

Structure Plan Concept
Figure 11

Figure 11 The Structure Plan

STRUCTURE PLAN OBJECTIVES

The Structure Plan aims to achieve the following:

- Create a mix of housing promoted with denser development responding to amenity and proximity to local services.
- Create a clear urban structure defined by site responsive design through a connected series of 'special places'.
- Retain and restore flood affected bushland areas to form part of the wider vegetation corridor.
- Adopt water sensitive urban design that employs best practice in quality and quantity controls.
- Use existing infrastructure where possible.
- Conserve Grevillea Parviflora and other significant species and communities.
- Support the establishment of the new District Centre at Warnervale and Village Centre at Wadalba through appropriate Density and design.
- Support public transport initiatives and resultant improved air quality emission/sustainability objectives.

PERFORMANCE REQUIREMENT

Any application for development within the LRIP must have regard to and demonstrate consistency with the objectives of the Structure Plan.

4.15.2 Density Distribution

The Louisiana Road Infill Precinct (LRIP) is part of Precinct 8A and 8B under draft SREP – Wyong Development Areas and Coal Mining and is included in Council's Residential Development Strategy 2002 (RDS). The RDS was endorsed by the Department of Planning. The RDS nominated a residential density target of 13 dwellings per hectare for the LRIP. The RDS also 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 Precinct B with lower targets in Precincts A and C.

4.15.2.1 Density Location Principles and Objectives

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.



Figure 12 Density Distribution Map

The underlying zones of the three villages will have a major bearing on potential residential densities. Precinct B has been zoned Zone No 2 (b) (Multiple Dwelling Residential) to enable a mix of low and medium density housing types such as villas, townhouses and courtyard houses 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 No 2 (a) (Residential) which allows for lower density housing. Denser housing forms such as villas, or townhouses or courtyard houses (sub 450 square metre lots) other than dual occupancy are not permitted in the Zone No 2 (a) (Residential).

4.15.2.2 Density Requirements

- Housing density generally determined by proximity to Wadalba Village Centre.
- Lots smaller than 450 square metres shall be considered as “Integrated Development” and comply with Section 4.2.1c&d of this Plan.
- Smaller lots are to front areas of higher amenity, such as local parks and the bushland floodplain.
- 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 12 - 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.

4.15.3 Road Layout and Hierachy and Public Transport Routes

DEVELOPMENT OBJECTIVES

The objectives for road layout and hierachy and the provision of Pedestrian, Cycleway and Transport Routes within the Louisiana Road Infill Precinct (LRIP) are as follows:

- Create a legible road hierarchy.
- Maintain links to the past by preserving rural road routes.
- Provide adequate and safe links between the three villages and to the surrounding locality and regional road networks.
- Encourage multiple access nodes to facilitate quick and even dispersal of local traffic to and out of the local street layout.
- Ensure all streets are overlooked by dwellings.
- Avoid circuitous loops and cul-de-sacs where possible.
- Make provision for efficient and convenient local public transport links and stops.

DEVELOPMENT REQUIREMENTS

4.15.3.1 Intersections

- 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.
- These signals are to be installed by the developer with the first stage of development which has accessed to Louisiana Road. The installation of the signals is to be carried out in accordance with the RTA's requirements.
- 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.
- 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.

4.15.3.2 Access

- No vehicle access is to be permitted to the Pacific Highway between Minnesota Road and Louisiana Road.
- 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. These properties include

Parcel Description

Lot 1 DP 201174

Lot 2 DP 201174
Lot 3 DP 201174
Lot 4 DP 201174
Lot 5 DP 201174
Lot 5 DP 201174
Lot 6 DP 201174
Lot 7 DP 201174
Lot 8 DP 201174
Lot 9 DP 201174

- Vehicular access to Minnesota Road and Louisiana Road is to be denied to those properties located between the Highway and the 1st intersection to the North.
- A recommendation of the Warnervale District Town Centre Study was to retain Minnesota Road open across the floodplain. This will facilitate access to the District Centre, but in times of flooding there will be an emergency system and vehicles will be required to utilise the East-West Collector road between Minnesota and Louisiana Roads. This 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.
- 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 13 and the 'Highway Edge' diagram. The landscaping should include plants that are terete such as Hakeas.

4.15.3.3 Public Transport

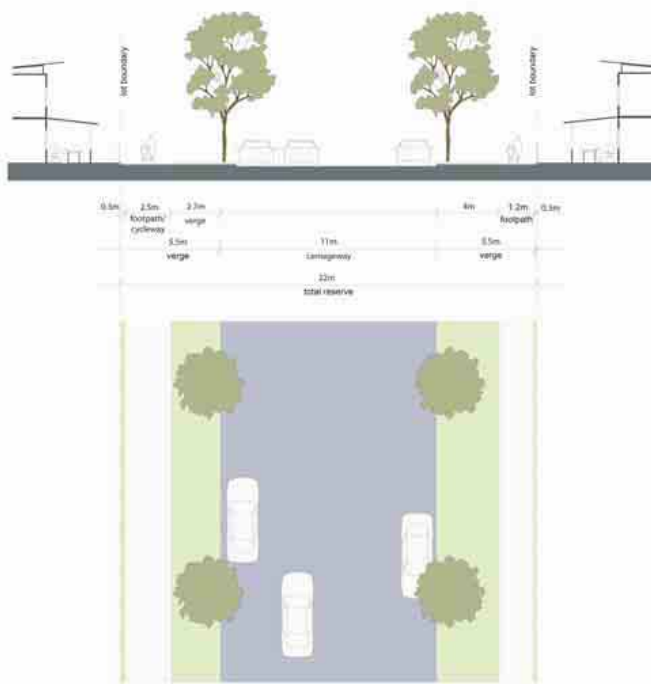
- Public transport is to be accommodated for the LRIP such that every future dwelling shall be within 500 metres walking distance of a bus stop. Bus routes will be located on Pacific Highway, Louisiana and Minnesota Roads.
- Bus stops with appropriate laybys are to be provided in the locations shown on Figure 13.

4.15.3.4 Road Layout and Hierachy

- The road layout and hierachy shall comply with the the Figure 13 and the following diagrams. Further detail is provided in Table 3C in Section 4.3 Road Hierarchy and Layout.

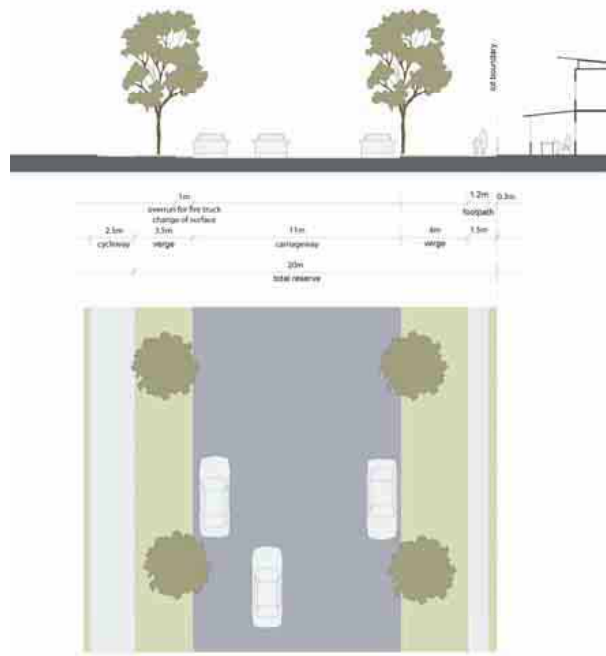


Figure 13 Road Typology and Hierachy



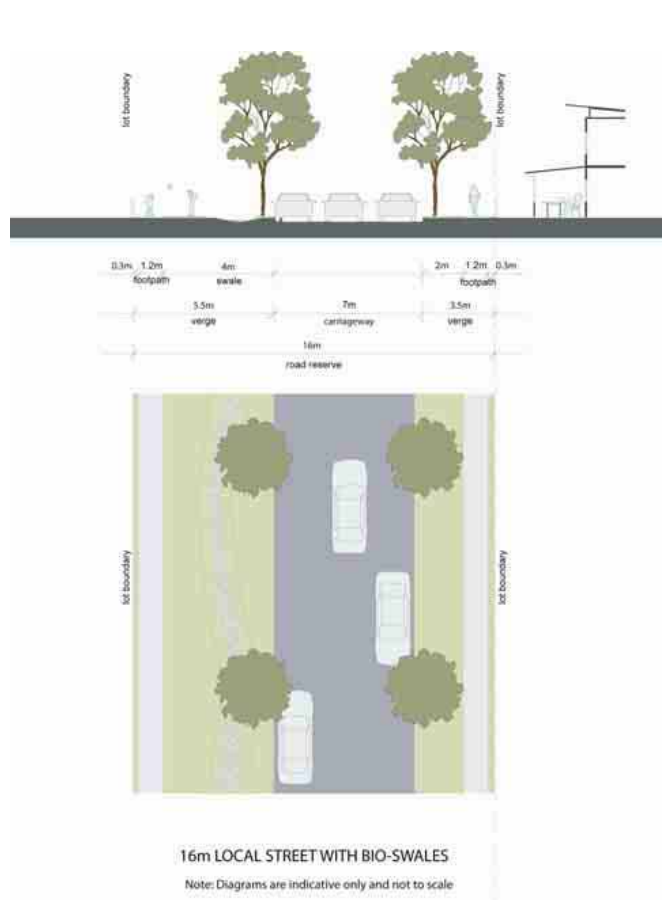
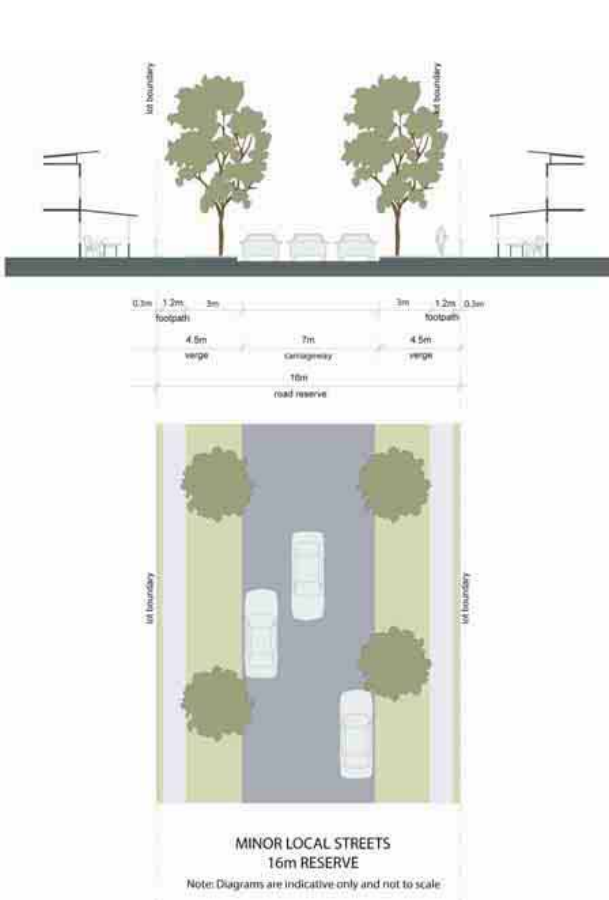
AVENUE - COLLECTOR
22m ROAD RESERVE

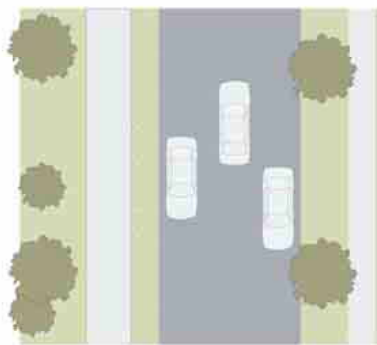
Note: Diagrams are indicative only and not to scale



AVENUE - COLLECTOR - BUSH EDGE
20m ROAD RESERVE

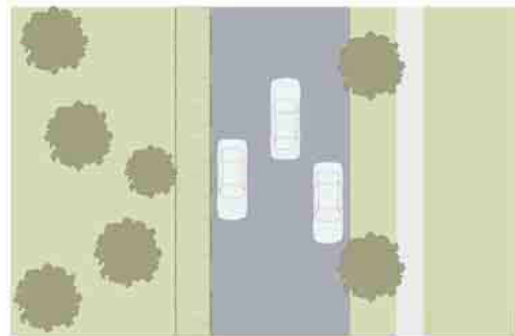
Note: Diagrams are indicative only and not to scale





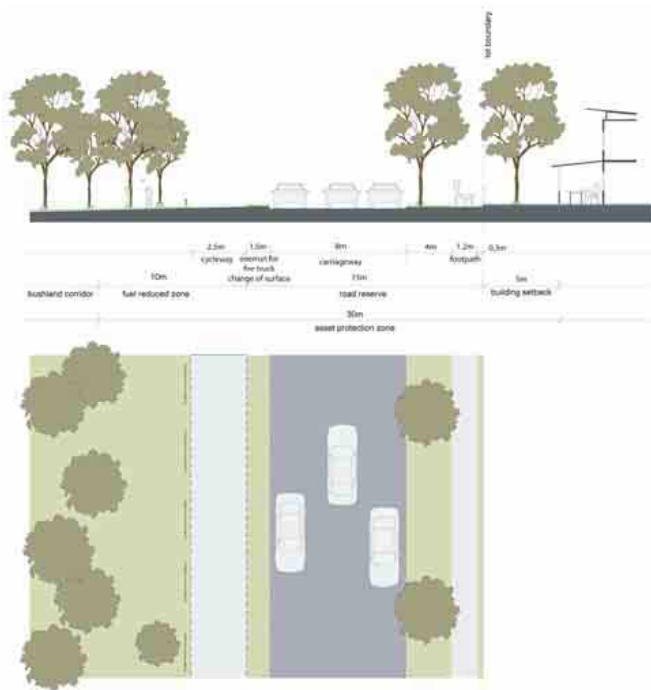
**BUSH EDGE ROAD WITH CYCLEWAY (20m APZ)
15m ROAD RESERVE**

Note: Diagrams are indicative only and not to scale



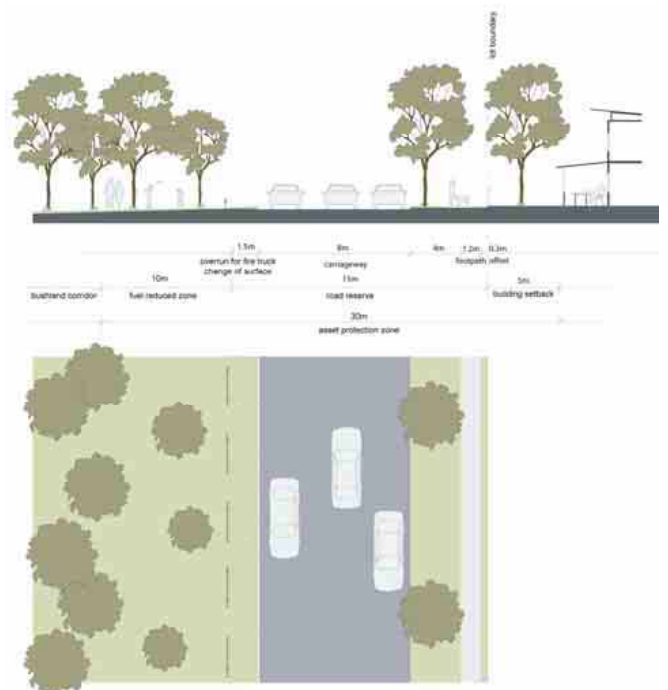
**BUSH EDGE ROAD - NO CYCLEWAY (20m APZ)
15m ROAD RESERVE**

Note: Diagrams are indicative only and not to scale



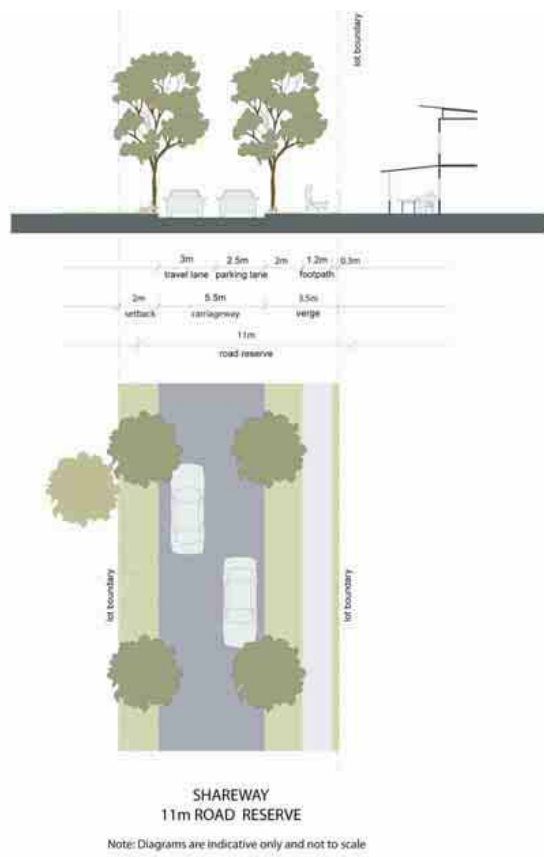
**BUSH EDGE ROAD WITH CYCLEWAY (30m APZ)
15m ROAD RESERVE**

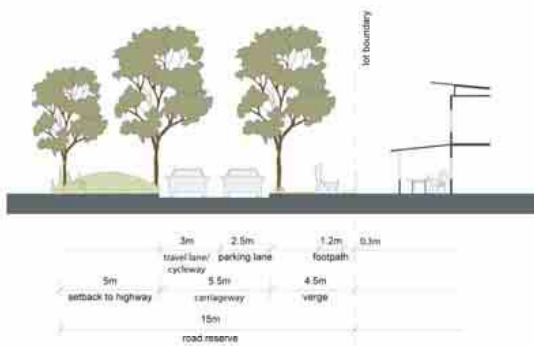
Note: Diagrams are indicative only and not to scale.



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

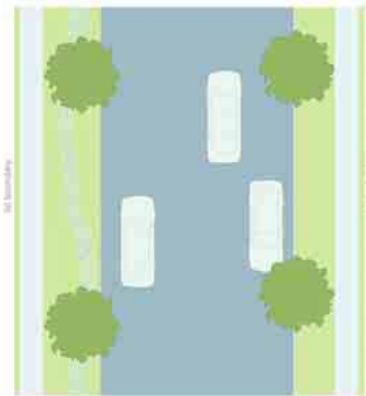
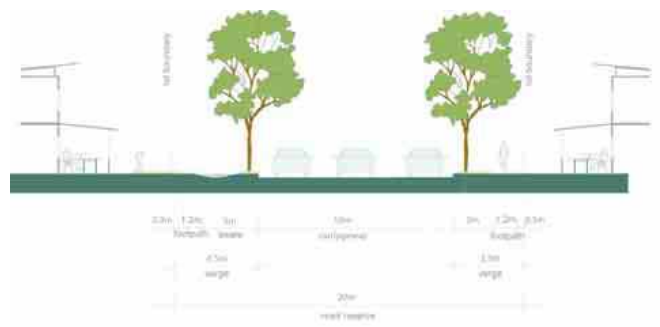
Note: Diagrams are indicative only and not to scale.





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.

4.15.4 Asset Protection Zone Requirements

DEVELOPMENT OBJECTIVES

- Ensure that all new allotments have measures sufficient to minimise the impact of bushfires.
- Minimise the impact of fire protection measures on vegetation, fauna, views, watercourses and so erosion, amenity and access.
- Identify the potential bushfire threats to individual sites.
- Reduce the risk to property and the community from bushfire.
- Ensure that bushfire protection is afforded to all new allotments and likely future improvements.

PERFORMANCE CRITERIA

- a A bushfire threat assessment must form part of all development applications for subdivision. The threat assessment is an integral part of the subdivision design, and affects lot shape, size, orientation, and road layout. Bushfire protection measures have the potential to affect vegetation, fauna, views watercourses, soil erosion, amenity and access.
- b Assessment of threat from bushfire must examine impacts of the proposal both within and external to the site, including the capacity of the existing road network serving the site to accommodate traffic in emergency situations.
- c Preparation of an assessment of threat from bushfire should include reference to:
 - NSW Rural Fire Service (RFS) – Planning for Bushfire Protection – a guide for land use planners, fire authorities, developers and home owners (most current version).
 - Consultation with Council and RFS staff.
- d Fire protection measures must be capable of being maintained by owners and users.
- e Asset Protection Zones must generally be contained wholly within the development site, and may incorporate fire trails, perimeter roads, cleared road verges and fixed building lines.
- f The subdivision design must provide adequate emergency vehicle access to those parts of the site fronting a potential bushfire source.

DEVELOPMENT REQUIREMENTS

- a Asset Protection Zones (APZ's) are to be generally placed wholly within the subdivision they are intended to protect. Asset Protection Zone requirements are to comply with the NSW Rural Fire Service (RFS) – Planning for Bushfire Protection – a guide for land use planners, fire authorities, developers and home owners. The APZ distances shown on Figure 14 below are a result of Council consultation with the RFS at land rezoning stage and are indicative only, highlighting the areas within the LRIP that bushfire protection will be required. Consultation with the RFS will be necessary to confirm the appropriate APZ distance requirements for the development site.
- b Hazard reduction within the Asset Protection Zone is to be carried out so as to minimise site disturbance. Where necessary, hazard reduction is to be carried out by hand with trees being felled rather than pushed over to minimise environmental impact.

- c Perimeter roads in subdivisions are to have the following minimum specifications:
- Minimum 8m wide seal.
 - Vertical kerb and gutter on the fire source side of the road.
 - Roll top kerb and gutter on the development side of the road.
 - 1 metre wide minimum mountable verge.
 - Have adequate turning facilities for emergency vehicles.
- d Long “dead end” sections of road are not acceptable.
- e The location of hydrants is to be delineated by blue pavement markers in the centre of the road as well as other standard practices. Refer to DCP 67.
- f Battle-axe shaped allotments, where the access handles are in excess of 30m in length, are to have hydrants located at the end of the access handle in addition to other hydrant requirements. Refer to DCP 67.
- g To ensure effectiveness of the fire protection measures, restrictions shall be placed upon the titles of the affected lots. These restrictions may relate to:
- Habitable and storage structures being excluded from within the Asset Protection Zone.
 - Level at which the fuel loading is to be maintained within the Asset Protection Zone.
 - Responsibility for and nature of maintenance of fire trail, hazard reduction and Asset Protection Zone.
- h Developer funding may be sought to fund the ongoing maintenance of Asset Protection Zones that are located on land that will fall into public ownership.



Figure 14 Indicative Bushfire Asset Protection Zone Requirements
Note: These distances are indicative only and show where bushfire APZ measures are required. Refer to Section 4.15.4 Development Requirements above.

4.15.5 Environment and Vegetation Protection

DEVELOPMENT OBJECTIVES

The environmental and ecological objectives of land within the LRIP are to:

- Maintain of biodiversity and protection of native flora and fauna species and their habitats (including threatened species and endangered ecological communities) through the designation of public lands.
- Protect of the environmental and ecological values of land indentified as designated public land.
- Minimise of the impacts of development upon designated public land, during the construction and occupation of adjoining and adjacent residential areas.
- Increase awareness and promotion of a culture of protection of environmentally sensitive lands by the community.
- 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.

DEVELOPMENT REQUIREMENTS

4.15.5.1 Conservation Management Plan

It is noted that Figure 15 shows peripheal 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.

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. 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:
- 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.
 - 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.
 - 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:
- Retain corridors of woodland around, and where possible over, the proposed facilities.
 - Not impact on the necessary glide angles and width requirements of the squirrel glider.
 - Not compromise the value and connectivity of the environmental corridor.
 - Not result in the significant clearing or fragmentation of the remnant vegetation within the area.
 - 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).

4.15.5.2 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 Bingarra 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 15 Consolidated Environmental Constraints and Requirements



4.15.6a 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 contemporary 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.

DEVELOPMENT OBJECTIVES

The objectives for Water Cycle Management in the LRIP are 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 runoff to achieve best practice standards, this shall be done by treating urban stormwater runoff to the standards specified in Council's Stormwater Policy.
- 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.
- 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.
- Minimise the piping of stormwater in closed conduits and the use of concrete structures and hard surfaces to convey stormwater.
- 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.

- 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.
-
- Maintain and improve water quality in streams and groundwater systems.
-
- Reduce floodrisk in urban areas and downstream water bodies by adopting requirements for minor and major system flow in accordance with Australian Rainfall & Runoff.
-
- Protect and restore aquatic and riparian ecosystems and habitats.
-
- Protect the scenic, landscape and recreational values of streams and water bodies.
-
- Ensure that WSUD incorporated into residential development is consistent with the State Government's Building Sustainability Index (BASIX).
-

DEVELOPMENT REQUIREMENTS

- a. The criteria for Urban Stormwater runoff quality for areas within the Woongarra Creek/Porter's Creek Catchments are as the following;
- 85% reduction in the post development mean annual load of Total Suspended Solids (TSS).
 - 65% reduction in the post development mean annual load of Total Nitrogen (TN).
 - 45% reduction in the post development mean annual load of Total Phosphorus (TP).
 - Retention of litter greater than 5mm for flows up to 50% of the one-year ARI peak flow.
 - No visible oils for flows up to 50% of the one-year ARI peak flow.

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

- b. 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.

A Soil and Stormwater Management Plan shall be submitted with any Development Application for subdivision (or integrated subdivision development) as is required by DCP 66 - Subdivision. Under DCP 66 this plan must address soil erosion, sediment control and stormwater management for the proposed subdivision during the construction phase and over the long term life of the development.

- c. In addition to the requirements for this plan as outlined in DCP 66, 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".

- d. The SSMP must utilise water sensitive urban design (WSUD) and shall incorporate a treatment train in accordance with Figure 16. The treatment train is intended to maintain outflow from the developed areas at pre-development levels and shall include the following:

- Demand Management – AAA+ fixtures and appliances, dual flush toilets, water efficient gardens (residential demand management in accordance with BASIX).
- Rainwater Tanks – Residential tanks where required by BASIX.
- 'At Source' Stormwater Treatment – Collect runoff and facilitate treatment by integration into landscaped areas, i.e. porous pavements, rain gardens, rainwater tanks, swales.
- '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.
- '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 Woongarra Creek floodplain as shown on Figure 16.
- 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 16 (refer to note I 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.
- 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.

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.

- e. 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;
- Water Sensitive Urban Design - Derwent Estuary Management Plan 2006, Natural Heritage Trust
 - Australian Runoff Quality- A Guide to WSUD, Engineers Australia 2006.
 - WSUD Technical Guidelines for Western Sydney, URS Australia for UPRCT 2004.
 - WSUD engineering Procedures:stormwater, CSIRO for Melbourne Water 2005

- f. 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 Category 3 Landscape report with any development application for subdivision or integrated housing.
- g. 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.
- h. 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).
- i. 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.
- j. Construction of the centralised Stormwater Storages as shown in Figure 16 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 Urban Release Area.

4.15.6b 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 Bingarra Channel Reach and Western tributary, known as South West Channel (refer to Fig. 16 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 Urban Release 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 Urban Release 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".

DEVELOPMENT OBJECTIVES

The objectives for Flood Plain Management and Channel Design are 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.
- Ensure access into and out of the proposed residential areas are possible during the 1% AEP storm event.
- 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.
- Minimise impacts of flood plain filling and channel re-alignment upon native vegetation and identified Ecological Endangered Communities, particularly within the flood plain.
- 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.
- 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.

DEVELOPMENT REQUIREMENTS

- a. Adopt 1% AEP levels as documented in the report titled "Bingarra 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 floor levels for habitable dwellings should be no less than 0.6 metres above the level of the 1% AEP.

- 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 Urban Release Area at or above the 1% AEP (see Fig. 13).
- 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.

4.15.7 Noise Assessment and Mitigation

DEVELOPMENT 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.

DEVELOPMENT 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

The report is to address the following:

- Identify existing and potential future noise sources.
 - Identify areas within the precinct where specific development should be restricted due to likely noise.
 - Identify mitigation measures to reduce existing or potential noise effects to allow development to occur while meeting appropriate environmental and amenity requirements.
- b Noise assessment measures need to take into account, and be consistent with and/or address:
- Projected traffic volumes along Pacific Highway up to 2018.
 - Preservation of significant vegetation.
 - Proposed future land use proposals.
 - Mitigation measures shall address not only internal residential amenity but also measures to ensure appropriate private open space amenity.
- c 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 Category 3 landscaping and mounding may be appropriate on land between the service roads and Pacific Highway solid noise fencing is not appropriate.
- d 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.
- e 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.

4.15.8 Residential Design

DEVELOPMENT OBJECTIVES

- Creating housing choice particularly focused within Precinct B.
- Facilitating housing mix from townhouses, semi-detached/duplex, courtyard housing to traditional houses on medium lots.
- Clustering denser housing types close to village centre, public transport routes and areas of higher amenity.
- Avoiding garage dominance on small lots.
- Ensuring that all dwelling types have a proper street frontage rather than fronting onto internalised driveways.

DEVELOPMENT 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 under the 2B Multiple Dwelling Zone which enables subdivision under 450m² as Integrated Housing (Refer to DCP 66 Subdivision). Figure 17 shows an indicative lot type distribution.
- b Five key housing types are identified under the Masterplan prepared by AAUD. The first four types may only be located in Precinct B under Zone 2 (b) (Multiple Dwelling) as Integrated Housing; however “detached dual occupancy” and “dual occupancy buildings” are a further housing type permissible in Precinct A and Precinct C under Zone 2 (a) (Residential). The five housing types and applicable allotment widths are categorised as follows:
- Terrace / Small Lot (7.5 - 9.5m wide).
 - Small Courtyard / Duplex (10 - 12.5m).
 - Courtyard (13 - 14m frontage).
 - Standard 400-450m² Lots (15m frontages).
 - Traditional (15m + frontages).
- c Lots are generally to have a standard depth of 30 metres.



Indicative Concept Lot Type Distribution
 Figure 17

Figure 17 Indicative Lot Type Distribution Concept Plan

4.15.8.1 Requirements for each Housing Type / Lot Size

a Terrace / Small Lot (7.5 - 9.5m wide)



This housing type provides the opportunity for rear loaded row housing in small groups. They may contain some home / work business opportunity and allow for smaller houses of one or two storeys suitable for singles, couples and the ageing market.

They will be located in proximity to the Wadalba Village Centre and in areas of high amenity, such as around local parks and adjacent to the floodplain corridor.

- Garaging must be provided from rear.
- Recessed gates to rear yards with landscaping forward of the fencing are to be used to help break up the laneway streetscape.
- Both Side Setbacks - zero lot line.
- Front building setback - 3.5m.
- Front veranda setback - 1.5m.
- Where there is a grouping of dwelling types with zero side setbacks (such as terraces and town houses, small courtyards and duplexes) special consideration and treatment is to be given to the dwelling located at each end of the row. The consideration shall take into account the design presentation and the impact upon the adjoining property.

b Small Courtyard / Duplex (10 - 12.5m)



This housing type provides for small lot courtyard housing forms generally with north facing (good solar access) rear yard and with rear lane car access or single stacked parking. These are zero lot line on one or both boundaries.

- Single width garage for primary street frontage or rear garage may include double width.

- Where laneway access is proposed recessed gates to rear yards with landscaping forward of the fencing are to be used to help break up the laneway streetscape.
- Side Setback 1 - zero lot line.
- Side Setback 2 - zero to 0.9m.
- Front building setback - 3.5 to 4.5m.
- Front veranda setback - 2m.

c Courtyard (13 - 14m frontage)



This housing type comprises courtyard housing suitable for free standing small family housing. This is a flexible and efficient housing form which allows for a separate house on lots comparable to those in traditional suburbs.

- Single or double width garage or rear garage.
- Side Setback 1 - zero lot line or 0.9m.
- Side Setback 2 - 0.9m.
- Front building setback - 3.5 to 4.5m.
- Front veranda setback - 2m.

d Standard 450m² Lots (15m frontages)



This housing type includes detached one and two storey houses on medium lots.

- Double garage from front.
- Side Setback 1 - zero lot line or 0.9m.
- Side Setback 2 - 2.5m.
- Front building setback - 4.5m.
- Front veranda setback - 2m.

e Traditional (15m + Frontages)



This housing type includes detached one and two storey houses on medium lots. Full compliance with DCP 100 Quality Housing.

- f For lots fronting onto floodplain bushland, greater front building setbacks will be required where Bushfire Asset Protection zone requirements dictate a greater exclusion zone for habitable structures.

4.15.8.2 General Residential Design Requirements for LRIP

a Building Form

All buildings are to be designed and sited to address street frontages. Buildings are not to address internalised driveways and 'turn their back' on the primary street front. Building entry is to be clearly identifiable from the street. Buildings are to be designed to create active street frontages with the use of pergolas, decks and verandas as appropriate. Such features should be integrated into the front facades of buildings and variation provided through articulation of façade treatments, colours and materials.



Building massing shall take account of passive solar access and climate control, special flow between indoor and outdoor areas and reflect the different zones of use such as living, sleeping and garage.

Roof form shall be integrated into the building design process and shall be composed of simple roof planes that reflect internal layout. They are to be comprised primarily of pitches, skillions and gables with an emphasis on overhangs and eaves to create distinct shadow lines. Roofs should be pitched within a 25-28 degree range and skillion roof forms at 7.5 degrees and above may be used for feature areas. Flat roofs with parapets are strongly discouraged and are not part of the desired future character of the Louisiana Road Infill Precinct. Roofs shall have a minimum overhang of 300mm except where the dwelling is built to the side boundary. In such instances the roof should have a forward projecting gable or roofed element which allows the eaves to be visible from the street.



b Walls

Walls shall incorporate a mix of materials, colours and finishes to create an interesting streetscape and promote variety. Complimentary use of composite materials is strongly encouraged on feature walls that front the street or that front the public domain such as public parks and open space. Compositions may include:

- Face brick, painted or bagged/rendered masonry, preferably ground floor as a way of highlighting the main entrance.
- Fibre composite cladding.
- Profiled metal sheeting.



c Windows and Doors

Windows that front the street should have a vertical aspect. Paired or triple window arrangements should be defined by light coloured mullians to emphasise verticality. This approach enables windows to positively contribute to façade character rather than taking on the appearance of 'black holes' in the wall. Casement, awning or double hung windows are encouraged for use on the street frontage. A mixture of different size individual windows on street facing facades is discouraged.



d Garages

The dominant appearance of double garages can be reduced in a number of ways. Garages may be setback from the front building façade; a neutral or recessive colour or material can be used; or a central column used to break up the size of the door. Refer to DCP 64 – Multiple Dwelling Residential Development – Section 5.2.2.g.



Garaging or vehicle accommodation on lots less than 10m must be provided via a rear lane.



e Front Verandas and Porches

Front verandas and porches are to be designed as articulation elements, to facilitate overlooking of the street and for efficient access and use of the front garden areas. They are to be accessible from an internal area via door(s) and be enclosed by a permanent roof, pergola or similar climate control.



f Balconies

Generous balconies are encouraged and should be posted, cantilevered or contained within the fabric of the building. The objective is to create a lightweight external element to contrast with the main building mass. Heavy concrete structures are not desirable.



g Corner Buildings

Buildings on corner lots are to be emphasised as important landmarks and are to be given design emphasis to address both frontages. Applications for buildings on corner lots shall demonstrate how this design emphasis has been addressed and achieved. Design measures to define the corner may include a gable facing both streets, a corner feature, additional height, a 'wrap-around' veranda, or a combination of these features. The siting of buildings on corner sites must comply with the setback requirements for "sight lines" outlined in DCP 99 Building Lines, Section 2.6.



h Front and Rear Lane Fences

Low front fencing is to be provided for development within Precinct B and is encouraged within the Precinct A and Precinct C. Low front fencing defines property boundaries and removes the ambiguity between public and private space without screening. The house and garden are still visible but are defined from public space and neighbouring properties and become useable semi-private spaces.



Front fences are not to exceed a height of 1.2m. The base may be solid but the upper component must be 'see-through'. Piers should be used at regular intervals to add interest to long, unbroken stretches of fencing. Solid masonry fences and Colorbond fencing are not to be used within the front setback.



Solid fencing such as masonry or Colorbond fencing is not desirable along rear lanes. Fencing is to be semitransparent to create the perception of, and to facilitate passive surveillance.



i Driveways

Driveways shall be coloured in recessive medium tone colours such as medium browns and greys and shall be finished in matt finish materials. Shiny, reflective or bright colours are not to be used.



j Rainwater Tanks

The location of rainwater tanks must be shown on Development Application plans. Rainwater tanks must not be located within front setbacks. Rainwater tanks should preferably be integrated into the building design. Rainwater tanks will not be included in the area calculation for private open space.

k The cost of upgrading common boundary fences rests with the developer.

14.15.9 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 2 (a) (Residential) and the flood affected southern portion zoned Zone 1 (c) (Non-Urban Constrained Land). All habitable structures are to be located within the Zone 2 (a) (Residential).

DEVELOPMENT 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.

DEVELOPMENT REQUIREMENTS

- A maximum of two residential lots only shall be sited as indicated on Figure 18.
- The allotments shall have a width of 30 metres, depth of 50 metres and area of 1500 square metres.
- The dwelling design upon each site shall be single storey and ranch style.
- The dwelling houses shall be sited on the envelopes outlined in Figure 18 with a minimum building setback of 6 metres.
- 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.
- The 30 metre APZ and the building envelope are to be notated on the property title for each site in accordance with Section 4.15.4.g.

- An APZ Management Plan is to be prepared and submitted with any development application for a dwelling on each these sites.
- A restriction as to user specifying a minimum floor level of 600mm freeboard above the 1% AEP floodlevel is to be placed on the title of each of the two allotments.
- Only open wire type fencing with posts that swing rom the top are to be situated to the south of the identified building envelopes along the side and rear property boundaries



Requirements for Lot 3 DP 208596
Figure 18

Figure 18 Requirements for Lot 3 DP 208596

4.15.10 Open Space, Pedestrian and Cycleway Routes

DEVELOPMENT OBJECTIVES

- Provide a range of public open spaces, sufficient for the active and passive recreation needs of residents.
- Provide linkages between open space, streets, special places and drainage features to create memorable public domain.
- Enhance the appearance, amenity and energy efficiency of urban development through integrated open space and landscape design.
- 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.
- Provide safe and convenient pedestrian and cycleway networks with clear internal links and connections to external regional networks

DEVELOPMENT REQUIREMENTS

a General

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.

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

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. Local Parks are to be provided in accordance with the locations and sizing shown in the Structure Plan represented in Figure 19.

- A 5000m² local park is to be provided within the Precinct A.
- A 3000m² local park is to be centrally located in Precinct B.
- A 2000m² local park is to be provided on the northern edge of the Precinct C.

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

The off-road shared path network is to provide recreational and normal access throughout the Louisiana Road Infill Precinct to other external areas. The onroad cycle network and the off road shared cycleway and pedestrian network is to be provided in accordance with Figure 19. Off-road Cycleways are to be generally aligned with the edge roads to optimise passive surveillance and street lighting.

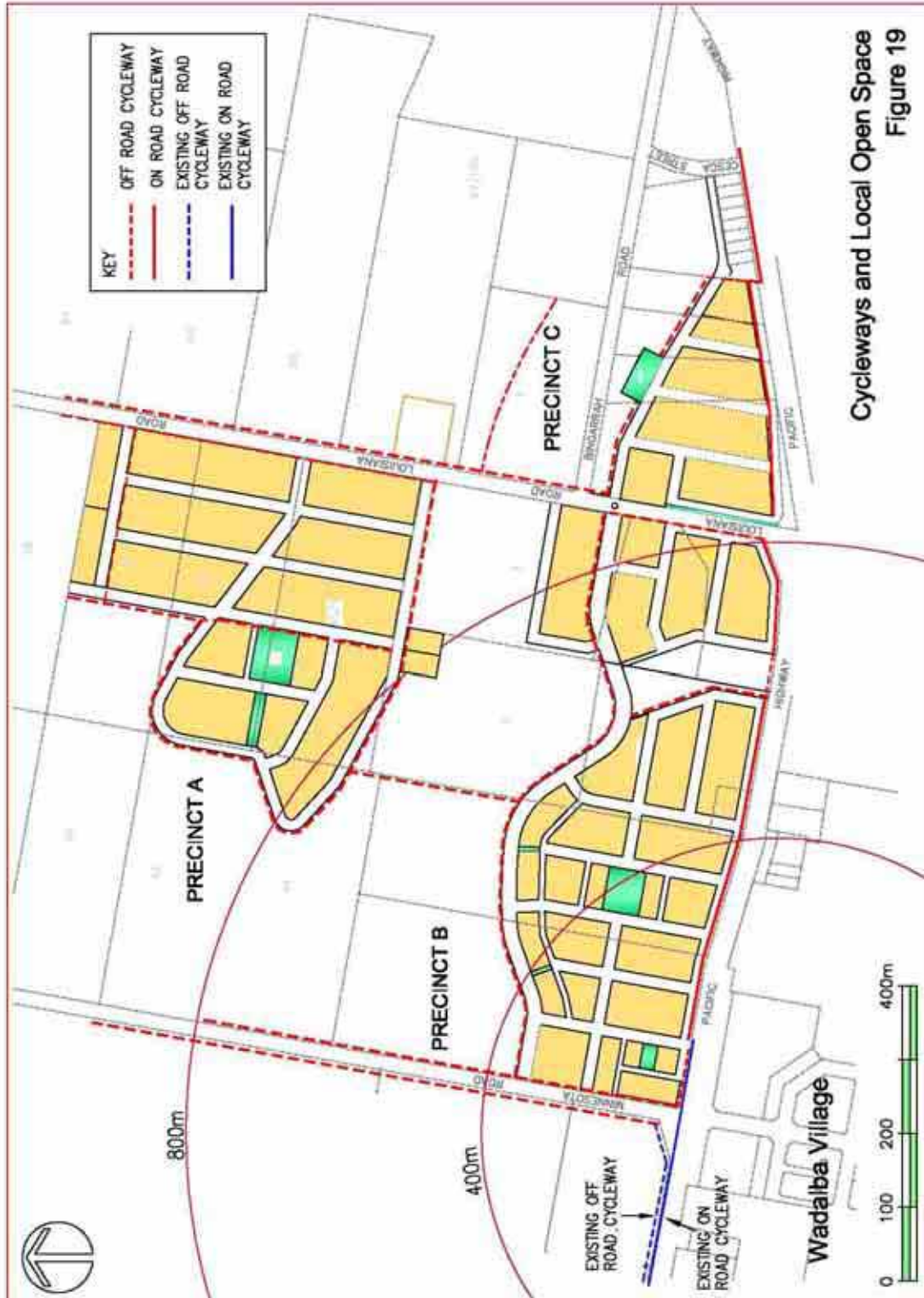


Figure 19 Cycleways and Local Open Space

4.16 Miscellaneous

- a Applications for subdivision shall generally provide a concept for subdivision for all of the land enclosed by any road shown by solid lines on Figure 1 prior to consideration of a development application for part of the said area.
- b Applications for development should address the provisions of all State Government Legislation enacted to protect threatened fauna and flora.
- c Landscape guidelines and plans shall be prepared and submitted to Council for approval to differentiate the major road hierarchy, open space areas, trunk drainage reserves and noise amelioration areas. Implementation of the landscape plans shall proceed in accordance with Council's Landscape Policy. Applicants are advised to contact Council's Landscape Architect for further details.
- d Sediment and Erosion Control Plans will be required in accordance with the publication - Engineering Requirements for Development, Design and Construction.
- e The excising of an existing dwelling from a larger allotment will be considered where it can be demonstrated that the subdivision will not prejudice the orderly development of the remainder of the allotment.

As a general rule the excised lot shall:

- i* Contain a minimum curtilage around the existing dwelling commensurate with a detailed house within a standard residential subdivision; and
 - ii* Contain a dwelling that would complement future dwellings in the locality.
- f Kanwal Reservoirs and Communication Tower
 - i* Vehicle access to Kanwal Reservoirs and the adjoining communication tower(s) must be maintained at all times.
 - ii* The street drainage of that land south of the Kanwal Reservoirs must be designed and constructed to accommodate overflow from the Kanwal Reservoirs. The applicant must liaise with Council's Water and Sewerage section in this regard.
 - iii* The water mains from Kanwal Reservoirs are to be located on land that is dedicated to Council as part of the road reserve. The mains must not be located on privately owned land requiring the formalisation of easements. Subdivisions are to be designed to maintain access to the mains at all times.
- g An opportunity has been identified in the Wadalba Urban Release Area – Development Concept to relocate a small park which borders the Council utility to the south of the Kanwal reservoirs (See Wadalba Development Concept Map). If the applicant seeks to relocate this park to an alternate location, the following issues must be satisfactorily addressed:
 - i* Utility and any landscape buffers must be retained under Council ownership. No credit will be given for the provision of these areas as local open space.
 - ii* Vehicle access to the utility must be provided.
 - iii* Appropriate measures are to be employed to ensure that residential development is sympathetically integrated with the utility and that neighbourhood amenity issues are considered.

h Aboriginal archaeological sites

A number of sites within the Wadalba North West Urban Release Area have been assessed as having a high significance to the local Aboriginal community as relatively rare sites at a local level. Archaeological monitoring must be undertaken when works are proposed which would affect ground surfaces or sub surface deposits within the environmental corridor and drainage corridor. These works include vegetation clearance and drainage works. If surface or sub-surface archaeological material is uncovered during this process, work should cease immediately and the NPWS notified. The monitoring should be undertaken by representatives of the Darkinjung LALC.

NOTE: APPENDICES A TO F (SEE APPENDICES REPORT)