CHAPTER 6.2 HAMLYN TERRACE – LOUISIANA ROAD INFILL PRECINCT (LRIP)

1.0 INTRODUCTION

The purpose of this Chapter is to provide specific development guidelines for the Louisiana Road Infill Precinct (LRIP).

1.1 Objectives of this Chapter

- To provide a high quality and varied residential environment with accessible open space, retail and community facilities
- To provide attractive streetscapes which reinforce the function of a street and enhance the amenity of dwellings
- To provide opportunity for a variety of housing types
- To provide a safe and efficient system of roads and pathways for vehicular, pedestrian and cycle movements
- To provide for the protection and enhancement of the environment
- To create a mix of housing promoted with denser development responding to amenity and proximity to local services
- To create a clear urban structure defined by site responsive design through a connected series of 'special places'
- To retain and restore flood affected bushland areas to form part of the wider vegetation corridor
- To adopt water sensitive urban design that employs best practice in quality and quantity controls
- To use existing infrastructure where possible
- To conserve *Grevillea parviflora* and other significant species and communities
- To support the establishment of new Centres at Warnervale and at Wadalba through appropriate Density and design
- To support public transport initiatives and resultant improved air quality emission/sustainability objectives

1.2 Land to which this Chapter Applies

This Chapter applies to land as shown on Figure 1

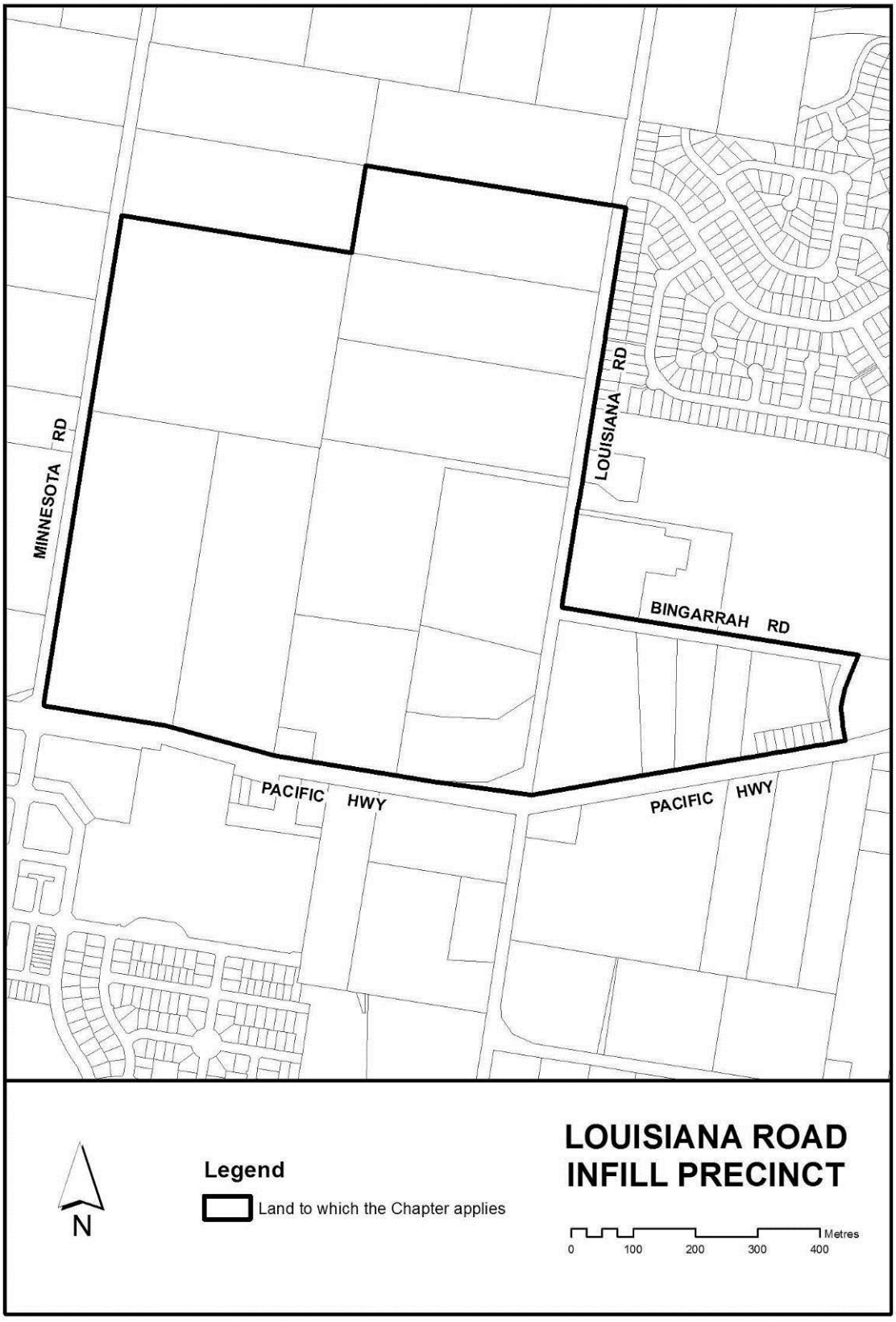


Figure 1 Land to which Chapter 6.2 applies

1.3 Relationship to other Chapters and Policies

This Chapter should be read in conjunction with other relevant Chapters of this Development Control Plan and other Policy Documents of Council, including but not limited to:

- Chapter 2.1 – Housing and Ancillary Structures
- Chapter 2.4 – Multi Dwelling Housing
- Chapter 2.11 – Parking and Access
- Chapter 3.6 – Tree and Vegetation Management
- Section 4 – Subdivision
- Chapter 6.17 – Warnervale East/Wadalba North West
- Council's Civil Works Design Guideline and Construction Specification

Where any inconsistencies arise with the provisions contained in this Chapter, this Chapter shall prevail.

2.0 DENSITY DISTRIBUTION

The Masterplan for this area nominated a residential density target of 13 dwellings per hectare for the LRIP and noted that the LRIP provided the scope for mixed housing to be located within the precinct closer to the Wadalba Village centre. Therefore a higher residential density target applies for the area denoted as Precent B with lower targets in Precincts A and C (refer Figure 2 below).

OBJECTIVES AND PRINCIPLES

- The criteria for the location of denser housing forms follow the principle of highest density at locations of high amenity or accessibility. Therefore, density locations reflect:
  - proximity to Wadalba centre and its facilities
  - proximity to public transport stops
  - proximity to open space
- Locations adjacent to the Wadalba Village centre have the best opportunities for denser housing forms to support local facilities, public transport and walkability.
- Other nodal points where bus stops will be located also present opportunities for denser housing forms, creating small local "places".
- Locations around open space and the central environmental corridor are particularly suitable for denser housing, with attached town houses generally to the north of spaces where they will not overshadow their own rear garden (other than those fronting the floodplain) and small lot or courtyard houses on the other frontages.
- The underlying zones of the three villages will have a major bearing on potential residential densities. Precinct B has been zoned Zone R1 to enable a mix of low and medium density housing to occur closer to the Wadalba Village centre.

- The remaining villages, Precinct A and Precinct C do not have the proximity advantage of Precinct B and therefore the underlying zone is a Zone R2 which allows for lower density single dwelling housing.

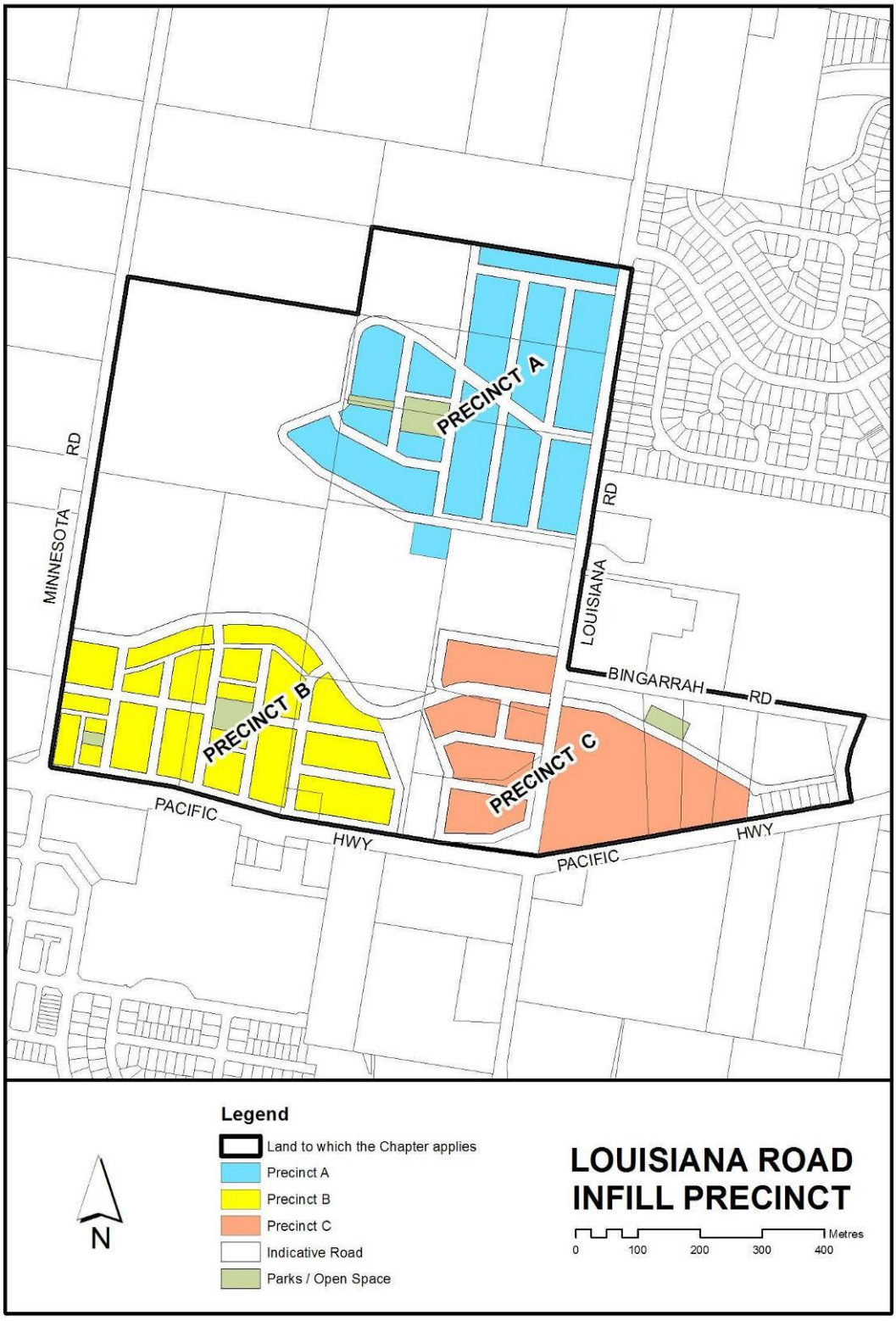


Figure 2 Density distribution map

REQUIREMENTS

a Housing density generally determined by proximity to Wadalba Village Centre.

b Lots smaller than 450 square metres shall be considered as Small Lot Subdivision and comply with Part 4 - Subdivision.

c Smaller lots are to front areas of higher amenity, such as local parks and the bushland floodplain.

d An overall density of 13 dwellings / ha must be achieved in the Louisiana Road Infill Precinct. This is to be achieved by applying the following minimum density requirement for each precinct as shown on the Figure 2 - 14.5 dwellings / ha in the Precinct B and - 12 dwellings / ha respectively in the Precincts A and C. The density requirements shown on Figures 11, 12 and 17 are indicative of how the overall density requirement of 13 dwellings per hectare may be achieved.

3.0 SUBDIVISION DESIGN

3.1 Streetscape

OBJECTIVES

- To ensure a consistent and pleasant streetscape blending into the surrounding natural environment
- To maintain pedestrian and road safety
- To, as far as possible, preserve the natural features of the area

REQUIREMENTS

a A streetscape plan, and Landscape Design Report prepared by a suitably qualified landscape professional is to be provided with each subdivision application. The streetscape plan shall show:

i the street reserve together with typical cross sections;

ii location and detailing of carriageway pavement, parking bays, bus stops, kerbs, footpath, cycle paths and speed control devices;

iii location and species of proposed trees or other vegetation;

iv location of existing vegetation to be retained and proposed treatments to ensure its health;

v typical dwelling front alignments including any proposed setback variations together with any building detailing proposed to promote special character or identity;

vi any relevant details for front garden treatment, e.g. fences, driveways and landscape themes;

vii any relevant details for the design and location of street furniture - lighting, seats, bus stops, street signs, etc.

b Applicants are required to consult with Council to ascertain preferred design standards for street furniture prior to the lodgement of a subdivision application.

Note: Wider verges are often necessary to provide space for larger trees, varied service requirements or varied parking requirements particularly where densities are 15 dwellings per hectare or greater.

c Street landscaping schemes shall:

i emphasise street tree planting particularly species that attain a minimum height of 8 metres at maturity;

ii select species that are drought resistant;

iii select species that are locally occurring where possible;

iv select species that have a growth habit and propagation that would inhibit weed growth;

v select species that would not obscure street lighting, vehicle sight lines at intersections or overhang the carriageway so as to interfere with service vehicles or buses;

vi require minimal maintenance once established.

3.2 Road Layout and Hierarchy and Public Transport Routes

OBJECTIVES

- To create a legible road hierarchy
- To maintain links to the past by preserving rural road routes
- To provide adequate and safe links between the three villages and to the surrounding locality and regional road networks
- To encourage multiple access nodes to facilitate quick and even dispersal of local traffic to and out of the local street layout
- To ensure all streets are overlooked by dwellings
- To avoid circuitous loops and cul-de-sacs where possible
- To make provision for efficient and convenient local public transport links and stops

REQUIREMENTS

3.2.1 Intersections

a Traffic signals are to be provided on the Pacific Highway at the intersection of Louisiana Road to improve safety whilst catering for the expected traffic movements into / out of the new area and other adjacent areas to the north and south.

b These signals are to be installed by the developer with the first stage of development which has access to Louisiana Road. The installation of the signals is to be carried out in accordance with the requirements of the RMS.

c Roundabouts are to be provided at the intersection of the East-West Collector road and Louisiana Road and the intersection of Louisiana Road and the southern perimeter road of Precinct A.

d A 'B' Type intersection in accordance with Austroads Guidelines is to be provided at the intersection of the East-West Collector road and Minnesota Road.

3.2.2 Access

a No vehicle access is to be permitted to the Pacific Highway between Minnesota Road and Louisiana Road.

b Properties located east of Louisiana Road on the Highway, currently with direct access to the Highway shall provide rear lane access linking into the internal road layout should any redevelopment of these properties be proposed. Rear Lane provision shall be in accordance with the Structure Plan. Affected properties include Lots 1 to 9 DP 201174 shown in Figure 3.

Note: These lots may be prone to flooding. Council should be consulted with regard to any proposed redevelopment of these lots.

c Vehicular access to both Minnesota Road and Louisiana Road is to be denied to those properties located between the Pacific Highway and the 1st intersections to be constructed to the north of the Pacific Highway. This is reflected in the indicative lot layout shown in Figure 8.

d Minnesota Road the East-West Collector Road and Louisiana Road are to be built above the 1% AEP flood level to provide flood free access to the District Centre to the north.

e Landscaping of a nature to discourage access is to be provided along the edge of the LRIP boundary with the Pacific Highway as shown on Figure 4 and the 'Highway Edge' diagram (see Appendix A). The landscaping should include plants that are terete such as Hakeas. Prior to the consideration of any redevelopment of these sites, Council should be consulted to discuss the potential for flooding on these sites.

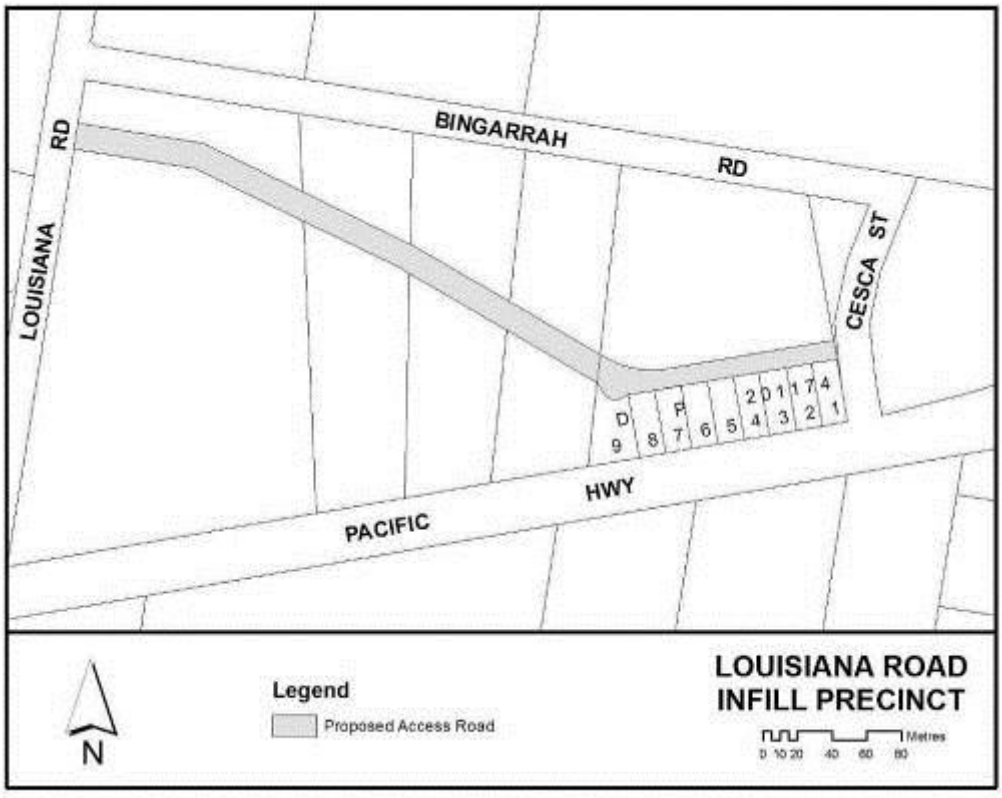


Figure 3 Access to Lots 1 to 9 DP 201174

3.2.3 Public Transport

Public transport is to be accommodated for the LRIP such that every future dwelling shall be within 500 metres walking distance of a bus stop. Bus routes will be located on Pacific Highway, Louisiana and Minnesota Roads.

3.2.4 Road Layout and Hierarchy

The road layout and hierarchy shall comply with Figure 4 and the diagrams in Appendix A. Further detail is provided in Table 1 Road Hierarchy and Layout.

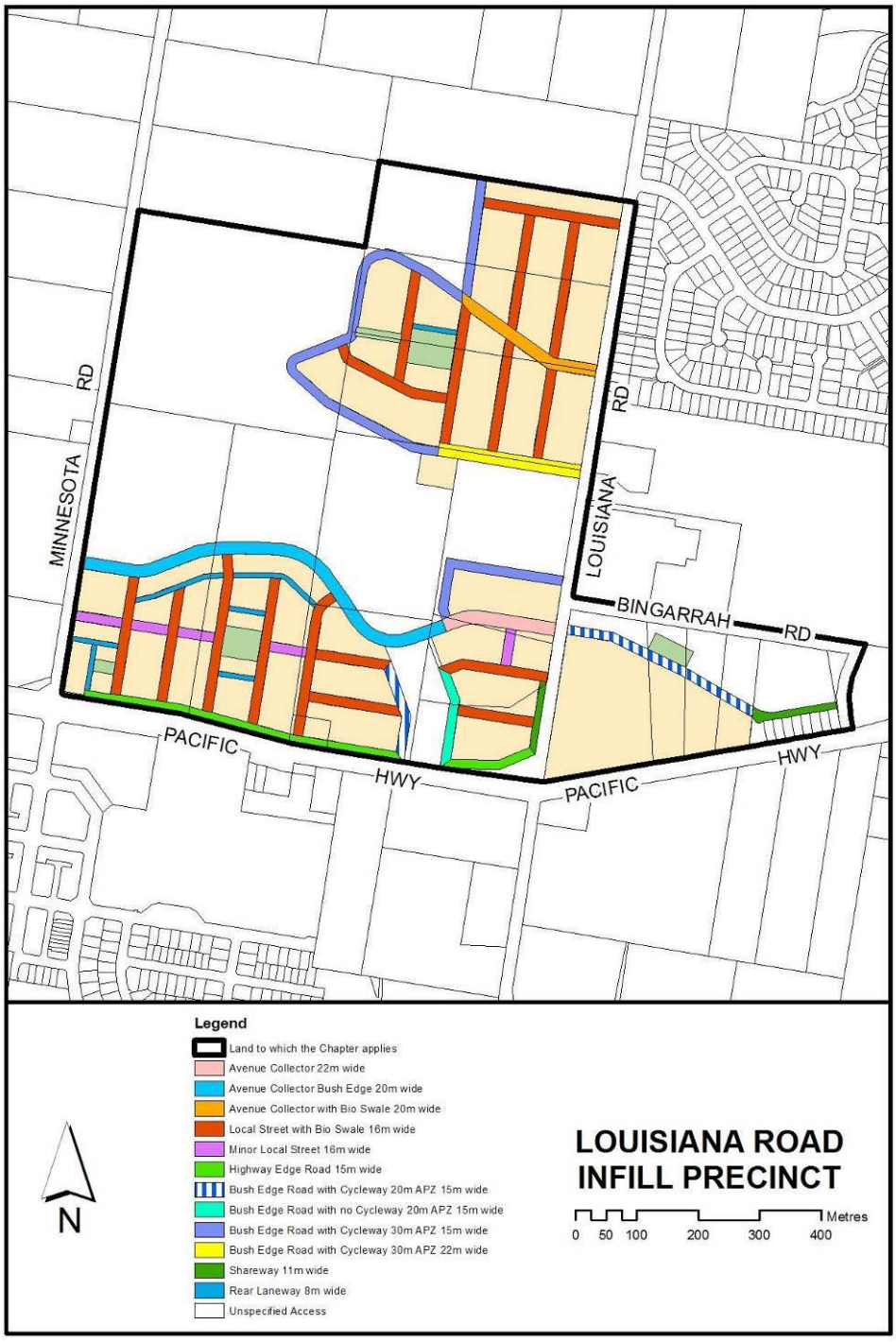


Figure 4 Road typology and hierarchy

Street Type	Indicative Max Volume (per day)	Max Street Speed (km/hr)	Road Reserve Width (m)	Preferred Carriageway / Pavement Width (m)	Parking Provisions within Road Reserve	Kerbing	Paved Footpath Provision	Cycleway Provision	Verge width (m)	Longitudinal Gradient
Avenue Collector	2000	50	22	11	2.5m parking on both sides within carriageway	Upright both sides	1.2 one side 2.5 other side	2.5 off road on one side	5.5m both sides	0.5% to 14%
Avenue Collector – Bush Edge	2000	50	20	11	2.5m parking on both sides within carriageway	Upright both sides	1.2m one side	2.5m Adjacent to but not within road reserve	3.5m Open Space side, 5.5m houses side	0.5% to 14%
Avenue Collector with Bio Swale	2000	50	20	10	2.5m parking both sides within carriageway	Upright one side swale kerb other side	1.2m both sides	None	6.5m to accommodate swale, 3.5m on other side	0.5% to 14%
Local Street with Bio-swales	1000	40	16	7	Within carriageway	Swale kerb one side rolled kerb other side	1.2m both sides	# None	5.5m to accommodate swale, 3.5m on other side	0.5% to 14%
Minor Local Street	1000	40	16	7	Within carriageway	Rolled kerb both sides	1.2m both sides	# None	4.5m both sides	0.5% to 14%
Highway Edge Road	500	30	15	5.5	Within carriageway	Upright Highway side rolled other side	1.2m houses side	Yes on road	4.5m to houses, 5m to highway	0.5% to 14%
Bush Edge Road with Cycleway	1000	40	15	8	Within carriageway	Upright bush side rolled other side	1.2m houses side	2.5m Adjacent to but not within road reserve	5.5m to houses 1.5m other side – Fire track overrun	0.5% to 14%
Bush Edge Road no Cycleway	1000	40	15	8	Within carriageway	Upright bush side rolled other side	1.2m houses side	None	5.5m to houses 1.5m other side – Fire track overrun	0.5% to 14%
Rear Access Laneway	150	20	8	6	None	Rolled both sides		None	0.5m one side 1.5m other side	0.5% to 14%
Shareway	150	20	11	5.5	Within carriageway	Upright both sides	1.2m houses side	None	4.5m to houses 1m other side	0.5% to 14%

Table 1 Characteristics of Street Types for Louisiana Road Infill Precinct

Notes from Table 1:
** Minor Local Street – Vertical kerb adjacent to Reserves*
 # Local Street – 2.0m wide off road cycleway as shown on Figure 19
+ Where upright kerbs are proposed rather than rolled kerbs identified in this table, an additional 0.3m width is to be added to the carriageway pavement and therefore to the overall road reserve width.

3.3 Open Space, Pedestrian and Cycleway Routes

OBJECTIVES

- To provide a range of public open spaces, sufficient for the active and passive recreation needs of residents
- To provide linkages between open space, streets, special places and drainage features to create memorable public domain
- To enhance the appearance, amenity and energy efficiency of urban development through integrated open space and landscape design
- To enable multiple use of open space and open space corridors for recreation, conservation, access and drainage without diminishing the recreation or conservation values of that space
- To provide safe and convenient pedestrian and cycleway networks with clear internal links and connections to external regional network

REQUIREMENTS

a General

i Open space shall be provided which:

- Reflects the positive attributes of the locality and contributes to its character.
- Provides for a range of uses and activities for all members of the community.
- Provides a local focus for social interaction.
- Is cost-effective to maintain.
- Provides or extends bushland corridors and assists the viability of bushland corridors as habitat for native fauna and flora.
- Retains significant natural features including trees.

ii The nature of local parks and natural bushland varies according to intended function and use. This distinction is to be reflected in plans which recognise the different character and function of these forms of open space.

b Local Parks

i Local Parks are to be generally bounded by public streets and/or fronted by dwellings to enhance passive surveillance and provide a desirable outlook for those properties.

ii Local Parks are to be provided in accordance with the locations and sizing shown in the Structure Plan represented in Figure 5.

iii A 5000m^2 local park is to be provided within the Precinct A.

iv A 3000m^2 local park is to be centrally located in Precinct B.

v A 2000m^2 local park is to be provided on the northern edge of the Precinct C.

vi Where dwellings front directly onto local parks, appropriate easements are to be placed within these parks to allow for maintenance of utility services.

c Cycleways and Pedestrian Routes

i The off-road shared path network is to provide recreational and normal access throughout the Louisiana Road Infill Precinct to other external areas. The on-road cycle network and the off road shared cycleway and pedestrian network is to be provided in accordance with Figure 5. Off-road Cycleways are to be generally aligned with the edge roads to optimise passive surveillance and street lighting.

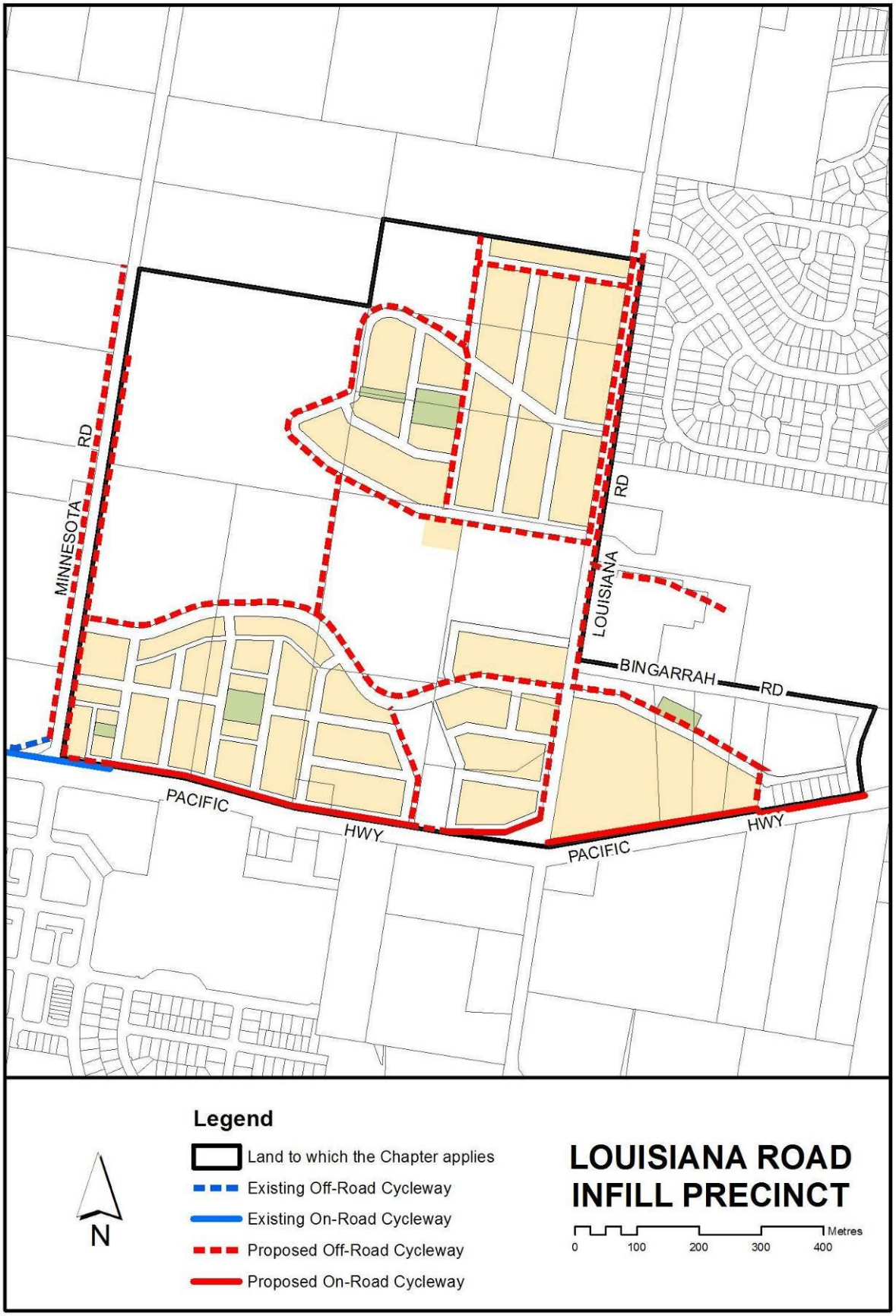


Figure 5 Cycleways and local open space

3.4 Environment and Vegetation Protection

OBJECTIVES

- To maintain biodiversity and protect native flora and fauna species and their habitats (including threatened species and endangered ecological communities) through the designation of public lands
- To protect the environmental and ecological values of land identified as designated public land
- To minimise the impacts of development upon designated public land, during the construction and occupation of adjoining and adjacent residential areas
- To increase awareness and promotion of a culture of protection of environmentally sensitive lands by the community
- To facilitate long term monitoring of the designated public lands to determine changes (if any) to flora and fauna, particularly threatened species, their habitats and endangered ecological communities and recommend actions if required

REQUIREMENTS

3.4.1 Conservation Management Plan

It is noted that Figure 6 shows peripheral portions of some vegetation types will be removed under the development of this precinct. The plan adopts the recommendation of detailed flora and fauna studies and negotiations with DECC (OEH).

A management plan for environmentally sensitive areas of the LRIP is to be prepared and submitted with the first development application for subdivision and shall be complied with during the ongoing development of the Precinct. Detail of the information required should be discussed with Council prior to lodgement. This management plan shall detail measures to provide for the following requirements:

a Rehabilitate areas of floodplain and rehabilitate gaps in vegetation, which provide valuable wildlife habitat. The plan for rehabilitation needs to take account of and be integrated with planning for bushfire asset protection zones (APZs), passive recreation activities and WSUD measures that will be located within the floodplain.

b Restoration works on floodplains shall include revegetation with canopy trees including Forest Red Gum (*Eucalyptus tereticornis)* and Swamp Mahogany (*E. robusta)* to provide winter nectar and pollen source for local fauna.

c Rehabilitate southern drainage line to create a corridor linkage which connects to the Wadalba Wildlife Corridor (to the south of the study area).

d The presence of threatened species *Grevillea parviflora* subsp. *parviflora* in the area excluded from development will require management measures such as the implementation of protection zones around the population to reduce the impact of upslope processes.

e The installation of fauna friendly devices at the point where the drainage corridor crosses the Pacific Highway (if this part of the Pacific Highway is upgraded in the future by the RTA). Principles include:

   i retention of tall trees on either side of the Pacific Highway or the installation of Squirrel Glider dispersal poles to facilitate the dispersal of arboreal fauna over this gap;

ii installation of box-style culverts (or a number of culverts) is recommended over this large drainage line for drainage and safe passage of fauna movements. Depending upon the physical characteristics of the landform and construction requirements for this roadway, a raised box style culvert is preferable across this corridor to increase safe fauna movement along the corridor;

iii revegetation and weed control programs will be required, and the success of such programs shall be monitored. A program is to be developed as part of the management plan and shall establish management actions for this component of the floodplain. Proposed actions will manage the floodplain, and other areas to be transferred into Council ownership. Additional management controls should require the control of sediment and drainage discharge from existing and new residential areas.

f Any facilities within the floodplain corridor including, but not limited to roads, drainage works, and small parks should:

i retain corridors of woodland around, and where possible over, the proposed facilities;

ii not impact on the necessary glide angles and width requirements of the squirrel glider;

iii not compromise the value and connectivity of the environmental corridor;

iv not result in the significant clearing or fragmentation of the remnant vegetation within the area;

v sensitively place services such as water, power and telecommunications, that are unavoidably required to be within the wildlife corridor, so as to avoid, protect or retain known habitat features (e.g. hollow bearing trees, dams, drainage lines, etc).

g No fencing which would prevent movement of ground dwelling mammals, including ground dwelling medium sized mammals, should be erected within the identified floodplain corridor.

h There is to be minimal use of overhead lighting within the floodplain corridor (to ensure nocturnal movements of native species along fauna corridors are maintained and native species are not disturbed by lighting).

i All necessary fire protection measures (asset protection zones, fuel free and fuel reduced zones) are not to impact on the floodplain corridor area. APZs are to be largely contained within the development footprint and/or within already cleared lands.

j Placement and construction of any detention/water treatment structures required within the floodplain are located sensitively and designed and landscaped to enhance habitat values for threatened amphibians and mitigate Identified Key Threatening Processes (e.g. *Gambusia* and frog chytrid).

3.4.2 Vegetation along Eastern Side of Louisiana Road

The existing vegetation, which includes Angophora Costata, located along the eastern side of Louisiana Road south of the Bingarrah floodplain shall be preserved. Any road improvements and widening, footpaths and service provision is to be located outside of the root zone of these trees. An arborist report is to be submitted to and approved with any application for works adjacent to this vegetation.

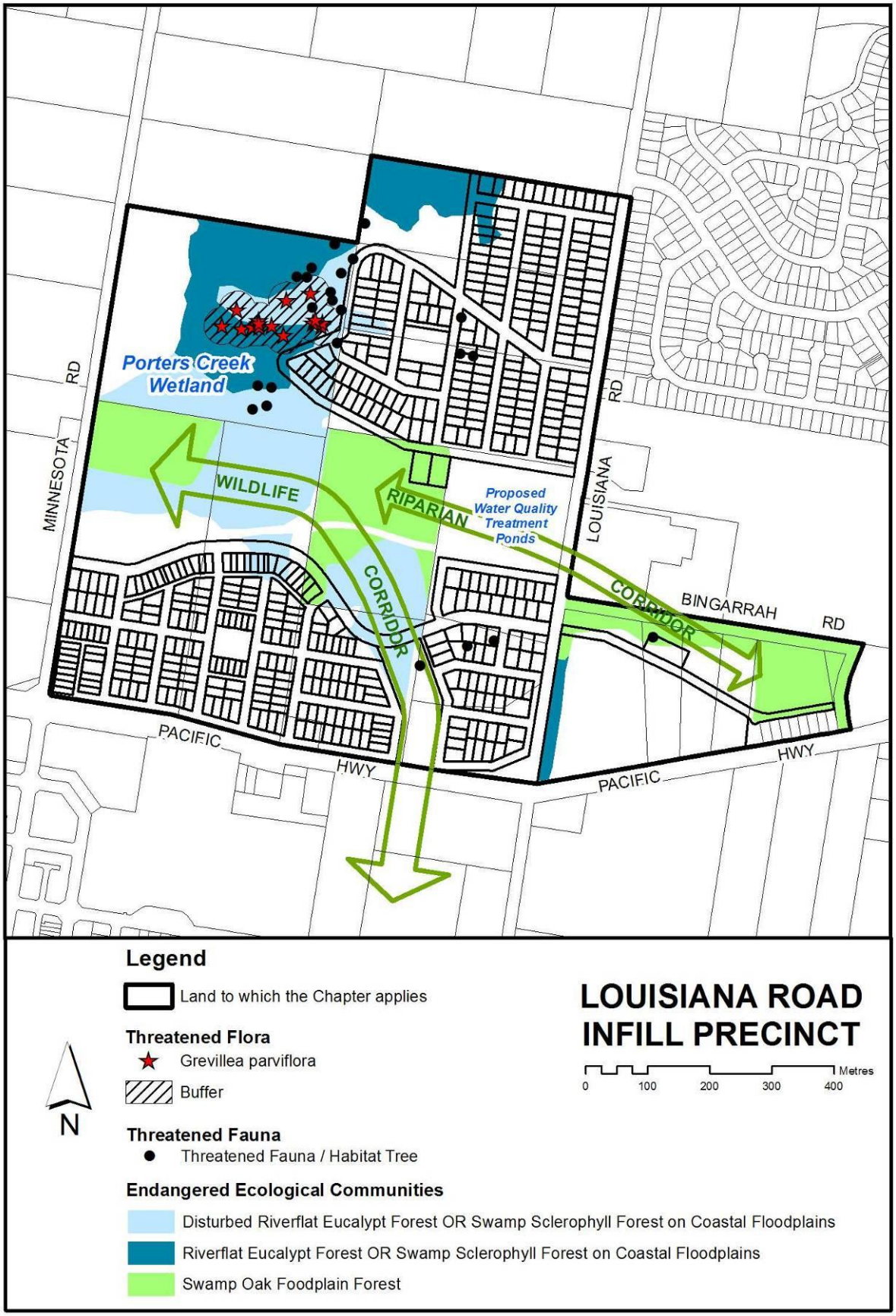


Figure 6 Consolidated environmental constraints and requirements

3.5 Water Cycle Management Requirements

Water Sensitive Urban Design (WSUD) seeks to ensure that development is carefully designed, constructed and maintained to minimise the negative impacts of urban development in the natural water cycle. WSUD utilises contemporize and alternative approaches to urban water management as part of a broader framework of Ecologically Sustainable Development (ESD).

The changes to the natural water cycle (i.e. the creation of an urban water cycle) has an important bearing on the conservation of land resources and biodiversity. A sustainable water cycle makes a significant contribution to the achievement of ESD.

Conventional water supply, stormwater and wastewater practices are largely based on centralised collection, conveyance, treatment and disposal of water flows. By contrast, WSUD promotes a decentralised approach that is attuned to the natural hydrological and ecological processes. It gives greater emphasis to the complete urban water cycle with features designed for on-site collection, treatment and utilisation of water.

A sensitive design response is required for each site meaning that careful consideration must be given to site characteristics such as soil type, slope, water table, rainfall characteristics, scale and density of development, sensitive environments and reuse opportunities.

OBJECTIVES

- To preserve both the flooding and drying hydrology from the development area to the natural wetlands and receiving waters in accordance with the Regional Stormwater Harvesting Scheme (refer to "Louisiana Road infill Precinct (LRIP) Rezoning Plan - Engineering Design Guidelines & Flood Planning")
- To safeguard the environment by improving the quality of stormwater run-off to achieve best practice standards, this shall be done by treating urban stormwater runoff to the standards specified in Council's Stormwater Policy
- To convey all minor storm events from developed areas (up to one-year ARI) to centralised storage basins for the purpose of harvesting stormwater in accordance with the requirements of the Regional Stormwater Harvesting Scheme
- To facilitate the inclusion of WSUD elements into development as an at-source treatment of stormwater whilst balancing with end of line water quality treatment devices in order to meet the required targets and satisfy the Regional Stormwater Harvesting Scheme
- To minimise the piping of stormwater in closed conduits and the use of concrete structures and hard surfaces to convey stormwater
- To preserve the nature of overland flow into the adjacent habitat and Flood Plain
- To control the impacts of urban development on channel bed and bank erosion by controlling the magnitude and duration of sediment-transporting flows
- To limit changes in flow rate, flow duration and overland flow path areas within the floodplain as a result of development. Avoid erosion of watercourses, slopes and banks due to runoff from impervious areas within the development
- To maintain and improve water quality in streams and groundwater systems

- To reduce flood-risk in urban areas and downstream water bodies by adopting requirements for minor and major system flow in accordance with Australian Rainfall & Runoff
- To protect and restore aquatic and riparian ecosystems and habitats
- To protect the scenic, landscape and recreational values of streams and water bodies
- To ensure that WSUD incorporated into residential development is consistent with the State Government's Building Sustainability Index (BASIX)

REQUIREMENTS

a Works are to be designed and constructed in accordance with Council's Civil Works Design and Construction Manual.

b The criteria for Urban Stormwater runoff quality for areas within the Woongarrah Creek/Porter's Creek Catchments are as the following:

i 85% reduction in the post development mean annual load of Total Suspended Solids (TSS);

ii 65% reduction in the post development mean annual load of Total Nitrogen (TN);

iii 45% reduction in the post development mean annual load of Total Phosphorus (TP);

iv Retention of litter greater than 5mm for flows up to 50% of the one-year ARI peak flow;

v No visible oils for flows up to 50% of the one-year ARI peak flow.

Compliance with these standards is to be determined through stormwater quality (MUSIC) modelling.

c WSUD elements must be provided to control suspended solids and nutrients leaving the site and the drainage system shall ensure that no runoff leaves the development area other than via water quality control structures.

d A Soil and Stormwater Management Plan shall be submitted with any Development Application for subdivision (or small lot subdivision development) as is required by Part 4 - Subdivision. This plan must addresses soil erosion, sediment control and stormwater management for the proposed subdivision during the construction phase and over the long term life of the development.

e In addition to the requirements for this plan as outlined in Part 4, the Soil and Stormwater Management Plan (SSMP) shall comply with the requirements outlined in "Louisiana Road infill Precinct (LRIP) Rezoning Plan - Engineering Design Guidelines & Flood Planning".

f The SSMP must utilise water sensitive urban design (WSUD) and shall incorporate a treatment train in accordance with Figure 7. The treatment train is intended to maintain outflow from the developed areas at pre-development levels and shall include the following:

i Demand Management – AAA+ fixtures and appliances, dual flush toilets, water efficient gardens (residential demand management in accordance with BASIX);

ii Rainwater Tanks – Residential tanks where required by BASIX;

iii 'At Source' Stormwater Treatment – Collect runoff and facilitate treatment by integration into landscaped areas, i.e. porous pavements, rain gardens, rainwater tanks, swales;

iv 'Streetscape' Stormwater Treatment – Integrated into road reserves to collect road and allotment runoff by use of bio swales. Street reserve widths of 16 metres or 18 metres will be required to accommodate bio swales to ensure treatment of stormwater prior to discharge to stormwater drainage systems and subsequently the stormwater storage. Roads shall have one-way cross-fall and a flush or broken kerb to facilitate run-off into the swales;

v 'Precinct' Stormwater Treatment – Large treatment systems such as wetlands and bio-retention systems integrated into open space, parkland or landscaped areas to accept runoff from the precinct scale catchments and facilitate treatment prior to discharge to the 'stormwater storage'. These large treatment systems are to be provided on the edge of the Woongarrah Creek floodplain as shown on Figure 7.

vi Stormwater Storage – Stormwater storage sized in combination with rapid drawdown pump rate to remove excess stormwater and deliver the Porters Creek wetland hydrologic objectives. The proposed Regional Stormwater Harvesting Scheme shall draw water from these centralised collection basins as illustrated in Figure 7 (refer to requirement l below regarding interim requirements). The storage basins are to be centralised as much as possible in order to reduce infrastructure such as additional pumps and reticulation.

vii Flow Diversion – Diversion of treated flows up to the one-year ARI along the swales / buffer edges of the creek corridor to bio-retention and/or stormwater storage locations at the base of the catchment, adjacent to the floodplain.

g Where the SSMP varies from the Recommendations of WCP49 supporting documentation, it shall provide justification for the variation and demonstrate to Council's satisfaction that the objectives and key performance criteria outlined above are met by the revised concept.

h Acceptable WSUD elements include the following; swales, bio-retention basins/swales, sand filters, vegetated buffers, rock rip rap channels, ephemeral wetlands, rain gardens. Design of such features shall be in accordance with the accompanying Council guidelines –"Louisiana Road infill Precinct (LRIP) Rezoning Plan - Engineering Design Guidelines & Flood Planning" and Best Management Practise, examples of which are contained in the following documents:

i Water Sensitive Urban Design - Derwent Estuary Management Plan 2006, Natural Heritage Trust;

ii Australian Runoff Quality- A Guide to WSUD, Engineers Australia 2006;

iii WSUD Technical Guidelines for Western Sydney, URS Australia for UPRCT 2004;

iv WSUD engineering Procedures: Stormwater, CSIRO for Melbourne Water 2005.

i Landscaping associated with or adjacent to WSUD elements should be based on plants indigenous to the locality. This will minimise requirements for water, energy, fertilizers and herbicides. This includes the use of native grasses. The landscaping should seek to capture runoff through the use of depressions, swales, rock channels, ridges, reed beds or similar. Details shall be provided in a Landscape design report prepared by a suitably qualified landscape professional with any development application for subdivision or integrated housing.

j WSUD elements such as bioretention systems / swales and constructed wetlands, that employ soil and vegetation based on treatment processes, require at least two growing seasons (i.e. two years) before vegetation in the systems has reached its design condition (i.e. height and density) thus a careful construction and establishment program should be prepared and implemented to ensure the systems establish in accordance with the design intent whilst accounting for the construction works that may be occurring in the catchment. As part of the design development and detailed design on site specific construction and establishment methodology must be documented for these and other IWCM elements (bioretention systems / swales, wetland and storages and reticulation) and the design package submitted to Council as part of the Construction Certification.

k Placement and construction of any detention/water treatment structures required within the floodplain are located sensitively and designed and landscaped to enhance habitat values for threatened amphibians and mitigate Identified Key Threatening Processes (e.g. Gambusia and frog chytrid).

l In the interim and prior to operation of the Regional Stormwater Harvesting Scheme the centralised storage basins shall be designed so as to allow passage of stormwater, up to the one-year ARI flow, into the adjacent floodplain area. (The storages basins will then be modified at a later date for stormwater harvesting by installing pumps and reticulation). Stormwater overflows during the interim period shall be conveyed in a suitable manner so as to minimise erosion and impacts on floodplain hydrology, geomorphology and ecology.

m Construction of the centralised Stormwater Storages as shown in Figure 7 shall take into account future development within the relevant sub-catchments and the corresponding requirements in accordance with the Regional Stormwater Harvesting Scheme. Future storage requirements shall be included in the storage basins which shall be constructed as part of the Warnervale & Wadalba area.

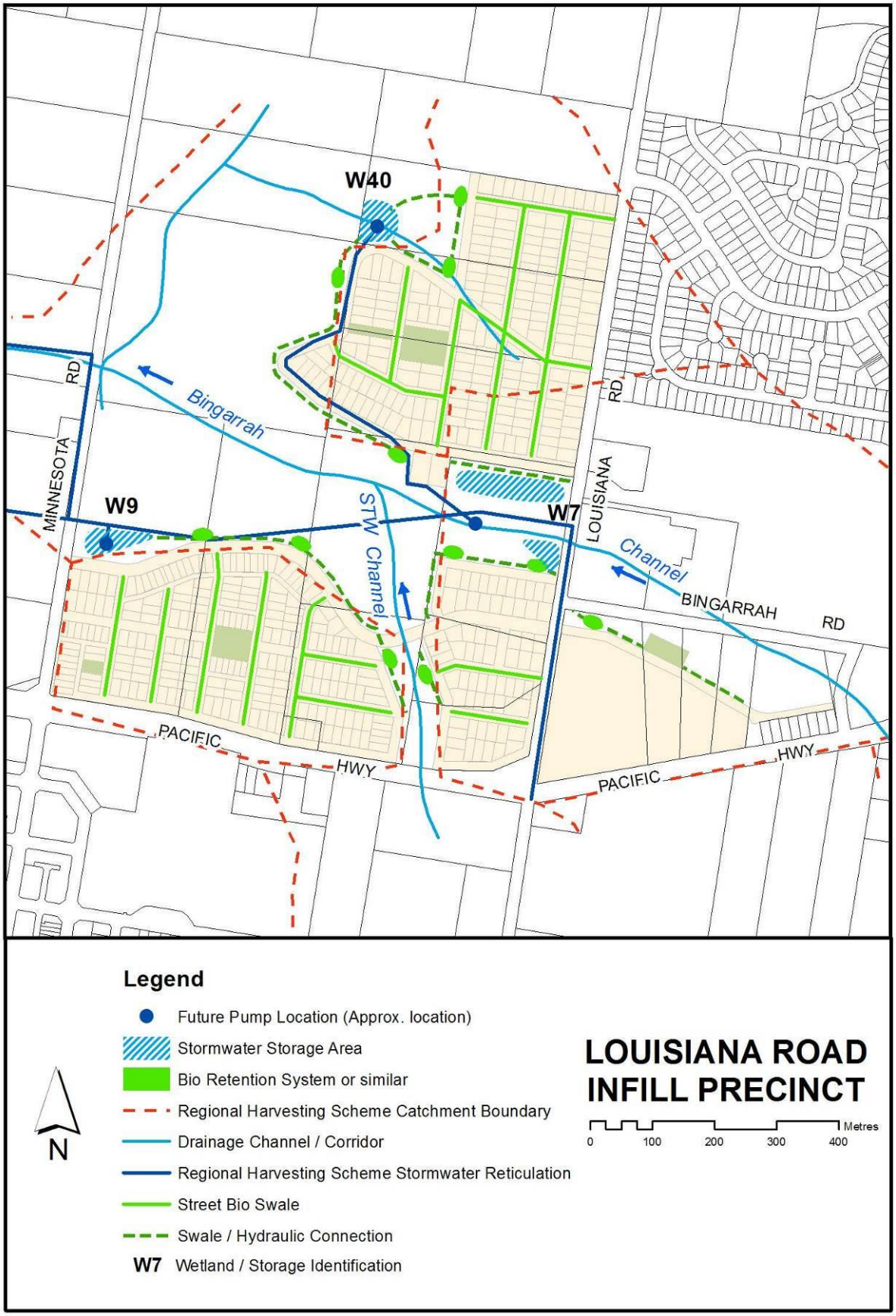


Figure 7 Indicative Water Cycle Management concept plan

3.6 Flood Plain Management and Channel Design

Council has adopted the 1% AEP event as the flood standard to guide planning and flood plain management activities within the Bingarrah Channel Reach and Western tributary, known as South West Channel (refer to Figure 7 for location).

Consideration to proposed flood plain filling has been accounted for in the 1% AEP prediction. The proposed filling is associated with the Warnervale and Wadalba area, comprising approximately 4 locations where the subdivision extents encroach on the fringes of the flood plain. Included in the proposed flood plain filling is an area upstream of Louisiana Road which is part of a separate development.

Flood planning investigation and modelling work as part of the Warnervale and Wadalba area included re-alignment of the existing South West Channel and upgrading of Louisiana Road culvert crossing.

This section is to be read in conjunction with the Council guidelines titled –"Louisiana Road infill Precinct (LRIP) Rezoning Plan - Engineering Design Guidelines & Flood Planning".

OBJECTIVES

- To ensure the subdivision and residential development is established above the 1% AEP flood level and that adequate freeboard to habitable areas is adopted in accordance with Council's Flood Planning Policy
- To ensure access into and out of the proposed residential areas are possible during the 1% AEP storm event
- To enhance and re-instate floodplain and riparian planting in a suitable manner that is consistent with the floodplain modelling and Best Management Practise for Stream Rehabilitation
- To minimise impacts of flood plain filling and channel re-alignment upon native vegetation and identified Ecological Endangered Communities, particularly within the flood plain
- To minimise and mitigate impacts of the proposed development on the Flood Plain and Channels through the adoption of "soft engineering" solutions such as vegetated batters, rock rip-rap channels, natural stone retaining walls, stabilisation through the use of native vegetation, etc.
- To ensure an adequate interface between subdivision infrastructure and the Flood Plain occurs in order to minimise erosion and sediment transport and mitigate impacts on the hydrology, geomorphology and ecology

REQUIREMENTS

a Adopt 1% AEP levels as documented in the report titled "Bingarrah Flood Planning" prepared by Cardno Willing, July 2007. This is presented in the Wyong Shire Council guidelines –"Louisiana Road infill Precinct (LRIP) Rezoning Plan - Engineering Design Guidelines & Flood Planning".

b All residential development to be located on lots identified as being subject to flood related development controls are to comply with the requirements of Chapter 3.3 – Floodplain Management.

c Louisiana Road and proposed subdivision Bush Edge road, connecting Precinct B and C, shall be trafficable in 1% AEP storm event. Culverts are to be sized in accordance with the concept design documented in the guidelines -"Louisiana Road infill Precinct (LRIP) Rezoning Plan - Engineering Design Guidelines & Flood Planning".

d Locate all Bush Edge Roads within the Warnervale & Waldalba area at or above the 1% AEP (see Figure 4).

e All new channel crossings shall be designed and constructed in-accordance with Best Practise Management for Stream design. In particular, road crossings shall be done in accordance with Guidelines prepared by NSW Fisheries "Policy and Guidelines for Fish Friendly Waterway Crossings" and Guidelines for Bridges, Roads, Causeways, Culverts and Similar Structures".

f Design of the South West Channel re-alignment shall be in accordance with Best Practise Management for Stream Design as documented in the "Natural Channel Design Guidelines" prepared by Brisbane City Council.

g Stormwater overflows from centralised storage basins are expected in the interim period prior to operation of the Regional Stormwater Harvesting Scheme. These flows have the potential to impact on the floodplain due to the increased quantity of flow expected from the impervious areas. The interim stormwater overflows shall be managed in a suitable manner so as to minimise the impact on the receiving environment. Soft engineering solutions such as rock riprap spillways, and vegetated channels, level spreaders etc should be used together with careful planning to mimic as much as possible the pre-development condition.

4.0 NOISE ASSESSMENT AND MITIGATION

OBJECTIVE

- To ensure that the residents of future dwellings adjacent to the Pacific Highway (or other significant noise generating roads) are not likely to have their amenity impacted by virtue of excessive noise

REQUIREMENTS

a A report by a suitably qualified acoustic consultant shall be submitted with any development application for subdivision or residential development adjacent to (excluding service roads and buffers) the Pacific Highway or close enough to the Highway that they potentially will be subject to acoustic impact. The report shall provide a detailed assessment of noise within the study area primarily focussed upon the Pacific Highway as the noise source. The Pacific Highway currently carries large volumes of traffic which is expected to increase over time. The site is also affected to a lesser extent by Minnesota Road and Louisiana Roads which both intersect with Pacific Highway. Signals exist at the Minnesota Road intersection and are proposed for the Louisiana Road intersection.

b The report is to address the following:

  i identify existing and potential future noise sources;

  ii identify areas within the precinct where specific development should be restricted due to likely noise;

  iii identify mitigation measures to reduce existing or potential noise effects to allow development to occur while meeting appropriate environmental and amenity requirements.

c Noise assessment measures need to take into account, and be consistent with and/or address:

  i projected traffic volumes along Pacific Highway up to 2018;

  ii preservation of significant vegetation;

iii proposed future land use proposals.

d Mitigation measures shall address not only internal residential amenity but also measures to ensure appropriate private open space amenity.

e A requirement of the Structure Plan for the LRIP is the provision of service roads which run parallel to Pacific Highway with residential development proposed to front these service roads. Hence residential development will not be 'backing onto' the Highway as has been past practice. It is intended for residential development to be visible from the Pacific Highway in order to provide passing pedestrians and motorists a sense of place. Recommendations to mitigate noise will need to be consistent with this design approach. While a combination of landscaping and mounding may be appropriate on land between the service roads and Pacific Highway solid noise fencing is not appropriate.

f Proposed residential development within the area affected by road noise will require a level of amenity appropriate to a residential area. However, if the level of noise in any area of the site is considered to be excessive for particular land uses, this study must identify exclusion or buffer areas where such development should not be permitted.

g Development on lots exposed to Pacific Highway (or other significant noise generating roads) will be required to meet the requirements of the RTA Manual of Acoustic Protection in evaluating appropriate noise attenuation from the Pacific Highway. The design of dwellings exposed to/fronting Pacific Highway are to comply with any relevant requirements of Australian Standard 2107.2000 unless otherwise directed by the report required above.

5.0 RESIDENTIAL DESIGN

OBJECTIVES

- To create housing choice particularly focused within Precinct B
- To cluster denser housing types close to village centre, public transport routes and areas of higher amenity
- To avoid garage dominance on small lots
- To ensure that all dwelling types have a proper street frontage rather than fronting onto internalised driveways

REQUIREMENTS

a A range of dwelling types and lot sizes will be located within the LRIP to provide future residents with housing choice and to enable residents to age in-situ. The primary location for a range of housing types is Precinct B. Precinct B is zoned R1 Residential under WLEP 2013 and permits with appropriate consent land uses such as multi-dwelling housing and attached dwellings.

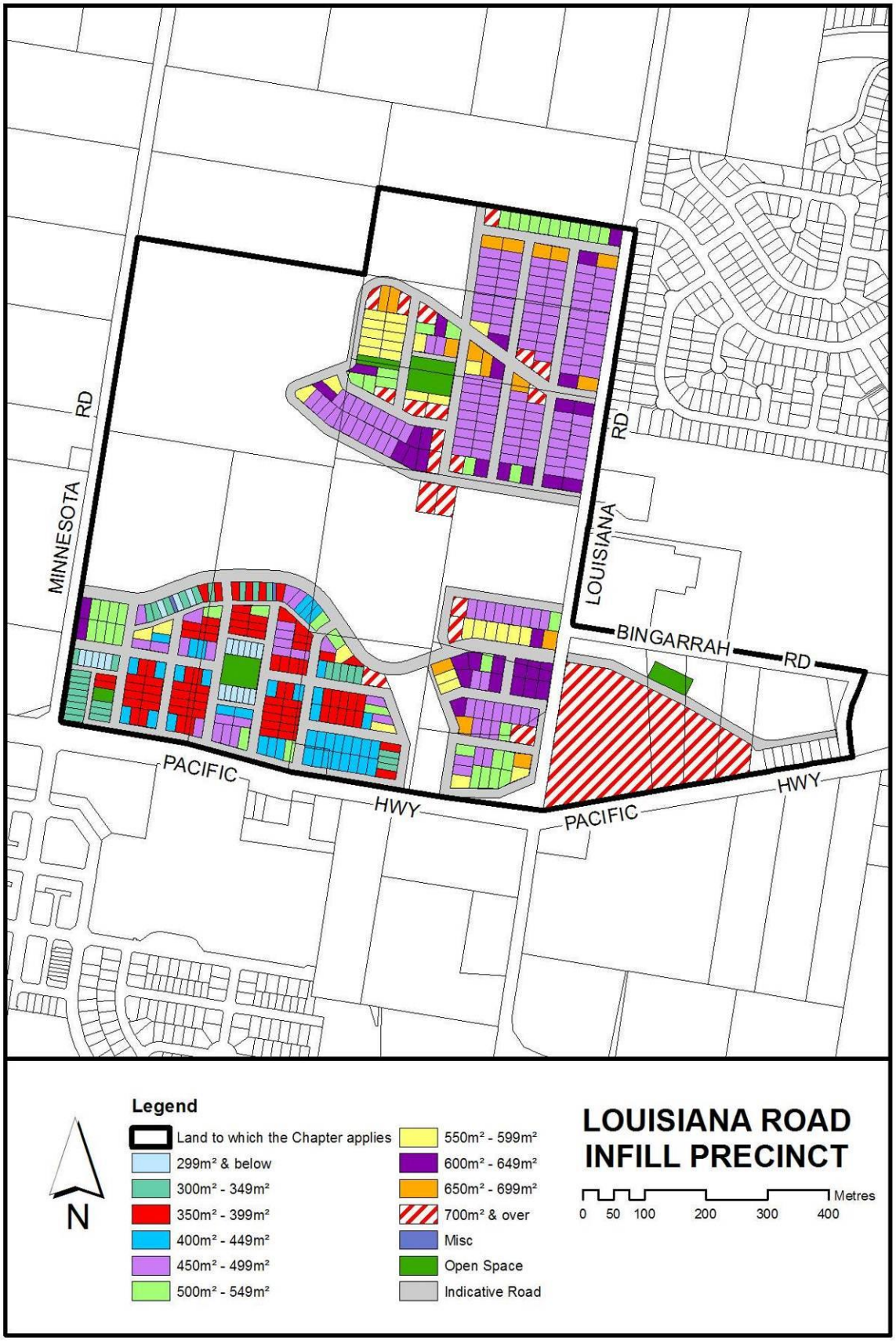


Figure 8 Indicative lot type distribution concept plan

5.1 Residential Development on Northern Portion of Lot 3 DP 208596 Louisiana Road, Hamlyn Terrace

The access handle for Lot 3 DP 208596 (Lot 3) is proposed to accommodate the southern perimeter road for Precinct A. Located at the western end of the access handle is some cleared land that is above the floodplain, which has the potential to accommodate two residential allotments. This section sets out development criteria to ensure that floodplain and bushfire issues are appropriately addressed in the siting and design of dwellings. The zoning of the two allotments is split with the northern flood free component zoned Zone R2 (Residential) and the flood affected southern portion zoned Zone E3 (Environmental Management). All habitable structures are to be located within the Zone R2 (Residential).

OBJECTIVES

- To accommodate two large residential allotments on the southern side of Precinct A's southern perimeter road
- To provide for appropriate siting of dwellings above the floodplain (1% AEP) including freeboard
- To provide for appropriate Asset Protection Zones (APZs)
- To ensure appropriate fencing within the flood affected portions of the two large residential allotments

REQUIREMENTS

a A maximum of two residential lots only shall be sited as indicated on Figure 9.

b The allotments shall have a width of 30 metres, depth of 50 metres and area of 1500 square metres.

c The dwelling design upon each site shall be single storey and ranch style.

d The dwelling houses shall be sited on the envelopes outlined in Figure 9 with a minimum building setback of 6 metres.

e A 30 metre Asset Protection Zone (APZ) applies from the rear boundary of each allotment to the building envelope. The first 10 metres from the rear shall be a Fuel Reduced Zone and the remaining 20 metres closest to the building envelopes being a Fuel Free Zone. No habitable structures shall be located within the APZ.

f The 30 metre APZ and the building envelope are to be notated on the property title for each site.

g An APZ Management Plan is to be prepared and submitted with any development application for a dwelling on each these sites.

h A restriction as to user specifying a minimum floor level of 600mm freeboard above the 1% AEP flood level is to be placed on the title of each of the two allotments.

i Only open wire type fencing with posts that swing from the top are to be situated to the south of the identified building envelopes along the side and rear property boundaries

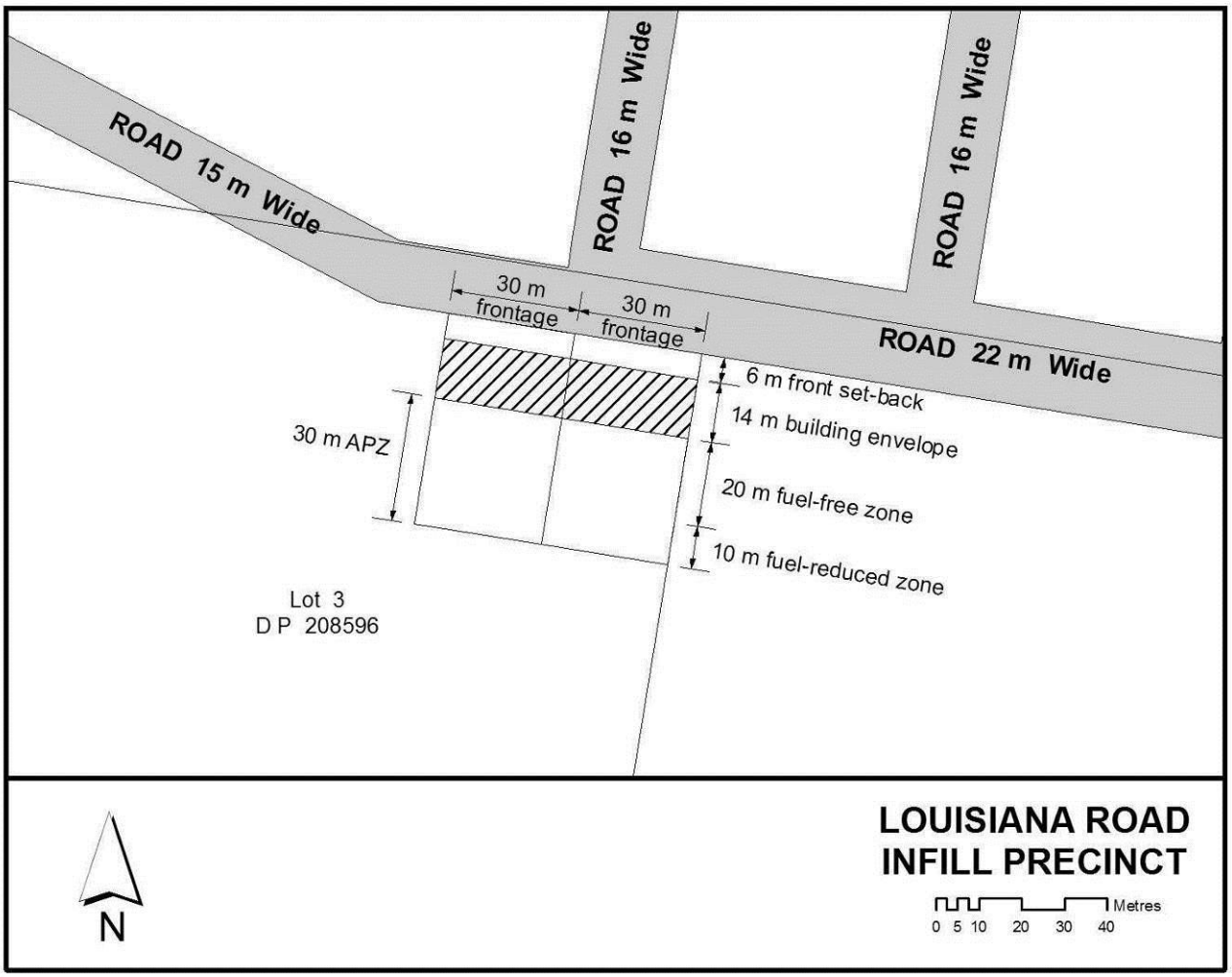
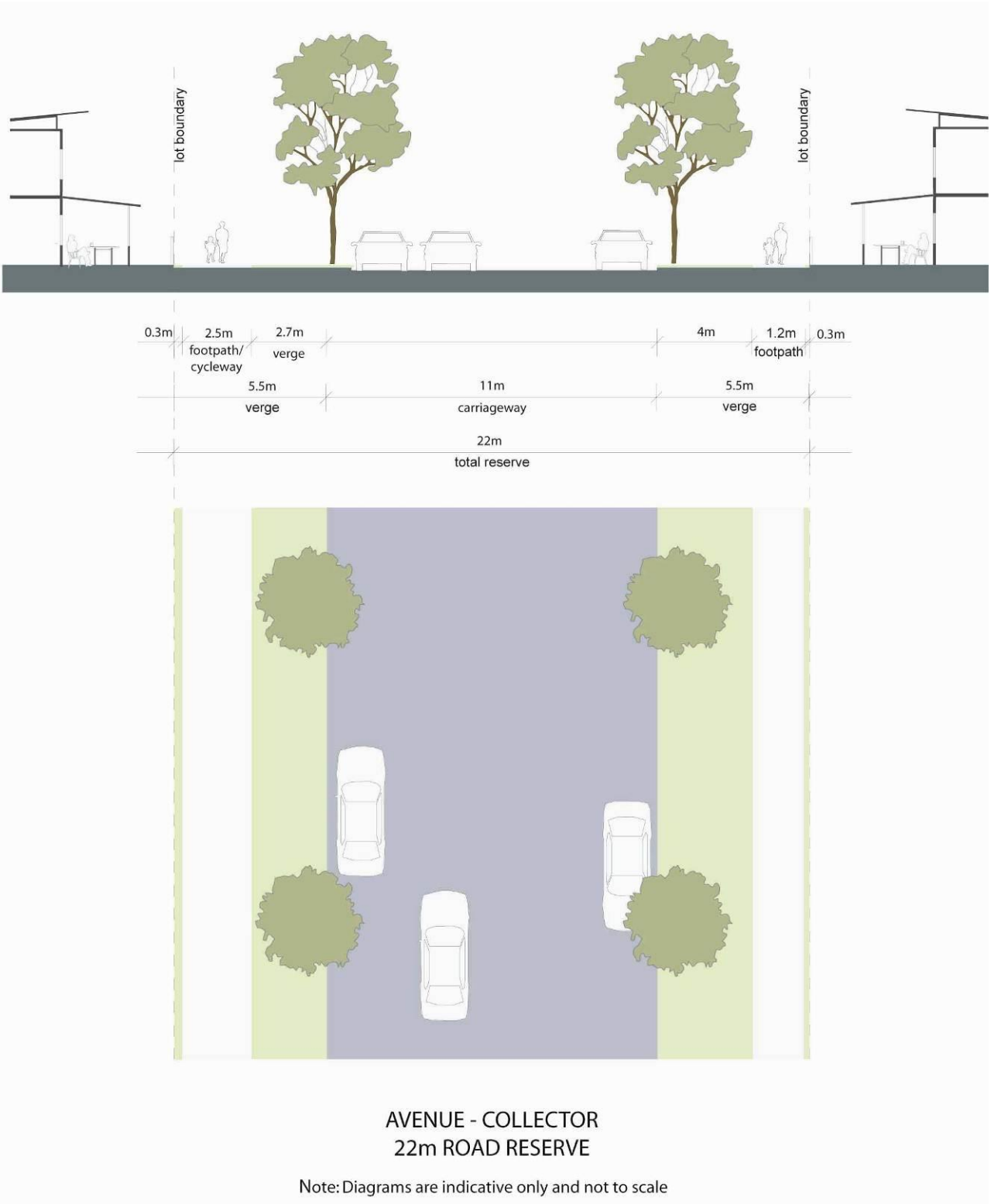


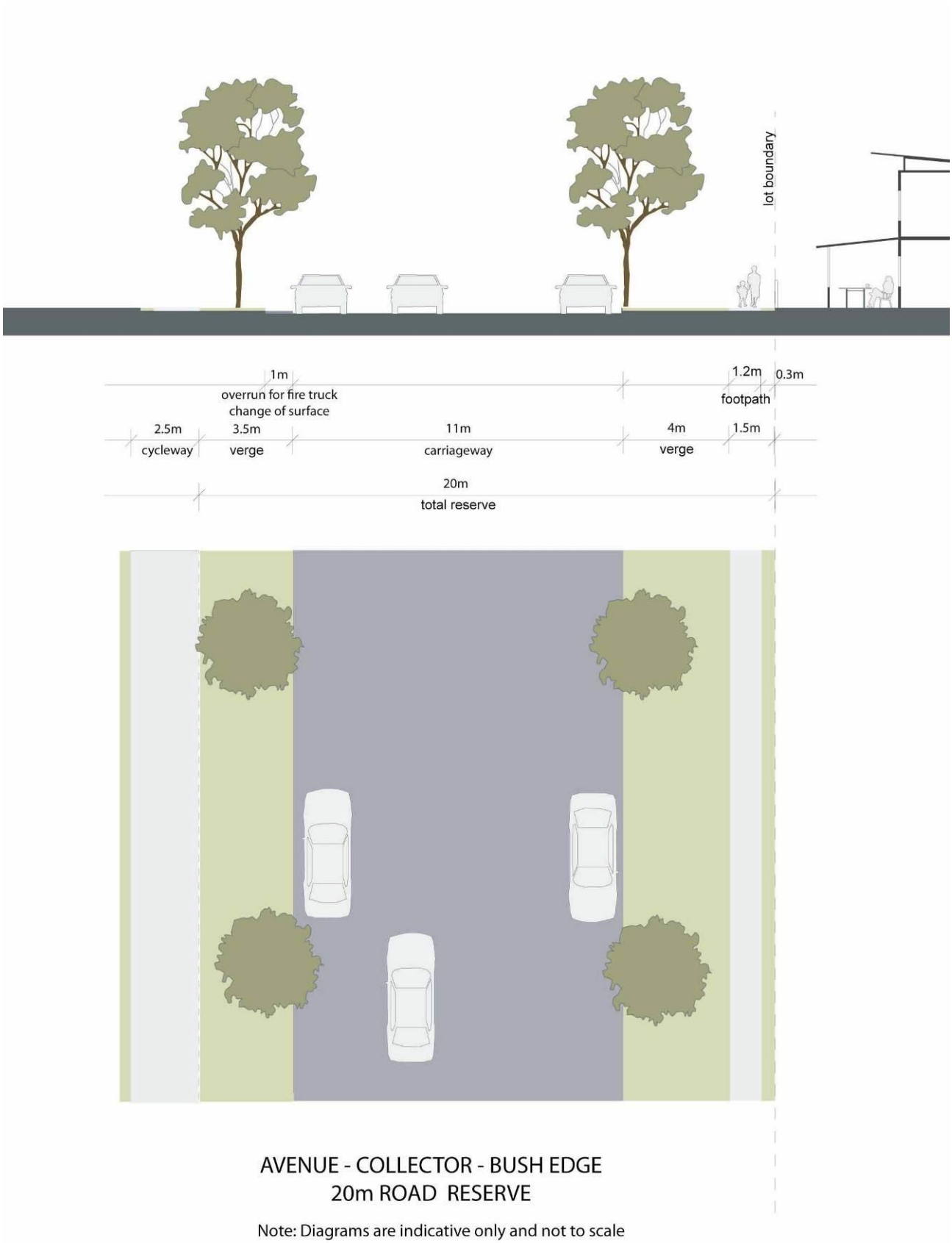
Figure 9 Requirements for Lot 3 DP 208596

APPENDIX A ROAD LAYOUT



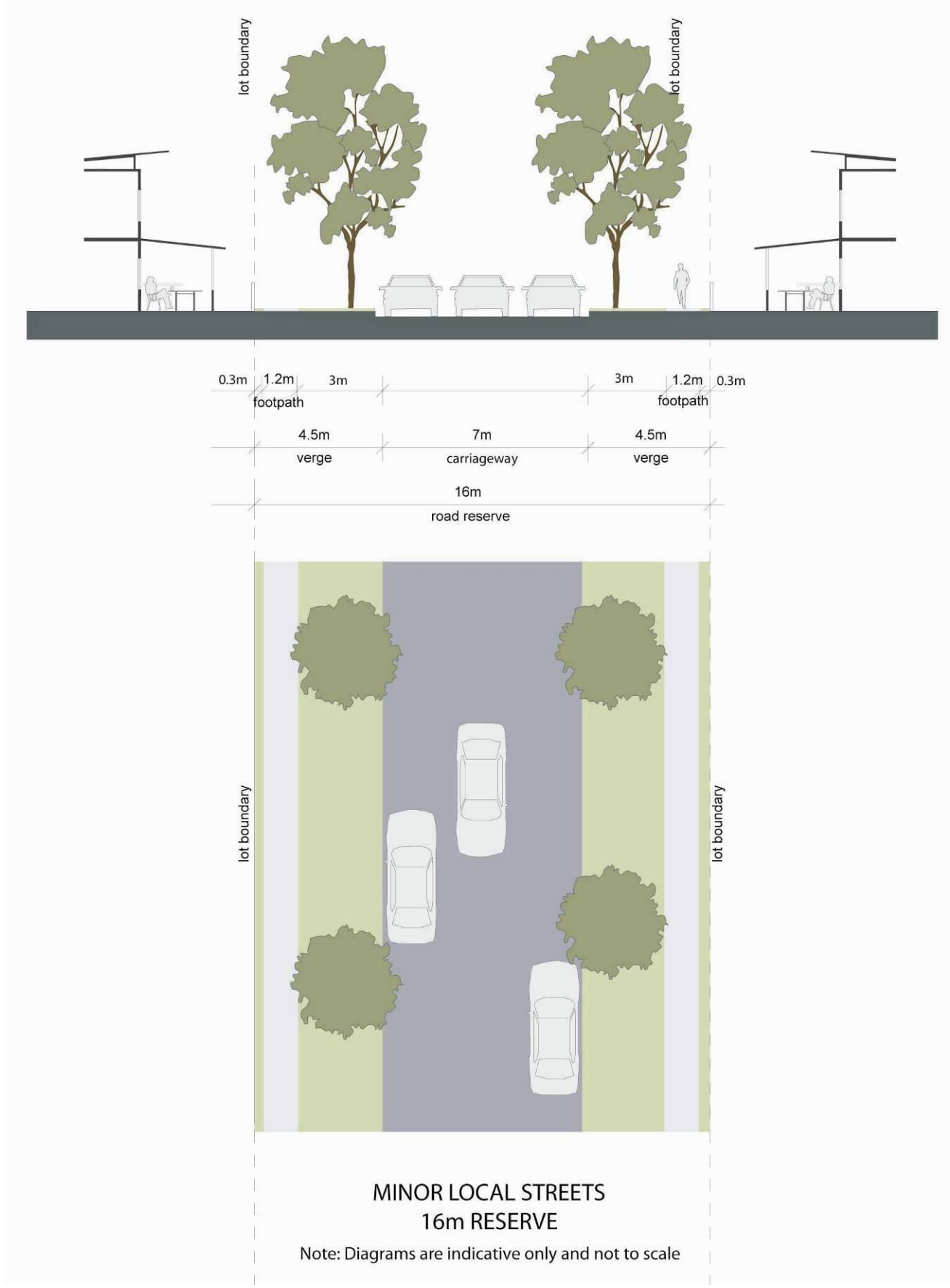
AVENUE - COLLECTOR
22m ROAD RESERVE

Note: Diagrams are indicative only and not to scale



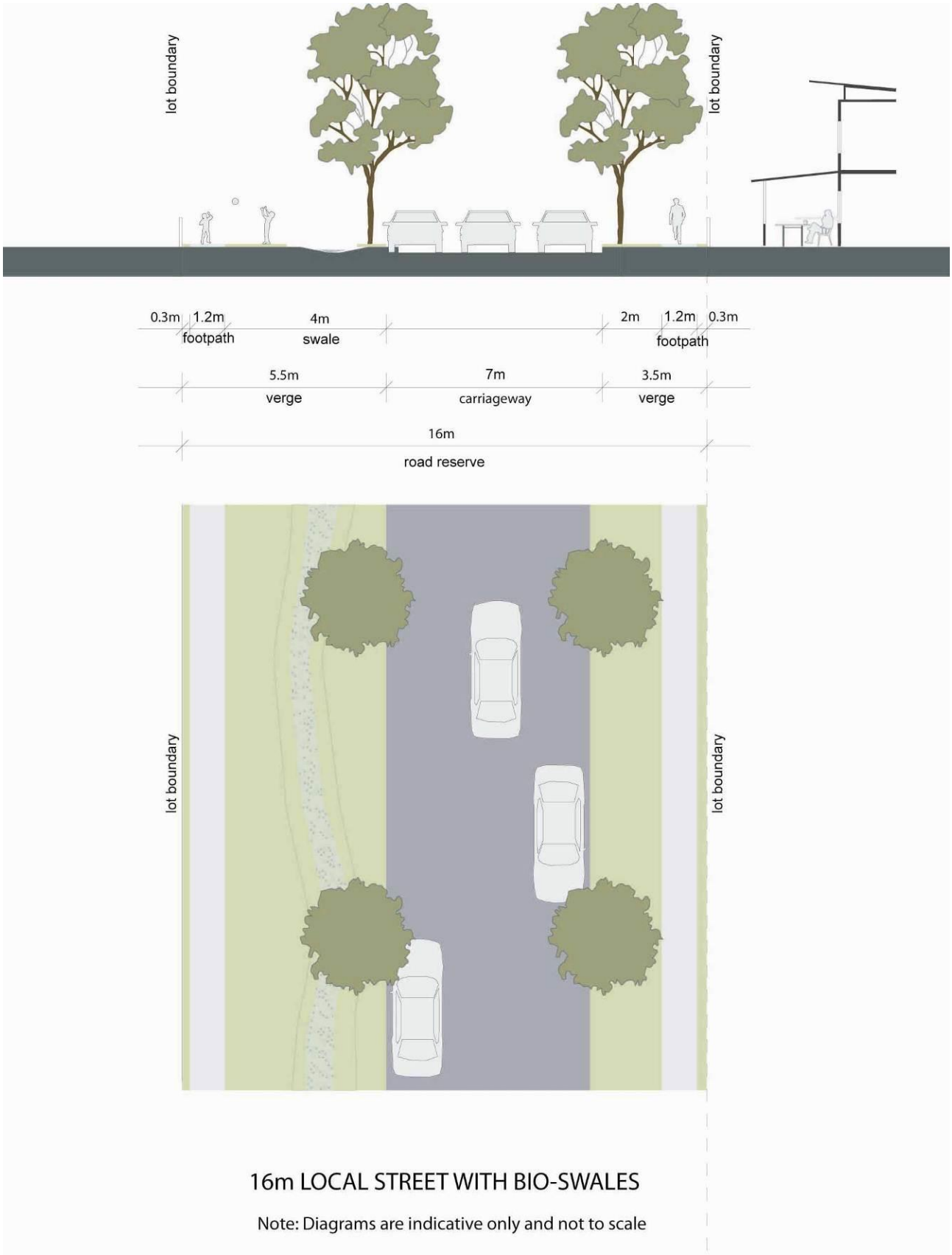
AVENUE - COLLECTOR - BUSH EDGE
20m ROAD RESERVE

Note: Diagrams are indicative only and not to scale



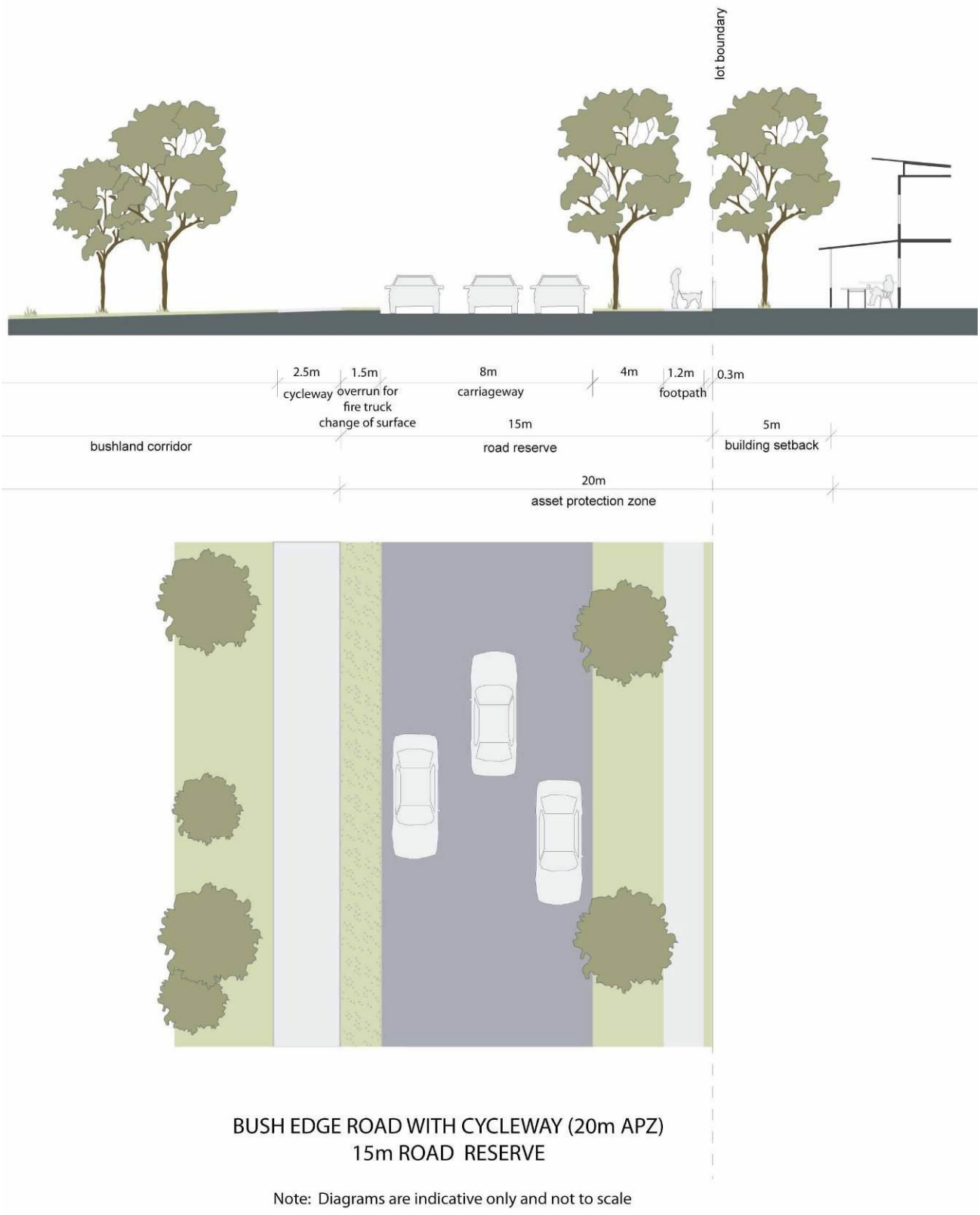
MINOR LOCAL STREETS
16m RESERVE

Note: Diagrams are indicative only and not to scale



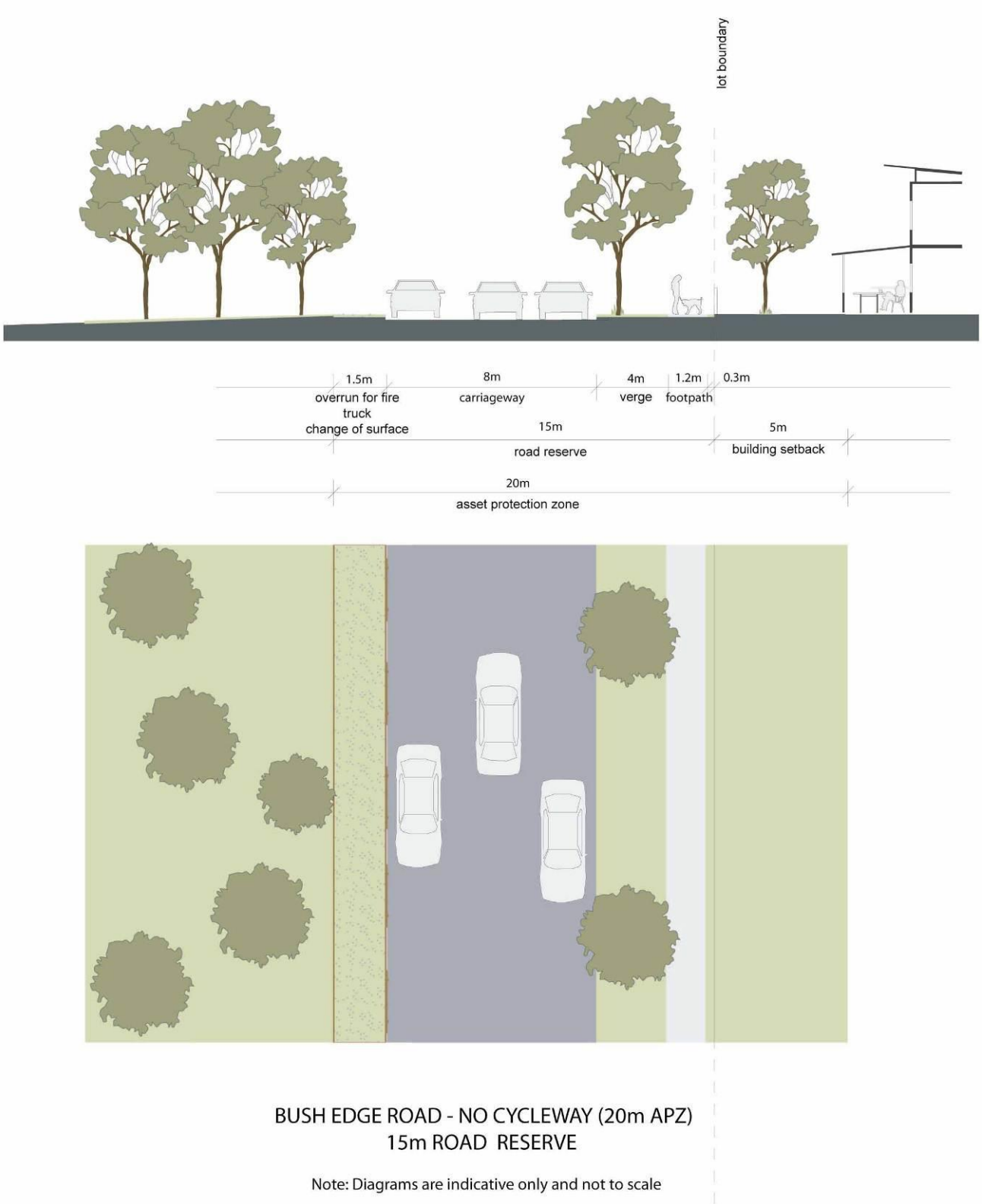
16m LOCAL STREET WITH BIO-SWALES

Note: Diagrams are indicative only and not to scale



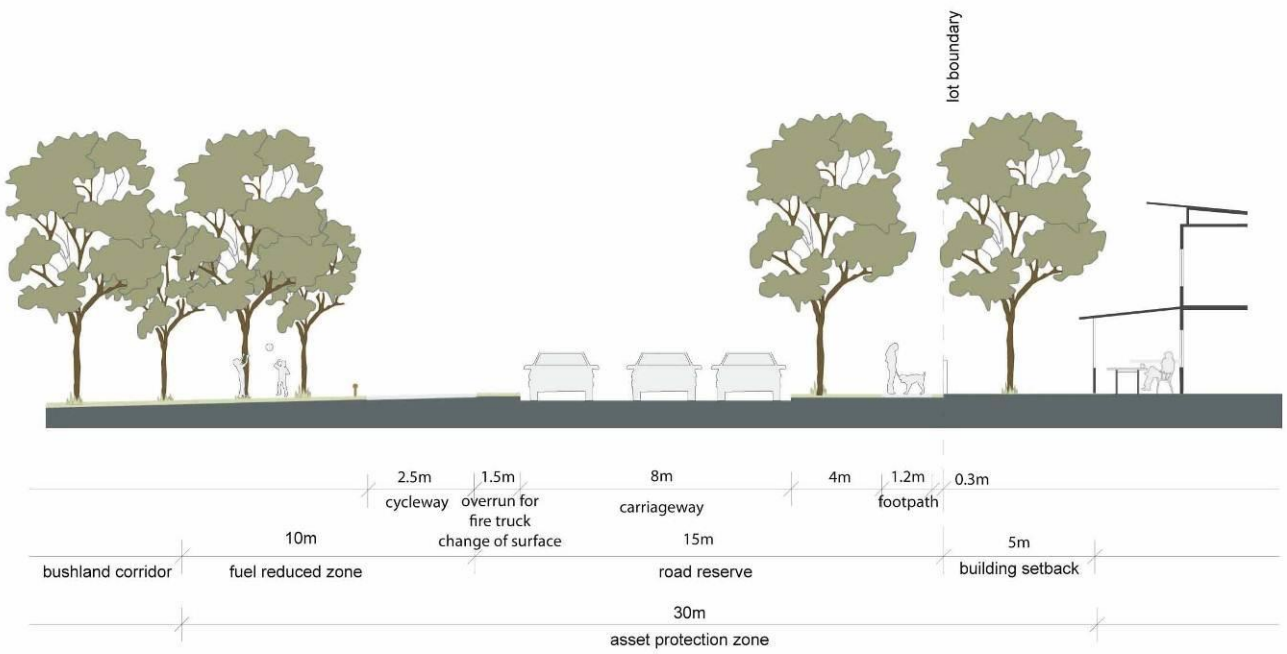
BUSH EDGE ROAD WITH CYCLEWAY (20m APZ)
15m ROAD RESERVE

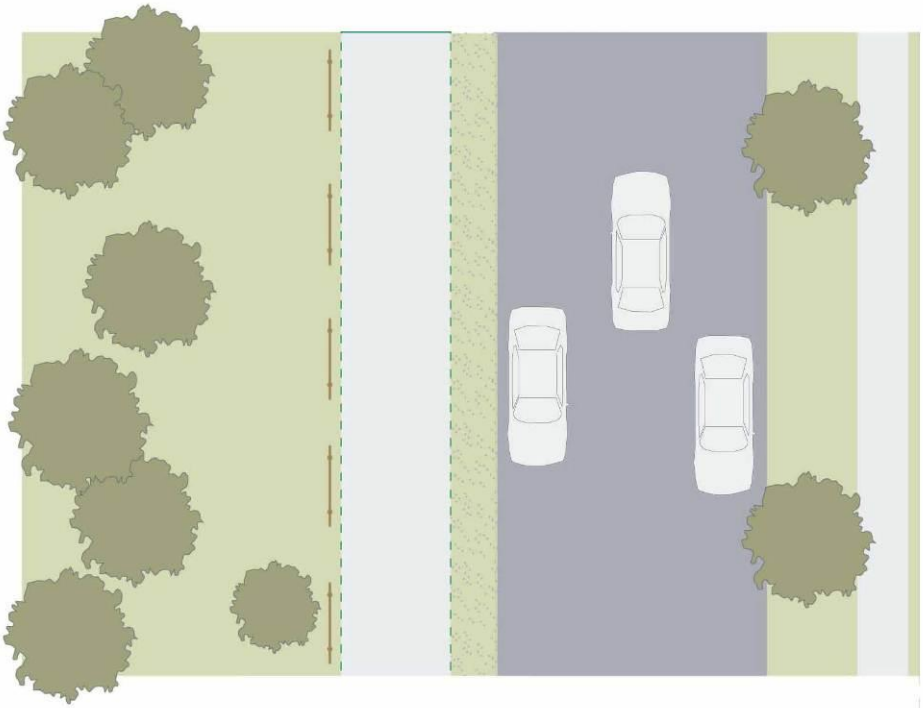
Note: Diagrams are indicative only and not to scale



BUSH EDGE ROAD - NO CYCLEWAY (20m APZ)
15m ROAD RESERVE

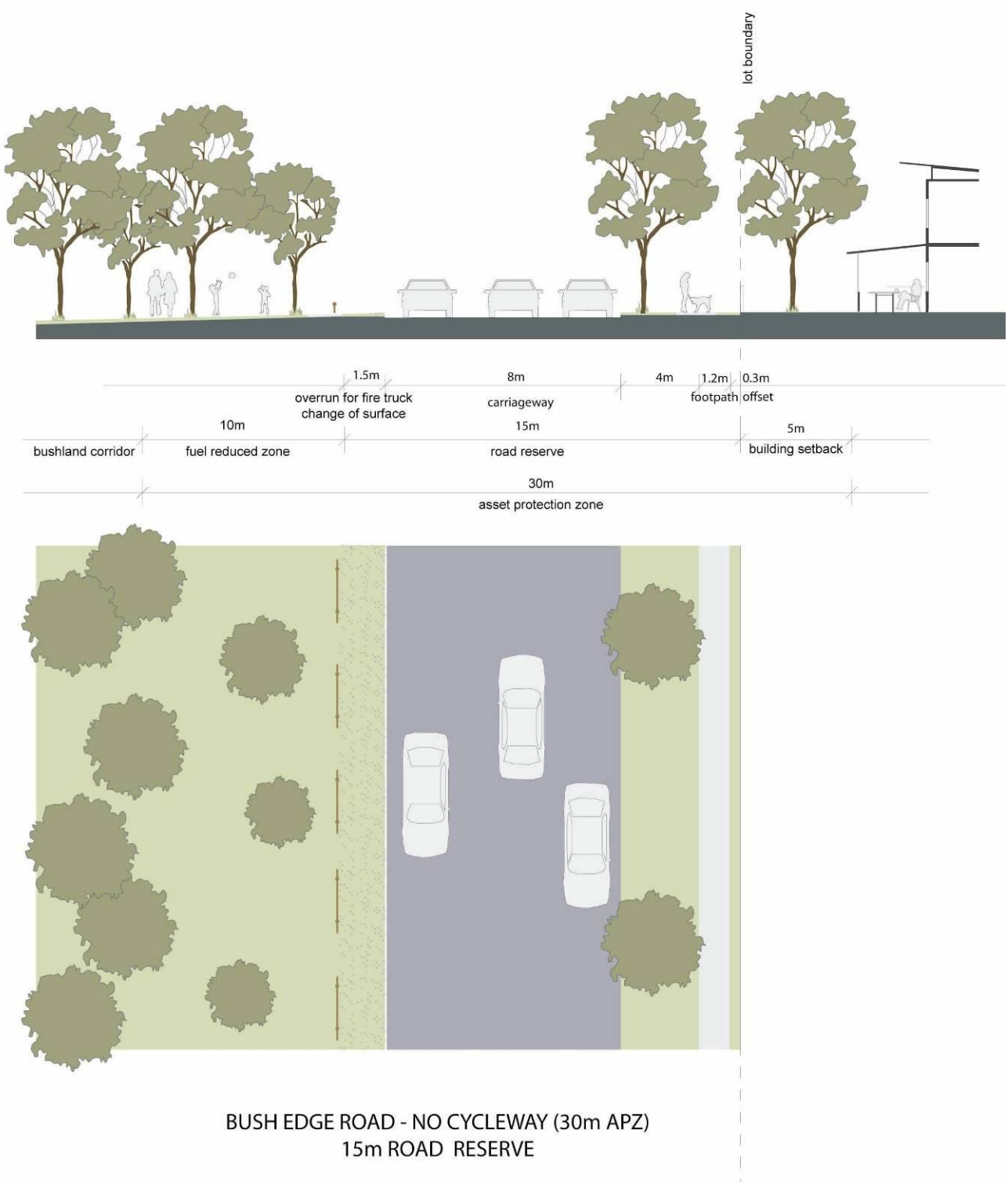
Note: Diagrams are indicative only and not to scale





BUSH EDGE ROAD WITH CYCLEWAY (30m APZ)
15m ROAD RESERVE

Note: Diagrams are indicative only and not to scale



BUSH EDGE ROAD - NO CYCLEWAY (30m APZ)
15m ROAD RESERVE

Note: Diagrams are indicative only and not to scale.

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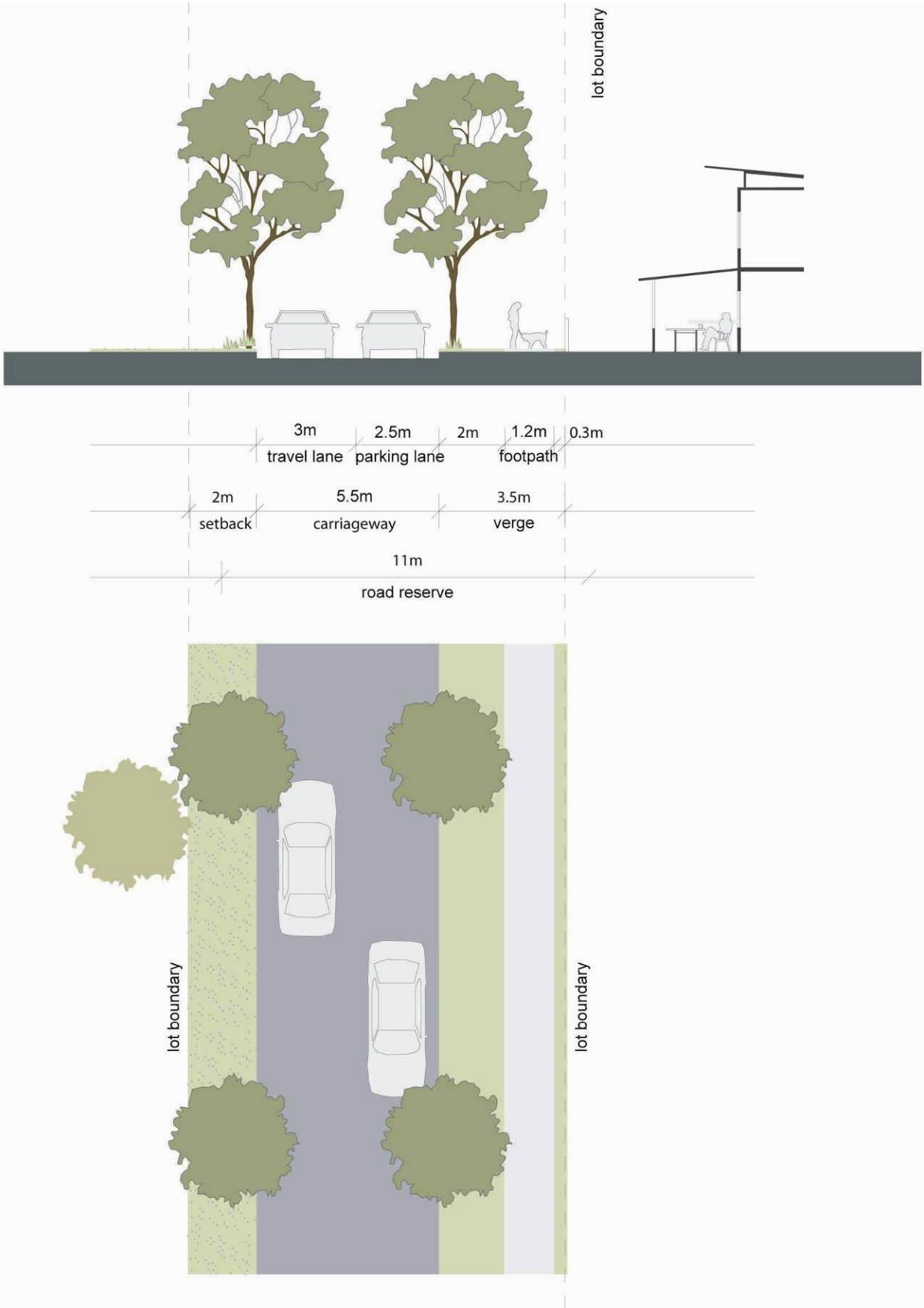
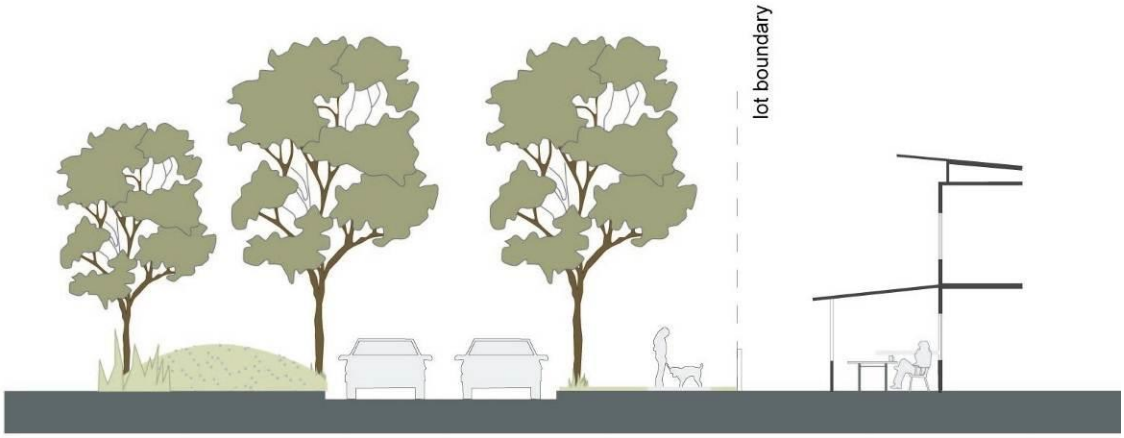
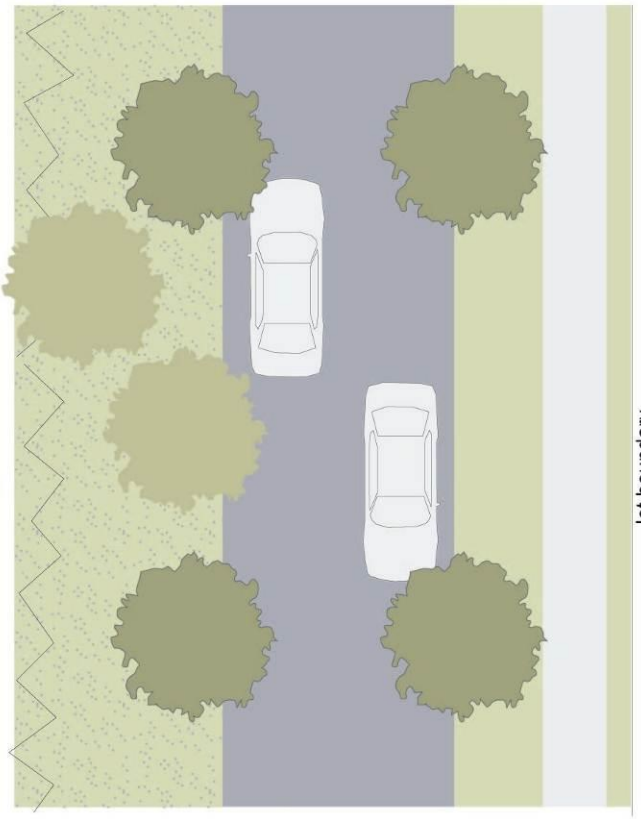


SHAREWAY
11m ROAD RESERVE

Note: Diagrams are indicative only and not to scale

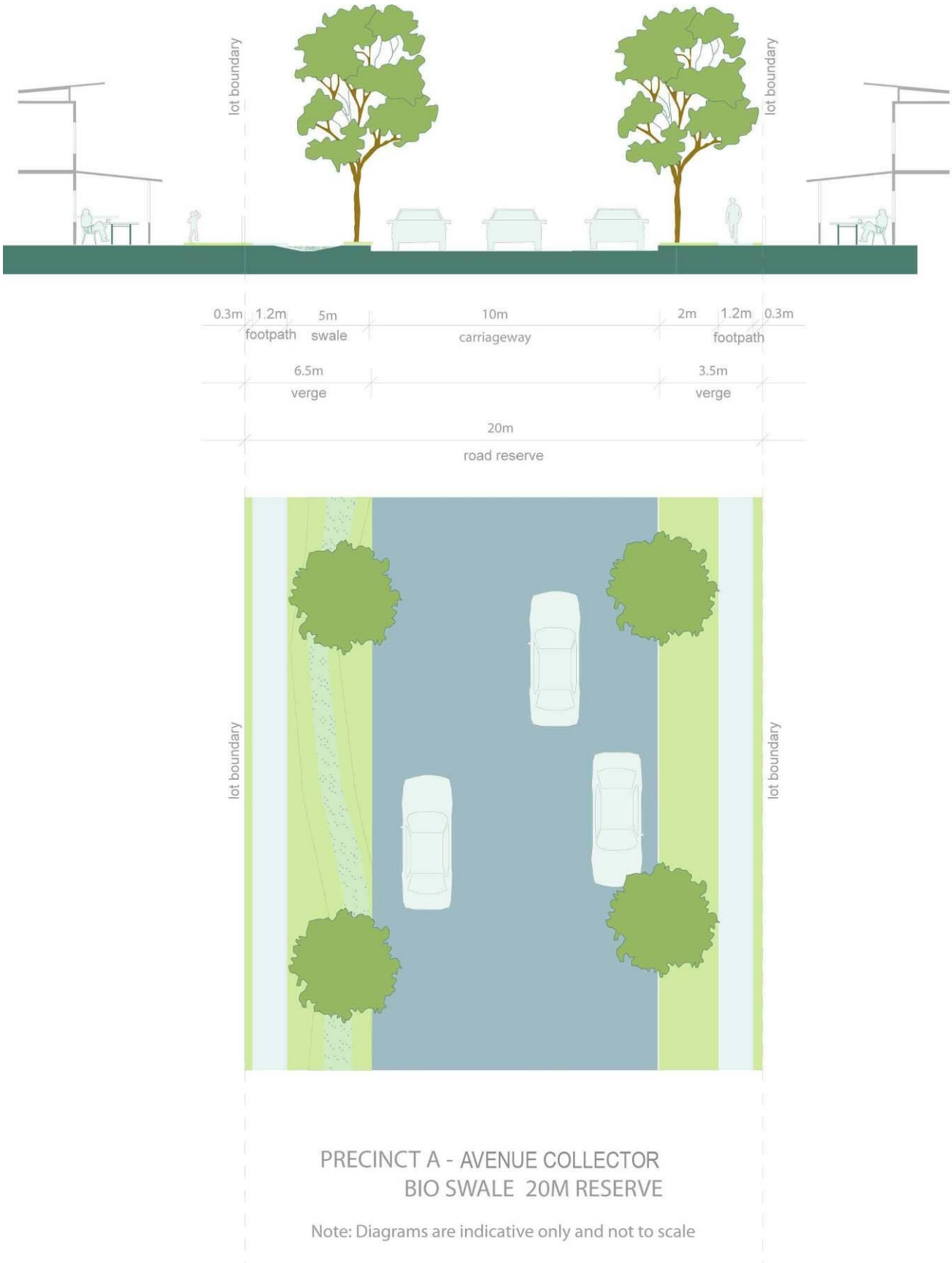




landscaping to be of a nature to discourage access

HIGHWAY EDGE ROAD
15m ROAD RESERVE

Note: Diagrams are indicative only and not to scale



PRECINCT A - AVENUE COLLECTOR
BIO SWALE 20M RESERVE

Note: Diagrams are indicative only and not to scale