



Wungong Urban Water Design Guidelines

Metropolitan Redevelopment Authority (ABN 69 92 571 142)

**DevelopmentWA acknowledges the traditional owners
of the land within its redevelopment area.**

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Figure 1: Aerial view of Wungong Urban Water Project Area looking Northeast



Chapter 1

Introduction

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CHAPTER 1 INTRODUCTION

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Chapter 1 Introduction

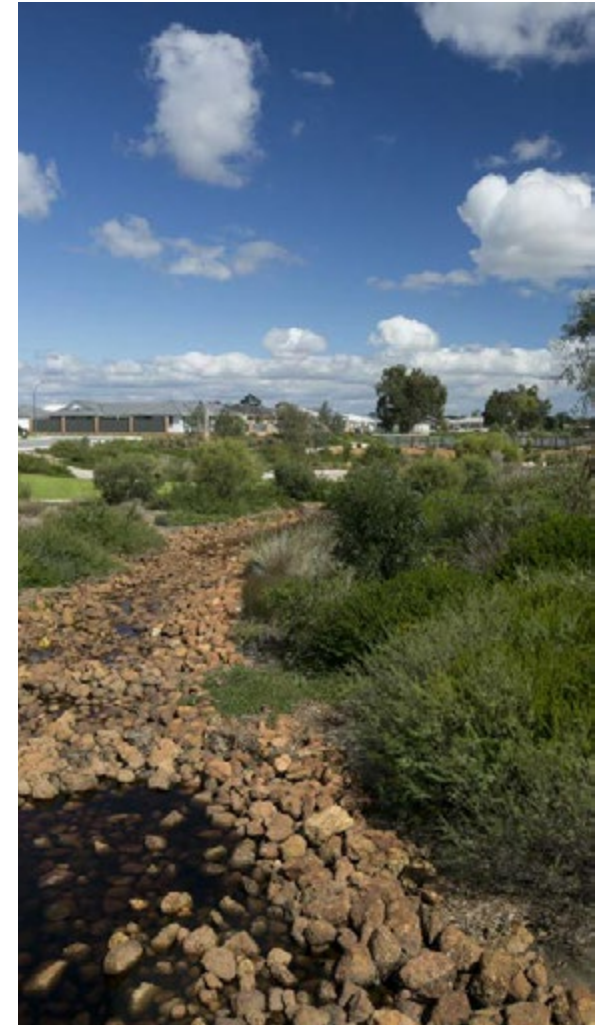
1.1 THE PURPOSE OF THE DOCUMENT

The Wungong Urban Water Design Guidelines (the Design Guidelines) have been prepared to guide development within the Wungong Urban Water Project Area (the Project Area) and ensure delivery of the vision and objectives of the *Metropolitan Redevelopment Authority Regulations 2011* (the Regulations), Armadale Redevelopment Scheme 2 (Scheme 2) and the Wungong Urban Water Master Plan.

The Design Guidelines require structure planning, subdivision and development proposals within the Project Area to deliver high quality design outcomes whilst complementing the region's significant environmental and cultural assets and facilitating the desired character for each of the Project Area's fourteen (14) Precincts consistent with the applicable Place Code identified under the Master Plan or relevant structure plan.

The Design Guidelines outline objectives and acceptable outcomes for structure planning, subdivision, built form and public realm outcomes within the Project Area. The Design Guidelines provides a basis for the control of residential, non-residential and mixed use development in Activity Centres, Commercial, Urban, Suburban and Rural Residential Place Codes, and other forms of development in the public realm.

For residential development in Urban, Suburban and Rural Residential Place Codes, the provisions of the Residential Design Codes will apply, except where stated otherwise in a Structure Plan and/or a Local Development Plan approved by the Authority or in the City of Armadale Local Planning Policy PLN 3.10 'Residential Design Codes Variations & R-MD Codes'.





1.2 THE REDEVELOPMENT OBJECTIVES

DevelopmentWA is the State Government's central land development agency that brings together the work of the Western Australian Land Authority (formerly trading as LandCorp) and the Metropolitan Redevelopment Authority, while retaining the legislative powers of both agencies.

The Design Guidelines are prepared under the powers of the *Metropolitan Redevelopment Authority Act 2011* (the Act) and Scheme 2. References to the Authority in this document refer to the Redevelopment Authority under the Act and any subsequent planning authority responsible for the subject land, including the City of Armadale, the Western Australian Planning Commission and/or Joint Development Assessment Panels (JDAP's).

The role of the Authority is to revitalise and transform underutilised urban areas into diverse and activated places for people to live, work and recreate, guided by the following Redevelopment Objectives as set out in the Regulations:

- To build a sense of place by supporting high-quality urban design, heritage protection, public art and cultural activities that respond to Perth's environment, climate and lifestyle;
- To promote economic wellbeing by supporting, where appropriate, development that facilitates investment and provides opportunity for local businesses and emerging industries to satisfy market demand;
- To promote urban efficiency through infrastructure and buildings, the mix of land use and facilitating a critical mass of population and employment;
- To enhance connectivity and reduce the need to travel by supporting development aimed at well-designed places that support walking, cycling and public transit;
- To promote social inclusion by encouraging, where appropriate, a diverse range of housing and by supporting community infrastructure and activities and opportunities for visitors and residents to socialise; and
- To enhance environmental integrity by encouraging ecologically sustainable design, resource efficiency, recycling, renewable energy and protection of the local ecology.

1.3 THE WUNGONG VISION

The Authority's vision for the redevelopment of the Project Area is to establish a vibrant and sustainable urban community within an environment that respects and promotes the ecological and cultural features of the site. Development within the Project Area will showcase innovative environmental and urban water management principles while addressing housing demand identified under broader State Government strategic planning for the Perth Metropolitan area.

Development in the Project Area will exemplify Scheme 2 Objectives, incorporating best practice water sensitive urban design measures, integrating with the site's natural drainage systems, and facilitating efficient use of resources and infrastructure. The Project Area contains areas of high environmental and heritage significance that are to be protected and preserved within the public open space network, through the provision of environmental buffers and the designation of compatible land uses.





1.4 THE WUNGONG URBAN WATER MASTER PLAN

The Wungong Urban Water Master Plan (the Master Plan) is the high level strategic guiding plan for the Project Area (See Appendix 1). The Master Plan identifies precinct boundaries, Place Code boundaries, Town Activity Centre and Neighbourhood Activity Centre locations, school locations, the open space network and the key movement network throughout the Project Area. The Master Plan has been developed to encourage 'Place Based Planning' to allow for flexible design outcomes to address site conditions, and to allow for variety in land uses and built form outcomes. To achieve this, Place Codes have been established to identify the intended development and land use types for areas within the Master Plan. The development requirements for Place Codes are specified in Chapter 2, Table 2: Place Code Requirements.

The Wungong Project Area consists of Place Codes as identified in the Master Plan as follows:

- Town Activity Centre;
- Neighbourhood Activity Centre;
- Urban;
- Suburban;
- Rural Residential;
- Active Open Space; and
- Passive Open Space.

Town Activity Centre

The Wungong Urban Water Town Activity Centre is centrally located within the Project Area (See Appendix 2, Site 1). State Planning Policy 4.2: Activity Centres for Perth and Peel identifies the Wungong Urban Water Town Activity Centre as a centre of district level significance within the South-East Sub-Region of the Perth Metropolitan region. Development within the Town Activity Centre will reflect the importance of the location as a key activity hub and meeting place for the residential community through the implementation of high quality 'main street' built form and urban elements. It is envisaged that the Town Activity Centre will perform the function of the Project Area's main centre for trade and enterprise.

Subdivision will reinforce the Town Activity Centre's role as a secondary retail centre to the Armadale Strategic Metropolitan Centre, and will be capable of supporting civic and employment uses and will allow for the provision of the prescribed floor space requirements outlined in Appendix 2.

Neighbourhood Activity Centre

Neighbourhood Activity Centres provide day-to-day convenience shopping for the surrounding neighbourhood as well as a focus for neighbourhood services and local community facilities. The Neighbourhood Activity Centres have been strategically located throughout the Project Area to ensure the majority of dwellings are within a 400 to 500 metre walking radius. Neighbourhood Activity Centres will be located adjacent to intersections and boulevards to capitalise on passing pedestrian and vehicular traffic within the Project Area. The prescribed size of these centres is specified in Appendix 2 to ensure the Neighbourhood Activity Centres complement the Town Activity Centre.

Commercial

The Commercial Place Code is located in Precinct 23 (M) Wungong North and provides opportunities for local conveniences and community facilities complementary to the Forrestdale Project Area, which is located immediately to the north. The Commercial Place Code is not to compete with, or undermine, the viability of established Activity Centres within the locality and will create a synergy of land use with the adjacent regional recreation sporting grounds.

Urban

Characterised by predominantly medium density residential development with a range of building types including single residential dwellings, townhouses and terraces. Buildings are setback such that the dwellings address, respond to and activate all streets and provide enhanced levels of security. The medium density residential development will support the Activity Centres and provide a critical mass for public transport, assisting to reduce private vehicle dependency. Development is to be designed and located to promote the use and enjoyment of the public open space (POS) areas.

Suburban

Characterised by predominantly low density residential development that supports the development of a variety of one and two storey detached and semi-detached building types. Diversity in the range of building types is encouraged, with two storey development located along the major roads, adjacent to the 'Urban' place coded areas, and around areas of high amenity, such as public open space (POS) and Activity Centres.





Rural Residential

Characterised by low density development that is sensitive to the natural environment and may incorporate buffers to significant environmental features or identified archaeological and aboriginal sites. Larger lot sizes are provided with detached houses, to maintain the rural residential character and lifestyle of the location.

Active Open Space

Areas of POS to promote formal and informal active recreation located outside of, or adjacent to, 'Living Streams' corridors, 'Park Avenues', wetland buffers, and where possible integrated with school sites to provide for a range of recreational pursuits with shared access and management. Active Open Space areas will be designed and landscaped to prioritise the retention and enhancement of existing native vegetation and incorporate water harvesting and re-use.

Passive Open Space

Areas of POS which promote passive and active recreational activities including walking, cycling, family play and barbecue/picnic areas. Passive open space areas will be designed, used, and managed to support the conservation of wetlands, wetland buffers, native vegetation areas, and waterway foreshores and maintain important drainage functions. Passive open spaces will be designed and landscaped to prioritise the retention and enhancement of existing native vegetation and incorporate water harvesting and re-use.

1.5 HISTORY

The Whadjuk Noongar Aboriginal people occupied the land in what is now the Perth Metropolitan region for approximately 45,000 years before it was colonised by European settlers. The region that later encompassed Armadale was valued by the Whadjuk Noongar people for its natural environmental diversity that offered important seasonal shelter and water sources.

The Armadale region was first developed following European settlement in what was to become Kelmscott, with the gazettal of the townsite in 1830. The development of Armadale itself occurred in the following decades, with gazettal formally occurring in 1909 following the completion of the Perth to Armadale (South-Western) Railway in 1892 and the opening of the Armadale Post Office in 1898.

European settlement of Wungong was initially for agricultural purposes, following the Goss family's subdivision of large lots to the south-west of the Armadale townsite in the late 19th century. A 'Wongong' townsite was planned adjacent to present day South Western Highway and consequently gazetted in 1909, however, plans for the development of the townsite were later cancelled.

Other than the development of rural residential lots and agricultural homesteads, further development within Wungong was largely restricted to essential infrastructure. In 1912, the 'Wongong Mission Hall' was built to cater for the local population centred around Eleventh Road and Rowley Road, as a result of the local population having limited access to a local civic building. The hall continued to be used as a civic hall until 1954, when it was converted to a church to cater for the local needs of a growing population of Dutch migrants.

In 2002 the Armadale Redevelopment Authority (ARA) commenced operations with a mandate to facilitate development within the Armadale region. In 2005, the ARA's mandate expanded to include Wungong, with the gazettal of the Brookdale Redevelopment Scheme 2005. The project was renamed 'Wungong Urban Water' in 2006, acknowledging the project's focus on water sensitive urban design principles in the development of the required infrastructure for a residential community of up to 50,000 residents.

In 2011, the suburbs of 'Hilbert' and 'Haynes' were gazetted. The names of the suburbs were chosen based on their relevance to the Wungong area, notably being the names of two families with historic connections to Wungong's agricultural history.





1.6 USING THE DESIGN GUIDELINES

The Design Guidelines provide a flexible and innovative approach to the delivery of high quality development that meet the Authority's objectives. The Design Guidelines promote early engagement with the Authority and identify the requirements for development proposals.

The Design Guidelines are structured in the following manner:

- Structure Planning and Subdivision Design Guidelines in Chapter 2 provide guidance for structure planning and subdivisions within the Project Area and is to be read in conjunction with the Western Australian Planning Commission's (WAPC) Liveable Neighbourhoods and Chapters 3 to 6 of the Design Guidelines. Where there is inconsistency between the provisions of Liveable Neighbourhoods and the Design Guidelines, the provisions of the Design Guidelines will prevail.
- Place Code Specific Design Guidelines in Chapter 3 and Chapter 4 provide detailed development standards that apply to the relevant Place Code of the Project Area that should be read in conjunction with the State Planning Policy 7.3 – Residential Design Codes (R-Codes) Volume 1 and Volume 2 and Chapters 5 and 6 of the Design Guidelines.
- Common Design Guidelines in Chapters 5 and 6 provide design criteria and development standards for streetscape, built form and car parking within the Project Area and are to be read in conjunction with the Place Code Specific guidelines identified above.

The Design Guidelines are comprised of the following:

- **OBJECTIVES**

The Objectives outline the intended outcome for each provision. It is mandatory to achieve the objectives. The Authority will give due regard to the achievement of the objectives in determining development applications or making any other discretionary decisions under the Design Guidelines and Scheme 2.

- **AUTHORITY DEVELOPMENT POLICY**

If an Authority Development Policy is applicable to a specific objective, it will be identified under this heading. It is mandatory to comply with the provisions of Development Policies.

- **ACCEPTABLE OUTCOMES**

Acceptable Outcomes are likely to assist in satisfying the objectives but are not a comprehensive 'deemed-to-comply' list. In order to achieve the Objectives, proposals may require additional and/or alternative design solutions in response to the site conditions, streetscape and design approach.

- **FIGURES AND IMAGES**

Figures and images have been included to illustrate design responses to Acceptable Outcomes:

- **Plans** - Identify Project Area and Precinct boundaries;
- **Diagrams** - Provide Place Code specific design criteria that visually represent potential solutions to site provisions including height and setbacks requirements; and
- **Photographs and Illustrations** - These are for illustrative purposes only and may include some elements of variations to the acceptable outcomes. This does not imply that the Authority will accept the same outcome in all cases as context may vary.





1.7 APPLICATION OF DESIGN GUIDELINES

The Design Guidelines provide Objectives and Acceptable Outcomes for structure planning, subdivision and development within the Project Area to achieve the Authority's Redevelopment Objectives. The Design Guidelines provide a comprehensive framework for the management of residential, non-residential and mixed use development and other forms of development within the public realm.

For residential development in Urban, Suburban and Rural Residential Place Codes, the provisions of the Residential Design Codes will apply, except where stated otherwise in a Structure Plan and/or a Local Development Plan approved by the Authority or in the City of Armadale Local Planning Policy PLN 3.10 'Residential Design Codes Variations & R-MD Codes'.

In considering any application for structure planning, subdivision and development approval, the Authority will utilise the Design Guidelines in conjunction with Scheme 2; the Development Policies; State Planning Policies (SPPs) including SPP 3.7 Planning in Bushfire Prone Areas, SPP 4.2 Activity Centres for Perth and Peel and SPP 7.3 – Residential Design Codes Volume 1 and 2; Western Australia Planning Commission's (WAPC) Liveable Neighbourhoods as well as the National Construction Code of Australia (NCCA); Disability Discrimination Act 1992 and all relevant legislation and Australian Standards.

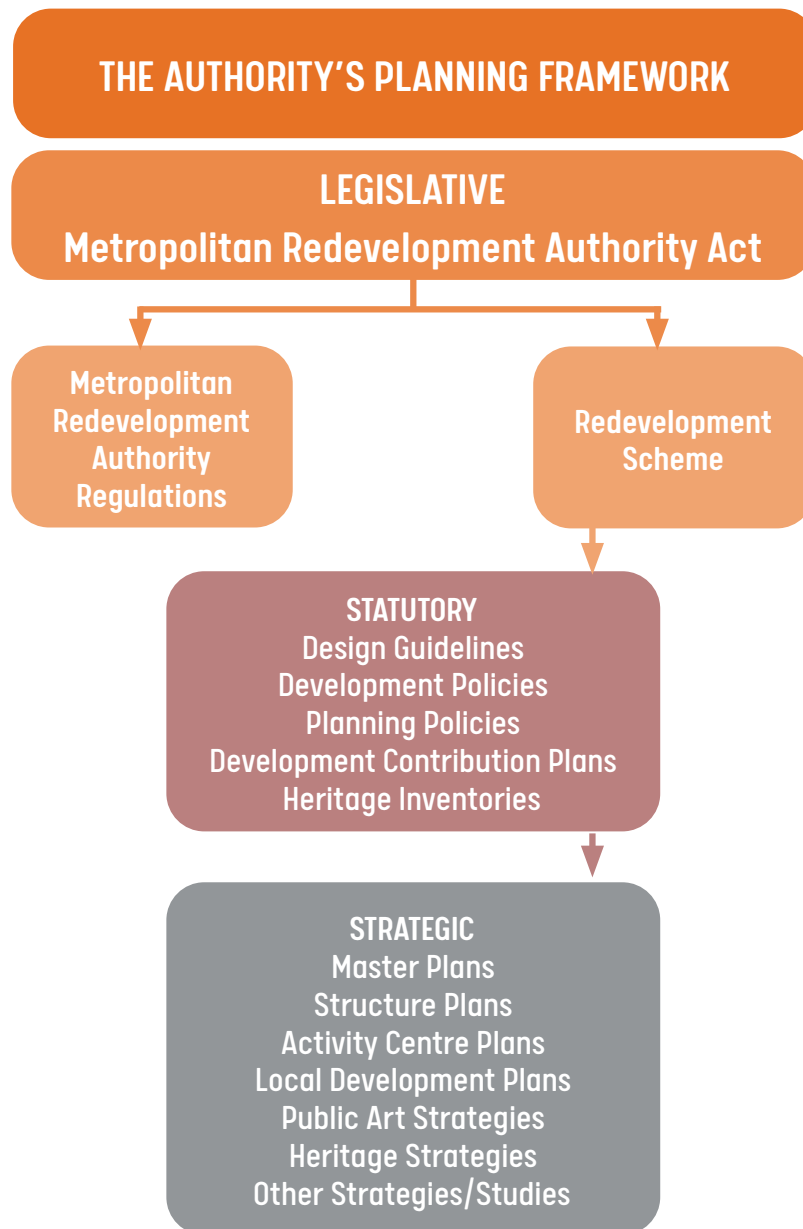
The full suite of Armadale Redevelopment Area Development Policies is available on the Authority's website.

Applicability of Liveable Neighbourhoods

In assessing and determining or providing a recommendation on structure plans and subdivision applications, the provisions identified in Liveable Neighbourhoods and the Design Guidelines apply. Where there is inconsistency between the provisions of Liveable Neighbourhoods and the Design Guidelines, the provisions of the Design Guidelines will prevail.

Applicability of Residential Design Codes

In assessing and determining applications for single residential, grouped dwelling or multiple dwelling development within the Project Area the provisions of the R-Codes will apply except where stated otherwise in a Structure Plan, Activity Centre Plan and/or a Local Development Plan approved by the Authority or in the City of Armadale Local Planning Policy PLN 3.10 'Residential Design Codes Variations & R-MD Codes'.





1.8 DISCRETIONARY CLAUSE

The Design Guidelines provide the opportunity for a development application to meet the Objectives through a range of design solutions. The Authority may approve a development application where the applicant has departed from the Acceptable Outcomes where, in the Authority's opinion, it is demonstrated that the alternative solution(s):

- a) is considered to meet the relevant Objective(s) of the Design Guidelines; and
- b) is consistent with Clause 5.19 Determination When Non-Compliant of Scheme 2.

Each application will be assessed on its own merits having regard to the matters above and Clause 5.18 Key Matters for Consideration in Determination, of Scheme 2.

1.9 DEVELOPMENT APPLICATION PROCESS

The Authority's review, assessment and determination process is included in Table 1 to detail the staged progression of design development, approval and construction. The staged process supports development to achieve the required high quality urban design and architectural outcomes as well as sustainability, functionality and well considered place making.

Table 1 outlines the design formulation, submission and approval process required for applications in the Project Area deemed major applications under Section 63 of the *Metropolitan Redevelopment Authority Act 2011* and Regulation 15 of the *Metropolitan Redevelopment Authority Regulations 2011*.

Note: In accordance with Regulation 9 (2)(g) of the *Metropolitan Redevelopment Authority Regulations 2011* a single house on a lot with an area greater than 260m², that complies with these Design Guidelines and the applicable R-Codes provisions does not require development approval from the Authority, however a Building Permit approval is required to be obtained from the City of Armadale prior to commencement of any works.

Table 1: Development Application Process for Major Applications

Pre-Development Application Submission (where relevant)	Development Application	Documentation (where required)	Construction
Step 1. The applicant and their project team meet with the Authority to discuss design and sustainability concepts.	Step 5. The applicant lodges a development application with the Authority, addressing the objectives and applicable specific elements of the Design Guidelines.	Step 8. The applicant lodges working drawings to the Authority demonstrating compliance with the development approval (plans and conditions)	Step 13. The applicant undertakes construction
Step 2. The applicant provides the Authority with indicative plans.	Step 6. The Authority refers the development application to the City of Armadale and other agencies as necessary. The Authority obtains the advice of its appointed Design Review Panel as required within the same period.	Step 9. The Authority refers the working drawings to agencies or consultants as required to verify compliance with the development approval (plans and conditions).	Step 14. Ongoing monitoring and building management to ensure compliance with the planning approval.
Step 3. The Authority obtains preliminary advice of its appointed Design Review Panel and other relevant agencies where required.	Step 7. The Authority assesses and determines the application, having regard to the advice received from referral agencies and the Design Review Panel	Step 10. The Authority assesses and certifies that the working drawings are compliant and provides its advice to the City of Armadale.	
Step 4. The Authority provides the applicant with focused feedback.		Step 11. Developers lodge a Building Permit application with the City of Armadale.	
		Step 12. City of Armadale issues a Building Permit. (Note: As per advice from other referral agencies, further approvals may be required by other authorities)	



Chapter 2

Structure Planning and Subdivision Design

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Chapter 2 Structure Planning and Subdivision Design



In designing new neighbourhoods, all structure plan and subdivision applications will comply with the principles and requirements identified in the WAPC's Liveable Neighbourhoods in addition to the provisions stipulated in this Chapter. Where there is inconsistency between the provisions of Liveable Neighbourhoods and the Design Guidelines, the provisions of these Design Guidelines will prevail.

Detailed planning through the preparation of precinct structure plans and subdivisions will provide for residential communities that are seamlessly connected to neighbouring precincts through efficient movement networks, with convenient access to well located community facilities, retail centres, and public open space areas.

Structure planning and subdivision is to ensure that the Project Area's natural and historical assets are protected, and that development is appropriately integrated, for the benefit of future generations. The Authority promotes the responsible and sustainable development of land within the Project Area.

Subdivisions will be designed to provide a coherent urban system of compact walkable neighbourhoods sympathetic to their natural surroundings. Medium density mixed use development is to be promoted around activity nodes, and Activity Centres, connected by pedestrian, cyclist, and public transport friendly streetscapes.

Subdivision applications on privately owned land are determined by the Western Australian Planning Commission in consultation with the Authority. The *Metropolitan Redevelopment Authority Regulations 2011* Regulation 6 (2) (b) exempts subdivision works from requiring separate development approval from the Authority.

2.1 LOT AREA AND SUBDIVISION DESIGN

Objectives

Structure Plans and subdivisions are designed to promote development in accordance with the Objective for the relevant Place Code, as detailed in Chapter 3 and Chapter 4. The layout of structure plans and subdivision proposals will enhance local identity by responding to the site context, characteristics, setting, landmarks and views and incorporates recognised elements of natural and cultural heritage significance.

Subdivisions will allow for a range of residential lot sizes suitable for a variety of housing and land use typologies to meet the diverse and changing needs of the community and will be designed in a way to promote permeability, legibility and high levels of amenity for pedestrians, cyclists and road users. The size and orientation of residential lots will enable the provision of dwellings that allow for adequate private open space, energy efficient design, solar access, casual surveillance, safe vehicular access and sufficient on-site car parking. New subdivisions will ensure a seamless integration between the proposed development and the surrounding existing development.

Acceptable Outcomes

- Lot sizes are in accordance with the minimum and average lot sizes specified in Clause 9.9 of Scheme 2 (refer to Table 2: Place Code Requirements).
- Non-residential and mixed use lots in Activity Centres have a minimum frontage of 20m to any street.
- Rural Residential lots have a minimum frontage of 30 metres and at least 70% of the lot is to be retained as private open space.
- Subdivision layout ensures delivery of walkable neighbourhoods and safe pedestrian and cycle networks in order to reduce private car dependency.
- Lots abutting POS or reserves are serviced by laneways of sufficient width to accommodate access for postal services, waste collection and public utilities, in consultation with the City of Armadale and other relevant agencies.



Continues

- Subdivision design promotes the conservation and preservation of cultural heritage places identified in the Armadale Redevelopment Area Heritage Inventory and approved Structure Plan(s).
- Residential development addresses streets, public open spaces and reserves to facilitate passive surveillance of the public realm.
- Street trees are provided at a minimum rate of 1 tree for every 4 on-street car parking bays or 1 tree to every 10m of lot frontage to contribute to a high quality street character and provide shade and cooling.
- Finished site levels and built form respond to the natural topography of the site, stepping or terracing as necessary to ensure the buildings relate to adjacent streets/roads and integrate with adjacent sites.
- Retaining walls and associated fill are no greater than 0.5 metres above the corresponding natural ground level.
- Battleaxe subdivisions are generally not supported. Where a battleaxe subdivision is proposed it meets all other applicable development standards including the use of permeable paving and providing passive surveillance to the street.

Table 2: Place Code Requirements

Place Code	Minimum Lot Size	Minimum Average Lot Size
Town Activity Centre	Residential development - 100m ² per dwelling	N/A
Neighbourhood Activity Centre		
Urban (R50 equivalent)	160m ² 380m ² for a battleaxe lot	180m ²
Suburban (R35 equivalent)	220m ² 395m ² for a battleaxe lot	260m ²
Rural Residential (R5 equivalent)	2,000m ² per dwelling	N/A

2.2 MOVEMENT NETWORK

Objectives

Streets are designed to ensure a functional, legible movement network providing a cohesive, pedestrian oriented and safe urban environment.

Authority Development Policy

Compliance with the Authority's Wungong Urban Water Project Movement Network Policy.





2.3 TOWN ACTIVITY AND NEIGHBOURHOOD ACTIVITY CENTRES

Objectives

The Master Plan supports a coherent urban structure of compact walkable neighbourhoods which cluster around Activity Centres capable of facilitating a broad range of land uses, employment and social opportunities. The distribution, scale and design of Activity Centres is to reinforce the intent of the Master Plan and deliver Activity Centres with a primary focus on mixing retail, commercial, cultural and entertainment facilities complemented by residential development and mixed use development. The Activity Centres are to complement the Armadale Strategic Regional Centre as the dominant activity centre in the region.

Activity Centre design will include active street frontages that support main street activation, providing a high quality public realm and pedestrian friendly environment with extensive shading and a focus on safe, shared traffic calmed streets supporting day to day public life (refer to Figure 2 and 3: Indicative Activity Centre subdivision requirements).

The design of an Activity Centre will support a mix of land uses and buildings with capacity to evolve and adapt to changing economic and social needs over time. Land uses which promote retail and community attractions and local employment opportunities and are compatible with surrounding land uses are encouraged.

Precinct 23 (M) - Wungong North, being highly visible from Armadale Road and Twelfth Road, offers the opportunity to define this prominent site as a gateway location to both the Project Area and the greater central Armadale region. Development will provide a high quality design interface with Armadale Road and Twelfth Road and be of a scale and character which is compatible with the desired development within the immediate locality.

Activity Centre Plans are required to be prepared for all identified Activity Centres in accordance with Chapter 9 of Scheme 2 and approved prior to any subdivision or development application being submitted to and determined by the Authority.

Acceptable Outcomes (Applicable to all Activity Centres)

- Activity Centres are dispersed throughout the Project Area in accordance with the Master Plan.
- The street layout and broad structure of the Activity Centres achieves a strong and unique sense of place and local identity to correspond with the local natural and cultural context.
- Roads within and accessing the Activity Centres provide embayed public car parking to both sides of the street with a minimum parking reserve width of 2.5m.
- Streetscapes are designed to ensure priority and comfort to pedestrian with road layout designed to facilitate a low speed environment. Vehicle speeds will not exceed 40km/h and will comply with Austroads Part 7 (Guide to Traffic Management – Traffic Management in Activity Centres).
- Pedestrian and cyclist movement are prioritised through the provision of a coherent network of wide footpaths, pedestrianised zone, dual pathways and mid-block links (laneways and arcades) to encourage walking and cycling and reduce private vehicle dependency.
- Verges within Activity Centres are a minimum 4 metres width between kerb and lot boundary and designed and constructed to maintain a minimum unobstructed pedestrian path width of 2.5 metres while facilitating street furniture, cycle parking and landscape treatments as well as alfresco dining opportunities.
- Pervious paving and vegetated stormwater systems (e.g. tree pits, biofilter pockets and swales) are incorporated within the streetscape and at-grade, uncovered car parks.
- Access to public transport is provided with well-located bus stops within 250m of all areas of the Activity Centres.
- The layout and design of activity centres incorporates a safe, well defined public realm and will incorporate Crime Prevention Through Environmental Design (CPTED) principles.
- The streetscape environment creates a legible, high quality street amenity incorporating shade, shelter, trees, street furniture, landscaping and public art.
- Activity Centres incorporate high quality public spaces in the form of urban squares, plazas, parks and other incidental public spaces which are functional and contribute to the amenity of the centre.
- Lot sizes are in accordance with the minimum lot size specified in Clause 9.9 of Scheme 2 to ensure a fine grain design and walkability of the Activity Centres that is not reliant on private right-of-ways for convenient access.





- Non-residential and mixed use lots in the Activity Centres have a minimum frontage of 20 metres to any street
- Activity Centre Planning and Subdivision ensures the provision of development capable of accommodating the total retail floor space in accordance with Appendix 2: Wungong Urban Water Project Area Activity Centres Location Plan and Retail Floorspace Allocation. Activity Centres are designed to facilitate active landuses generating employment opportunities.
- Service stations and drive-through stores are generally not supported in Activity Centres. All applications for development approval are to demonstrate:
 - a high quality built form outcome including an active public realm interface;
 - a pedestrian friendly movement network;
 - sufficient vehicle storage capacity clear of the public road network at peak usage; and
 - servicing arrangements do not compromise the operation of the Activity Centre.

Town Activity Centre Acceptable Outcomes

- The Town Activity Centre (Precinct 15 – Town Centre) is structured in a main street layout, to accommodate multi-storey mixed use development with built frontage to streets, on-street parking and additional parking at the rear of buildings.
- Development accommodates retail, commercial and dining and entertainment land uses with supporting residential uses confined at the northern side of the Town Activity Centre. The southern side capitalises on the connection with the Wungong River and the conservation category wetland by providing tourist and/or entertainment based activities such as restaurants and cafés with accompanying medium density residential development.

Neighbourhood Activity Centres Acceptable Outcomes

- Neighbourhood Activity Centres are designed to complement rather than compete with the higher order commercial function of the Town Activity Centre and will include medium density residential development, small scale convenience stores and specialist services/retail functions which address local demand from residents within a walkable catchment.

Precinct 23 – Wungong North Acceptable Outcomes

- Development provides visual interest to the streetscape and take advantage of the passing trade opportunities to build business diversity and robustness. Detailed design requirements for the precinct will be established by a Structure Plan or Local Development Plan.
- Development is designed and oriented to capitalise on the connection with the adjacent Precinct 10 – Recreation.
- Direct vehicle access to Armadale Road is not permitted unless prior approval is obtained from Main Roads Western Australia and where there is no alternative option.
- Sensitive land uses may not be permitted as the site is affected by an environmental odour buffer from the adjacent Water Corporation waste water pumping station site.





Figure 2: Indicative Activity Centre subdivision requirements

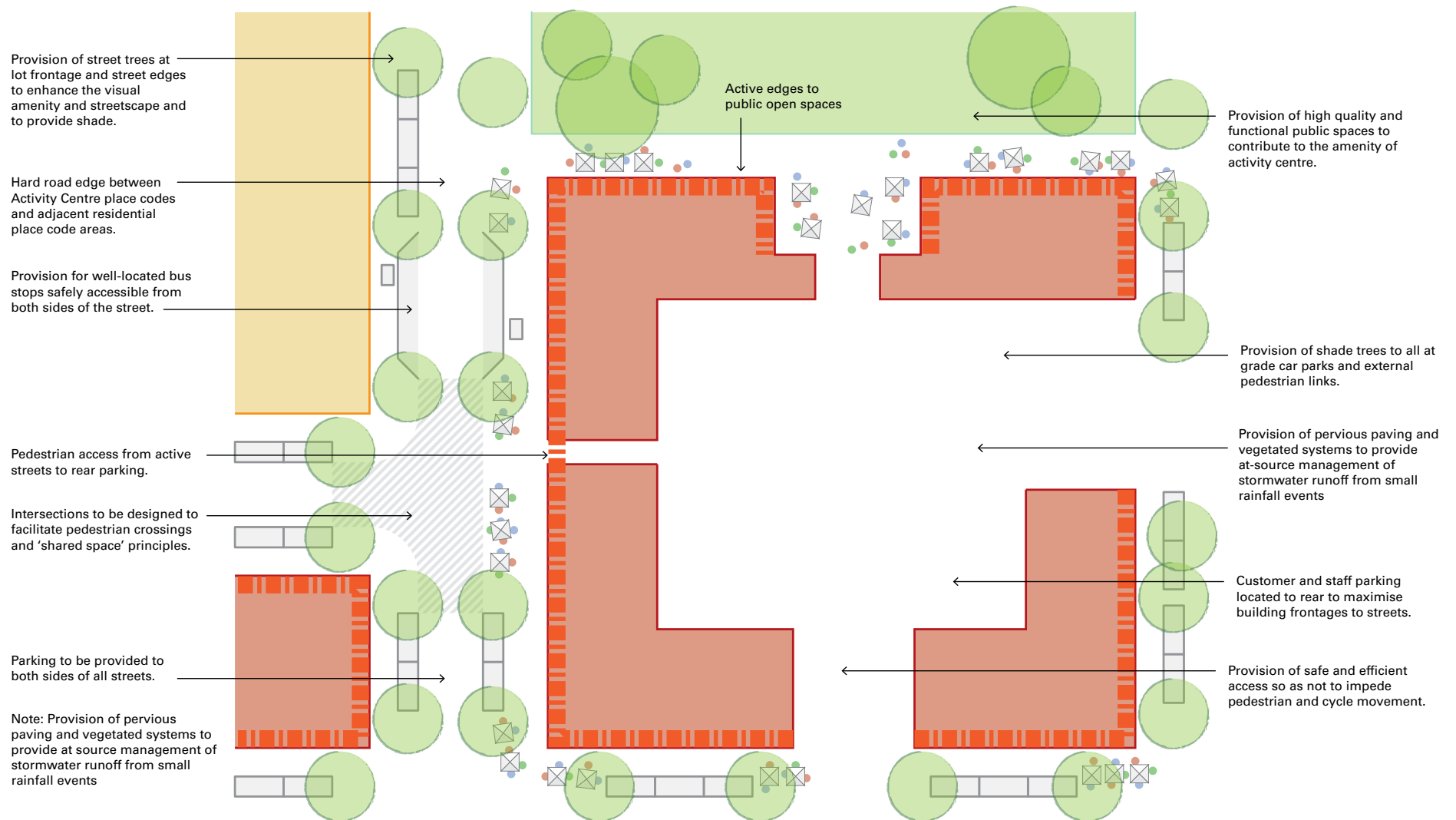


Figure 3: Indicative Activity Centre subdivision requirements: Public Realm



2.4 PUBLIC OPEN SPACE

Objectives

Public open space will be designed and constructed to provide for the recreational and social needs of the community in appropriate locations in a manner which integrates conservation and water sensitive urban design principles and management. The design of public open spaces will be functional for sport, nature and recreation purposes, drainage and water management and provide convenient access to schools, community facilities and Activity Centres.

Authority Policy

Compliance with the Authority's Wungong Urban Water Project Public Open Space Policy

2.5 LANDSCAPING

Objectives

Landscaping will contribute to the character and visual amenity of the streetscape, provide shade and comfort, increase biodiversity, manage stormwater volumes and quality, and improve people's mental and physical health. Landscaping assists in mitigating bulk and scale of buildings, creates attractive delineation between the public and private realm, provides shelter and shade in public spaces and creates a pleasant living, working and recreational environment. Landscaping design will be environmentally sustainable through the incorporation of innovative and best practice urban water management and the use of waterwise planting species.

Acceptable Outcomes

- A Landscaping Plan is prepared to establish a landscaping theme for the subdivision area reinforcing the identity of the Project Area. The Landscaping Plan identifies major planting species for the area, and in particular street trees species.

Continues

- Landscape plans are prepared in consultation with the City of Armadale's Technical Services Directorate, and in accordance with the following strategies and documents:
 - Wungong Urban Water District Water Management Strategy; and
 - Any relevant precinct/subdivision based Landscape and Irrigation Management Strategy, Wetland Management Plan, Foreshore Management Plan, Local Water Management Strategy, and/or Urban Water Management Plan (Refer to Appendix 5 of Scheme 2).
- Landscape design is viable and sustainable through:
 - utilising native and waterwise species and will includes a sustainable watering/irrigation system. Lawn and other high maintenance landscaping are limited;
 - innovative landscape treatments such as green walls and roofs are encouraged to reduce stormwater generation, enhance the soft landscape aesthetic of the development, improve thermal massing and assist in reducing the urban heat island effect;
 - landscaped areas are integrated with rainwater capture and reuse and/or waste water recycling;
 - permeable pavements and other sustainability techniques are employed to increase the self-sufficiency of landscaping; and
 - existing mature trees on site are retained wherever possible.
- Landscape design contributes to amenity and recreation through:
 - landscaping is designed in accordance with the CPTED principles and allows development to take advantage of views over the public realm or open space while assisting with creation of an attractive urban edge with landscaping on the verge or forward of the building front façade;
 - landscaping is designed in accordance with the 'Healthy Active by Design' principles to provide the community with the positive physical and mental health outcomes;
 - POS not being used to mitigate against bushfire. The primary function of public open space is to provide recreation, sport and nature functions for the community;
 - appropriate plant species selection and planting themes responds to local conditions and relate to the character, scale and proportions of the streetscape and built form; and
 - landscaped urban areas having a mix of soft and hard surfaces that are appropriate for the site context.





2.6 EDUCATION

Objectives

School sites will be provided for in accordance with the Master Plan to accommodate the educational needs of existing and future communities and support co-located services such as out-of-school care, special education and health facilities. Schools will be conveniently located to their local catchment within a well-connected local movement network and have an appropriate interface with adjoining land uses.

Acceptable Outcomes

- School sites are identified on structure plans and plans of subdivision in accordance with the Master Plan in consultation with the Department of Education (DoE). A structure plan that contains a school site must also submit an indicative school layout plan and obtain the endorsement of the DoE prior to its submission to the Authority. The purpose of an indicative layout plan is to demonstrate that the proposed school site:
 - is capable of satisfying the DoE requirements for ultimate design and construction of a school;
 - provides appropriate location/functional playing fields to be jointly used for active open space for students and the wider community and stormwater retention/infiltration functions as appropriate; and
 - provides sufficient on-site car parking bays and promote safe walkability, pedestrian, cycling and public transport access to and from the proposed school site.
- School sites are useable and the developable area maximised, having regard to the following:
 - desirability of a slope no greater than 1 in 60 for the entire site;
 - limiting or avoiding areas that may require retention for conservation areas including wetlands, flora and fauna being located on school sites;
 - limiting or avoiding the location of service easements on school sites; and
 - requirements for noise buffers to primary and integrator arterial roads.

Continues


- Where a Road Avenue abuts a school, the street environment is designed to enhance the pedestrian-oriented environment along the school edge. This includes elements such as threshold paving, island medians, vertical elements such as trees and bollards to enclose the vehicular environment, on-street embayment parking (which should be maximised to accommodate 14 bays for every 100 pre-primary to year 6 students and 7 bays for every 100 year 7-12 students) and bus bays on the school edge and pedestrian crossings.
- Site levels are suitably integrated with surrounding development and water retention/infiltration functions specifically for the purpose of the school are accommodated within the site where appropriate and/or identified in the Master Plan and as identified in any applicable Urban Water Management Plan.
- Schools are not located in the core of Activity Centres.
- The size of school sites will be in accordance with the Master Plan, DoE requirements and Table 3 below:

Table 3: Size of School Sites

School Types	Minimum Size (in hectare)	Description
Primary School Sites	4.5	School site with self-contained designated playing fields and other recreational facilities.
	4	School site where there is co-location with adjoining public open space
Government Secondary School Sites	10	High school site (years 7-12)
Non-government Secondary School	10	Secondary school
	10-12	Combined primary and secondary school

Continues





Where a variation to the location and/or size of a school site is proposed, the applicant is to provide detailed justification to the Authority, demonstrate that affected landowners have been engaged and provided with the opportunity to comment and obtain written acceptance and agreement for the variation from the DoE.

Any variation to the location of a school site from that shown on the Master Plan, will be considered against the following:

- projected demographic profiles and population densities within the Master Plan precincts;
- the location of established schools within and abutting the Project Area;
- sites which are located on the interconnected network of road avenues on the periphery of neighbourhoods to maximise school catchments and contribute to the public realm;
- sites which abut the integrated open space network (park avenues) and offer good accessibility for walking, cycling and public transport through interconnected system of shared pathways;
- protection of the Wungong River foreshore, wetlands and their associated buffers and Bush Forever sites;
- opportunities for co-location with other community services, public recreation needs and water retention/infiltration functions; and
- consultation with DoE (taking account of any site feasibility study undertaken by the DoE), the WAPC, the City of Armadale and community and industry groups.

2.7 UTILITIES

Objectives

Development within the Project Area will be provided with essential utility services that will be designed and located to minimise visual impact in the public realm while supporting best practice sustainable design outcomes.

Acceptable Outcomes

- All lots are provided with underground power, connected to a reticulated sewerage and reticulated water system and provided access to a reticulated gas supply.
- Street verges are of sufficient width to contain the anticipated services, including street lighting, large canopy street trees of an appropriate species and, where appropriate, embayed car parking, landscaping and footpaths.
- Rear laneways may be used to accommodate drainage and sewer infrastructure to individual lots.
- Where lots are encumbered by a service easement, the easement may be used for access ways, car parking, and/or open space requirements but is not to be built over unless a suitable design solution can be agreed with the relevant service provider and the Authority.
- All water and sewer infrastructure are laid within the existing and proposed road reserves, on the correct alignment and in accordance with the Utility Providers' Code of Practice.
- Metered services and related infrastructure are located and screened to minimise visual impact from the street.
- Utilities and servicing infrastructure, including transformer pads, are designed and installed to respond to the site context and characteristics, setting, landmarks and views, with routes selected to minimise visual impacts on the environment and the amenity of the locality.
- Street lighting is designed in accordance with Australian Standards (AS/NZS 115.6 - Lighting for Roads and Public Spaces) and provided to adequately illuminate streets, footpaths, public transport stops and major pedestrian and bicycle links including open spaces that are likely to be well-used at night to assist in providing safe passage for pedestrians, cyclists and vehicles.
- Where dual use/shared paths are required directly adjacent to trunk service alignments verge widths are widened accordingly, while maintaining the intent and design outcome of the standard cross section appropriate to the road hierarchy as detailed in the Wungong Urban Water Project Movement Network Policy.





2.8 URBAN WATER MANAGEMENT

Objectives

All Subdivision and Development within the Project Area will be designed to facilitate the implementation of innovative and best practice urban water management in accordance with water sensitive urban design principles.

Acceptable Outcomes

- All structure plans and associated Local Water Management Strategies (LWMS) are consistent with Scheme 2, the Master Plan and the approved District Water Management Strategy (DWMS).
- All subdivision works are compliant with an approved Urban Water Management Plan (UWMP).
- All environmental and water management plans are prepared in accordance with Appendix 5 of Scheme 2. The following project-specific design criteria are to be demonstrated in the LWMS and UWMP in accordance with Appendix 4: Design Criteria to be Addressed in Local Water Management Strategies and Urban Water Management Plans of the Design Guidelines:
 - water supply and conservation;
 - stormwater;
 - groundwater;
 - living streams and watercourses;
 - wetlands;
 - water quality; irrigation for Public Open Spaces; and
 - water quality monitoring.

Continues

The level of detail required for each document will be determined by the Authority based on the complexity and risk associated with each development proposal, on advice from relevant government agencies.

- To prevent potential mobilisation of nutrient or contaminant rich groundwater, dewatering effluent should either be re-infiltrated on-site, reused, stored and evaporated, discharged to sewer, or transported off-site, and will not be discharged directly to the river (directly or indirectly) without first consulting the relevant agencies. See Corporate Policy No. 50: Planning for Dewatering Affecting the Swan Canning Development Control Area (Department of Parks and Wildlife and Swan River Trust 2017).
- During construction, appropriate management practices are employed by the construction contractor to manage any potential Acid Sulfate Soils. Management practices are in accordance with the Department of Water and Environmental Regulation's 'Acid Sulfate Soils Guidelines Series Treatment and Management of Disturbed Acid Sulfate Soils'.

Local Water Management Strategy (LWMS)

- A LWMS is approved by the Authority in consultation with the Department of Water and Environmental Regulation (DWER) as a technical appendix to all structure plan applications.
- A LWMS is to address the provisions of DWER's Wungong Flood Modelling and Drainage Study and is to demonstrate project-specific design criteria in accordance with Appendix 4 of these Design Guidelines.
- The LWMS demonstrates compliance with the WAPC's Better Urban Water Management, Department of Water 2008, Interim: Developing a local water management strategy, Department of Water, Perth, Western Australia and Department of Water and Environmental Regulation 2017, Decision Process for Stormwater Management in WA, Department of Water and Environmental Regulation, Perth, Western Australia, with the consideration of:
 - risks to the proposed irrigation source should be identified and a robust contingency plan included if required; and
 - demonstrate compliance with relevant policies and management plans (e.g. Bushfire Management Plan, Foreshore Management plan, etc.)





Urban Water Management Plan (UWMP)

- A UWMP is prepared in accordance with the relevant LWMS and approved by the City of Armadale in consultation with DWER, Department of Biodiversity, Conservation and Attractions and the Authority, prior to the submission of a subdivision application to the WAPC. The Authority will not generally support a subdivision application prior to the preparation of a satisfactory UWMP.
- A UWMP is to demonstrate project-specific design criteria in accordance with Appendix 4 of these Design Guidelines.
- The UWMP demonstrates compliance with the WAPC's Better Urban Water Management, Department of Water 2008, Urban water management plans, Guidelines for preparing plans and for complying with subdivision conditions, Department of Water, Perth, Western Australia and Department of Water 2016, Decision Process for Stormwater Management in WA: Draft for consultation, Department of Water, Perth, Western Australia (2009 or later edition).
- The proposed development terrain should tie into the existing terrain at the perimeter of the development and at DCP roads.
- An amended UWMP is submitted with any amended subdivision application that seeks to alter one or more of the following:
 - catchment boundaries;
 - flow rates/volumes entering or exiting the site;
 - housing density; and/or
 - size or location of a Living Stream or Park Avenue.

2.9 BUSHFIRE MITIGATION

Objectives

Development will demonstrate effective, risk-based land use planning to minimise the occurrence and impact of bushfires on people, buildings, infrastructure and the environment.

Acceptable Outcomes

- All development will comply with the provisions of the State Planning Policy 3.7: Planning in Bushfire Prone Areas (SPP 3.7).

Structure Planning and Subdivision Applications

- A Bushfire Hazard Level (BHL) assessment or Bushfire Attack Level (BAL) contour map is prepared as part of Structure Plan and Subdivision application for any area located within a designated bushfire prone area. A BHL assessment should be prepared for a Structure Plan when the lot layout is not known, while a BAL contour map should accompany a Structure Plan when the lot layout is known.
- If sections of the development are identified as BHL moderate or extreme (if a BHL assessment is prepared), or BAL- 12.5 or above (if a BAL contour map has been prepared), then the proposal should be accompanied with a Bushfire Management Plan (BMP).
- The BMP for a Structure Plan/Subdivision should demonstrate how the development will comply with the relevant Bushfire Protection Criteria measures outlined in Appendix 4 of State Planning Policy 3.7 Planning in Bushfire Prone Areas (Department of Planning, Lands and Heritage, 2015). Further guidance on what should be included in a BMP can be found in Appendix 5 of State Planning Policy 3.7 Planning in Bushfire Prone Areas (Department of Planning, Lands and Heritage, 2015)



Continues

Development Application Process

- All development applications in bushfire prone areas are accompanied by a BAL assessment. Where a BAL contour map has been prepared for the subject site for a previous subdivision approval, this may be used in place of a BAL assessment providing it is at a scale that is appropriate for the development and the original subdivision design has not been modified. If the BAL rating for the development site is BAL-12.5 or above, the development application is to be accompanied with a BMP.
- The BMP demonstrates how the development will comply with the relevant Bushfire Protection Criteria measures as outlined in Appendix 4 of the Guideline for Planning in Bushfire Prone Areas. Further guidance on what should be included in a BMP can be found in Appendix 5 of the Guideline for Planning in Bushfire Prone Areas.

Note: BMP are to be prepared by an accredited Bushfire Planning Practitioner at the level appropriate to the information required. Level 2 and 3 Bushfire Planning capabilities are outlined in Section 6.14 of the Guidelines for Planning in Bushfire Prone Areas.

2.10 HERITAGE

Heritage is intrinsic to a location's sense of place and identity. Through an appropriate response to the natural, aboriginal and post-colonial heritage of the place, new development can be shaped in a way that benefits from natural and human processes. The development of the Project Area has been shaped by consultation with traditional owners of the land, the Whadjuk people of the Noongar community. Their response to the studies of Aboriginal archaeological sites helped form the approach to land management and settlement. The Master Plan sets a framework to respond to the place through protection of environmental areas, aboriginal heritage site protection and interpretation.

Objectives

The built form and scale of new development is informed by and responds sympathetically to the individual heritage building or place.

Applicants should refer to the following section where their property contains, or is located adjacent to, a heritage place. Heritage listed properties are identified in the Authority's Armadale Heritage Inventory.

Authority Development Policy

Compliance with the Authority's Development Policy 2 - Heritage Places.

Acceptable Outcomes

- Lot layouts for sites containing, or adjacent to, heritage places protect natural or cultural heritage features.
- Subdivision proposals incorporate the retention or interpretation of heritage elements and themes that relate to the history of pre and post-colonial settlement of the area as identified as part of the structure planning process in order to enrich the redevelopment.
- New development within, on, or adjacent to a heritage place is designed and located to ensure a sympathetic and compatible response to the individual heritage building or place.
- Prior to any ground disturbance, clearance needs to be sought and obligations met under Section 18 of the *Aboriginal Heritage Act 1972*. Commencing ground disturbing works prior to the required clearances being obtained could constitute an offence under Section 17 of the *Aboriginal Heritage Act 1972*.



Development Approval Process

Where land is occupied by, or within the curtilage of, a heritage building or place, applications for approval for alterations, additions, demolition or development that may affect the heritage place is accompanied by a Heritage Impact Statement prepared by a suitably qualified heritage consultant.

The Authority is required to refer all development applications for lots containing places listed on the State Register of Heritage Places, or development within a heritage precinct that is listed on the State Register, to the Heritage Council of Western Australia in accordance with the *Heritage Act 2018*. Developers are encouraged to discuss preliminary proposals with the Department of Planning, Lands and Heritage prior to submission of a development application.

Further reference and details in relation to the development and management of categories of places in the Authority's Armadale Heritage Inventory are contained in the Authority's Development Policy 2 - Heritage Places. Developers should refer to and have regard to any Conservation Management Plan for Heritage Places where available.

Continues





Chapter 3

Urban, Suburban and Rural Residential

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Chapter 3 Urban, Suburban and Rural Residential

This chapter contains provisions that are applicable to residential development throughout the Project Area.



Note: All residential development in the Urban, Suburban and Rural Residential Place Code will be subject to the provisions of the R-Codes except where stated otherwise in a Structure Plan and/or a Local Development Plan approved by the Authority or in the City of Armadale Local Planning Policy PLN 3.10 'Residential Design Codes Variations & R-MD Codes'.



3.1 URBAN

Objective

Urban development will be located in close proximity to the Activity Centres and public transport routes. Smaller residential lots, within the prescribed size range are located adjacent to Activity Centres to achieve higher intensity development adjacent to local services and amenities.

Streets will be pedestrian friendly, typified by avenues of trees and high quality public open spaces which compensate for the comparative lack of private open space available to the occupants of individual dwellings.

Acceptable Outcome

- The provisions of the R-Codes apply except where stated otherwise in a Structure Plan and/or Local Development Plan approved by the Authority or in the City of Armadale Local Planning Policy PLN 3.10 'Residential Design Codes Variations & R-MD Codes'.
- The design elements of a R50 density coding of the R-Codes apply to all Urban place code areas.
- Non-residential development in an Urban place code complies with the specific development standards listed in Table 4: Primary Controls Urban, Suburban and Rural Residential in addition to the general guidelines identified in Chapters 5 and 6.





3.2 SUBURBAN

Objective

The Suburban area is characterised by low to medium density residential development supporting a variety of one and two storey detached and semi-detached building types. A diversity of dwelling typology is provided, with a higher intensity of development located along the major avenues, adjacent to the Urban areas, and around areas of higher amenity such as parks and Activity Centres.

The Suburban area will accommodate a range of dwelling sizes and typologies, catering to the needs of a variety of household types. The provision of high quality pedestrian and cycle connections will provide residents alternative active transport options to private vehicle use.

Acceptable Outcome

- The provisions of the R-Codes apply except where stated otherwise in a Structure Plan and/or Local Development Plan approved by the Authority or in the City of Armadale Local Planning Policy PLN 3.10 'Residential Design Codes Variations & R-MD Codes'.
- The design elements of a R35 density coding of the R-Codes apply to all Suburban place code areas.
- Non-residential development in a Suburban place code complies with the specific development standards listed in Table 4: Primary Controls Urban, Suburban and Rural Residential in addition to the general guidelines identified in Chapters 5 and 6.

3.3 RURAL RESIDENTIAL

Objective

Responding to the natural environment that may incorporate buffers to significant environmental features or identified archaeological and aboriginal sites, larger lot sizes are provided that assist to create a rural character. Buildings will be detached houses with generous setbacks on all sides to maintain the rural residential character and lifestyle.

Whilst generous lot sizes will provide opportunities for dwellings to have a larger footprint than dwellings in other residential place codes, dwellings are expected to be generously setback from the street, low rise and therefore reasonably inconspicuous and unobtrusive. Trees and other vegetation will characterise the streetscapes.

Acceptable Outcome

- The provisions of the R-Codes apply except where stated otherwise in an approved Structure Plan and/or Local Development Plan
- The design elements of a R5 density coding of the R-Codes apply to all Rural Residential place code areas.
- Non-residential development in a Rural Residential place code complies with the specific development standards listed in Table 4: Primary Controls Urban, Suburban and Rural Residential in addition to the general guidelines identified in Chapters 5 and 6.



Table 4: Primary Controls – Urban, Suburban and Rural Residential

Preferred Land Uses

Urban, Suburban and Rural Residential – Single Dwelling, Grouped Dwelling.

Building Design and Scale

Residential development will be undertaken in accordance with the provisions of the applicable R-Codes with a higher intensity of development located adjacent to Activity Centres.

R-Code Density

Development will comply with the requirements of the relevant density coding of the R-Codes as follows:

- Urban – R50
- Suburban – R35
- Rural Residential – R5

Site Access

For sites with more than one street frontage, access will be provided from the lowest order road unless otherwise required and/or approved by the Authority.

Non-Residential Development

Non-residential development will comply with the specific development standards of the R-Code Density for the place code in addition to the general guidelines identified in Chapters 5 and 6 of these Guidelines.



Chapter 4

Activity Centres

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Chapter 4 Activity Centres



This chapter relates to the physical form of development within the Town and Neighbourhood Activity Centres. Performance standards, including built form and massing, streetscape, roof form and materials, as well as design response to wind and noise are covered in this chapter. All buildings will be designed to make a positive contribution to the streetscape and amenity of the area and will be connected to the street through the provision of openings that provide opportunities for passive surveillance and facilitate activation.

Quality architectural design contributes to a locations distinct character and sense of place. The quality and character of the street edge is directly influenced by the façades of the buildings fronting onto it, including:

- the relationship between the internal uses of a building and the streetscape;
- the opportunity for passive surveillance of the public realm;
- interaction between the public, private and semi-private realms;
- visual interest of the built form;
- fine grain detailing and pedestrian scale;
- the use of quality materials that respond to the site context and locality; and
- the use of landscaping.

4.1 DESIGN QUALITY

'Good design' is the baseline standard for all development within the Wungong Project.

State Planning Policy 7.0: Design of the Built Environment sets out the following Design Principles to guide design, development and achieve 'good design' outcomes:

- Context and character - responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.
- Landscape quality - recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.
- Built form and scale - ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.
- Functionality and build quality - meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.
- Sustainability - optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.
- Amenity - provides successful places that offer a variety of uses and activities while optimising internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.
- Legibility - results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.
- Safety - optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use
- Community - responds to local community needs as well as the wider social context, providing buildings and spaces that support a diverse range of people and facilitate social interaction.
- Aesthetics - is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.



Objective

A general level of good design is provided creating highly valued and highly responsive environments. The needs of residents, workers and visitors are met in innovative ways that support the community and contribute positively towards the creation of sense of place.

Acceptable Outcomes

- Built form, open space and public realm designs satisfy the above principles of good design and meet all objectives of the Design Guidelines relevant to design quality and amenity.
- High quality and cohesive palettes of materials and finishes are incorporated into the built form and landscape design.
- All areas of POS are designed by Registered Landscape Architects.

4.2 TOWN ACTIVITY CENTRE

Objective

The Town Activity Centre will be developed as a mixed use district level centre to service the retail, business, and community needs of local residents and provide opportunities for local employment generation. Medium density residential development in mixed use buildings will be provided to enhance activity within the centre at all times of the day and night, reduce private vehicle dependency and, provide opportunities for passive surveillance.

The internal movement network will be characterised by a low speed 'main street' design with priority given to pedestrian and cyclist movement. Streets will be designed to prioritise alternative transport modes and incorporate wide footpaths to both sides; integrated landscaping and street tree planting; on-street car parking; and frequent pedestrian crossings.

Land uses will capitalise on their location, with development in the northern portion of the Town Activity Centre close to Forrest Road providing for compact and highly active street frontages. Land uses closer to the Neerigen Brook and Wungong River will support tourist or entertainment based activities with accompanying residential development, integrated with high quality POS.

Development within the Town Activity Centre will be of a high architectural standard and provide for active frontages to all streets and areas of POS. Buildings will respect the scale of the street, with architectural emphasis provided to prominent street corners and intersections adjacent to Forrest Road. Buildings will be designed and articulated so that they support a continuous walkable 'main street' environment with minimal vehicle crossovers and car parking areas located to the rear of buildings and screened from public view.



Acceptable Outcomes

- Development complies with the primary controls in Table 5 Primary Controls – Town Activity Centre below in addition to the general guidelines identified in Chapters 4 to 6 except where otherwise stated in an approved Activity Centre Plan or Local Development Plan.
- Single residential and grouped dwelling development within the Town Activity Centre complies with the design elements of the R80 coding of the R-Codes except where otherwise stated in an approved Activity Centre Plan or Local Development Plan.
- Development incorporates a variety of uses which promote day and night time activation. An active ground floor through retail and commercial uses will be encouraged with residential development to upper storeys.
- The Primary Frontage of a development achieves a minimum 80% street level activation. Note: Primary frontages are generally defined as being the street with the highest assumed pedestrian movement (or as otherwise agreed with the Authority). Secondary frontages (frontages other than the primary frontage) of development achieve a minimum 50% street level activation.
- Built form is designed to incorporate adaptable built form outcomes.
- Buildings are located to abut and address streets, public spaces and/or parks with visually permeable, active uses at street level being provided.
- Where the subject site and an affected adjoining site are subject to different density codes, the length and height of a boundary wall on the common property boundary between them is determined by reference to the lower density code.
- Vehicle access to commercial loading and unloading areas are provided either to the side or rear of buildings, with no parking located onsite between the building frontage and the street.

Table 5: Primary Controls - Town Activity Centre

Preferred Land Uses	Ground Floor:	Business Services, Child Care Premises, Community Facility, Consulting Rooms, Medical Centre, Personal Services, Restaurant/Café, Shop, Office	
	Upper Floors:	Multiple Dwelling, Office	
Setbacks (minimum)	Street/Front:	3 storeys up to 12.0 metres	Nil
		Above 3 storeys or 12.0 metres	3.0 metres (from the front façade of the lower 3 storeys)
		Balconies may project up to 50% into front setback area	
	Side:	3 storeys up to 12.0 metres	Nil to a maximum of two-thirds of the side lot boundary.
		Above 3 storeys or 12.0 metres	4.5 metres
	Rear:	3 storeys up to 12.0 metres	7.0 metres
		Above 3rd storey or 12.0 metres	10.0 metres
		Balconies may project into the rear setback area subject to compliance with visual privacy setback requirements of the R-Codes	
Building Heights (measured from the corresponding natural ground level)	Minimum:	Mixed Use, Multiple Dwelling or Non Residential	2 storeys up to 7.0 metres (concealed roof) 2 storeys up to 9.0 metres (pitched roof)
	Maximum:	Mixed Use, Multiple Dwelling or Non Residential	5 storeys up to 18.0 metres (concealed roof) 5 storeys up to 20.0 metres (pitched roof)
	Minimum floor to floor height of 4.0 metres for ground floor in Mixed Use or Non Residential Development		
Percentage Site Coverage (maximum)	80%		
Minimum Frontage for Non-Residential/Mixed Use Lots	20.0 metres		
Single Dwellings/Grouped Dwellings	Single Dwellings/Grouped Dwellings will be assessed against the R80 requirements of the R-Codes.		

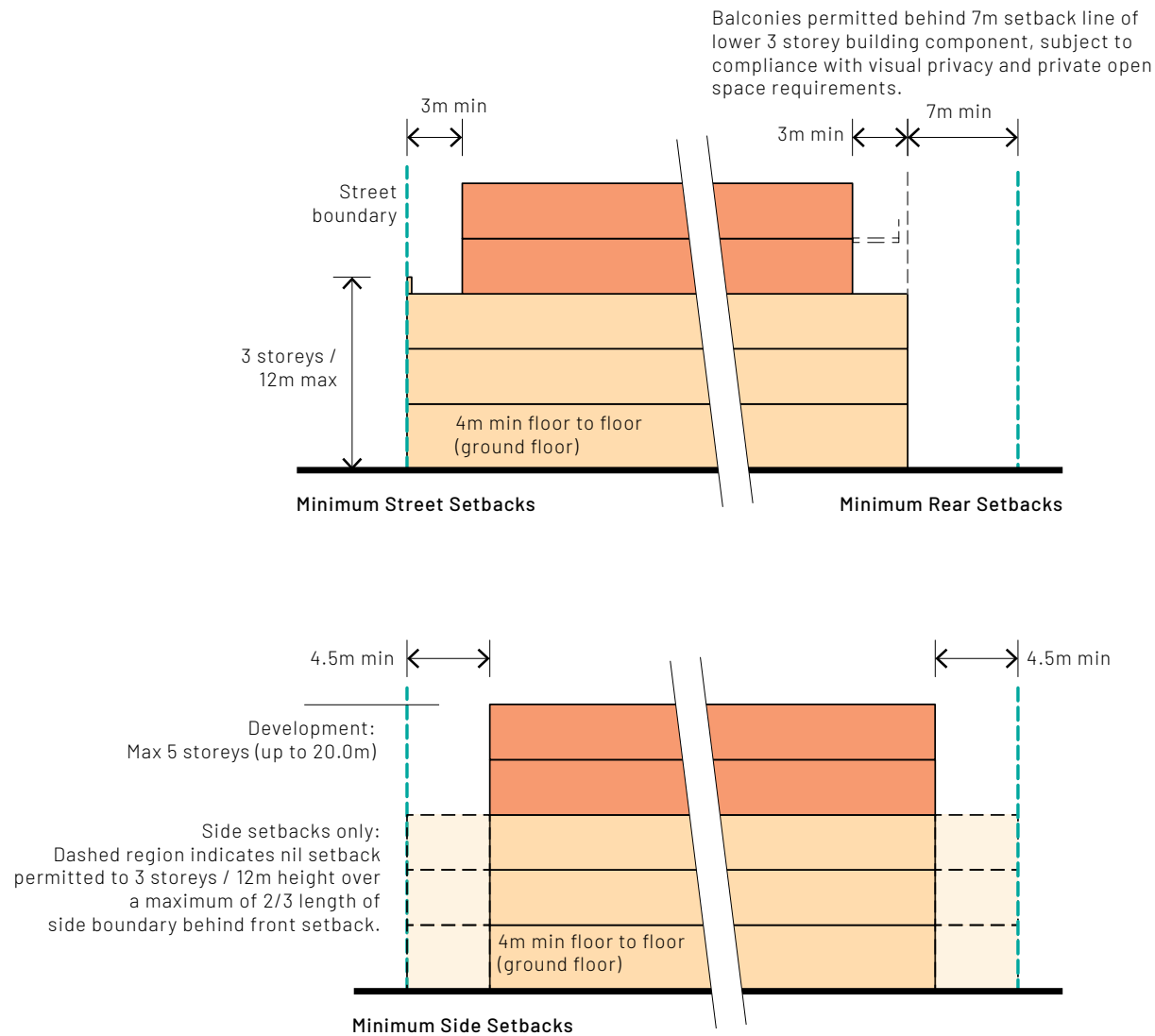


Figure 4: Town Activity Centre- Indicative Sections

4.3 NEIGHBOURHOOD ACTIVITY CENTRES

Objective

Neighbourhood Activity Centres will provide for convenience retailing within small to medium scale centres in a local 'main street' setting. The design of buildings within the Neighbourhood Activity Centre will complement the surrounding built form by stepping or transitioning building height and bulk, presenting well-articulated treatments to all elevations and ensuring that overshadowing and privacy is carefully considered.

Mixed use development is encouraged to support Neighbourhood Activity Centres becoming focal points for each precinct. The incorporation of medium density residential development is supported as it will assist to promote walking and cycling, and reduce private vehicle dependence.

Buildings will be on an appropriate character and scale, with high pedestrian activity thoroughfares sheltered and softened through the use of awnings and landscaping. Building heights up to three storeys will generally be sited on the front property line assisting to activate the streetscape. Parking areas will be located and designed to be screened from public view and protect the visual amenity of the streetscape. The public realm will be characterised by tree lined main streets, with wide footpaths capable of incorporating alfresco dining, formal landscaping including the integration of parks or plazas and embayed street parking.





Acceptable Outcomes

- Development complies with the primary controls in Table 6 below in addition to the general guidelines identified in Chapters 4 to 6.
- Single residential and grouped dwelling development within Neighbourhood Activity Centres complies with the design elements of the R80 coding of the R-Codes except where otherwise stated in an approved Activity Centre Plan or Local Development Plan.
- Development incorporates a variety of uses which promote day and night time activation. An active ground floor through retail and commercial uses will be encouraged with residential development to upper storeys.
- The Primary Frontage of a development achieves a minimum 80% street level activation. Note: Primary frontages are generally defined as being the street with the highest assumed pedestrian movement (or as otherwise agreed with the Authority). Secondary frontages (frontages other than the primary frontage) of development achieve a minimum 50% street level activation.
- Built form is designed to incorporate adaptable built form outcomes.
- Buildings are located to abut and address streets, public spaces and/or parks with visually permeable, active uses at street level being provided.
- Where the subject site and an affected adjoining site are subject to different density codes, the length and height of a boundary wall on the common property boundary between them is determined by reference to the lower density code.
- Vehicle access to commercial loading and unloading areas are provided either to the side or rear of buildings, with no parking located onsite between the building frontage and the street.

Table 6: Primary Controls - Neighbourhood Activity Centre

Preferred Land Uses	Ground Floor:	Business Services, Medical Centre, Consulting Rooms, Office, Veterinarian Clinic, Shop, Personal Services, Child Care Premises, Community Facility, Restaurant/Café	
	Upper Floors:	Multiple Dwelling, Office	
Setbacks (minimum)	Street/Front:	2 storeys up to 7.0 metres.	Nil
		Above 2 storeys or 7.0 metres	3.0 metres (from the front façade of the lower 2 storeys)
		Balconies may project up to 50% into front setback area.	
	Side:	2 storeys up to 7.0 metres	Nil to a maximum of two-thirds of the side lot boundary
		Above 2 storeys and/or 7.0 metres	4.5 metres
	Rear:	2 storeys up to 7.0 metres.	7.0 metres
		Above 2 storeys or 7.0 metres	10.0 metres
		Balconies may project into the rear setback area subject to compliance with visual privacy setback requirements of the R-Codes.	
Building Heights (measured from the corresponding natural ground level)	Minimum:	Mixed Use, Multiple Dwelling or Non Residential	2 storeys up to 7.0 metres (concealed roof) 2 storeys up to 9.0 metres (pitched roof)
		Maximum:	Mixed Use, Multiple Dwelling or Non Residential
	Minimum floor to floor height of 4.0 metres for ground floor in Mixed Use or Non Residential Development		
Percentage Site Coverage (maximum)	80%		
Minimum Frontage for Non-Residential/Mixed Use Lots	20.0 metres		
Single Dwellings / Grouped Dwellings	Single Dwellings/Grouped Dwellings will be assessed against the R80 requirements of the R-Codes.		

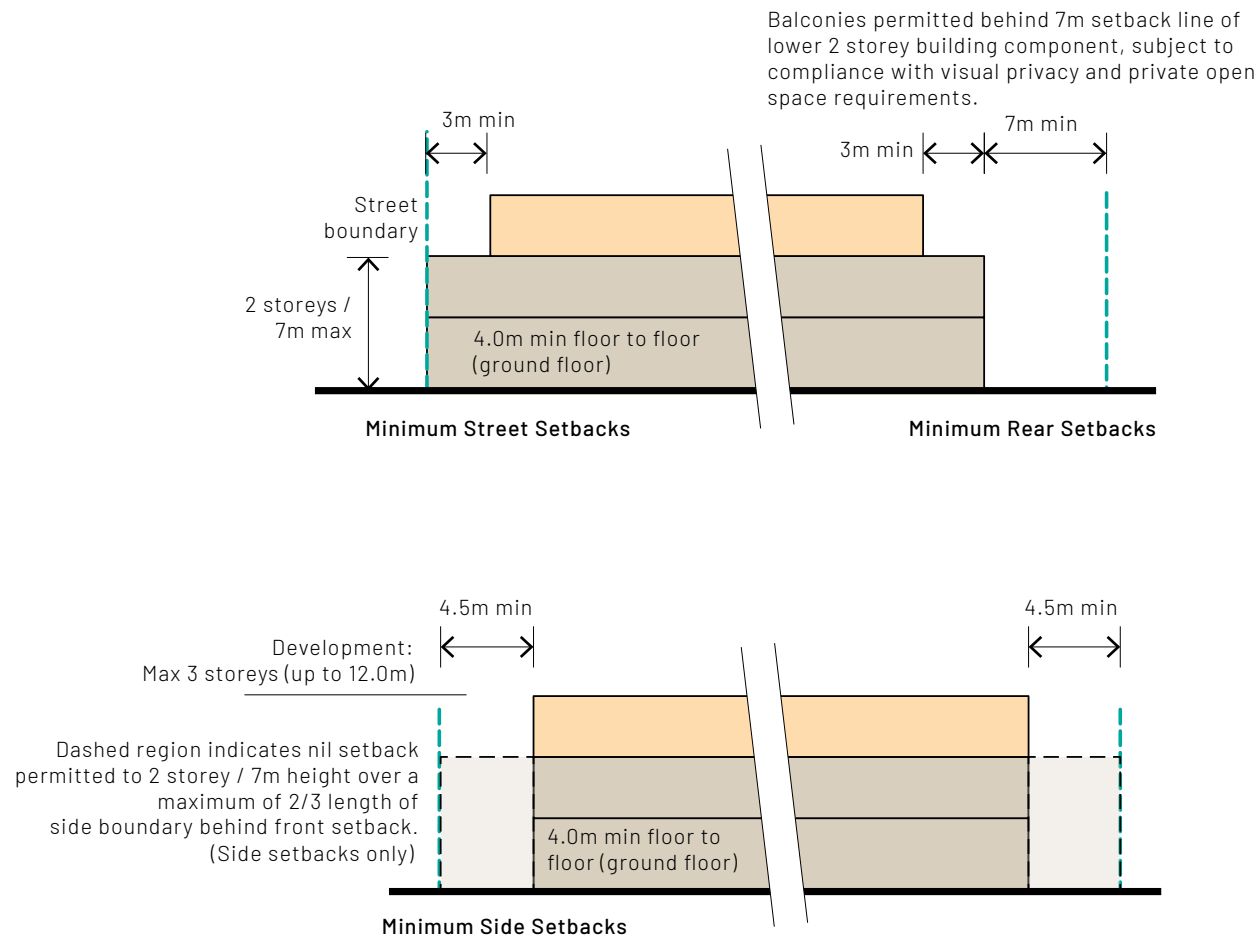


Figure 5: Neighbourhood Activity Centre- Indicative Sections

4.4 BUILDING LAYOUT, OPENINGS AND VISUAL PRIVACY

Objectives

Buildings will be designed, located and oriented to maximise access to natural light and ventilation for internal habitable areas and to take advantage of views and provide for passive surveillance while respecting the privacy of neighbouring sites. The impact of overshadowing from development on the public realm and adjacent development will be minimised. Ground floor tenancies in non-residential and mixed use buildings will be functional and suitable for their intended purpose while being adaptable to cater for a range of uses.

Acceptable Outcomes

- Buildings are oriented and/or designed to maximise northern solar access.
- Habitable rooms (i.e. bedrooms, studies and living spaces) and balconies are provided with direct access to natural light and designed to maximise cross ventilation.
- Common internal corridors have access to natural light and, wherever fire regulations permit, natural ventilation.
- Development provides solar modelling to demonstrate a minimum of 70% of residential apartments receive a minimum of 2 hours direct sunlight to living rooms and private open space between 9am and 3pm in mid-winter (21 June).
- No more than 50% of the public domain (excluding streets) and communal space areas are overshadowed between 10am and 2pm between 21 April and 21 August.
- Development provides appropriate shading in summer for communal space areas.
- Buildings and individual dwellings are provided with minimum standards of amenity and visual privacy as per the R-Codes (Volume 1 and Volume 2).





4.5 ARTICULATION

Objectives

Buildings within the Wungong Project Area will reflect a sense of place through the use of materials and forms that responds to the local character, the scale of the street or place and adjacent buildings and creates a clear connection and interface between the public and private realm.

Acceptable Outcomes

- Architectural design ensures variation in the building plane, materials, colours and textures to reduce the overall bulk and scale of development.
- Buildings provide modulation of façades into no greater than 10 metre sections between distinct design elements.
- Where more than one building within a proposed development fronts the same street, the façade of the buildings incorporates variations in design, colour and materials to create visual interest.
- High quality, innovative, imaginative and cohesive palettes of materials are incorporated into the building design.
- Buildings are detailed and articulated at the street level to create a human scale pedestrian environment that break up long horizontal façades and provide visual interest.
- Any building façade that is visible from the public realm is designed, articulated and finished as if it were the primary frontage of the building. Secondary frontages may have less detail but relate to the design of the primary frontage and offer high level of amenity and visual interest. Blank walls and large expanses of precast concrete are minimised. Development is designed to facilitate passive surveillance of the public realm.
- Developments on corner lots provides a legible and memorable experience and assists in wayfinding within the Project Area.
- Roofs which are visible (or have the potential to be visible) from the street or adjoining sites are designed to make a contemporary and positive architectural contribution to the streetscape.

Continues

Awnings

- Where built form abuts the street boundary or public realm, an awning with a minimum depth of 2.5 metres is provided for pedestrian shelter and solar protection at the ground floor level. Awning height provides a clear path of travel for a minimum of 2.75 metres and a maximum of 3.6 metres above the footpath level.
- The provision of awnings will not result in the removal of street trees.
- Variation in awning height, depth, length and detail, and varying treatment for entry canopies is encouraged to assist with legibility and streetscape interest, to reduce the impact of long horizontal bands of awnings on building façades and to emphasise entrances to buildings. Awning soffit treatments contribute to the creation of an interesting pedestrian experience.

4.6 ENTRY AND CIRCULATION

Objectives

Building entries provide an interface within the public realm, contribute to the activation of the street and assist in creating an identity for a development. Legibility and circulation reflects the principles of good urban design ensuring quality wayfinding and ease and comfort for pedestrian movement.

Acceptable Outcomes

- Building entry points provide:
 - a clearly identifiable element within the façade design;
 - sheltered, well-lit and highly visible spaces to enter the building and collect mail;
 - clear sight lines between the street and entry foyer space to provide for a safe environment; and
 - separate entry points for vehicles and pedestrians and for different uses within the building, particularly between residential and non-residential uses.





4.7 DWELLING DIVERSITY

Objective

Activity Centres will provide a range of dwelling types and, where multiple residential and mixed-use developments are proposed, dwelling tenures that encourage a diverse and inclusive mix of people to live and recreate in the area, increasing the vitality, character and interest of the place.

Authority Development Policy

Refer to the Authority's Development Policy 9 - Affordable and Diverse Housing.

4.8 PRIVATE OPEN SPACE

Objective

All dwellings will have direct access to functional private open space in the form of private gardens, balconies or courtyards, that enhance the amenity of the development and provides a usable space that is attractive and secure.

Acceptable Outcomes

- Residential development complies with the requirements for outdoor living areas of the R-Codes.
- Private open space is:
 - oriented to maximise access to northern sunlight where possible;
 - directly accessible from and connected to a habitable living space within the dwelling; and
 - not be used for car parking or storage.
- Balconies that overlook a street, laneway or internal courtyard provide appropriate amenity/outlook and passive surveillance.
- Balconies will not run continuously along the façade. Separate individual balconies are appropriate.
- Balcony balustrades are predominantly visually permeable. Balustrades may be obscured up to 20% of the balcony face length to provide adequate privacy and screening.

Continues

- Movable solar/wind/privacy screens only partially obscure balconies and courtyards up to 20% of the balcony or courtyard face length and will still allow for the area to function as a genuine outdoor space
- Lightweight weather protection structures are permitted in courtyards, however the extent of roofed structures is limited to a maximum of 20% of the total private open space allocated to the dwelling.

4.9 LIGHTING

Objectives

The provision of outdoor lighting will enhance safety and security for occupants and visitors without being visually intrusive and will highlight architectural and landscape features to provide visual interest to the urban form through the creative use of lighting that enhances streetscape character.

Acceptable Outcomes

- Lighting illuminates entrances of development and adjoining streets and public space to create safe, secure and well-lit environments with minimal glare and avoidance of light spill.
- Lighting is integrated into built form to highlight architectural features, landscaping, main entrances and the corners of buildings.
- Lighting to ground floor frontages of non-residential development is provided to illuminate key pedestrian areas, provide visual interest and display to shopfronts.
- A Lighting Strategy is required for all 'Major' development applications demonstrating how the development and landscaped areas are lit to highlight architectural features and provide an attractive and safe night time environment.





4.10 ENVIRONMENTAL SUSTAINABILITY

Objectives

Development will ensure best practice resource efficiency through minimising potable water consumption, maximising use of renewable energy sources and reducing production of waste, pollution and other damaging emission.

Authority Policy

Compliance with the Authority's Development Policy 1 - Green Buildings.

Development Standards

All new buildings, with the exception of single houses and grouped dwellings comply with 4 Star Green Star Rating or Sustainable Design Assessment Report (SDAR) equivalent in addition to the following standards:

Energy Efficiency

- All developments are to optimise the application of passive solar design including building orientation, shading, natural lighting and cross-flow ventilation.
- Buildings are designed to provide direct access to natural light and ventilation and will be designed and oriented to minimise heat gain in summer months.
- A minimum of 70% of all lighting throughout the building is high efficiency lighting (>70 lumens/watt).
- A solar hot water or heat pump hot water system with a minimum energy rating of 5 stars is installed. Electrical boosters or compressors include a DC switch timer to enable the hot water system to operate only.
- Exposed thermal mass floors and walls should be exposed to direct winter sun and completely shaded in summer. Effective use of thermal mass also requires effective night purging by natural ventilation.

Continues

Water Efficiency

- The following fittings and appliances meet the respective minimum star rating in accordance with the Australian Government's Water Efficiency Labelling and Standards (WELS) scheme:
 - all shower fittings are at least 3 star WELS rated with a maximum 7.5L/minute consumption;
 - all WCs are a minimum 4 star WELS rated and 6 star WELS rated for urinals or waterless urinals;
 - all basin taps are a minimum 6 star WELS rated;
 - all other taps excluding outdoor and bath taps are at least 4 star WELS rated; and
 - dishwashers and washing machines are a minimum 4.5 star and 4 star WELS rated respectively.
- Rainwater harvesting is incorporated for internal non-potable uses (e.g. toilet flushing and cold water to washing machine);
- Landscaped areas are irrigated with fit-for-purpose water source (e.g. rainwater reuse and/ or waste water recycling). If bore water is proposed it is justified with a stormwater capture and infiltration plan capable of demonstrating on-going sustainability;
- All POS and road verge landscaping is designed in accordance with Water Corporation's Waterwise gardening principles such as use of native and water-wise plants and irrigation and rain water management.
- Runoff from small rainfall events is managed at source as much as practical.
- Stormwater conveyance is managed via vegetated overland flow paths.
- A Stormwater Management Plan that complies with all higher order documents (i.e. UWMP, LWMS etc.) is submitted for all new development.



Continues



Resource Efficiency

- Building design demonstrates the use of materials, colours and finishes and/or vegetated components as part of the roof and façade to reduce urban heat island effect, internal heat loading of buildings and glare.
- Any useful demolition materials from the site to be reused wherever possible. Any vegetation that is removed from the site is mulched and stored for reuse if suitable.
- All non-structural concrete mixes use recycled aggregate and replacement of Portland cement content (30%).
- If PVC or products containing PVC are used, these are compliant with the Best Practice Guidelines for PVC in the Built Environment. The Vinyl Council of Australia has a registry of compliant products.
- All timber/wood products are Forest Stewardship Council (FSC) certified. In addition, FSC Chain of Custody certification is also required from the processing to delivery of wood products to the site.
- All gypsum boards contain more than 10% recycled gypsum and/or use recycled paper.
- Paints, adhesives, sealants or floor coverings contain zero or 'ultra-low' Volatile Organic Compounds (VOC).
- All engineered wood products are E-zero (E0), including joinery, trim, cladding and any constructed furniture items.

4.11 SOUND AND VIBRATION ATTENUATION

Objectives

All developments in the Wungong Project Area are designed and constructed to achieve high amenity through suitable sound and vibration attenuation.

Authority Development Policy

Refer to the Authority's Development Policy 3 - Sound and Vibration Attenuation.

4.12 SOLAR ACCESS ON ADJOINING RESIDENTIAL SITES

Objective

Development will be designed to protect solar access for adjoining residential properties taking into account the potential to overshadow existing outdoor living areas and north facing major openings to habitable rooms.

Acceptable Outcomes

- Development is designed so that the shadow cast by the development at midday 21 June onto any other adjoining residential property does not exceed 70 per cent of the site area.
- Where a development site shares its southern boundary with a lot, and that lot is bound to the north by another lot(s), the limit of shading for the development site as detailed above is reduced proportionate to the percentage of the affected property's northern boundary that the development site abuts.

Note: Site Area refers to the surface of the adjoining lot and is measured without regard to any building on it but does take into account its natural ground levels.



Chapter 5

Public Realm

Contents

CHAPTER 5 PUBLIC REALM INTERFACE

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Chapter 5 Public Realm Interface



This section refers to development in and adjacent to the public realm.

A high quality public realm is important to the vitality of urban settings. Streets, meeting places, and landscaped environments should communicate a strong 'sense of place'. 'Sense of Place' is achieved when built form, public realm design, programming and economic activity reinforce a distinct, locally recognisable cultural and environmental experience. One of the key focus points for the Project Area's ongoing regeneration is the creation of a series of high quality public places that provide opportunities for further creative place making and development, which will be reinforced by the contribution that private development makes to the public realm. These spaces will become areas for activity, engagement and exchange.

5.1 STREETScape

Objectives

High quality built form and streetscape design will make a lasting contribution to the quality of the public realm with an interesting, stimulating and effective network of streets and other public spaces in the precinct which are safe, sustainable and attractive to visitors and are of a high quality and enduring design.

Acceptable Outcomes

- Streets are designed to prioritise the movements of pedestrians and cyclists, incorporating traffic calming measures where appropriate to ensure vehicle movements are managed while still accommodating street furniture, cycle parking, landscaping and at source stormwater management systems.
- Street trees are provided at a minimum rate of 1 tree for every 4 bays for uncovered street car parking areas and 1 tree to every 10m of lot frontage to contribute to a high quality street character and provide shade and cooling.
- Large canopy shade trees are provided to all at grade car parks at a minimum rate of 1 tree for every 4 car bays to ensure appropriate protection from the elements and to assist in breaking up any significant expanse of parking area. Shade trees will not obstruct driver sight lines to directional signage and/or traffic signals.
- Existing mature trees on private property are retained wherever possible.
- Buildings are located and designed so that they do not contribute to negative wind impacts in the public realm i.e. wind tunnels.
- Crossovers are up to a maximum width of 6 metres and designed and located to minimise impact on the streetscape.
- Streets and public spaces are designed to be accessible to people of all abilities and respond to their context, having a positive transition with the design of adjacent areas in terms of materials, features and configuration.





5.2 ACTIVE EDGES, CORNERS AND VIEW CORRIDORS

Objectives

Development will be designed to create continuous and contained streetscapes and maximise both visual and physical interaction between buildings and pedestrians at the street level and above. Buildings will address and activate the street, pedestrian access ways and POS to contribute to a sense of place and create a vibrant, diverse, inviting and safe urban environment.

Balconies and courtyards are designed to maintain the primary function of these areas as open space allowing for the establishment of a visual relationship, interplay and passive surveillance opportunities between the private and public realms.

Acceptable Outcomes

- All buildings are designed to incorporate CPTED principles to ensure surveillance of the street and public realm.
- Buildings abutting streets and other public spaces incorporate 'active' ground floor uses that promote surveillance of the street and visible indoor activity.
- Primary internal living spaces, verandahs and balconies of dwellings are oriented towards the street.
- A minimum of 80% of commercial, dining, retail and dining and entertainment frontages to the street are transparent and utilise clear glazing.
- Glazing to commercial tenancies to the street frontage at ground level have a minimum head height of 3m above natural ground level. Sills are encouraged and are not more than 500mm above the adjacent pavement level.
- Roller shutters over building openings are not permitted to address the street frontages at any level.
- Upper floors with street frontages contribute to the creation of an active interface through incorporation of balconies and habitable room windows.
- All buildings are designed to be universally accessible incorporating at grade pedestrian entrances.
- Corner sites provide an opportunity for architectural expression arising from a building with two exposed facades and the capacity to see the building more three-dimensionally. Designers are encouraged to work with these opportunities.

5.3 PUBLIC ART

Objective

Public art elements will be designed and integrated on or within the public realm or located within the private property where it is clearly visible from the public realm in order to enhance the amenity of the area and celebrate the unique character and heritage of the Project Area.

Authority Development Policy

Refer to the Authority's Development Policy 4 - Providing Public Art.

Acceptable Outcomes

- Public art installations reflect the character and local context by recording and interpreting past histories, culture and ideas. Public art draws upon local stories and themes, and utilise materials and elements that respond to the precinct's identity.
- Artwork is designed by a professional artist and is a unique, high quality artwork.
- Artwork is designed specifically for the site and is responsive to the site context, including consideration for surrounding buildings and activities, and reflecting the relevant local themes and stories.
- Artwork design should integrate with the building design and site layout and be responsive to the building materials and colours through early involvement of the artist in a collaborative design process.
- The Authority's Armadale Redevelopment Area Heritage Inventory, which includes a Thematic History, may be used as a source of reference for public art, particularly where the artwork relates to a Heritage Place or the site of a building that no longer exists.





5.4 FENCING

Objective

Delineation between the public and private realm is achieved primarily through the use of built form, changes in ground level and landscaping. Fencing will be designed to maintain passive surveillance of the public realm while providing privacy and security of individual dwellings and private open spaces.

Authority Development Policy

Compliance with the Authority's Development Policy 5 - Additional Structures, and the following acceptable outcomes (refer to Figure 7: Fencing Requirements).

Acceptable Outcomes

General Requirements

- Designed and constructed of high quality materials such as (but not limited to) limestone, brick, timber, wrought iron or weathering steel.
- The design, colours and finishes of fencing are to reflect or complement the surrounding built form and not detract from the style and/or character of the buildings located behind it.

Front Fencing (within the front setback area and forward of the front building façade) is provided in accordance with the following:

- No higher than 1.20m above the corresponding natural ground level of the adjacent footpath or road with:
 - the solid portion of a wall or fence does not exceed 0.30m high, with the upper portion of the wall/fence being visually permeable;
 - piers of maximum width and depth dimension of 460 mm x 460 mm; and
 - fibrous cement and metal sheet are not permitted.

Continues

Fencing to Secondary Street frontage is provided in accordance with the following:

- No higher than 1.80m above the natural ground level of the adjacent footpath or road; and
- For corner lots, fencing from the truncation to a minimum of 3.00m behind the dwelling alignment closest to the secondary street boundary is visually permeable above a height of 0.60m.

Fencing along Laneways is provided in accordance with the following:

- No higher than 1.80m above the corresponding natural ground level with the following:
 - the solid portion of a wall or fence does not exceed 0.60m high, with the upper portion of the wall/fence being visually permeable; and/or
 - piers of maximum width and depth dimension of 460mm x 460mm.

Fencing directly adjoining POS or Reserves is provided in accordance with the following:

- No higher than 1.80m above the finished lot level; and
- The solid portion of a wall or fence does not exceed 0.60m high, with the upper portion of the wall/fence being visually permeable.

Fencing to Heritage Places is provided in accordance with the following:

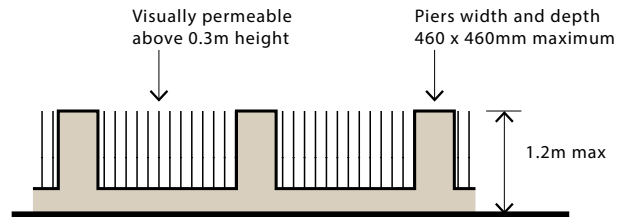
- Where fencing is permitted, or is required to keep heritage elements safe, fencing should be sympathetic in colour and style to the heritage elements.

Fencing to Non-Residential Development is provided in accordance with the following:

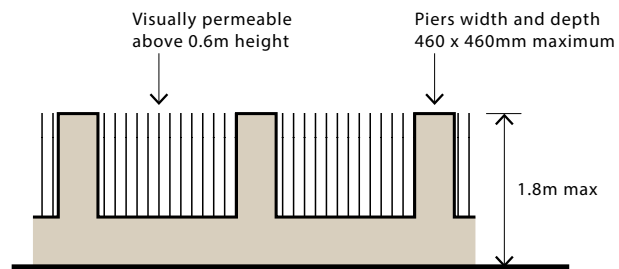
- Fencing to street property boundaries and/or forward of the building façade is not permitted for non-residential development.

Note: Any structures, walls or fences located within 1.50m from vehicle access points are required to comply with the visual sightline provisions – refer to Section 6.1 Site Access of the Design Guidelines.

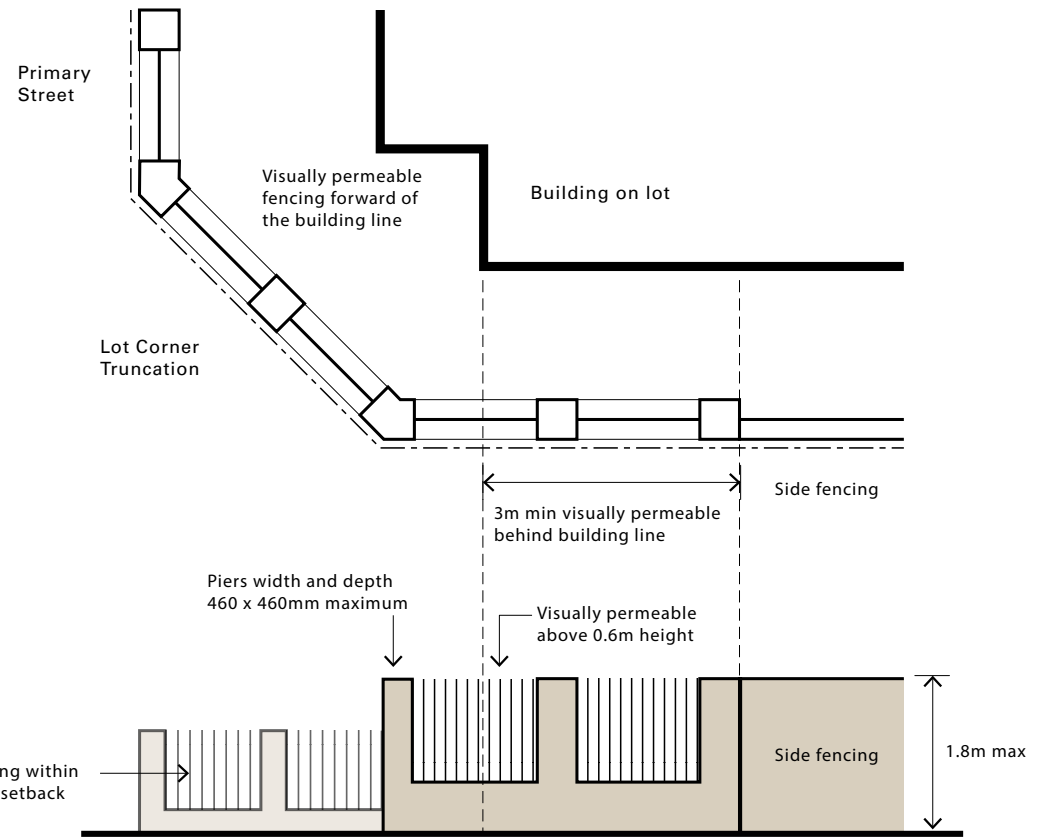




Front Fencing
(within the front setback area and forward of the front building facade)



**Fencing to laneways,
reserves and public open space**



**Fencing to secondary streets
(corner lots)**

Figure 6: Fencing Requirements

5.5 SIGNAGE

Objective

Well located and integrated signage will be provided to assist with wayfinding and identification of attractions, activities and businesses and will not visually dominate the building or streetscape. The incorporation of signage will enhance the amenity of the area providing quality design adding to sense of place and supporting public amenity. Signage will not restrict sightlines and views or lead to a reduction in the extent or delivery of tree canopies. Signage will not reduce the visual connection between indoor and outdoor activities.

Authority Development Policy

Refer to the Authority's Development Policy 6 - Signage.

5.6 ALFRESCO DINING AREAS

Objective

Alfresco dining areas provide an active connection between the public and private realm where patrons can enjoy the outdoors when the weather is favourable, without unduly 'privatising' public spaces.

Acceptable Outcomes

- Alfresco dining is designed to contribute to a sense of vibrancy and activity in public spaces.
- Alfresco dining is limited to the area adjacent to the road carriageway immediately in front of the associated business premises providing food and beverage service and does not compromise public access, circulation, safety of patrons, sightlines of motorists or other street activities. Alfresco dining is located on the street side of the footpath to maintain a hard edge against the building for wayfinding.
- A minimum of 2.5 metre width of footpath remains free of obstruction to ensure safe pedestrian access (refer to Figure 8: Alfresco Dining).



Continues

- No permanent structures are permitted in the public realm. All infrastructure is removed from the public realm outside of the operating hours of the business.
- Applicants are to liaise with the City of Armadale regarding separate Alfresco Dining Permit approvals.

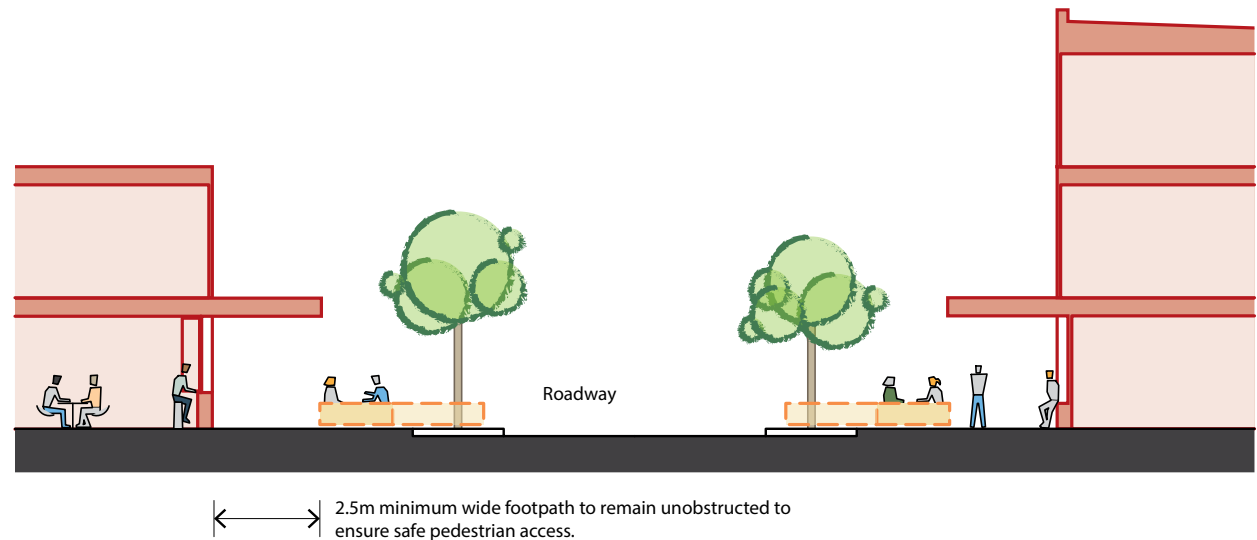


Figure 7: Alfresco Dining

5.7 PUBLIC THOROUGHFARES

Objectives

Pedestrian accessways through development sites will contribute to an interesting and legible pedestrian network, facilitating safe and convenient access throughout the Project Area. Where pedestrian access is proposed through a site, access should be in the form of open laneways rather than enclosed malls.

Acceptable Outcomes

- Where accessways are available for public use outside of normal business hours:
 - tenancies facing the accessways should include food and beverage, retail outlets or other uses to support activation in the evening, early mornings and/or weekends;
 - CPTED principles are employed including the provision of passive surveillance from balconies and windows overlooking the accessway (refer to the Western Australian Planning Commission's Designing Out Crime Planning Guidelines); and
 - lighting is provided as a key feature of the accessway to promote a safe, well-lit environment.
- If an accessway is not open to the public outside of normal business hours, the accessway is secured through high quality and visually permeable fencing with restricted access provided to residents and/or tenants.



5.8 ENCROACHMENTS IN THE PUBLIC REALM

Development Application Process

Where buildings or other structures encroach into Crown land from an adjoining freehold title (e.g. awnings), it may be necessary to obtain the City of Armadale's approval for the encroachment and to create suitable tenure arrangements between the Department of Planning, Lands and Heritage and the developer. For example, an easement may need to be registered under the *Land Administration Act 1997*.

Applicants are advised to consult with the City of Armadale and the Department of Planning, Lands and Heritage for additional information on this matter.



5.9 LANDSCAPE DESIGN

Objectives

Landscaping will contribute to the character and visual amenity of the streetscape and public realm providing shade and reduces urban temperatures, increases biodiversity, manages stormwater volumes and quality, and improves people's mental and physical health. Landscaping assists in mitigating the bulk and scale of buildings and creates attractive delineation between the public and private realm. Landscaping design will be environmentally sustainable through incorporation of innovative and site responsive approaches to urban water management.

Acceptable Outcomes

- Landscaping responds to the architecture of the building and the local landscape.
- Low water use species suitable for the climatic conditions are used.
- Lawn and other high maintenance landscaping is limited.
- Landscaped urban areas have a mix of soft and hard surfaces.
- Landscaped areas are irrigated with rainwater capture and reuse and/or waste water recycling.
- Permeable pavements and other sustainability techniques are employed to increase the self-sufficiency of landscaping.
- Existing mature trees on site are retained. A minimum clearance of 1.0m is maintained between a crossover and a verge tree to allow for root and canopy growth and safety of road users. The minimum clearance is measured from any section of the crossover to the edge of the verge tree measured from the closest point of the trunk to the crossover.
- Innovative landscape treatments such as green walls and roofs are encouraged to reduce storm water generation, enhance the soft landscape aesthetic of the development, improve thermal massing and assist in reducing the urban heat island effect.
- All development applications, with the exception of single houses or internal fit out of existing buildings, include a Landscaping Plan that is prepared in accordance with the Water Corporation's Waterwise criteria for landscaping, such as use of water-wise plants and irrigation and rain water management.



Chapter 6

Parking, Access and Services

Contents

CHAPTER 6 PARKING, ACCESS AND SERVICES

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Chapter 6 Parking, Access and Services



Movement issues such as vehicular and pedestrian access, parking for cars and bicycles and end of trip facilities are covered in this chapter.

This chapter addresses:

- Site Access;
- Car Parking;
- Bicycle Parking and End of Trip Facilities;
- Building Services;
- Waste Reduction and Management; and
- Universal Access.



6.1 SITE ACCESS

Objectives

The number, size and visual impact of vehicle access points to lots will be minimised to reduce conflict between pedestrians and vehicles and avoid inactive areas within the streetscape. Safe and accessible pedestrian and cycle movement will be prioritised.

Acceptable Outcomes

Pedestrian Access

- Pedestrian access from the street and from any car park area is clear, direct and safe. All pedestrian entrances have casual surveillance from within the development and are covered to provide shelter.
- Clear wayfinding devices are provided throughout the development with particular consideration of the needs of visitors and those with disabilities and mobility impairments.

Vehicle Access

- Only one vehicle access point is permitted for each lot and has a maximum width of 6 metres at the lot boundary.
- Vehicle access from a primary street is only be permitted where no secondary street, laneway or vehicular access easement is available.
- Vehicle access is designed so as not to impede pedestrian and cycle movement while providing safe and efficient access to the adjoining carriage way.
- Where possible 'shared' vehicle access is provided between adjacent lots to improve efficiency of site utilisation and reduce the impact of crossovers on the streetscape.
- A 1.5m by 1.5m visual sightline truncation is provided at the intersection of a vehicle crossover and street property boundary. Walls, fences and other structures with a maximum height of 0.75m above natural ground level may be permitted within the sightline truncation.
- Street trees should not be impacted or removed for vehicle access. Where street tree removal is unavoidable appropriate replanting is required.



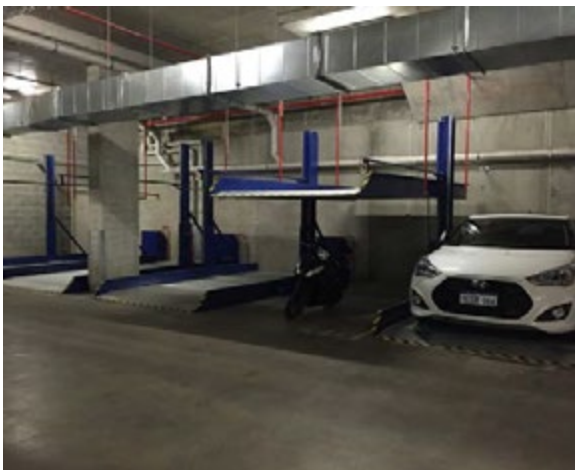
6.2 CAR PARKING

Objectives

Development within the Wungong Project Area will ensure that sufficient car parking is provided to accommodate the anticipated requirements of the development, whilst encouraging alternative means of transport. Parking areas will be located and designed not to impact upon the amenity of the public realm.

Acceptable Outcomes

- Car parking is provided in accordance with Table 6.3 of Scheme 2 with the exception of 'Permanent Residential' and 'Visitor' parking associated with all types of residential development, which is in accordance with the provisions of the R-Codes.
- Vehicles are not accommodated between the street front and the building line.
- Parking is sleeved by active uses to primary street frontages or POS and screened from public view where located on secondary frontages.
- Parking to secondary streets or laneways is appropriately designed and screened from adjacent or nearby buildings and the street through the use of innovative wall detailing, decorative screening, patterning and vegetation. Screening is compatible with the surrounding streetscape.
- Opportunities for reciprocal car parking arrangement, shared parking and vehicle stackers may be considered to maximise efficiency of use and where the parking demand by the uses proposed will not coincide.
- Where tandem car parking for visitors/customers is proposed for a non-residential use, only one of the two visitor/customer tandem car bays is calculated as part of the approved car parking requirement for the development.
- All car parking is designed to facilitate ease of pedestrian movement, clear wayfinding, safety, security and comfort in the design of parking areas.
- Shade trees are provided to all at grade car parks at a minimum rate of 1 tree to 4 car bays, to ensure appropriate protection from the elements and to assist in breaking up any significant expanse of parking area.
- Stormwater runoff from small rainfall events is managed (retained and/or detained) within at-grade car parks.
- Car parking bays are marked and line-marked for the exclusive use of residents and/or visitors.
- Public parking bays comply with Australian Standards (AS 2890-5-1993).
- A Transport Impact Statement may be required where proposed parking facilities or land uses are likely to generate excessive parking demand and have a significant impact on the surrounding transport network.



6.3 BICYCLE PARKING AND END OF TRIP FACILITIES

Objectives

The Wungong Project Area will be well serviced by pedestrian and cycle paths and is located within easy walking, running or cycling distance from Activity Centres and amenities. Buildings will be designed to encourage and support the use of alternative active travel modes through the provision of end of trip facilities.

Acceptable Outcomes

- Development provides bicycle parking and end of trip facilities in accordance with the Table 7: Bicycle Parking and End of Trip Facilities below.
- All facilities are designed in accordance with CPTED design principles to promote the safety and security of users.
- All bicycle parking facilities are designed, located and constructed in accordance with AS2890.3 and Austroads Guide to Traffic Engineering Practice Part 14 – Bicycles.
- Tenant and resident bicycle parking facilities are concealed from view from the street, located within the basement or ground floor level and easily accessible from the entrance to the building;
- Visitor bicycle parking are located at ground level adjacent to the building entry and:
 - allow for passive surveillance from public spaces such as from roads and other buildings;
 - do not disrupt pedestrian flow;
 - are accessible from the road and cycle paths; and
 - are in well-lit areas.
- Bicycle parking facilities for commuting staff include end of trip facilities with weather proof secure bike storage, showers, change rooms and lockers.
- All end of trip facilities are designed with convenience and safety of the user in mind to encourage cycling, and located as close as possible to bicycle parking facilities.
- Lockers and locker rooms are well ventilated and are of a size sufficient to allow the storage of cycle attire and equipment.
- Bicycle parking and end of trip facilities are centrally located and accessible from the road and cycle path.





Table 7: Bicycle Parking and End of Trip Facilities

Building Type and Land Use	Number of Bicycle Parking Facilities
Non-Residential buildings less than 500m² of net lettable area	A minimum of 1 bicycle parking bay is provided.
	Accessible Showers: 1 unisex shower and change room is provided. Additional shower facilities are provided at a rate of one additional male and female shower for every additional 10 bicycle bays.
	Changing Facilities: Including 1 secure locker for each bicycle.
Non-Residential buildings more than 500m² of net lettable area	Visitor Bicycle Storage: A minimum of 1 space located and signed near the main public entrance to the building.
	Secure bicycle storage for 10% of building staff (based on 1 person per 15m ² of Net Lettable Area (NLA)).
	Accessible Showers: Where less than 10 bicycle parking bays are required, 1 unisex shower and change room is provided. Where 10 or more bicycle parking bays are required, a minimum of two female and two male showers, located in separate changing rooms, are provided. Additional shower facilities are provided at a rate of one additional male and female shower for every 10 bicycle bays required.
Residential	Changing Facilities: Including 1 secure locker for each bicycle.
	Visitor Bicycle Storage: A minimum of 1 space per 750m ² of NLA located and signed near the main public entrance to the building.
Residential	As per the R-Codes requirements.

6.4 BUILDING SERVICES

Objectives

Services and related hardware required for the function of buildings are designed and located in a manner that they do not negatively impact on the character and amenity of the area and are designed to meet changing needs over time. Site and building services will be fully integrated into the design of buildings or screened from public view.

Authority Development Policy

Compliance with the Authority's Development Policy 5 - Additional Structures.

Acceptable Outcomes

- Loading and service areas, storage areas and ancillary equipment such as mechanical plant are appropriately screened from public view in a manner that does not undermine the amenity of the area or quality of the development.
- Roof plant and ancillary equipment is screened from public view.
- Photovoltaic solar panels and flat solar water heating panels may be in the public view provided that they are appropriately arranged and well integrated with the building design. Panels may sit flat against the roof pitch or may be integrated into elements such as awnings. Where solar panels are not integrated in this manner and/or where solar water heating storage tanks are provided, they are not visible from the street or public places.
- Service doors and other utility equipment enclosures including but not limited to electric and gas meters and cable boxes are located away from street fronts and appropriately treated to reduce their visual presence.
- All piped and wired services including fire booster cabinets, service meters and the like are concealed from public view or integrated into the architectural design.
- Machinery and equipment does not create a nuisance through noise, smell or other impact. Mechanical ventilation does not discharge toward the public realm. Development complies with all relevant provisions of the *Environmental Protection (Noise) Regulations 1997*.



Continues



- Air conditioning units, pool filtration equipment, motors, pumps and mechanisms and similar items are suitably located in areas that minimise negative impact on neighbours and comply with the provisions of the *Environmental Protection (Noise) Regulations 1997*.
- Service enclosures are screened from public view and located and designed to prevent the release of odours and sound emissions.
- All service infrastructure is integrated in the design of the building and screened from view from the public realm and occupants of the building.
- Where lots are encumbered by a sewer easement, the easement is not built upon unless a suitable design solution can be reached to the satisfaction of the utility provider and the Authority. The easement may be used for access ways, car parking or open space requirements.
- Letterboxes are provided and located on the front boundary of the property on the street or laneway where applicable to which the property is addressed. The letterbox is close to the main pedestrian access point with the street number clearly displayed.

6.5 WASTE REDUCTION AND MANAGEMENT

Objectives

Waste management is planned and co-ordinated as an integral component of the design and development process. Sustainable waste management will be achieved through the combined strategies of waste reduction, reuse and recycling, waste awareness and performance monitoring.

Acceptable Outcomes

- Building design includes space for waste and recycling storage and collection requirements, taking into account the need for easy access for drop off and collection that limit pedestrian and vehicle disruption.
- Refuse storage and collection facilities comply with the requirements of the City of Armadale waste and recycling collection regimes.
- Building designs ensure that the City of Armadale waste removal vehicles have the ability to access and service bins on site, including in basements. The access route has a minimum clear height of 2.85 metres. This arrangement may remove the need for waste bins to be put out on verges. Contact the City of Armadale for further information on waste removal requirements.
- Kitchens and waste storage/collection areas allow for sorting of waste such as 'recycling' and 'general waste'.
- Service areas and bin enclosures are located and screened from general view to minimise odours and sound emissions.





6.6 UNIVERSAL ACCESS

Objective

Building, streets and public open spaces will incorporate universal design principles to provide for accessibility, usability, safety and equitable convenience to all people, regardless of age or ability, to utilise the amenities and services within the Project Area. All mixed use and multiple residential developments will provide dwellings that are accessible and adaptable, to allow people who are living with or develop a disability to remain in their dwelling.

Authority Development Policy

Compliance with the Authority's Development Policy 10 - Adaptable Housing.

Acceptable Outcomes

- Universal access is provided in accordance with the requirements of the *Disability Discrimination Act 1992* and relevant Australian Standards and legislation.
- On sloping sites, new developments are stepped to avoid large differences between the footpath level and the finished level of the commercial ground floor. Ramps that facilitate universal access are accommodated within the private boundary with at-grade access provided to reduce their visual impact and assist in achieving a strong built edge to the street boundary.

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APPENDIX 1 - WUNGONG URBAN WATER PROJECT AREA MASTER PLAN

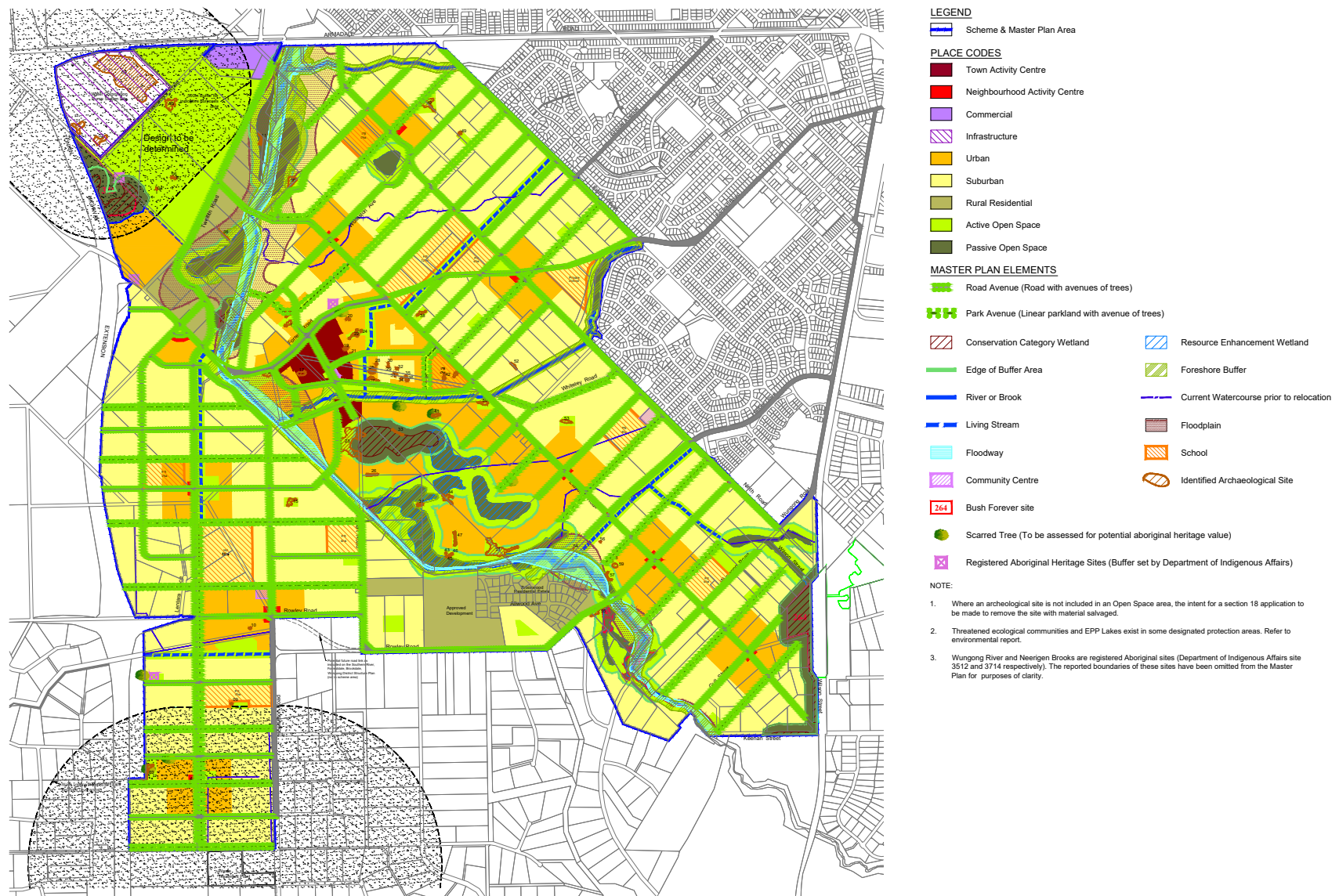


Figure 8: Wungong Urban Water Master Plan

APPENDIX 2 – WUNGONG URBAN WATER PROJECT AREA ACTIVITY CENTRES LOCATION PLAN AND RETAIL FLOORSPACE ALLOCATION

Table 8: Retail Floor Space Allocation

Building Type and Land Use	Retail Floorspace Allocation (NLA)
Site 1 – Town Centre	17,100 (min)
Site 2 – Neighbourhood Centre	5,900
Site 3 – Neighbourhood Centre	2,500
Site 4 – Neighbourhood Centre	1,500
Site 5 – Neighbourhood Centre	1,000
Site 6 – Neighbourhood Centre	700
Site 7 – Neighbourhood Centre	700
Site 8 – Neighbourhood Centre	650
Site 9 – Neighbourhood Centre	450
Site 10 – Neighbourhood Centre	400
Site 11 – Neighbourhood Centre	400
Other Retail (May be permitted under an approved Centre Plan)	Up to 200m ² for each tenancy not exceeding 500m ² in any one centre.
Total	31,300m²

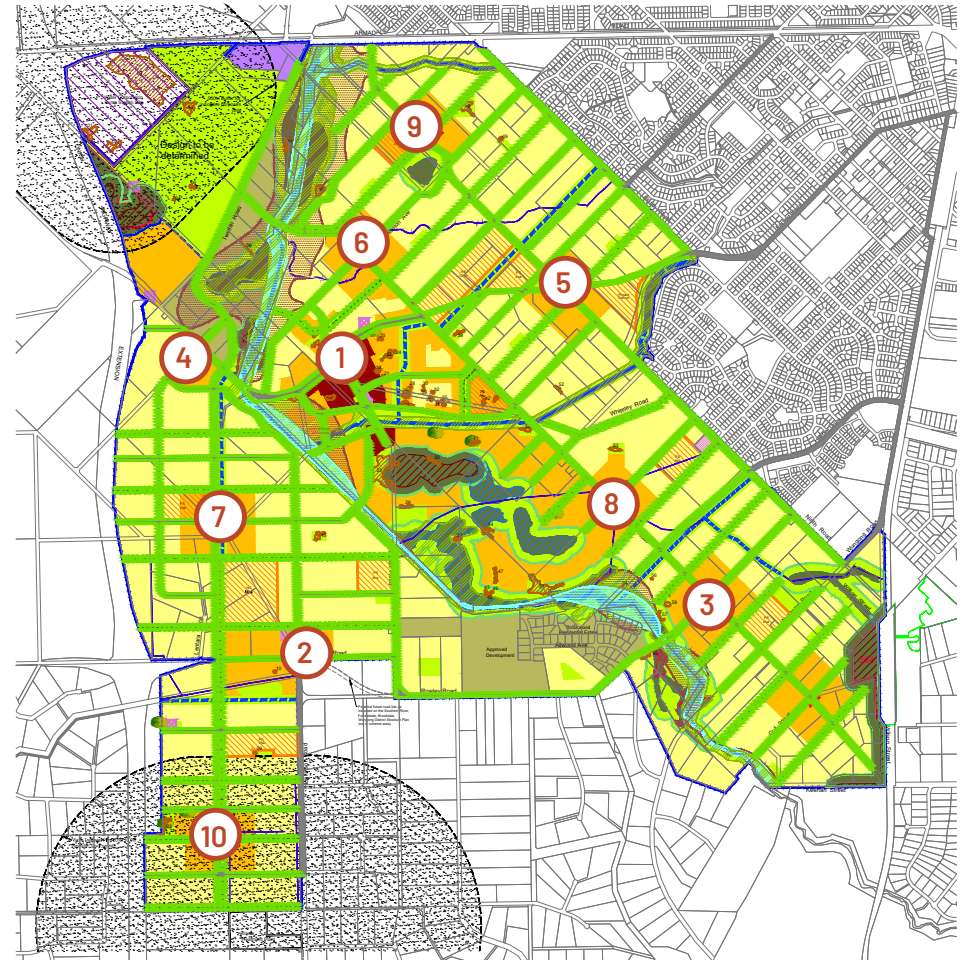


Figure 9: Activity Centres Location Plan

APPENDIX 3 – GLOSSARY OF TERMS

Active Frontage	Areas which provide a direct visual and physical relationship between the internal areas of a building and the adjacent public realm and contain uses which attract people, promote activity on the street and provide opportunities for surveillance.
Alfresco Dining	Outdoor dining or drinking (or both) in a public place. An alfresco dining area is defined as an area in which tables, chairs and other structures are provided for the purpose of the supply of food or beverages or both by the public or the consumption of food or beverages (or both) by the public.
Amenity	The liveability or quality of a place which makes it pleasant and agreeable to live in for individuals and the community. Amenity is important in both the public and private domain and includes the wellbeing of occupants, access to sunlight and privacy.
Articulation	The three dimensional modelling at the periphery of a building, including any changes in façade alignment, balconies, windows and sun shading devices.
At Grade	At ground level (not above/below ground level or on a building structure).
Average Recurrence Interval (ARI)	means the average or expected value of the periods between exceedance of a given rainfall total accumulated over a given duration. It is implicit in this definition that the periods between exceedance are generally random.
Community Park	means a park, generally with dimensions of 60x60 metres, designed to fulfil a neighbourhood function within the open space network.
Design Quality	As per Section 4.1 'Design Quality' of the Design Guidelines.
Façade	The external face of a building.
Gross Site Area	The total area of the lot or lots on which development is proposed to be carried out.
Human Scale	The proportional relationship of the physical and built environment (buildings, streets, etc.) to human dimensions to create a comfortable pedestrian environment at street level.
Legibility	The coherency of a building or public realm design and its effectiveness in facilitating the movement and use of its occupants.
Liveable Neighbourhoods	means the WAPC's Liveable Neighbourhoods operational policy, that guides the structure planning and subdivision for greenfield and large brownfield (urban infill) sites, and/or any amendments, prepared by the WAPC.
Living Stream	means an established watercourse, relocated or retained in place in accordance with its depicted location on the Master Plan, landscaped and/or remediated to function as a viable aquatic ecosystems that enhances biodiversity and water quality.
Main Street	A vibrant street with active retail and commercial use interface on at least one side of the street.
Mixed Use	Buildings that contain commercial and/or other non-residential uses in conjunction with residential dwellings in a multiple dwelling configuration.

Park Avenue	means a 26m wide linear active open space, designed to perform both a drainage and recreation function. Park avenues may run continuously parallel to a road or only for short sections of the road, and will incorporate a 1.5m footpath to property lines.
Passive Surveillance	The casual or indirect surveillance of streets and public open spaces by people in buildings or the public realm, facilitated through design elements such as balconies, usable roofs, openings, and active uses and clear glazing at street level.
Playing Field	means a sports playing field capable of accommodating senior level sports, ideally with dimensions of 185 metres in length and 143 metres in width, with 4 metre boundary clearances and 15 metre spacing behind goals.
Primary Street Frontage	means the boundary of a lot that faces the street with the highest assumed pedestrian movement.
Public Car Parking	means parking that is provided or offered to members of the public whether or not upon payment of a fee or subject to other condition, but does not include parking that involves the use of a reserved or dedicated parking bay.
Public Realm	Public domain, the public space, streets, laneways, footpaths, parks, gardens, etc. which are normally open to the public without charge.
Residential Design Codes	means State Planning Policy 7.3 Residential Design Codes, and/or any amendments, prepared by the WAPC.
Secondary Street Frontage	means lot boundaries other than the Primary Lot Frontage
Shared Space	means a street or place designed to improve pedestrian movement and comfort by reducing the dominance of motor vehicles and enabling all users to share the space rather than follow the clearly defined rules implied by more conventional street designs.
Site Coverage	<p>means the area of the site occupied by a building, excluding:</p> <ul style="list-style-type: none"> • Areas beneath eaves • Unroofed open structures • Verandahs, patios or other such roofed structures not more than 0.5m above natural ground level, unenclosed on at least two sides and covering not more than 10 per cent of the site area or 50m², whichever is the lesser. <p>Where a basement protrudes up to a maximum of 1 metre above natural ground level, the area above such a basement may be excluded from the calculation of site coverage, provided that it is useable, landscaped (with soft and/or hard landscaping) and generally follows the natural contours of the site.</p>
Sleeved Parking	Vehicle parking areas that are fronted by an active use, such as residential dwellings, commercial or retail uses that provide an active edge to the public street or public open space.
Trunk Services	means service infrastructure installed during subdivision to provide critical services to the resident community and may include: sewer, electrical, potable water, and fibre optic cable.
Wetland	means an area of permanent, seasonal or intermittent inundation, whether natural or otherwise; fresh, brackish or saline; static or flowing.

APPENDIX 4 - DESIGN CRITERIA TO BE ADDRESSED IN LOCAL WATER MANAGEMENT STRATEGIES AND URBAN WATER MANAGEMENT PLANS

The following project-specific design criteria are to be demonstrated in the LWMS and UWMP. The level of detail required for each document will be determined by the Authority based on the complexity and risk associated with each development proposal on advice from relevant agencies.

1. Water Supply and Conservation

- 1.1. The Wungong Urban Water (WUW) Project Area will be serviced by a conventional drinking water supply provided by the Water Corporation.
- 1.2. In line with the objectives of Liveable Neighbourhoods, the Authority encourages alternative water supplies and conservation measures to be nominated by developers and their consultants, including but not limited to:
 - Treatment of urban stormwater for re-use and/or conveyance to surface waters;
 - Reducing potable mains water demand through water efficient appliances, rainwater, stormwater and, in some cases, grey water or wastewater re-use (where environmental water quality objectives will not be undermined);
 - Specially designed landscaping for conveying run-off;
 - Use of porous paving in appropriate areas to increase infiltration rates;
 - Restoration of stream corridors; and
 - Identification of suitable and sustainable irrigation source for public open space.

2. Stormwater

- 2.1. The local stormwater management system should be designed to mimic natural hydrological processes to reduce the impacts of urban development on the water cycle and on sensitive receiving environments. The natural hydrological processes can be included in stormwater systems by:
 - Minimising effective imperviousness by maximising overland flows and disconnecting impervious surfaces;
 - Managing small rainfall events as close to source as possible;
 - Providing infrastructure that mimics nature, such as Park Avenues and Living Streams;

- Retaining natural water bodies as integral components of hydrological processes with conveyance of treated stormwater to water bodies via bio retention areas or vegetation buffers where appropriate;
- Providing detention storage areas within Park Avenues and Living Stream corridors;
- Maintaining pre-development environmental flows to existing wetlands (and buffers), subject to approval from relevant State agencies; and
- Delivering multi-functional community parks and other open space areas, or other means as approved by the Authority.

2.2. Overland flow paths for stormwater are to be used in preference to piped systems.

2.3. Impervious areas immediately adjacent to Park Avenues are permitted to discharge uncompensated flows to Park Avenues via vegetated overland flow paths, subject to meeting design flow rate, water quality and public safety criteria. It is preferred that roads discharge to Park Avenues via overland flow rather than via a formal pipe drainage system.

2.4. Maintain the pre-development peak flow rates and total runoff volume from the outlets of the development area for the critical 1 exceedance per year event.

2.5. Retain and/or detain stormwater runoff from constructed impervious areas generated by up to a 15mm rainfall depth as close to source as possible.

2.6. Building floor levels will be a minimum of 0.5m above the estimated 1% annual exceedance probability (AEP) flood level (equivalent to 100 year ARI flood level) adjacent to the Wungong River Flood plain and living streams.

2.7. Catchment runoff for the minor drainage design event and the 1% AEP flood event can be maintained at or below pre-development peak flows, unless otherwise agreed with the asset owner. Changes to the pre-development flood heights, flow rates and flood storage volume should address the determination of ecological water requirements for water sensitive environments, protection of receiving environments from erosion, sedimentation and scour, risks to life, and infrastructure and cumulative impacts.

2.8. Demonstrate the design of the 1% AEP accounts for all losses.

2.9. The developer is required to show the location of all water quality treatment and flood storage areas in the LWMS.



3. Groundwater

- 3.1. Clearance to groundwater is to be addressed using a three tier approach, considering built form, controlling groundwater levels (drainage, pumping, recharge mitigation), and fill importation.
- 3.2. Where a Controlled Groundwater Level (CGL) is to be implemented, it is to be supported by calculations which demonstrate engineering and environmental suitability consistent with requirements of the DWMS and in accordance with water resource considerations when controlling groundwater levels in urban development (DoW 2013).
- 3.3. Where groundwater is proposed as an irrigation source, it is to be demonstrated that the yields and water quality are sustainable and fit for purpose.

4. Living Streams and Watercourses

- 4.1. The tributary drains of the Wungong River are to be rehabilitated as Living Streams and watercourses as defined in the WUW Master Plan. (Refer to the WUW Public Open Space Policy).
- 4.2. Neerigen Brook North and Neerigen Brook South are to be generally maintained on their existing alignments, but realignment of Brickworks A & B drains (subject to approval by environmental regulators) and Birrega Main Drain are to be undertaken consistent with the WUW Master Plan (or an approved Structure Plan).
- 4.3. Where water dependent ecosystems are impacted by drain relocation, environmental flows and/or hydrological regimes will be maintained or restored consistent with requirements of the DBCA and the DWER.
- 4.4. Regional flood management will need to demonstrate recognition of existing flow paths for upstream catchments, and provision of adequate widths in Living Streams and watercourses to safely accommodate the 1% AEP flood.
- 4.5. All development is to be consistent with the Wungong Flood Modelling and Drainage Study and the Wungong Drainage and Water Management Plan.
- 4.6. All Living Streams and watercourse design is to be in accordance with the WUW Public Open Space Policy and the WUW Foreshore Management Plan, DWER's Stormwater Management Manual for Western Australia (2004-2007) and the River Restoration Manual (Water and Rivers Commission/ Department of Environment 1999-2003).

5. Wetlands, Waterways and Sensitive Environments

5.1. There are three management categories for wetlands within the WUW Master Plan:

- Conservation Category Wetlands (CCWs);
- Resource Enhancement Wetlands (REWs); and
- Multiple Use Wetlands.

Surrounding development is to be sensitive to wetland environments to minimise potential impacts.

5.2. In addition to Wetlands, other Sensitive Environments may be found in waterways, foreshore areas or Bush Forever Sites.

5.3. Where water dependent ecosystems are impacted by development (including relocation of drainage paths/courses), environmental flows and/or hydrological regimes are to be maintained or restored consistent with requirements of DBCA/DWER.

5.4. Where wetlands or watercourses currently form part of the surface drainage system, they will continue to receive surface flow.

5.5. Consideration may be given to enabling surface water to be diverted to water dependent ecosystems which have been impaired by changes in climatic conditions and may require additional water to maintain their function.

5.6. End-of-winter water levels at wetlands are to be maintained within the range of pre-development levels unless alternative water levels are established in consultation with DBCA/DWER through determination of Ecological Water Requirements.

5.7. Stormwater infrastructure (such as pipes, constructed drains, detention areas and vegetated swales) should not be constructed within the following areas and their buffers:

- Conservation Category Wetlands;
- Bush Forever sites;
- Resource Enhancement Wetlands; or
- waterways and foreshore areas.

- 5.8. Where Controlled Groundwater Levels (CGLs) are implemented, it is to be demonstrated that sub-soil drainage will not adversely impact on the hydrological regime of wetlands or sensitive environments.
- 5.9. Implementation of subsoil drainage exclusion zones around wetlands or sensitive environments may be required, on advice from DBCA and DWER.
- 5.10. REWs and CCWs and their buffers are to be protected and revegetated.
- 5.11. Bushfire risk assessment is to be based on the extent of post-development revegetation, not existing pre-development condition.
- 5.12. This information is to be demonstrated in a Management Plan, LWMS and UWMP. The level of detail required for each document will be determined by the Authority based on the complexity and risk associated with each development proposal on advice from relevant agencies.



6. Water Quality

- 6.1. The UWMP is to outline post-development water quality targets consistent with the LWMS and establish the actions required by government, developers, landowners and residents to improve the pre-development water quality. The UWMPs must include:
 - For stormwater quality management, a treatment train approach will be implemented using structural and non-structural controls consistent with the requirements of the LWMS. Manage runoff from constructed impervious surfaces generated by the first 15mm of rainfall at source as much as practical;
 - Where subsoil drains are provided, groundwater needs to be treated either in-situ or at the outfall, prior to discharge to surface water systems. The treatment proposed needs to be suitable for the nutrients and/or contaminants of concern present in the groundwater;
 - If groundwater contains elevated levels of nutrients and/or contaminants and cannot be treated for some reason (e.g. because there is insufficient space on the site to provide suitable treatment or there are not proven treatment measures available for the nutrient/contaminant of concern), groundwater mobilised from the site will need to be minimised;
 - When infrastructure is proposed to provide treatment for both stormwater and subsoil drainage discharges, the capacity of the systems needs to be appropriate to provide effective treatment for both water sources and this should be addressed in the LWMS, and refined in the UWMP; and

- For contaminated sites, remediation and re-classification of the site in accordance with the Contaminated Sites Act does not necessarily mean that the quality of groundwater present is suitable for mobilisation off site. If elevated nutrients or contaminants remain following remediation and/or reclassification, the relevant water management document should identify this and address how surface water and ground water will be managed to ensure they are not mobilised to waterways and/or wetlands.

7. Irrigation for POS

- 7.1. Requirements for the irrigation of POS are to demonstrate the functions of the POS, determine the irrigation volumes and that the source is secure. Where proponents are relying on groundwater, it must be demonstrated the source is sustainable and suitable, including testing of the production bore water quality and yields. A contingency plan addressing robust alternatives must be provided.
- 7.2. Innovative designs are encouraged to reduce water demand with efficient irrigation systems.

8. Water Quality Monitoring

- 8.1. Water quality targets are set under the LWMS. A location plan will be provided indicating bores, sampling sites and any equipment installed on site. Locations will be identified in the LWMS and further refined in the UWMP, incorporate existing bores installed for DWMS and representing dominant post-development land use including demonstration sites if applicable.
- 8.2. Water quality monitoring is required to be undertaken for the following development stages:
 - Pre-development phase – for 3 years unless otherwise approved by the Authority;
 - Subdivision phase– from the completion of Predevelopment Phase and for the duration of the subdivision and landscaping works until practical completion;
 - Development phase – for a minimum of 2 years following practical completion of the Subdivision Phase; and
 - Post development phase – from the completion of the Development Phase for a minimum of 2 years.
- 8.3. The Water Quality monitoring will be undertaken at the following frequency:
 - Ground water level – monthly
 - Ground water quality – quarterly

- Surface water quality - 6 fortnightly grab samples during winter flow
 - Surface water flow and level – site specific
- 8.4. The water sampling should follow Australian Standards AS/NZ 5667 Water Quality Sampling Guidelines and a NATA accredited laboratory is required for testing. Refer to DWMS for requirements for water quality, ground water level, surface water flow and level monitoring.
- 8.5. At practical completion subdivision/landscape works monitoring bores and equipment are to be handed over to the Authority free of cost.
- 8.6. The data collected is to be provided to the Authority on an annual basis during the pre-development phase and on a monthly basis during the subdivision phase.

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APPENDIX 8 - DOCUMENT CONTROL

DOCUMENT CONTROL	
Adoption Date:	6 July 2020
Amendment Date:	Nature of Amendment:
{Date}	{Description}
{Date}	{Description}
{Date}	{Description}
{Date}	{Description}
{Date}	{Description}
{Date}	{Description}

MORE INFORMATION

If you require any further information or explanation about the Authority's planning framework, Development Applications or the Scheme, the following options are available:

Website:

visit the Authority's website at:
www.developmentwa.com.au

Email:

email your query to the Authority at:
planning@developmentwa.com.au

Phone:

phone the Authority to speak with a planner on (08) 9482 7499

Meeting:

book a meeting to discuss your proposal with a planner by phoning (08) 9482 7499