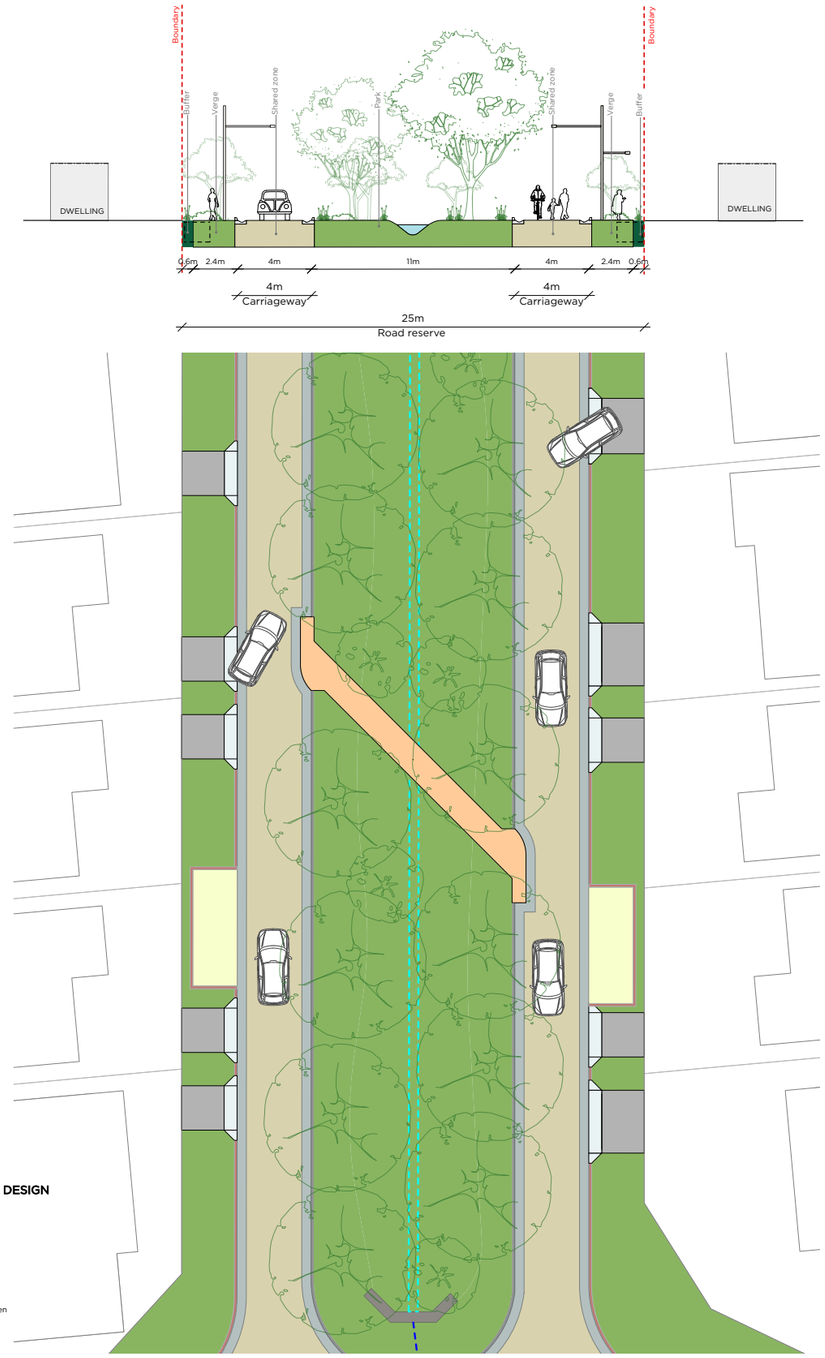


Figure 66: Swale Street I - section and plan

Key Features - Swale Street H

1. Active Park area
2. Shared Zone
3. Pathway serving rear-loaded dwellings
4. 600mm no-planting zone against lots to allow for access and maintenance
5. On-street parking outside of carriageway zone
6. WSUD within Swale

Figure 67: Swale Street H - axonometric character diagram

Figure 68: View looking east along the Swale Street H

Key Features - Swale Street I

1. WSUD within Swale
2. Shared Zone - one-way loop
3. Driveway access
4. 600mm no-planting zone against lots to allow for access and maintenance
5. On-street parking outside of carriageway zone
6. Swale crossing on raised walkway

Figure 69: Swale Street H - axonometric character diagram

Figure 70: View looking east along the Swale Street I

J - WSP Street - 6.2m - 7.8m

Western Sydney Parklands (WSP) Street runs along the southern portion of Austral East's eastern boundary.

This Shared Zone forms public interface with the parklands and services large rural lots that run along the eastern boundary.

Reservation	7m
Type	Shared Zone
Behavioural Speed	– 10km
Active Transport	– Mixed in Shared Zone
Landscape	– Mature trees
WSUD	– None
Parking	– Integrated into road reserve
Finishes	– Paving sets or varied colours to break up surface and visually delineate spatial changes
Furniture	– Light posts (by others)
Traffic Calming	– Narrowing of carriageway – Threshold treatment

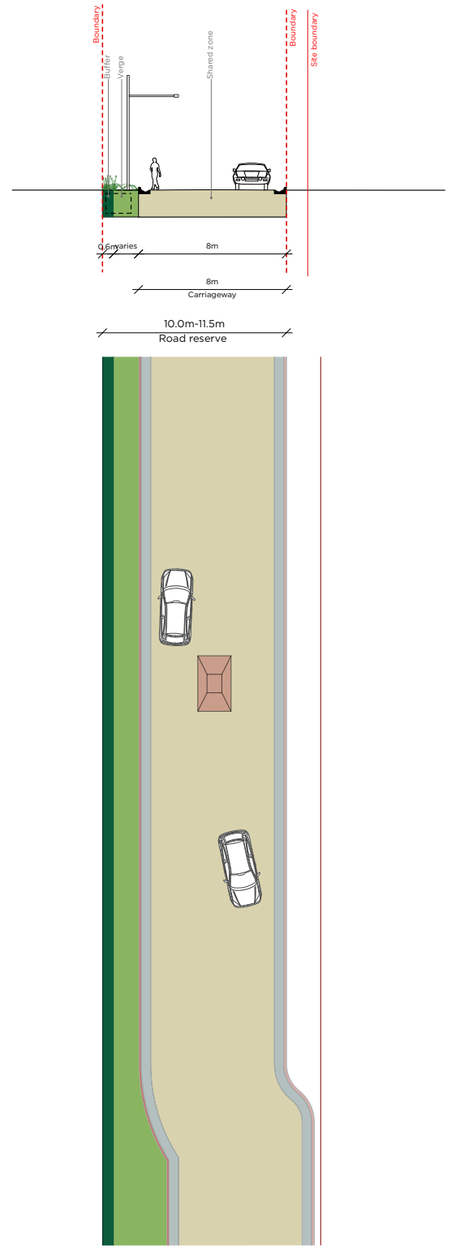


Figure 71: WSP Street - section and plan

Key Features - WSP Street

1. Shared Zone - one-way
2. WSP interface
3. 600mm no-planting zone against lots to allow for access and maintenance
4. On-street parking outside of carriageway zone

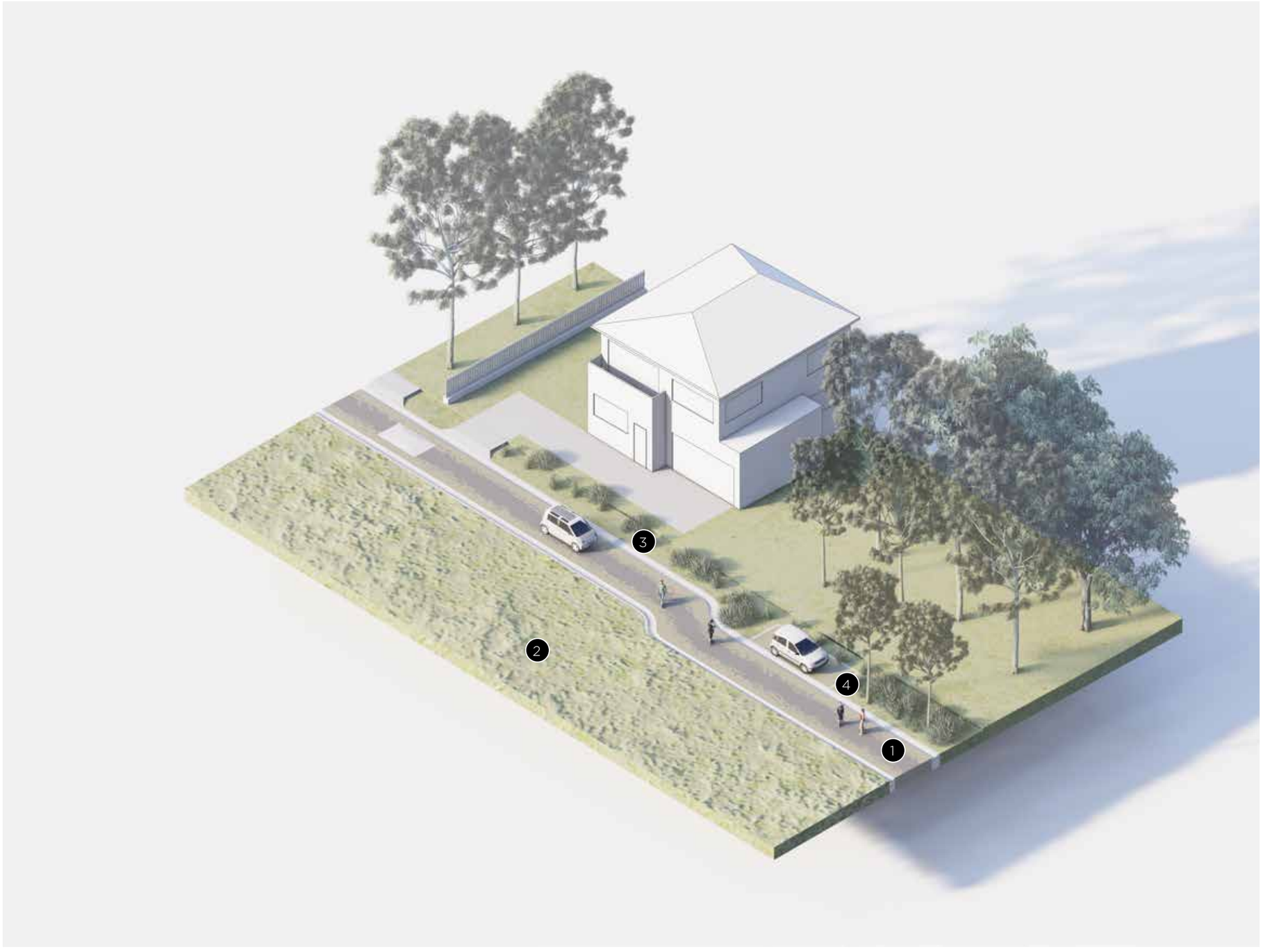


Figure 72: Swale Street H - axonometric character diagram

K - Trafficable Path 5m

Trafficable footpaths are located adjoining the basins (25 and 27) in Austral West.

The paths allow for emergency vehicle access and do not support day to day access.

The inclusion in the plan is to meet bushfire risk mitigation.

Reservation	5m
Type	Footpath
Behavioural Speed	– N/A
Active Transport	– On path
Landscape	– Mature trees
WSUD	– None
Parking	– None
Finishes	– Paving sets or varied colours to break up surface and visually delineate spatial changes
Furniture	– Light posts (by others)
Traffic Calming	– N/A

STREET J
Edge Path

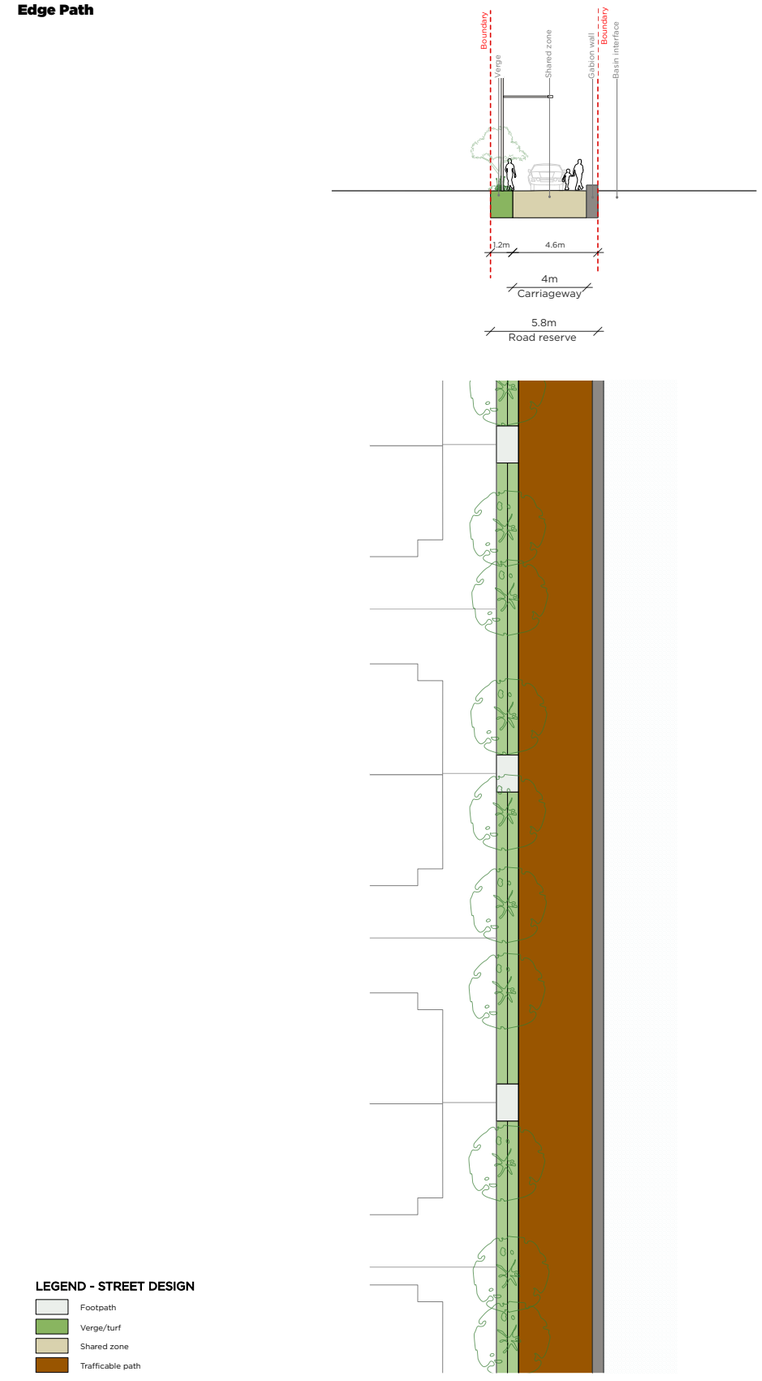


Figure 73: Trafficable Path - section and plan

Figure 74: View looking east along the Trafficable Street adjacent to Basin 27 in Austral West

5.14 Street Tree Master Plan

Street trees are fundamental in delivering an interconnecting network of public open space that will keep the city cool as well as creating shaded linkages between public open spaces.

Figure 75 highlights the differing street tree combinations for the Master Plan.

Tree species have been selected from the Liverpool City Council DCP schedules for Austral.

Figure 75: Street tree master plan - Austral East

Figure 76: Street tree master plan - Austral West

5.15 Open Space Master Plan

Key objectives in the development of the Open Space in The Master Plan include:

Integration of:

- Form and function of green and blue infrastructure with urban green space and development (e.g. Built form, water supply, transportation, waste water)
- The design and spatial requirements of Liverpool City Council
- Open space developments with existing natural amenities and character of the surrounding area

Connectivity of:

- Networks that serve humans and wildlife
- Active transport and public transport to the surrounding key centres and employment areas

Multi-functionality of:

- Landscapes that offer ecological, socio-cultural and economic benefits
- Spaces that foster interaction and stewardship, community identity, sense of connectedness and community capacity
- Existing landscape performance via improved connectivity, stormwater management, flood mitigation, biodiversity and environmental quality

Participation that:

- Discovers a balance of interest for many different stakeholders to maximise the benefits of proposed green space
- Improves equity of access to green space services by considering the needs, values, motivations, uses and barriers to engagement with various cultures and user groups
- Encourages the use of currently underutilised open space corridors

The Master Plan proposes two park typologies which are Local Parks and Parklets distributed all within the street network.

The open space of The Master Plan is shown in Figure 76.

Figure 77: The open space of The Master Plan

Consideration for public art

The plan on the right shows potential locations for public art interventions.

One of the main considerations is to locate artworks in locations with good views of natural features such as riparian corridors, basins and Western Sydney Parklands.

There are also opportunities of incorporating First Nations cultural planning into those public art sites.

The Site

Public art location

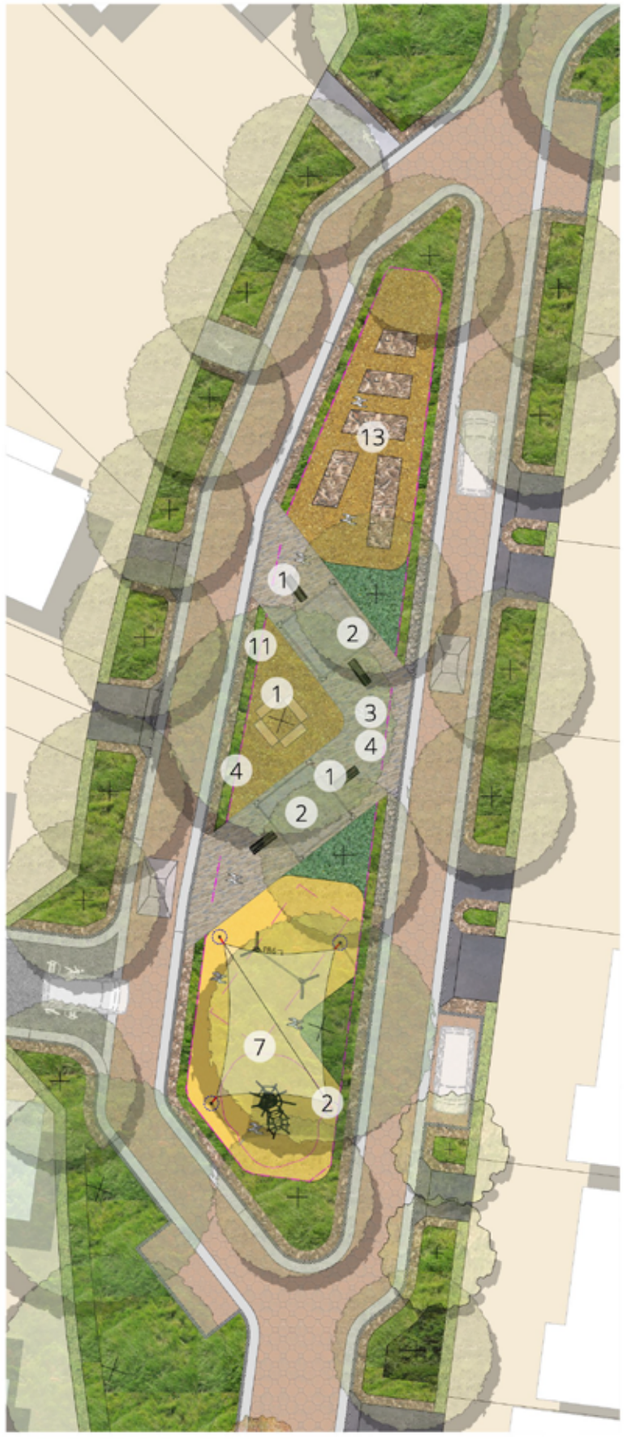
Figure 78: Indicative public art locations and exmaples of artworks

5.16 Public Open Space Programming

Figure 77 shows the location and open space programming requirements for each park based on the Open Space for Recreation Guide 2018 performance approach.

Figure 79: Public domain Master Plan - Austral East

Figure 80: Public domain Master Plan - Austral West



01 POCKET PARK 1 - CENTRAL PARK
PLAN 1:150@A1

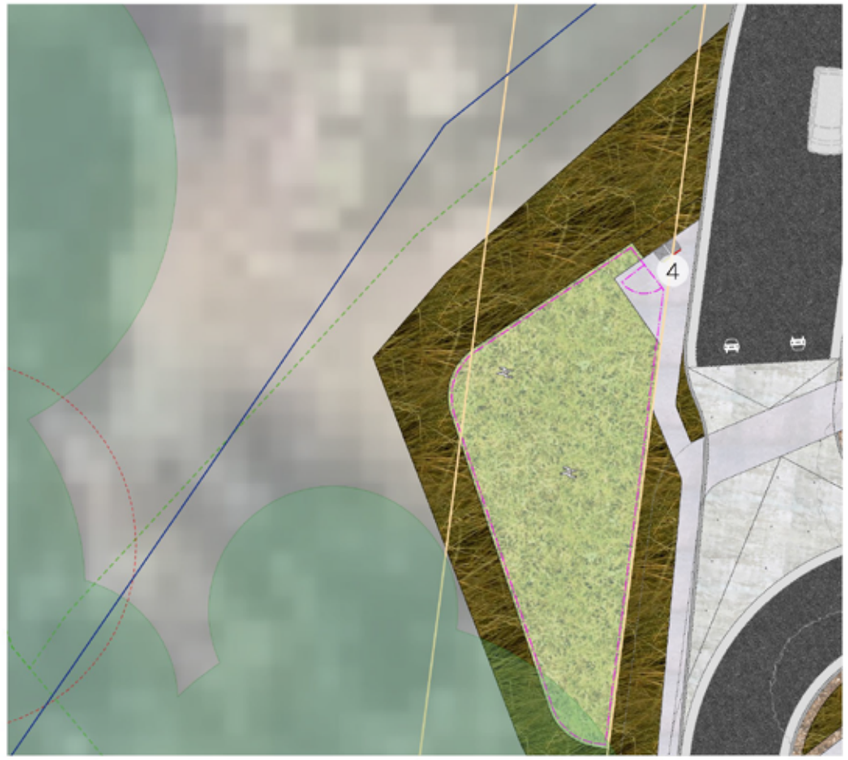
OPEN SPACE INFRASTRUCTURE SCHEDULE		
PARK NAME/TYPE	Pocket Park 1 - Central Park	
SIZE (TOTAL)	446	m2
MINIMUM REQUIRED ELEMENTS		
Furniture Types	**Quantity**	**Unit Description**
1. Bench seating	4	Each
2. Shade structures	3	Each
3. Drinking fountains	1	Each
4. Rubbish bins	2	Each
5. BBQ Facilities	-	Each
6. Lighting/bollards/posts	Required	To meet lighting safety standards
7. Playground equipment	Required	Items
8. Exercise equipment	-	Items
9. Amenity building/structure	-	Male/female/accessible/baby change room
10. Wayfinding signage	Required	As part of precinct strategy
11. Public art	Yes	As part of precinct strategy
12. Sporting facilities	-	Multi purpose
13. Raised Garden Bed		

Transport	Quantity	Unit Description
Bus stop	-	As part of precinct strategy
Bicycle rack	3	Each
Shared path	-	As part of precinct strategy
Car parking	-	Spaces/accessible spaces

Vegetation	Quantity	Unit Description
Min area of softscape/planting	200	m2
Turfing	50	m2
100L trees	5	no.
200L trees	2	no.

Pavement	Quantity	Unit Description
Hard stand	50	m2
Permeable paving	50	m2
Softfall	50	m2

Note - Park programming has been indicated on detail plans



02 POCKET PARK 2 - DOG PARK
PLAN 1:150@A1

OPEN SPACE INFRASTRUCTURE SCHEDULE		
PARK NAME/TYPE	Pocket Park 2 - Dog Park	
SIZE (TOTAL)	400	m2
MINIMUM REQUIRED ELEMENTS		
Furniture Types	**Quantity**	**Unit Description**
Bench seating	-	Each
Shade structures	-	Each
Drinking fountains	-	Each
Rubbish bins	2	Each
BBQ Facilities	-	Each
Lighting/bollards/posts	Required	To meet lighting safety standards
Playground equipment	-	Items
Exercise equipment	-	Items
Amenity building/structure	-	Male/female/accessible/baby change room
Wayfinding signage	Required	As part of precinct strategy
Public art	-	As part of precinct strategy
Sporting facilities	-	Multi purpose

Transport	Quantity	Unit Description
Bus stop	-	As part of precinct strategy
Bicycle rack	-	Each
Shared path	-	As part of precinct strategy
Car parking	-	Spaces/accessible spaces

Vegetation	Quantity	Unit Description
Min area of softscape/planting	100	m2
Turfing	250	m2
100L trees	-	no.
200L trees	-	no.

Pavement	Quantity	Unit Description
Hard stand	20	m2
Permeable paving	-	m2
Softfall	-	m2

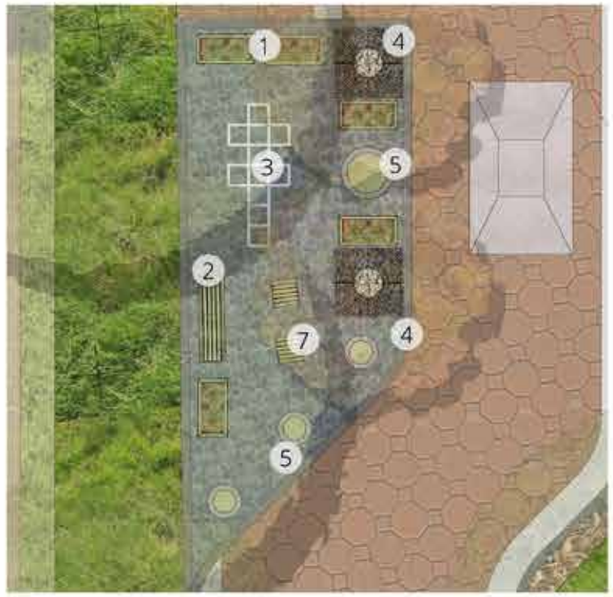
Note - Park programming has been indicated on detail plans

Figure 81: The open space of The Master Plan

Figure 82: View looking into the park in Austral West

01 PARKLET 1
PLAN 1:50@A1

0 0.5 1.0 1.5 2.0 2.5M



02 PARKLET 2
PLAN 1:50@A1

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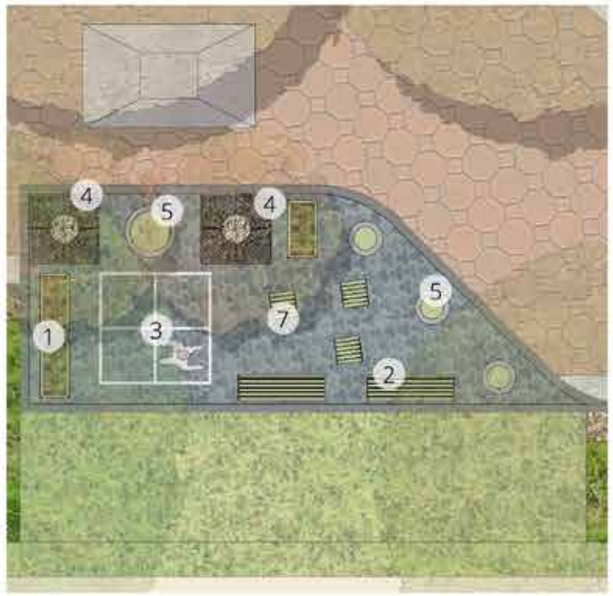
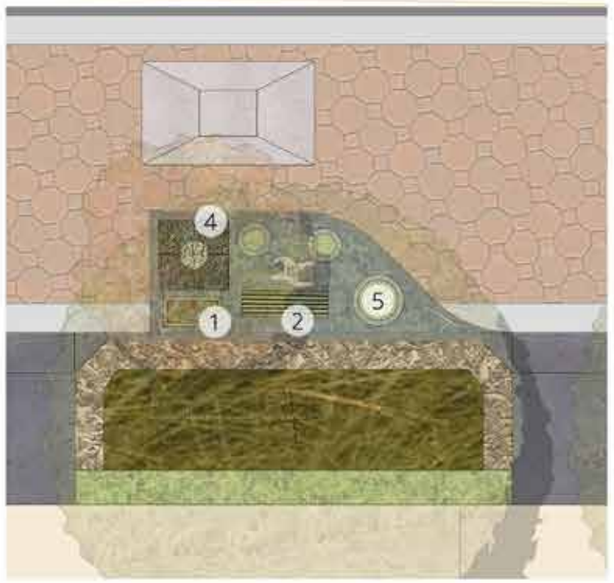


03 PARKLET 3
PLAN 1:50@A1

0 0.5 1.0 1.5 2.0 2.5M



04 PARKLET 4
PLAN 1:50@A1

0 0.5 1.0 1.5 2.0 2.5M

OPEN SPACE INFRASTRUCTURE SCHEDULE		
PARK NAME/TYPE	Parklet (combined)	
Parklet 1	10	m2
Parklet 2	29	m2
Parklet 3	28	m2
Parklet 4	8	m2
Parklet 5	26	m2
Parklet 6	40	m2
Parklet 7	42	m2
Parklet 8	9	m2
Parklet 9	10	m2
SIZE (TOTAL)	**202**	**m2**
MINIMUM REQUIRED ELEMENTS (total)		
Furniture Types	**Quantity**	**Unit Description**
1. Raised planter boxes	20	As part of precinct strategy
2. Seating (benches)	15	As part of precinct strategy
3. Linemarking (play/art)	4	As part of precinct strategy
4. Tree grate	10	As part of precinct strategy
5. Bollards	30	As part of precinct strategy
6. Chillout Hubs	1	As part of precinct strategy
7. Seating play (cubes)	20	As part of precinct strategy
8. Shade structures	2	As part of precinct strategy
9. Chess tables	2	As part of precinct strategy
10. Exercise equipment	2	As part of precinct strategy
11. Public art	2	As part of precinct strategy
12. Veggie gardens	4	As part of precinct strategy
Note - Park programming has been indicated on detail plans		

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Figure 83: View to a typical parklet along a Shared Zone

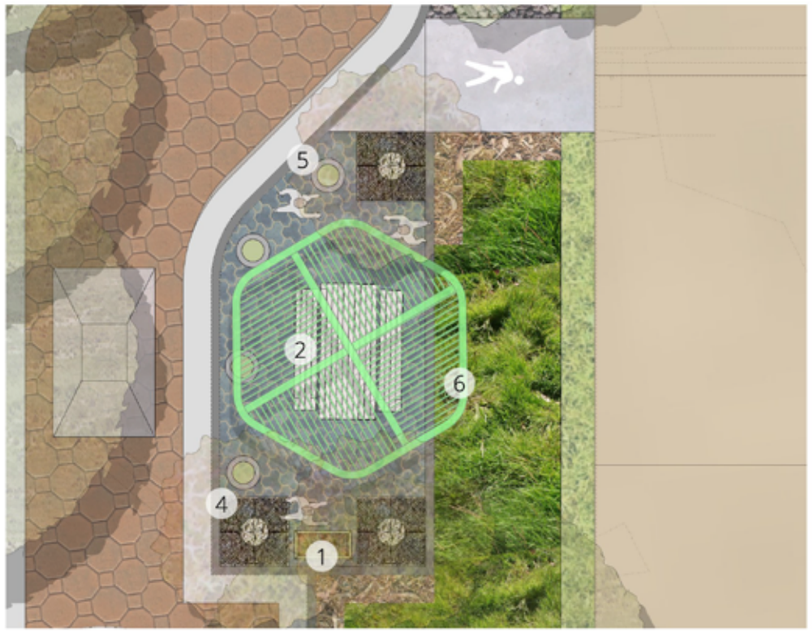
08 PARKLET 8
PLAN 1:50@A1

0 0.5 1.0 1.5 2.0 2.5M

09 PARKLET 9
PLAN 1:50@A1

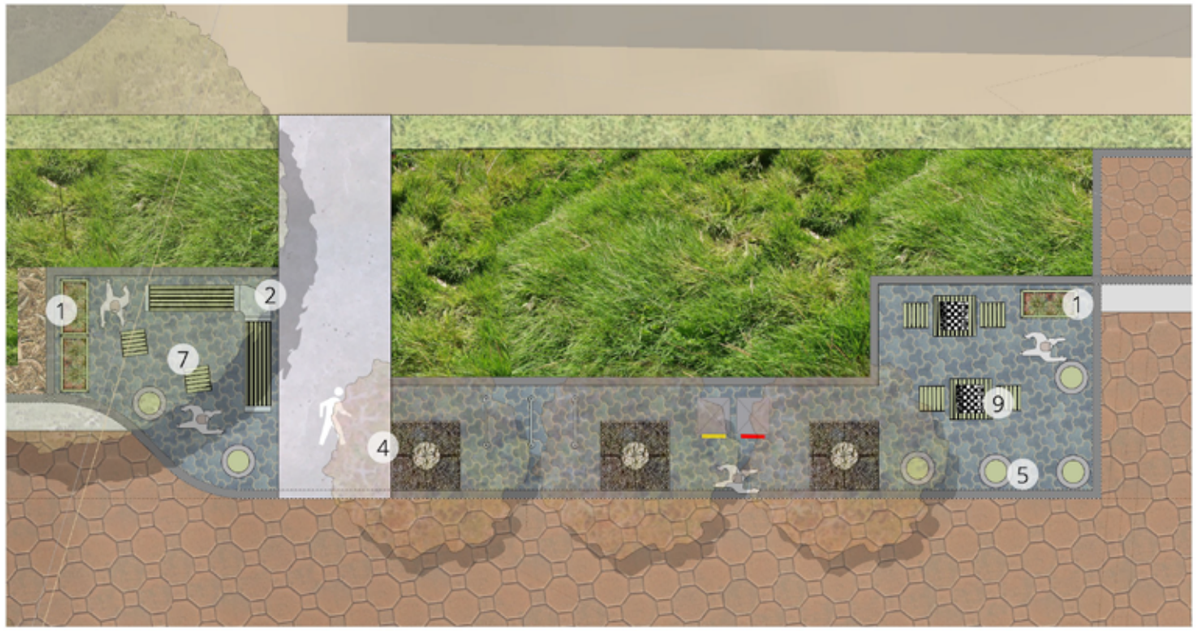
0 0.5 1.0 1.5 2.0 2.5M

OPEN SPACE INFRASTRUCTURE SCHEDULE		
PARK NAME/TYPE	Parklet (combined)	
Parklet 1	10	m2
Parklet 2	29	m2
Parklet 3	28	m2
Parklet 4	8	m2
Parklet 5	26	m2
Parklet 6	40	m2
Parklet 7	42	m2
Parklet 8 - East	9	m2
Parklet 9 - East	10	m2
SIZE (TOTAL)	**202**	**m2**
MINIMUM REQUIRED ELEMENTS (total)		
Furniture Types	**Quantity**	**Unit Description**
1. Raised planter boxes	20	As part of precinct strategy
2. Seating (benches)	15	As part of precinct strategy
3. Linemarking (play/art)	4	As part of precinct strategy
4. Tree grate	10	As part of precinct strategy
5. Bollards	30	As part of precinct strategy
6. Chillout Hubs	1	As part of precinct strategy
7. Seating play (cubes)	20	As part of precinct strategy
8. Shade structures	2	As part of precinct strategy
9. Chess tables	2	As part of precinct strategy
10. Exercise equipment	2	As part of precinct strategy
11. Public art	2	As part of precinct strategy
12. Veggie gardens	4	As part of precinct strategy
Note - Park programming has been indicated on detail plans		



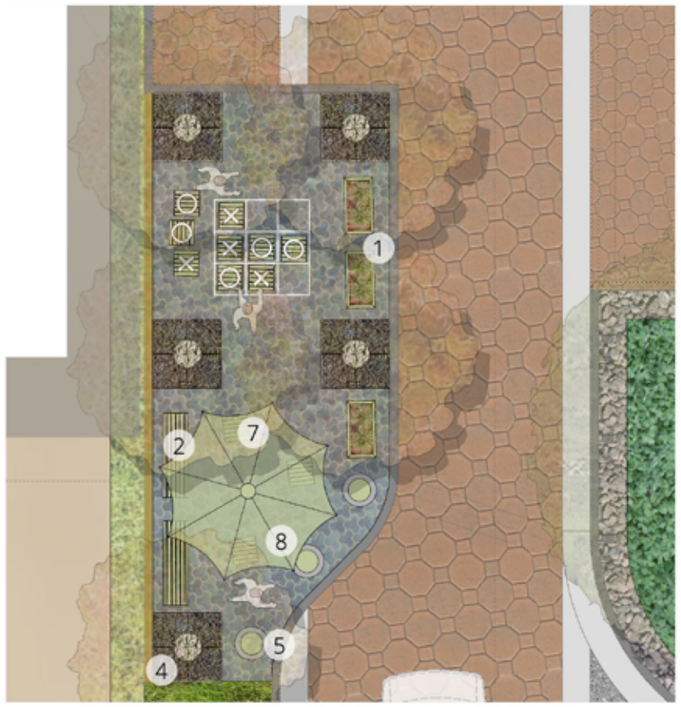
05 PARKLET 5
PLAN 1:50@A1

0 0.5 1.0 1.5 2.0 2.5M



07 PARKLET 7
PLAN 1:50@A1

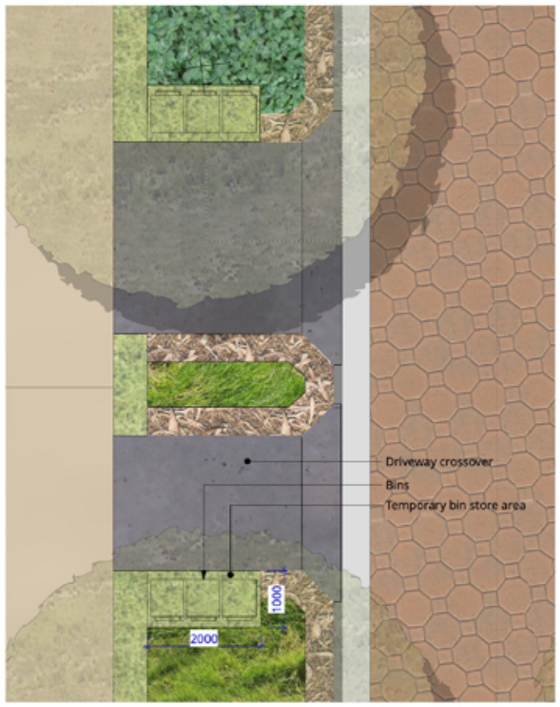
0 0.5 1.0 1.5 2.0 2.5M



06 PARKLET 6
PLAN 1:50@A1

0 0.5 1.0 1.5 2.0 2.5M

OPEN SPACE INFRASTRUCTURE SCHEDULE		
PARK NAME/TYPE	Parklet (combined)	
Parklet 1	10	m2
Parklet 2	29	m2
Parklet 3	28	m2
Parklet 4	8	m2
Parklet 5	26	m2
Parklet 6	40	m2
Parklet 7	42	m2
Parklet 8	9	m2
Parklet 9	10	m2
SIZE (TOTAL)	**202**	**m2**
MINIMUM REQUIRED ELEMENTS (total)		
Furniture Types	**Quantity**	**Unit Description**
1. Raised planter boxes	20	As part of precinct strategy
2. Seating (benches)	15	As part of precinct strategy
3. Linemarking (play/art)	4	As part of precinct strategy
4. Tree grate	10	As part of precinct strategy
5. Bollards	30	As part of precinct strategy
6. Chillout Hubs	1	As part of precinct strategy
7. Seating play (cubes)	20	As part of precinct strategy
8. Shade structures	2	As part of precinct strategy
9. Chess tables	2	As part of precinct strategy
10. Exercise equipment	2	As part of precinct strategy
11. Public art	2	As part of precinct strategy
12. Veggie gardens	4	As part of precinct strategy
Note - Park programming has been indicated on detail plans		



08 TYPICAL TEMPORARY BIN STORE AREA
PLAN 1:50@A1

0 0.5 1.0 1.5 2.0 2.5M

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OPEN SPACE INFRASTRUCTURE SCHEDULE		
PARK NAME/TYPE	Linear Park 1	
SIZE (TOTAL)	2000	m2
MINIMUM REQUIRED ELEMENTS		
Furniture Types	**Quantity**	**Unit Description**
1. Bench seating	4	Each
2. Shade structures	4	Each
3. Drinking fountains	2	Each
4. Rubbish bins	4	Each
5. BBQ Facilities	2	Each
6. Lighting/bollards/posts	Required	To meet lighting safety standards
7. Playground equipment	-	Items
8. Exercise equipment	-	Items
9. Amenity building/structure	-	Male/female/accessible/baby change room
10. Wayfinding signage	Required	As part of precinct strategy
11. Public art	Yes	As part of precinct strategy
12. Sporting facilities	Yes	Multi purpose

Transport	**Quantity**	**Unit Description**
Bus stop	-	As part of precinct strategy
Bicycle rack	3	Each
Footpath	Required	As part of precinct strategy
Car parking	-	Spaces/accessible spaces

Vegetation	**Quantity**	**Unit Description**
Min area of softscape/planting	800	m2
Turfing	400	m2
100L trees	8	no.
200L trees	4	no.

Pavement	**Quantity**	**Unit Description**
Hard stand	500	m2
Permeable paving	200	m2
Softfall	-	m2
Note - Park programming has been indicated on detail plans		

01 LINEAR PARK 1
PLAN 1:200@A1

0 2 4 6 8 10 M

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Figure 84: View into active area within the Local Park within Austral East

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Figure 85: View into active area within the Local Park within Austral East

OPEN SPACE INFRASTRUCTURE SCHEDULE		
PARK NAME/TYPE	Linear Park 2 - Swale Park	
SIZE (TOTAL)	1900	m2
MINIMUM REQUIRED ELEMENTS		
Furniture Types	**Quantity**	**Unit Description**
1. Bench seating	4	Each
2. Shade structures	1	Each
3. Drinking fountains	-	Each
4. Rubbish bins	1	Each
5. BBQ Facilities	-	Each
6. Lighting/bollards/posts	Required	To meet lighting safety standards
7. Playground equipment	-	Items
8. Exercise equipment	2	Items
9. Amenity building/structure	-	Male/female/accessible/baby change room
10. Wayfinding signage	Required	As part of precinct strategy
11. Public art	Yes	As part of precinct strategy
12. Sporting facilities	-	Multi purpose

Transport	**Quantity**	**Unit Description**
Bus stop	-	As part of precinct strategy
Bicycle rack	2	Each
Shared path	-	As part of precinct strategy
Car parking	-	Spaces/accessible spaces

Vegetation	**Quantity**	**Unit Description**
Min area of softscape/planting	1300	m2
Turfing	200	m2
100L trees	20	no.
200L trees	10	no.

Pavement	**Quantity**	**Unit Description**
Hard stand	200	m2
Permeable paving	100	m2
Softfall	-	m2
Note - Park programming has been indicated on detail plans		

02 LINEAR PARK 2 - SWALE PARK
PLAN 1:200@A1

0 2 4 6 8 10 M

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Figure 86: View into Local Park within Austral East

Figure 87: View into Local Park within Austral East

Figure 88: View into Local Park within Austral East

LANDSCAPE & PLANTING CHARACTER

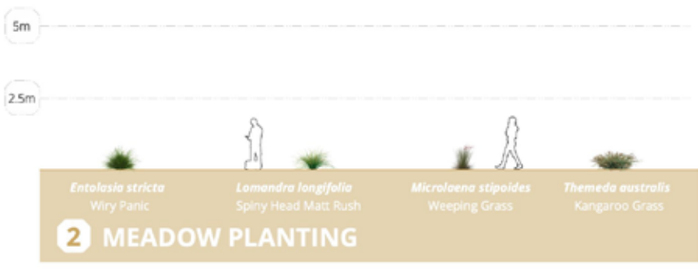
CUMBERLAND PLAIN WOODLAND

RIVER FLAT EUCALYPT FOREST

LANDSCAPE & PLANTING CHARACTER

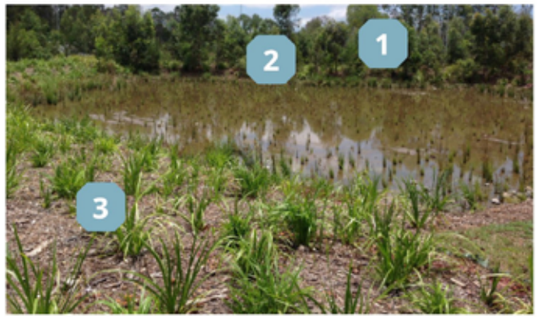
FLOWERING GUM GROVE

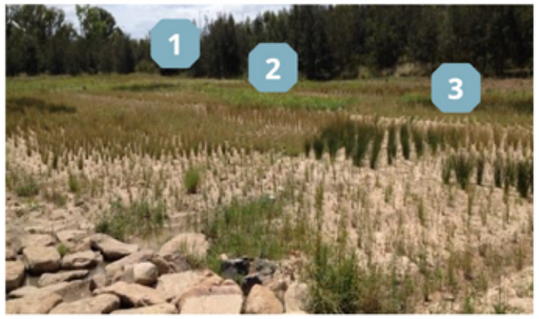
NATIVE MEADOW/GRASSLANDS

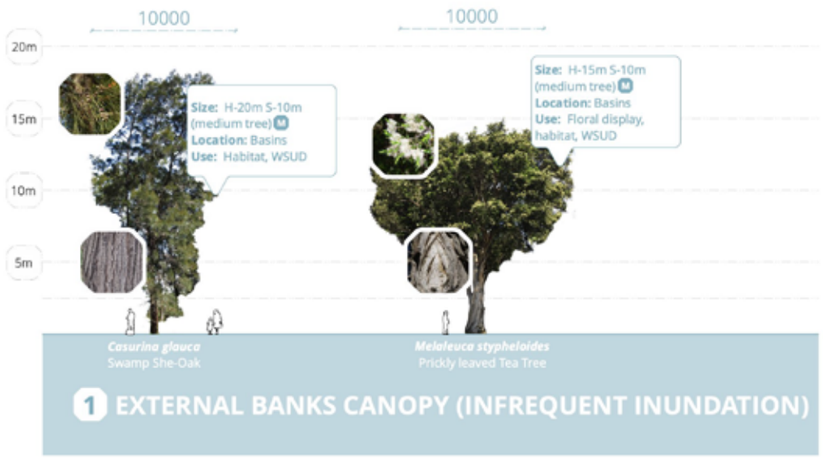


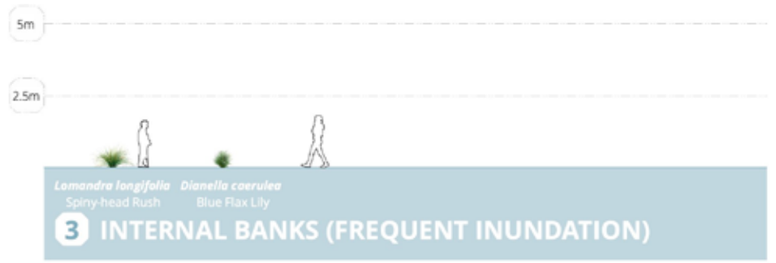
LANDSCAPE & PLANTING CHARACTER

WETLAND/BASIN PLANTING









NOTE
Rural Fire Service Requirements

Trees:
- Tree canopy cover should be less than 15% at maturity;
- Trees (at maturity) should not touch or overhang the building;
- Lower limbs should be removed up to a height of 2 m above ground;
- Canopies should be separated by 2 to 5 m; and
- Preference should be given to smooth barked and evergreen trees.

Shrubs:
- Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- Shrubs should not be located under trees;
- Shrubs should not form more than 10% ground cover; and
- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grasses
- Should be kept mown (as a guide grass should be kept to no more than 100 mm in height); and
- Leaves and vegetation debris should be removed.

The following species were not able to be included in these zones:
- Carex appressa
- Ficinia nodosa
- Juncus usitatus
- Gahnia clarkei
- *Pennisetum alopcureioides*
- *Other native grass and sedge vareties*

Reason - Native grassland species present a fire hazard

RIPARIAN ELEVATED WALKWAY

PRECEDENTS


BICYCLE BRIDGE, LIMBURG, BELGIUM

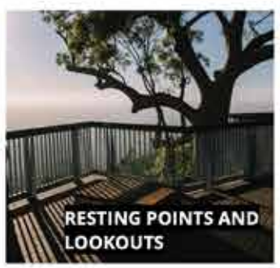

BLACKTOWN WORKERS SPORTS CENTRE, ARNDELL PARK


MT ARCHER RAISED WALKWAY, QUEENSLAND

AMENITY


PORTAL - WAYFINDING


LIGHTING


RESTING POINTS AND LOOKOUTS


RETAINING EXISTING VEGETATION

CONNECTION TO COUNTRY


EASTERN WATER DRAGON


NATIVE VEGETATION COMMUNITIES

MATERIALITY


PERFERATED CORTEN STEEL & PATINA PAINT (SCALE PATTERN)


SANDSTONE BOULDERS (HABITAT)


ALTERNATING PANELS (X-TEND MESH AND PERFORATED STEEL)


FRP BOARDWALK


MESH FOR TRANSPARENCY & SAFETY


CORTEN STEEL


X-TEND TENSILE MESH

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Figure 89: View from the Bridge to Austral West

Figure 90: View from Austral West into the Bridge

Figure 91: View of the Bridge towards Austral West

Figure 92: Viewing the Bridge from distance

Figure 93: View of the Bridge and basin

Figure 94: View from Austral West into the Bridge

Figure 95: Viewing the Bridge from distance

Figure 96: View of the Bridge from North

5.17 Housing Diversity and Yield

Master Plan Yield

The Master Plan provides a broad range of housing types. The distribution of the housing types have been developed to:

- Allow for future flexibility;
- Offer a diverse range of lot sizes and housing forms;
- Provide entry point products;
- Provide GrowHomes that allow for future expansion;
- Respond to the particular conditions of the Site and interfaces;
- Comply with the SEPP controls, and;
- Response to the proposed public domain and open space structure within the Site.

Figure 95 illustrates the indicative housing typologies across the Site.

The Master Plan envisages a mix of the following housing typologies

Standard - Front Loaded		
	24	9.1m Frontage
	65	10m Frontage
	8	11.6m Frontage
	44	12.5m Frontage
	33	15m Frontage
	10	Large Lot
Rear Loaded		
	48	6.9m - 7.5m GrowHome
	18	8.3m Frontage
	32	8.9m GrowHome
Other		
	4	Battle Axe
	23(46)	Dual Occupancy
Not Shown	85	R3 Strata (Gurner Ave)
	1	Childcare (900 sqm)

Based on this mix of housing the following dwelling yield has been achieved.:

Total = 417 dwellings

The yield table on the following page provides a detailed breakdown of the housing yield.

Figure 97: Housing product and distribution

Front Loaded - Torrens Title	**No.**	**Area**	**Average Size**	**Mix**
9.1m	24	6,521 sqm	272 sqm	6%
10m	65	19,710 sqm	303 sqm	16%
11.6m	8	2,696 sqm	337 sqm	2%
12.5m	44	16,470 sqm	374 sqm	11%
15m	33	14,045 sqm	426 sqm	8%
Large lot	8	17,984 sqm	2,248 sqm	2%
Sub total - dwellings	182	77,426 sqm	425 sqm	44%

Dual Occupancy - Torrens Title				
Dual Occ (lots)	25	13,420 sqm	537 sqm	-
Sub total - dwellings	46	13,420 sqm	292 sqm	11%

Rear Loaded - Torrens Title				
4.5m	0			0%
6.5m	0			0%
6.9m - 7.1m - GROWHOUSE	44	9,884 sqm	225 sqm	11%
7.5m	4	1,028 sqm	257 sqm	1%
8.3m	18	4,067 sqm	226 sqm	4%
8.5m	0			0%
8.9m - GROWHOUSE	32	8,262 sqm	258 sqm	8%
Sub total - dwellings	98	23,242 sqm	237 sqm	24%

4/5 Pack				
4 Pack	4	2,428 sqm	607 sqm	-
Sub total - dwellings	4	2,428 sqm	607 sqm	1%

Sub Total house and Land	331	117,076 sqm	354 sqm	80%

R3 Zoned - Strata				
Apartments - Gurner (@85sqm GFA)	85	7,217 sqm		20%
Apartments - East (@85sqm GFA)	0	-		0%
Sleeved Town House - 3 bed	0	-		0%
Sleeved Town House - 1 bed	0			0%
Sub total - dwellings	85	7,217 sqm		20%

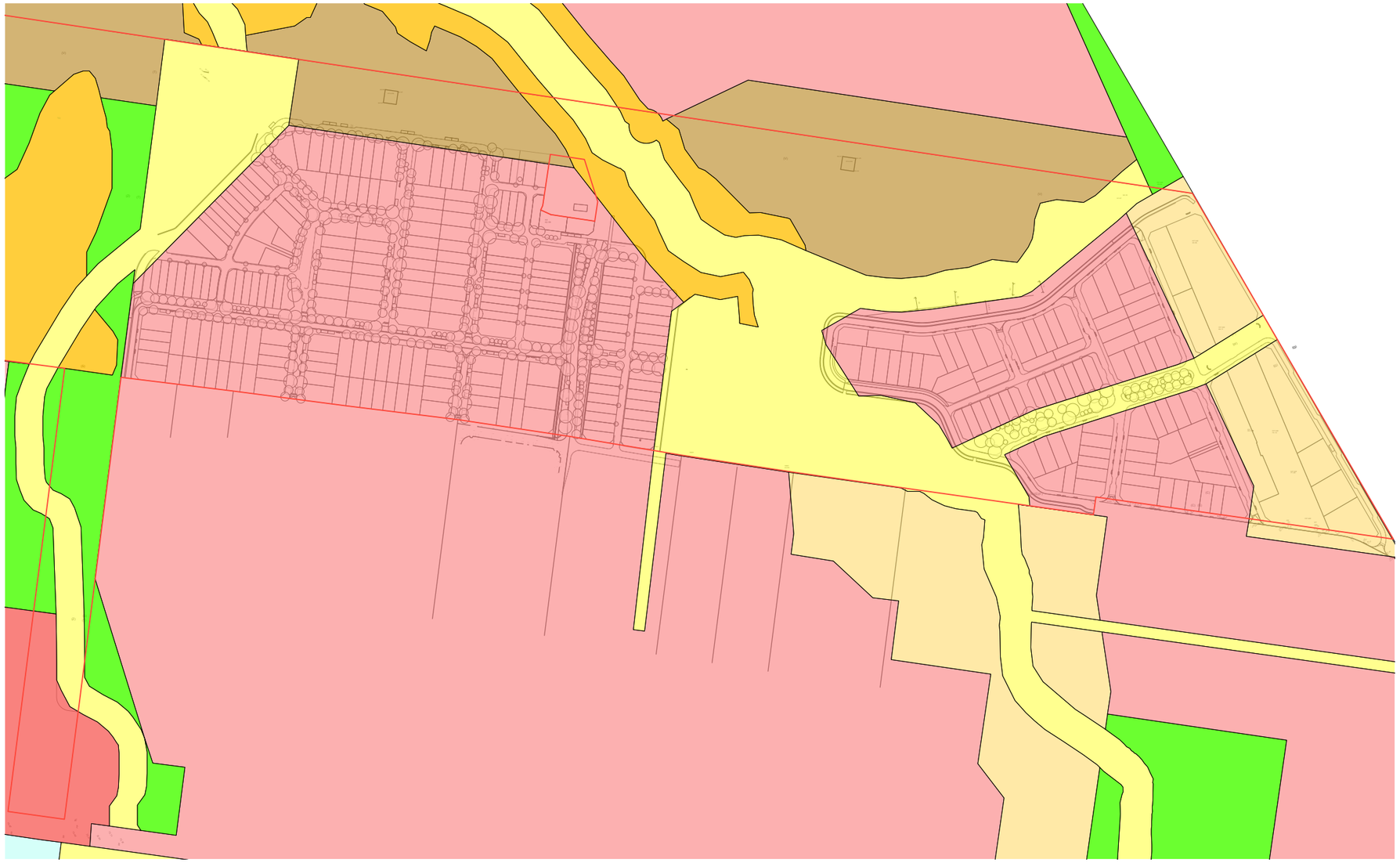
Childcare	1	906 sqm	906 sqm	-
Sub total	1	906 sqm	906 sqm	

Total	**416**	**124,639 sqm**		**100%**

5.18 Zoning Overlay

The adjacent diagram show an overlay of the LCC LEP with the Master Plan.

It demonstrates that the Master Plan conforms with the zoning for the Site.



Zoning Overlay

- Site Boundary
- E2 Environmental Conservation
- E4 Environmental Living
- R2 Low Density Residential
- R3 Medium Density Residential
- RE1 Public Recreation
- RU6 Rural Transition
- SP2 Infrastructure

Figure 98: LEP Land Use Zoning Overlay

5.19 Jemena

It is noted that Jemena Gas Pipeline and Eastern Gas Pipeline go through the south-eastern portion of the Site. The circled areas in blue and purple are identified as hazardous areas where no buildings are proposed to be built. Outside the hazardous area, the gas concentration is expected to be below 50% of the lower explosive limit (LEL).

The two applicable Jemena limitation zones are:

- Austral 50% LEL distance
- Cecil 50% LEL distance

The adjacent plan highlights the lots that are affected by the two. Our lot design consideration for Jemena can be further seen in the Building Envelop Plans which are shown in Section 5.20.

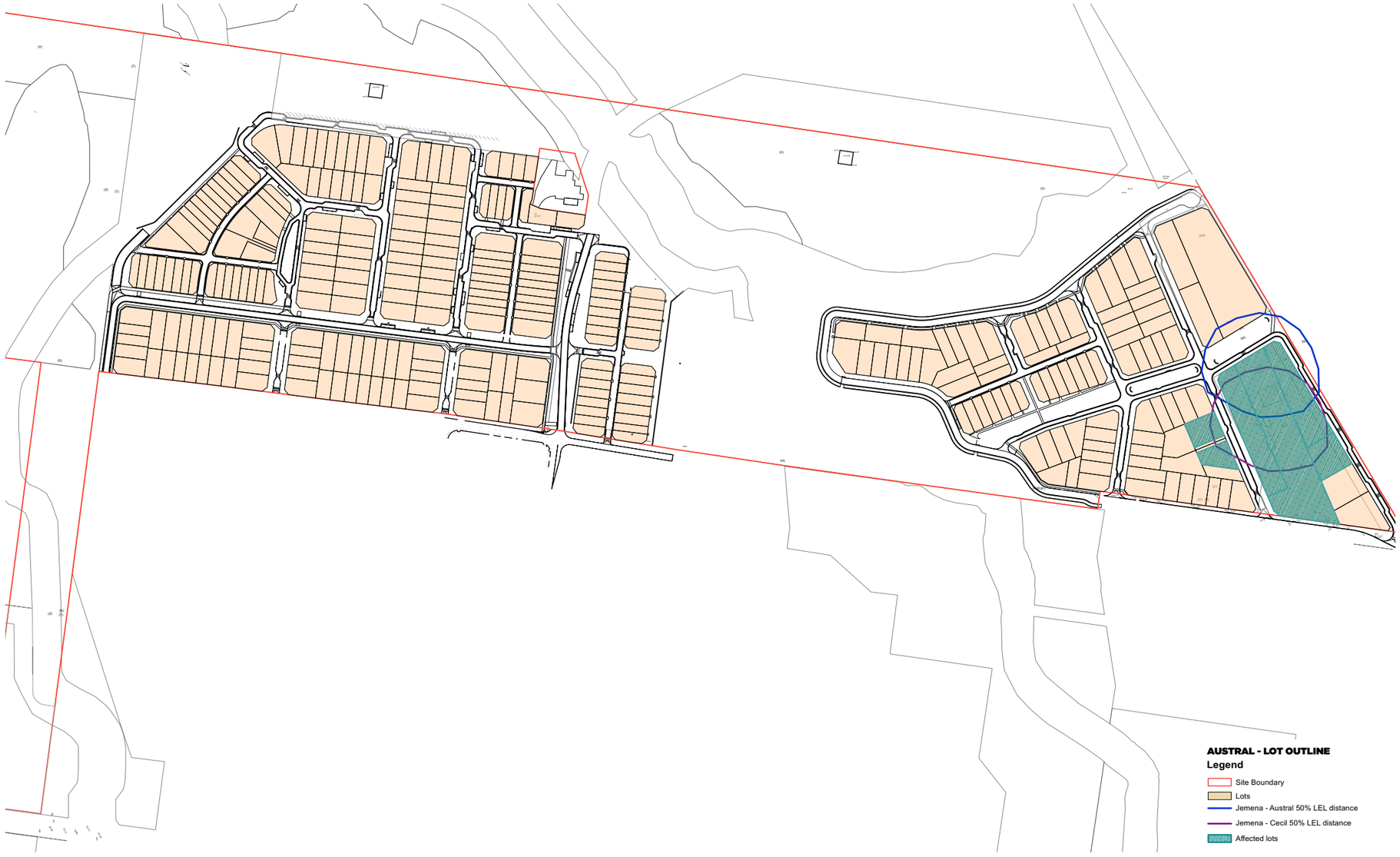


Figure 99: Lot plan with Jemena-affected lots highlighted

5.20 Building Envelop Plans

The Master Plan envisages a flexible and diverse mix of housing types.

Generally the superlots are between 60m and 68m deep allowing for multiple configurations with either rear loaded product served by laneways or front loaded product.

We have developed Building Envelop Plans (BEPs) to demonstrate how dwellings can be sited on the various lot types within Austral.

Figure 97 identifies six main building typologies that the BEPs address.

The table on the following page highlights the key setback controls that have been utilised in the development of the BEPs and plans provide scaled drawings for each lot within Austral.

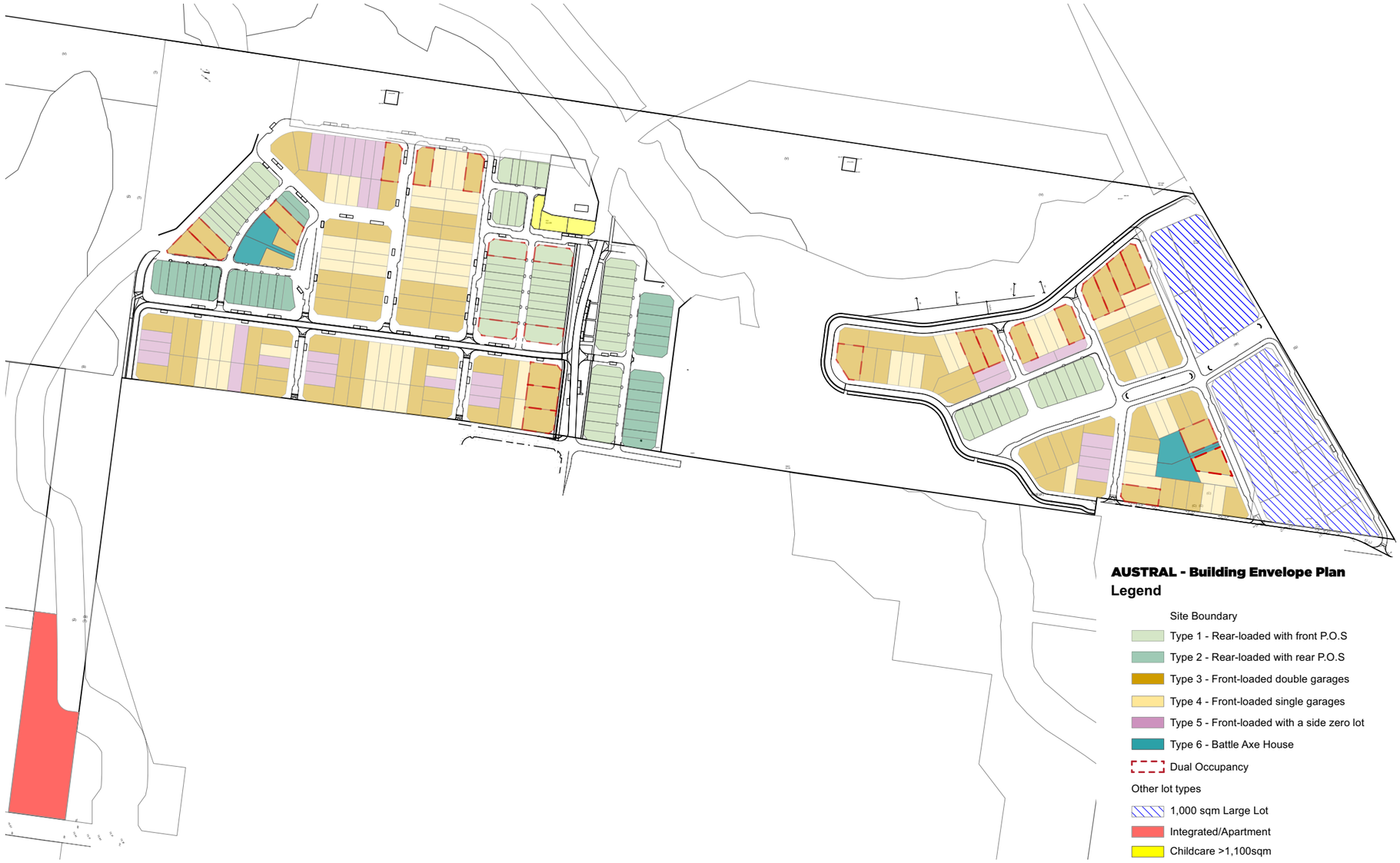


Figure 100: Building Envelop Plans by typology

BEP Type 1 – Laneway-loaded

Applicable lot products: 6.9m, 8.9m, 8m

Front setbacks	4.5m to building facade line; 3.5m to building façade fronting open space 3.0m to articulation zone; 2.0m to articulation zone fronting open space.
Side setback	Zero Lot - Attached or Abutting Boundary (benefited lot) . - Ground floor: 0m - Upper floor: 0m Detached Boundary 0.9m. - If lot burdened by zero lot boundary, side setback must be within easement: - 0.9m (single storey zero lot wall) - 1.2m (double storey zero lot wall)
Rear setback	0.5m
Secondary street setback (corner lots)	1m
Max length of zero lot line on boundary	Attached/abutting house: - 15m (excludes rear loaded garages) upper levels only. No limit to ground floor. Zero lot house: - 15m (excludes rear loaded garages)
Principal private Open Space	Min 16m2 with minimum dimension of 3m.
Garages and car parking	Rear loaded garage or car space only for lots of this type. Minimum garage width 2.4m (single) and 4.8m (double). 1-2 bedroom dwellings will provide at least 1 car space. 3 bedroom or more dwellings will provide at least 2 car spaces.

BEP Type 2 – front-loaded, single garage

Applicable lot products: 9.1m, ~~10m~~, 11.6m,

Front setbacks	4.5m to building facade line; 3.5m to building façade fronting open space or drainage land 3.0m to articulation zone; 2.0m to articulation zone fronting open space or drainage land 5.5m to garage line and 1m behind the building line
Side setback	Detached boundary: Ground Floor: 0.9m Upper Floor: 0.9m
Rear setback	4m (ground level) and 6m (upper levels)
Secondary street setback (corner lots)	2.0m
Principal private Open Space	Minimum 20m2 with minimum dimension of 4.0m. Minimum 25% of allotment area
Garages and car parking	Lots ≥9m and <12.5m: - Where front accessed, single width garages only. - Rear lane or side street accessed double garages permitted. - Max. carport and garage door width not to exceed 3m (single) or 6m (double) 1-2 bedroom dwellings will provide at least 1 car space. 3 bedroom or more dwellings will provide at least 2 car spaces.

BEP Type 3 – front-loaded, double garage

Applicable lot products: 15m

Front setbacks	4.5m to building facade line; 3.5m to building façade fronting open space or drainage land 3.0m to articulation zone; 2.0m to articulation zone fronting open space or drainage land 5.5m to garage line and 1m behind the building line
Side setback	Detached boundary: Ground Floor: 0.9m Upper Floor: 0.9m
Rear setback	4m (ground level) and 6m (upper levels)
Secondary street setback (corner lots)	2.0m
Principal private Open Space	Minimum 20m2 with minimum dimension of 4.0m. Minimum 25% of allotment area
Garages and car parking	Lots ≥12.5m and ≤15m: - Front or rear accessed single, tandem or double garages permitted - Triple garages are not permitted. 1-2 bedroom dwellings will provide at least 1 car space. 3 bedroom or more dwellings will provide at least 2 car spaces.

BEP Type 4 – Zero-lot

Applicable lot products: 10m (excluding easement area, 9.1m) & 12.5m (excluding easement area, 11.6m)

Front setbacks	4.5m to building facade line; 3.5m to building façade fronting open space or drainage land 3.0m to articulation zone; 2.0m to articulation zone fronting open space or drainage land 5.5m to garage line and 1m behind the building line
Side setback	Lots with a zero lot boundary (side A): Ground Floor: 0m (Side A), 0.9m (Side B) Upper Floor: 1.5m(Side A), 0.9m (Side B)
Rear setback	4m (ground level) and 6m (upper levels)
Secondary street setback (corner lots)	2.0m
Max length of zero lot line on boundary	11m
Principal private Open Space	Minimum 20m2 with minimum dimension of 4.0m. Minimum 25% of allotment area
Garages and car parking	Lots ≥9m and <12.5m: - Where front accessed, single width garages only. - Rear lane or side street accessed double garages permitted. - Max. carport and garage door width not to exceed 3m (single) or 6m (double) Lots ≥12.5m and ≤15m: - Front or rear accessed single, tandem or double garages permitted - Triple garages are not permitted. 1-2 bedroom dwellings will provide at least 1 car space. 3 bedroom or more dwellings will provide at least 2 car spaces.

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AUSTRAL - Lot Typology

- Lot Type 1 - rear-loaded with front P.O.S
- Lot Type 2 - rear-loaded with rear P.O.S
- Lot Type 3 - front-loaded with double garages
- Lot Type 4 - front-loaded with single garage
- Lot Type 5 - front-loaded with zero lot boundary
- Lot Type 6 - Battle axe house

AUSTRAL - Building Envelope Plan

- Site boundary
- Building envelope (ground level)
- Building envelope (upper level)
- Front - Primary street setback (3.5-4.5m)
- Front - Articulation zone (3m)
- Front - Garage setback (5.5m)
- Side - Secondary street setback on laneway-loaded lots (1m)
- Side - Secondary street setback on front-loaded lots (2m)
- Rear - Garden setback (4m minimum)
- Rear - Rear garage setback (0.5m minimum)
- Side - Side setback (0.9m)
- Zero lot line on front-access lots (11m)
- Zero lot line on laneway-access lots (15m)
- Duplex centre line
- Garage
- Private Open Space

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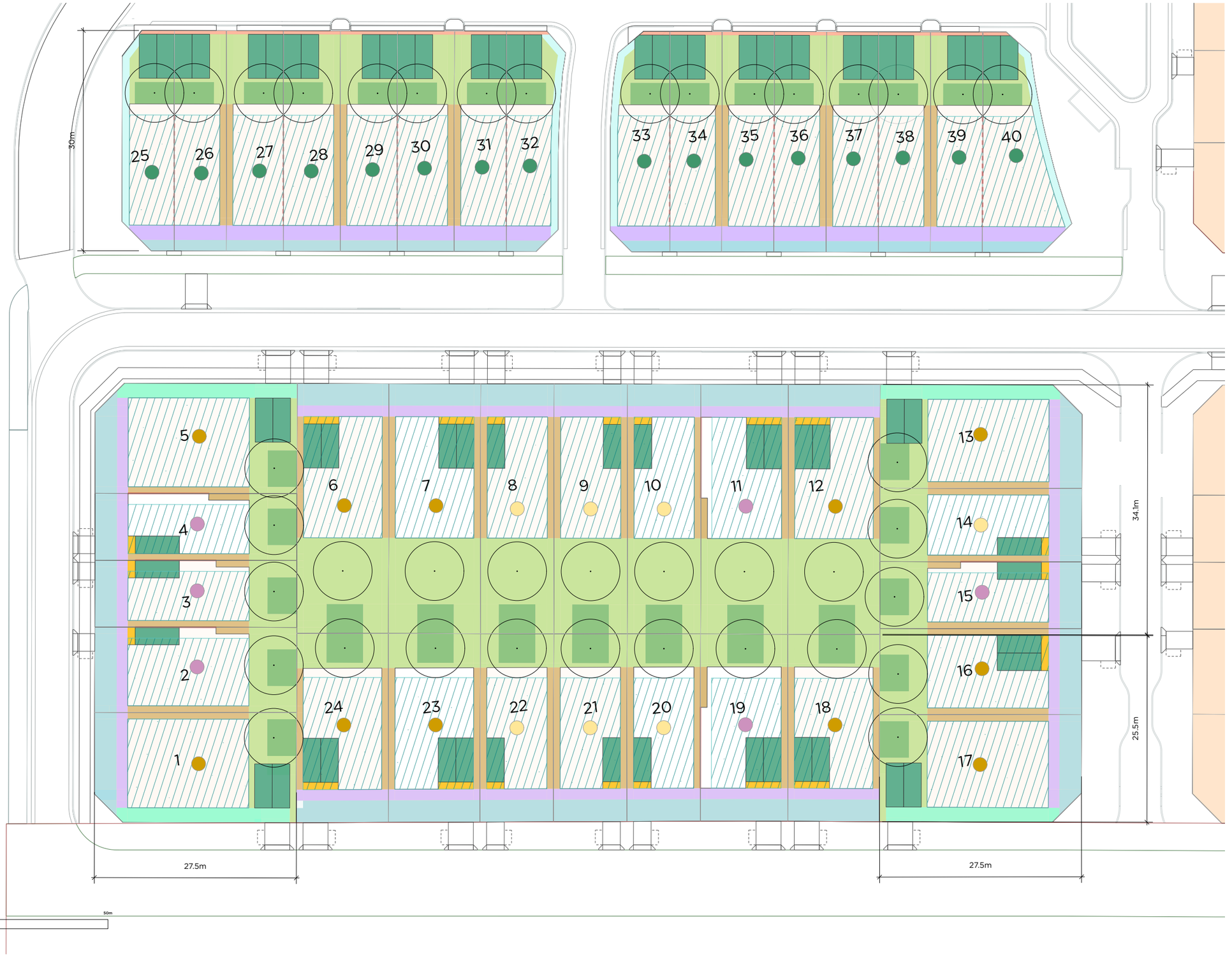

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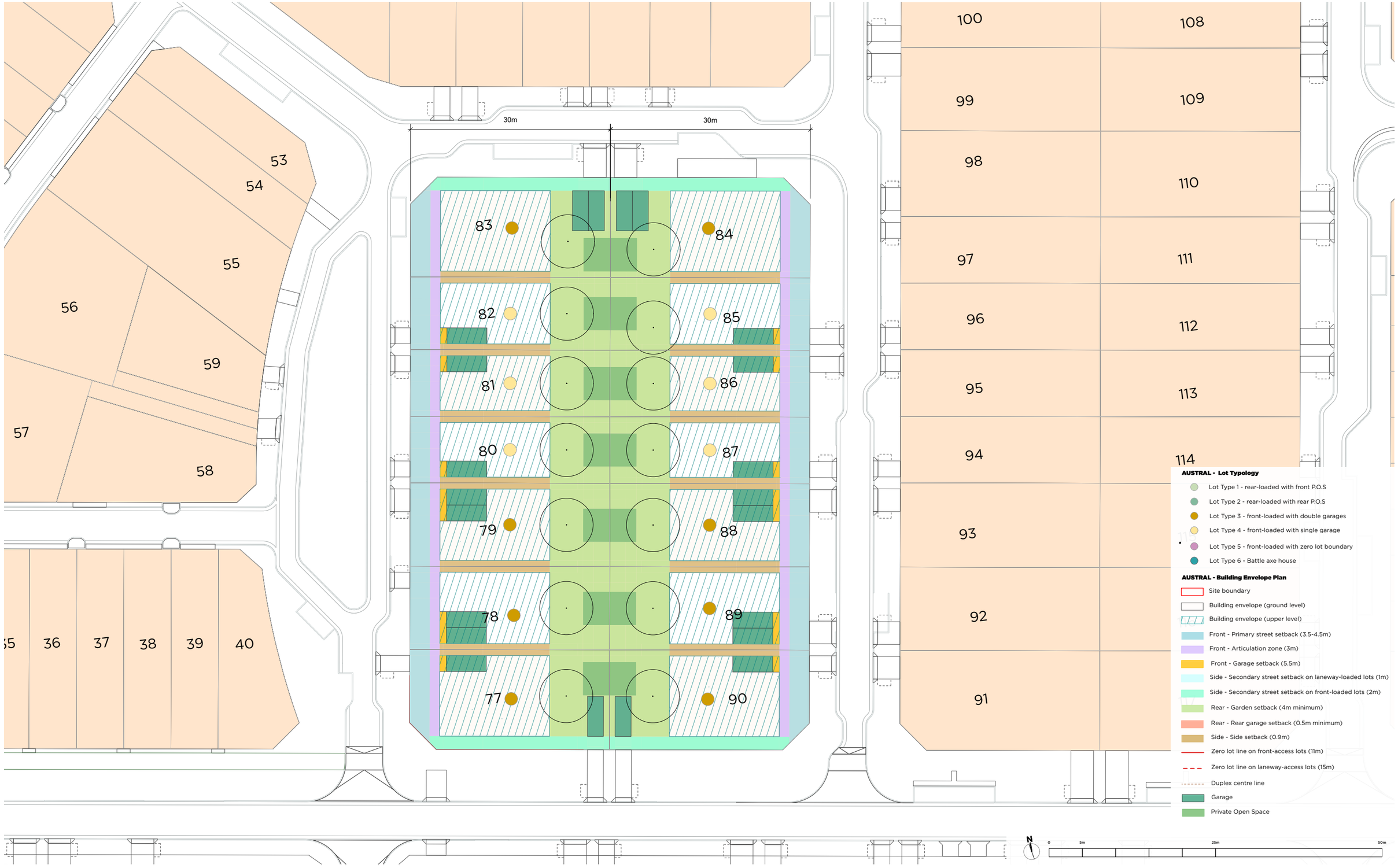

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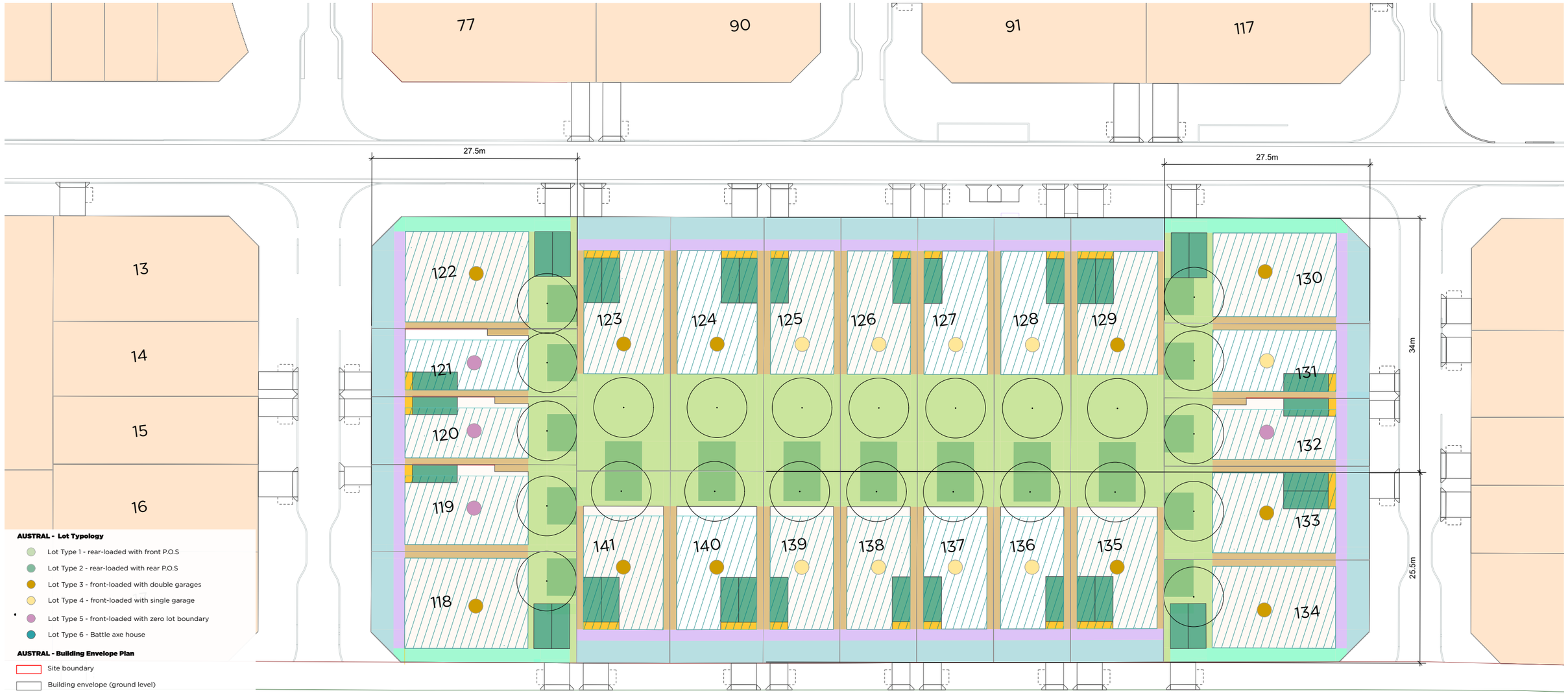

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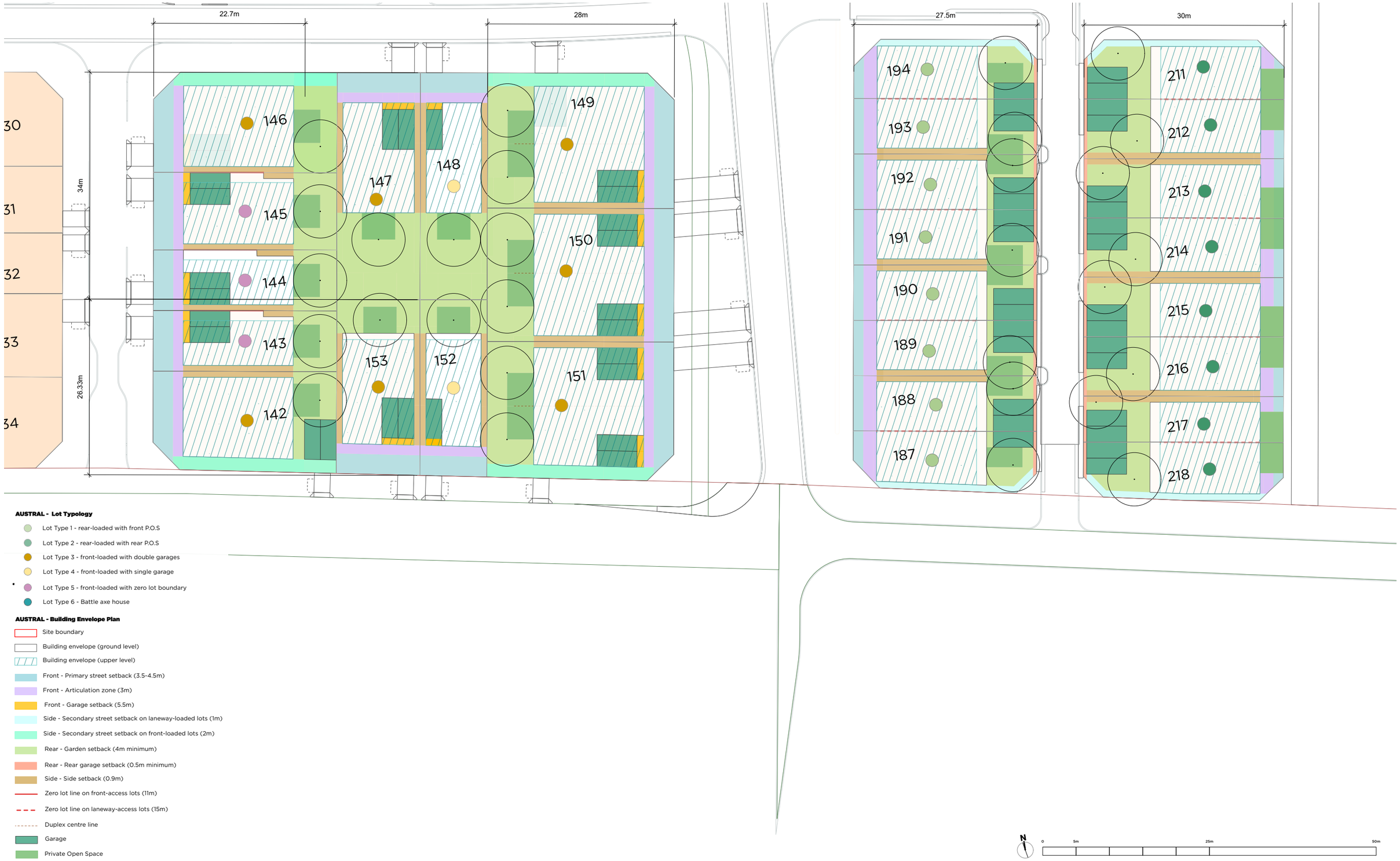

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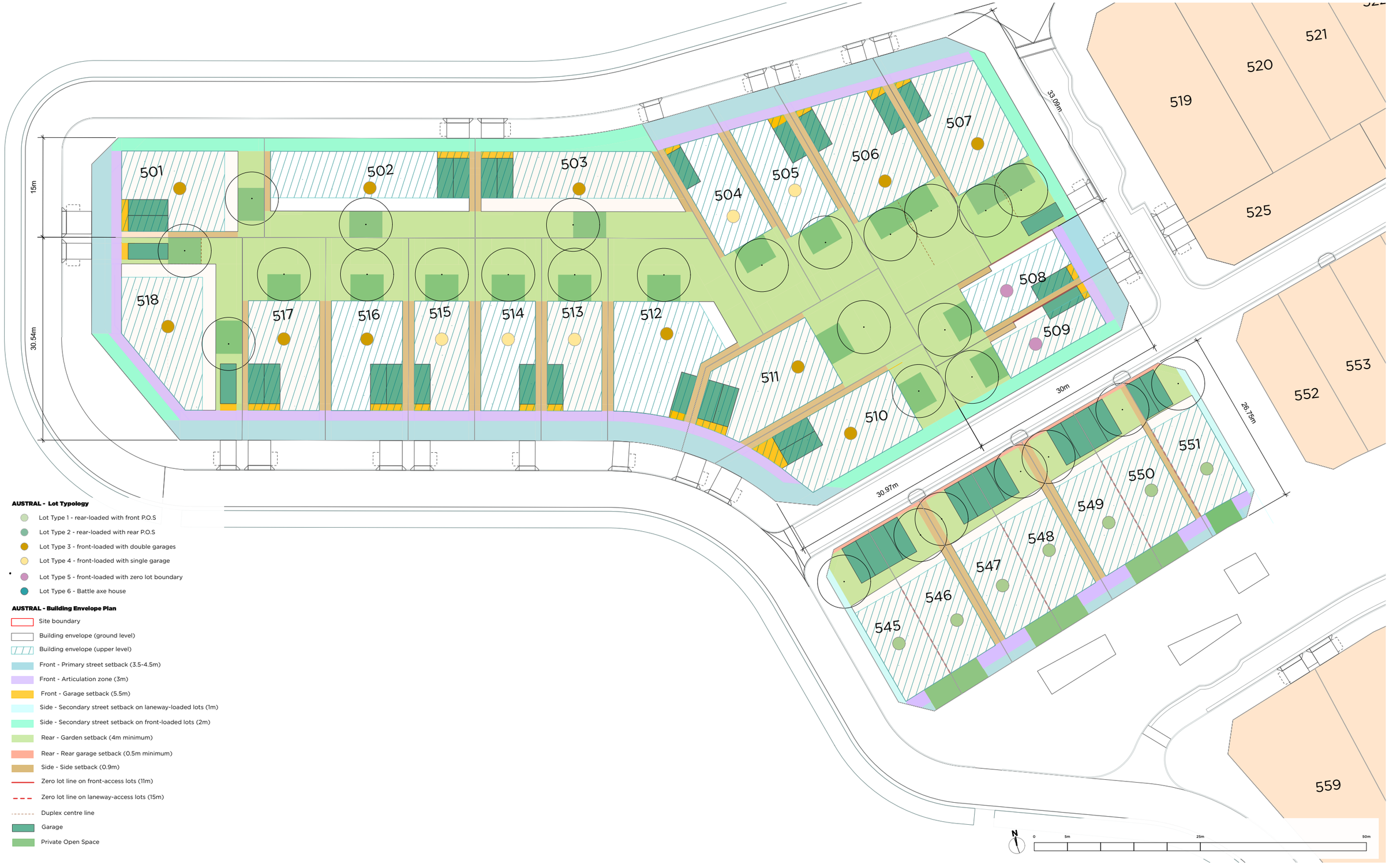

AUSTRAL - Lot Typology

- Lot Type 1 - rear-loaded with front P.O.S
- Lot Type 2 - rear-loaded with rear P.O.S
- Lot Type 3 - front-loaded with double garages
- Lot Type 4 - front-loaded with single garage
- Lot Type 5 - front-loaded with zero lot boundary
- Lot Type 6 - Battle axe house

AUSTRAL - Building Envelope Plan

- Site boundary
- Building envelope (ground level)
- Building envelope (upper level)
- Front - Primary street setback (3.5-4.5m)
- Front - Articulation zone (3m)
- Front - Garage setback (5.5m)
- Side - Secondary street setback on laneway-loaded lots (1m)
- Side - Secondary street setback on front-loaded lots (2m)
- Rear - Garden setback (4m minimum)
- Rear - Rear garage setback (0.5m minimum)
- Side - Side setback (0.9m)
- Zero lot line on front-access lots (11m)
- Zero lot line on laneway-access lots (15m)
- Duplex centre line
- Garage
- Private Open Space

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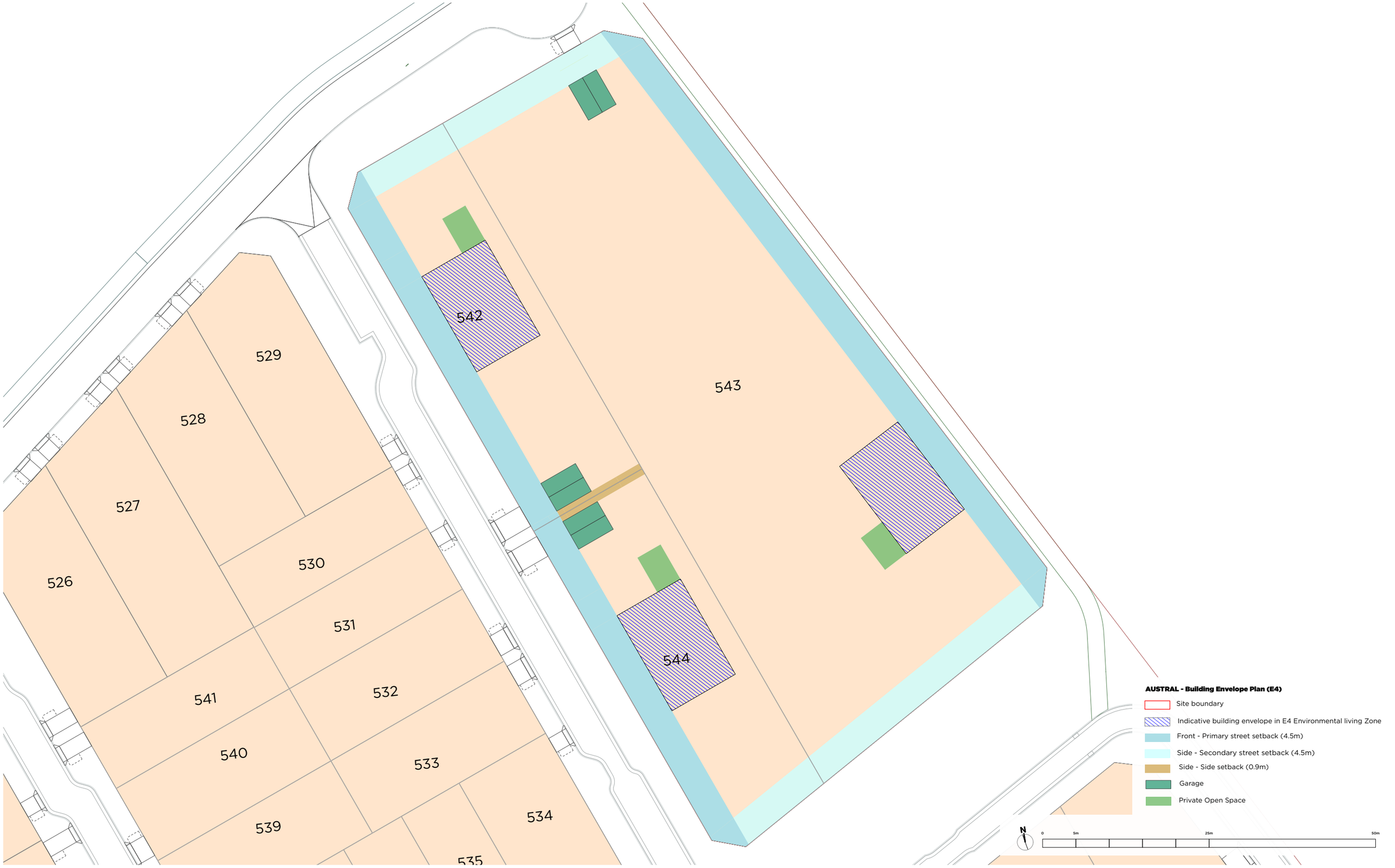

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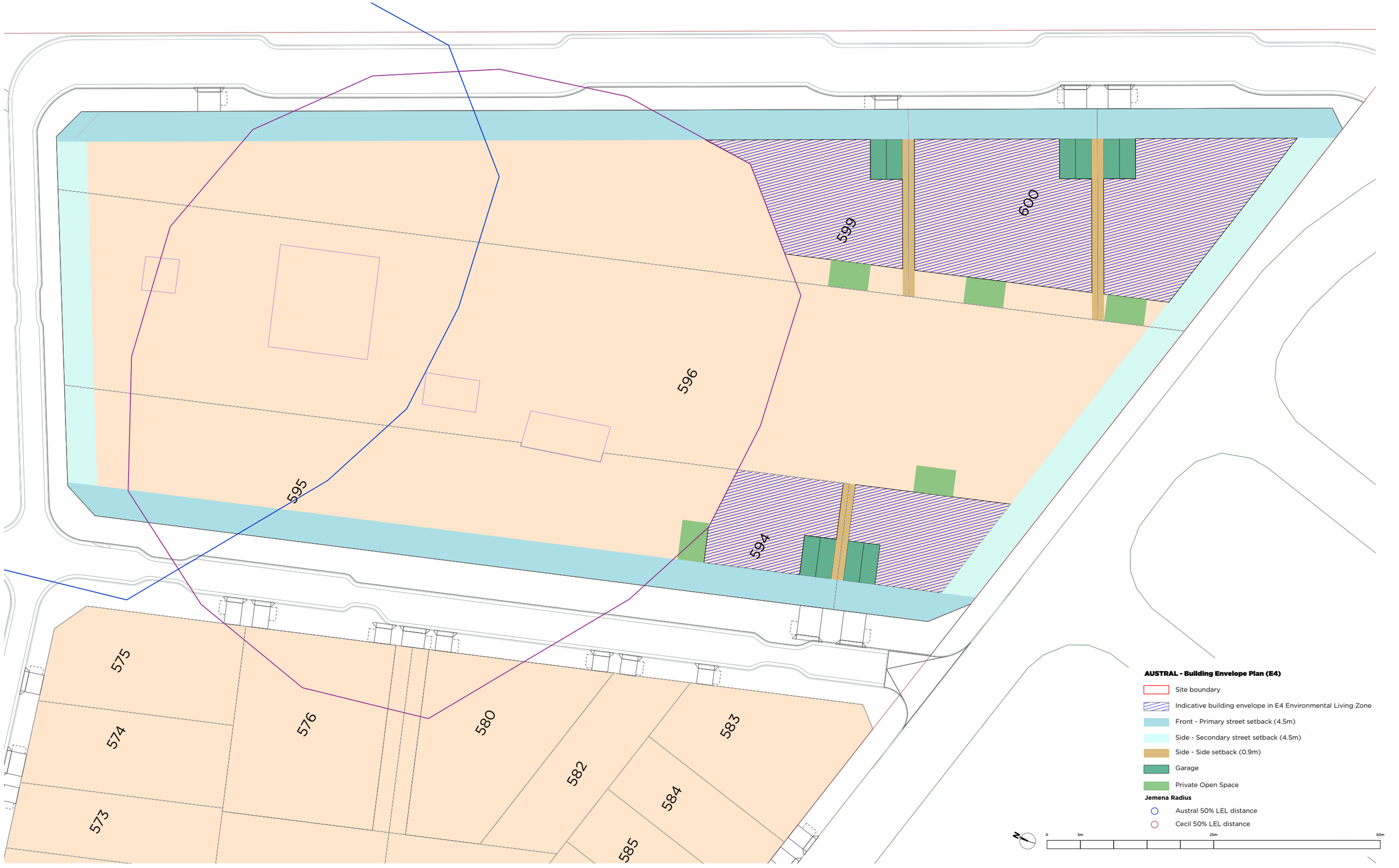

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Appendix A - DEP RESPONSES_ DA-1295/2021

Response to Liverpool City Council Design Excellence Panel Thursday April 14th, 2022

No.	LCC Comments	Design Team Response	Design Team Action	Ref
1	During the preparation of the ILP, a neighbourhood centre containing shops and a community centre was identified south of Gurner Avenue opposite the Al-Faisal College and playing fields. Council requested further consideration of the location and configuration of the proposed centre to confirm site suitability and that sufficient land had been allocated to enable retail and other related development in each centre.	A review was conducted. A number of options were considered for the relocation of the neighbourhood shops. As a result, the Precinct Plan shows the neighbourhood centre in the location shown on the draft Precinct Plan, but with some adjustments to the zone boundaries.	An additional analysis diagram has been developed to form part of the updated Urban Design Report to highlight the surrounding context and accessibility of the Site.	Section 1.2 on page 14.
2	As discussed in the Traffic and Access Study submitted as part of the DA, Edmondson Avenue is currently a half width road, and the remaining half width construction will not be available until the neighbouring development commences.	We acknowledged the half road construction in the Traffic and Access Study which confirmed that the traffic conditions would be acceptable under the half road conditions as an interim.	-	-
3	Concerns on the location of the centre-based child care facility proposed within the Site.	The facility is proposed to be located at the intersection of Edmondson Avenue (a Collector road) . A local street has been coordinated in order to provide a high level of visibility in a central location for all residents. The Master Plan also identifies the potential for a future walkway connecting the eastern and western sides of the development across Basin No. 27.	The Urban Design Report has been updated to strengthen and further articulate the connections to/across the Western Sydney Parklands	The relevant diagrams are on page 14 and 17 of the Urban Design report.
4	The Site is currently impacted by the 1% annual exceedance probability (AEP) flood level.	The benching and grading strategy prepared for the Site has been based on the need to raise the developable area above the 1% AEP flood level.	-	-
5	The majority of the Site including development surrounding the Site is zoned R2 Low Density Residential.	Suitable suggestions to zoning have been made as part of the Urban Design Report where the change is considered to provide a better outcome for the Site as a whole. The Master Plan has provided a broad range of housing typologies reflecting the diversity and needs of the local community.	-	Section 5.17 of the report outline product types and yields. Section 5.18 presents our proposal under the current zoning control.
6	Building Envelope Plans	Building Envelope Plans have been prepared as part of the Urban Design Report in line with the ILP and DCP.	We have taken a review of the subdivision layout and associated Building Envelope Plans to identify opportunities to pair driveways to minimise individual cross overs and maximise landscaped areas within the road verges.	Please see updated plans on pp. 104-121.
7	Council have requested details on kerbside waste collection	The subdivision and proposed streets of the DA have been designed using a combination of the updated DCP and the Western Sydney Street Design Guide with all streets having been checked with swept path analysis for Councils waste collection vehicles.	The kerbside waste collection details has prepared by the Landscape Architects and will be provided when available.	
8	The distribution and programming of the open space	The distribution and programming of the open space within the Site has been based on correspondence with the relevant Council officers, noting there is currently no areas zoned RE1 Public Recreation within the Site.	-	Please see section 5.3 on page 25 of the Urban Design report.
9	Two park typologies: local parks and parklets	The Master Plan proposes two park typologies which are local parks and parklets distributed all within the street network, providing open space and activation nodes. The objective of this strategy is to promote social interactions and create distinct character areas within the Site.	Further coordination between the Landscape Architect, traffic consultant and Civil Engineer is inform the updated Urban Design Report.	Indicative design of our local parks and parklets can be found in section 5.16 of the report (pp.80-92).

Appendix B - RFI RESPONSES_ DA-1295/2021

Response to Liverpool City Council letters dated 28 January 2022 and 25 March 2022

No.	LCC Comments	Design Team Response	Design Team Action	Ref
1	Entry street and street hierarchy	A key feature of the Master Plan is the entry and arrival statement provided by Edmondson Avenue as an extension of the ILP collector road, that evokes a native forest with flowering gums and wide verges.	Accordingly, the street hierarchy has been developed to provide a logical network for pedestrians and drivers, that gives easy access to the wider road network and meet requirements for potential bush fire access.	Please see street hierarchy diagram in Section 5.4 on page 32.
2	Entry Street - The intent of creating an entry sequence should be explored for this phase / section of the development as well. The proposed north-south spine connecting Seoul Ave and Oslo St could be explored as a potential entry sequence for the site. Additionally, the entry sequence should include a terminal element / landmark or focal point to improve legibility.	Agreed – view termination is currently in the linear open space which addresses this comment	Additional street views of arrival sequence are provided.	The consideration of Entry Street design can be found on pp. 44-48.
3	Cycleway Council's 'Liverpool Bike Plan' identifies a north/south route along the northern extension of Edmondson Avenue.	Noted, the cycleway along Edmondson Avenue will be added in urban design diagrams. Also, it is noted that the Bike Plan has not indicated that the proposed cycleway is on the western side of Edmondson Avenue. We are also not aware of the current design for Edmondson Avenue upgrade works being publicly available. As part of future approvals for the delivery of Basin No. 27, the Applicant intends to deliver an east/west shared pedestrian and cycle link that will link this site with the development to the east that is the subject of DA-1298/2021.	Urban Design Report has been updated to include the cycleway along Edmondson Avenue.	The contextual diagram on page 14 shows the existing and proposed cycleways.
4	Pairing driveways	A review of the subdivision layout and associated Building Envelope Plans to identify opportunities to pair driveways to minimise individual cross overs and maximise landscaped areas within the road verges will be taken.	Building Envelope Plans are revised.	Please see updated plans on pp. 104-121.
5	Jemena	We acknowledged Jemena's advice and no physical works within at least 250m of the gas pipelines under Jemena's authority and as such does not represent a change of land use that would impact the safety and operation of the gas pipelines.	The lots affected by Jemena are identified. The lot layout and Building Envelop Plans are updated accordingly.	Section 5.19 shows the lot layout with Jemena consideration (p.103). The applicable lots are updated in Building Envelop Plans (pp.119-121)
6	APZ	Our proposal is designed in accordance to the advice from NSW Rural Fire Service	Identify bushfire hazard zone in relevant drawings.	The bushfire hazard zone is added on street hierarchy plan on p.32 and street type on p.42.
	The proposed future pedestrian walkway connecting eastern and western sides of the development (i.e., across the storm water basin) is supported. It is recommended that an iconic / feature pedestrian bridge should be considered as part of the design. The future pedestrian and cycleway link should be indicated in all drawings for clarity / consistency (e.g., this connection is not identified in the 'Proposed Street Types' drawing and therefore needs to be indicated).	Noted	Drawings are updated.	The pedestrian bridge design can be found on pp.96-99.

Appendix C - DEP RESPONSES_ DA-1298/2021

Response to Liverpool City Council Design Excellence Panel Thursday April 14th, 2022

No.	DEC Comments	Design Team Response	Design Team Action	Ref
Context				
1	The Panel appreciates the implementation of Western Sydney Street Design Guide as part of the overall design with a focus on tree canopy for cooling the streets and other Water Sensitive Urban Design (WSUD) measures being taken into consideration. The Panel encourages the applicant to strive for design excellence and develop an exemplar model for future subdivisions in the area.	Noted.	-	-
2	The Panel questions the applicant regarding access to local services for the residents (e.g., local shops and facilities) An additional analysis plan is required at a more detailed scale than the one shown on page 11 of the Urban Design Report. The additional plan(s) should show the short, medium and long term access and urban amenities available to the site: - Which of the masterplanned streets to the south are currently constructed and how would residents access the site in the short term - Which of the surrounding parcels of land have a longer term redevelopment timeline, and what are the implications for accessing shops, parklands, public transport, etc.	In addition to the local open space the site is connected to the following amenity: - Local shops - Transport	Diagram developed to highlight context and accessibility	Figure 6, 8 in the Urban Design Report.
3	The Panel questions the rationale for the current location of the childcare centre. The Panel recommends the applicant to elaborate on the broader context for the site and provide details for access to Childcare centre by the residents of both phases. - Refer to section 4.2 for further discussion on the seting, location, and amenity of the childcare centre.	Childcare centre is located on the intersection of the Collector Road and a local street. The location provides a high level of visibility in a central location for all residents, it is also close to the proposed east west link that connects the two side of the Austral development	-	-
4	The Panel requires the applicant to strengthen the connections to / across the adjoining Western Sydney Parklands. Prepare a principles diagram to establish the immediate and surrounding context for the site.		An diagram to further articulate this link is provided.	Strengthening connections to and across the adjoining western Sydney Parklands is one of main design principles which can be found on page 21 of this report.
5	The panel notes that there is considerable benching / re-grading of the site that will be required as part of the development. The Panel recommend the applicant to reduce the amount of benching and re-grading being proposed for the site. - One suggestion raised by the panel to reduce the amount of benching is to consider a stoop / raised ground floor levels for some of the proposed housing to reduce the amount of grading required on site. This would need to be reviewed in tandem with an interface strategy to the new street typologies proposed. - The Panel raised concern that the extensive benching on the site may be the reason for the removal of all existing trees (outside of the protection / environmental zones) and considers this to be a weakness of the scheme. Any and all efforts to retain as many existing trees on the site would be supported by the panel, and in particular the stand of existing and mature trees located in alignment with the central “Collector” street.	The site is currently impacted by the 1% AEP flood levels. The benching and grading strategy is based on the need to raise the developable area above the 1% AEP flood level. We note the following: - There are very few trees on the site outside the protected riparian and ecological areas	The locations of existing trees in the collector road alignment are reviewed.	-
6	The Panel recommends the applicant to explore the opportunity of modifications to the current zoning (even to a limited extent) to achieve a better design outcome (i.e., higher densities at the corners or at prominent locations facing the detention basin). The Panel recommends the applicant to liaise with Council to explore the opportunity of rezoning the land through a planning proposal/ site specific DCP. The Panel appreciates the applicants efforts to date to think laterally about the implementation of greater density through strategies like the “GrowHome” typologies. The Panel encourages the applicant and council to enter into a dialogue to further discuss greater density models in key locations.	Suitable suggestions for higher density housing is provided on the attached sketch. A expedient rezoning led by LCC would be required to achieve these outcomes	Provide locations for other dwelling densities	Section 5.17 provides an overview of the housing products that are proposed. Section 5.18 shows the current zoning overlay with the Master Plan.
7	The Panel notes that the proposed street design does not align with the current DCP guidelines for the streets. The Panel recommends the applicant to prepare a comparative analysis of the proposed streets versus DCP streets, highlighting the key differences between the two and outlining the broader principles of the DCP provide further details for the parklets and the proposed 10km/hr streets.	Noted With regards to the speed limits, Landcom are meeting with TfNSW to discuss the speed limits and shared zones	Table is being prepared by SCT to compare the DCP and WSSDG street reserve and functional area Sketch of design principles for the Sharedzone have been prepared to explain the design mechanisms employed to create the low-speed environment	Section 5.5 provides our justification and description of social streets and shared zones.

No.	DEC Comments	Design Team Response	Design Team Action	Ref
8	The Panel raises concern that the proposed wet detention basin is quite substantial in size and may not be serviced by the subject site's catchment. The Panel requires the applicant to detail out the catchment area for the detention basin and ensure that the wet basin will sustain the dry conditions during summer months / periods of droughts.	Noted The proposed wet detention basin (which I assume is Basins 25 and 27) is part of the LCC flooding strategy and yes, part of the site does not drain to either of these. Areas that do not sit within these catchments will be treated through GPT or similar prior to discharge into the creek. The Stormwater Management Plans provided as part of the DA identify the catchments to the permanent and temporary basins. The permanent basins will be designed in accordance with the requirements in the LCC flooding strategy but are not a requirement under this DA.	This has been action by Calibre Consulting.	-
9	The Panel recommends the applicant to explore the opportunity of modifications to the current zoning (even to a limited extent) to achieve a better design outcome (i.e., higher densities at the corners or at prominent locations facing the detention basin). The Panel recommends the applicant to liaise with Council to explore the opportunity of rezoning the land through a planning proposal/ site specific DCP.	Noted We would support a Rezoning led and facilitated by LCC to provide greater flexibility in the zoning and minimum lot sizes	We have prepared a sketch to highlight the location for higher density development Smaller lot sizes could be implemented across the development if changes to the density controls and Minimum Lot Sizes and Frontage were permitted	-
10	The Panel understands that there might be constraints regarding water supply and servicing within the area, and notes that the application is contingent on the servicing requirements being met by Sydney Water. The Panel recommends the applicant to ensure that the subject site is covered within the service area for Sydney Water.	Noted Sydney Water has advised that the site is serviced by water and sewer. Details on any upgrades, connections, etc will be provided on formal application to SWC. Refer SWC letter to LCC dated 8 April 2022.	This has been action by Calibre Consulting.	-
11	The Panel raises concern that the proposed wet detention basin is quite substantial in size and may not be serviced by the subject site's catchment. The Panel requires the applicant to detail out the catchment area for the detention basin and ensure that the wet basin will sustain the dry conditions during summer months / periods of droughts.	Noted Refer Item 8 above	This has been action by Calibre Consulting.	--
12	The Panel requires further details regarding the staging of civil works. The Panel recommends the applicant to consider delivering the pedestrian bridge across the basin as part of phase 1.	The walkway across the basin is an important design feature that benefits connectivity. The main impediment to it's early delivery is the approvals process – it would require a Part 5 approval due to ecological constraints. Including this in the DA has the potential to delay the overall project and therefore it has been separated into the DA that will address the Basins	-	-
13	The Panel requires the applicant to provide details on the design of the bridge across Western Sydney Parklands and elaborate on the phasing / funding of the bridge. The Panel recommends that all public infrastructure (e.g., bridge connections, wet basin, public domain works) are delivered as part of Phase 1.	See comment above	-	-
Built Form + Scale				
15	The Panel requires the applicant to address the 'Missing Middle' typology within the proposed development and include further diversity (i.e., terraced housing, low rise apartments) within the built form being offered by the site. The Panel recommends the applicant to test the model with the developers and seek their support / concurrence on the proposed scheme.	The current R2 low-density zoning of the site impedes the ability to develop extensive areas of small lot housing. The current minimum lot size is 200 sqm for a semi-detached property. We have worked within the framework of the Growth Centres SEPP and ILP to provide a broad mix of dwellings within the planning framework	As per Point 9 above	-
16	The Panel requires the applicant to provide details for the proposed childcare centre and elaborate on the context / rationale for its siting. The Panel notes that the childcare centre shares around 70% of its boundary to the sewerage pumping station, which is not a preferred outcome. The Panel requires the applicant to ensure that the odour and air quality around the childcare will not be affected by the neighbouring pumping station. • Further detail on the childcare centre should be provided, including the proposed number of children and consequential calculations for indoor and outdoor space. It is noted that limited outdoor play space is located on the plans provided.	The childcare center is currently a suggested use. The final outcome for these lots will be based on future sales advice. Any childcare center would be subject to a DA and further studies.	LCC have requested further information on general issues around odor and other potential impacts associated with the pump station	-
17	The Panel notes that the design of the battle axe lots can be resolved further in tandem with some redesign / re-conceptualisation of the laneway street typology ie: the majority proposed street typologies are "muse" like shared spaces, with the exception of the laneways. If the laneways were to be re-conceptualised in a similar way then the battle axe block typology could be investigated further.	The DCP requires that all lots have a street address. We would expect that the laneways to have additional Fonzie flats that would activate the laneways and add to the mews character articulated by the panel	-	-

No.	DEC Comments	Design Team Response	Design Team Action	Ref
18	The Panel requires the applicant to detail out the interface of built form with the proposed public domain. Provide detailed sections to elaborate various interface treatments and the scale of vegetation / canopy cover being proposed on site. - Further clarification should be provided on the 3m "Articulation Zone" shown on the block plans on pages 89-97 of the Urban Design Report.	Building Envelop Plans area provided in the UD Report in line with the ILP Requirements. All setbacks and articulation zones are in line with the DCP. Further details in the interface zones will be provided in the project built form design guidelines to be developed by Landcom.	Design Guideline to be developed by Landcom. Note – this is a standard procedure for Landcom projects and developments.	-
19	The Panel notes that the applicant will be partnering with other developers to deliver the built form on site, which might lead to inconsistencies within the built form. The Panel requires the applicant to develop comprehensive built form controls and define the various development parameters for the site.	See Point 18 above	See Point 18 above	-
20	The Panel requires the applicant to provide details regarding servicing / waste removal for the development. The Panel recommends the applicant to ensure that the proposed road layouts have capacity / required turning circles to provide access for waste trucks.	All streets have been checked with swept path analysis for council vehicles LCC have requested details on curbside waste collection which is being draft by the project landscape architects	Confirm curbside waste space allocation	-
21	The Panel notes that the proposed density aligns with the current regulations of the LEP. The Panel recommends the applicant to explore the avenue of a planning proposal / site specific DCP to incorporate additional densities at strategic corners / locations for the site.	See response to Point 9 above	-	-
22	The Panel recommends that the applicant prepare a series of simplified diagrams / drawings demonstrating: The number of proposed lots / dwellings, comparable to the overall land area of each stage	Noted	Metrics is added to the Urban Design Report	The Metrics can be found on p.101 of this report.
23	The Panel notes that the design focuses on WSUD principles and proposes extensive tree canopy cover for cooling the streets (which is appreciated). The Panel recommends the applicant to consider additional sustainability measures as part of the overall development controls (e.g., Photovoltaic cells, rainwater collection and harvesting for individual dwellings, etc.).	Noted Landcom has intention to develop design guideline and will have additional Design Controls in the development guidelines that will cover ESD requirements, and are currently looking at options for a community battery.	-	-
24	The Panel notes that the development proposes an elaborate planting program for the site, however, the Panel questions the applicant for the status of existing trees on site and whether more existing trees can be retained as part of the design. To this end The Panel requests the following: - A full tree survey for the site with grading of the existing trees - noted that during the meeting the applicant mentioned this has been prepared,but has not been provided to council to date. - Specific areas where it appears existing trees may be able to be retained include: - At the future site entry along the "Collector" street. (Edmonson Avenue extension) - Integrate parklets and build outs around existing trees to save additional tree canopy on site.	Please note the following: 1. The site is fully bio-certified for urban development 2. The flooding constraints require a degree of benching and regrading 3. There are limited trees outside of the Riparian zones that are to be retained and revegetated under management plans prepared by the ecologist. Unfortunately, there is limited scope to retain any of the stand-alone trees on the site – the exception being some in the entrance along Edmondson Ave	An overlay of existing trees to be retained and incorporate into landscape drawing set.	-
25	The Panel requires the applicant to develop additional details for landscaping / public domain areas within the site (e.g., gateway entries, interface treatments, materiality, fencing including the area around wet basin, vegetation mix, etc.).	This information has been provided in the Landscape DA package	Forward Landscape DA set to DEC	-
26	The Panel requires the applicant provide a full tree survey for the site and generate a comparative analysis for the overall tree canopy cover on site (e.g., as per existing, on day one, at half maturity and at full maturity).	The arborist report will be provided, notwithstanding the response to Point 24 above	Forward Arborist report to DEC	-
27	The Panel requires the applicant to elaborate on the strategic intent of the proposed landscaping scheme and instill the principles of 'Connection to Country' and reference the cultural landscapes of the area. The Panel encourages the applicant to explore the potential of creating meaningful relationships with the surrounding open space in the area.	The CwC is an evolving element that is being developed concurrently with the DA. The planting and landscape palette has been drawn from the LCC documentation in collaboration with the project ecologist. We expect further development of the public art strategy, the CwC and the landscape plan to evolve post-lodgment.	-	-
28	The Panel notes that the proposed basketball courts seem to be placed in a constricted space. The Panel requires the applicant to detail out the play spaces / recreational areas being proposed as part of the overall scheme.	The distribution and programming of the open space within the development has been based on correspondence with LCC's relevant officers. There are currently no areas of zoned RE1 open space and the location for the proposed half-courts was selected at an accessible point in the development as part of a chain of activities along the linear open space	-	-

No.	DEC Comments	Design Team Response	Design Team Action	Ref
29	Greater detail on the civil works is required: - The Panel requires the applicant to elaborate on design of the network of water reticulation / detention and provide diagrams and greater design details, system capacity and functional relationship of all elements proposed in the street design as they relate to the WSUD system. Given that it is the intention of the applicant to dedicate the ownership of all streets to council, the above details would be required as part of any VPA or dedication. - In addition to the above the applicant must provide additional detail at precinct scale to demonstrate the feasibility of the proposed wet basin. Provide details for the catchment and capacity of the overall WSUD system, and detention basin. - The Panel requires the applicant to develop a fill diagram / contour diagram to demonstrate the functional aspects of the proposed WSUD system.	Noted There are no permanent basins being provided under these DA's. All basins are temporary until Basins 25 and 27 and rehabilitation of the creek is complete. Wet basin and WSUD details associated with these will be provided under separate DA. However, in regard to the temporary basins, all catchment details, bioretention filters and planting details are shown in the Stormwater Management Report. Contour and fill details are provided in the engineering plans.	Action is undertaken by Calibre.	-
30	The Panel recommends the applicant to consider a diverse mix of planting / vegetation being proposed to ensure adequate solar amenity for the lots (especially during both summer and winter months). That the concepts of Country be integrated into the overall amenity and character of the place that translates to an integrated character reflecting the inherent values of place.	This has been considered and will evolve with further development of the CwC strategy	-	Plant characters are illustrated on pp.43, 93-84.
31	The Panel notes that some of the parklets being proposed within the streets might become a safety concern for the engineers. The Panel recommends the applicant to detail out the design for the parklets to ensure their functionality / aesthetics are retained throughout the development process.	Noted	Further coordination between landscape, traffic and civils is taken.	The details of parklet design can be found pp.81-86.
32	The Panel recommends the applicant to consider further diversity within the housing typology being proposed on site. Explore the appetite for a denser housing along Gurner Avenue, and in specific corner locations.	There is provision for a medium density R3 apartment site along Gurner Avenue.	-	-
33	The Panel requires the applicant to develop controls for materiality and finishes as part of the overall built form controls / guidelines for the site. The Panel recommends that, given the innovations in the street typologies being proposed, that the applicant develop controls for the interface of the built form and streetscape be provided for the site.	Noted. Landcom will have Design Controls in the development guidelines that will address these considerations. This is typical of Landcom developments and there may also be sustainability and landscape rebates to encourage key outcomes	-	-

Appendix D - RFI RESPONSES_ DA-1298/2021

No.	LCC Comments	Design Team Response	Design Team Action	Ref
Urban Design				
1	The curved alignment of the proposed entry sequence as an extension of Edmondson Avenue needs further refinement.	Alignment based on need to tie into fixed point to north and south and avoid the Sydney Water Pump Station Challenge is also integrating a full road with the existing half road on Edmondson Ave	Provide sketches to highlight constraints and rational for design	Entry Street's design is adjusted and can be found on pp.45-47.
2	Additionally, the entry sequence road does not connect to any of the main streets and entry in a shared path.	Preference is for dedicated cycleway along eastern edge of Collector Road Shared-path along east-west street links to dedicated cycle way	Updated diagrams are provided to show location of active transport links	Section 5.10 of the report shows our proposed active transport circulation.
3	A more formal treatment of the entry sequence with a terminal element / landmark or focal point is recommended.	Explore locations for public art at entry	Provide a plan to show potential locations for public art interventions Incorporation of First Nations cultural planning	Please see indicative public artwork plan on p.80 of this report.
4	The current streetscape design for Edmondson Avenue proposes a dedicated two-way cycleway along the western alignment of Edmondson Avenue. This needs to be considered as part of the design for the entry sequence street within the proposed development.	Preference is for dedicated cycleway along eastern edge of Collector Road Logic for locating the cyclepath on the yet-to-be constructed eastern edge of Edmondson Ave	Worked with Council to confirm location. Updated diagrams are provided to show location of active transport links	Section 5.10 of the report shows our proposed active transport circulation.
5	The active transport map identifies a separated cycleway on the eastern side of the entry street which does not align with the cycleway as per the current design for Edmondson Avenue. The Active Transport map (Chapter 5.7) should indicate, address and incorporate the proposed cycleway routes as per the adopted 'Liverpool Bike Plan' and the current design for Edmondson Avenue Upgrade works.	See above	See above	See above
6	The proposed east-west green link has a potential to become one of the key view corridors within the master plan.... It is also recommended that appropriate terminal elements / focal points or landmarks are considered as part of the design to improve legibility.	Explore locations for public art at entry	Provide a plan to show potential locations for public art interventions Incorporation of First Nations cultural planning	Please see indicative public artwork plan on p.80 of this report.
7	The proposed future pedestrian walkway connecting eastern and western sides of the development (i.e., across the storm water basin) is supported. It is recommended that an iconic / feature pedestrian bridge should be considered as part of the design. The future pedestrian and cycleway link should be indicated in all drawings for clarity / consistency (e.g., this connection is not identified in the 'Proposed Street Types' drawing and therefore needs to be indicated).	Design to be developed as art of the Part 5 application for Basin 27	Noted – plans are updated.	The pedestrian bridge design can be found on pp.96-99.
8	The intent of a low-speed shared zone streets being proposed throughout the development is supported; however, this initiative should not undermine the bare minimum convenience for the users. It is recommended that a comprehensive study identifying the different street configurations and street typologies is prepared as part of the documentation.	Noted	Further details and rational are developed to better explain the concept, function, and amenity of the sharedzones	Section 5.5 provides our justification and description of social streets and shared zones.
9	The rear laneways that seems to get neglected and are mere access ways with a couple of trees. It is recommended that all street typologies are considered for adequate amenity and character.	Noted – we are investigating potential solutions	Precedents for shading to be developed and tabled with Council Trees in rear garden on BEP	Regarding street typologies, all plans, sections and explanation of design consideration are updated in Section 5.13 (pp.44-76).
10	The proposed master plan identifies access to the existing sewage pumping station through a shared path. Although this access is acceptable, it is recommended that an alternate access route to the pumping station is explored in order to eliminate any visual amenity / odour issues. It is recommended that a buffer planting is considered along the boundary of the existing sewage pumping station.	To be investigated Anticipated that buffer planting could be provided in-lot There is existing boundary planting	Design sketches to provide solutions Civils/Traffic to investigate access solutions The adjacent lot layout is adjusted.	Please see relevant lot layout on p.104 and Building Envelop Plan on p.112.
11	It is recommended that different streetscape elevations are developed to identify the overall built form relationship / streetscape outcome being proposed as part of the development.	Noted	Landcom to provide design guidelines	-
12	The subdivision plan identifies super lots as part of the overall development; however, the master plan indicates the finer subdivision within these lots which is not part of the subdivision plan. It is recommended that clear guidelines for future developers (i.e., of these super lots) should be mandated / outlined to ensure consistency with the overall master plan proposal.	Noted	Building Envelop Plans have been provided to highlight future sub-division pattern	Please see Building Envelop Plans on pp.108-121

No.	LCC Comments	Design Team Response	Design Team Action	Ref
13	The proposed development scenarios indicate tentative building envelopes as part of the subdivision. It is recommended that an alternative option with consolidated driveways is developed to reduce the number of driveway crossings and maximise the amount of green space along street frontages.	Noted This would be supported, subject to agreement with traffic planners and client	The pairing driveways option has been expored. The building envelop plans are now updated with paired driveways.	Building Envelop Plans with paired driveways are shown on pp. 106-121.
14	The master plan should develop an indicative built form / space allocation for the local shopping centre and childcare facility (including open space provisions for the childcare facility) being proposed. The master plan should also identify the privacy and noise attenuation measures that needs to be considered for the Childcare facility.	Zoning would not allow for retail uses – we would support a rezoning led by Council.	We would be happy to discuss options for rezoning a superlot to support these outcomes.	-
15	The master plan considerations for reducing urban heat island effects are supported. It is recommended that additional measures to ameliorate the effects of urban heat island should be considered as part of the recommendations (e.g., use of light-coloured roofing, installation of Photovoltaic (PV) panels, maximising green area within the private realm, use of permeable paving for driveways, etc.) should be mandated as part of the master plan.	We support these measures and would work to include them in the final master plan	Landcom design guidelines	-