

Riverstone East

Stage 3

ILP AND URBAN DESIGN REPORT

FINAL ISSUE
03/10/2023



Acknowledgement of Country

Hatch would like to acknowledge the Traditional Owners of the lands upon which our company operates and pay respect to their Elders past, present and emerging, and their enduring connection to land, waters and culture.

Hatch is committed to ensuring our communities thrive sustainably, now and in the future, and we acknowledge the importance of the rich and diverse traditions and cultures held by Aboriginal and Torres Strait Islander Peoples.

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Executive Summary

This summary report provides Urban Design analysis, evolution of the design process and the Draft Indicative Layout Plan (ILP) to support the re-zoning of Stage 3 of the Riverstone East precinct, NSW.

The Study Area is strategically located in the North West Priority Growth Area as the third stage in the Riverstone East Precinct. The Study Area presents an opportunity to plan for new housing and community infrastructure served by well incorporated open space, transport and infrastructure and integrates with the delivery of Stages 1 and 2.

Hatch RobertsDay was appointed by the Department of Planning and Environment (the Department) to work collaboratively with a team of technical specialists to determine the placement of new housing, infrastructure and new and improved public spaces and community facilities in Stage 3. The vision for the study area is to respond to the lessons learnt from Stages 1 and 2, and deliver on the principles of The Seven Essential Elements of Great Places.

The ILP is consistent with the Blacktown City Council (BCC) Growth Centres Precinct controls, with additional controls proposed to address the unique urban design outcomes sought and has been assessed by the various technical disciplines and stakeholders to provide a holistic design approach.

The purpose of this report:

This report summarises the ILP from an urban design perspective. The ILP responds to:

- The site's technical opportunities and constraints as provided by the multi disciplinary project team;
- DPE and NSW Government Architect guidance;
- Blacktown City Council (BCC) development guidelines and policies, criteria and advice; and
- Input from a range of agencies and stakeholders.

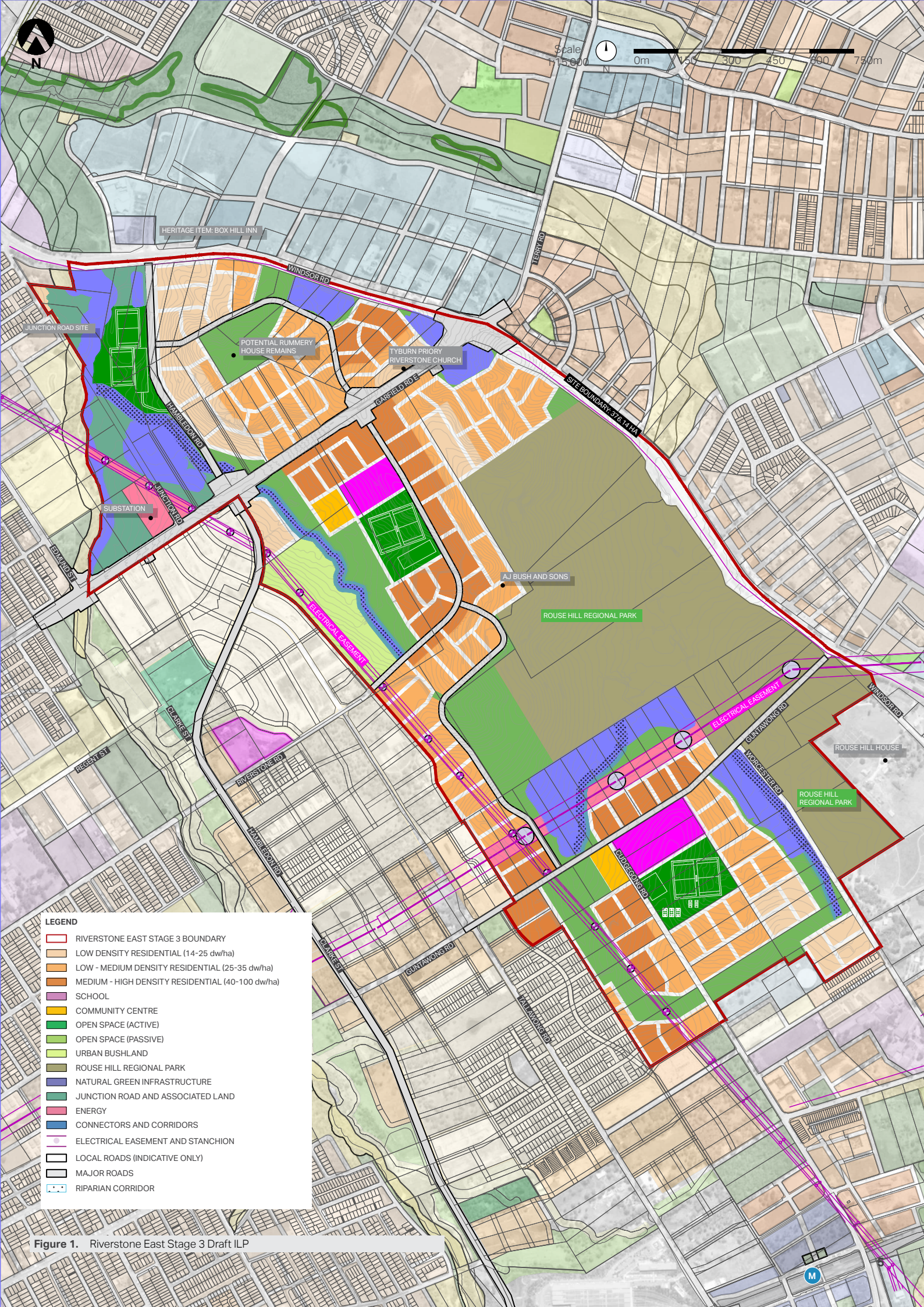
The detailed technical assessment of the ILP is provided as separate appendices to this Urban Design Summary Report and should be read in conjunction with this Report as all technical details are not embedded within the body of this report.

The proposed ILP delivers:

1. A strategy for the delivery of community facilities including schools, community centres and playing fields that serve the entire catchment of Riverstone East Stage 3 and provides for the shortfall of adjacent precincts.
2. Housing located outside flood prone land and confidence in yield for the future development of the precinct.
3. A coordinated concept plan with technical requirements and future plans for the precinct.
4. Zoning and built-form strategies to control development outcomes and respond to heritage assets and values

including preservation of key views from Rouse Hill House and Estate.

5. Outcomes of Aboriginal community engagement integrated into the ILP response.
6. A public domain strategy that delivers high quality open space and provides connectivity to key destinations within the precinct.
7. Retention of tree canopy cover and high quality vegetation to shape a cooler urban environment and contribute to the 40% canopy cover target across Stage 3.
8. Road network design that connects residents with key destinations and allows for active travel and public transit, WSUDs and street planting to contribute to 40% canopy cover target.
9. Stakeholder objectives and expectations integrated into the identification of key sites within ILP
10. Riverstone East Stage 3 Vision and Principles around the Seven Essential Elements.
11. A final ILP established through an iterative process from the preferred design scenario based on the outcomes of the EbD workshops and further technical assessments.
12. Site-specific built form and design controls for inclusion in Blacktown Centre Precincts DCP.
13. Recommendations for amendments to the broader planning framework to give effect to final ILP and deliver an efficient approval processes.



- LEGEND**
- RIVERSTONE EAST STAGE 3 BOUNDARY
 - LOW DENSITY RESIDENTIAL (14-25 dw/ha)
 - LOW - MEDIUM DENSITY RESIDENTIAL (25-35 dw/ha)
 - MEDIUM - HIGH DENSITY RESIDENTIAL (40-100 dw/ha)
 - SCHOOL
 - COMMUNITY CENTRE
 - OPEN SPACE (ACTIVE)
 - OPEN SPACE (PASSIVE)
 - URBAN BUSHLAND
 - ROUSE HILL REGIONAL PARK
 - NATURAL GREEN INFRASTRUCTURE
 - JUNCTION ROAD AND ASSOCIATED LAND
 - ENERGY
 - CONNECTORS AND CORRIDORS
 - ELECTRICAL EASEMENT AND STANCHION
 - LOCAL ROADS (INDICATIVE ONLY)
 - MAJOR ROADS
 - RIPARIAN CORRIDOR

Figure 1. Riverstone East Stage 3 Draft ILP

01

Introduction

Riverstone Stage 3 Context

In 2016, Riverstone East Stages 1 and 2 were planned and rezoned for development. Although a Draft ILP for Stage 3 was prepared in 2015, a number of new government policies at State and Local levels have since been introduced or revised.

Governance

The Department of Planning & Environment

The Department of Planning & Environment (the Department) is responsible for planning and rezoning "in regional NSW". The Department leads the master planning process, including technical studies and community and stakeholder engagement.

Technical Investigations

The technical investigations opposite provided baseline constraints and opportunities for the ILP. They have assessed the validity and viability of the final ILP summarised within this document.

 Social and Community Infrastructure	 Demographics and Housing Analysis
 Traffic and Transport	 Sustainability
 Hydrology and water demand	 Flooding and Water-cycle management
 Utilities infrastructure	 Biodiversity
 Aboriginal and Non-Aboriginal Cultural heritage	 Bushfire
 Geology, soils and contamination	 Air, noise and odour

The Master Plan Process

Work Undertaken to Date

Planning for the Riverstone Stage 3 Precinct began in November 2022. A team of technical consultants were engaged and have provided guidance and feedback on the preferred design scenario in their reports (refer to the Appendix).

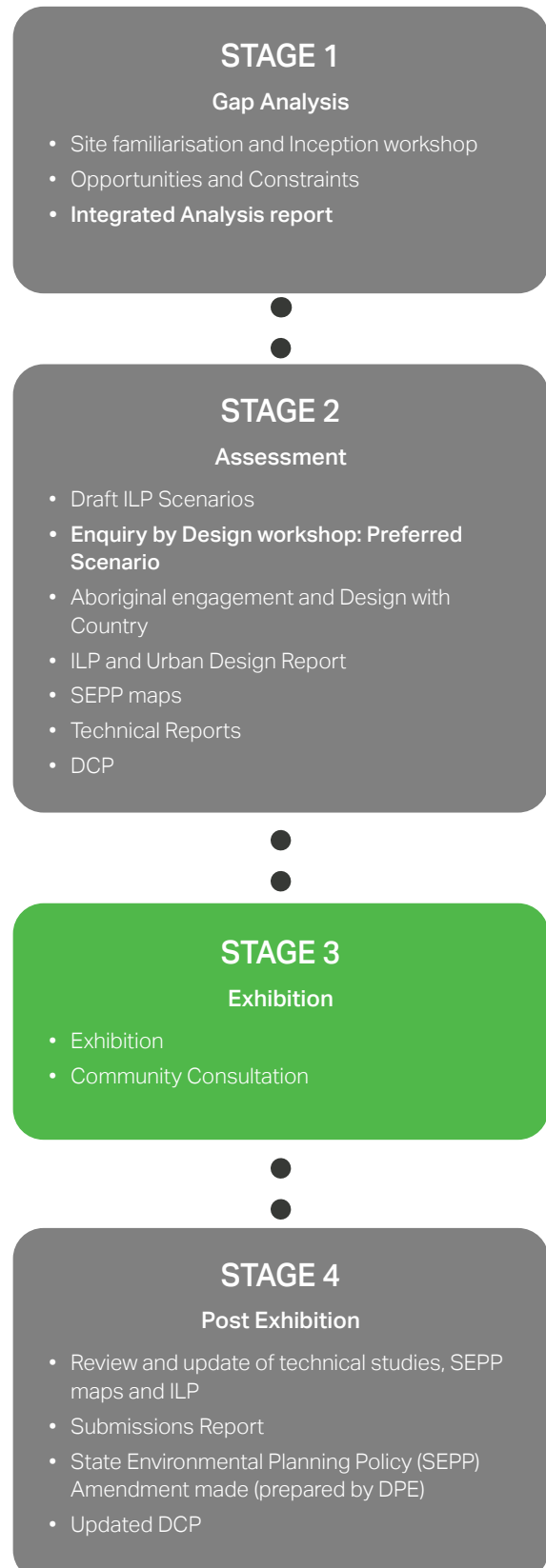
The Enquiry by Design Workshop is at the core of this process. This event brought together the project team, stakeholders and agencies to expedite and align the project design thinking. The key outcomes of this process are contained and evolved within this document and remain evident in the ILP.

This Urban Design Summary Report supports the exhibition material towards rezoning.

Next Steps

The Department, Council and public bodies are to review and provide feedback on the ILP, SEPP maps and technical reports prior to the exhibition period. The exhibition period provides further opportunity for community and stakeholder review of this ILP.

Following the exhibition period all feedback submissions will be reviewed and assessed prior to finalising the ILP and rezoning of Riverstone East Stage 3.



Stakeholder Objectives

The Department

DPE support a strong and liveable NSW by supporting delivery of new housing and jobs in a resilient and sustainable environment. The following objectives have been identified for the Riverstone East Stage 3 Precinct.

Objective 1:

Engage council and key project stakeholders to develop a shared vision that delivers successful design and planning outcomes.

- Existing Landowners, Blacktown City Council, Aboriginal Engagement.
- Community consultation
- Identify key issues and constraints

Objective 2:

Ensure a fully integrated strategy and planning controls that brings together disciplines, agendas and stakeholders.

- Enable environmental, economic, social and sustainable development
- Connect housing to transport, services, facilities. Amenities and open space

Objective 3:

Prepare the land for redevelopment and provide a diverse mix of housing that caters to a range of household types and population growth.

- Housing affordability
- Variety of housing choices
- Manage and integrate environmental and infrastructure constraints

Objective 4:

Plan for the sustainable development of housing to meet the needs of a well-connected and diverse community, supported by local facilities and infrastructure.

- Identify feedback and lessons learnt from Stages 1 and 2 to progress the planning of Stage 3

Blacktown City Council

The following objectives were identified by Blacktown City Council during the inception of the Master Plan process for Riverstone East Stage 3.

Objective 1: To plan for the future, we need to learn from the past.

- Have a holistic overview of the North West Growth Area
- Consider adjoining precincts
- Reduce Drainage Basins Strategy
- Design with Country. Secure Open Space around Creeks

Objective 2: Existing Subdivision Pattern

- Practical and Enactable
- Commercially Viable

Objective 3: Manage Density

- Development should meet a maximum residential density target
- Plan for and control unanticipated growth
- Assess the implications of growth on recreation, community facilities, traffic and urban heat
- Confidence in population projection

Objective 4: Plan for Sustainability

- Protect land for biodiversity purposes and retain existing native vegetation
- Tree Canopy Cover, protect street trees within public open space.
- Environmental Conservation

Objective 5: Plan for Key Sites

- Respect cultural heritage of Rouse Hill House and Farm and reduce impact on view lines and curtilage.

Objective 6: Public Open Space

- Provide for Stage 3 anticipated population and accommodate the shortfall of public open space within Stages 1 and 2.
- Adopt benchmarks of Blacktown City Council's Open Space and Recreational Strategy 2017
- Co-location of active open space and community/social infrastructure

Planning Framework

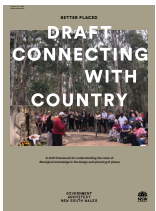
We acknowledge the breadth of strategic documents that have informed the ILP from a multidisciplinary perspective, these are captured holistically within the Department’s discussion paper. The role of this urban design report is to identify gaps and opportunities where relevant to best practice, urban design trends since the 2015 ILP was prepared. This page summarises the key urban design aspects relevant to the ILP design development.

1. Government Architect: Greener Places



This document discusses how to design, plan, and implement green infrastructure in urban areas throughout NSW, focussing primarily on delivering open space by residential density but also discusses principles of the Blue Green Grid and canopy cover, urban cooling and other case studies and mechanisms relevant to Stage 3.

2. Government Architect: Connecting and Designing with Country



Connecting with Country (June 2023) is a Framework for developing connections with Country to inform planning, design and delivery of built environment projects. When combined with Designing with Country, HRD has worked to ensure that design of Riverstone East Stage 3 integrates genuine engagement and Aboriginal Darug values. The Indigenous Design Forum was integral.

3. Codes SEPP



The recently updated Codes SEPP (2022), as relevant to Riverstone East, includes General Housing Code and General Development Code. It is intended to streamline housing delivery by identifying exempt and complying development. It overwrites local planning mechanisms such as LEPs and DCPs and has been considered in the ultimate development potential of this ILP.

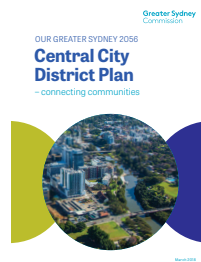
4. Local Strategic Planning Statement 2020



This document outlines how growth will be sustainably managed over 20 years. NWGA provision of infrastructure has not kept pace with the rate of development. Planning Priorities relevant to our recommendations include lack of Green Grid, cultural

engagement, bus routes, new schools and a future community hub in Stage 3 and funding associated with these items. It also identifies Riverstone East as a location for housing diversity including affordable housing opportunities.

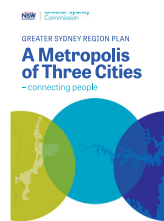
5. Central City District Plan



This document outlines the vision and key planning objectives for the growth of Central City District. Planning objectives and principles relevant to Riverstone East Stage 3 and our urban design recommendations include:

- The focus of growth will be on well-connected walkable places that build on local strengths and deliver quality public places.
- Providing housing supply, choice and affordability with access to jobs, services and public transport
- Providing increased walkable access to local centres and increased access to open space
- Adapting to the impacts of urban and natural hazards and climate change
- Increasing urban tree canopy cover and delivering Green Grid connections
- Provide cool, green links and a network of high quality open spaces to support walking, cycling and community access to open space.

6. NSW Environmental Protection Authority (EPA)



The Greater Sydney Region Plan accounts for the growing and changing population of Greater Sydney (includes Riverstone) and addresses the need to safeguard industries from encroachment from sensitive uses.



Riverstone Stage 3: Vision and Objectives

Hatch RobertsDay created The Seven Essential Elements of Great Places; Identity, Equity, Identity, Greenery, Urbanity, Mobility, Wellness and Resilience. These Seven Elements are used for the assessment of a project's performance against relevant policy and key place metrics.

The Riverstone East Stage 3 Draft ILP uses these essential elements, to shape the master plan around each of these principles.

Through the scenario development and ILP finalisation, decisions have been measured against these seven themes, allowing an understanding of a projects strengths and to identify where there is a need for improvement. These principles have been updated throughout the decision making process to reflect the objectives of the community, stakeholder and Aboriginal engagement.



Equity

Riverstone East Stage 3 will provide appropriate and affordable housing diversity, facilities and services which are safe, inclusive and can be enjoyed by all. Creating inviting areas to support an engaged diverse community that are connected physically and socially throughout the entire Riverstone East Precinct, Rouse Hill and Tallawong Station Precinct.



Identity

We will shape a place that the community will feel proud to belong to, connecting to Country and celebrating the North-West's unique character and diversity, the Darug peoples' values and non indigenous assets of this site.



Greenery

Riverstone East Stage 3 will contribute to, and correct aspirations for a high tree canopy cover, leverage the existing Blue Green Grid; connecting the community physically and psychologically to Country and nature.



Urbanity

Riverstone East Stage 3 will deliver public benefit in parallel with development outcomes, shaping vibrant and liveable neighbourhoods with flexibility to adapt over time. It will become a precinct that supports the activity of a growing population and helps to form a new and dynamic local character.



Mobility

Riverstone East Stage 3 will be a connected place, giving priority to pedestrian and active movement with a high level of accessibility, connecting the community to destinations throughout the precinct, Metro, local public transport and open space.



Wellness

Riverstone East Stage 3 will be a healthy place to live, with diversity of spaces for people to gather and foster social connectedness and places to recreate and exercise, improving daily life through physical and mental health benefits.



Resilience

Riverstone East Stage 3 will contribute to environmental and economic resilience through sustainable design creating a place that responds to a changing climate, and keeps residents cool.

02

**Context and
Site Analysis**

Strategic Context

Riverstone East Stage 3 forms part of the Riverstone East Precinct and lies within the North West Priority Growth Area.

Riverstone East Precinct is formed of 3 separate stages and under the local government area (LGA) of Blacktown City Council and is located less than 50km north west of Sydney's central business district and 20km from Parramatta.

The study area covers approximately 378 ha and is bounded by Windsor Road to the north-east, Tallawong District to the south and Riverstone East Stages 1 and 2 to the west. Most of the Riverstone East Stage 3 study area is outside the 800m walking catchment of metro and rail public transport options. Southern portions of the study area are located within 1km catchment of Tallawong Metro station. Riverstone Train Station is located approximately 2km from the Study Area.

BCC's Local Strategic Planning Statement (2020) have identified several aspirations for the Riverstone Precinct. Improvements to public transport in this area will connect Tallawong Station with business hubs in Western Sydney including Rouse Hill Strategic Centre and Western Sydney Airport within 30 minutes. There is an opportunity for Riverstone East Stage 3 to provide a diverse range of greenfield housing opportunities as part of the NWGA and support the revitalisation of Riverstone Town Centre as a Strategic Centre.

The map opposite identifies the expanded area of Rouse Hill Regional Park. This regional recreational space alongside Rouse Hill House and Farm have an important role in attracting regional visitors and activating the future Stage 3 area and wider Riverstone Precinct.

It is important to note that the Junction Road site is considered as part of this ILP. This is due to the potential requirements for decontamination to be undertaken by the future owner/ manager of the land

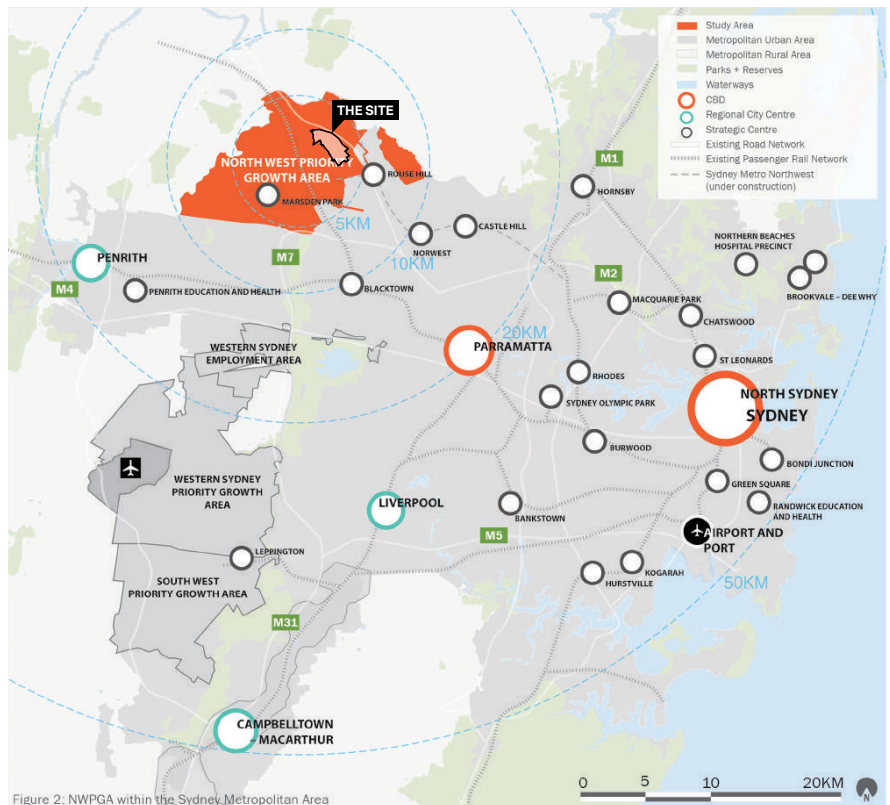


Figure 2: NWPGA within the Sydney Metropolitan Area

Figure 2. North West Priority Growth Area in Greater Sydney Context

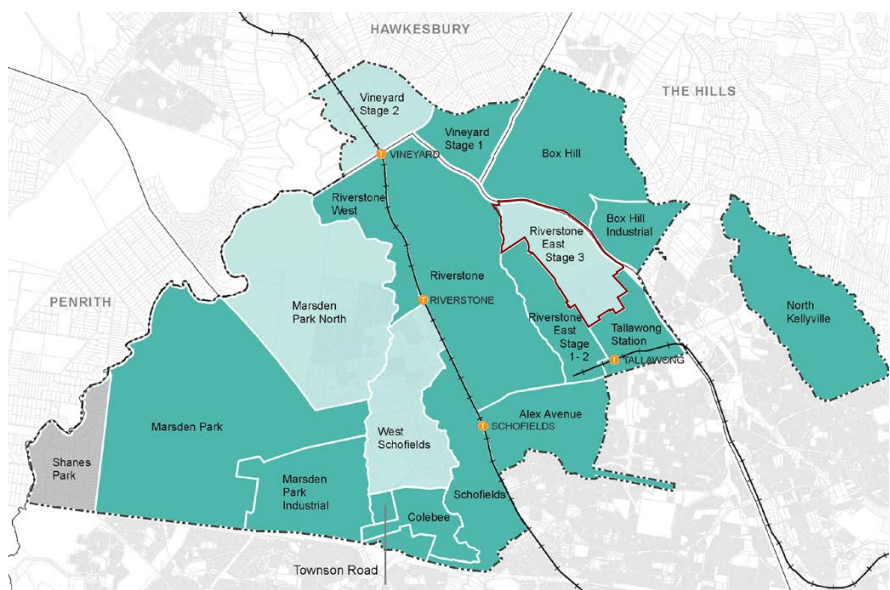


Figure 3. Location of Riverstone East Stage 3 within the North West Priority Growth Area

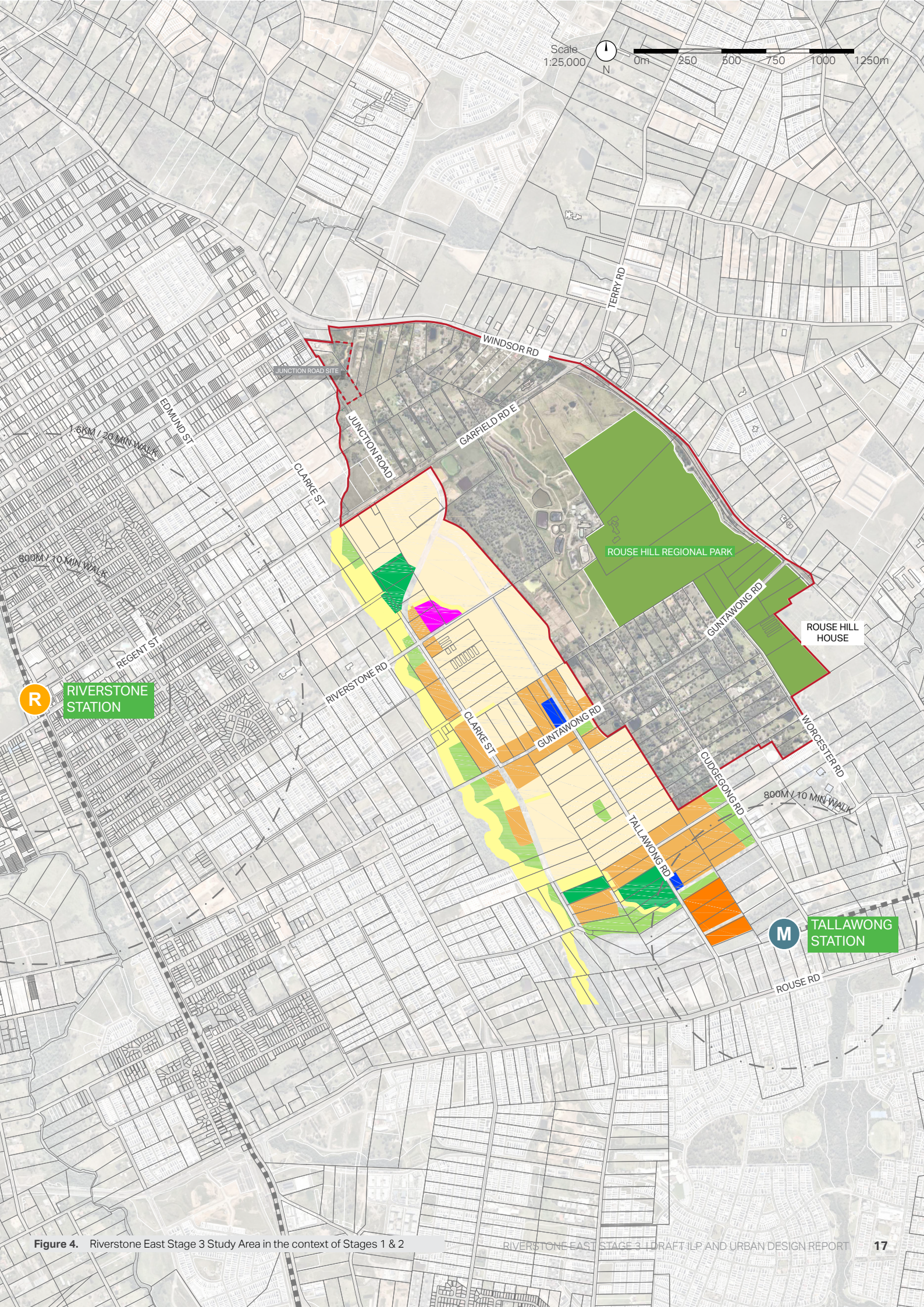


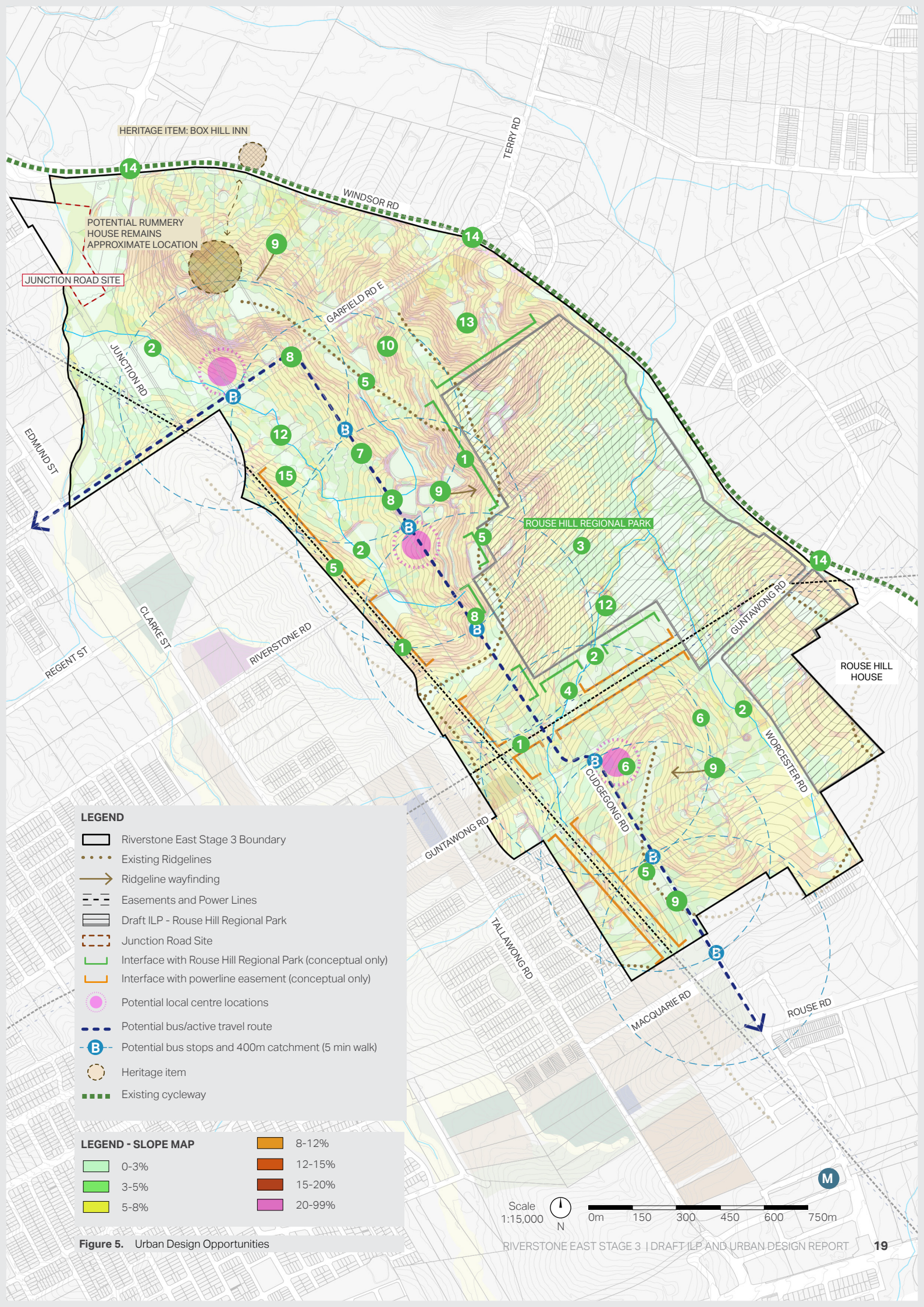
Figure 4. Riverstone East Stage 3 Study Area in the context of Stages 1 & 2

Urban Design: Opportunities

The following urban design opportunities were prepared at the early stages of the project and have formed our thinking and investigations into the ILP contained within this document.

Opportunities

- 1 Support innovative housing typologies that match lifestyle values and price points which respond to topography, amenity and access.
- 2 Reflect and incorporate the outcomes of the Aboriginal Engagement Workshop in the spatial layout of the ILP and foster these relationships as the ILP is developed.
- 3 Consider interface opportunities with Rouse Hill Regional Park that utilises and future- proofs connections and sensitively activates this neighbouring asset.
- 4 In addition to the required open space quantities, leverage existing non- developable land for multi-purpose open space to service the additional population and promote stewardship of high value areas and reduce maintenance costs:
 - The Regional Park;
 - Bushland and high quality tree retention; and
 - Land underneath the power lines for open space and active transport connectivity.
- 5 Celebrate and 'use' the topography to reinforce place, character, legibility and heritage:
 - Map the view lines to/ from the high point at Rouse Hill House to terminate vistas and/ or retain development- free corridors;
 - Develop a thoroughfare network that traces the ridge lines as treed boulevards;
 - Locate medium and high density housing on low- lying land; and
 - Match the intended character and functionality of the open space with the location and topography to minimise earthworks, retain trees and improve usability.
- 6 Co-locate open space/ schools/ school and community centres and consider walkability and active transport as the priority access mode.
- 7 Locate, and size appropriately, a transit spine for active travel and frequent bus services, connecting the residents to Tallawong and Rouse Hill metro stations as well as Riverstone train station to provide alternative options to driving to stations and using the commuter car parks.
- 8 Define preferred bus stop locations within Riverstone East Stage 3 based on key destinations and walking catchments.
- 9 Explore using the ridge lines and topography as natural way-finding.
- 10 Realign the proposed street network (collectors) and local road to be more responsive to the natural topography and ridge lines.
- 11 Design the urban structure in accordance with best practice sustainable urban design principles at a precinct scale including:
 - Designing for passive cooling
 - Designing with consideration to prevailing winds
 - Biophilic design
- 12 Test and understand the benefits of a connected online drainage system in accordance with the blue-green grid infrastructure policy.
- 13 Control/ restrict density through planning controls.
- 14 Consider a well integrated active travel network with opportunities to connect with existing cycleway along Windsor Road and pedestrian desire lines.
- 15 Retain high quality and existing native vegetation to contribute and meet the NSW Government's tree canopy target of 40%, retaining as much vegetation within the public domain and streets. Opportunity for urban heat and environmental outcomes.



LEGEND

- Riverstone East Stage 3 Boundary
- Existing Ridgelines
- Ridgeline wayfinding
- Easements and Power Lines
- Draft ILP - Rouse Hill Regional Park
- Junction Road Site
- Interface with Rouse Hill Regional Park (conceptual only)
- Interface with powerline easement (conceptual only)
- Potential local centre locations
- Potential bus/active travel route
- Potential bus stops and 400m catchment (5 min walk)
- Heritage item
- Existing cycleway

LEGEND - SLOPE MAP

- | | |
|---|---|
| 0-3% | 8-12% |
| 3-5% | 12-15% |
| 5-8% | 15-20% |
| | 20-99% |

Figure 5. Urban Design Opportunities

Scale 1:15,000
 0m 150 300 450 600 750m
 N

Urban Design: Challenges

The following urban design challenges were identified in relation to the 2015 ILP and prior to the integrated spatial constraints mapping to guide our innovation and solutions towards the ILP finalisation.

Challenges

- 1** To date, approximately 30,000 dwellings have been forecast within the North West Growth Area (NWGA) in excess of planned growth.

The Codes SEPP enables subdivision and creation of duplexes which has resulted in unanticipated population growth and challenges to the provision of sufficient physical and social infrastructure.

Acknowledging NSW Government's commitment to achieve 40% urban tree canopy, controlling permeable area and canopy trees within the private lot has proven challenging within the NWGA.

Riverstone East Stage 3 faces the same challenges. Consideration must be given to lot size and density locations and intent and the implications of further subdivision of those lots. Tree planting should be maximised within the public realm.
- 2** Private ownership makes on-site survey prohibitive and therefore some areas have not been accessed through this process.
- 3** The required number of playing fields identified in the 2015 ILP needs to be reviewed against the current demographic and regional requirements and opportunities for shared use.
- 4** The 2015 ILP shows no direct/ continuous North-South road through the site forcing longer journeys to access different areas and potential key destinations.
- 5** Large land holdings have contamination issues and/ or are existing businesses; some having odour impacts.
- 6** It is acknowledged that a structure/ street network that follows the existing cadastre boundaries would assist in delivery that is not overly reliant on amalgamation or land deals. However, the benefits of slope responsive streets, integration with existing uses, vegetation protection and large land use requirements such as playing fields don't always make this strategy possible/ optimum. This can be further reviewed during detailed design as local roads are not fixed within the ILP.
- 7** Western indicative school location is sited between two transmission lines and lacks connectivity to the under-served North East of Stage 3.
- 8** Micro-mobility and walkability is challenging to achieve in the local climate. Change of approach is needed to start delivering streets and that encourage walking and cycling.
- 9** Noise associated with traffic on Windsor Road and Garfield Road East and the meat rendering plant operations.
- 10** There is sometimes the perception of usability/ management constraints associated with co-locating/ sharing neighbourhood open spaces with riparian corridors (a strategy that is consistent with the Greener Places strategy).
- 11** Urban Heat Island effect is a significant risk and constraint for developing new communities in Western Sydney. Urban Heat Island projections for Riverstone East Stage 3 Area already experiences 3-6 degree warmer temperatures compared to established baseline. The temperature is likely to increase as development occurs, if appropriate strategies and mitigations measures are not considered in the planning. An increase of over 9 degrees has been observed in more established neighbouring areas such as The Ponds and Rouse Hill, which are relatively new residential neighbourhoods.

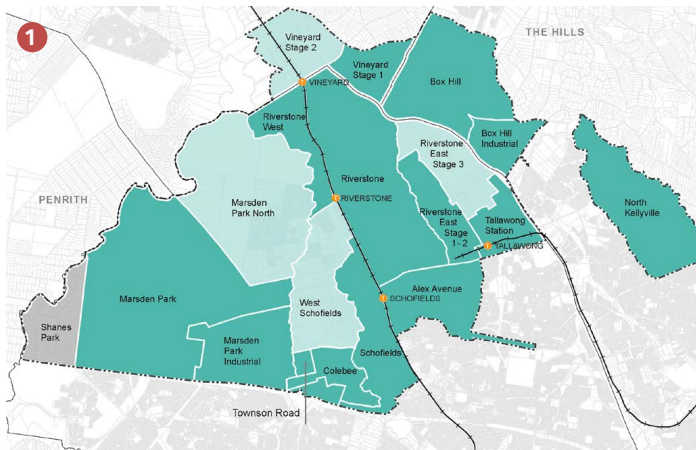


Figure 6. North West Priority Growth Area

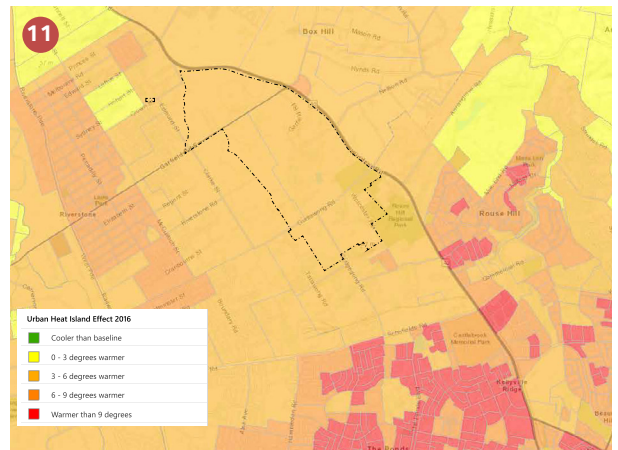
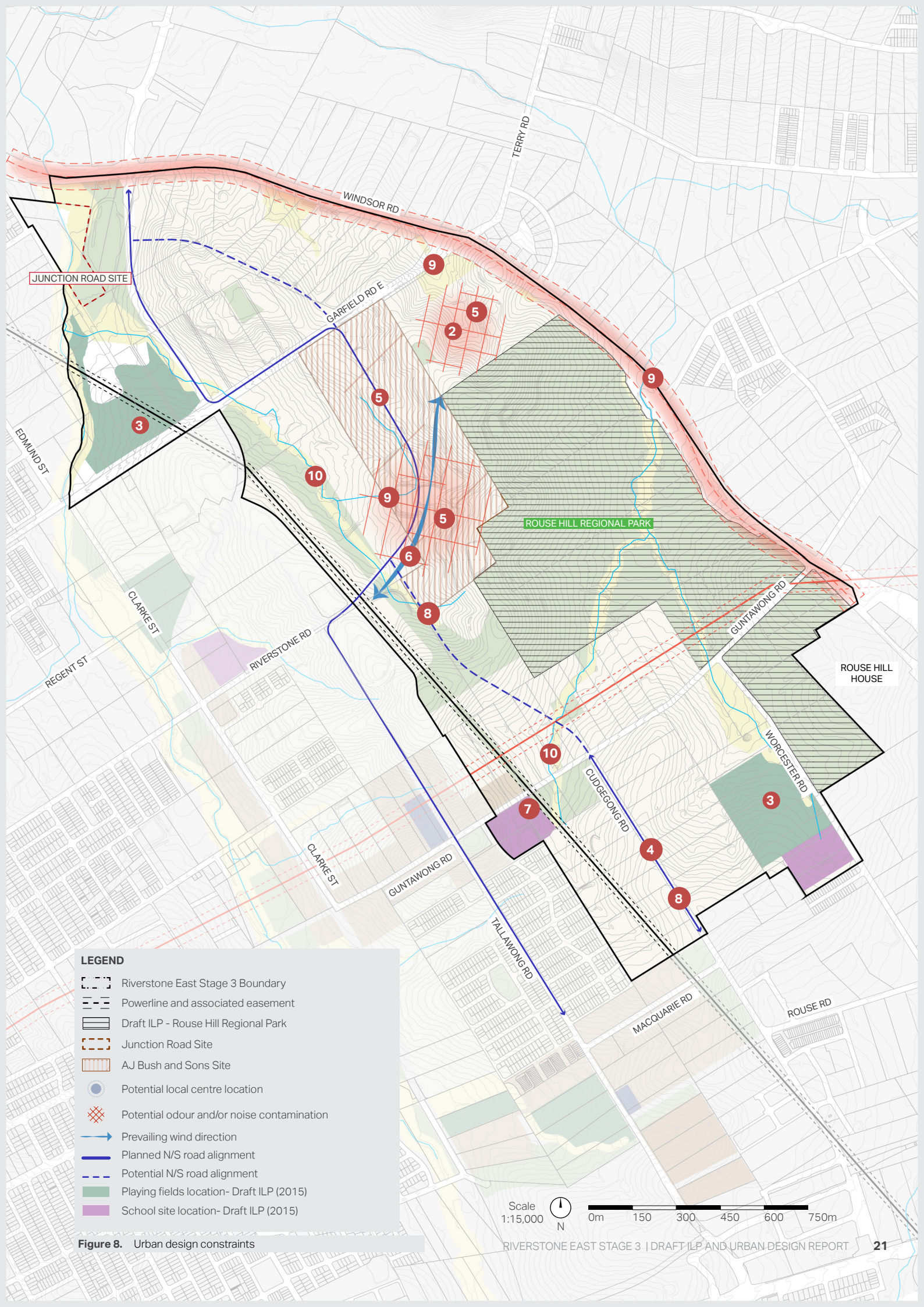


Figure 7. Urban Heat Island Effect 2016: Source: geo.seed.nsw.gov.au



LEGEND

- Riverstone East Stage 3 Boundary
- Powerline and associated easement
- Draft ILP - Rouse Hill Regional Park
- Junction Road Site
- AJ Bush and Sons Site
- Potential local centre location
- Potential odour and/or noise contamination
- ➔ Prevailing wind direction
- Planned N/S road alignment
- Potential N/S road alignment
- Playing fields location- Draft ILP (2015)
- School site location- Draft ILP (2015)

Scale 1:15,000 N
 0m 150 300 450 600 750m

Figure 8. Urban design constraints

Integrated Constraints

The opposite map shows the combined technical constraints for Riverstone East Stage 3. The Constraints Map was the basis for discussion at the Enquiry by Design workshop and in identifying the extent of developable land available and progressing the ILP. The ILP is a direct response to these constraints.

The following summary of constraints have been used to inform the final ILP and establish a developable area.

Flooding:

- Consideration of existing and future flood evacuation routes (access and egress). Evacuation from this area is not an issue;
- The ILP will consider updated flood modelling that considers extreme scenarios of Climate Change;
- Riparian corridors should be able to accommodate flooding with potential to support active travel routes and recreation;
- Development will be located outside of the flood plain to protect vulnerable communities;

Traffic and Transport:

- Future-proof access to Rouse Hill Regional Park through the Precinct;
- Collector road widths should accommodate buses and active travel;
- Potential for a N/S connector from planned roads to Tallawong Station;

Environmental:

- Development will consider Asset Protection Zones (APZ), in particular those adjacent to riparian corridors;
- The ILP should consider staging of development around existing noise and odour from AJ Bush and the relocation of their operations;
- Development will be setback a minimum of 20m setback from Windsor Road;
- There is a 39% tree canopy cover across the site with potential to retain dense patches of existing native vegetation;
- Council prefers that open space

is located outside of areas with contamination risk;

Utilities and Infrastructure:

- The 330kV power line easement can accommodate crossings e.g. paths and streets and other uses outside of clearance zone;
- The 132kV power line easement can support trees up to 3m;
- The undergrounding of the 132kV power line has many benefits to development potential, amenity and connectivity and should be investigated in terms of cost and viability ensuring that the ILP still functions as intended if the undergrounding is a long term outcome;

Social Infrastructure:

- Challenges related to the approval process for an active transport corridor under electrical easement;
- Location and provision of parking to support mobile community amenities e.g. mobile libraries;
- 2.83 ha/1000 people is the standard metric used across the Blacktown LGA to define usable and unconstrained public open space;
- Site suitability for Schools Infrastructure NSW (SINSW) to meet criteria and address risk e.g. electrical easements, flood and bushfire risks;

Demographics:

- Supporting additional dwelling growth with additional infrastructure is critical;
- Relatively larger lots (greater than 600sqm) are generally unaffordable and should be provided in limited amounts to contribute to diversity and affordability;
- Provision of affordable housing is

supported, located close to social infrastructure noting challenges to delivery mechanisms, funding and application beyond only Stage 3;

Non-Indigenous Heritage:

- Consideration and protection of the views from Rouse Hill House and Farm and curtilage. Taller development should be located on low lying land and have height controls;
- Protection of heritage items and their locations.

Aboriginal Heritage:

Key points arising from the discussion with Aboriginal Stakeholders:

- Important to protect and restore water courses and the land around them, water holes and wildlife
- Artefacts have been found within 30m x 30 metres of water courses
- The "wilderness landscape" has been significantly altered
- Important to protect the Cumberland Woodland vegetation where possible
- Important to protect views and provide visual connection between areas of significance + open space where Sky (Biari) meets earth (Wiari)
- Provision of larger areas of open space particularly at the intersection of creeks rather than small pockets of open space.
- Preference is to locate larger lots adjacent to open space to provide a buffer
- Traditional visual language
- Retain artefacts/sites in natural landscape context
- "Old Riverstone" - historical places retained.

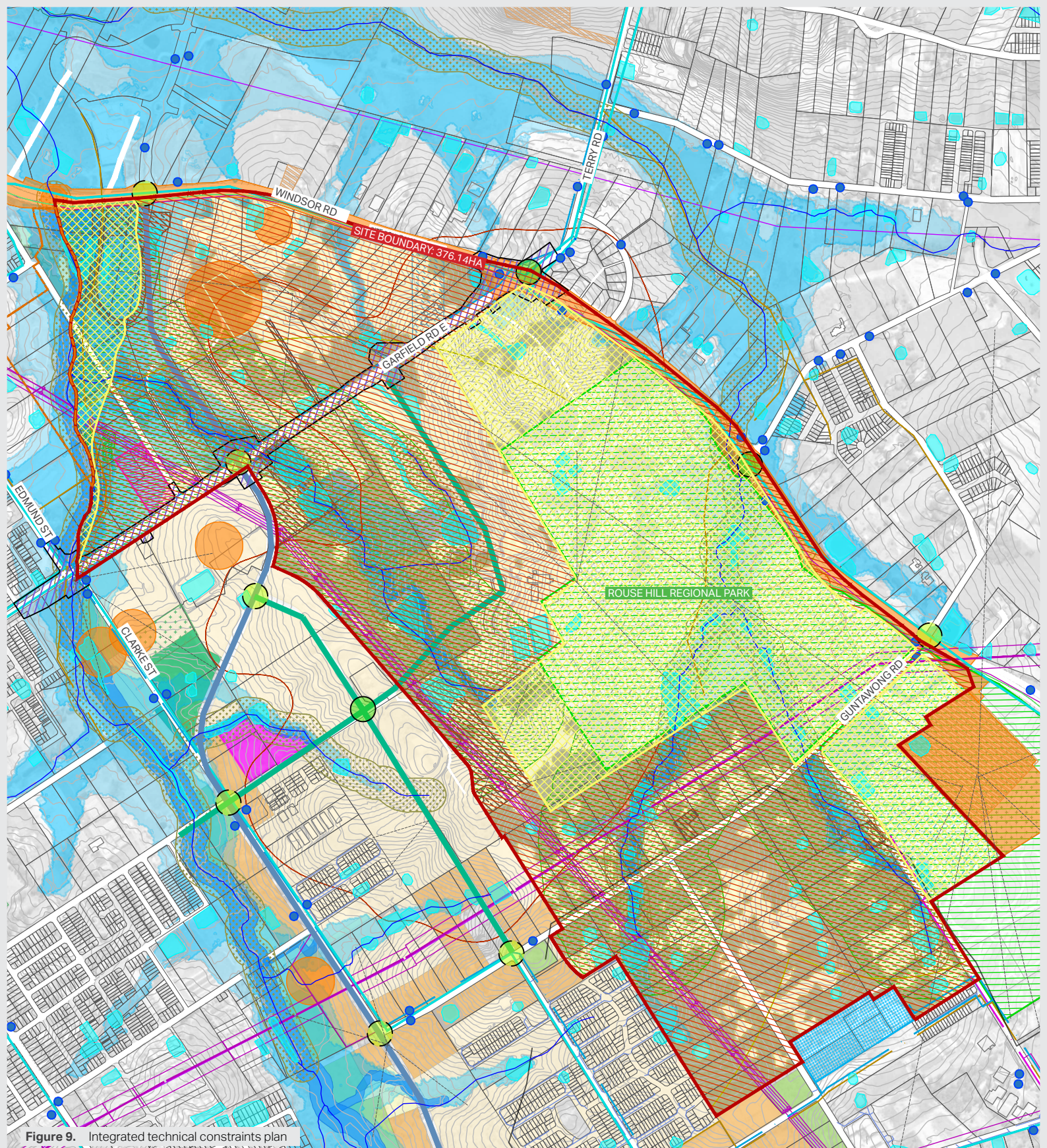


Figure 9. Integrated technical constraints plan

LEGEND		FLOODING		BIODIVERSITY		INDIGENOUS HERITAGE		NON-INDIGENOUS HERITAGE		UTILITIES	
— RIVERSTONE EAST STAGE 3 - SITE BOUNDARY	— EXISTING CONTOURS 2M	— EXISTING RIPARIAN CORRIDOR	— 1% AEP FLOOD EXTENT	— LOW BIODIVERSITY VALUE	— MODERATE ARCHEOLOGICAL POTENTIAL	— LEP HERITAGE ITEM	— SUGGESTED EXTENSION OF ROUSE HILL AND FARM CURTILAGE	— TRANSGRID - 330KV ABOVE GROUND	— TRANSGRID - EXISTING EASEMENT	— ENDEAVOUR ENERGY - 33KV BELOW GROUND	— ENDEAVOUR ENERGY - 132KV ABOVE GROUND
— CADASTRAL BOUNDARIES	— CREEKS AND WATERWAYS	— PMF FLOOD EXTENT	— PRELIM. HN PMF	— HIGH BIODIVERSITY VALUE	— MODERATE HIGH ARCHEOLOGICAL POTENTIAL	— SPP CULTURAL HERITAGE - SUGGESTED EXTENSION	— HIGH POTENTIAL FOR ARCHEOLOGICAL REMAINS	— ENDEAVOUR ENERGY - 132KV POLE	— RIVERSTONE EAST STAGE 3 - SITE BOUNDARY	— ENDEAVOUR ENERGY - 132KV BELOW GROUND	— SYDNEY WATER - POTABLE WATER
— JUNCTION ROAD SITE				— VERY HIGH BIODIVERSITY VALUE	— VERY HIGH ARCHEOLOGICAL POTENTIAL	— MEDIUM POTENTIAL FOR ARCHEOLOGICAL REMAINS	— POTENTIAL REMAINS OF RUMMERY HOUSE	— SYDNEY WATER - EXISTING SEWER	— SYDNEY WATER - RESERVOIR	— EXISTING DAM	— EXISTING STORMWATER PIPE
				— CERTIFIED BIODIVERSITY	— DISTURBANCE	— STATE HERITAGE REGISTER - HERITAGE ITEMS	— CENTRAL RIVER CITY 2021 SPECIAL PROVISION	— PLANNED SUBSTATION LOCATION			
				— UN-CERTIFIED BIODIVERSITY		— KEY VIEWLINES					
TRANSPORT		AIR QUALITY AND ODOUR		INDICATIVE LAYOUT PLAN							
— PUBLIC TRANSPORT ROUTES	— CYCLE PATHS	— AJ BUSH - INDICATIVE 90% ODOUR LEVELS	— INDICATIVE POULTRY FARM ODOUR IMPACTS	— DRAFT ILP - LOW DENSITY HOUSING	— DRAFT ILP - LOCAL OPEN SPACE						
— METRO STATION - WALKABLE CATCHMENTS	— NEW ROAD - ARTERIAL ROAD			— DRAFT ILP - SCHOOLS	— DRAFT ILP - SPORTING FIELD						
— NEW ROAD - COLLECTOR ROAD	— NEW ROAD - GARFIELD ROAD EAST UPGRADE			— DRAFT ILP - TOWNHOUSES	— DRAFT ILP - WATER MANAGEMENT						
— BUS STOPS	— EXISTING SIGNALISED INTERSECTION (UPGRADED)										
— NEW SIGNALISED INTERSECTION											

03

The Master Plan

What We Have Heard: EbD Summary

The Enquiry By Design workshop sessions gave the working group the opportunity to understand constraints, shape and test ideas, evaluate high level scenarios and develop innovative solutions at scale, through an iterative cross-disciplinary design process. The Preferred Design Scenario produced at the EbD workshop represented a multi-disciplinary collaborative effort to balance the housing, infrastructure and open space needs of the local and regional community.

Key outcomes of the EbD included:

Indicative Housing Typologies

1. Larger lot sizes to be located on steep slope and where development would be highly visible from Rouse Hill House;
2. Smaller lots and apartments (medium and high density) to be located proximate to amenity such as open space, schools and community facilities and on low-lying land where less visible from Rouse Hill House;
3. Housing typologies should consider apartments, aged care, terraces,

duplexes, small cottages, courtyard homes, houses on larger lots with less site coverage to accommodate trees and houses that sensitively respond to slope minimising cut and fill;

4. Affordable housing is desirable whilst percentage, delivery mechanism and location requires further investigation.

Indicative Zoning

1. Medium-high density housing to be zoned R3 with a maximum height of 15m (4 storeys) and consideration of 1.1:1 FSR;
2. All other housing to be zoned R2;
3. Infrastructure and easements, education investigation areas and open space with drainage functions to be zoned SP2;
4. Community facility sites to be zoned SP1;
5. Linear open space along riparian corridors to be zoned C2;
6. All other open space, playing fields and non-certified land to be zoned RE1;
7. 132kV power line easement to be undergrounded and zoned as per

adjoining land use. Subject to further investigation required to confirm business case;

8. N/S transit spine to be considered for SP2 zoning;
9. Further investigation required for the Junction Road site.

Indicative Open Space Strategy

1. Generally co-locating open space with the existing blue and green systems to create a connected 10km 'loop.'
2. In addition to retaining trees on non certified land, create large parklands where there is a high concentration of high value vegetation on certified lands. In particular along the southern boundary of the regional parklands and at the newly created 'Riverstone East Parklands (described below);
3. Create the Riverstone East Parklands where high quality trees will be retained next to a reformed creek line/ pond system and co-located with community uses and medium density housing.

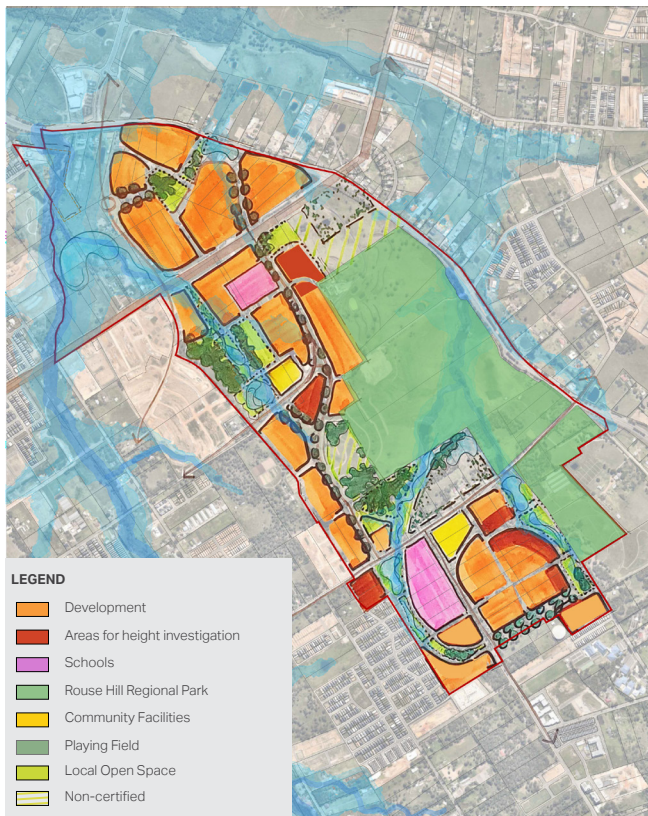


Figure 10. Preferred Design Scenario



Figure 11. Indicative Housing Typologies Plan

What Has Changed: ILP Evolution

Technical assessments of the EbD preferred scenario and further investigations following the EbD and Aboriginal engagement workshops resulted in several refinements to the current ILP.

Housing Typologies

- Following feedback from the Aboriginal Engagement, medium density lots and apartments were re-allocated away from the creek corridor and out of the immediate views of Rouse Hill House Estate east of the ridge line.
- Density was shifted onto the western side of the ridge, transitioning towards lower densities in higher areas to the south.
- Introduction of R4 zoning to curtail the location of higher density apartments. FSR controls not required due to proposed height and density controls.
- Further discussion on affordable housing resulted in a 10% target provision within Stage 3.
- Further investigation into possible subdivision of lot sizes based on Code

SEPP provided certainty of a maximum yield for Stage 3. Refer to Built form strategy and DCP controls later on in this report for further information on controlling development yield.

Open Space Strategy

- Classification of Open Space were introduced and technical investigations undertaken to give certainty to council on open space calculations and an understanding of the potential area retained as Existing Native Vegetation.
- Refinement of Playing Field areas locations through indicative testing of sporting field layouts reducing impact on existing native vegetation.
- Further coordination of the ILP to reflect drainage requirements and retention of existing native vegetation.

Zoning

- Refinement of RE1 zoning to reflect new recreational open space categories.
- Further discussion on the zoning of the Junction Road site and associated lands, resulting in a combination of R2,

RE1, SP2 and C2 zoning.

- Confirmation of the intent to underground the 132kV easement within the study area and zoning of the easement corridor to reflect adjoining land uses.

Community Infrastructure

- The secondary school site and playing fields in the south were re allocated to the eastern side of Cudgegong Road following feedback on the proximity to the electrical easements. The community centre, medium and high density were restructured around this.
- The northern community centre and sporting fields were relocated closer to the primary school based on feedback around co-location and site topography.



Figure 12. Indicative Zoning Plan

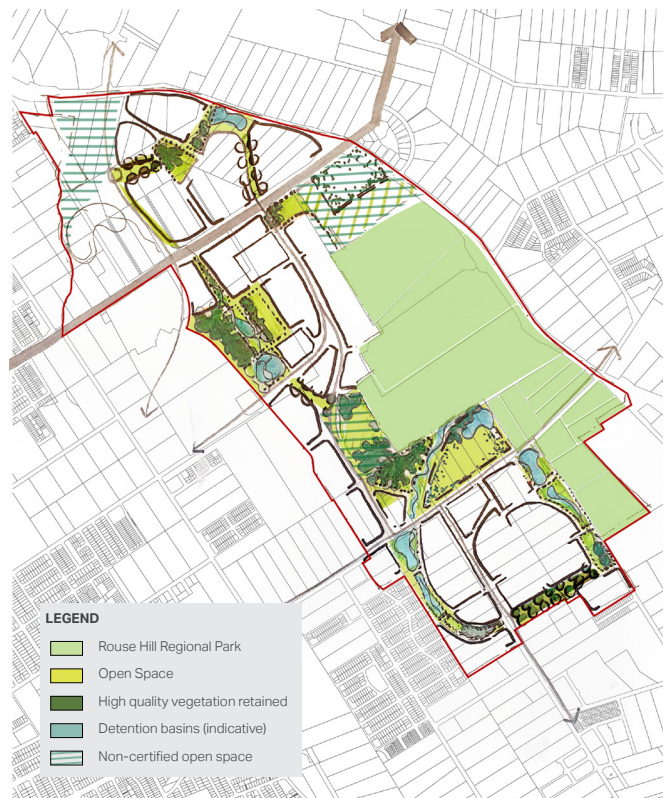


Figure 13. Indicative Open Space Strategy

Place Design Principles

Principle: Diversity

The map below illustrates the suitable locations for medium density lots up to 12m in height and high density apartments up to 16m, which represent 30% of the total lot mix within the ILP. The following design principles have influenced the location of medium and high density housing:

- Access to community infrastructure i.e. schools, playing fields;
- Location near Stage 1 and 2 higher density locations and local centres;
- Location near bus route to support car-free travel.
- Protecting views from Rouse Hill House and Farm. Medium density housing are located away from immediate view lines of Rouse Hill House and Estate and apartments are located on low lying land where less visible;
- Height controls for medium and high density housing;
- Higher concentration of residents located in closer proximity to Tallawong metro station to encourage active travel and reduce car reliance; and
- Amalgamation of land under single land ownership and incentivisation for housing delivery.

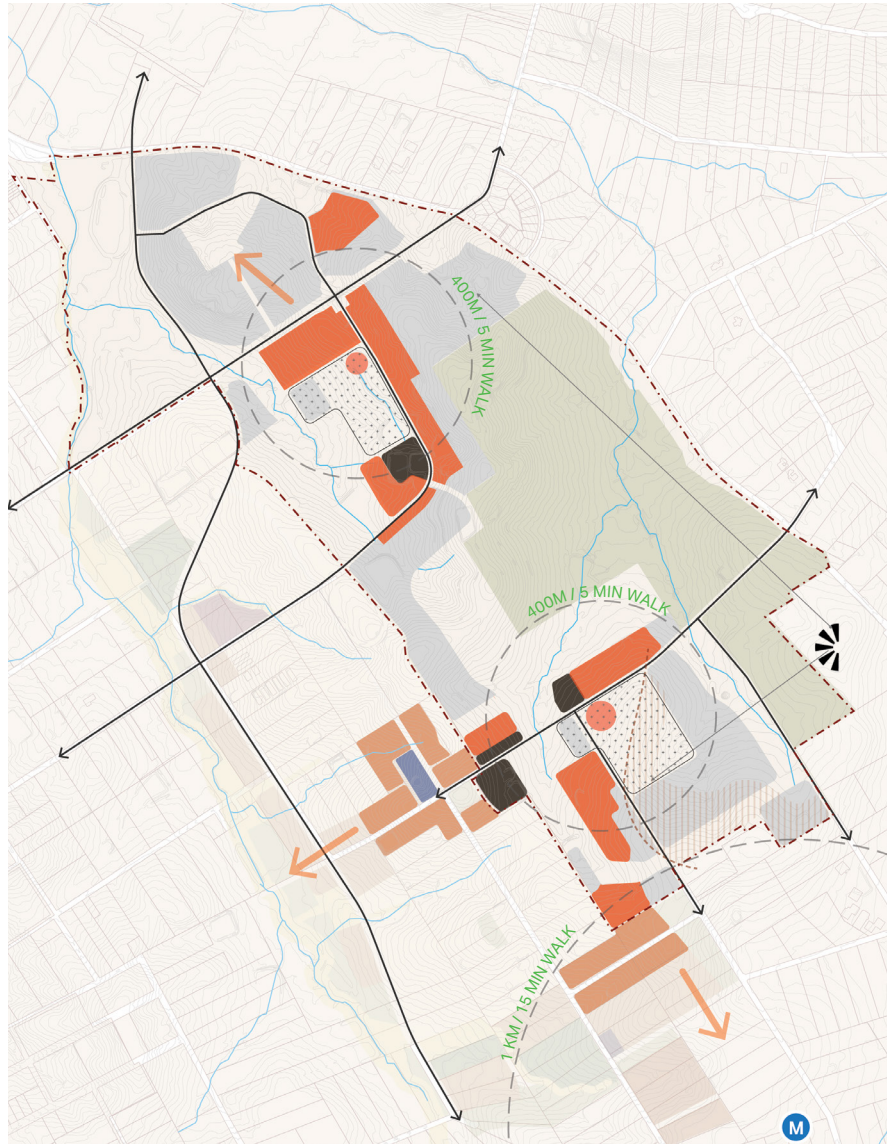


Figure 14. Diversity design principle diagram

LEGEND

- Medium density
- High-density (Apartments)
- Stage 1 and 2 medium density
- Stage 1 and 2 Local Centre
- + + + + Community cluster
- School sites
- Ridge line



Figure 15. Example medium and high density housing typologies

Principle: **Community**

The map opposite illustrates the location of community infrastructure for the ILP. Key design principles that influenced these location include:

- Provision of playing fields generally co-located with other community infrastructure and clustered where possible;
- Playing fields to be located in relatively flat areas;
- Co-locating community infrastructure to provide multi-functional spaces in accessible locations;
- Staging community infrastructure appropriately with development;
- Education investigation area identified for a secondary in the south with the preferred location to the east of Cudgegong Road. This location would leverage existing infrastructure/connections to Stage 1-2 for early delivery potential;
- An education investigation area was identified for a primary school in the north providing catchment distribution and co- location opportunities with open space and public transport/ active travel;
- Co-location of playing fields and schools provide opportunity for sharing of sporting fields, reducing area required for schools; and
- Due to the ability for schools to be 4 storeys by right, development of school and community buildings should be located on lower lying land, with S1 buildings located to the northern end.

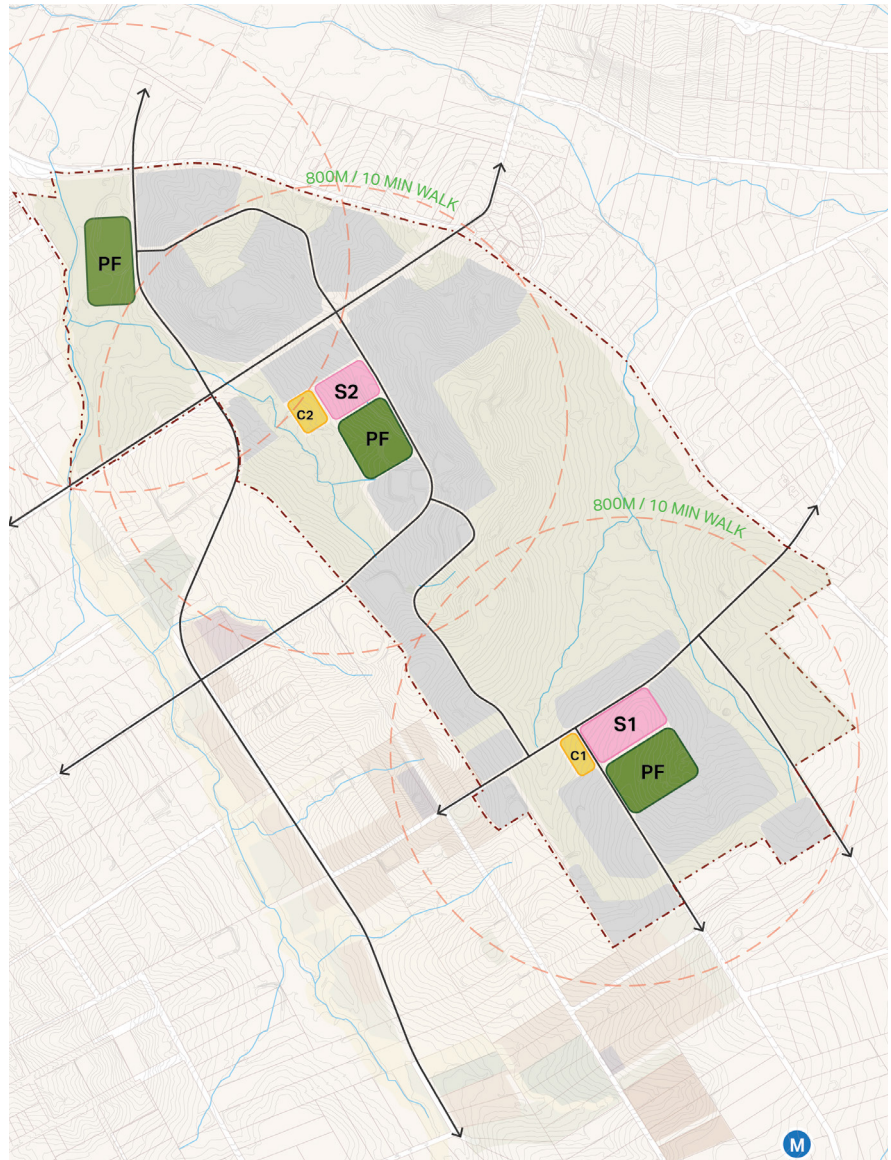


Figure 16. Community design principle diagram





Community Infrastructure Target	Gross Area [ha]
 School 1 (Secondary)	4.00
 School 2 (Primary)	2.00
 Community Centre Site	2.00
 Playing Field (Based on Draft ILP)	17.82

Table 1. Community infrastructure targets

Principle: **Open Space**

The map opposite illustrates the provision of Open Space for the preferred ILP scenario. The following design principles influenced the open space strategy:

- Creation of +40ha of high quality Open Space with areas for recreation accessible within 500m of development;
- Blue-Green grid and provision of a +10km health and recreational loop, future-proofing recreation and the commuter network;
- Creation of Riverstone Parkland through the co- location of open space with waterways and riparian corridors;
- Optimisation of detention basins and management of drainage infrastructure;
- Retention of high quality vegetation within open space and public domain to contribute to 40% tree canopy site coverage target;
- Creating an interface between bushland and development with consideration for Asset Protection Zones (APZs);
- Protection of Aboriginal and European heritage and artefacts e.g. Rummery House remains;
- Street tree canopy cover and WSUD contributing to the blue-green grid;
- Potential for future off-road walking/ cycle trails through Rouse Hill Regional Park to complete the green loop; and
- Connect proposed active travel to existing active travel links e.g. along Windsor Road.
- Connect areas of open space together through a network of quietways that enable active travel movement.

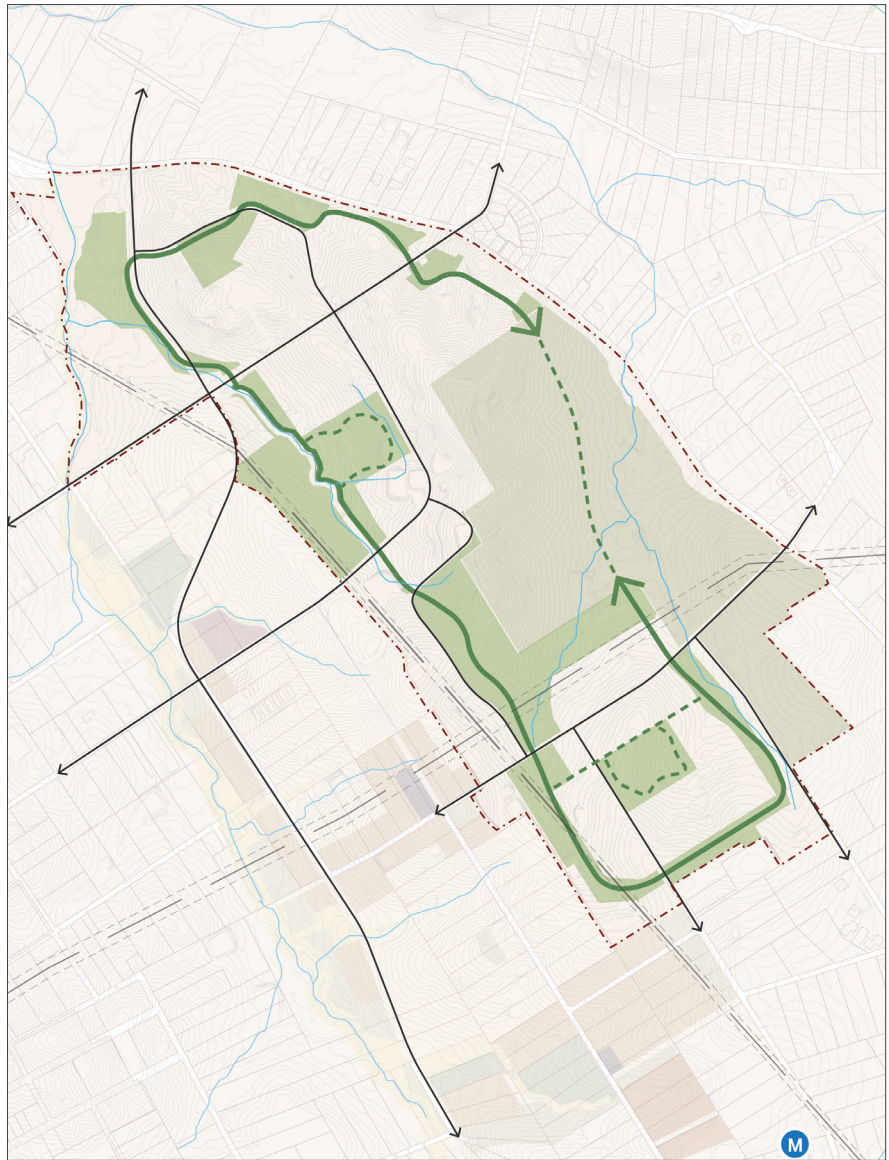







Figure 17. Open Space design principle diagram

LEGEND

-  Rouse Hill Regional Park
-  Open Space
-  Recreational green loop
-  Secondary green links
-  Riverstone Parklands

Principle: **Mobility**

The map below illustrates the proposed road network strategy for the ILP. The plan was a result of the following principles and advice from the transport technical assessment:

- Future proofing bus routes and cycle ways along planned road upgrades for Riverstone Road extension, Guntawong Road and Cudgegong Road;
- A new bus capable N/S transit spine road and active travel corridor between Garfield Road East and Guntawong Road, connecting the precinct and commuters towards Tallawong Metro Station;

- Undergrounding the lower voltage power line (132kV) to future-proof active travel alongside recreation with a road carriageway to run above the easement;
- The transit spine road is to be bus capable with a minimum width of 13m;
- Shared path of 2.5m along the transit spine road to allow for active travel;
- Figure 17-18 illustrate Blacktown DCP's typical road width sections. The proposed transit spine road will be the equivalent of a medium-high density local road (Figure 19), with an additional 2m to be bus capable. Although DCP controls set the minimum for

street widths. HRD supports the use of *Western Sydney Streets Design Guidelines* as a guide to increase opportunities for street tree planting, WSUD, pedestrian priority and deep soil planting;

- New street cross sections should be considered in the DCP to promote street tree planting within the verge;
- Providing future access from the precinct to Rouse Hill Regional Park;
- Secondary local/shared streets will provide a buffer between development and bushland within the APZ. These will plug in to the transit spine road.

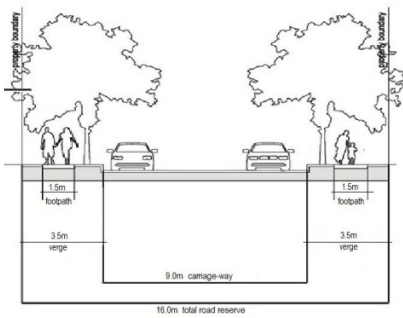


Figure 18. Typical Local Street Section - 16m (Source: Blacktown DCP)

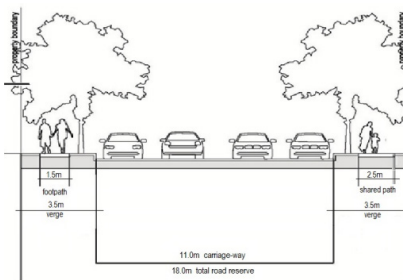


Figure 19. Medium-high density local road reserve - 18m (Source: Blacktown DCP)

LEGEND

- Developable area
- Open Space
- Community infrastructure
- N/S transit spine
- Key E/W active travel connections
- Major roads
- Secondary roads
- B Indicative bus stop location

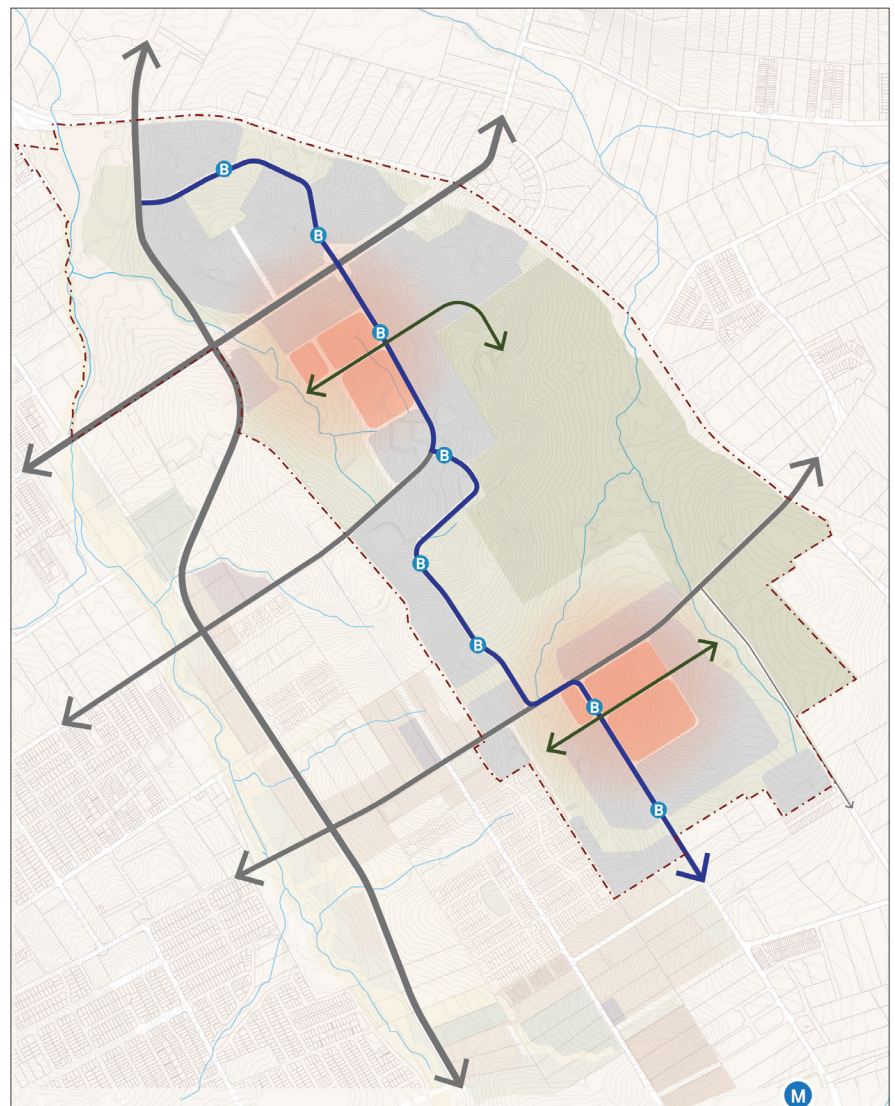


Figure 20. Mobility design principle diagram

Draft ILP

The map opposite shows the proposed ILP for Riverstone East Stage 3. The ILP represents a multi-disciplinary collaborative effort to balance the housing, infrastructure and open space needs of the local and regional community.

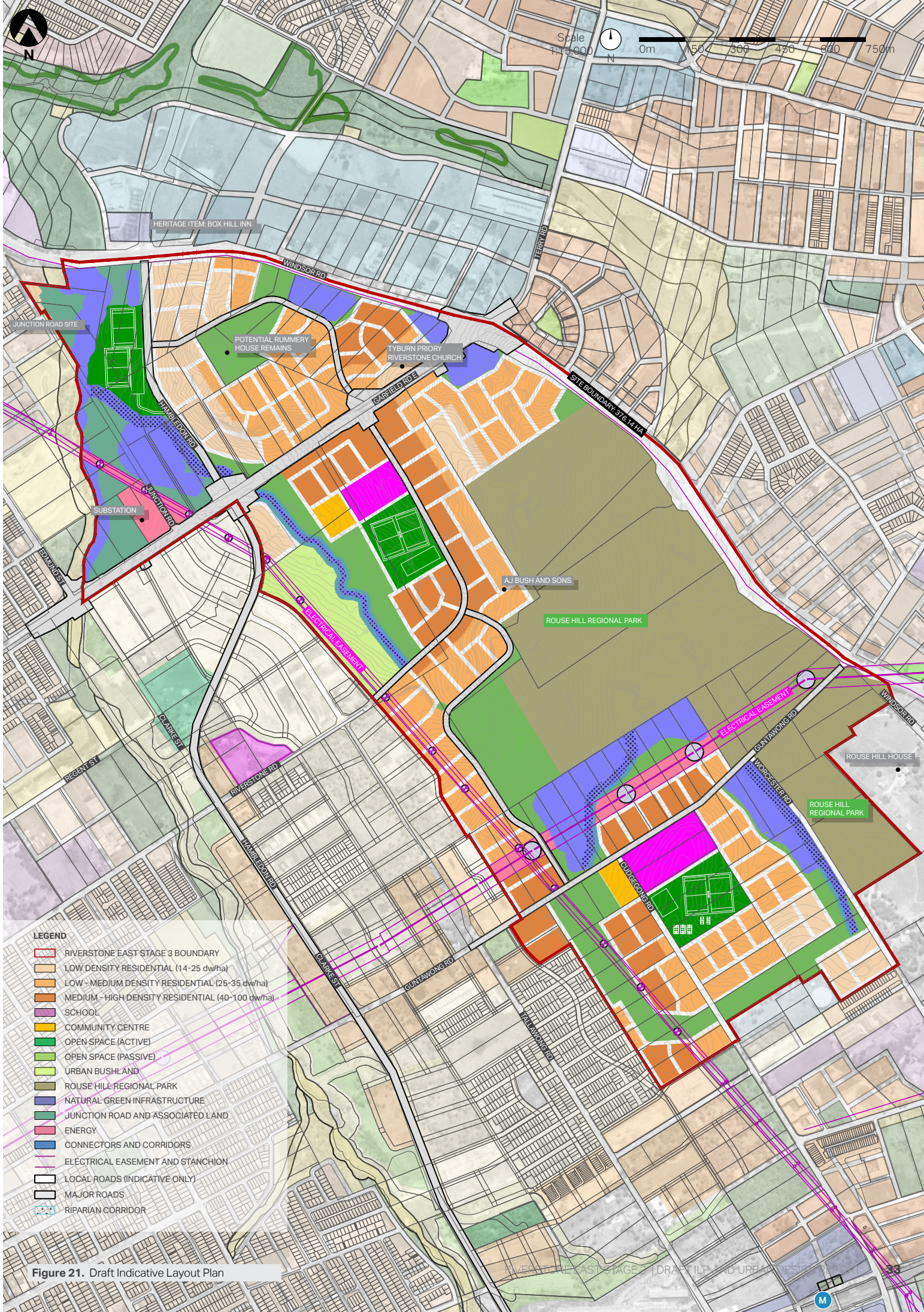
The ILP has been refined through an iterative process from the initial preferred scenario developed at the EbD workshop to accommodate technical requirements and feedback from various stakeholders.

- Development lies outside flood prone areas, with open space and riparian corridors interwoven, creating the blue-green grid;
- A total of 125.10 ha of gross developable area that represents 33.0% of the total study area;
- The Net Developable Area made up of 88.51 ha ranges from low - high density housing;
- A total of 6.14 hectares is identified for school sites, which has been confirmed as appropriate locations by SINSW. The location of playing fields are adjoining the school sites to provide a multi-functional shared use of facilities by the school;
- 2.07 hectares is identified for community centres, which are co-located with the school sites to provide a multi-functional and accessible facility;
- The ILP responds to the general slope and topography of the study area with no smaller lots located to the eastern side of Cudgegong Road;
- The location of playing fields and community buildings are co-located with schools to provide multi-functional and shared facilities. A total of 6 sports fields could be provided across 3 active open space areas based on indicative detailed layouts. These meet the sporting field requirements set out by Blacktown City Council's Recreation and Open Space Strategy and are accessible to the Stage 3 population;
- Larger lots are located on steeper terrain as they are typically not as tall (maximum 1-2 storeys), protecting views from Rouse Hill House and Farm;
- The ILP assumes the undergrounding and realignment of the 132 kV easement under a N/S road corridor, illustrating possible development over the easement corridor;
- The ILP accommodates the latest drainage information, riparian corridors and basin extents; and
- Open space has been categorised within the ILP based on their function and illustrates the possible retained areas of Existing Native Vegetation.

Net Land Uses	Net Factor	Net Area
	33.0%	125.10
Net Developable Area	70.8%	88.51
Local Roads	29.2%	36.59

Riverstone East Stage 3 ILP	Gross Land Uses	Gross Area [m2]	Gross Area [ha]	%
Land Use Category		3,786,143.56	378.61	100.0%
Gross Developable Area		1,250,954.35	125.10	33.0%
Undevelopable Area		2,535,189.21	253.52	67.0%
Land Uses: Non Residential	Schools	61,357.54	6.14	1.6%
	Community facilities	20,747.16	2.07	0.5%
	Rouse Hill Regional Park	965,338.26	96.53	25.5%
	Energy	73,673.27	7.37	1.9%
	Junction Road associated lands	90,798.75	9.08	2.4%
	Connectors and Corridors	23,012.03	2.30	0.6%
	Natural Green Infrastructure	315,415.79	31.54	8.3%
	Active Open Space	157,007.99	15.70	4.1%
	Passive Open Space	365,102.51	36.51	9.6%
	Urban Bushland	86,621.05	8.66	2.3%
	Major Roads and Other stuff	376,114.87	37.61	9.9%
	Totals	2,535,189.21	253.52	67.0%

Table 2. ILP developable area and land uses



- LEGEND**
- RIVERSTONE EAST STAGE 3 BOUNDARY
 - LOW DENSITY RESIDENTIAL (14-25 dw/ha)
 - LOW - MEDIUM DENSITY RESIDENTIAL (25-35 dw/ha)
 - MEDIUM - HIGH DENSITY RESIDENTIAL (40-100 dw/ha)
 - SCHOOL
 - COMMUNITY CENTRE
 - OPEN SPACE (ACTIVE)
 - OPEN SPACE (PASSIVE)
 - URBAN BUSHLAND
 - ROUSE HILL REGIONAL PARK
 - NATURAL GREEN INFRASTRUCTURE
 - JUNCTION ROAD AND ASSOCIATED LAND
 - ENERGY
 - CONNECTORS AND CORRIDORS
 - ELECTRICAL EASEMENT AND STANCHION
 - LOCAL ROADS (INDICATIVE ONLY)
 - MAJOR ROADS
 - RIPARIAN CORRIDOR

Figure 21. Draft Indicative Layout Plan

Built Form Strategy

The map opposite illustrates the preferred location of lot sizes across Riverstone East Stage 3, which have been used to inform zoning and minimum lot size LEP controls. LEP maps can be found in the appendices of this report.

Net Developable Area: 88.51 ha

Yield: 3,147 dwellings

Population: approx. 9,925

Upper Limit Potential:

Critical to the lessons learnt of the past within Blacktown City Council is acknowledgement that there is potential that the intended yield could exceed the 3,147 dwellings through the ability to further subdivide lots above 400sqm and through secondary dwellings under the Code SEPP. This could result in an upper limit of circa 3,600 dwellings, approximately 453 more dwellings compared to the preferred ILP. To calculate this, it has been assumed that 80% of the 453 additional dwellings would be duplexes, with the remaining 20% being secondary dwellings. Based on this high-level estimate, a total population of 11,159 residents would result. Consideration has been given to this yield and population range in allocating open space, recreation and all infrastructure elements to this development, whilst managing the risks of over provision and cost.

Alongside DCP controls, SEPP maps include zoning and average density categories with maximum yields to provide certainty and control additional development growth. A detailed breakdown of the upper limit scenario can be found in the Appendix Demographic and Housing Paper.

Affordable Housing Target Provision:

A target of 10% was agreed across the Stage 3 study area. This would likely be adopted into medium and high density areas.

Council Open Space Standard:

Under Council's open space standard of 2.83 ha / 1,000 population, the projected population results in a minimum requirement of 28.09 ha of open space. A total of 54.51 ha of open space has been provided.

Locational Criteria

Lot sizes, dwelling typologies and height limits have been carefully considered at the granular level based on natural and man-made characteristics of the site as well as proximity to future amenity and services.

In addition to the rationale for medium and high density housing outlined within the **Principle: Diversity** section of this report; the following lot size/ density bands are based on following locational criteria:

- **700sqm lot** - on the higher land along the southern boundary within a key view corridor from Rouse Hill House and as identified in the Aboriginal Workshop. Also included is the very steep land east of Hambledon Road and to provide a respectful curtilage to Tyburn Priory Riverstone Church.
- **600sqm lot** - generally used as an appropriate and sensitive transition between the 700sqm, 450- 350sqm lots and in steeper areas.
- **350sqm** - the most attractive lot size is equitably spread throughout the precinct with immediate walkable access to parks, schools and community centres as well as providing an activated frontage to Rouse Hill Regional Park.
- **450sqm** - rounding out the diversity offering ensuring that every neighbourhood within Stage 3 has a mix of lot sizes, demographic and family construct providing variety and the opportunity to upsize and downsize.

Maximum Building Height

A maximum building height has been established for residential densities through the following parameters:

- High-density apartments zoned R4 to have a maximum height of 16m (4 storeys);
- Medium density housing zoned R3 to have a maximum height of 12m (3 storeys). Housing typologies include townhouses, terraces and other medium density dwellings;
- Low - medium density housing zoned R2 to have a maximum height of 8.5m (2 storeys); and
- Only 10% of the lot mix is allocated to 600sqm and above as a reflection of market affordability research.

Lot Size Mix and Distribution:

The following lot size mix has been established based on market demand, affordability and most up-to-date forecast of dwellings for Riverstone East Stage 3.

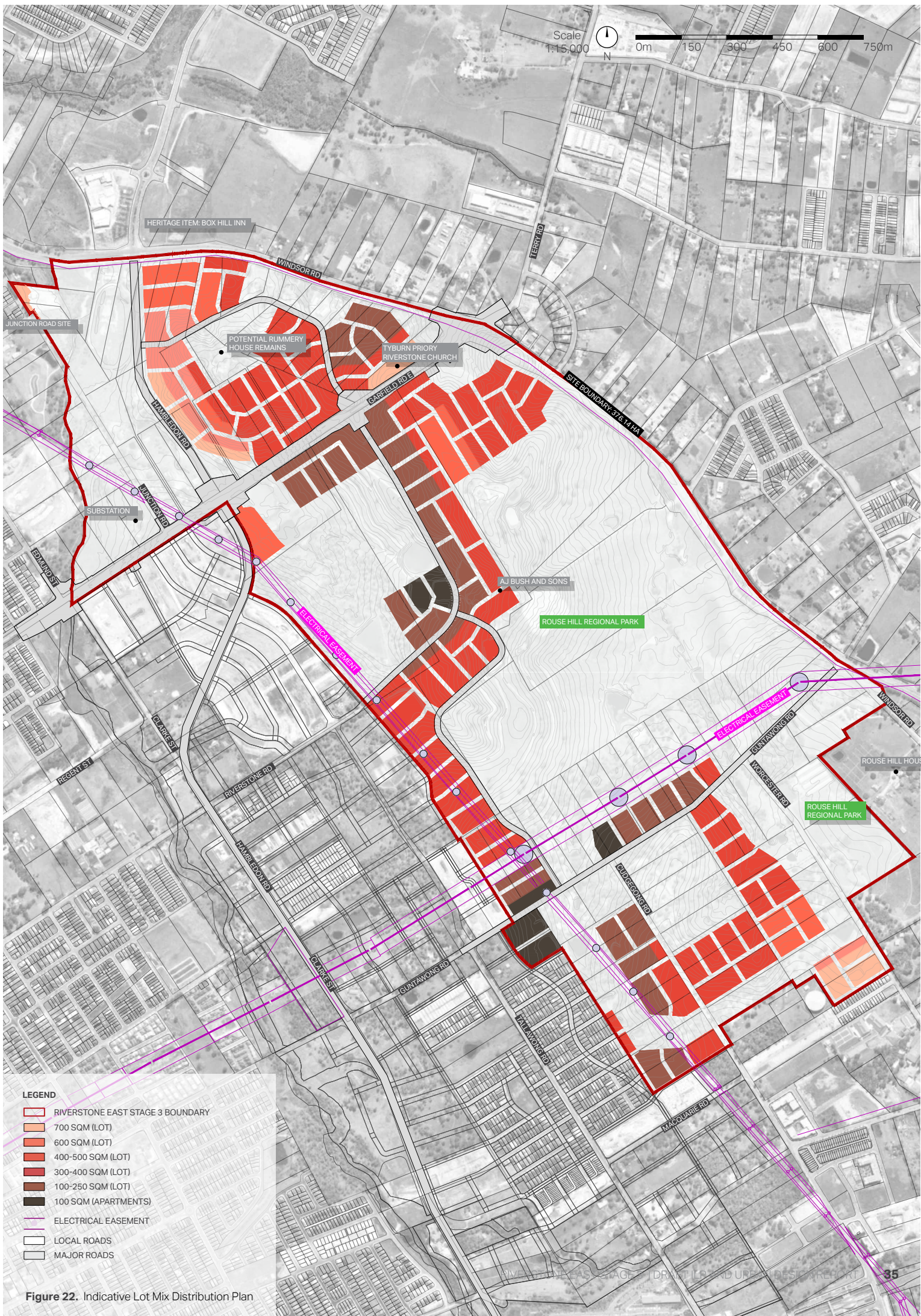
Lot Size	Percentage
700sqm	5%
600sqm	5%
450sqm	10%
350sqm	50%
200sqm	25%
100sqm (Apartments)	5%

Open Space	
Council's Projection	
X ha / 1000 residents	2.83
Required Open Space Under Council Assumptions	28.09

Table 5. Open space projection

Lot Size and Population Projection							
Lot Size Mix Breakdown							
Dwelling Types	Large Lots	Large Lots	Traditional Lots (400-500sqm)	Small Lots (300-399sqm)	Compact Lots (150-250)	Apartments	Totals
Lot Size Sqm	700	600	450	350	200	100	
Dwellings / Ha	14.29	16.67	22.22	28.57	50.00	100.00	
Percentage	5.0%	5.0%	10.00%	50.00%	25.00%	5.00%	100%
Avg Dw/Ha	35.56						
Avg Lot Size	281.25						
Developable Area [ha]	4.43	4.43	8.85	44.26	22.13	4.43	88.51
Yield	63	74	197	1264	1106	443	3147
Population							
Resident / dwelling	3.80	3.50	3.50	3.50	2.90	2.50	3.15
Population	240	258	688	4425	3208	1106	9925

Table 4. Lot Size Mix and population projection



- LEGEND**
- RIVERSTONE EAST STAGE 3 BOUNDARY
 - 700 SQM (LOT)
 - 600 SQM (LOT)
 - 400-500 SQM (LOT)
 - 300-400 SQM (LOT)
 - 100-250 SQM (LOT)
 - 100 SQM (APARTMENTS)
 - ELECTRICAL EASEMENT
 - LOCAL ROADS
 - MAJOR ROADS

Figure 22. Indicative Lot Mix Distribution Plan

Land Use Strategy

The map opposite illustrates the ILP zoning to reflect the delivery of housing, major infrastructure and open space needs.

Residential Zoning

- Medium- high density housing are to be zoned R3;
- Apartments are zoned R4 with additional height controls; and
- Low-medium density housing are zoned R2;

Open Space

- Open space classifications to be zoned RE1 include active open space, passive open space, urban bushland and 'connectors and corridors' as defined in the Open Space Strategy section. These categories are included within open space contributions to Council; and
- The open space classification 'urban bushland' as defined in the Open Space Strategy section is zoned RE1, however does not contribute to council's open space standards calculations. This is bushland physically integrated with and contributing to urban neighbourhoods and community uses. ENV and AHCVV should be retained in this area with potential to provide nature trails for community use.

Infrastructure

- Infrastructure including major roads and the 330kV easement, education investigation areas and open space with drainage functions to be zoned SP2. This includes the proposed N/S transit 'spine' road; and
- The N/S transmission line easement to be zoned as per adjoining land use.

Junction Road and Associated Lands

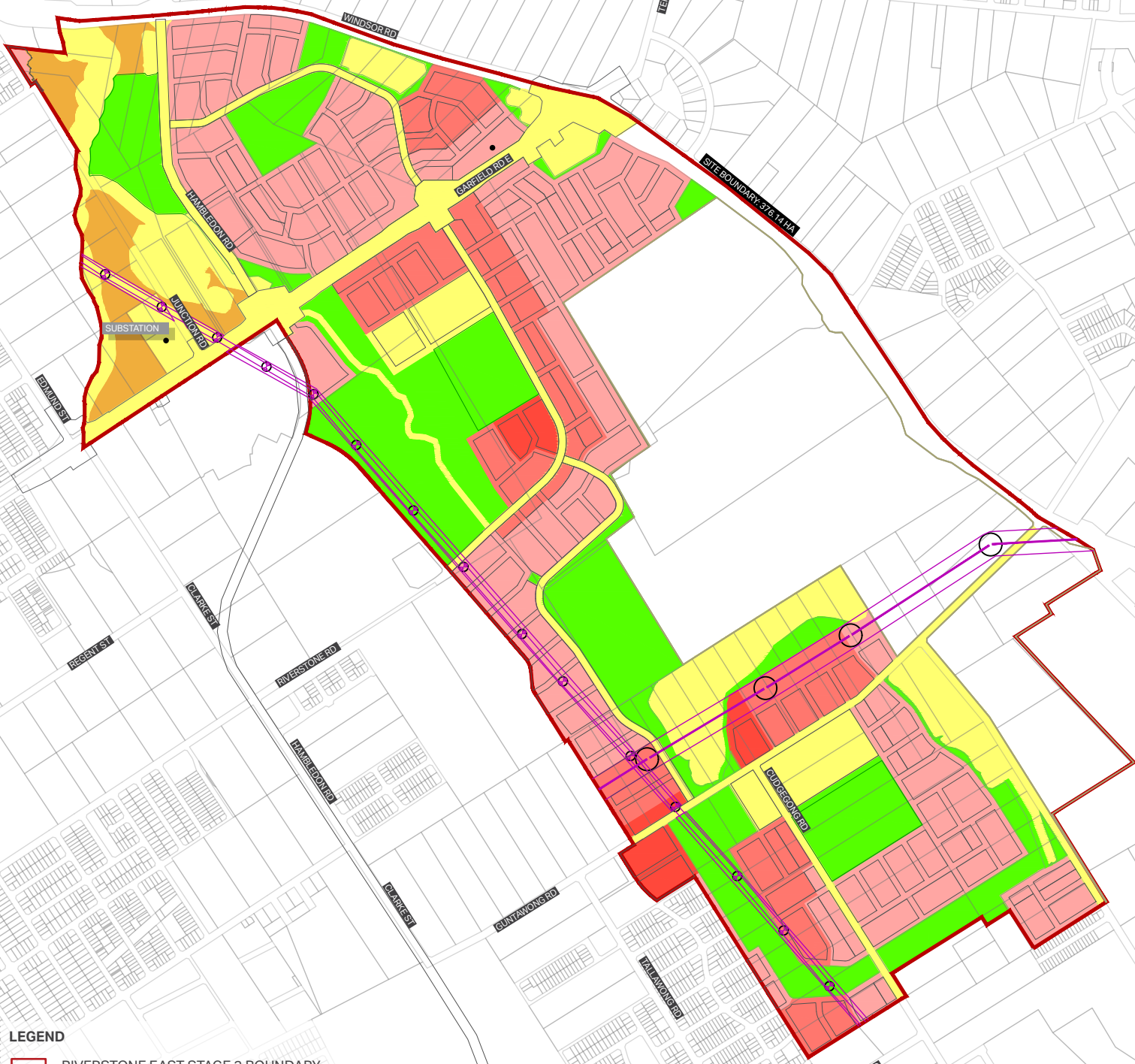
- The majority of the Junction Road site and associated lands lie within flood prone land and is undevelopable. Therefore areas that perform a drainage function and within the riparian corridor is to be zoned SP2;
- Land that is currently zoned RU4 that now lies below the 1% AEP and outside the riparian corridor should not be developed and zoned environmental C2;
- Existing residential to be zoned C2 and playing fields to the north to be zoned RE1; and
- The remainder of the Junction Road site previously zoned R2 that lies above the 1% AEP will continue to have a R2 zoning, allowing for the provision of low impact residential development in these areas.

Community Infrastructure

- Community facility sites to be zoned SP1 Special Activities;
- Sporting fields/active open space to be zoned RE1; and
- School sites to be zoned SP2 infrastructure.

Heritage Assets

- Land on which Tyburn Priory Church is located is to be zoned R2 with minimum lot size controls, allowing for the retention of the church building as a potential future heritage item;
- Rummery House remains are located on passive open space zoned RE1 to have no direct impact on this asset; and
- Zoning for multi-storey buildings are restricted to low lying areas and to the western side of the ridge lines protecting the short-medium range visual lines from Rouse Hill House.



LEGEND

- RIVERSTONE EAST STAGE 3 BOUNDARY
- R2 - LOW DENSITY (600+ SQM LOTS)
- R2 - LOW TO MEDIUM DENSITY
- R3 - MEDIUM DENSITY
- R4 - HIGH DENSITY
- SP1 - SPECIAL ACTIVITIES
- SP2 - INFRASTRUCTURE
- C2 - ENVIRONMENTAL
- RE1 - PUBLIC RECREATION

Figure 23. Zoning Plan

Special Places

The Riverstone East Stage 3 Special Places reflect where the Place and Design Principles come together to create unique and immersive environments centred around:

- Country and connection to water
- Open space and tree retention
- Community
- Diversity
- Mobility

Riverstone Parklands



Rummery House Hilltop Park



Regional Park Interface



Community Cluster





LEGEND

-  Recreational Open Space
-  Active Open Space
-  Wetlands/Basins
-  Riparian Corridors
-  Rouse Hill Regional Park
-  Proposed active travel connections

Figure 24. Open space location plan

Special Places

Riverstone Parklands

Riverstone East Parklands is approximately 14.60 ha and will function as the heart of the community as well as a gateway into Stage 3 from Riverstone Road transit spine providing public transport and active travel access.

The park encompasses significant high-quality vegetation and tree canopy that will be retained wherever possible. The creek line will be reconfigured to improve drainage function and bank stability and provide the opportunity for an enhanced pond and riparian area as a community and gateway feature.

The Parklands will generally be natural in bushland character with bushfire mitigation and trails, lighting and passive surveillance ensuring safety and activation.

The Parklands are surrounded by a community cluster (refer Special Places-Community Cluster) and a range of housing including medium density to leverage the high amenity offering. The community cluster includes a primary school, playing fields and community centre frontages and direct pedestrian access into the Parklands.



Figure 25. Riverstone Parklands location plan

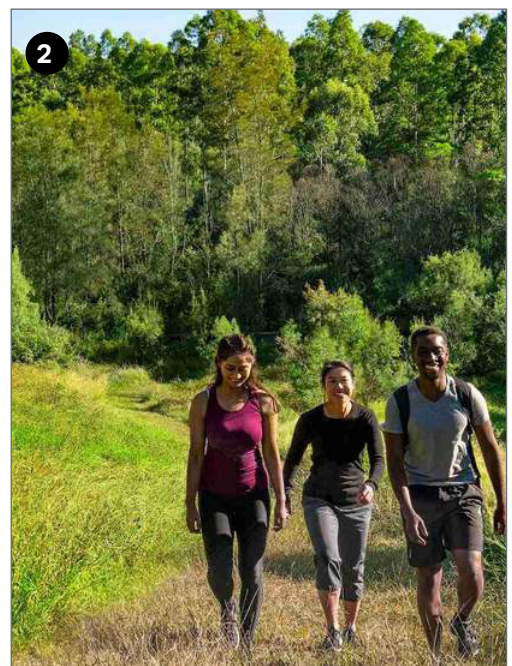
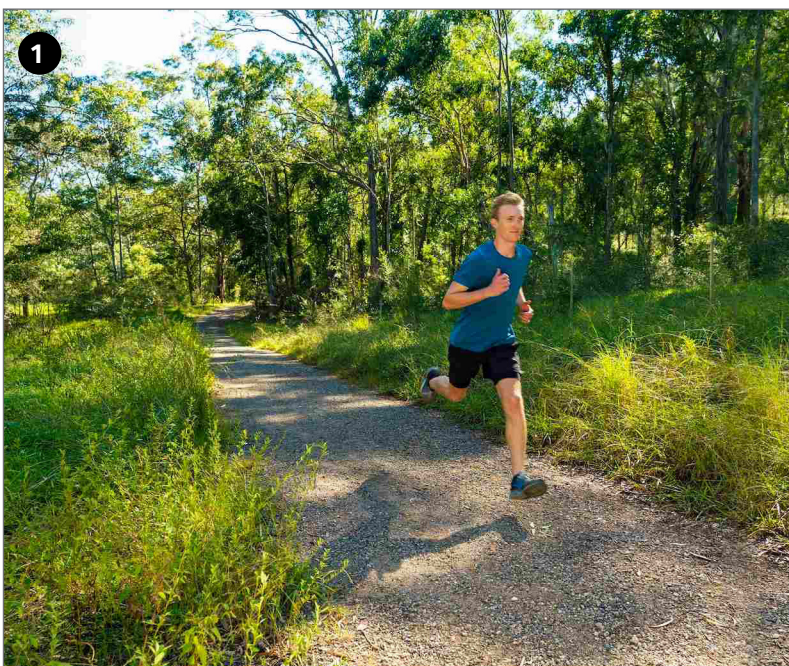


Figure 26. Precedent imagery for Riverstone Parklands

Rummery House Hilltop Park

Located at the northern tip of Stage 3 at the convergence of First Ponds Creek and Windsor Road, this neighbourhood benefits from defined edges, varied topography and existing canopy/ vegetation that can 'soften' resident outlook and experience from challenging interfaces such as Windsor Road.

Rummery House Hilltop Park is approximately 7.38 ha providing a meaningful focal point for the northern neighbourhood and will be a cultural destination for the broader area. The neighbourhood provides a range of lot sizes and housing types within a 5 minute walk of the park.

The hilltop location benefits from an equitable amount of shaded canopy and open areas ideal for passive and more active recreation and offers stunning views of the area.

The size and shape of the park ensures that indigenous cultural sites and Rummery House heritage remains and tracks are protected and celebrated as part of a quality park.



Figure 27. Rummery House Hilltop Park location plan



Figure 28. Precedent imagery for Rummery House Hilltop Park

Special Places

Regional Park Interface

More than half of the Stage 3 boundary interfaces with Rouse Hill Regional Park. The interface varies in land use, topography and future opportunity for access and connectivity.

Burns Pet Food and AJ Bush and Sons sites currently share a boundary with the northern interface of the Regional Park. This area has significant level changes at the interface and the ridgeline establishes a natural barrier between the Regional Park and future development.

The southern interface to the Regional Park has a number of environmental features as an extension of the regional asset; being creek and drainage lines, high quality vegetation and a large pocket of non-certified land that requires the protection of native vegetation.

Consideration has been given to a

range of interface conditions creating opportunities for special places and strong connections to the Regional Park in perpetuity.

The residential development to the north and north-west of the Regional Park provides perimeter roads that assist with bushfire asset protection requirements as well as allowing a range of future access opportunities to align with the Regional Park recreation and trail planning. Appropriate residential interface is mutually beneficial as it provides passive surveillance and activation the Regional Park and borrowed amenity for future residents.

The 7.78 ha park along the western interface sits wholly on non certified land and acts as a natural extension of the Regional Park with maximum tree retention, whilst providing public access and proximity to Stage 3 residents and

the broader region. With the exception of areas of native vegetation, this land will become certified and could accommodate additional play spaces as part of the passive open space.

This area of open space combined with the integrated constructed wetlands along the southern interface of Rouse Hill Regional Park creates a gateway into the park. The wetlands and pond system will be an attractive destination in its own right, a legible entry into the Regional Park and a logical system for recreational active travel paths and trails. A potential E/W pedestrian and cycle route could be established through this area and across the Regional Park in the future.

This open space, as well as the blue green linear park immediately adjoining Rouse Hill House, provides a sensitive green and natural outlook from Rouse Hill House aligned with heritage view corridors.



Figure 29. Regional Park interface location plan

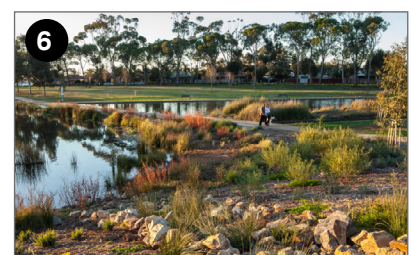
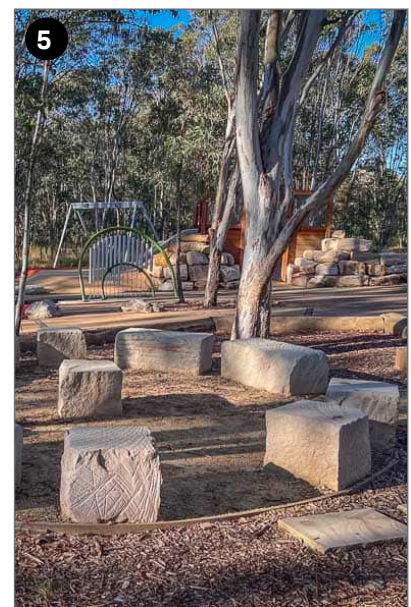


Figure 30. Interface precedent imagery

Community Clusters

Applying the Place and Design Principles for Community, SINSW and Council criteria for locating social infrastructure and playing fields. Two community clusters have been provided within the ILP. A sensitive detailed design and engineering response should be taken in the future to retain as much tree canopy cover as possible, whilst meeting the requirements for playing fields and social infrastructure.

A community cluster is defined by the co-location of a secondary school, community facility and playing fields. The northern community cluster is located and described as a contributing asset to the Riverstone Parklands earlier in this section.

The southern community cluster services a complete neighbourhood unit nestled

within the ridgeline area of Rouse Hill House and within a 10min walk of Tallawong Station. This community cluster is generally located on and to the east of the ridgeline and is visible from Rouse Hill House. It is proximate to natural drainage lines, native vegetation and the Rouse Hill Regional Park.

All elements of the community cluster benefit from direct public transport and active travel access via Cudgegong and Guntawong Roads and the new transit spine for Stage 3.

This community cluster is also strategically located to provide early education staging to support Riverstone Stages 1 and 2 and synergies with the mixed use centre to the west.

The design for the community cluster facilities should be more organic and sensitive to the landscape with streets

and lots responding to the amphitheatre slope and respecting Country through building siting and response to topography.



Figure 31. Southern community cluster location plan



Figure 32. Community infrastructure precedent imagery

04

Technical Response

Road Network

Road Network & Hierarchy

The map opposite illustrates the hierarchy of proposed road networks that include the upgrade of existing roads and new roads within the Riverstone Stage 3 area. Major roads include the Garfield Road East and Hambledon Road planned upgrades as Arterial and Sub-Arterial roads as well as a new north-south 'spine' road, which is to be a bus capable collector road.

Other collector roads within the Stage 3 area include Riverstone Road, Guntawong Road, Worcester Road and Cudgegong Road. Road widths are consistent with the North West Growth Area (NWGA) DCP, however key differences include widening collector roads to at least 22m to make them bus capable and providing footpaths on both sides of local roads.

Street hierarchy should follow the road types set out in Table 3.1 of the transport assessment found in the Appendix to this report. Under the Movement and Place classification, Local and Access streets

are categorised as Local Streets, whilst Collector Roads and Sub-Arterial Roads are categorised as Main Roads.

N/S Transit Spine Road

The ILP proposes a new N/S spine road that connects the study area north towards Box Hill Shopping Centre, and south to Tallawong Station. This route starts at the intersection with Hambledon Road in the north-east of the study area, travelling south directly past key community facilities including both primary and secondary schools. The road continues along Guntawong Road and Cudgegong Road south towards Tallawong Station.

A road reserve of 22m with a 13m road corridor has been recommended for the 'spine' road in order to be bus capable and to enable active travel shareways and footpaths.

Sections along Guntawong Road and Cudgegong Road form part of the transit spine. These are existing collector roads

that would need to be widened or have intersections upgraded to be bus capable.

Local Roads

Local road shown on the ILP are indicative and consistent with the NWGA DCP at 16m allowing for footpaths on both sides of the street. Where access streets are required, these are to have a road reserve width of 13.1m.

Road Speed Limits

The speed limits below align with the NSW Speed limit Guidelines – 50km/h for local streets and collector streets and 60km/h for Sub arterial. The quietway speed limit of 30km/h is in line with the Transport for NSW policy. This has been recently updated to include 30km/h speed limits. The sections below illustrate the typical road widths for road types across Riverstone Stage 3 and proposed speed limits. As a minimum speed limits should be in accordance with NSW Speed Zoning Standard. Further details of the different road types can be found in the Appendix.

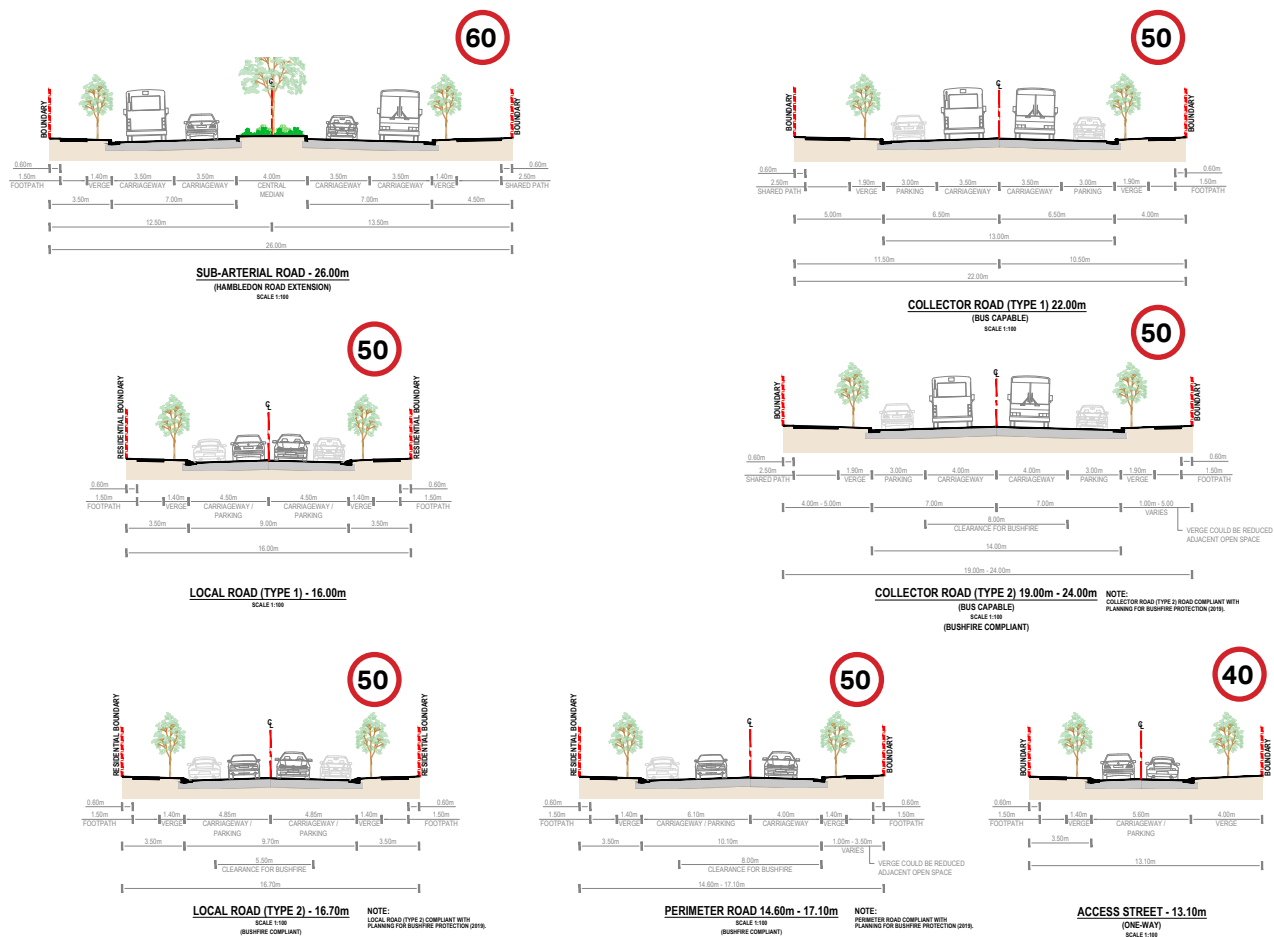
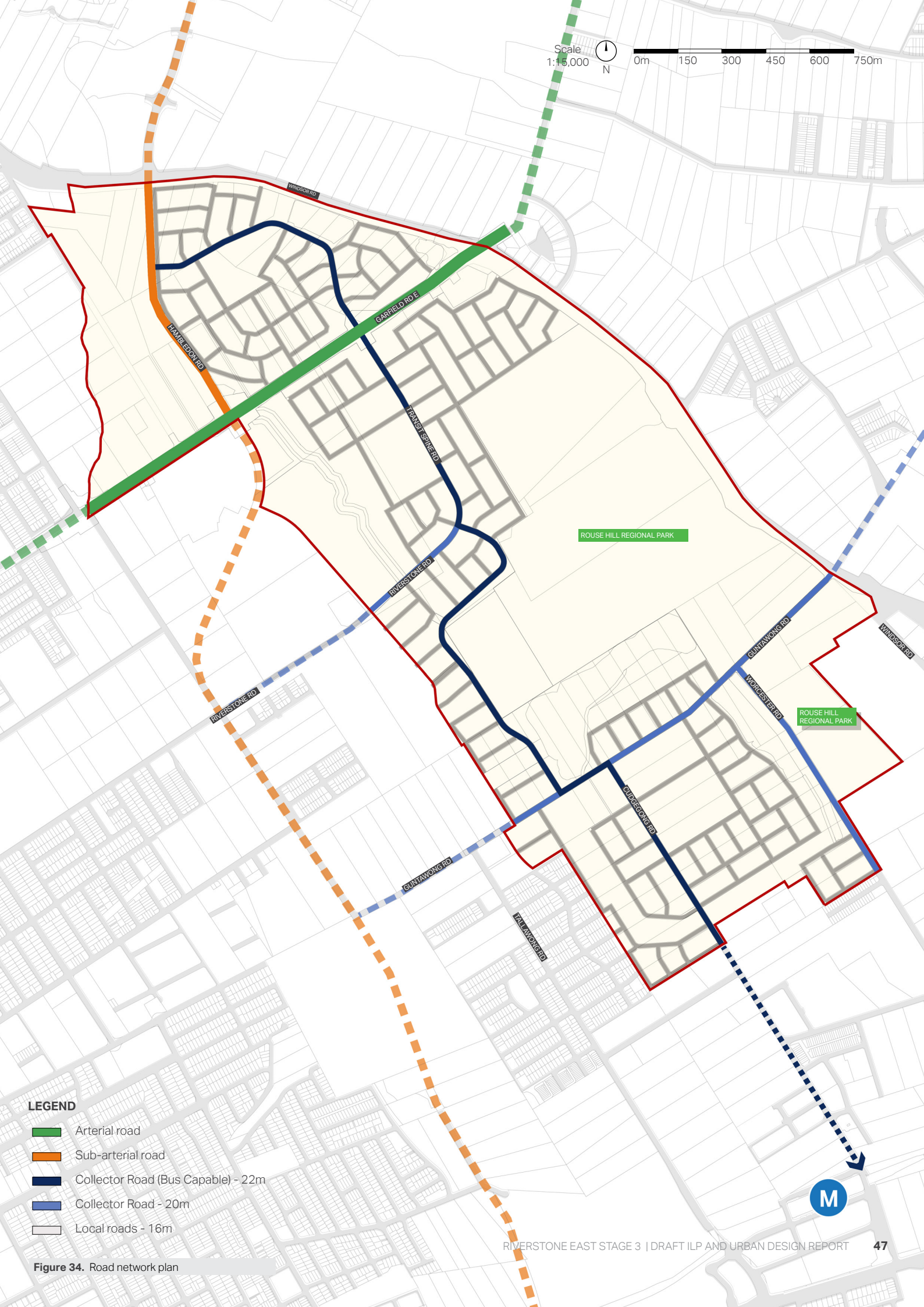


Figure 33. Riverstone East Stage 3 road reserve sections (Source: TTPP)



- LEGEND**
- Arterial road
 - Sub-arterial road
 - Collector Road (Bus Capable) - 22m
 - Collector Road - 20m
 - Local roads - 16m

Figure 34. Road network plan

Public Transport and Active Travel

The map opposite illustrates key active travel connections and N/S transit spine road link through the precinct to align with the principles for a '30 minute city' and '15 minute neighbourhood' under the Greater Sydney Commissions objectives.

The strategy focuses on connecting key destinations such as schools and Tallawong metro station to housing within the precinct within 15-minutes. This is achieved through the co-location of community infrastructure, provision of a bus capable transit spine road, reducing the number of road crossings and focusing on safety and accessibility for pedestrians and cyclists. All major roads are designed to have cycle infrastructure to encourage commuting by active travel from Stage 3 to rail stations and across the Precinct.

The strategy is enhanced through the utilisation of open space and creeks as active travel corridors with low traffic quiet ways connecting parks and open space together to create a +10km continuous health and recreation loop. This includes future access from the study area into Rouse Hill Regional Park.

Active Travel

To encourage active travel throughout the year, footpaths and cycleways should have tree canopies that provide adequate shade as part of the urban cooling strategy.

Active travel routes along open space should have a dedicated 2.5m cycle path and 1.5m footpath. Quiet ways provide a safe environment for mixed-traffic cycling on local roads and are characterised by 30 km/h speed limits. Shared paths are to be provided along all major roads. Further details and recommendations on footpath and cycle path widths can be found in the Appendix of this report.

Public Transport

A new bus service using the proposed transit spine road is necessary to connect the majority of housing within the study area to the nearest local retail centres under the 30-minute city objectives. The nearest local centres include Box Hill Shopping Centre, Tallawong Station and the future Riverstone East Local Centre. A new bus route will also connect schools and community facilities within Stage 3 with housing outside of the study area.

Pedestrian crossings

The map opposite illustrates the proposed locations for zebra and signalised intersection crossings. As a minimum crossings should be located at major road intersections and to connect to key destinations especially community infrastructure.

The co-location of community infrastructure provides the opportunity to design perimeter roads consistent with Movement and Place principles whereby the nature of the road responds to the immediate land use and user groups and are designed to be:

- Naturally calmed;
- Shared surface/ shared zone designation; and
- Restricted access during peak community use hours.



Figure 35. Precedent imagery for public transport and active travel; Bus capable collector road in Blacktown, NSW (left); Shareways around natural green infrastructure, North Richmond NSW (right);



- LEGEND**
- Open Space
 - Green space shared path
 - Low traffic quietways
 - Bus route
 - Signalised Intersections
 - Zebra Crossings

Figure 36. Road network plan

Flooding and Water Cycle Management

The map opposite illustrates the ILP in relation to the 1% AEP as a result of post development and flood mitigation measures. It also demonstrates the proposed locations of detention basins and riparian corridors that are coordinated to support the proposed development outcomes of the Stage 3 area.

Flood Risk Management

The ILP has been designed to ensure that future development is located outside of flood-affected areas (above 1% AEP) including mainstream flooding such as flash-floods associated with intense rainfall and backwater flooding from the Dyarubbin-Hawkesbury-Nepean River system. This strategy avoids the need for any evacuation of the Precinct with the exception being that area downstream of Garfield Road East, which is primarily open space, integrated water cycle management assets or electricity assets.

Local road networks have been designed to be compatible with the natural

topography of the study area and allow for drainage towards detention basins which often results in misalignment of local roads with cadastral boundaries. These basins perform a drainage function in mitigating surface water run off associated with development as well as a being an important part of the open space strategy and performing a biodiversity function. Future development design should consider the projected effects of climate change at a 0.2% AEP (1 in 500 year flood event).

Water Cycle Management

Riparian corridors are designed and incorporated in the ILP to support drainage, water quality, biodiversity, open space, heritage and Aboriginal engagement objectives. The majority of riparian corridors within the Stage 3 study area are 1st order streams of 40m in width, with the exception of First Ponds Creek to the north-west of the site. This riparian corridor is a 3rd order stream with a total width of 60m+channel width. As

the Creek is located in a flood affected area and away from development, no 'connectors and corridors' are assumed within the Vegetated Riparian Zone (VRZ). Riparian corridors should be vegetated with appropriate local plant species for biodiversity purposes and to provide a natural habitat for fauna.

The cross section below illustrates the use of the 1st order VRZ for watercourse and recreational purposes as a connector and corridor, adhering to natural channel design principles of 10:20:10 metre widths. The watercourse channel of 20m is able to support low-high channel flows between 50% AEP to 0.2% AEP. The high channel section incorporates a 1:6 bank slope to allow for maintenance of landscape.

The Riparian Buffer section of 10m either side of the channel has a 1:8 bank slope to allow for maintenance of the landscape and to accommodate shareways within open space for pedestrian and cyclists of 5m wide.

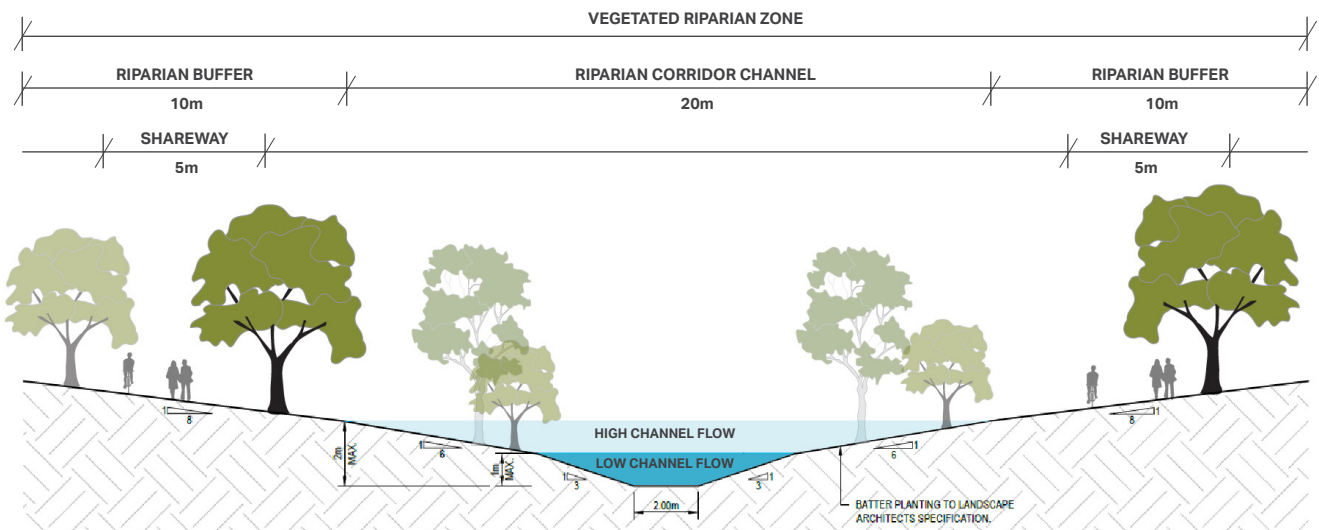
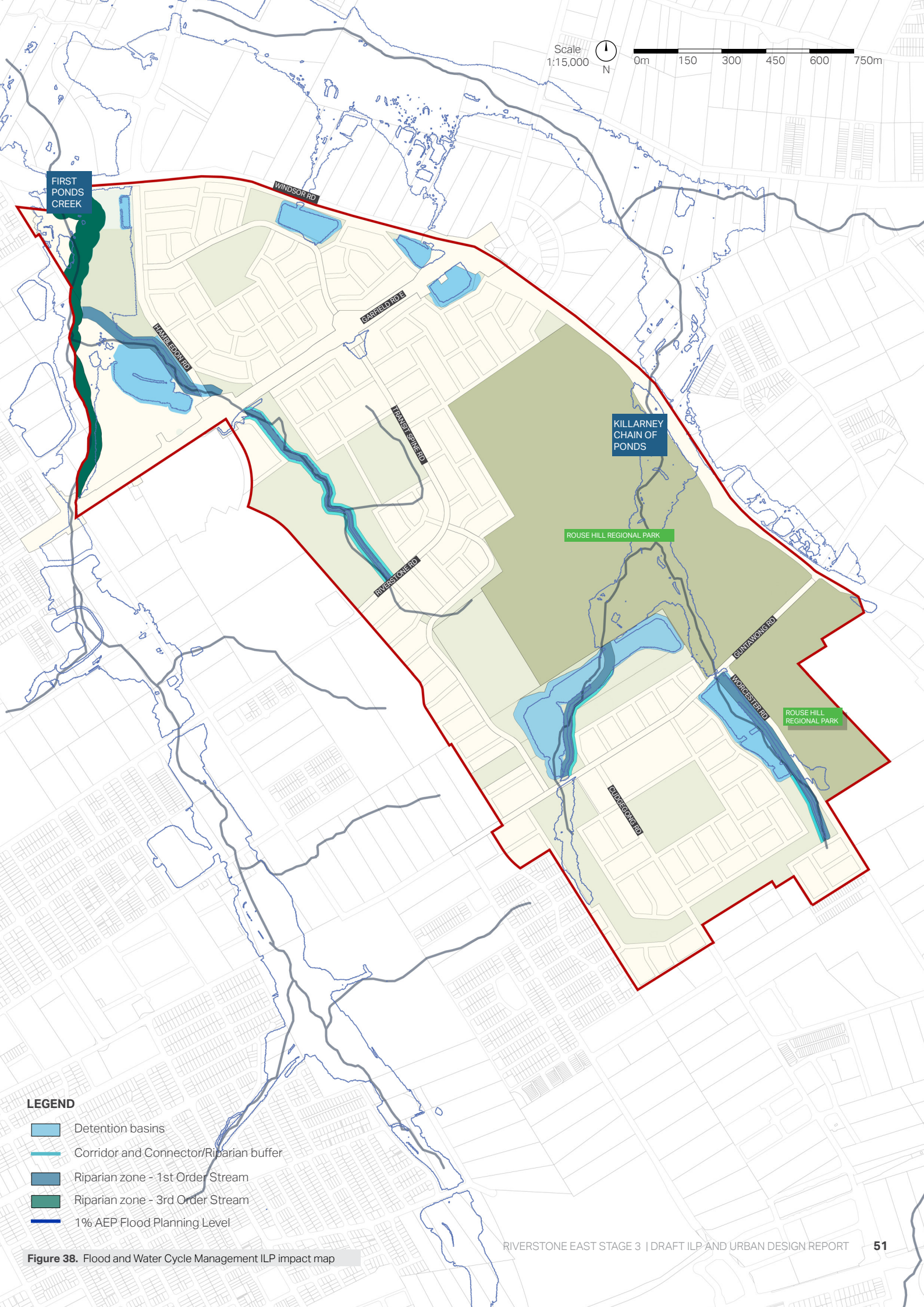


Figure 37. Illustrative riparian corridor section (1:1250)



- LEGEND**
- Detention basins
 - Corridor and Connector/Riparian buffer
 - Riparian zone - 1st Order Stream
 - Riparian zone - 3rd Order Stream
 - 1% AEP Flood Planning Level

Figure 38. Flood and Water Cycle Management ILP impact map

Utilities

132kV and 330kV Powerline

There are two overhead electrical easements that cross the study area. A 132kV overhead powerline and associated easement of 30.48m is owned by Endeavour Energy and crosses the site from north-south. The Master Plan proposes that the entire stretch of easement is undergrounded and re-zoned as per adjoining land uses to enable development along the easement corridor.

Where the easement is undergrounded under proposed development, the easement should be realigned under road carriageways to allow for maintenance of powerline cables. A 10m carriageway width is required for the easement and there is a possibility for this to be realigned under the north-south transit spine road. Subdivision layout should avoid entrapment and maximises frontage to high amenity areas.

The 330kV overhead powerline and associated easement crosses the Site from east-west north of Guntawong Road and is owned by TransGrid. TransGrid have confirmed that the powerline is not able to be undergrounded due to the limited length of easement that crosses the site. Therefore the Master Plan proposes development either side of the 60.96m easement corridor with passive open space and constructed wetlands to the north where the easement passes south of Rouse Hill Regional Park.

Access under the easement should be provided for roads, pedestrian/cyclist connections to the constructed wetlands and into Rouse Hill Regional Park and for maintenance access of the detention basins. Paths and access roads are subject to TransGrid's approval and has been designed to avoid stanchion exclusion zones.

Water and Sewage

Due to heightened water usage resulting from adjacent built developments to the study area, a reduction in surplus servicing capacity has been identified by Sydney Water for the Site. Based on the predicted yield for Stage 3, new water infrastructure may be required to accommodate potable and waste water requirements. Likewise, new wastewater infrastructure will be required to service the proposed developments. Further investigation by Sydney Water is required to determine these infrastructure options.

Telecommunications

Technical analysis of existing infrastructure has confirmed that existing telecommunication infrastructure is adequate to service future development in Stage 3.



LEGEND

- Substation
- Undergrounded 132 kV easement
- Stanchion
- Easement corridor

Figure 39. Location of energy infrastructure and possible undergrounding

Noise, Odour, Contamination

Noise and Vibration

The Stage 3 study area has several existing major roads that present potential noise constraints including Windsor Road, Garfield Road East and Schofields Road. Future development areas proposed on the ILP fronting major roads should consider at-property treatments and appropriate setbacks to mitigate noise from these sources set out in DCP controls. There are no existing or long-term vibration impacts that effect the ILP.

Odour

The Stage 3 study area is currently constrained by odour impacts produced by the AJ Bush and Sons meat rendering facility and 20 Clarke street poultry farm. The Master Plan assumes that these

facilities will relocate in the near future to remove the odour impact entirely for redevelopment to occur. Other mitigation measures could be applied to reduce the existing odour impacts subject to a Level 3 Odour impact assessment. For details of mitigation measures, refer to DCP controls and odour assessment in the appendices.

Contamination

The risk of contamination varies from low to high across the Stage 3 study area. Due to limited data for the precinct, future investigations are required to determine the level of contamination and further strategies for remediation of the land. Thorough contamination investigations a remediation plan will be required and

assessed by an NSW EPA accredited site auditor prior to any development occurring.

The Master Plan has responded to contamination constraints through placement of land uses and zoning. In particular the majority of the Junction Road site has been zoned as SP2 and C2 to avoid intensifying existing land uses. A small area of the Junction Road site with existing R2 zoning has been retained and refined to be located above the 1% AEP Flood Planning Level.

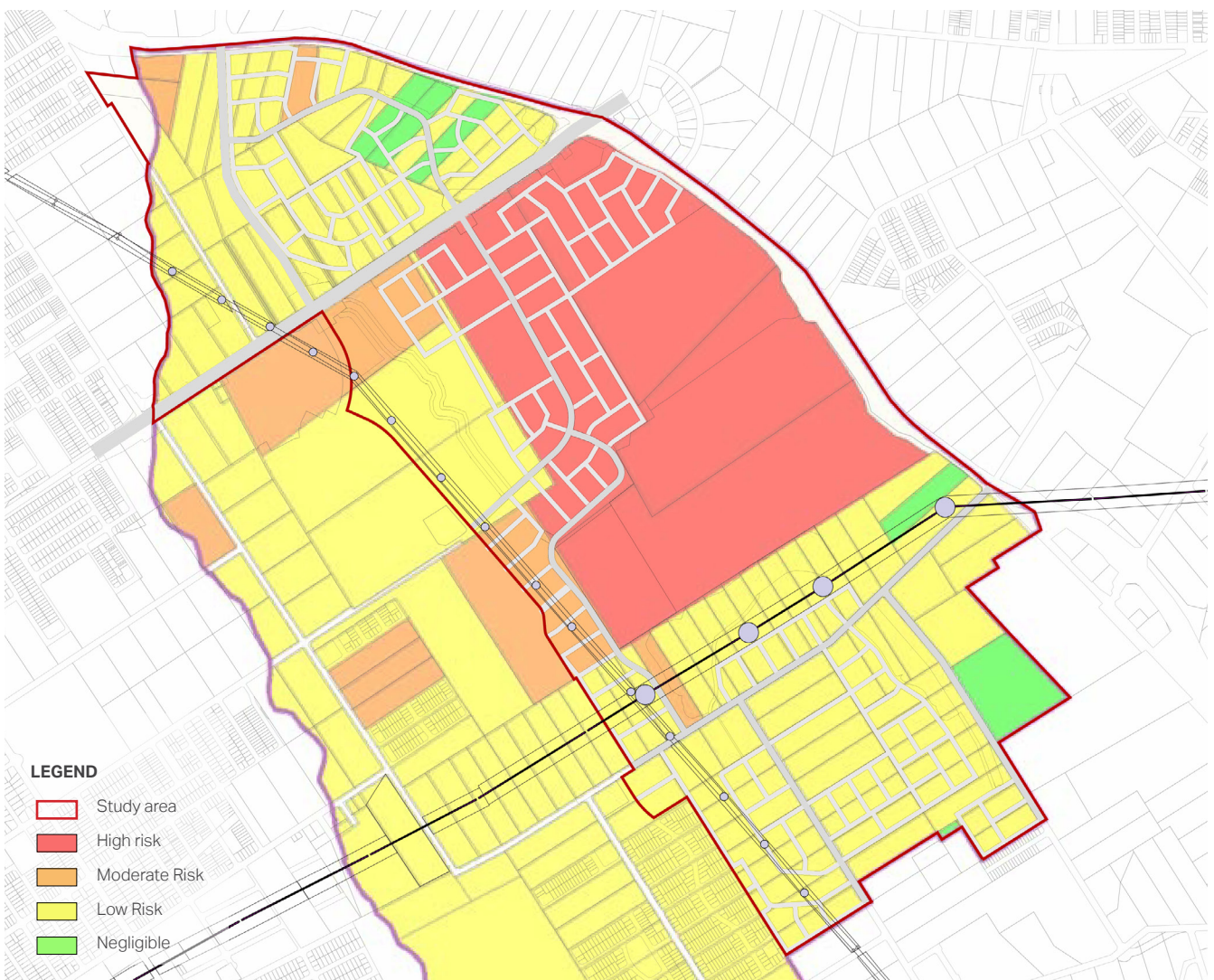


Figure 40. ILP contamination impact map (source: Aurecon)

Biodiversity, Vegetation and Bushfire

Tree Retention

The Master Plan maximises the retention of Existing Native Vegetation (ENV) and Additional High Conservation Value Vegetation (AHCVV) prioritising areas within open space land uses and that serve as habitats for local fauna. These include large areas of high quality vegetation within certified lands, in particular on urban bushland, passive open space and along riparian corridors.

There is also potential to retain remnant vegetation in areas zoned for development and infrastructure including along streets, private open space, drainage and social infrastructure.

Tree Canopy Cover

The ILP aims to maximise tree canopy cover to mitigate urban heat island effect and achieve the NSW government target of 40%. This can be achieved through both the public and private open space, however the Master Plan prioritises this outcome through the retention of tree cover on public land such as open space and on local streets where tree cover can be controlled and maintained.

To achieve this outcome, road reservations should be widened to accommodate WSUD and street trees. Where ENV cannot be retained, additional street trees should be planted and carefully selected to conserve water ensuring the Riverstone East Precinct will be a resilient, cool and green place.

Bushfire Hazards and APZs

A bushfire assessment has been prepared for the ILP and recommends Asset Protection Zones where development adjoins open space that present a bushfire risk. The Master Plan incorporates perimeter roads or footpath/cycle paths between development and open space accounting for necessary APZ/bushfire separation distances. Housing along these roads should present a high quality street frontage to open space.

A local perimeter road has also been indicatively shown between Playing Fields 2 (PF2) and the adjacent passive open space due to thick vegetation, bushfire risk and to provide a safe and activated park edge when the playing fields are not in use.



Figure 41. Indicative locations of retained ENV and AHCVV within open space

Heritage

The ILP considers Aboriginal and non-indigenous heritage through the proposed land uses and slope response following feedback from technical assessments and Aboriginal stakeholder engagement. The map opposite illustrates the ILP in relation to the slope response, the possible locations of indigenous heritage and non-indigenous heritage items and provides flexibility for curtilages identified through detailed design.

General Slope Response

The following principles were adhered to in locating density across the ILP as a response to Aboriginal Engagement and sensitivity to Non-indigenous heritage items:

- Low density of 600+ sqm lots located in areas with the steepest slope;
- Low density of 400-600sqm lots located around creek corridors and within key view lines;
- Medium density located in low lying areas and west of Cudgegong Road and ridgeline; and
- High density located in low lying areas.

Aboriginal Cultural Heritage

Several locations of heritage value were identified during the Stage 3 analysis, particularly along riparian corridors and within Rouse Hill Regional Park. The ILP avoids impact on areas identified as having high and very high archaeological potential as well as registered sites through proposed open space land uses. Significant Existing Native Vegetation have also been retained in areas of open space with further potential to retain trees along local roads/streets.

Medium-high density housing are to be located away from creeks to respect the indigenous cultural landscape and the connection to river systems.

Non-Indigenous Heritage

Three key sites for potential archaeological remains were identified during the analysis of the Stage 3 area, namely Rummery House Remains and Box Hill Inn Stable Remains. These areas have been given an open space land use to protect the potential archaeological remains.

The Tyburn Priory Church building has

been protected for future heritage item listing through zoning and density controls. The ILP proposes an R2 zone and low-density residential development for the church site to enable the church to be retained and protect the future heritage listing.

The visual lines from Rouse Hill House (RHH) and Estate have been protected through several development controls. In particular, multi-storey apartment buildings have been given a maximum building height of 16m and are located on low-lying areas within the study area. The existing and potential expansion of the RHH curtilage are considered through the location of low to medium density housing adjacent to and west of Worcester Road. Any proposed development within the curtilage should be subject to a heritage impact assessment.

Further advice regarding development within areas of the heritage key view lines is provide in the section of this report that makes DCP recommendations.

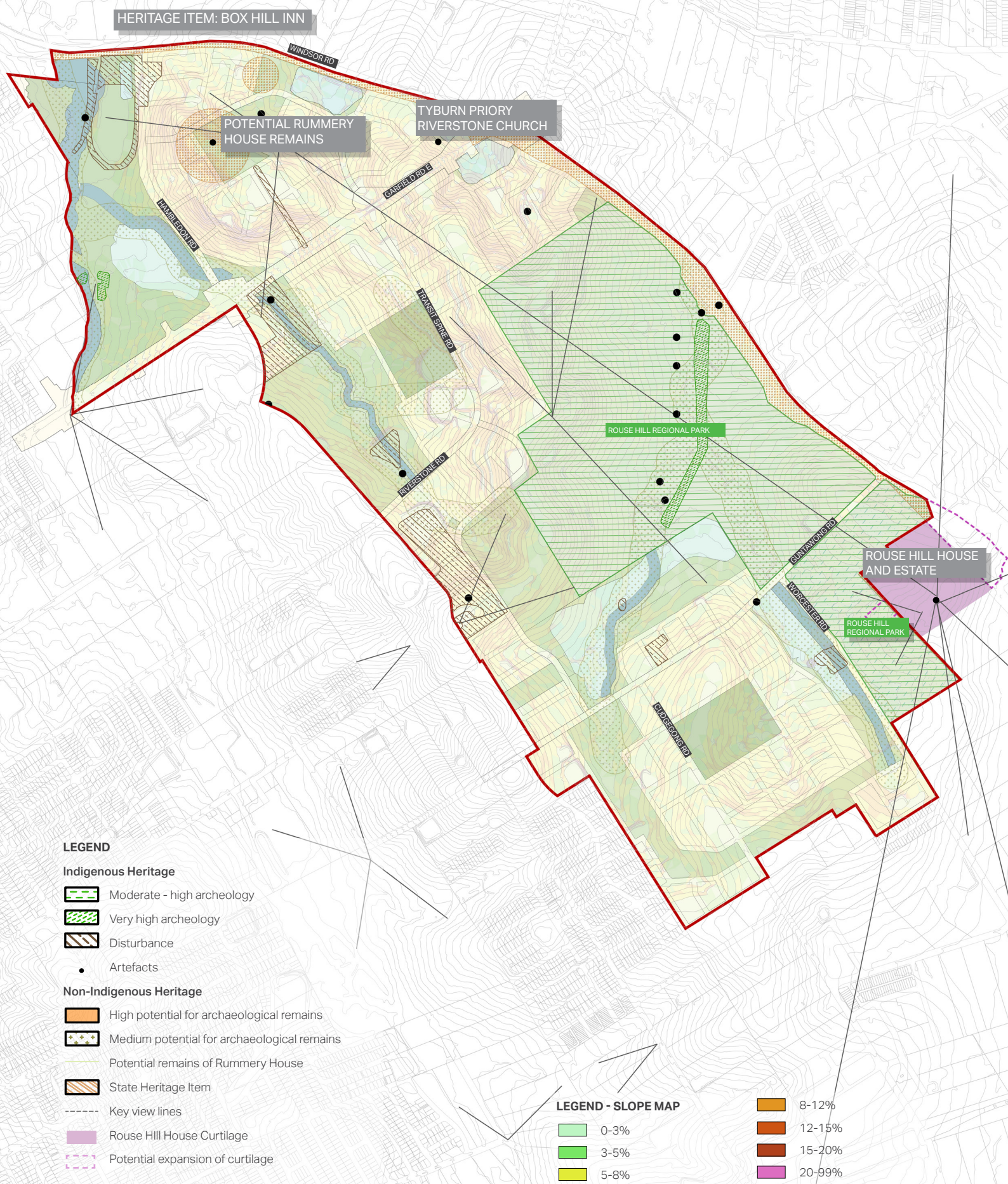


Figure 42. Indicative Indigenous and non indigenous heritage impact map

Public Open Space Strategy

Open Space has been distributed across the Stage 3 area to provide a variety of high quality public spaces for leisure and recreation as well as the retention of Existing Native Vegetation. The master Plan provides 54.51 ha of open space that contributes towards Blacktown City Council's open space standard of 28.09 ha based on the projected population for the Stage 3 ILP. The categories opposite define the types of open space within the Riverstone Stage 3 area that contribute to the open space network. Areas of active and passive open space as well as connectors and corridors contribute to recreational open space outcomes, whilst Urban Bushland and Natural Green Infrastructure still play an important role in providing open space benefits for communities.

The strategy focuses on providing large clusters of open space in response to Aboriginal Engagement feedback. These spaces are still highly accessible for residents at a local neighbourhood level and are within 400-500m of dwellings. These spaces could be used for recreational purposes including

playgrounds and informal kick about spaces. Additionally three locations for sporting fields have been identified across the study area that could provide 6 sports pitches, 3 netball/basketball courts and 2 tennis courts. Two of these sports fields are co-located with the school sites and community facilities to provide multi-functional and shared use facilities.

The map opposite illustrates the following range of open space categories and walking catchments for possible play spaces within the study area.

Active Open Space

- Larger land areas that are flat and allow for multiple uses including sports fields / courts, outdoor fitness stations, playgrounds and off leash dog areas. This is provided at a local scale.

Passive Open Space

- Smaller parklands that have some play spaces but no formal organised sports. This includes linear parks, playgrounds, kick about spaces.

Connectors and Corridors

- Linear spaces which act as connectors between places. This includes active transport corridors within open space, outer edge of riparian vegetated zones (assumes 20m along entirety of riparian corridors), and biodiversity corridors.

Urban Bushland

- Bushland physically integrated with and contributes to urban neighbourhoods and community uses.
- Protection of endangered ecological communities.

Natural Green Infrastructure

- Green spaces that are critical to storm water management.
- Inner riparian vegetated zone (assumes 20m along entirety of riparian corridors), flood detention, stormwater, WSUD infrastructure, clusters of street trees / larger landscaped spaces.



LEGEND

- Passive Open Space
- Active Open Space
- Corridor and Connectors
- Natural Green Infrastructure
- Urban Bushland
- Rouse Hill Regional Park
- Possible locations of playgrounds
- 500m walkable catchment

Figure 43. Indicative play space locations

Social Infrastructure Strategy

The proposed ILP responds to shortfalls in recreational space in Stages 1 and 2, providing community infrastructure that serves the north and south catchment of Riverstone East. Stage 3.

Schools

The draft ILP identifies two school sites for one new primary school of 2 ha and one new secondary school of 4 ha. Both sites are located along public transit/active travel routes and are co-located with community centres and playing fields to create a multi-functional community hub.

The identified school site locations have been confirmed by SINSW as appropriate, with the secondary school site able to support a building height of 3-storeys (15m height) without impacting views from Rouse Hill Estate. School buildings should be located on lower lying land to mitigate these impacts. Initially a site area of 2.5 ha and 6 ha were identified by SINSW in order to mitigate environmental factors and provide school sporting facilities, however due to the sporting fields relocation to adjoin the school sites, a reduced footprint has been provided. This strategy assumes the sharing of sporting fields by the schools, however further discussion with SINSW is necessary to confirm size and placement of the school sites.

The site suitability can be achieved through the following criteria:

- Provision of 4 perimeter roads that can facilitate pedestrian access onto the sites and provide flexibility for vehicular access and parking.
- Minimal need for retaining walls;
- Located away from retained vegetation to allow for minimal setbacks or APZ.
- Closely located to bus stops/routes to minimise on site parking and significantly reduce DCP parking requirements.
- Located away from environmental constraints including powerlines, flood and bushfire risk, possible Aboriginal heritage and contamination risk.
- Co-location of school sites and playing fields/outdoor courts.

Future design of the school site should aim to minimise the impact on views from Rouse Hill Estate and seek the opportunity to retain existing significant canopy trees on school grounds where possible.

Community Facilities

Two community centre sites of 1ha each are identified within the draft ILP to support the northern and southern catchment of Riverstone East Stage 3. These sites provide opportunities for community gathering and the provision of local needs and services if the population demand arises beyond that of the nearby mixed use centres. The key benefits of the northern community facility include:

- Immediately adjoining the primary school and could be designed with no street separation.
- On low lying land so height is less constrained
- High amenity location with direct park and nature interface.
- Located on a recreational cycle route through the park.

The southern community facility responds to the relocation of the secondary school site to the east of Cudgegong Road. Key benefits of this location include:

- Provides a gateway entry into Stage 3 from the west (Stages 1 and 2)
- Provide synergy/ co-location with the mixed use centre to the west
- Supported by medium and high density housing on low lying land.
- Low lying land so height is less constrained
- High amenity location with direct park access (no perimeter road to the west-safer for crossing/ cycleway access)
- Located on bus and 2 x cycle routes (recreational and on-road)
- Immediately adjoining the playing fields and active travel path through into Regional parklands.

Sporting Fields

The sports fields identified in the draft ILP are located on the most suitable land and are able to accommodate council's requirement of 6 playing fields and 5 outdoor courts with supporting car parking. The number of sporting fields considers the planned population growth for Stage 3, the Stages 1 and 2 recreational open space deficit and unanticipated growth under the Codes SEPP.

The location of the three sports fields were suitably identified due to their location on low lying land and/or in close proximity to school and community facilities. The maps opposite illustrate the indicative layout for sports pitches/outdoor court with associated car parking and the relationship to other community infrastructure.

The southern Playing Fields (PF1) are located south of the secondary school site S1, separated by a local road that forms part of the active travel network. The ILP proposes that sports facilities will be shared with the school. The map opposite illustrate an indicative double playing field arrangement that can be accommodated on the site with supporting car parking. The sports field site has a large area of existing native vegetation and future earthworks of the site should retain these trees where possible.

PF2 adjoining the primary school site and community centre also achieves a double Playing Field configuration. The size of the school site assumes the sharing of playing field facilities. A third sporting field location (PF3) is provided to the north of the study area to the west of Hambledon Road accommodating a further two playing fields in a stacked arrangement. Pedestrian and cycle crossings should be provided to cross the sub-arterial road safely.



Figure 44. Southern community facilities location



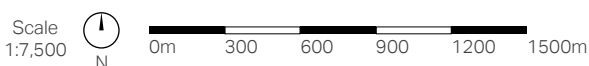
Figure 45. Northern community facilities location

Community Infrastructure	Gross Area [ha]
S1 - School 1 (Secondary)	4.05
S2 - School 2 (Primary)	2.09
C1 - Community Centre 1	1.01
C2 - Community Centre 2	1.06
PF 1 - Playing Field 1	5.63
PF 2 - Playing Field 2	4.60
PF 3 - Playing Field 3	5.47
Recreational Open Space	54.51
Rouse Hill Regional Park	96.53

Table 6. Community infrastructure and open space provision



Figure 46. Playing field 3 location



05

DCP Controls

DCP Built Form and Design Controls

There are a number of development controls that apply to Riverstone East Stage 3 including the Blacktown Council DCP and the Codes SEPP Housing Code.

It is not the intention to overcomplicate this by adding more controls. However, a key objective of this project is to observe the lessons learnt from other areas and make recommendations for solutions that may alleviate Council's key challenges. These challenges communicated to us are outlined below as well as the related urban design principles and recommend controls to assist.

ELEMENT	CHALLENGE	PRINCIPLE
Private Realm		
POS	<p>Current controls require 24sqm POS for all lot sizes.</p> <p>Narrow strips or side setbacks are being counted which achieve not meaningful tree planting zone.</p>	<p>POS should be provided to correlate to the size of the lot and minimum dimensions used to achieve useable, meaningful POS.</p>
Front Setback for mature trees	<p>Front setback (when combined with driveways) is insufficient to achieve tree planting zone.</p>	<p>Setbacks should be meaningful and achieve privacy and/ or usability.</p> <p>Rather than increasing the size of the lot or reducing the site coverage resulting in misalignment with price points; residual setbacks should be reallocated in a meaningful manner.</p>
Garage dominance	<p>There is a tension between lots getting smaller/ narrower and the remaining expectation of a traditional double garage. This results in a 'snout' typology whereby the garage dominates</p>	<p>Garages do not provide passive surveillance or activation to streets and therefore cannot dominate the streetscape. By ensuring that the garage is a passive element, the streetscape environment will be safe and more attractive encouraging walking.</p>
Public Realm		
Wider verges for trees	<p>Mature tree planting and retention is difficult to control and encourage within the private lot.</p>	<p>The public realm is within Council's control and changes to street cross sections that focus on WSUD, increased permeability and street tree planting capability will significantly improve urban cooling, sustainability and canopy cover.</p>
Driveway crossover for trees	<p>The frequency and extent of driveway crossovers makes it difficult to find adequate verge width for tree planting.</p>	<p>The frequency and extent of driveway crossovers makes it difficult to find adequate verge width for tree planting.</p>

RECOMMENDED CONTROLS

R2 Zone (375≤420sqm)

- Minimum Principal Private Open Space (PPOS): 20 sqm
- Minimum PPOS width: 4m

R2 Zone (420≤600sqm)

- Minimum Principal Private Open Space (PPOS): 25 sqm
- Minimum PPOS width: 5m

R2 Zone (601+sqm)

- Minimum Principal Private Open Space (PPOS): 30 sqm
- Minimum PPOS width: 6m

R3 Zone (Rear Loaded)

- Minimum Principal Private Open Space (PPOS): 20 sqm
- Minimum PPOS width: 4m

R3 Zone (Front Loaded)

- Minimum Principal Private Open Space (PPOS): 25 sqm
- Minimum PPOS width: 4m

Rear setback reduced and redistributed into the front setback.

The POS can include rear 'setback' subject to POS criteria being met.

Garage controls below also contributes.

The garage width cannot be greater than 50% of the total house frontage.

- To utilise a double garage on a front-loaded lot, the lot width must be minimum $\geq 13\text{m}$
- To utilise a single garage on a front-loaded lot, the lot width must be minimum $\geq 8.5\text{m}$
- To utilise a single garage tandem on a front-loaded lot, the lot width must be minimum $\geq 8.5\text{m}$
- Lots less than 8.5m must be accessed via a rear laneway and utilize a single or tandem garage arrangement

Garage setback 1.5m from primary building line.

Verge width minimum determined by landscape architect based on species.

The street tree planting verge should be located between the street and footpath to provide shade, pedestrian separation and allow double row of trees assuming front setback planting.

Driveway crossover at verge shall be no greater than 2.5m and continue for 50% of the front setback depth.

ELEMENT	CHALLENGE	PRINCIPLE
ROUSE HILL REGIONAL PARK		
Views	More than half of the Riverstone East Stage 3 boundary interfaces with the Regional Park. In the absence of appropriate controls, this interface will be unsafe, uncontrolled and critical heritage viewlines will be compromised.	The ILP, LEP and DCP should work together to ensure that land use, building types and heights sensitively respond to Rouse Hill House viewlines, view corridors and appropriately transition down to the Regional Park.
Interface- Perimeter road		A public perimeter road must be located along the residential/ Regional Park interface to safely manage bushfire risk, maximise amenity, outlook and surveillance.
Interface- Open space		Open space should be maximised along the interface with the Regional Park to increase the potential for retained trees, flora and fauna corridors and connectivity as well as provided well- planned active travel and recreation routes.
Access	The Regional Parklands are a high value asset that requires security and protection but isolation will have negative impacts and is a missed opportunity in terms of leveraging a sharing a high quality open space asset for the local and regional area.	Rouse Hill Regional Park should be considered as the open space heart of Riverstone East and the NWGA. There should be genuine coordination across aspects of access, connectivity, County, recreation, active travel and ecology.

Table 7. Recommended DCP controls

RECOMMENDED CONTROLS

The ILP sites high density development sensitively and the LEP illustrates maximum heights to ensure that viewlines to and from the Regional Parklands and Rouse Hill House are maintained and not obstructed.

Map development within the heritage view corridors and require the following considerations for approval:

- Locate local roads along viewlines wherever possible to safeguard corridors free of development.
- Heritage viewlines are to be protected and considered through building siting/ lot coverage.
- Focus tree planting on high points and ridgelines to supplement the landscape character of the area.

Residential rear fences onto the Regional Park are prohibited.

Perimeter road cross section shall absorb the entire APZ width (APZs should not extend into private lot/ front setbacks where possible).

Fencing along the Regional Park boundary should be low and transparent promoting surveillance, amenity and connectivity.

A Landscape Management Plan should be created to ensure that all species and character proposed within Riverstone East Stage 3 is consistent with, and protects, the ecological values of the Regional Parklands.

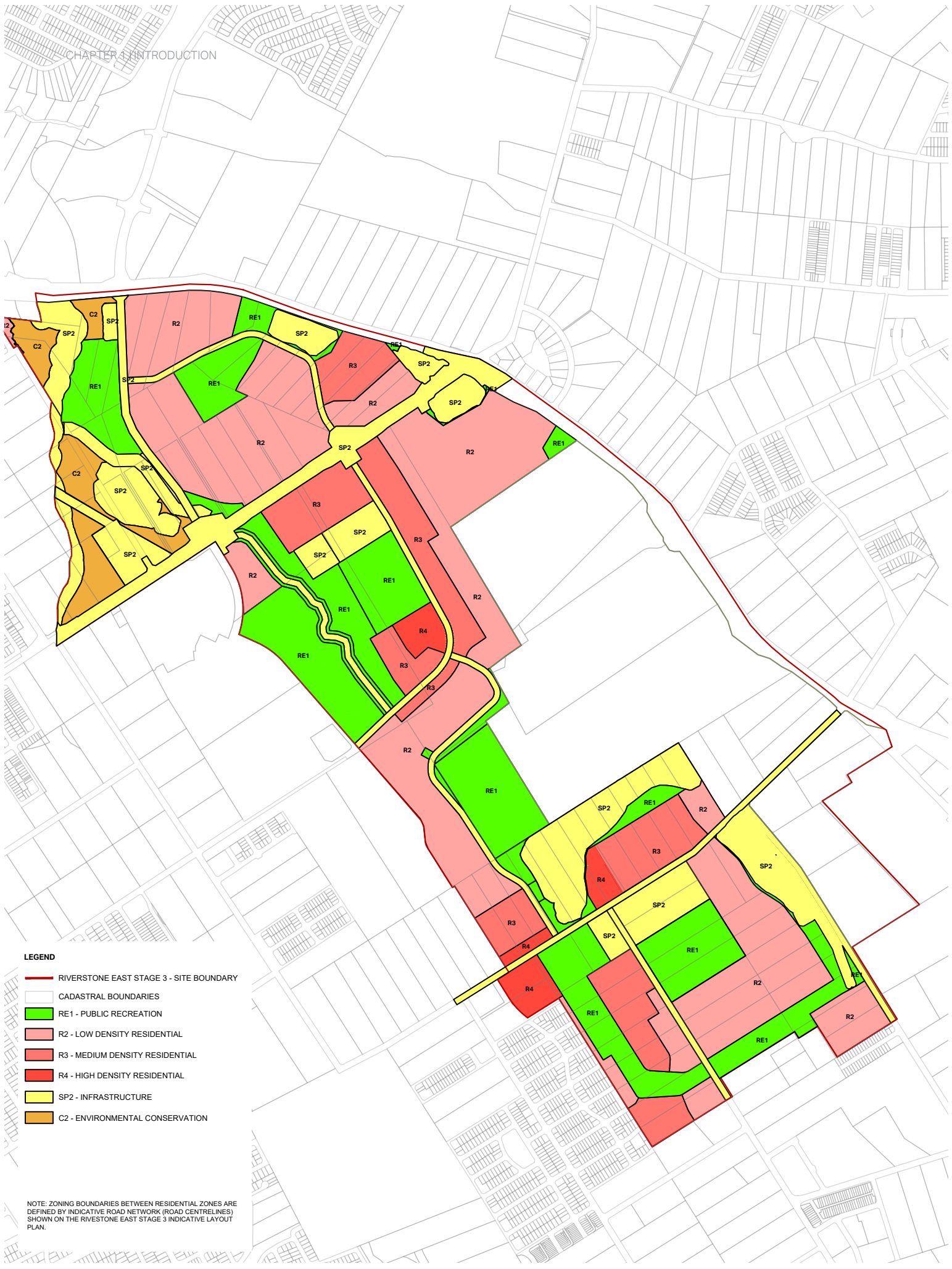
Vehicle- Limited and controlled access to minimise vandalism and unsafe activities.

Shared paths/ cycleways-

- 24 hour public access
- Appropriate lighting that provides pedestrian safety whilst also being sensitive to lightspill and fauna
- Liaise with the local indigenous community to create a consistent strategy for signage, dual naming, art, wayfinding and materiality when travelling along paths that move between Riverstone Stage 3 and the Regional Park
- Ecology- flora and fauna corridors should be planned and maintained to contribute to protection of the Regional Parklands and rehabilitation of the open space within Riverstone East Stage 3.



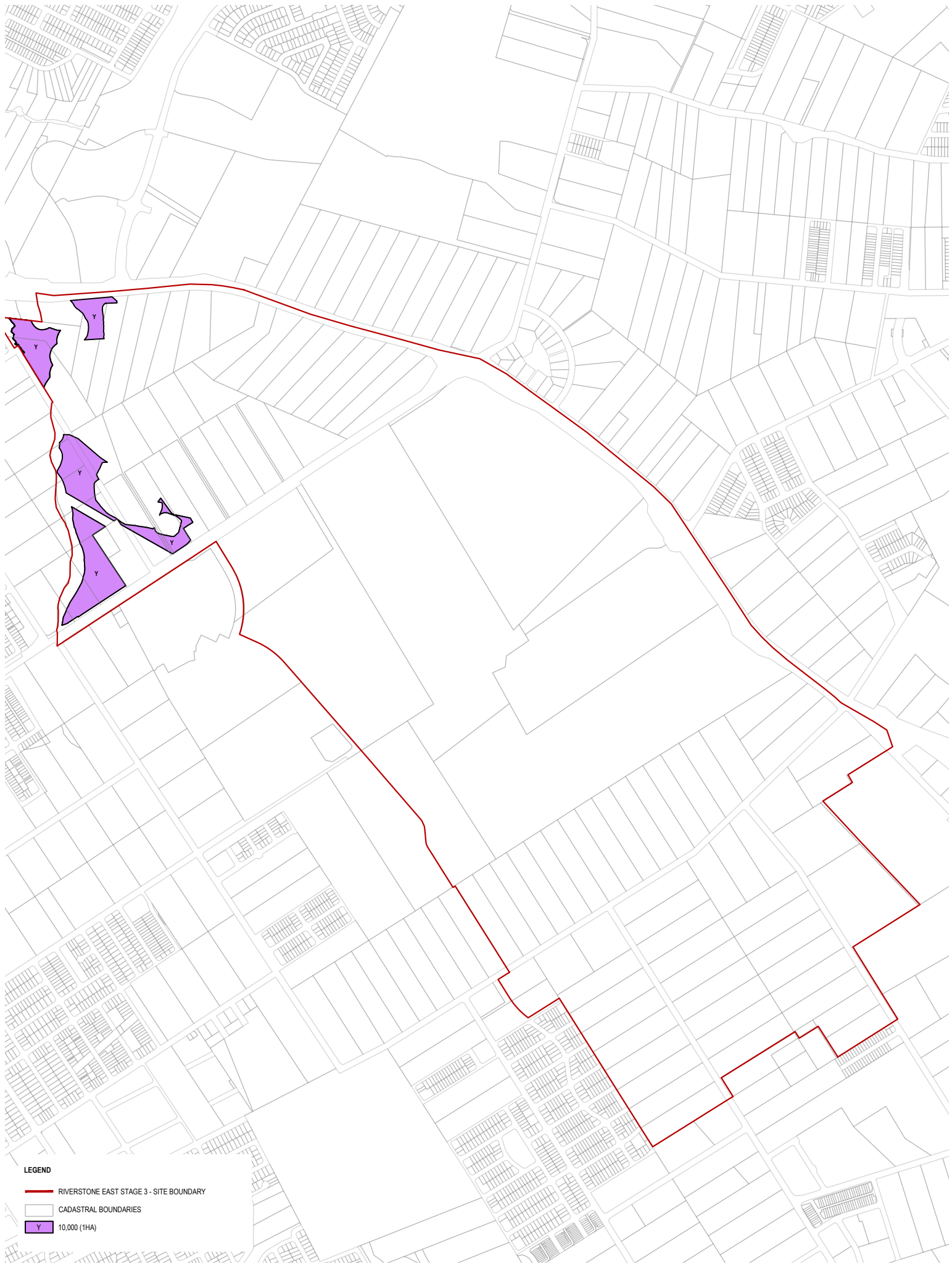
Appendix 1



- LEGEND**
- RIVERSTONE EAST STAGE 3 - SITE BOUNDARY
 - CADASTRAL BOUNDARIES
 - RE1 - PUBLIC RECREATION
 - R2 - LOW DENSITY RESIDENTIAL
 - R3 - MEDIUM DENSITY RESIDENTIAL
 - R4 - HIGH DENSITY RESIDENTIAL
 - SP2 - INFRASTRUCTURE
 - C2 - ENVIRONMENTAL CONSERVATION

NOTE: ZONING BOUNDARIES BETWEEN RESIDENTIAL ZONES ARE DEFINED BY INDICATIVE ROAD NETWORK (ROAD CENTRELINES) SHOWN ON THE RIVERSTONE EAST STAGE 3 INDICATIVE LAYOUT PLAN.

Figure 47. Zoning






- LEGEND**
-  RIVERSTONE EAST STAGE 3 - SITE BOUNDARY
 -  CADASTRAL BOUNDARIES
 -  10,000 (1HA)

Figure 48. Minimum Lot Size

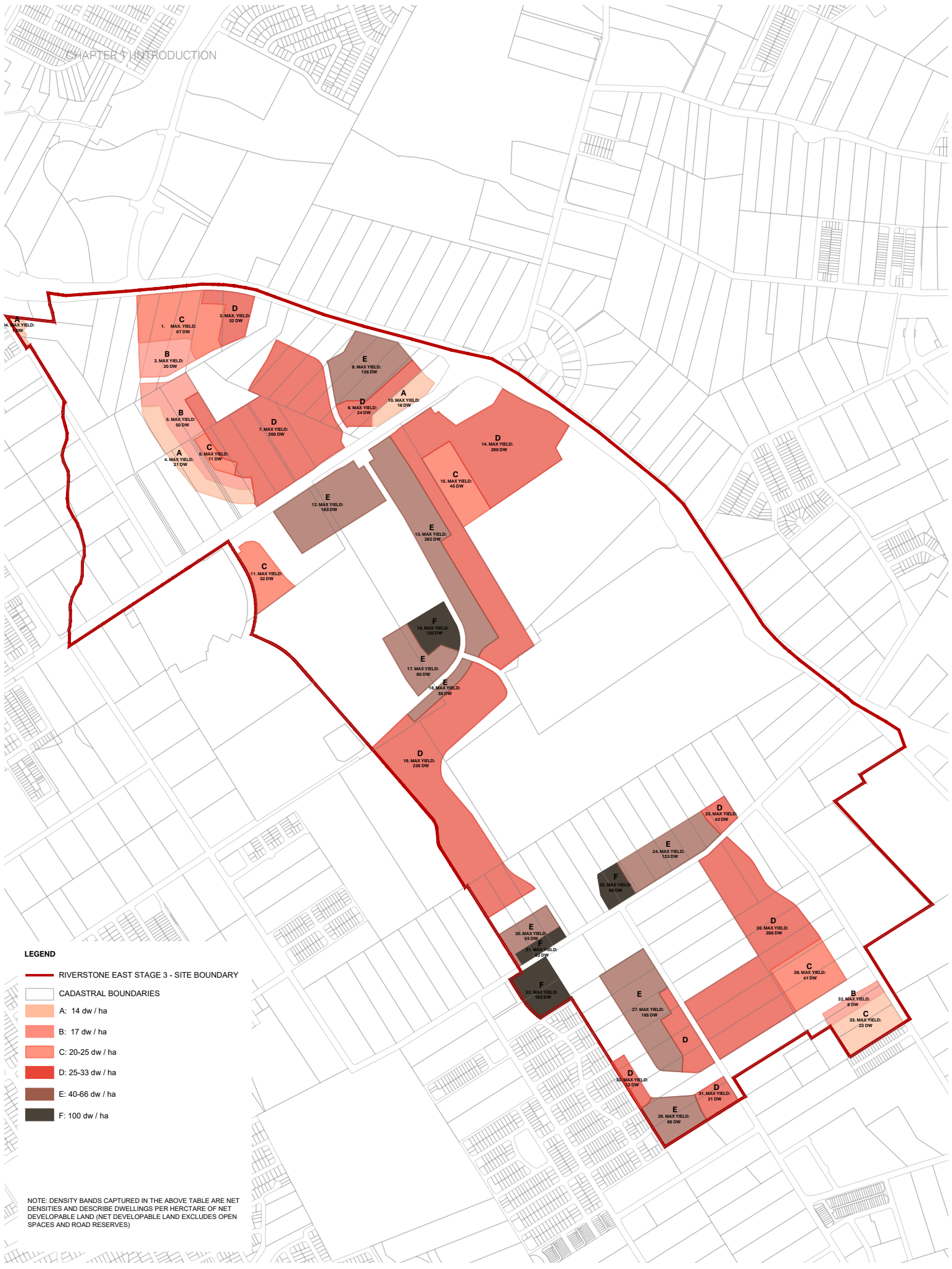


Figure 49. Residential Densities Map



- LEGEND**
- RIVERSTONE EAST STAGE 3 - SITE BOUNDARY
 - CADASTRAL BOUNDARIES
 - I 8.5m
 - M 12m
 - O 16m

Figure 50. Height of Buildings

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