



WESTERN SYDNEY PARKLANDS BUNGARRIBEE PRECINCT PROJECT

Doonside Residential Parcel Development Design Code

September 2009



DEVELOPMENT DESIGN CODE

Document prepared by

Elisabeth Peet

Associate Urban Design & Planning

Lei Pei

Senior Urban Designer

Urban Design and Planning

Architectus Sydney Pty Ltd

Architectus Sydney Pty Ltd

architectusTM

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1 Introduction

1.1 Background

The land known as Bungaribee at Doonside and subject to these Development Design Controls was identified by the NSW Department of Planning as 'Interface Land' because it is land that adjoins the Western Sydney Parklands. Development of the Interface Land will raise funds to be returned to the Parklands Trust.

The entire Western Sydney Parklands covers 5,500 hectares of land in Sydney's west and stretches 27km from Quakers Hill to Leppington. The Parklands corridor contains existing recreation facilities such as the Olympic Equestrian, Shooting and Baseball Centres, Prospect Reservoir and Eastern Creek Raceway.

The component of the Western Sydney Parklands corridor that adjoins the site is known as the Bungaribee Precinct and covers 300 hectares from Eastern Road, Doonside in the north to the M4 in the south. Eastern Creek flows from south to north through the middle of the Parklands corridor and adjoins the western boundary of Bungaribee.

Bungaribee is strategically located near Doonside rail station and near the Great Western Highway, the M4 and the M7. Bungaribee is entirely within the Blacktown City Local Government Area. It adjoins the existing Doonside neighbourhood south of Doonside railway station and is a convenient location to live with good access and close to employment.

The NSW Department of Planning as the landowner and Landcom as the development manager aim to encourage high quality innovative development which meets the needs of the residential market and which provides an appropriate interface with the Western Sydney Parklands.

1.2 Purpose and aims of the DCP

The purpose of this document is to outline the development objectives and controls for the development of the residential land at Bungaribee.

The aims of this DCP are to:

- Facilitate the economic and orderly development of the interface land for the purpose of residential development, providing a range of housing product to meet market demand;
- Ensure a positive visual, environmental and management relationship with the adjoining Western Sydney Parklands;
- Protect and manage the ecological values adjacent to the urban development within the development area;
- Ensure Ecologically Sustainable Development principles are integrated into the development;
- Ensure Water Sensitive Urban Design principles are integrated into the built and landscape elements of the development;
- Enable the provision of a high quality innovative and integrated residential area particularly in terms of built form and landscaping;
- Provide areas of landscaped public domain that are compatible with the built environment and to ensure that the landscape design guidelines are implemented to a high standard;
- Provide an effective traffic network within the residential area and connections to the arterial road system; and
- Promote the on-site collection and re-use of stormwater.

1.3 Development vision

The overall vision for Bungaribee was workshopped by the design team and used to inform the design process:

‘A neighbourhood inspired by the Parklands where nature and home come together: comfortable accessible and harmonious.’

This vision was broken down into a series of detailed statements intended to shape the planning, design and management of the future development at Bungaribee. These are to:

- Develop a high quality residential neighbourhood within a parkland setting that incorporates best practice design and environmental measures and which has a strong integration with the Western Sydney Parklands.
- Develop residential uses in a way that provides the best development outcome for the site.
- Develop the residential land in a way that creates the most appropriate interface with the Western Sydney Parklands.
- Provide a high quality built environment.
- Offer a range of housing product to accommodate housing choice.
- Create a residential area within a landscape setting that integrates with the adjoining Western Sydney Parkland's natural and conservation values and that has a strong urban character and sense of place.
- Integrate new development with the Western Sydney Parklands and with the existing neighbourhood at Doonside and encourage visual and access links.
- Promote the understanding of the natural values of the site to encourage their protection.
- Create a residential neighbourhood where public art is integrated into the streetscapes, open spaces, heritage precinct and Parklands perimeter to aid in the creation and interpretation of places of unique character within the precinct.
- Manage water cycle impact, flood/fill impact and incorporate Water Sensitive Urban Design principles and practices where possible.
- Incorporate best practice environmental planning and design, particularly techniques for conserving the consumption of energy and water in all buildings.
- Provide public domain and vegetation/drainage corridors that are interconnected with a high level of well-lit pedestrian and cycle access routes and that link into the surrounding environment.
- Implement quality architectural standards and guidelines as well as appropriate environmentally sensitive building design.
- Create a well connected and legible street network.
- Incorporate quality development where housing enjoys high levels of internal and external amenity and which is supported by an attractive public domain that is both pedestrian friendly and efficient.
- Encourage the provision of public transport links including a bus route.

1.4 Land to which the DCP applies

This plan applies to the parcel of land at Bungaribee bounded by Bungaribee Creek in the south, Eastern Creek to the west, Eastern Road to the north and Doonside Road to the east as shown on Figure 1.

Note: The Western Sydney Parklands Trust will be responsible for the management of the intact native vegetation beyond the urban development footprint and managed in accordance with the Western Sydney Parklands Vision (DIPNR 2004).

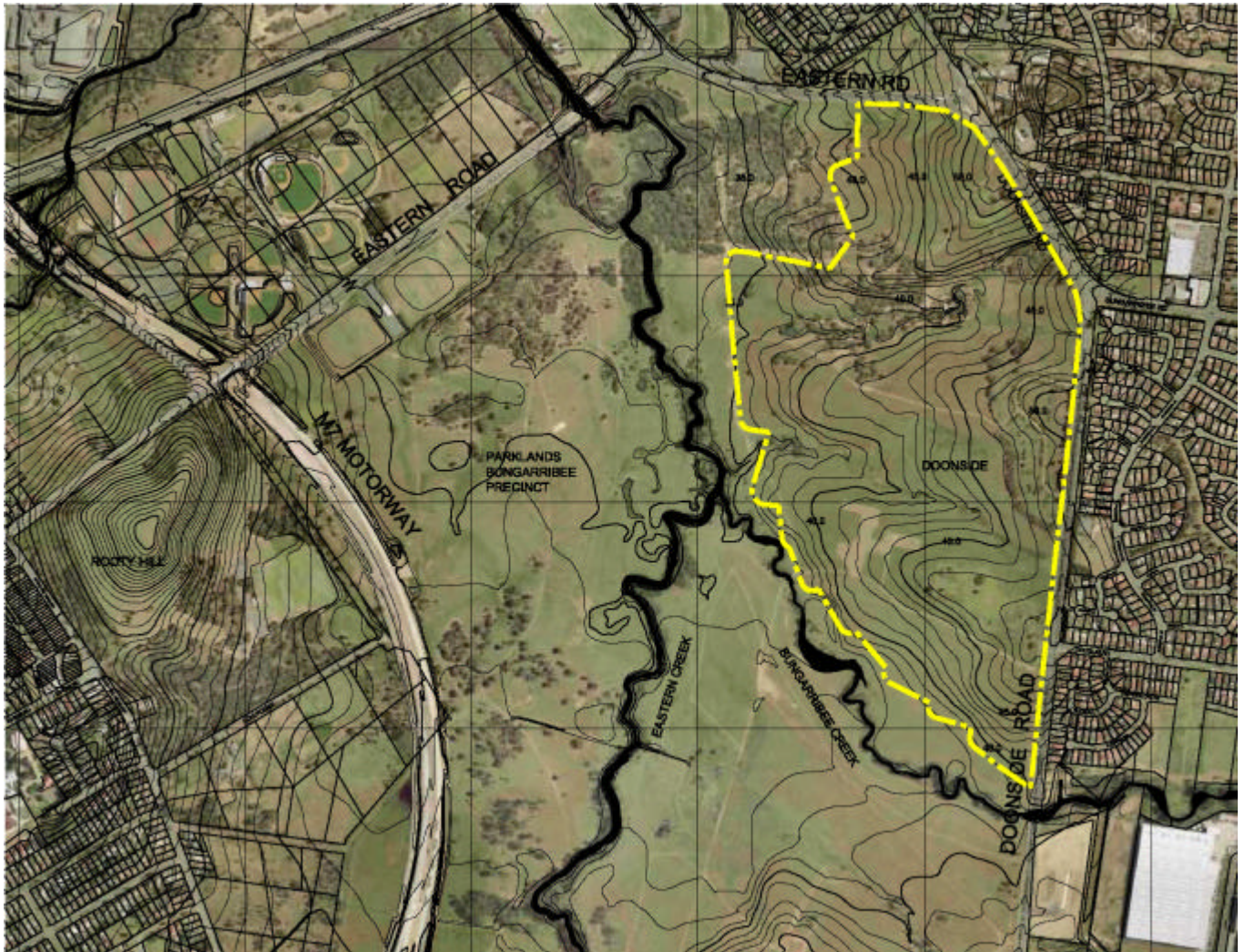


Figure 1: Land to which the DCP applies

Bungarribee is indicated by the black dashed line and is bounded by Bungarribee and Eastern Creeks and Doonside and Eastern Roads.

1.5 How to use this document

Section 1 – Introduction

This section identifies the nature and extent of this plan and outlines the vision and aims for Bungarribee.

Section 2 – Site characteristics and development principles

This section identifies the key planning issues for the site and constraints that have informed the preparation of the Concept Plan and articulates the principles on which the future development of Bungarribee will be based.

Section 3 – Proposed master plan

This section describes the proposed Master Plan for Bungarribee. The Master Plan illustrates how the proposed development of Bungarribee will respond to the development principles outlined in Section 2.

Section 4 – Infrastructure

This section describes the infrastructure that will be put in place to support the new development

Section 5 –Housing – built form controls

This section contains specific objectives and development guidelines/controls for the design, layout and siting of residential buildings on the site.

1.6 Date of enforcement

This DCP came into force on 03 August 2009 in accordance with Clause 21 of the Environmental Planning Assessment Regulation 2000.

1.7 Relationship to other environmental planning instruments

This DCP is made under, and conforms with the Blacktown Local Environmental Plan (LEP) 1998 as amended. The Blacktown LEP 1998 takes precedence over this DCP to the extent of any inconsistencies. This DCP is to be read in conjunction with the following:

- Blacktown Local Environmental Plan 1998;
- **Blacktown Council Development Control Plan (BDCP) 2006;**
- Other relevant Council Policies;
- Relevant S94 plans adopted by Blacktown City Council; and
- Relevant State Environmental Planning Policies and Regional Environmental Plans.

Where there is an inconsistency with this DCP and any other DCP in force, the provisions of this DCP are to prevail to the extent that it applies to the land to which this DCP applies. Where an element is not covered by this DCP, then other sections of BDCP 1992 may apply.

2 Site characteristics and development principles

2.1 Topography and natural features

The site has a shallow fall westwards toward Eastern Creek. There is an overall fall of some 20m between Doonside Road and the banks of Eastern Creek.

The most prominent natural features on the site are riparian vegetation along Eastern and Bungaribee Creeks, ephemeral creeks that flow westwards across the site to Eastern Creek and a high point at the Bungaribee Homestead Complex Archaeological Site adjacent to the intersection between Doonside Road and Douglas Road.

The existing topography is comprised of three spurs that extend westwards from Doonside Road divided by two ephemeral creeks. The southern most spur is the site of Bungaribee Homestead Complex Archaeological Site. The southern ephemeral creek has an intact watercourse with relatively little vegetation in contrast to the northern creek which has been dammed and traverses a stand of remnant Cumberland Plain Woodland.

Major views to the site are available from Doonside Road to the east and Rooty Hill to the west.

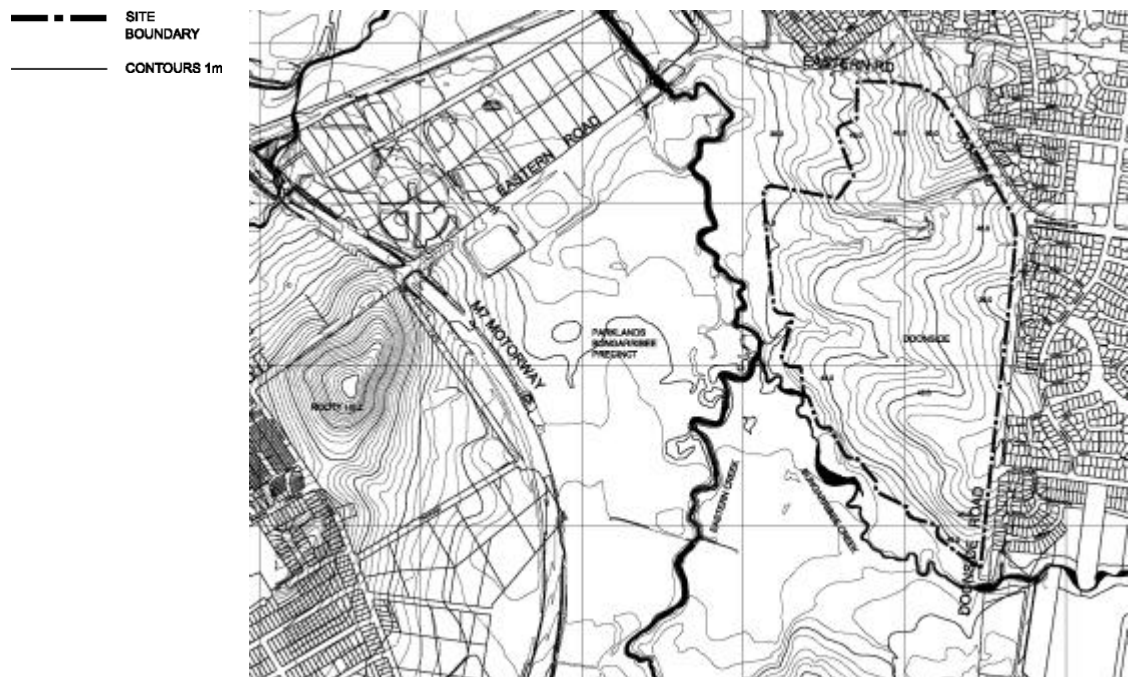


Figure 2: Topography

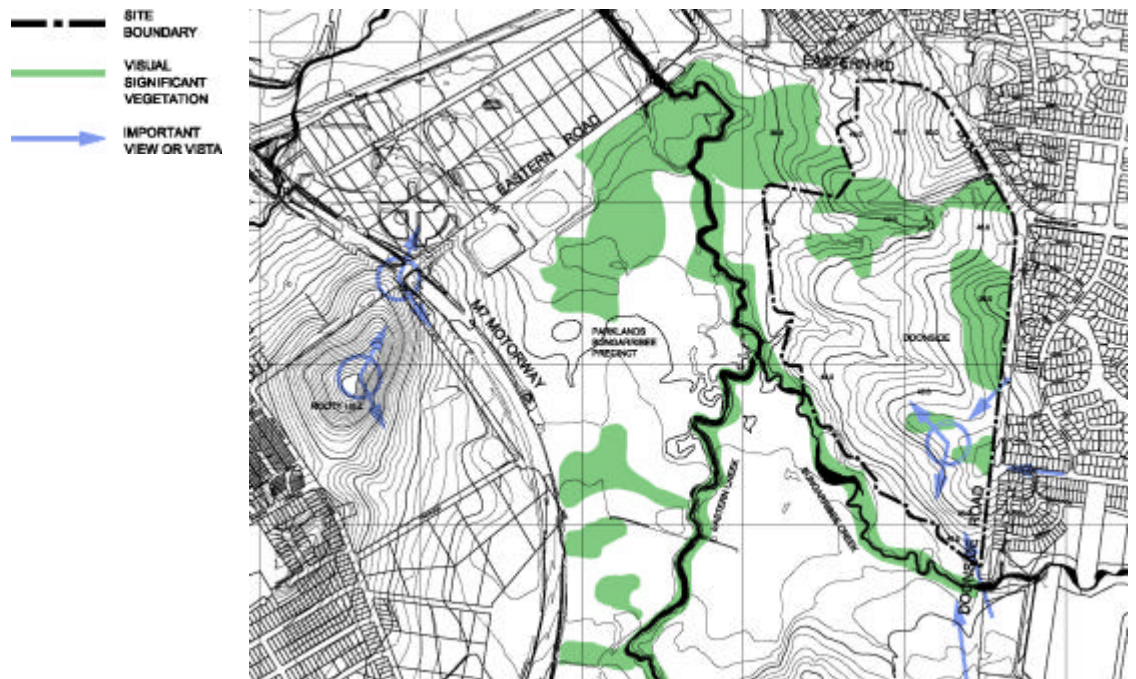


Figure 3: Landscape features and views

2.2 Vegetation and biodiversity

Four vegetation communities exist on the site and are indicated on Figure 4.

- Exotic grassland
- Native grassland
- Shale Plains Woodland
- Swamp Oak Floodplain Forest

The native vegetation communities on site are listed as endangered ecological communities under the Threatened Species Conservation Act 1995. The threatened species *Grevillea juniperina* and Cumberland Plain Land Snail are also found in the native grasslands on the north of the site with threatened micro bats utilising the remnant vegetation within the Eastern Creek corridor. The vegetation communities on the site will continue to provide habitat for these species in addition to supporting a broad range of habitat types for a diverse suite of fauna species.

The majority of Eastern Creek and all of Bungarribee Creek in the study are considered to be of moderate ecosystem condition. The remaining streams and a highly altered section of Eastern Creek are considered to have low ecosystem condition.

The proposed development footprint has been designed to minimise the impact of these populations and vegetation communities.



Figure 4: Vegetation types found on the site
(Source: Eco Logical Australia Pty Ltd 2006a)

2.3 Infrastructure and services

Roads and cycleways

The site is well located with respect to road infrastructure – Doonside Road links directly to the Great Western Highway and the M4 and the M7 are nearby. Bungaribee Road is a direct connection to Blacktown which provides regional shopping and there are a number of public and private schools in the vicinity. The site is adjacent to an extensive cycleway network, both existing and proposed.

Public transport

Doonside railway station is approximately 650 metres walking distance from the northern site access point at the Eastern Road-Doonside Road roundabout. Public bus service 725 runs to Blacktown along Douglas Road and Rosenthal Road. Service 726 runs between Doonside Station and Blacktown via Kildare Road and Mandoo Drive.

Water

The area will be served from the Minchinbury Reservoir Zone and existing water mains around the site. Amplification works will be undertaken to augment supply. Sydney Water is constructing a second reservoir to provide for the proposed development.

Sewer

Existing sewer mains to the south and west of the site will drain the new development.

Electricity supply

A Zone substation will be constructed to fully service the development. The substation site has been selected. An upgrade of the existing 33kV overhead line along Doonside Road to 132kV is required to supply the proposed Doonside Zone substation. The upgrade will be linked to the zone substation construction.

Gas

Existing gas supply lines adjoining Doonside will require upgrading to provide adequate supply. The capacity upgrade is relatively simple and can match development of the project.

Telecommunications

Copper cable supply is available to Doonside. Fibre reticulation will be made available subject to demand.



Figure 5: Services and easements

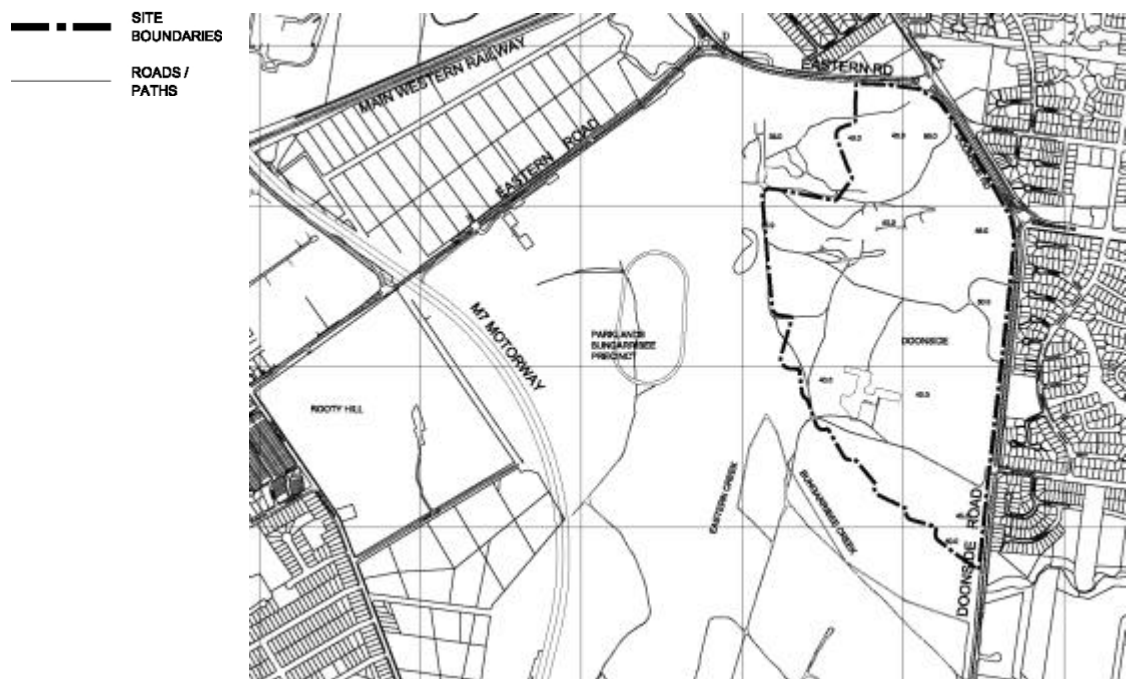


Figure 6: Roads and paths

2.4 Heritage

2.4.1 Indigenous heritage

In terms of indigenous heritage there are 16 archaeological surface sites as shown on the diagram below and 2 zones of good Potential Archaeological Deposit (PAD). It is proposed that the Bungarribee precinct of the Western Sydney Parklands will have an Indigenous heritage conservation strategy and outcome. This strategy, based on scientific and cultural values, will identify a conservation zone that encompasses a range of representative landscapes with the best conservation potential. It is anticipated that this conservation zone will be centred on the riparian zone of Eastern Creek north of the Great Western Highway. This represents the most meaningful management outcome and has the result that land which falls outside the conservation zone should be considered developable. Proposed development within these lands should be managed on the basis of the sensitivity mapping and the defined management principles. These include:

- A conservation zone be identified from Zone 1 lands associated with the Eastern Creek and Northern Creek riparian corridor.
- No further archaeological investigation is required within the Zone 3 lands inside the Doonside development parcel.
- A representative sample of remnant Zone 1 and Zone 2 landscapes (those not falling within the identified Conservation Zone) will be subject to further archaeological investigation. A representative sample of landscapes will be chosen from within the Parklands and Doonside parcels.
- The opportunity for the Deerubbin Local Aboriginal Land Council and community groups to collect surface artefacts prior to development.
- Continued consultation with the Deerubbin Local Aboriginal Land Council and community groups throughout further archaeological investigations.

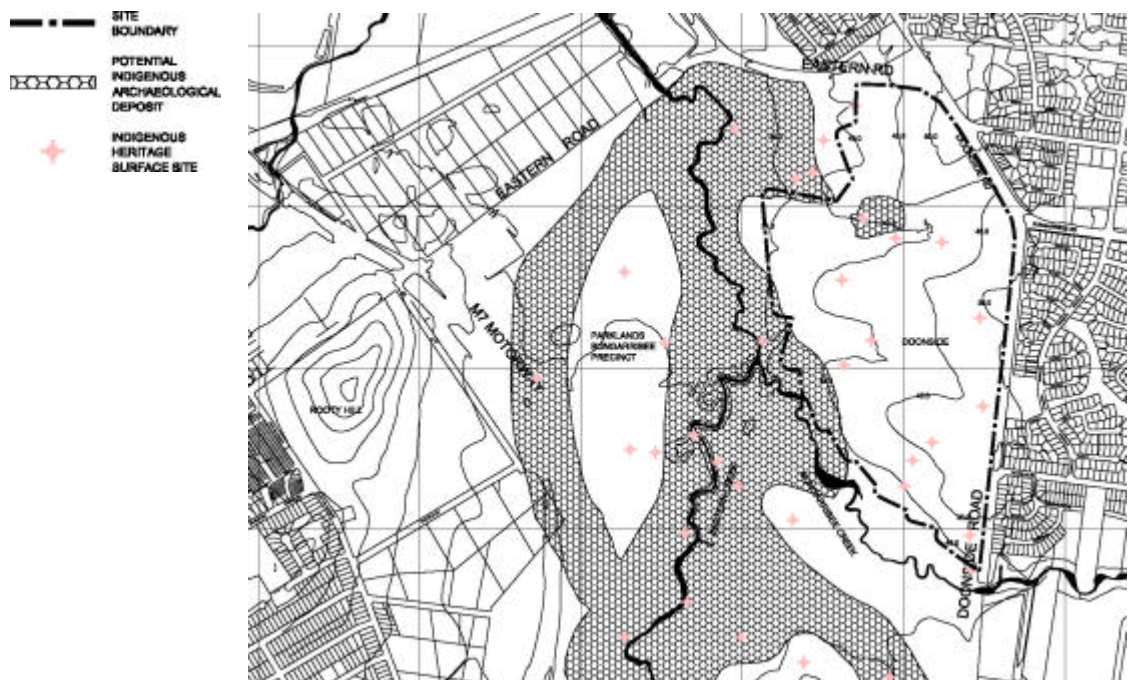


Figure 7: Indigenous heritage

2.4.2 Non-indigenous heritage

The remains of Bungaribee House are located in the south east corner of the site, adjacent to the existing Douglas Road and Doonside Road intersection. The Bungaribee Homestead Complex Archaeological Site represents a rare, intact footprint of a very early colonial farmstead and includes relics of a main house, outbuildings and plantings. The remains have State heritage significance and are included on the State Heritage Register (SHR). Refer to the Conservation Management Plan prepared by Godden Mackay Logan dated April 2007 for further information.



Figure 8: Non-indigenous heritage

2.5 Land capability

Adjacent to the site is the 1 in 100 flood area associated with Eastern Creek as shown on Figure 9. Figure 9 indicates the extent of the site that is potentially affected by flooding in the Probable Maximum Flood (PMF) and the degree of flooding hazard that has been determined for the 1 in 100 year ARI. This represents the western boundary of the development site.

The site is subject to salinity as shown on Figure 10. Asset protection zones of 10m are also required for re-vegetation greater than 1 hectare adjacent to the urban edge.

The contamination assessment and audit done for the site concluded that the site was suitable for the proposed residential and recreational uses. The Site Auditor requires that a Management Plan authorised by a NSW EPA Accredited Auditor be prepared in the unlikely event that contamination is encountered during site earthworks.

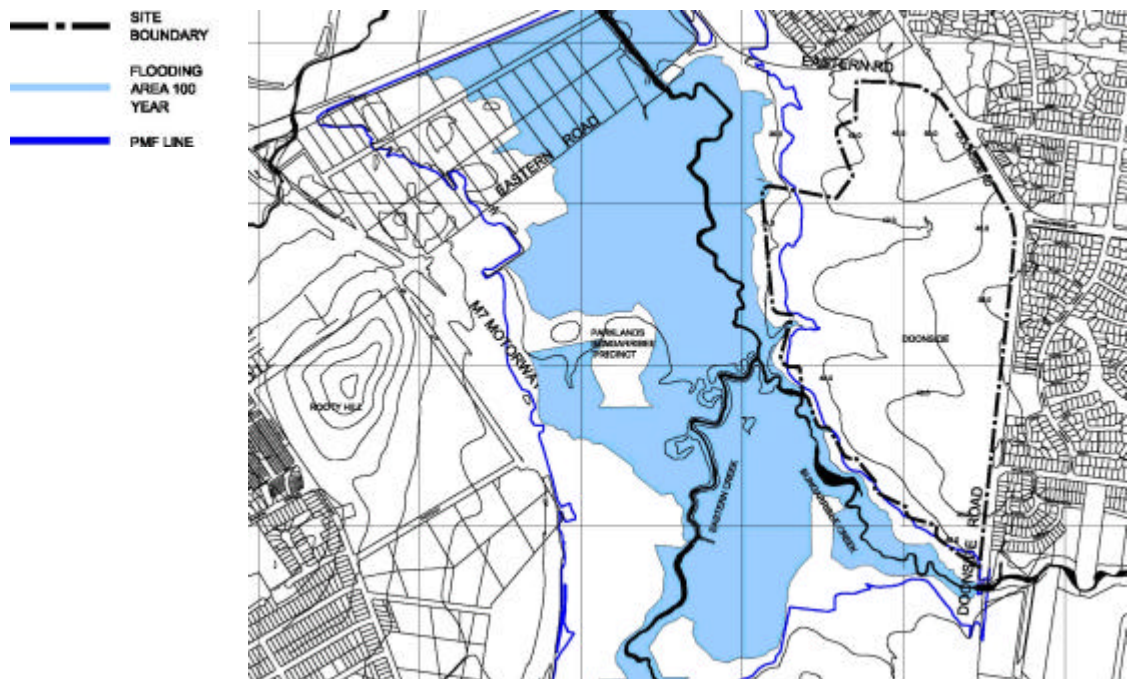


Figure 9: 1 in 100 flood area
(Source: URS Australia)

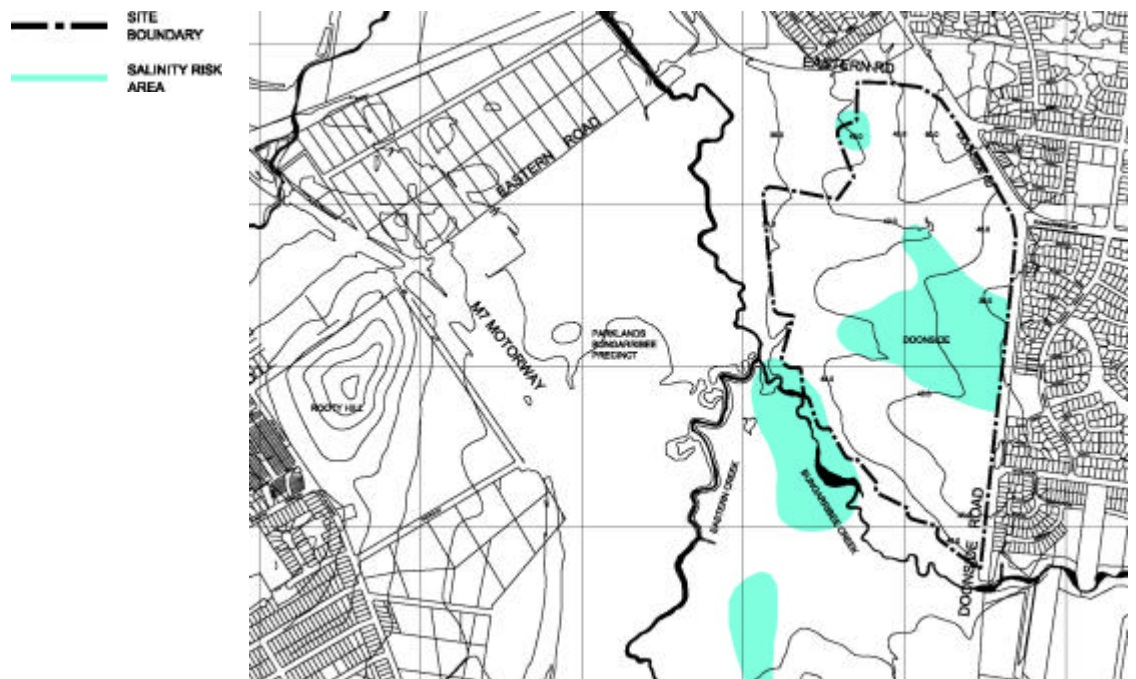


Figure 10: Salinity risk areas
(Source: Douglas Partners)

3 Proposed Concept Plan

3.1 Urban structure

The Bungarribee Master Plan is illustrated in Figure 11. The Plan:

- Establishes and confirms residential development as the principal land use.
- Allows for a yield of approximately 700~730 new residential lots.
- Provides three vehicular access points to Doonside Road, one at the intersection with Eastern Road, a second at the intersection with Bungarribee Road and a third at the intersection with Douglas Road.
- Provides three pedestrian access points, one at the intersection between Doonside Road and Douglas Road and a new signalised pedestrian crossing over Doonside Road adjacent to Peplow Place and across Eastern Road on the northern edge of the site.
- Allows for access to the new subdivision via a collector road that links to the three intersections with Doonside Road and a series of connected local access roads.
- The proposed collector road which connects the new local street grid with existing street networks has the potential to accommodate a bus route through the site.
- Creates an appropriate interface with the Western Sydney Parklands via the establishment of a road edge between residential development and the Park, appropriate built form and the location of open space.
- Integrates with the Western Sydney Parklands via pedestrian, bicycle and landscape linkages.
- Incorporates Water Sensitive Urban Design principles, stormwater harvesting and innovative reuse.
- Retains the built and landscape remnants of the Bungarribee Homestead Complex Archaeological Site and associated significant vistas within public open space.
- Retains the existing east west riparian corridors that flow into Eastern Creek as public open space.
- Retains significant vegetation communities and remnants within the public domain to preserve biodiversity and maximise site amenity.
- Retains highly sensitive potential indigenous archaeological deposit within an identified Conservation Zone.
- Provides landscaped setbacks and buffers to Doonside and Eastern Roads.
- Provides opportunities for integrated public art to assist in the understanding and interpretation of indigenous, non-indigenous and ecological values of the site and to use these along with the contemporary cultural heritage of the existing Doonside community as opportunities for place-making in the new neighbourhood.
- Encourages strong visual connections between the new sub-division and Parklands through an urban structure that opens out to the adjacent Parklands.

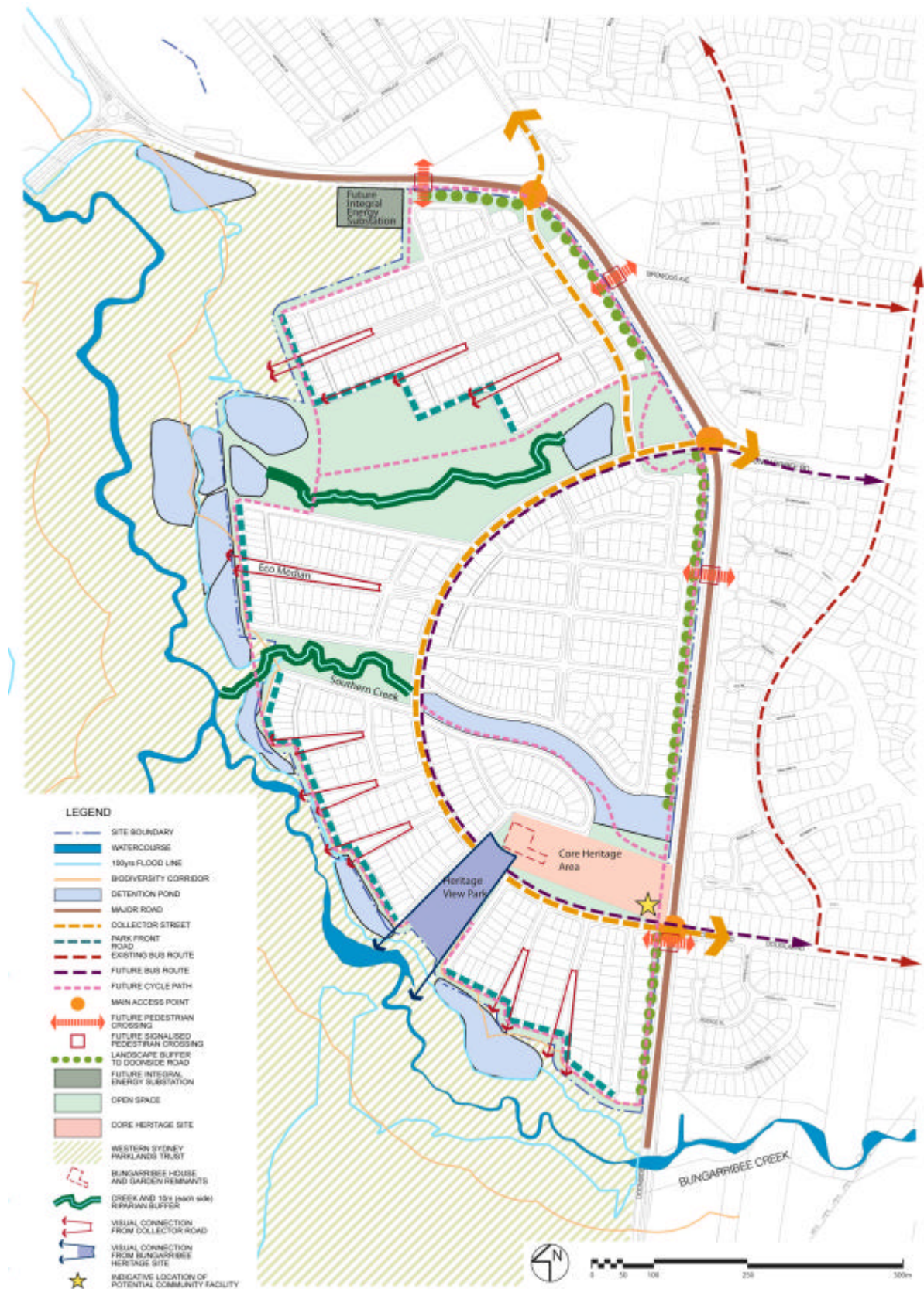


Figure 11: Urban structure

3.2 Land use

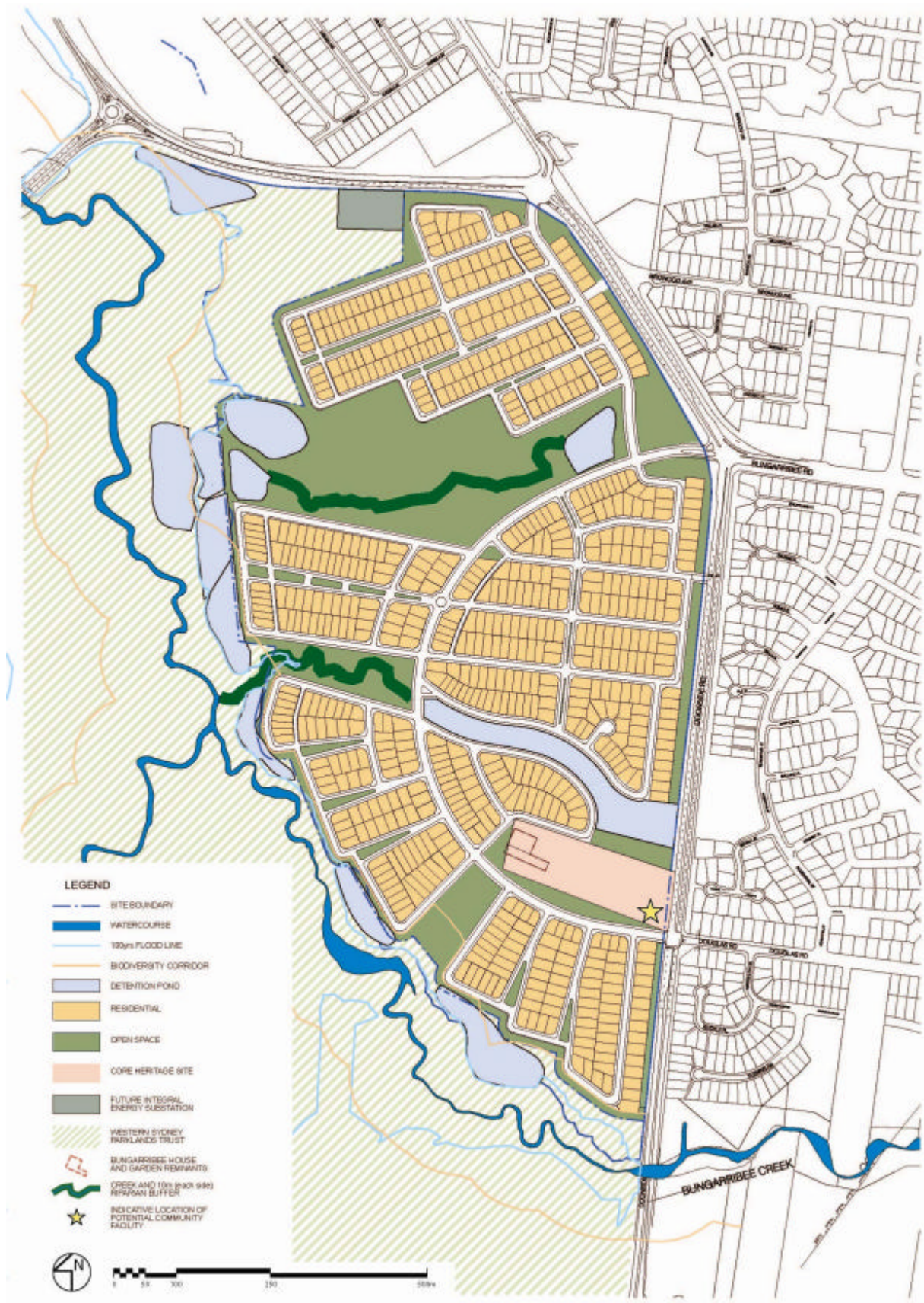
The principal land use at Bungaribee is to be residential development.

Objectives

- To provide a range of lot sizes and house types.
- To ensure residential development adjacent to the Bungaribee Homestead Complex Archaeological Site is scaled appropriately to respect its heritage significance.
- To ensure residential development has no adverse impact but rather makes a positive contribution to the Western Sydney Parklands.
- To provide an appropriate location for a community centre that will support community needs and facilitate interaction for residents.

Controls

- a) Land uses are to conform to Figure 12.
- b) A neighbourhood community centre of approximately 300sqm gross floor area is to be located as shown on Figure 13 below.



3.2.1 Residential density distribution

As this development area is close to a railway station and located next to the Western Sydney Parklands which provide a high degree of amenity, a higher residential density is achievable in comparison to surrounding suburbs. The provision of a variety of lot sizes in each stage is designed to encourage a variety of housing types. In this regard, the distribution of residential density at Bungaribee is based on the following general principles:

- Higher density is to be located in the precinct closest to Doonside Railway Station.
- Higher density is to be located in areas where there is greatest amenity, for example, adjoining open space of the Parklands and creek lines and adjacent to the eco-medians
- Larger lots and lower densities are to be located in the precinct between the Collector Street and Doonside Road.
- Larger lots and lower densities are to be located adjoining the Bungaribee Homestead Complex Archaeological Site and the heritage view corridor.
- Where the Collector Street is double loaded, larger lots are to be located on the western side of the street which is the side visible on entering the site. This is to ensure that views of development on entering the site are not overly congested by built form.
- Where there are medium sized lots adjoining the heritage site, built form is to be semi-detached to give the appearance of fewer buildings when viewed from the Bungaribee Homestead Complex Archaeological Site.
- Where there are medium sized lots adjoining the Parklands, built form is to be semi-detached to give the appearance of fewer buildings when viewed from the Parklands.

Objectives

- Provide a range of housing types to meet the needs of the community.
- Locate higher densities close to the railway station and in areas that adjoin open space.
- Locate lower densities in areas that have no external amenity and in areas that adjoin the heritage site.

Controls

- a) The lot layout for Bungaribee is to generally conform to the layout in Figure 13.

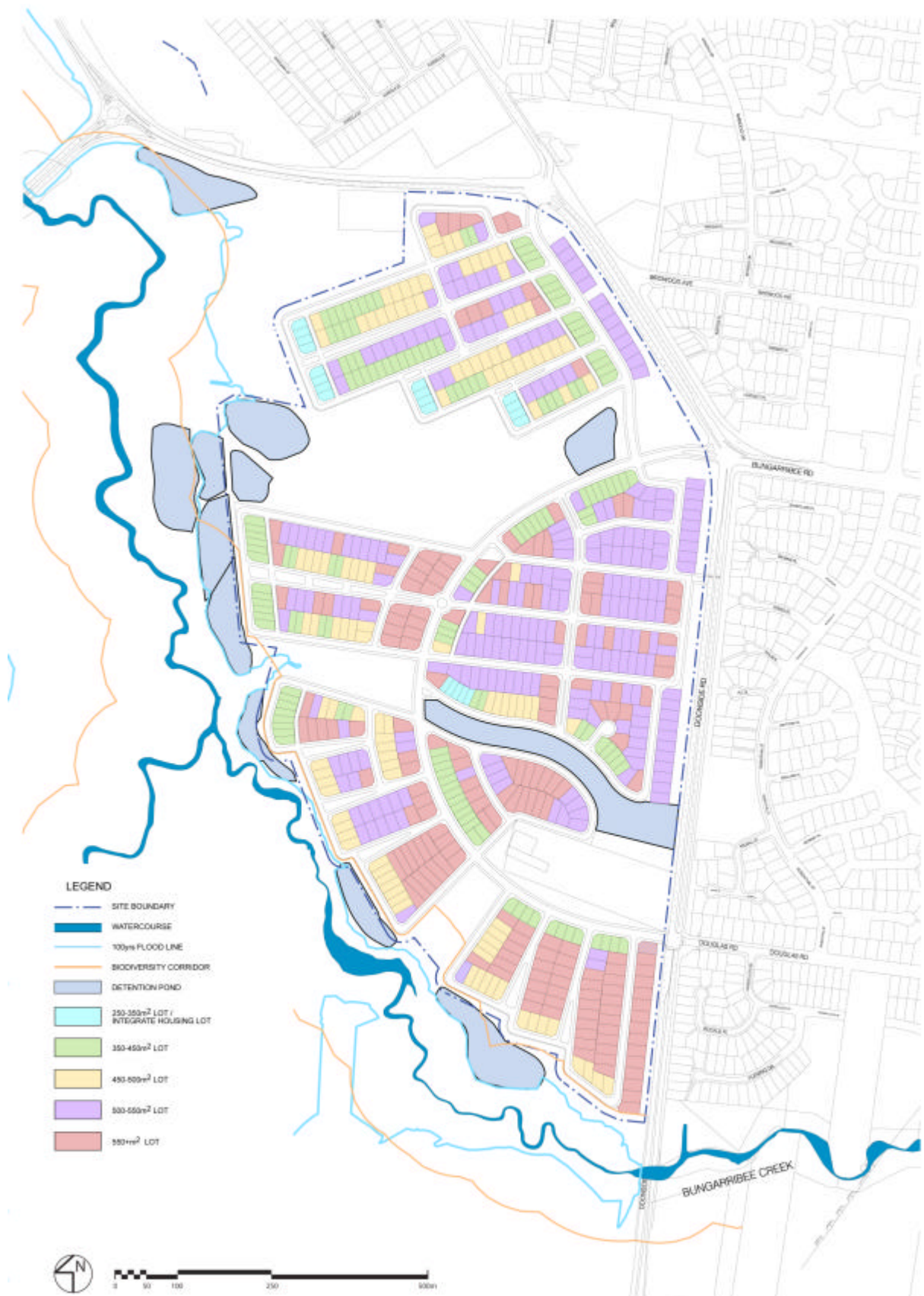


Figure 13: Indicative lot mix

3.3 Conservation values

The Doonside residential footprint is approximately 55 ha in area, most of which is exotic grassland. Shale Plain Woodlands and Swamp Oak Floodplain Forest (Alluvial Woodland) both endangered ecological communities listed under the NSW Threatened Species Conservation Act 1999, also occur within Doonside Residential Parcel. These communities are part of the Cumberland Plain Woodland complex listed under the (Cth) *Environment Protection and Biodiversity Conservation Act 1999*. The residential parcel also contains areas of native grassland containing threatened species habitat and known locations of *Grevillea juniperina*, Cumberland Plain Land Snail and micro bats.

The proposed residential development requires the loss of approximately 12.35 hectares of native vegetation including areas of EEC and threatened species habitat. These impacts include:

- 0.37ha of Alluvial Woodland in good condition
- 2.34ha of Shale Plain Woodlands in good condition
- 2.1ha of Shale Plain Woodlands in moderate condition
- 7.54ha of native grassland
- Cumberland Plain Land Snail habitat and locations
- Removal of vegetation supporting threatened micro bats

To counterbalance (offset) this loss and to adhere to the principle “maintain or improve” under Part 3A of the *Environmental Planning and Assessment Act 1979*, some 27ha hectares of ‘like for like’ habitat and communities within the Bungarribee Parklands Precinct will be protected, enhanced or created. These offset actions include:

- protection, enhancement and creation of 1.11 ha of Alluvial Woodland at an offset ratio of 3: 1
- protection, enhancement and creation of 11.2 ha of Shale Plains Woodland at an offset ratio dependent upon condition (3:1 for higher, 2: 1 for lower quality)
- relocation of existing native grasslands (7.54 ha) and provision for protection of an additional 7.54 ha of existing native grasslands within the Parklands Precinct (effecting a 2:1 ratio for offsetting)

These actions would be subject to more detailed planning at the discretion of the Western Sydney Parklands Trust and an EPBC Act referral. Further survey work to determine the significance of Cumberland Plain Land Snail habitat and roost sites is also required.

Objectives

- Protect to the greatest extent possible the natural values of the site
- Counterbalance impacts through offsets within the Western Sydney Parklands and open space within the development area

Controls

Within the development mitigation measures and strategies for the development are as follows:

- a) Appropriate riparian buffers according to Sydney Metro CMA

-
- guidelines; 40 metres either side for Eastern Creek (Category 1), 20 metres for Bungarribee Creek (Category 2), and 10 metres Northern Ck.
- b) Minimum asset protection zones are required for each parcel of land, varying between 20 and 50 metres, however are subject to updating distance in accordance with the new Planning Guidelines issued by RFS.
- c) Within the urban dominated area between the development and parklands:
- Adjacent to retained remnant vegetation, use of native species of local provenance only in landscaping plans beyond the external loop road.
 - Fencing of intact remnants prior to construction. Surrounding the larger northern remnant a more permanent, robust, fire resistant and aesthetically acceptable barrier
 - Landscape plantings should reflect potential higher soil moisture levels below stormwater / flood detention basins located beyond the external loop road.
- d) Within the parkland dominated areas beyond the urban area (bike paths etc):
- Retention and protection of all extant native vegetation
 - Utilisation of intact native grasslands, particularly those dominated by Themeda sp, through a relocation trial. It is proposed that the existing native grasslands impacted by the development be excavated intact and placed on pre-prepared disturbed areas adjacent to urban development and initially irrigation
 - Regeneration of the Swamp Oak Floodplain Forest by management of the western edge of the creek lines encouraging spread of native species out from remnant vegetation through appropriate bush regeneration techniques
 - Revegetation by planting directly below the bike path, namely:
 - Revegetate with as wide a range of species as possible
 - Ensure appropriate long term management to ensure weed growth is kept under control and the spread of native vegetation is encouraged.
 - Active suppression of weeds between the existing riparian vegetation and the planted bike path revegetation.
 - Bike paths and access tracks in areas of native vegetation to follow existing track and roads and limit clearing to the greatest extent possible.
 - No new access tracks or recreational facilities established within existing native vegetation.
 - In the proposed 'kick-about area', mapping of native grass patches and retention of these where possible. Otherwise, relocation or harvesting of seed from native grasses prior to development.
- e) Adopt Water Sensitive Urban Design to enhance aquatic habitats
- f) Retain remnant vegetation wherever possible with open spaces or as part of setbacks, buffers and road reserves
- g) Where it is not feasible to retain native vegetation insitu, this impact is to be offset within open space areas of Bungarribee.

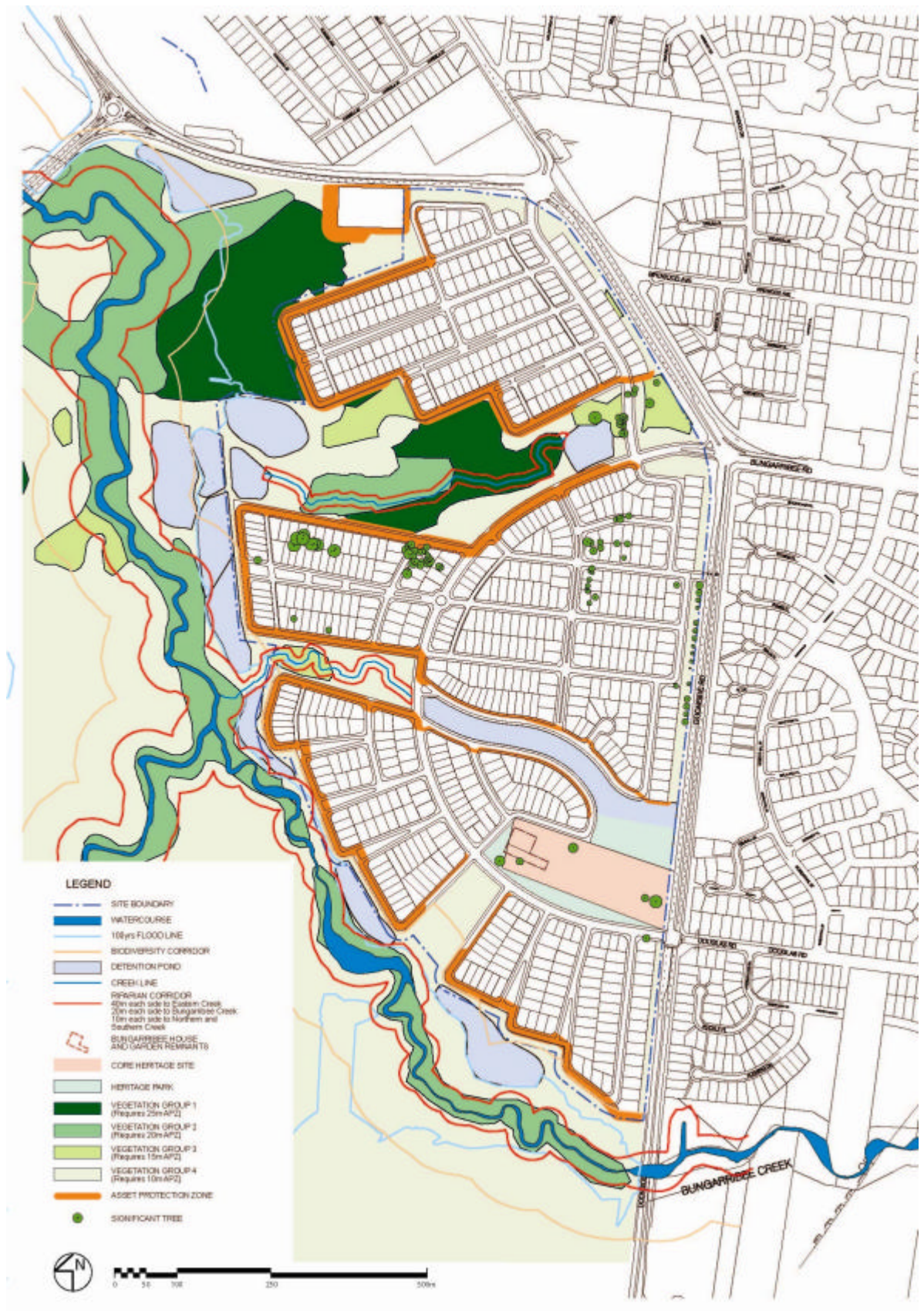


Figure 14: Conservation and natural values

3.4 Conservation of heritage values

3.4.1 Indigenous heritage

Objectives

- To ensure a meaningful conservation and management outcome for the Bungarribee Precinct of the Western Sydney Parklands.

Management Principles:

- A Conservation Zone is to be identified, incorporating a range of landscapes identified as having good archaeological potential.
- Zone 1 sites and/or landscapes falling outside the Conservation Zone require further archaeological investigation prior to their destruction. Selection of salvage areas should be landscape based and made on the basis of a 'whole of development' approach in conjunction with the Parklands.
- Zone 2 lands are to be managed on the basis of their assessed significance. If representative landscapes fall within this zone that are absent from Zone 1 lands, then these are to be the target of salvage excavation.
- Zone 3 sites and/or landscapes do not require further archaeological investigation.
- The relevant Aboriginal groups are to be consulted regarding collection of any surface artefacts prior to development and monitoring the initial construction activity across the developable lands.

3.4.2 Non-indigenous heritage

Objectives

- Development is to be in accordance with the policies contained within the Conservation Management Plan prepared April 2007 by Godden Mackay Logan.
- Protect the heritage values of the Doonside Parcel generally, but particularly the Core Heritage Area as shown in Figure 13 & 15 and in the Conservation Management Plan prepared April 2007 by Godden Mackay Logan.
- To ensure that the management of the archaeological relics, known and potential within the Core Heritage Area is given the highest priority in the management, re-use and planning of the Core Heritage Area and land in its immediate vicinity.
- Retain a remnant pastoral landscape and view corridor between the Core Heritage Area and the Bungarribee Precinct of the Western Sydney Parklands.
- Ensure that a remnant of the pastoral landscape character is retained and managed as a central and fundamental part of the site's overall significance.
- Ensure that the remnant cultural plantings within the Core Heritage Area and their setting are retained and managed as a central and fundamental part of the site's overall significance.
- Ensure that significant landscape elements are conserved in accordance with their level of significance and contribution to the site as a whole and are managed and maintained in accordance with an adopted Maintenance Schedule, as part of the site's Total Asset

-
- Management Plan or Strategy.
 - Ensure that the heritage values of the Core Heritage Area are appropriately interpreted.

Controls

Potential Archaeological Resource

- a) Development is not to intrude upon the ability to understand and appreciate the history of the Core Heritage Area, in particular the Former Bungaribee House site and its associated structures (as represented by their archaeological remains).
- b) Development is not to adversely impact on the physical conservation of the significant archaeological relics on the site.
- c) Ground disturbance in areas with archaeological potential within the State Heritage Register (SHR) boundary must be preceded by appropriate archaeological assessment.
- d) Works, such as interpretive media, within the Core Heritage Area must not disturb archaeological relics relating to the former Bungaribee House site (and its associated structures) as identified in the Conservation Management Plan prepared April 2007 by Godden Mackay Logan.
- e) Archaeological relics disturbed during infrastructure, grading or landscaping works outside the Core Heritage Area in public land, road alignments and open space will be appropriately investigated, recorded and monitored. Note: Archaeological relics outside the Core Heritage Area in private residential allotments do not require investigation or recording prior to disturbance or removal.

Remnant pastoral landscape and view corridor

- a) Development is to maintain and interpret the significant visual and physical links between the Core Heritage area, remnant pastoral landscape and view corridor and the wider Doonside Parcel.
- b) Development within the remnant pastoral landscape and view corridor to the southwest of the Core Heritage Area must be restricted to the developable areas identified in Figure 13 & 15 and in the Conservation Management Plan prepared April 2007 by Godden Mackay Logan.
- c) Development applications and proposed maintenance work are to be consistent with the policies contained in the Conservation Management Plan prepared April 2007 by Godden Mackay Logan.

3.5 Public domain: open space

3.5.1 Landscape and drainage network

The principal consideration in the design of the landscape and drainage network is the integration and relationship with the Western Sydney Parklands which adjoins the precinct to the west and south. The Parklands provides a major biodiversity and habitat resource which needs to be protected. Other important considerations in the design of the landscape and enhanced drainage network are the integration and relationship with the Northern and Southern creeklines, the detention and treatment of stormwater flows from upstream – i.e. from existing neighbourhoods to the east of the site which currently discharge directly onto the site, and the retention and interpretation of relics on the Bungarribee Homestead Complex Archaeological Site. The proposed indicative locations and categories of landscape and drainage areas within Bungarribee are shown on Figure 15. The landscape and drainage network of open space developed for Bungarribee falls into the following categories:

- a) Eco-parks to east west streets that perform a stormwater treatment, bio-filtration and detention function as well as providing biodiversity and landscaped open space amenity to the streetscape.
- b) Vegetated Northern Creekline that retains existing stands of Cumberland Plain Woodland and a remediated watercourse with detention systems for upstream flows adjacent to the Bungarribee Road intersection will form an ephemeral landscaped entry statement to the precinct sympathetic to the Parklands landscape.
- c) Heritage Park located on the site of Bungarribee Homestead Complex Archaeological Site which retains and interprets archaeological relics associated with the former Homestead.
- d) Southern Creekline natural watercourse and vegetation retained intact west of the Collector Street and incorporating a system of cascading detention basins east of the Collector Street to deal with upstream flows.
- e) Green streetscapes providing strong visual identity, retaining existing trees and designed to support an integrated network of access links catering for pedestrian and cycle access through the residential zone and linking to the Parklands.
- f) An edge treatment to the Parklands that incorporates a pedestrian path, a level change, transitional vegetation and detention systems west of the local street edging the precinct.
- g) 35m wide landscaped and mounded acoustic impact mitigation buffers to Doonside Road and Eastern Road; the retention, where possible, of existing trees on the western side of Doonside Road; and an appropriate objective and reasonable and flexible controls to address the future design of acoustic barriers.

Objectives

- To utilise water capture and reuse through the passive irrigation of the cultural landscape, such as production based plantings (i.e. fruiting trees).
- To use production based plantings to benefit the community and to mark and express the seasonal change of the cultural landscape.
- To use production based plantings that create cultural connections and reference the former Bungarribee Homestead.
- To register the change of water and other seasonal elements through a juxtaposition with permanent, robust materials that interact and

-
- mark the change of season and time
 - To use materials in and adjacent to the Bungaribee Homestead that are compatible with its history and built form.
 - To integrate WSUD and informal play elements creating an appreciation of the natural environment.
 - To provide informal play opportunities in the cultural and natural landscape of the new development
 - To respond to natural systems by protecting and enhancing areas of natural, indigenous, heritage and scenic importance as part of the open space network.
 - To provide for a diversity of interests catering for a wide variety of users.
 - To use the open space network to provide linkages through the new development to the Western Sydney Parklands and in so doing resolve potential isolation of the new neighbourhood from existing neighbourhoods.
 - To seamlessly integrate the Parklands with the residential lands
 - To extend the ecologies and vegetation structure of the Eastern Creek and Bungaribee Creek corridor into the site through streetscapes.
 - To use species from the Cumberland Woodland suite of species.
 - Retain and integrate existing trees.
 - To develop a landscape expression which is founded on the principle of water capture and passive re-use.
 - Develop a framework for future design development.
 - Provide a park-like driving experience through the new neighbourhood.
 - Emphasise a clear road hierarchy.
 - Provide a safe and efficient circulation system for vehicles, cyclists and pedestrians.
 - Establish ecological connections through the new neighbourhood to the Parklands.
 - Contribute to effective management of stormwater, biodiversity and energy efficiency; and to improve visual amenity.
 - Use landscape elements to relate to and interface with the Parklands.
 - Retain and integrate existing landscape elements where possible (such as vegetation and topographic features), in the design of the new neighbourhood.
 - Assist in the management of salinity.
 - Assist in the delineation of character areas within the precincts.

Controls

- a) Provide a range of open space and conservation areas in accordance with Figure 15.
- b) A Landscape Strategy is to be prepared prior to the linen release of the first subdivision in accordance with the Landscape Plan in Appendix A.
- c) The Landscape Strategy shall demonstrate the following:
 - Use of endemic species from the area applicable to the situation and recommended by Council and Landcom;
 - The appropriate use of street trees in accordance with Figure 15, to encourage views, flora and fauna movement. Tree selection and planting typologies with help embrace the character of each zone in the new development as per Figure 15;
 - Selection of low water demand drought resistant vegetation for use in common landscaping areas, including native salt tolerant

-
- trees;
 - Use of mulching cover in public landscaped areas (excluding drainage corridors);
 - Use of smart irrigation systems that respond to soil moisture and climate conditions; and
 - Integration with Water Sensitive Urban Design principles in the selection and application of species to detention basins, bio-filtration systems and planted swales.
 - Design an appropriate selection of landscape planting for Asset Protection Zones having regard to the recommendations of Ecological Australia Pty Ltd in Section 8.3.2 of the Ecological Assessment and the requirements of 'Planning for Bushfire Protection Guidelines' issued by the NSW Rural Fire Service.
 - Acoustic treatments that are designed in accordance with the EPA's Environmental Criteria for Road Noise and which incorporate a combination of mounds and noise walls with appropriate landscape buffers to provide screening to acoustic mounds.
 - Acoustic treatments that are designed so that they demonstrate safety and security.
 - Noise walls that use a combination of multiple panels, articulation, varied materials and landscaping to ensure they do not present a blank wall to Doonside or Eastern Roads.
- d) If the boundary with the Parklands is to be fenced it is to be post and rail or low bollards where the principal purpose is to define the boundary rather than restrict access. The boundary can also be indicated by means of planting and low berms.

3.5.2 Heritage park

Design principles

- Detailed design of the Heritage Park is to be in accordance with the Conservation Management Plan prepared April 2007 by Godden Mackay Logan.
- Incorporate interpretation of the site by means of signage and public art installation in accordance with an Interpretation Strategy and/or Public Art Strategy.
- A community centre if provided is to be located close to the Douglas Road and Doonside Road intersection.
- The Heritage Park should provide community gardens as a continuing use and a neighbourhood resource.
- The Heritage Park should provide a mixture of active and contemplative spaces.
- Detailed design of the Heritage Park is to be submitted to Council for approval.

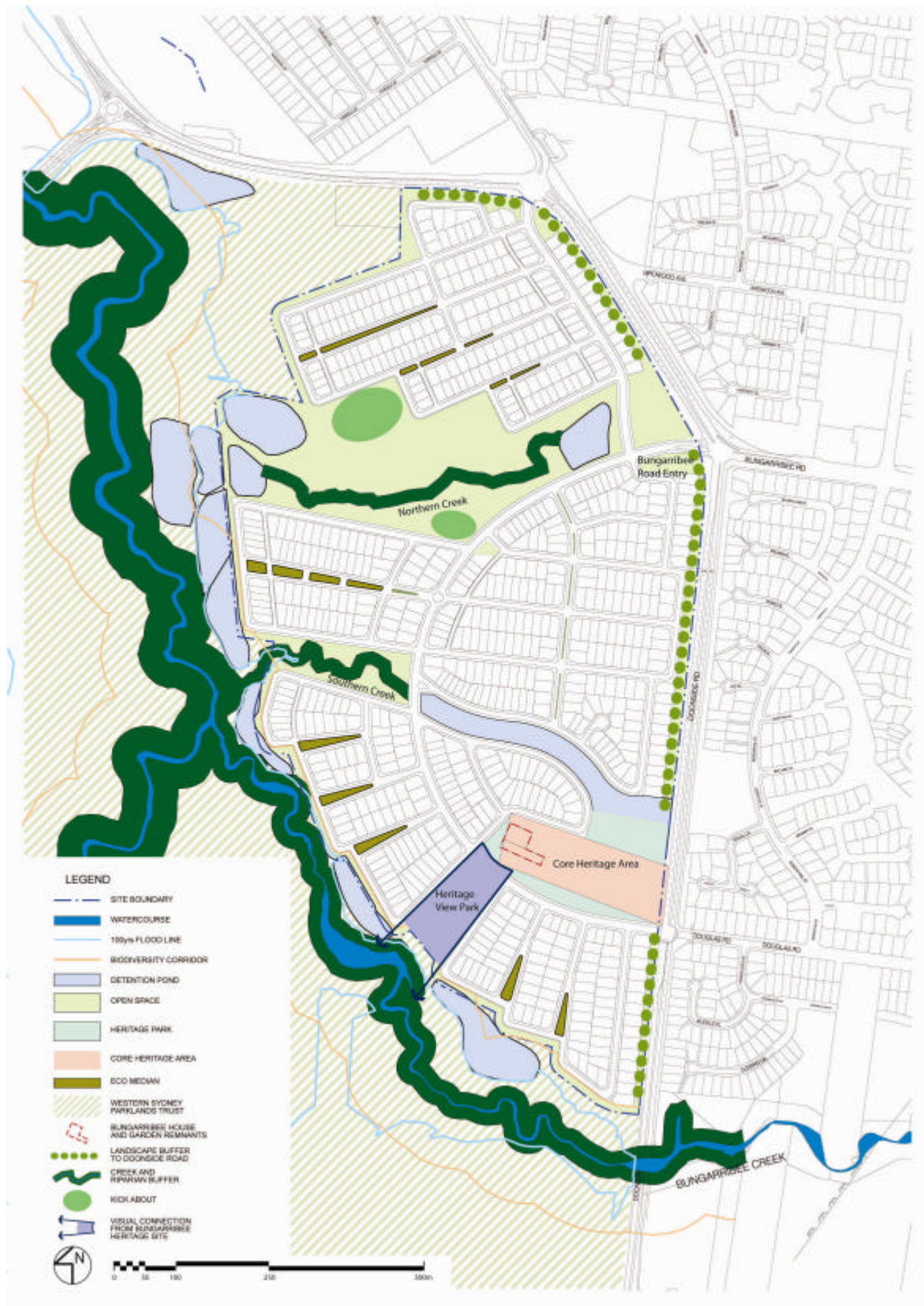


Figure 15: Landscape framework

3.5.3 Streetscape planting

Objective

- Ensure high quality street tree planting is provided throughout Bungaribee.
- To retain and integrate existing trees into the streetscape where possible.
- To extend the flora, fauna and ecologies of Eastern Creek and Bungaribee Creek into the site.
- To provide a foreground of vegetation to the built form and as a visual connection to the vegetation behind.

Controls

- a) Any development application proposing the positioning of trees within the road carriageway is to be accompanied by:
 - Details relating to service provision (e.g. the location and design of street lighting, the impact on the manoeuvrability of garbage trucks), drainage and location of future driveway accesses; and
 - A Road Safety Audit prepared in accordance with the RTA Guidelines.
- b) Tree species are to emphasise the road hierarchy.
- c) There are to be a combination of trees to be planted at irregular intervals in groups to create copses and at regular spacings. Refer Figures 17-22.
- d) Where singular street tree planting is nominated it shall be of an endemic species that provides habitat for Parklands fauna, whilst framing views out to the Parklands landscape and beyond.
- e) Copping shall occur in a minimum of 3 to 5 trees to provide habitat for parklands fauna and shade to public open space.
- f) Provide tree guard for the trees until they mature to protect them from vehicles.
- g) The Landscape Strategy shall demonstrate the following:
 - Use of appropriate durable native tree species that are endemic to the region to promote linkages to the Parklands and to support biodiversity values within the Bungaribee Precinct and the adjacent Eastern Creek corridor;
 - Use of a species that minimises the risk to utilities and services;
 - The location of street trees to maintain adequate lines of sight for vehicles and pedestrians, especially around driveways and street corners;
 - Selection and location of street tree species to provide appropriate shade;
 - Selection and location of street trees to create an attractive and interesting landscape character, clearly defining public and private areas, without blocking the potential for street surveillance;
 - Use of low maintenance native grasses or paved treatments at ground level within the road reserve; and
 - Selection and location of species appropriate for bio-filtration systems, detention basins and planted swales;

3.5.4 Signage

Objectives

- Develop an identifiable, marketable and appropriate character for

Bungarribee public domain signage.

- Facilitate the design and erection of an array of imaginative and innovative signage that brings vitality and interest to the estate.
- Ensure that signs contribute to the safety, legibility and amenity of the Estate's natural and modified environment both by day and night.
- Ensure that all signage is of a high quality of design and construction and integral of the built environment and landscape setting.
- Ensure that visual clutter is minimised by limiting unnecessary duplication of signage.

Controls

- a) Signage in the public domain is generally restricted to:
 - Traffic control and place identification signs; and
 - Place making signage of the estate developer including directional information, identification signs marking different precincts within the estate and signs containing information about services within the estate.
- b) Signage is to be:
 - Designed to reinforce the district identity of the development;
 - Designed to express the existing natural environment and where possible to mark seasonal and ephemeral change; and
 - Located so as to minimise visual clutter in the public domain.
- c) Locating entry signage and the like within a public road reserve is subject to Council agreement.
- d) The location and design of signage is to be indicated on a Landscape Masterplan.
- e) Public domain signage is to be located so as not to obstruct sight lines of motor vehicles or trucks, or impede pedestrian movement.
- f) Temporary signage is permitted in the public domain to provide general directional, estate marketing and other information for a period of no longer than 2 years.

3.5.5 Street furniture and lighting

Objectives

- Ensure a high quality, functional, safe and attractive public domain.
- To read as an extension of the Parklands aesthetic to establish stronger links between the Parklands and employment lands.

Controls

- a) Footpath paving must provide a hard wearing, cost effective, practical and maintainable surface.
- b) Street furniture is to be incorporated into the design of the streetscape and shall include a consistent approach to street lighting, street and information signs.
- c) Street furniture and lighting is to be:
 - Designed to reinforce the district identity of the development;
 - Coordinated in design and style; and
 - Located so as to minimise visual clutter in the public domain.
- d) The location and design of street furniture is to be indicated on a Landscape Masterplan.
- e) Vehicular street lighting is to be mast top lighting to meet relevant RTA and Austroads standards.
- f) Pedestrian lighting is to be pole mounted to meet relevant Australian Standards.

-
- g) Major cycle routes and pedestrian access paths are to be lit for night time usage.
 - h) Lighting is to be designed and managed to mitigate light spill impacts on fauna habitat, particularly adjoining the Parklands.
 - i) Lighting shall be designed to incorporate a mature tree environment.

3.5.6 Public art and place-making

A key principle of the new neighbourhood at Bungarribee is the involvement of artists, craftspeople, and selected community groups with the design team and developer in the creation of a distinct and unique village in a parkland setting. The integration of a public art program into the Precinct is an integral part of the development of landscape and urban form.

The interpretation by artists and craftspeople of the attributes, characteristics, ecosystem, multi-culturalism, and the Indigenous and post-contact heritage of this rich Bungarribee Precinct site in relation to Doonside is a significant contributing element in the definition of the character of this new village. A Public Art Plan is to be developed for Bungarribee to ensure this artistic interpretation and place making activity takes place. The potential for involving selected multicultural community groups in the successive briefing processes for artists creating site-specific works in the development is one of:

- helping to engender a palpable sense of welcome to new residents from existing residents in existing adjacent neighbourhoods,
- strengthening an ongoing caring relationship among all residents for this precious area of natural and cultural heritage,
- revealing and celebrating the remarkable, rich multiculturalism of the existing community both to itself and to new residents, and
- nurturing cultural development between the new neighbourhood at Bungarribee and the existing Doonside residential areas.

Objectives

- Involve artists, craftspeople and specialist community groups with the design team and developer in the creation of a distinctive and unique environment.
- Provide for the expression of the wide diversity in ethnicity, custom, and art forms characteristic of Doonside and the Blacktown LGA in the design of the public realm and the provision of public art.
- Encourage the linking of specialist community groups, arts collectives, local artisans, and Landcare organisations with the design team and commissioned artists, craftspeople, and artisans in the briefing of public art intended to acknowledge local and regional identity and place.
- Integrate a public art program in the Precinct as an essential part of the development of landscape and urban form.
- In the planning process for the Bungarribee Precinct, seek ways of facilitating and strengthening local cultural industry development as part of the planning and execution of the Precinct's public art program.
- Reflect the cultural significance of the Bungarribee precinct and associated parklands, including its landscape, ecosystem, and history of occupation in the Precinct's design, including both the areas of location of residential buildings and open space.
- In the planning process for the development and its public art

program, seek ways to facilitate community cultural development which reinforces the role of the site in providing and developing identity for the community, particularly with regard to the interaction between:

- natural heritage,
 - Aboriginal heritage,
 - post-contact heritage and migration patterns,
 - open space systems and the riparian ecosystem,
 - contemporary cultural diversity and transitory lifestyles among residents,
 - built form and streetscape design, and
 - contemporary Western Sydney visual, craft, performing, and community arts practice.
- To incorporate community artists in the design development and construction of WSUD, landscape, street furniture and play elements.
 - To provide structured play opportunities in the new development whereby community artists will be engaged to help design, and construct a unified suite of play elements.

Controls

- a) Site-specific public art is to be provided for the
 - Heritage Park,
 - streetscapes,
 - riparian corridors, and
 - Parklands edgeas an integrated element of the hard and soft landscape and built form design and as part of an overall community cultural development strategy integrated within the Bungarribee Precinct development.
- a) Public art is to include works of contemporary artists, craftspeople, designers, and/or artisans and is to include works or functional objects which explore and interpret those elements or ideas relating to community, heritage, environment, art and design which can reinforce and develop the Bungarribee Precinct's unique 'village within the Parklands' identity.
- b) In the Precinct these works or functional objects are to aid in the creation of landmarks, pedestrian itineraries, gathering places, and public amenities with a strong sense of local and regional identity.
- c) A master plan of locations and types of works of art/craft/design is to be prepared, identifying appropriate sites of a minimum of one work or project to be commissioned for each of the locations listed in a) above.
- d) Works of public art, craft, and design are to be commissioned from a range of nationally-based, regional and local artists and craftspeople, more than one of which should be designed or fabricated in collaboration with an appropriate community group with special skills from within the adjacent Doonside or Blacktown LGA communities.
- e) Based on the Landscape Master Plan for the Precinct containing the proposed locations and basic conceptual parameters for the works of public art to be included, the Precinct's Development Application (DA) shall re-confirm the requirement for the inclusion of site-specific public art or projects as an integrated element of the urban, landscape, and building design of the Precinct. The art shall be commissioned, coordinated, and installed at the Developer's cost and designed in consultation with Blacktown Council's Open Space section including the maintenance and management regime.

3.6 Public domain: circulation

3.6.1 Site access

Objective

- Provide linkages that create connections within the site and to adjoining places.

Controls

- a) Provide three principle public road vehicular access points to the site from Doonside Road, one each at the intersections with Douglas Road, Bungarribee Road and Eastern Road in accordance with Figure 16.

3.6.2 Road hierarchy

The hierarchy of roads, streets and paths, taken collectively constitute the overall circulation system for the site and accommodate vehicular, pedestrian and cycle traffic into and throughout the development.

Street trees will provide a critical element of the landscape strategy for streetscapes in their role as the most prominent of landscape elements. Good landscaping creates a sense of place and helps with continuity and containment of the street by containing vistas, defining boundaries, reducing traffic speeds by narrowing the perceived travel-way, providing shade, habitat, biodiversity and being integrated with stormwater management systems.

The proposed road hierarchy for Bungarribee is shown in Figure 16. The road hierarchy comprises the following:

Collector street

The general principles for the collector street are:

- The collector street connects to Doonside road at the three intersections noted above.
- The collector street provides the main vehicular route for pedestrians, vehicles, cyclists and public transport.
- Street trees are to be located in the verge and in the parking lane to facilitate coping.
- The design standards for collector streets are listed in Table 1 below and illustrated in Figure 17.

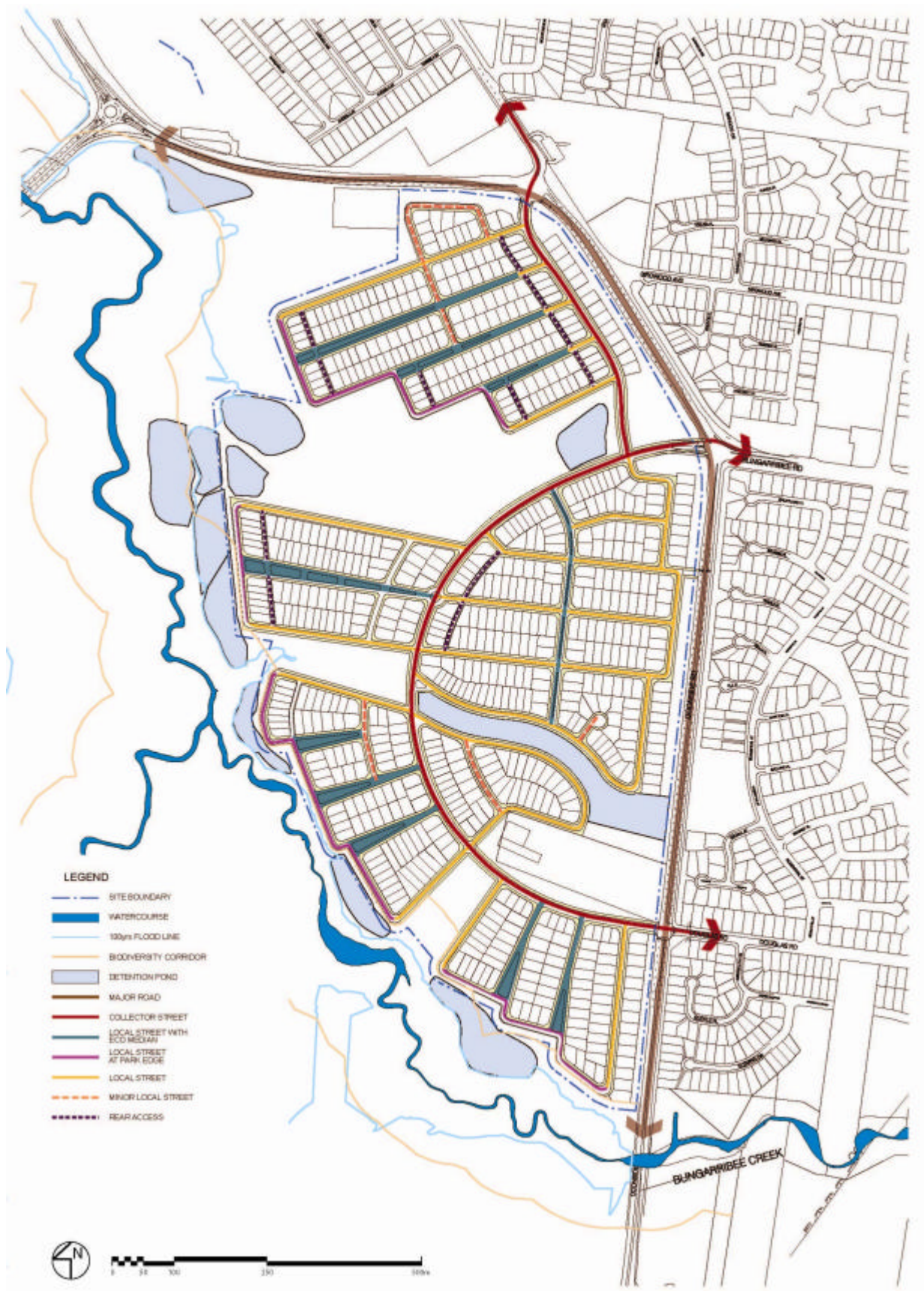


Figure 16: Road hierarchy

Local street

Local streets provide access to residential lots off the collector street. There are two types of local streets. One is a standard two way carriageway with parking lanes and forms the edge to the development where it extends west of the collector street. The other incorporates a median of varying width and is known as an eco-median street. Eco-medians generally extend west of the collector street and open the vista along the street toward the Parklands. The general principles for local streets are:

- Street trees are to be located in the verge and in the parking lane to facilitate copsing.
- Local streets are to prioritise pedestrians and cyclists.
- Local streets that connect to the collector street and edge the Western Sydney Parklands are to incorporate an edge footpath to the Parklands with transitional planting, bollards and a level change.
- The design standards for local streets are listed in Table 1 below and illustrated in Figure 18, 19 & 20.

Minor local streets

The general principles for minor local streets are:

- Minor local streets that connect local streets to each other or provide access to a limited number of residential lots.
- Lot frontages on local streets are to be a minimum of 15m.
- Where the minor local street terminates in a cul-de-sac the length of the street is limited so that it serves a maximum of 10 houses.
- The design standards for minor local streets are listed in Table 1 below and illustrated in Figure 21.

Rear access streets

The general principles for rear access streets are:

- Minor streets that provide rear access to dwellings.
- Rear access streets are not to be treated as purely utilitarian. They are to be designed as pleasant and safe elements of the street network in accordance with the principles of CPTED (Crime prevention through environmental design). Upper floor habitable space is to be provided at regular intervals along both sides of laneway. Garages are to be setback 1m to allow for balconies over the laneway to improve passive surveillance.
- For narrower lots the bin enclosure will be within the rear courtyard.
- The design standards for lanes are listed in Table 1 below and illustrated in Figure 22.

Objectives

- Provide acceptable levels of access, safety and convenience to all users – drivers, pedestrians and cyclists - ensuring acceptable levels of amenity.
- Make adequate provision for the operation of bus services on site.
- Provide a legible, safe and convenient network of 'all weather' pathways for pedestrians, cyclists including users with disabilities and limited mobility in accordance with provisions contained within the Disability Discrimination Act.
- Cater for the integrated provision of landscaping, public utilities and drainage.

Controls

- The road hierarchy is to conform to that shown on Figure 16, Table 1 and Figures 17 -22 (plans and sections).
- No direct vehicular access except at the intersections listed in Section 3.6.1 is permitted to Doonside Road.
- Corner lots are to have a minimum 5m splay and kerb returns are to have a minimum 8.5m radius.
- All services within road reservations are to be designed and located in an integrated manner to avoid conflict with landscape and tree planting.

Table 1: Road design standards

Road type	Road reserve	Carriage-way width	Traffic lane width	Parking lane width	Verge width	Median width	Footway width	Services zone
Collector street	20m	Min 11m	6-8m	2.5m	3.7m & 4.7m	-	1.5m & 2.5m	0.6m
Local street	16m	9m	-	-	3.5m	-	1.5m	0.6m
Eco-median	18m plus varying median	5.5m	3.2m	2.3m	3.5m	Varies – min 1m	1.2m	0.6m
Minor local street/cul-de-sac	14.8m	7.6m	-	-	3.6m	-	1.2m	0.6m
Rear access streets	8m	6m	-	-	0.5m & 1.5m	-	-	-
Park edge street	13.1m	8m	-	-	3.5m & 1.6m	-	-	-

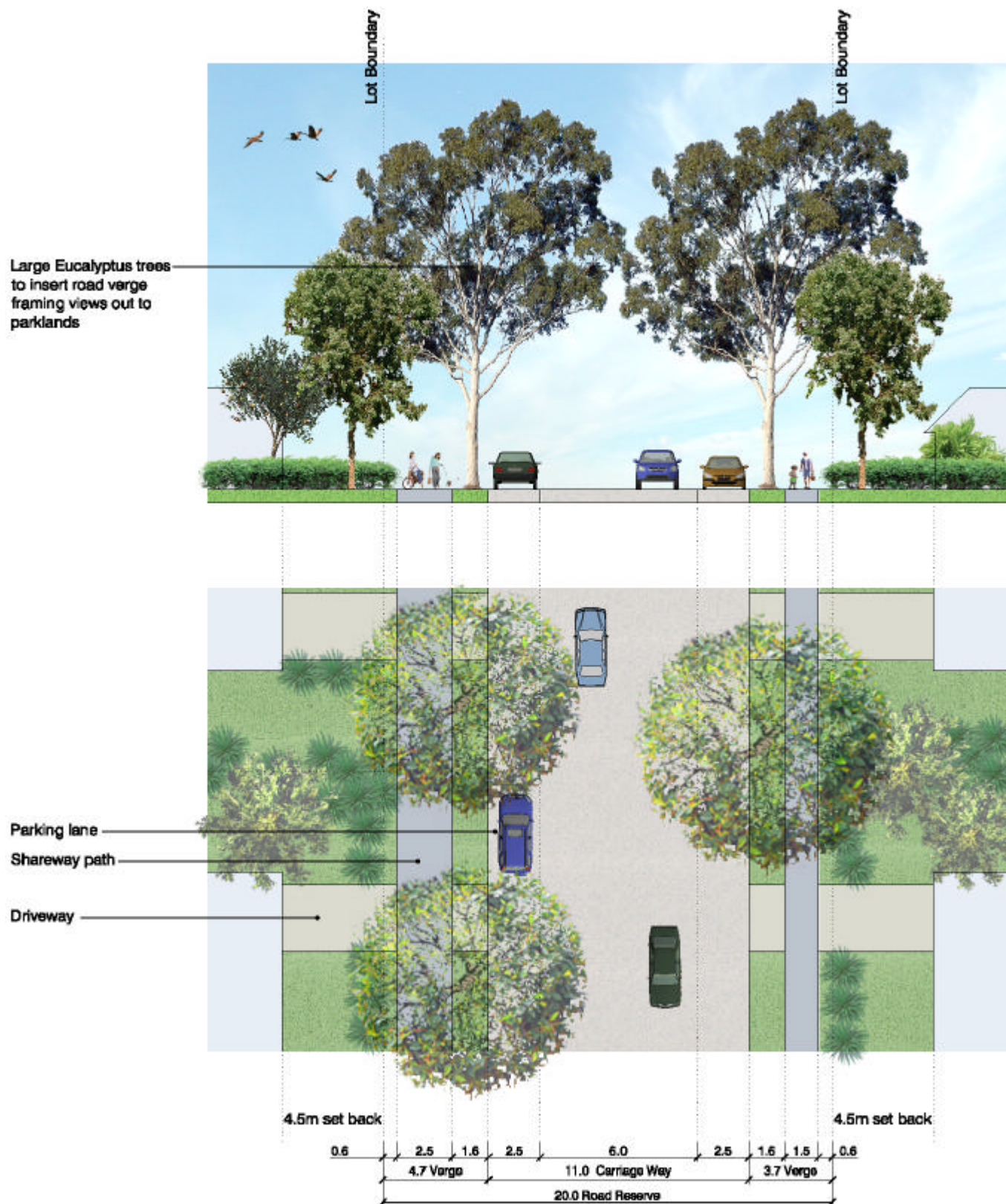


Figure 17: **Collector street**
(Developed in collaboration with EDAW)

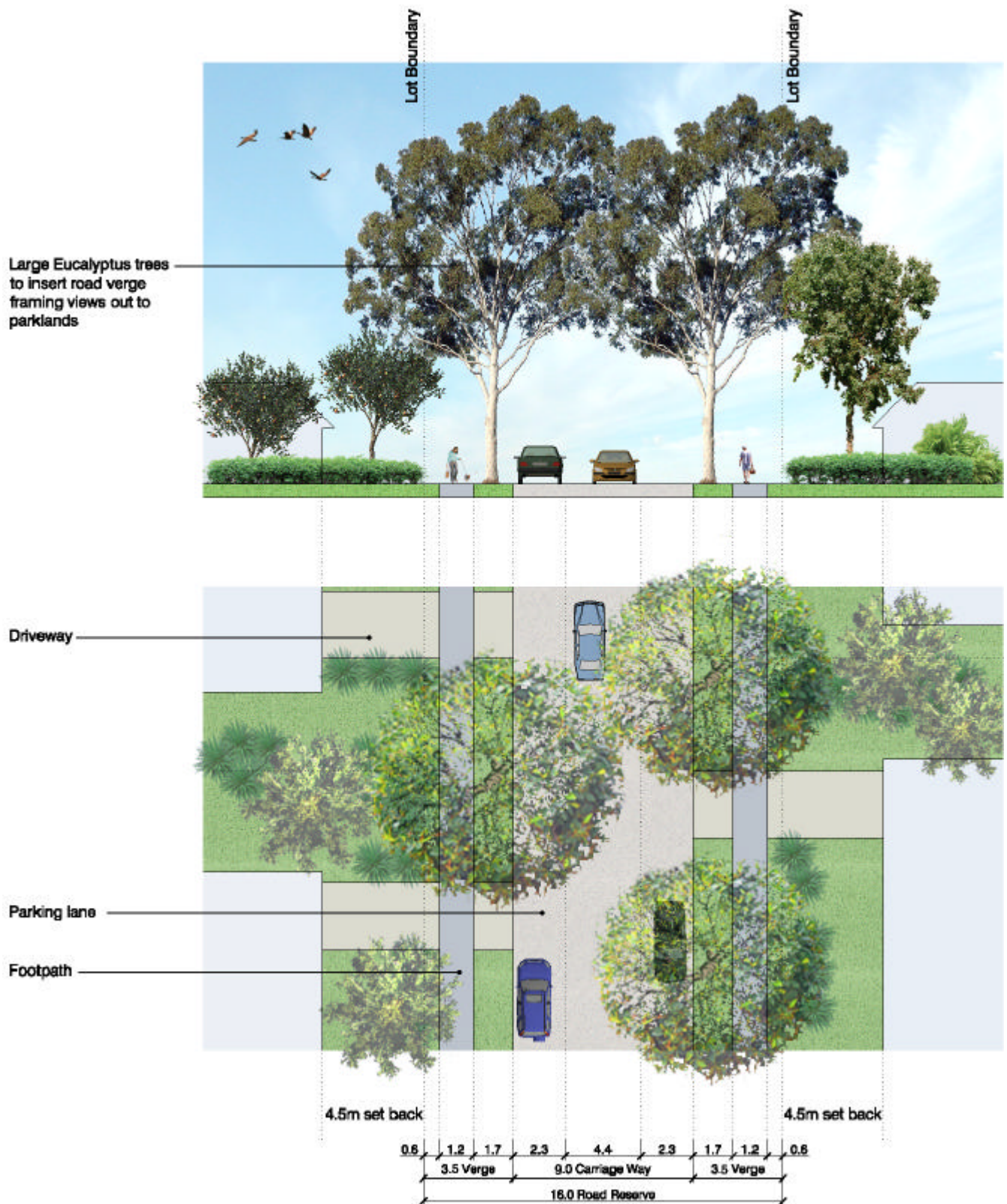
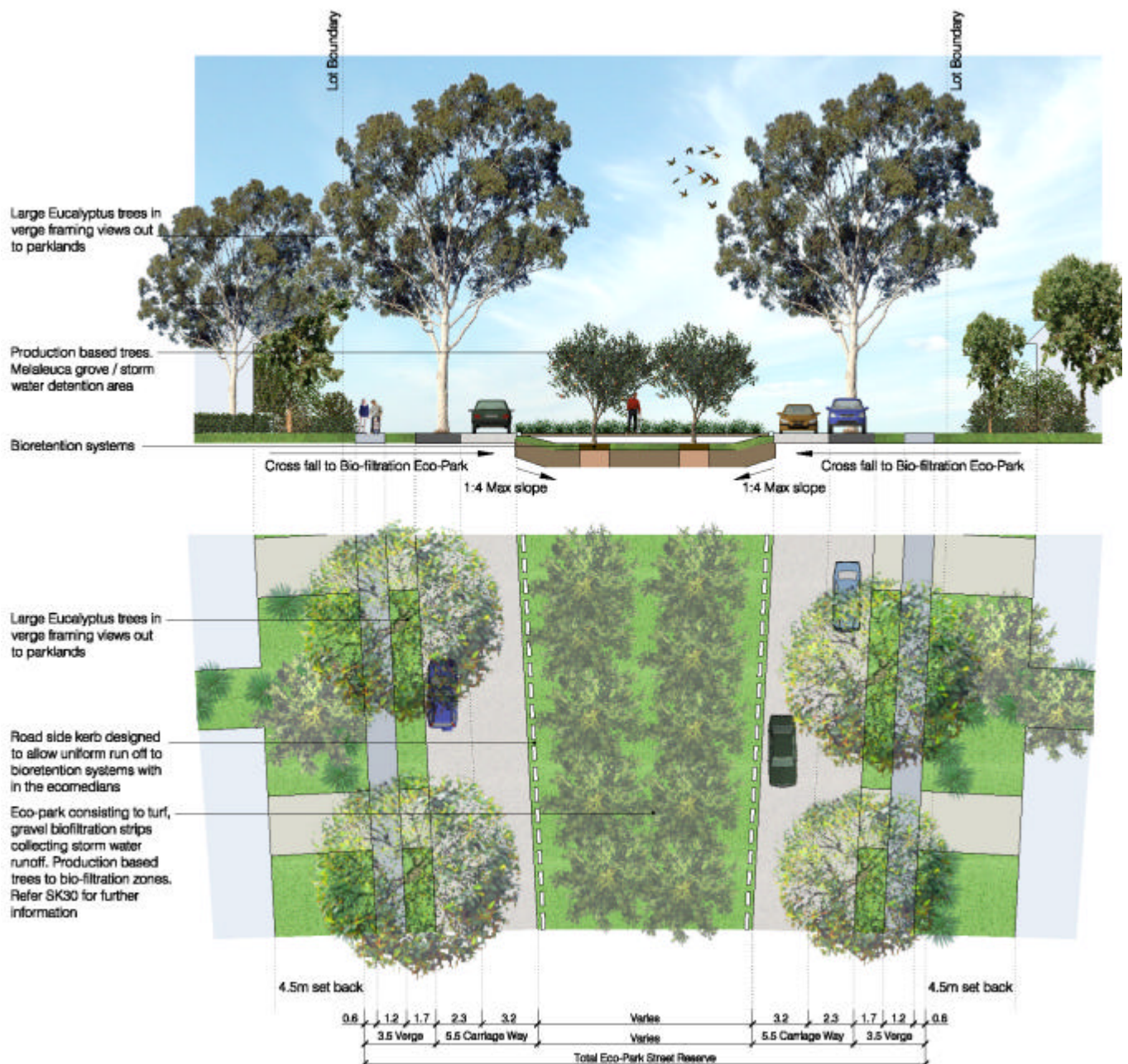


Figure 18: Local street
(Developed in collaboration with EDAW)



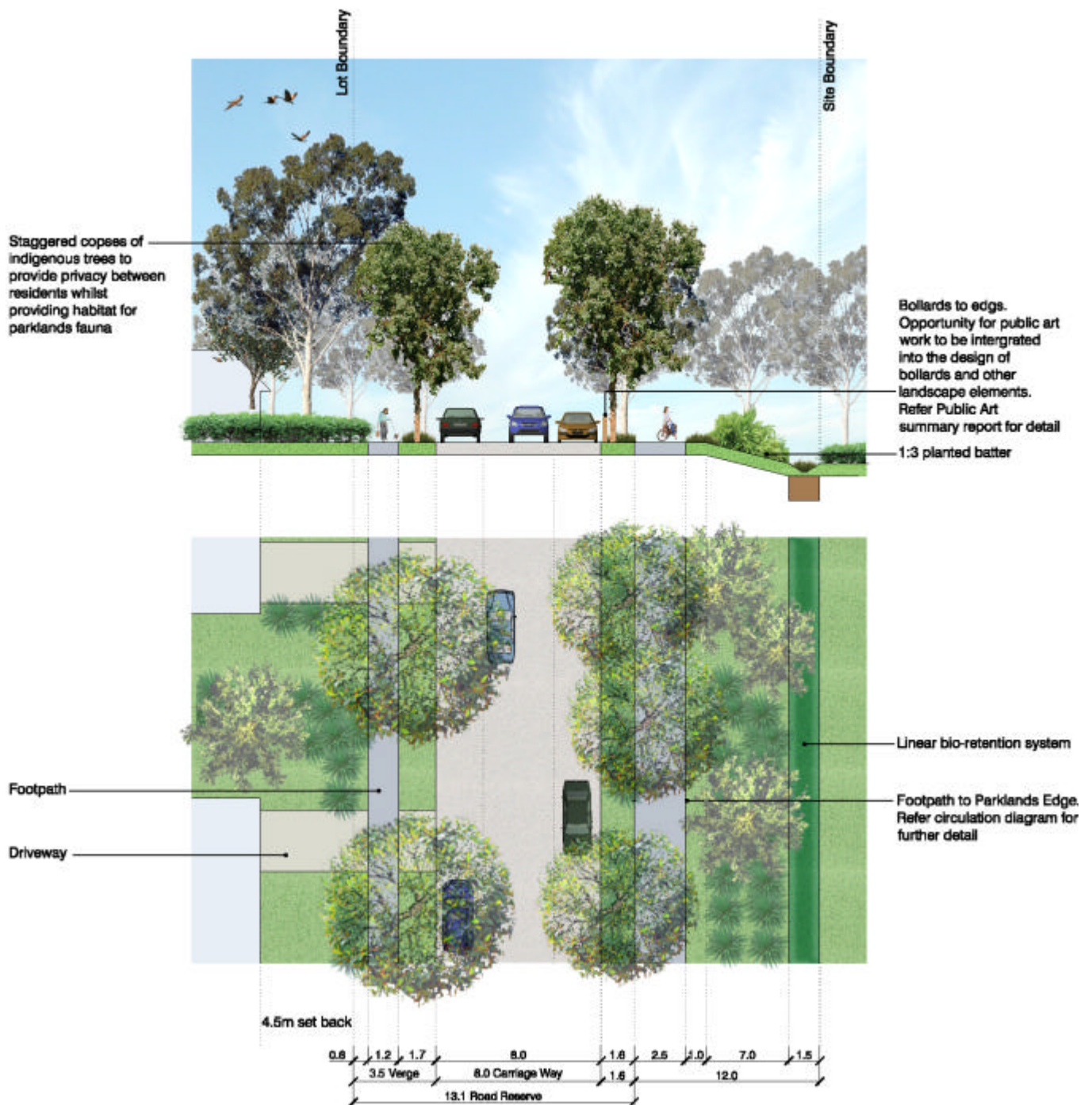


Figure 20: Park edge access street
(Developed in collaboration with EDAW)

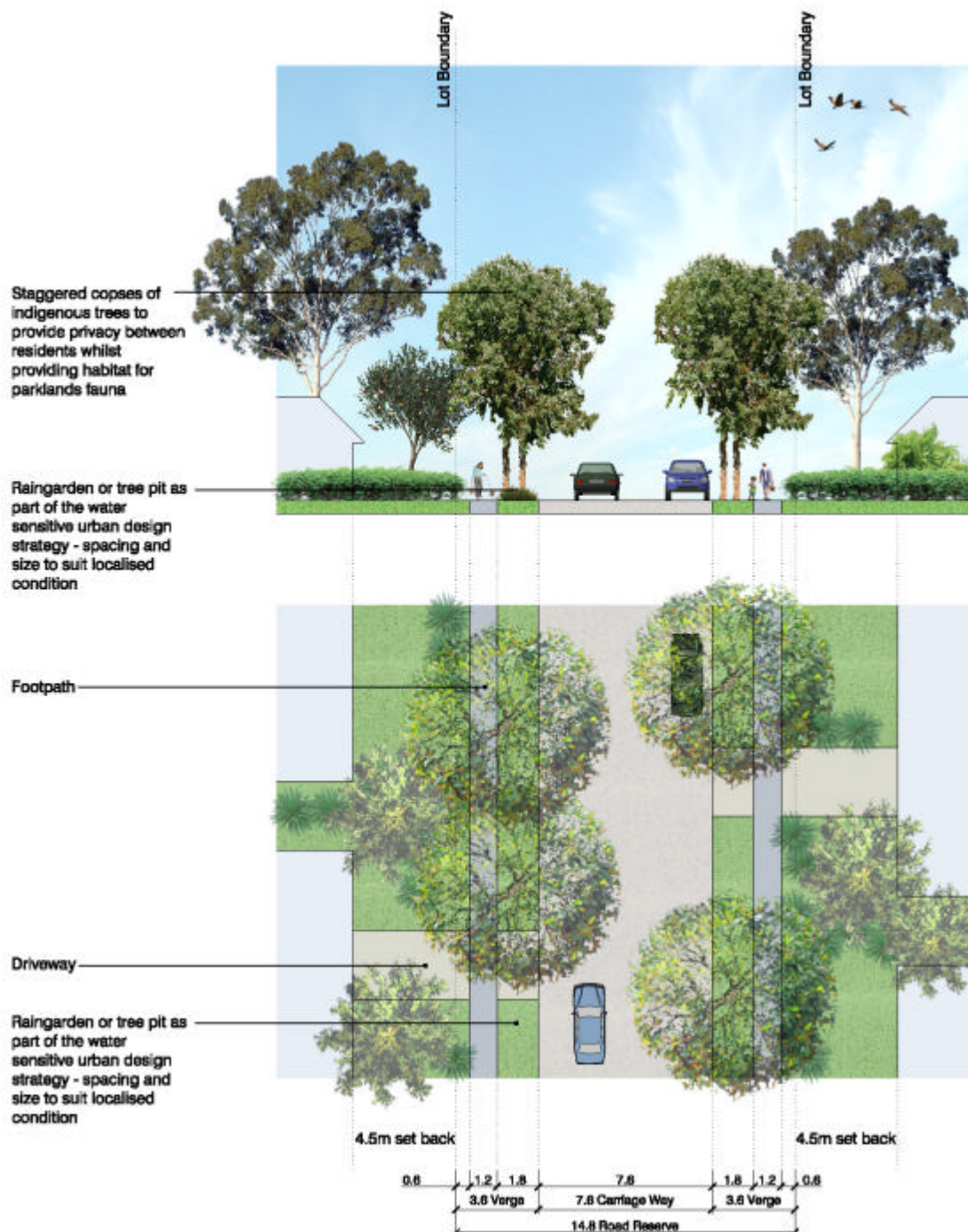


Figure 21: Minor local street
(Developed in collaboration with EDAW)



Figure 22: Rear access street
(Developed in collaboration with EDAW)

3.6.3 Pedestrian and cycle network

The indicative pedestrian and cycle network for Bungarribee is shown in Figure 23. Pedestrian and cycle paths form a key component of the connectivity of Bungarribee. The key features of the network are:

- Provision of shared pedestrian and cycle paths within the Collector and Eco-median road reserves,
- Accommodation of road cycle routes on the local streets, and
- Integration of pedestrian and cycle routes with the public domain within Bungarribee, the riparian corridor of the North Creek and the Western Sydney Parklands.

Objectives

- Provide a network of pedestrian and cycle linkages to allow residents easy and safe access to open spaces and other public amenity features of the site including access to public transport.
- Provide an all weather pedestrian network of suitable material, width and design that links into existing and future pedestrian networks
- Provide legible and convenient pedestrian and cycleway connections that link into existing and new neighbourhoods and connect open spaces and proposed pedestrian and cycle networks in the Parklands.
- Allow for connections of pedestrian and cycle routes with new and existing facilities along Doonside Road, Douglas Road and Bungarribee Road.

Controls

- a) The pedestrian and cycle network is to be in accordance with that shown in Figure 23.
- b) Provide an on-grade signalised pedestrian and cycle crossing on Doonside Road in the vicinity of Birdwood Avenue and Peplow Place and a second across Eastern Road as shown on Figure 23.
- c) Pedestrian and cycle crossings are to be located where there is adequate sight distances and suitable lighting provided at road crossings.
- d) Cycleways are to be built in accordance with Council specifications.

3.6.4 Public transport

Walking and catching the bus to connect with the rail system are the most effective form of public transport for Bungarribee. The northern sector of the site is within a kilometre (or approximately 10 minutes) actual walk distance of Doonside Railway Station. Public bus services to Blacktown Station are available from Douglas Road, Rosenthal Road and Mando Drive.

To encourage the use of public transport, the proposed road hierarchy is designed to accommodate the extension of bus service 725 through the site via the collector street. The provision of public transport services will ensure the connectivity of Bungarribee with surrounding neighbourhoods and to the established transport systems serving the greater metropolitan area.

Objectives

- Facilitate the provision of a future bus service through the site.
- Provide bus stops at appropriate intervals on intersections with the

collector street in consultation with the bus service providers and Council.

- Provide suitable locations for bus stops at appropriate intervals on the collector street in consultation with the Ministry of Transport and local bus operators to accommodate any future service.

Controls

- a) 90% of all dwellings should be within 400m safe walking distance of a bus route or rail line.
- b) Pedestrian routes and crossing facilities are to connect the pedestrian network to public transport stops
- c) The pedestrian routes and their road crossings are to be located conveniently to designated bus stops.
- d) An indicative bus route is indicated on Figure 23 below.

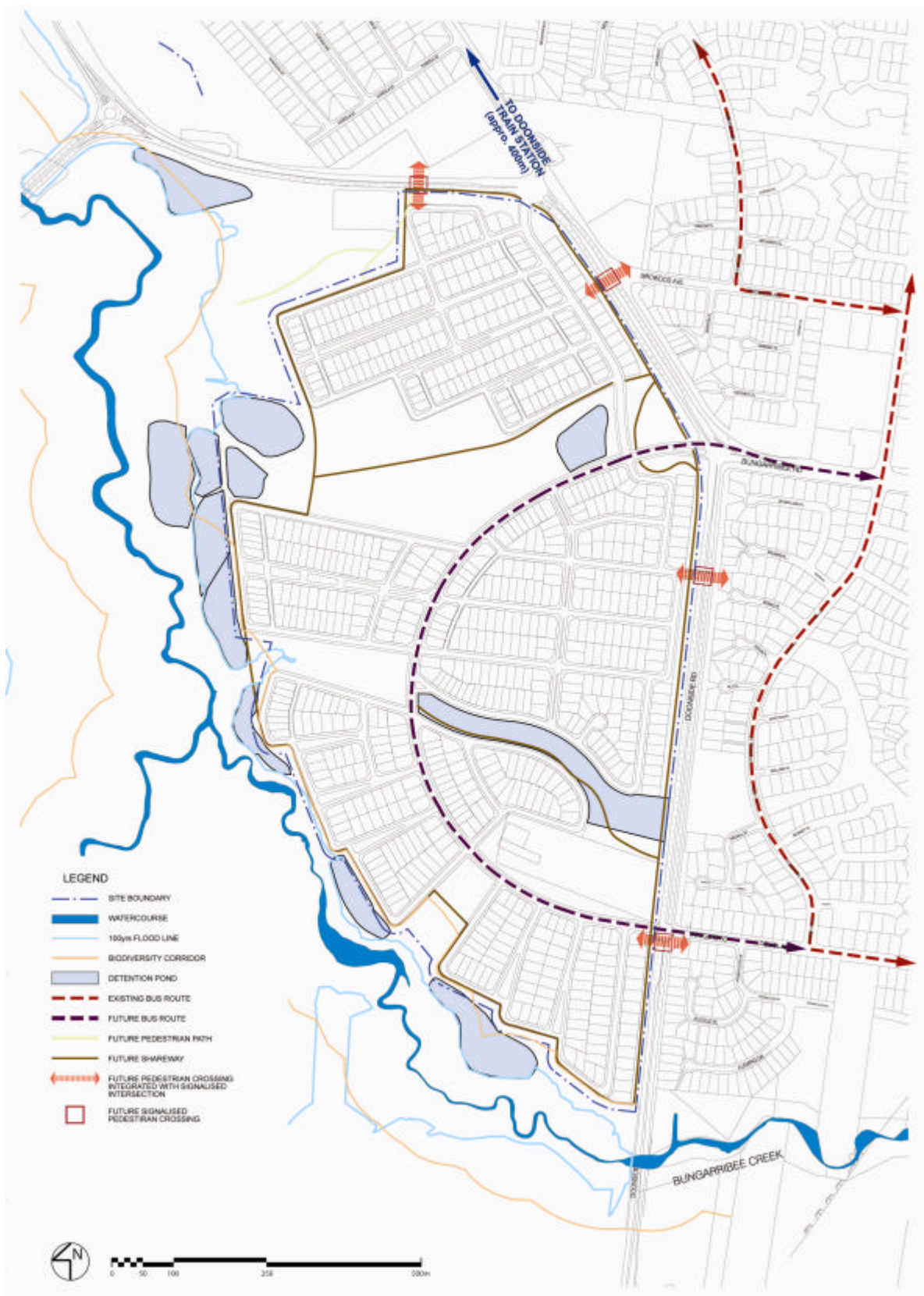


Figure 23: Pedestrian access and public transport

4 Infrastructure

4.1 Water and sewer

Objective

- To establish core infrastructure is to be established at the early stages of development.
- To ensure the orderly development of the land and assist in the coordinated programming and provision of sewer and water infrastructure.
- Minimise the use of potable mains water.
- Promote and encourage the re-use of stormwater both passively and actively.
- Minimise ground infiltration.

Controls

- a) All new residential dwellings are to demonstrate compliance with State Environmental Planning Policy – Building Sustainability Index (BASIX). Potable mains water can be reduced through demand management including the installation of water efficient fixtures and using alternative sources of water based on matching water quality to uses on a fit-for purpose basis.
- b) Potential alternative water sources including wastewater and stormwater to meet non-potable demand on the site are to be investigated. Where reticulated recycled water is available from the local water utility, it must be used for appropriately matched uses such as toilet flushing, garden watering etc.
- c) The use of non-potable water sources for public open space irrigation is required.
- d) The design and construction of sewer and water services are to conform to the standards of Sydney Water.
- e) Mains water supply is to be made available to every lot.
- f) Mains water supply is to be provided within the road reserve wherever possible.

4.2 Electricity, telephone and gas

Objectives

- To establish core infrastructure at the early stages of development.
- To ensure the orderly development of the land and assist in the coordinated programming and provision of electricity, telephone and gas infrastructure.
- Shared (common) trenching is to be utilised to reduce restrictions on landscaping within road verges.
- Ensure that site facilities are functional and accessible to all properties and are easy to maintain.
- Ensure that site facilities are integrated into development in an unobtrusive manner.

Controls

- a) Underground services are required for all utilities, including electrical services, where possible.
- b) Garbage and recycling facilities are to be integrated with the overall

-
- design of buildings and landscaping.
- c) Modern telecommunications infrastructure and services such as high speed internet services are to be provided (subject to negotiations with the relevant service providers).

4.3 Water cycle management

Objectives

- Stormwater runoff from the development as well as the catchment to the east of the development which flows through the site, is to meet the following pollution reduction targets:
 - total suspended solids – 80% reduction in the average annual load from that typically generated from an urban catchment;
 - total phosphorous (TP) and total nitrogen (TN) - 45% reduction in the average annual load from that typically generated from an urban catchment;
 - litter and gross pollutants will be removed from stormwater leaving the site; and
 - Hydrocarbons, oil & grease: 90% total annual load, total hydrocarbon discharge < 10 mg/L
- The configuration and sizing of appropriate WSUD measures to meet the stormwater quality should be identified in accordance with a WSUD Strategy documented for development application. Compliance with these targets is to be determined through stormwater quality (MUSIC) modelling in accordance with the WSUD Strategy.
- Post-development storm discharges to equal pre-development storm discharges for the one and a half years ARI event, so as to minimise the impact of frequent events on the natural waterways and to minimise bed and bank erosion.
- Post-development storm discharges up to the 100 year ARI event need to be controlled so as to avoid any increases in the peak discharges in Eastern Creek and Bungarabee Creek.
- The adoption of stormwater management measures which minimise impacts on soil salinity.

4.3.1 Source controls

- a) Stormwater quality controls are to meet the development objectives and can include a combination of gross pollutant traps, bio-retention systems, rain gardens and wetlands. These systems can be located as discrete individual elements, as larger regional elements or a combination thereof.
- b) Modelling at the detailed design stage for the WSUD Strategy should determine the appropriate size, configuration and location of these elements.
- c) All WSUD elements are to minimise any potential impact on soil salinity.

4.3.2 Downstream controls

- a) Retarding basins are to be provided within the development so that the one and a half year ARI event equals the pre-development one and a half year ARI event.

4.3.3 Minor and major drainage controls

The drainage system is to consist of the following components:

- a) Minor drainage system - Pipe and street system able to convey runoff safely through the development up to the 5 year ARI storm.
- b) Major drainage system - Overland flow paths must be designed to convey the 100 year ARI flows.
- c) Combined retarding/wetlands to provide necessary quantity/quality controls while being able to cope with 100 year ARI flows.

4.4 Soils management

Objective

- Control sediment and erosion during construction.

Controls

- a) An Erosion and Sediment Control Plan is to form part of any Construction Certificate Application.
- b) The Erosion and Sediment Control Plan is to provide best practice solutions towards soil and water management.
- c) All works and proposed works are to conform to relevant Council requirements, plans and codes.

4.4.1 Cut and fill

Controls

- a) The maximum height of retaining wall elements within a precinct is to be 2m. Where filling requires a retaining wall element to be greater than 2m in height, the retaining wall is to be terraced with minimum 1.5m wide intermediate benches. If retaining walls are required on individual residential lots, the maximum height is 1m.

4.5 Salinity

Objectives

- To manage and mitigate the impact of, and on, salinity.

Controls

- a) Subdivision applications where affected by saline soils are to be accompanied by a Salinity Management Plan prepared by a suitably qualified consultant, reporting on the conditions of the site, the impact of the proposed subdivision on saline land, the mitigation measures that will be required design and construction and a requirement that the consultant signs off on the Construction Certificate Drawings and Works as Executed Plans for the project on completion.

4.6 Tree retention

Objective

- Ensure the protection and enhancement of existing trees where practical outside the necessary fill areas.

Controls

- a) A Tree Survey Plan is to be submitted with each subdivision DA.
- b) The Tree Survey Plan is to identify the location, type and condition of all existing trees and is to indicate those trees proposed to be removed and those to be retained.
- c) Existing significant trees are to be retained wherever possible.

4.7 Weed management

Objectives

- Prevent the spread of weeds from the Bungaribee to the Western Sydney Parklands.
- Control the spread and intensification of existing weed species within Bungaribee.
- Prevent the introduction of new weed species to Bungaribee.
- Reduce existing weed populations within Bungaribee.

Controls

- a) Landscaping in accordance with an approved landscape plan is to be established as soon as practicable following completion of construction to prevent weeds from infesting disturbed ground.
- b) All mulch and topsoil utilised in landscaping is to be certified weed free by the material supplier or landscaper.
- c) Any plant species identified within the Noxious Weeds Act 1993 are not to be used in any landscaping scheme.

5 Housing: built form controls

5.1 Introduction

The pattern, scale and types of dwellings are important elements in creating a successful residential neighbourhood.

The following sections set out the objectives and controls that relate to the design and development of dwelling houses, dual occupancy housing, integrated housing, medium density housing and studios.

5.2 Streetscapes

The character of the frontage of a house is a major contributor to the streetscape and the overall neighbourhood. The frontage includes the design of the façade, the design of gardens and fences and the selection of trees and shrubs. It also includes the letterbox, garage and driveway.

Objectives

- Ensure that streetscapes are varied, interesting and well designed.
- Ensure that the interface between private and public space is clearly defined.
- Ensure that gardens include a component of native vegetation
- Ensure that trees in the backyard are visible from the street thereby adding to the landscape quality of the street.
- Ensure the garage and driveway does not dominate the façade.

Controls

- a) There are to be a maximum of 6 houses of **exactly** the same product type in a single street block.
- b) The front boundary is to be defined by either, a low fence, shrubs, hedging or mounding. **Houses facing the Heritage Park and the Heritage Vista Park are to have front fences in accordance with Clause 5.8.6. (f).**
- c) The primary frontage is to be in accordance with Figure **24.**
- d) Porticoes, balconies and pergolas are permitted within a 2m articulation zone within the front setback zone.
- e) Building entries are to be legible and obvious from the street.
- f) Garage doors are to have a maximum width of 5m or 50% of the dwelling width, whichever is the lesser and a maximum height of 2.4m.
- g) The driveway is to be a maximum of 4m wide at the boundary and located a minimum of 1.5m from the side boundary.
- h) The garage door is to be set back a minimum of 1m from the main façade of the building and 5.5m from the front boundary.



Figure 24: Frontage diagram

5.3 Dwelling houses

5.3.1 Definition

A 'Dwelling House' is defined in Blacktown LEP 1988 as 'a building containing 1 but not more than 1 dwelling'.

5.3.2 Development controls for dwelling houses

Control	Requirement
Minimum allotment size	450sqm
Minimum frontage width	12m
Minimum lot depth	25m
Private open space	80sqm – 1,2 or 3 bedroom 100sqm – 4 bedrooms or more Generally to be located at the side or rear of the dwelling
Minimum width of private open space	2.5m – directly accessible from living areas
Min dimension of principal private open space	4m x 6m
Setbacks : <ul style="list-style-type: none"> Primary frontage (building) Primary frontage (garage) Facing open space Side (main dwelling) Rear (main dwelling) Side and rear (garage) Corner lots (secondary frontage) 	4.5m – building façade 2m articulation zone permitted within the setback for minor architectural features . 5.5m 3.5m except for lots facing the Heritage Park and the Heritage Vista Park for which the standard primary setback of 4.5m to the building façade applies . 900mm single storey 3m 1.5m – two storey zero – single storey 3m – for max length 9m 4m – along both street frontages for length beyond 9m 3m where frontage is to open space except for lots facing the Heritage Park and the Heritage Vista Park for which the standard secondary frontage setback of 3m for a max length of 9m and thence 4m applies.
Max no. storeys	2, upper storeys are to have smaller floor plate than ground level.
Max building depth of second storey component	14m
Max height dwelling	7.2m to uppermost ceiling 10m to ridgeline
Max height of carport	3.5m
Car parking spaces	2 with at least one covered
Garage minimum internal dimensions	Single – 5.5mx3.0m Double – 5.5mx5.5m

Control	Requirement
Max carport and garage door width	Not more than 5m wide or 50% of the dwelling width – whichever is the lesser.

5.4 Dual occupancy

'Dual Occupancy Housing is defined as two dwellings on a single allotment of land, whether or not the dwellings are attached where:

- The dwellings have the general external appearance, character and scale of a dwelling house or dwelling houses; and
- The part of the allotment on which the dwellings are not situated is available for use by the residents of the dwellings.

Dual occupancy housing includes:

- The alteration or addition to an existing dwelling house erected on an allotment so as to create two dwellings; or
- The erection of another detached dwelling house in addition to the one already erected on an allotment but only if not more than two dwellings will be created as a result of the development being carried out; or
- The erection of two attached dwellings on an allotment; or
- The erection of two detached dwelling houses on an allotment.
- The subdivision (whether Torrens Title, Strata Title or Community Title) of an allotment on which there are two dwellings as a result of an approved dual occupancy development is prohibited except where the approved development is a detached dual occupancy located on a corner lot.

Control	Requirement
Minimum allotment size	500sqm
Minimum allotment size - corner blocks	600sqm
Minimum lot depth	20m
Floor Space Ratio	0.5:1
Private open space (POS)	80sqm for each dwelling – 1,2 or 3 bed dwellings 100sqm for each dwelling for 4 bed dwellings
Minimum dimensions of principal POS	4mx6m – directly accessible from living areas
Minimum width of POS	2.5m
Setbacks : <ul style="list-style-type: none"> • Primary front (building) • Primary front (Garage) • Facing open space • Side and rear (Main dwelling) • Corner lots (Secondary Street Frontage) 	4.5m – building façade, 2m articulation zone permitted within the setback for minor architectural features. 5.5m garage door 3.5m building façade 1m (main dwelling) Zero – for more length of 10m and internalised 3m – for max length of 9m in the secondary street frontage 4m – along both street frontages for length of frontage beyond 9m

Control	Requirement
	3m – along both street frontages for length of frontage beyond 9m where frontage is to public or community open space
Easement for Zero Lot line	1m – single storey 1.5m - two storey
Maximum no. storeys	2, upper storeys are to have a smaller floorplate than ground level.
Max building depth for any second storey component	14m
Maximum height of dwelling	7.2m – uppermost ceiling 10m – to ridgeline
Maximum height of carport	3.5m
Resident car parking spaces	1 per dwelling – 1 or 2 bedrooms 2 per dwelling – 3 or more bedrooms
Visitor car parking	Visitor parking can be stacked in driveway where garage spaces are provided. Otherwise 1 visitor space to serve both dwellings is to be provided off the driveway.
Garage and parking space minimum dimensions	Covered – 3m width, 5.5m length Uncovered – 2.5m width, 5.2m length
Maximum carport and garage door width	Not more than 5m wide or 50% of the dwelling width, whichever is the lesser.

5.5 Integrated housing

5.5.1 Definition

“Integrated Housing ‘ is defined as development that consists of:

- a) the subdivision of land into 5 or more allotments; and
- b) the erection of a single detached dwelling house on each of the allotments created by that subdivision, where a single application for consent for the subdivision and other development is submitted. Further, each proposed allotment must have a site area of 250 square metres for attached or semi-detached dwellings or 300 square metres for detached dwellings.

The definition of a ‘detached dwelling house’ is contained within Blacktown LEP 1988: a ‘detached dwelling house is a dwelling house that is not attached to another dwelling house by a common wall, ceiling, floor breezeway, carport or any other structure’.

Integrated housing differs from most other forms of residential development in that a Development Application must be made for the both the subdivision and the proposed development concurrently. Once approved, no further Development Application is required.

5.5.2 Design principles

Integrated housing presents the opportunity to consider all aspects of the building and site design together, to be combined effectively to create a functional and attractive residential environment.

It is essential in any integrated housing development that all proposed dwelling houses are shown to be capable of being accommodated on proposed allotments without compromising Council's requirements,

particularly solar access and privacy.

All integrated housing developments are to be designed so as to ensure a compatible relationship between dwelling houses with the development and dwellings on adjoining land.

5.5.3 Development application requirements

Any person undertaking an integrated housing development is required to submit a combined development application to Council for the construction of the dwelling houses and subdivision of the land.

Factors which are to be considered in the layout of an integrated housing development include:

- Slope and orientation of the land,
- Energy efficient design of subdivision and dwelling houses,
- Solar access to adjoining dwellings,
- Adequate visual and acoustic privacy to each dwelling house,
- Relationship to adjoining dwellings,
- Retention of special qualities or features such as trees and views,
- Provision of adequate site drainage,
- Provision for landscaping and private open space, and
- Existing landscape character.

Allotment orientation is to take into account the type of dwelling to be constructed on the site. Internal living and external private open space areas are to be generally orientated to the north. Dwelling houses are to be positioned so that the possible overshadowing impact of and on existing or future adjoining dwellings is minimised.

In determining the suitability or otherwise of any integrated housing proposal, Council will give consideration to the above matters together with those specified in Section 79(c) of the Environmental Planning and Assessment Act 1979.

5.5.4 Development controls for integrated housing

Control	Requirement
Minimum allotment size	250sqm where attached
Minimum frontage width	10m
Floor space Ratio	0.55:1 – measured as an average over entire development and excludes garages
Private open space (POS)	80sqm – 1,2 or 3 bedroom 100sqm – 4 bedrooms or more Generally to be located at the side or rear of dwelling
Minimum dimension of Principal POS	4mx6m – directly accessible from living areas
Minimum width of POS	2.5m
Setbacks	
Primary front (building)	4.5m – building façade. 2m articulation zone permitted within the setback for minor architectural features.
Primary front (garage)	5.5m – garage door
Facing open space	3.5m building facade
Side and rear (garage)	Zero – for a max length of 10m and

Control	Requirement
Corner lots (Secondary street frontage)	internalised within the development 3m – for a max length of 9m on the secondary street façade 4m – along both street frontages for a length of frontages beyond 9m 3m – along both street frontages for a length beyond 9m where frontage is to open space.
Zero lot, max wall length	10m – one side wall may be built on the boundary for a maximum continuous length
Easement for zero lot line	1m – single storey 1.5m – two storey
Max no. of storeys	2, upper levels are to have a smaller floorplate than ground level.
Max height of dwelling	7.2m - uppermost ceiling 10m - ridgeline
Max height of carport	3.5m
Garage and parking space minimum dimensions	3.5m width 5.5m length
Max carport and garage door width	Not more than 5m wide or 50% of dwelling width, whichever is the lesser
Resident car parking spaces	2 – parking may be in tandem. Both spaces need to be covered
Visitor car parking	Visitor car parking can be stacked in driveway where garages are provided. Otherwise one space per dwelling for Torrens Title or 1 space per 2.5 dwellings for visitor parking.

5.6 Medium density housing

5.6.1 Definition

“Medium density housing” is defined in the Blacktown Local Environmental Plan (LEP) as three or more dwellings on the same parcel of land where each dwelling has an individual entrance and direct private access to private open space at natural ground level for the exclusive use of the occupant of the dwelling but, in the table to Clause 9 of the LEP, does not include any other form of dwellings elsewhere specifically defined in this plan.

Examples of medium density housing include development commonly known as villas and townhouses but does not include dual occupancy housing, integrated housing or any other form of housing specifically defined in Blacktown LEP 1988.

5.6.2 Development controls for medium density housing

Control	Requirement
Minimum frontage width	26m – applications proposing the development of irregular shaped sites will be treated on their merits in terms of their compliance within the spirit of the requirements below.

Control	Requirement
Maximum depth	No greater than 2.75 times the width of the site. On sites approaching the max allowable depth ratio, Council may require buildings to be offset one from the other to create a development that is aesthetically pleasing
Maximum no. of attached dwellings in one group	4 6 when opposite public or community open space
Minimum gap between group of attached dwellings comprising two or more dwellings per group	5m
Minimum gap between group of attached dwellings and a detached dwelling	2.5m
Maximum no. of dwellings of same façade type in a single street block	4
Private open space (POS)	50sqm – 1 bedroom 60sqm – 2 bedroom 70sqm – 3 or more bedrooms Generally to be located at the side or rear of dwelling
<ul style="list-style-type: none"> Minimum dimension of POS Minimum width of POS 	6x4m – directly accessible from living areas 2.5m
Setbacks : <ul style="list-style-type: none"> Primary frontage (building) Primary frontage (garage) Facing open space Side and rear (main dwelling) Side and rear (garage) Corner lots (secondary street frontage) 	4.5m – building façade 2m articulation zone permitted within the setback for minor architectural features . 5.5m garage door 3.5m building facade 1m single storey 1.5m two storey Zero – for a max length of 10m and internalised within the development 3m – for a max length of 9m on the secondary street façade 4m – along both street frontages for a length of frontages beyond 9m 3m – along both street frontages for a length of frontages beyond 9m where frontage is to open space
Easement for zero lot line	1m – single storey 1.5m – two storey
Minimum gap between groups of attached buildings	5m
Max no. storeys	2 (excludes attic) upper levels are to have a smaller floorplate than ground level.
Max building depth of second storey component	14m
Max height dwelling	7.2m - to upper most ceiling 10m – to ridge line
Max height of carport	3.5m

Control	Requirement
Max carport and garage door width	Not more than 5m wide or 50% of the dwelling, whichever is the lesser
Car parking spaces	1 per dwelling – 1 and 2 bedroom 2 per dwelling – 3 bed or more 1 space covered – stack parking permitted
Visitor car parking	1 space per 2.5 dwellings
Garage and parking space minimum dimension	Covered – 3m width, 5.5m length Uncovered – 2.5m width, 5.2m length

Other controls

- a) Where there is a common wall between individual medium density dwellings, locate bedrooms away from the common wall if possible.

5.7 Studios and secondary dwellings

5.7.1 Definition

A 'studio' or **secondary dwelling** is defined as a room or suite of rooms no greater than 60sqm in floor area located above a garage and detached from the dwelling. A studio may, but does not have to, contain a kitchen. **If it does not contain a kitchen it is not considered an secondary dwelling.**

5.7.2 Development controls for studios

Control	Requirement
Private open space (POS)	Self contained (with kitchen): 25sqm in addition to normal requirement Non-self contained (without kitchen): no requirement
Minimum width of POS	2.5m
Setbacks <ul style="list-style-type: none"> – Rear – Side 	Zero Zero or garage setback
Car parking	1 space – self contained No requirement – Non-self contained

Other controls

- a) Studios above garages in private driveways can be attached as long as there are no more than 2 in a continuous row.
- b) Studio accommodation is not be located over garages directly opposite in a private driveway unless adequate separation for privacy is achieved.
- c) No more than 1 studio per 7 dwellings.
- d) A studio is to be on the same title as the main residence.
- e) **Studios and secondary dwellings where located above garages may not be located on the primary street frontage of the allotment.**

5.8 Common issues

5.8.1 External appearance

Objectives

- Enhance the streetscape amenity and residential character of the site.
- Create a high standard of architectural design for both individual dwellings and groups of dwellings.
- Consider proportions in the design of the building elevations.
- Reinforce significant street intersections particularly on open space and other key strategic areas through the articulation of corner buildings.

Controls

- a) Articulate the building façades using:
 - Variations in setbacks
 - Material, colour and detailing
 - Building entrances
 - Verandahs, balconies and other elements
 - Shutters, awnings and louvres; and
 - Attention to proportion of openings, window type and size.
 - Attention is to be paid to the design of side and rear facades, as well as the front façade.
 - Attention to the size, colour and location of downpipes, rainwater tanks and roof plumbing.
- b) Corner buildings are to be articulated to address both street frontages by incorporating verandahs, pergolas and an attic storey.
- c) Windows to living areas are to be directed either to the street or rear private open space (and private driveway) to provide visual surveillance to the street and other open space areas.
- d) No bathroom, ensuite or laundry windows are to face a public road unless they have windows of a similar size to those of other rooms on the same street facade.
- e) Building entries are to be clearly visible from the street.
- f) Modulating elements on the façade are to be integral to the design of the building and must not appear to be 'stuck' on.
- g) Attention to both the building base and roof is required. Roofs are to be either pitched between 20 and 40 degrees with simple forms that avoid small pieces of roof with messy flashing details, or designed as a flat or skillion roof.
- h) Communication devices, including antennae, satellite dishes and similar elements are not to be visible from the street.
- i) An eaves overhang of at least 450mm is required, except on party walls and zero lot line walls.
- j) Lightweight material such as boarded cladding may be used to add interest to the façade. Materials such as fibre cement cladding are to be rendered with either a reveal joint or no joint.
- k) Houses are to have a maximum 60% of face brickwork on any one façade.
- l) External colours are to be selected using the following guide:
 - Primary/vibrant colours are to be avoided;
 - Strong/bright colours are to be restricted to highlights and trims;
 - Large areas of white are to be avoided;
 - Large wall expanses are to be coloured in recessive, mid or neutral tones;

-
- Retaining, landscape, garden or courtyard walls are to be of earthy colours;
 - Windows or structural frames are to be in a colour that is darker than that used for the walls.
- m) Carports and garages are to be constructed of materials that complement the colour and finishes of the main dwelling.
- n) Garbage storage areas and clothes drying areas are not to be visible from the public street.

5.8.2 Safety – crime prevention through environmental design (CPTED) requirements

Objectives

- Enhance safety, maximise surveillance and minimise opportunities for crime.

Controls

- a) The front façade is to incorporate verandahs and balconies to encourage surveillance of the street.
- b) Building entries are to be clearly visible from the street. They are not to be obscured by carports or other elements. A covered entry is encouraged. Entries are to be adequately lit.
- c) Habitable rooms such as living, dining and bedrooms are to face the street.
- d) Where garages are located behind dwellings in car courts with private driveway access, measures must be taken to minimise opportunities for crime. These include ensuring there is good lighting and no alcoves or darkened areas. Fencing should be flush with the garage wall face.
- e) Provide lighting both to streets and private driveways sufficient for surveillance.

5.8.3 Privacy

Objectives

- Ensure that buildings are designed and sited to provide privacy between neighbours and between occupants and the public.

Controls

- a) Windows to upper storeys to be located on front or rear facades where possible. Where this is not possible, 1.2m sill heights, translucent glass or screening is required.
- b) Second storey windows to living areas that face directly to windows, balconies or private open space of adjoining properties to be offset.
- c) First floor balconies to living room windows not permitted to directly overlook private open space of adjoining dwellings unless suitable screening is provided.
- d) Maintain adequate privacy between studio accommodation located on private driveways.

5.8.4 Solar access

Objective

- Maximise solar access to private open space and living areas of dwellings.

Controls

- a) Areas of private open space are to achieve at least 3 hours of sunlight to 50% of the required private open space between 9am and 3pm on 21 June. Shadows from fences up to 1.8m high and vegetation are to be assumed to have no effect.
- b) Dwellings to be designed to avoid unreasonable overshadowing of adjacent properties. Buildings are to be designed to ensure that 50% of the on-site private open space on adjoining sites receives a minimum of 3 hours of sunlight between 9am and 3pm on 21 June.
- c) An application proposing a 2 storey dwelling must include shadow diagrams showing the impact of the proposal on site and adjoining sites between 9am and 3pm on 21 June.

5.8.5 Residential landscaping

Objective

- Maximising micro-climate benefits to residential lots.
- Enhance streetscape amenity
- Ensure planting success and continuity.
- Minimise requirements for irrigation and fertilisers.
- Contribute to biodiversity

Controls

- a) Indigenous species to make up a large percentage of the plant material mix.
- b) At least one small to medium shade tree is to be located in the rear yard to create a wildlife corridor down the rear boundaries and to mitigate privacy impacts between dwellings.
- c) Select species for their drought resistance and general robustness.

5.8.6 Fencing

Objectives

- Ensure front fences contribute to the streetscape and create a clear distinction between public and private domain.
- Ensure that rear and side fencing assists in providing privacy to open space areas.
- Ensure that fence height, location and design does not affect traffic and pedestrian visibility at intersections.

Controls

- a) Fences to the street frontage are to be a maximum of 0.9m in height except corner lots.
- b) Fences to corner lots are to be a maximum 0.9m high on the primary street frontage and on the secondary street frontage to a point 4m from the dwelling frontage where it may then increase to 1.8m in height.
- c) Side and rear boundary fencing constructed behind the building alignment setback is to be a maximum 1.8m high and constructed of materials to complement the design of the dwelling. Metal sheeting is not permitted.
- d) The design of front fences is to be compatible with the design of the house.
- e) Front fences and side fences are to be the same design within the front setback. Beyond the main building frontage side fences may be

-
- of a simplified design.
- f) Front fences may be of solid construction to a maximum height of 0.6m. The balance of the fence is to have a minimum opening ratio of 50%. Metal sheeting is not permitted.
 - g) Retaining walls visible from a public place are to be masonry.
 - h) Courtyard retaining walls will require fencing to be positioned on top of the retaining wall.

5.8.7 Water efficiency

Objectives

- Minimise potable water consumption in accordance with Landcom Optimum Sustainability Measure (BASIX 70) which exceeds State Government requirements (BASIX 40).
- Increase stormwater retention and reuse.

Controls

- a) Best endeavours are to be made to achieve the provisions of BASIX 70 for water requirements. This includes, but is not limited to, the installation of 6000 litre underground rainwater tanks.

5.8.8 Energy efficiency

Objectives

- Minimise energy use and greenhouse gas emissions in accordance with Landcom Optimum Sustainability Measure (BASIX 70) which exceeds State Government requirements (BASIX 40).

Controls

- a) Best endeavours are to be made to achieve the provisions of BASIX 70 for energy requirements. This includes, but is not limited to, the installation of gas boosted solar hot water and 1kW photovoltaic panels.
- b) Maximise cross flow ventilation in all dwelling designs.
- c) Incorporate outdoor clothes lines and drying areas into all dwellings.
- d) Provide generous ceiling heights to accommodate ceiling fans plus access to natural light.
- e) Use verandahs pergolas, balconies, awnings and other sunshading devices to provide shade to windows and walls on northern and western elevations.
- f) If the only suitable roof surface for locating solar collectors faces the street, careful consideration is to be given to their positioning and detailing. Solar hot water tanks are not permitted on a roof that faces the street.

5.8.9 Services

Objectives

- Ensure that services are not visually intrusive.

Controls

- a) All electrical reticulation within the site is to be underground.
- b) If an electrical substation is necessary (within the site area or on the street frontage of the site) the requirements of both Council and Integral Energy are to be met.

-
- c) Provision is to be made to illuminate all common accessways and driveways to the satisfaction of Council. All common accessways are to be lit at the vehicular footway crossing by an approved means from dusk til dawn utilising light fittings that minimise lightspill into the sky and into the Parklands. Solar powered light fittings are to be used where possible.

5.8.10 Materials selection

Objectives

- Select materials that minimise the use of non-renewable resources.

Controls

- a) The selection of materials for pipe infrastructure, foundation and brickwork are to have sulphate resistant properties to cope with saline conditions.
- b) Specify where possible, the use of recycled and renewable materials.
- c) Materials are to be selected with consideration to their durability, appearance and diversity.

5.8.11 Salinity

Objectives

- Manage and mitigate the impacts of, and on, salinity.

Controls

- a) Salinity is to be considered during the siting, design and construction of dwellings including drainage, vegetation type and location, foundation selection, cut and fill activities, to ensure the protection of the dwelling from salinity damage and to minimise the impacts that the development may have on the salinity process.

5.8.12 Noise

Objectives

- Ensure appropriate acoustic amenity inside dwellings adjacent to Doonside Road and Eastern Road.

Controls

- h) Dwellings on lots affected by noise impacts from Doonside Road or Eastern Road are to be single storey or two storeys with acoustic treatments to the second floor facades facing Doonside Road or Eastern Road as follows:
- Minimum single skin brickwork,
 - Windows to habitable rooms may be openable but must be well sealed and glazed with minimum 6.38mm thick laminated glazing,
 - 2 layers of 13mm thick plasterboard and 200mm thick insulation is required to ceilings in rooms facing Doonside Road or Eastern Road,
 - Doors to rooms facing Doonside Road or Eastern Road are to be solid core with surround seals.
- i) Lots to which these controls apply are shown on Figure 25 below.



5.8.13 Flood liable land

All development on the site is deemed to be flood liable where such land lies below the level of the Probable Maximum Flood (PMF).

Objectives

- Conform to the NSW Government's Floodplain Management Manual 2001 and Blacktown Council's requirements with respect to development on flood liable land.

Controls

- d) Dwellings below the line of the Probable Maximum Flood are to be designed in accordance with the requirements of the NSW Government's Floodplain Management Manual 2001 Appendix I Land Use and Development Guidelines.