Draft Medium Density Design Guide

Tools for improving the design of medium density residential development

NSW GOVERNMENT Planning & Environment

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NSW Department of Planning and Environment
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Minister's Foreword

NSW requires more housing to meet the needs of our diverse and growing population. Our state is projected to grow by more than 100,000 people every year until 2036, and we will need to provide homes for an additional 2.1 million residents. Sydney alone will need 725,000 new homes over the next 20 years to keep pace with demand.

Currently, most new housing in NSW falls into two categories – traditional free-standing homes or strata-titled apartments. What is missing are the low-rise, medium sized homes, like terraces, dual occupancies, manor homes or townhouses. This gap in our housing market has become known as the 'Missing Middle'.

We need affordable housing solutions for families. We also need to increase the variety in the types of housing available to give people more choice, provide an interesting and vibrant built environment and ensure housing supply caters for the needs of changing demographics into the future.

By 2036, the number of people in NSW aged over 60 years will have increased by 56 per cent, to more than 2.6 million people. In the same timeframe, the number of people aged between 0-19 will have increased 24 per cent to more than 2.4 million. While single and couple-only households will increase to represent almost half of all households in the state.

We need to act strategically and put the policies in place today which encourage the creation of a diverse mix of housing types tomorrow. Older people, families with children, singles and couples all need and deserve greater choice when it comes to housing. They should be serviced by a market which provides the right homes for their needs, preferences and budgets.

The new draft *Medium Density Design Guide* and draft *Medium Density Housing Code* have been developed to ensure a consistent approach to the design and delivery of quality low-rise medium density housing in neighbourhoods across NSW.

Both these documents have been developed based on feedback from the discussion paper we released late last year, which sought comment on what should be required for low-rise medium density housing types to be assessed as 'complying development' – a fast-track assessment process for development consistent with existing council zoning.

There was strong support for the development of a guide to promote better design outcomes for medium density housing. We have acted on that feedback, taking on board the comments from councils, the community and industry.

Councils also highlighted the importance of ensuring that development respects an area's existing local character and streetscapes. As a result, the draft *Medium Density Design Guide* includes proposed building height limits, setbacks, landscaping and other building standards to help ensure existing local character and neighbour privacy are maintained.

Increasing the supply and quality of medium density housing across NSW will provide many benefits and offer more choice for our changing population. Thank you to all the stakeholders who provided valuable input into this work so far. We welcome your comments on the draft *Medium Density Design Guide* and draft *Medium Density Housing Code*.

Rob Stokes MP
Minister for Planning

Part 1

Introduction

This part provides an introduction to the guide, and how and when to use it.

It also contains the 9 Design Quality Principles that all developments should respond to.

1.1 About this Guide

What is the Medium Density Design Guide?

This Medium Density Design Guide (Design Guide) provides consistent planning and design standards for low rise medium density residential dwellings across NSW.

Who is the Design Guide intended for?

The Design Guide has been prepared to:

- assist developers, planners, urban designers, architects, building designers, landscape architects, and other professionals when designing medium density dwellings and preparing a complying development or development proposal.
- assist planning professionals in local and state government with strategic planning, preparing local controls and assessing development proposals.
- inform the community of what is required to achieve good design and planning practice for medium density residential dwellings.

What is Medium Density Housing?

Low rise medium density residential development is development that contains more than one dwelling and has a height of less than 10m. Typically, it results in a net density of 25-45 dwellings per hectare. This includes:

- terrace style housing on torrens or strata titled lots
- dual occupancies and semi-detached dwellings
- villa and townhouse developments
- community titled, master-planned and medium density developments
- manor houses and 'one on top of other' dual occupancies - buildings of between 2-4 dwellings

Aims of the Design Guide

The Design Guide is intended to assist in achieving better design and planning outcomes for low rise medium density housing. It provides guidance and criteria for designing and assessing these developments.

The Design Guide's objectives are to:

- deliver better quality design for buildings that respond appropriately to the character of the area, landscape setting and surrounding built form;
- improve the quality of neighbourhoods and precincts;
- improve livability through optimal internal and external amenity, including functional layouts, ceiling heights, solar access, natural ventilation and visual privacy;
- deliver improved sustainability, greater building adaptability and robustness, improved energy efficiency and water sensitive urban design;
- improve the relationship of dwellings to the public domain including streets, lanes and parks;
- deliver design guidance and assist in providing a diverse housing mix and choice; and
- support councils in developing planning controls and master plans through improved guidance.

Figure 1-1 Medium density development in the spectrum of residential accommodation

1.2 Structure of the Guide

The Design Guide has four parts:

Part 1 – Introduction

An introduction to how and when to apply the Design Guide. The overarching 9 Design Quality Principles in this part underpin the objectives of this guide and must be considered by design professionals when preparing an application and by the consent authority in the assessment of the application.

Part 2 - Design Guidelines

Guidance to achieve good design outcomes across the 26 design elements (A-Z). These elements provide structure for the objectives and Design Criteria and are linked to the 9 Design Quality Principles.

The design guidelines explain:

- envelope controls - how a development should relate to its immediate context, interfacing with other buildings and the public domain to achieve quality open spaces and provide quality landscape. These controls establish the overall form and character of the development.
- detailed design element - site layout, residential amenity and servicing requirements. These elements are universal and often independent of local character issues.

Councils will use this section to help them establish precinct plans and principal controls.

Designers will use this section to guide good design, specific principles and approaches which might be used to achieve the objectives and Design Criteria of Part 3.

Part 3 - Design Criteria

The specific Objectives and Design Criteria to be achieved relevant to a particular type of medium density housing. Only elements relevant to each development type are included.

To obtain a complying development certificate, a proposed development must satisfy each of the Design Criteria.

A development application must be submitted demonstrating how the objectives and Design Criteria are achieved.

Part 4 - Delivery

This part discusses how medium density housing can be delivered across NSW. It includes information to assist with strategic planning, preparing a development application or complying development certificate application and also assessment of the applications. This section will be used by strategic planners, and consent authorities.

Appendices

Checklists and additional information to assist at various stages of the planning and assessment process.

Terms used in the Design Guide

Terms used in the Design Guide have the same meaning as those within the *Environmental Planning and Assessment Act 1979* and the *Standard Instrument Local Environmental Plan*. All terms and used in this guide are provided.

Objectives, Design Criteria, and Guidance

The content of the guide is structured around providing objectives, Design Criteria and design guidance.

Objectives:
These are the outcomes that developments are required to achieve.

Design Criteria:
The measurable standards for how an objective can be achieved.

Design Guidance:
Specific principles and approaches that can be used to achieve the objectives and Design Criteria. They include diagrams and photos to illustrate and explain the how to achieve the Design Criteria.

Complying development must satisfy all the Design Criteria relevant to the development.

Development applications can comply with Design Criteria or use an alternate solution which satisfies the objectives. The design guidance can assist in preparing and assessing the alternate solution.

1.3 Planning Context

Role in Strategic Planning

The purpose of this Design Guide is intended to inform the strategic planning of a local area and assist councils and communities to determine the future form of development in the area. Part 2 provides specific guidance for developing local controls.

Examples of the different housing typologies within the medium density development spectrum can be found in Appendix 5 of this guide.

The future character of an area is to be determined by the local council and community. The Design Guide encourages a design-led strategic planning process to determine the type, scale and built form of medium density housing permitted in an area.

The development controls established as a result of this process will be expressed in the Local Environmental Plan (LEP) and Development Control Plan (DCP) that applies to the site.

Relationship with other Environmental Planning Instruments for Development Applications

The provisions of the following also relate to development applications to which this section applies:

- State Environmental Planning Policies applying to the land or development
- The relevant Local Environmental Plan applying to the land

If inconsistencies exist between this guide and the above listed environmental planning instruments, the environmental planning instrument prevails.

Relationship to Development Control Plans

Where a council has adopted this guide, this document is intended to sit alongside the Development Control Plan applying to a site. The DCP provides guidance on local principal controls such as character, building envelope, setbacks and car parking requirements.

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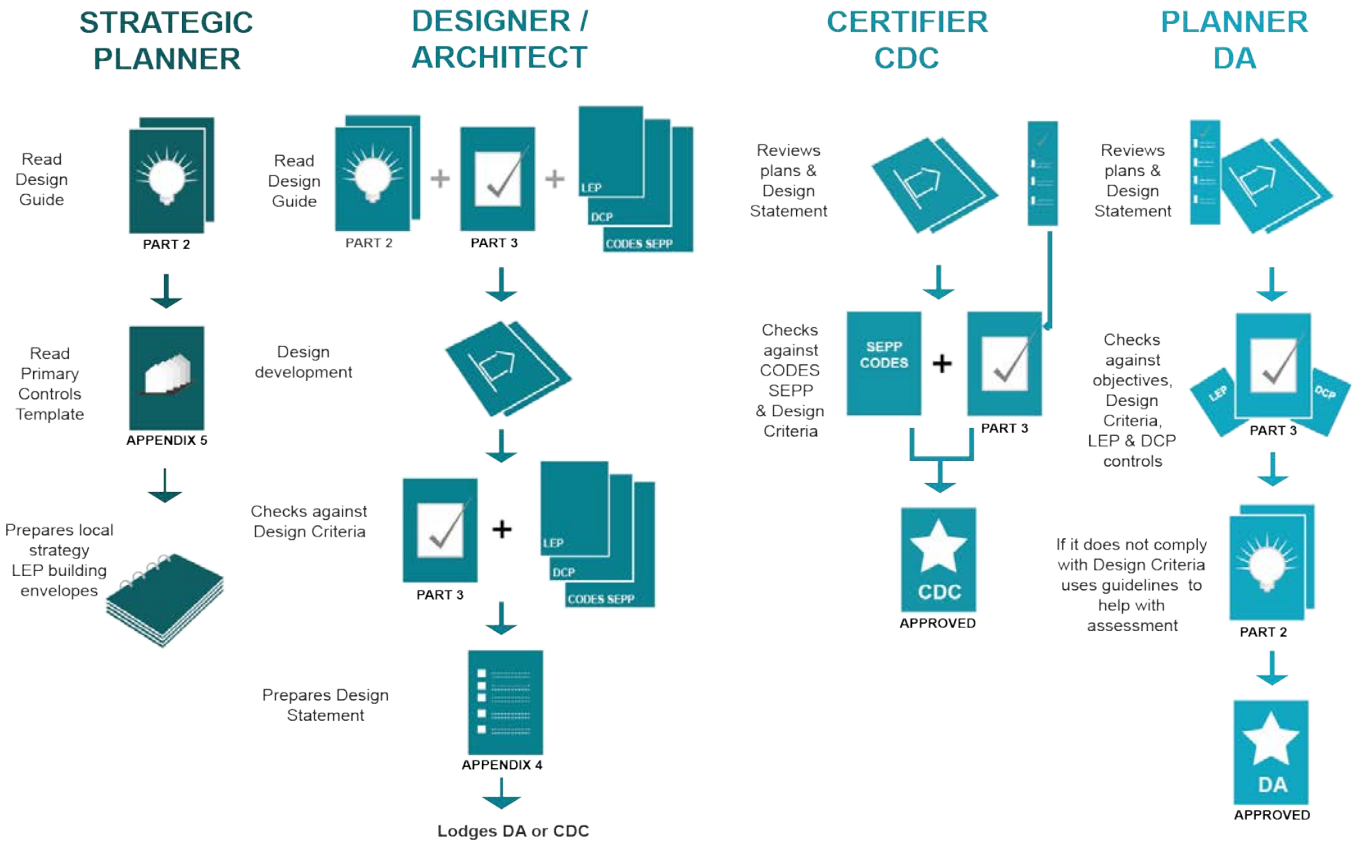


Figure 1-2 Flow chart identifying how different uses will use the Deign Guide within the planning context

1.4 Obtaining Consent

Consent for development covered by the Design Guide can be achieved by a :

- Complying Development Certificate (CDC), or
- Development Application (DA)

Complying Development

The following medium density development can be assessed as complying development under the Medium Density Housing Code within the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* (Codes SEPP):

- Two dwellings side by side
- Terrace Houses
- Manor houses

Principal Controls

The proposed development must comply with the development standards contained within the Codes SEPP.

Design Controls

The Codes SEPP requires that the proposed development meet the Design Criteria contained in Part 3 of this guide.

Submission requirements for complying developments are set within the *Environmental Planning and Assessment Regulation 2000*. Appendix 5 provides more detail on these submission requirements.

Additional guidance for preparing and assessing a CDC is provided in Part 4.

The design guide refers to Council policies with respect to waste collection, car parking and stormwater management.

Development Applications

The Design Guide applies to a DA where it has been adopted by council.

Principal Controls

The LEP and DCP set out the principal standards that apply to a site. The DCP may also articulate the urban strategy and desired future character.

Design Controls

Part 3 contains Objectives and Design Criteria. The Design Criteria set a clear and measurable standard of how each objective can be practically achieved. Alternate solutions which achieve the objectives can be considered by the consent authority.

Additional guidance for preparing and assessing a DA is provided in Part 4.

The design guide refers to Council policies with respect to waste collection, car parking and stormwater management.

Design Verification Statement

For complying development and development applications the statement is to be prepared by the person who designed the development.

The statement must:

- explain how the Design Quality Principles are achieved;
- illustrate how the development is suited to the context;
- for complying development - demonstrate how the Design Criteria have been achieved; and
- for a development application - demonstrate how the objectives have been achieved using the Design Criteria as a measure.

A template for the statement is provided in Appendix 3.

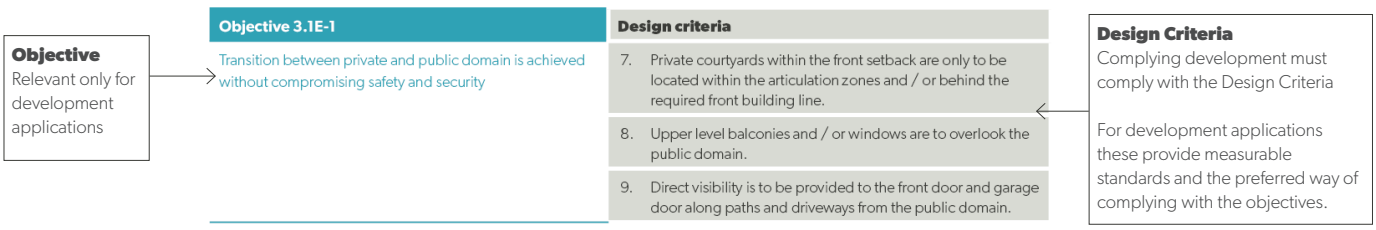
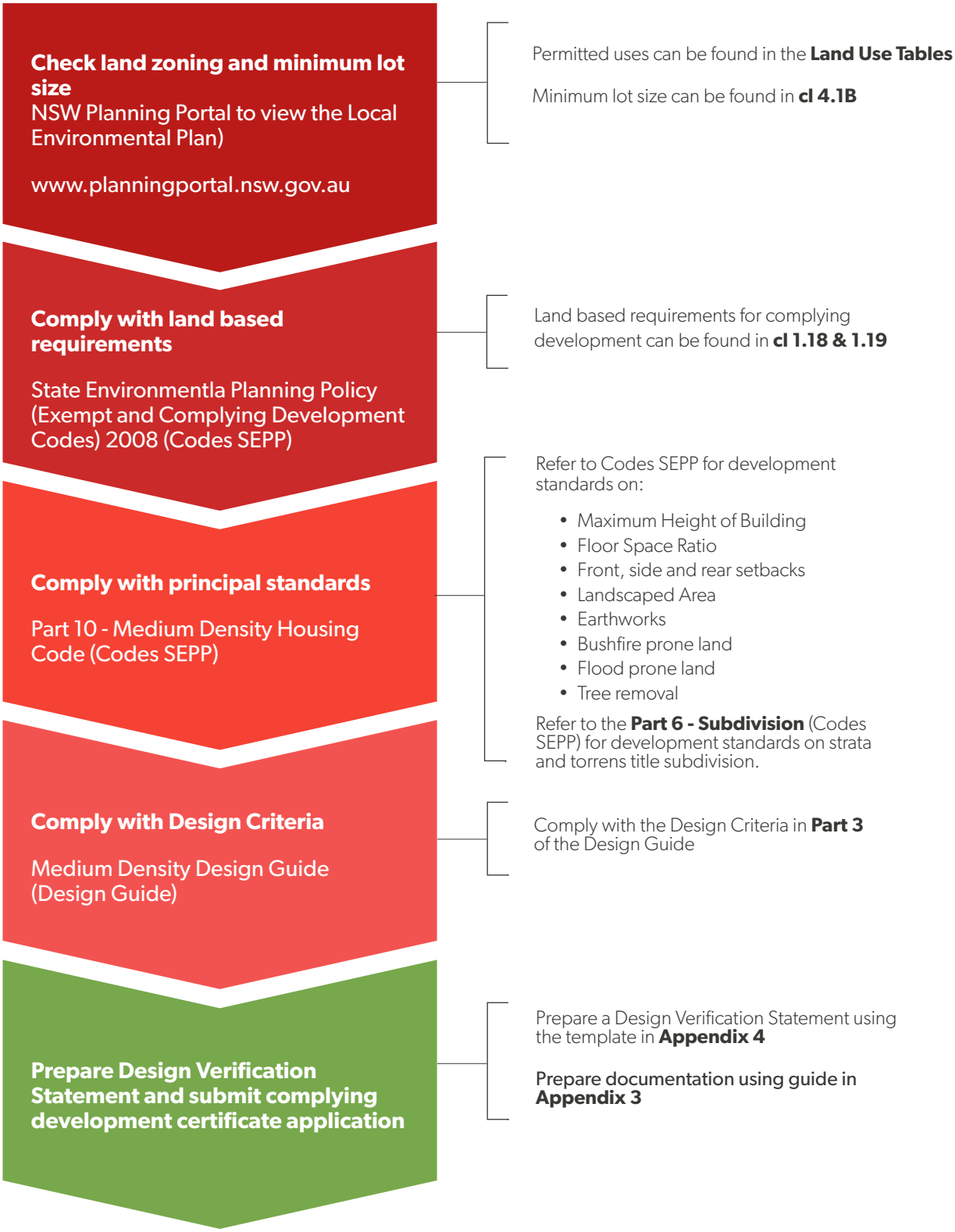


Figure 1-3 Explanation of the format of Part 3 of this guide - Objectives and Design Criteria is explained on previous pages

Steps for Preparing a Complying Development Certificate



Steps for Preparing a Development Application if Council has adopted the Design Guide

NSW Planning Portal to view the Local Environmental Plan for zoning, land based restrictions and principal standards.

www.planningportal.nsw.gov.au

Permitted uses can be found in the **Land Use Tables**

Minimum lot size can be found in **cl 4.1B**

Principal standards:

- Maximum Height of Building **cl 4.3**
- Floor Space Ratio **cl 4.4**
- Landscaped Area
- Minimum lot size **cl 4.1**

Refer to local character guidance, envelope, parking and stormwater controls

Development Control Plan

The development control plan that applies to the land may contain the following guidance:

- Local character and building envelopes
- Landscaped area (if not in the LEP)
- Front, side and rear setbacks
- Car parking
- Stormwater
- Subdivision

Satisfy the Objectives

Medium Density Design Guide (Design Guide)

The development must satisfy all relevant objectives in **Part 3** of the Design Guide

Use Design Criteria as a measurable standard

Medium Density Design Guide (Design Guide)

The design criteria provide a measurable standard in **Part 3** of the Design Guide. Alternate solutions that are consistent with the objectives will be considered.

Use the guidance in **Part 2** for explanation of the objectives and design criteria.

Prepare Design Verification Statement and submit development application

Prepare a Design Verification Statement using the template in **Appendix 4**

Prepare documentation using guide in **Appendix 3**

1.5 Design Principles

Good design is integral to creating sustainable and liveable communities. As a core planning principle, designers and decision makers should always seek to achieve high quality design, creating places, and buildings that responds in a creative and practical way to enhance the function and identity of a place.

The following design principles underpin the objectives of the Design Guide. These principles are a recognised means of defining the qualities of good design and achieving best practice.

In the Design Verification Statement the designer is required to articulate how the proposed development responds to these principles.

1. Context and Neighbourhood Character

Good design responds and contributes to its context. Context includes the key natural and built features of an area, their relationship and the character they create when combined. It also includes social, economic, health and environmental conditions.

Responding to context involves identifying the desirable elements of an area's existing or future character. Well-designed buildings respond to and enhance the qualities and identity of the area including the adjacent sites, streetscape and neighbourhood.

Consideration of local context is important for all sites, including sites in established areas and those undergoing or identified for change.

2. Built Form and Scale

Good design achieves a scale, bulk and height appropriate to the existing or desired future character of the street and surrounding buildings.

An appropriate built form for a site and the building's purpose is achieved regard to building alignments, proportions, building type, articulation and the manipulation of building elements. The space between buildings should be of a scale and character that is defined and suited to purpose.

Appropriate built form defines the public domain, contributes to the character of streetscapes and parks, including their views and vistas, and provides internal amenity and outlook.

3. Density

Good design achieves a high level of amenity for residents and each dwelling, resulting in a density appropriate to the site and its context.

Appropriate densities are consistent with the area's existing or projected population. Appropriate densities can be sustained by existing or proposed infrastructure, public transport, access to jobs, community facilities and the environment.

4. Sustainability

Good design combines positive environmental, social and economic outcomes.

Sustainable design includes the use of natural cross ventilation and sunlight for the amenity and livability of residents, as well as passive thermal design for ventilation, heating and cooling. These measures reduce the reliance on technology and operational costs. Additional elements include: recycling and reuse of materials and waste, use of sustainable materials and deep soil zones for groundwater recharge and vegetation.

5. Landscape

Good design recognises that together landscape and buildings operate as an integrated and sustainable system, resulting in attractive developments with good amenity. A contextual fit of well-designed developments is achieved by contributing to the landscape character of the streetscape and neighbourhood.

Landscape design enhances a development's environmental performance by retaining natural and cultural features which contribute to the local context, co-ordinating water and soil management, solar access, micro-climate, tree canopy, habitat values and preserving green networks.

Landscape design should optimise usability, privacy and opportunities for social interaction, equitable access, respect for neighbours' amenity and provides for practical establishment and long term management.

6. Amenity

Good design positively influences internal and external amenity for residents and neighbours. Achieving good amenity contributes to positive living environments and resident wellbeing.

Good amenity combines appropriate room dimensions access to sunlight, natural ventilation, outlook, visual and acoustic privacy, storage, indoor and outdoor space, efficient layouts and service areas and ease of access for all age groups and degrees of mobility.

7. Safety

Good design optimises safety and security within the development and the public domain. It provides for quality public and private spaces that are clearly defined and fit for the intended purpose. Opportunities to maximise passive surveillance of public and communal areas promote safety.

A positive relationship between public and private spaces is achieved through clearly defined secure access points, well-lit and visible areas that are easily maintained and appropriate to the location and purpose.

8. Housing Diversity and Social Interaction

Good design achieves a mix of dwelling sizes, providing housing choice for different demographics, lifestyles and household budgets.

Well-designed developments respond to social context by providing housing and facilities to suit the existing and future social mix.

Good design involves practical and flexible features, including different types of communal open space for a broad demographic range and provide opportunities for social interaction.

Good design allows for dwellings to be adaptable and people to live in a dwelling through different stages of life by accommodating various household types.

9. Visual Apperance

Good design achieves a built form which exhibits good proportions and a balanced composition of elements, reflecting the internal layout and structure. Good design uses a variety of materials, colours and textures.

The visual appearance of a well-designed development responds to the existing or future local context, particularly desirable elements and repetitions of the streetscape.

Part 2

Design Guidance

Guidance on the design and configuration of low rise medium density residential development.

Building designers and architects should use this section for guidance on how a development should relate to its immediate context, interface with other buildings and the public domain to achieve quality open spaces and provide quality landscape. Guidance on the building form, layout, residential amenity and servicing requirements is also provided.

Planners may use this guide to assist in preparing local strategies, creating local envelope controls and assessing low rise medium density residential development. Councils may choose to adapt this draft as their DCP or integrate it alongside their current DCPs.

Certifiers may use this section for an explanation of the criteria in Part 3.

Design criteria are contained in Part 3. Interpretation of the design criteria is included in this Part.

2.1 Relationship of Design Quality Principles and Design Elements

The 26 design elements provide the structure and are linked to the 9 Design Quality Principles. This matrix is a guide that identifies the key relationships and interactions between the Design Quality Principles and the Design Elements in the Guide.

	Design Quality Principles / Design Elements	1. Context and Neighbourhood Character	2. Built Form and Scale	3. Density	4. Sustainability	5. Landscape	6. Amenity	7. Safety	8. Housing Diversity and Social Interaction	9. Visual Appearance
	Principal Development Controls									
A	Building Envelopes - Heights and Setbacks	♦	♦							
B	Floor Space Ratio		♦	♦						
C	Landscaped Area					♦				
	Siting the Development									
D	Local Character and Context	♦								
E	Public Domain Interface	♦	♦		♦					
F	Internal Streets - Pedestrian and Vehicle Access		♦			♦		♦	♦	
G	Orientation and Siting	♦						♦		
H	Building Separation					♦				
	Amenity									
I	Solar and Daylight Access				♦		♦			
J	Natural Ventilation				♦		♦			
K	Ceiling Heights						♦			
L	Dwelling Size and Layout			♦			♦			
M	Private Open Space						♦			
N	Storage						♦			
O	Car and Bicycle Parking				♦		♦	♦	♦	
P	Visual Privacy						♦			
Q	Acoustic Privacy						♦			
R	Noise and Pollution	♦					♦			
	Configuration									
S	Universal Design								♦	
T	Communal Space					♦			♦	
U	Architectural Form and Roof Design	♦	♦							♦
V	Visual Appearance and Articulation	♦								♦
W	Pools and Ancillary Development		♦							
	Environment									
X	Energy Efficiency				♦					
Y	Water Management & Conservation				♦					
Z	Waste Management				♦					

Principle Development Controls

The principal development controls are the planning tools used to manage the scale of the development and the spatial qualities of the urban environment. The suitable outcome relates to the context and desired future character of an area, which manages impacts on surrounding development.

Principal controls should be developed through a design-led strategic urban design process as the basis of integrated planning, design and community engagement. The primary controls relate closely to the context and the future urban structure.

Local strategy and structure should be articulated in council's Development Control Plan:

- Structure plan;
- Spatial network;
- Movement networks;
- Green grid;
- Building envelopes; and
- Setbacks.

The upper limits of the principal controls to be contained within the Local Environmental Plan are:

- Land use;
- Height of buildings;
- Floor space ratio; and
- Landscaped area.

Where a local strategy has not yet been prepared, the guidance in this section can be used to assist in preparing and assessing of a development application.

Setting and Testing the Controls

Principal controls are the shapers of the built environment - they must work together to achieve a quality urban and built environment.

The appropriate principal controls are the result of identifying future character, appropriate heights, building depths, spaces between buildings and ensuring good amentiy. Control testing should also consider:

- Orientation to control sunlight and daylight access and limit overshadowing;
- Natural ventilation;
- Visual and acoustic privacy;
- Private open space;
- Communal open space;
- Deep soil zones;
- Ceiling heights ;
- Dwelling sizes;
- Public domain interface; and
- Noise and pollution.

The controls must be checked to ensure they are co-ordinated and that the desired built form outcome is achievable. The controls should ensure the optimal density and massing can be accommodated within the building height and setback controls.

It is vital to consider the type of dwelling proposed as different dwelling types have diverse forms and result in wide-ranging economic outcomes.

Appendix 5 provides guidance on setting the principal development controls for different types of medium density housing.

Complying Development

Complying development is an approval process for straightforward development. The primary controls are contained within the State Policy. The strategic design work and testing must have been carried out to ensure that a positive design outcome has been achieved.

2A Building Envelopes - Heights and Setbacks

Related Design Quality Principles

Design Principle 1. Context and Neighbourhood Character
Design Principle 2. Built Form and Scale,

A building envelope is a three dimensional volume which defines the maximum extent of a building on a site by length, width (through setbacks and maximum building dimensions) and height.

Building envelopes set the appropriate scale of future development in terms of bulk and height relative to the streetscape, public and private open spaces, block and lot sizes in a particular location. Envelopes are especially appropriate when determining and controlling the desired urban form in town centres, brownfield sites, precinct plan sites and special sites such as those with heritage significance, views or steep and varied topography.

Building envelopes help to:

- Define the three dimensional form of buildings and wider neighbourhoods;
- Inform decisions about appropriate density for a site and its context;
- Define open spaces and landscape areas;
- Provide appropriate building sizes in relation to internal habitable spaces and configured to take advantage of solar access, daylight and natural ventilation requirements;
- Test the other primary controls to ensure they are coordinated and achieve the desired outcome; and
- Demonstrate the mass, scale and location of future development.

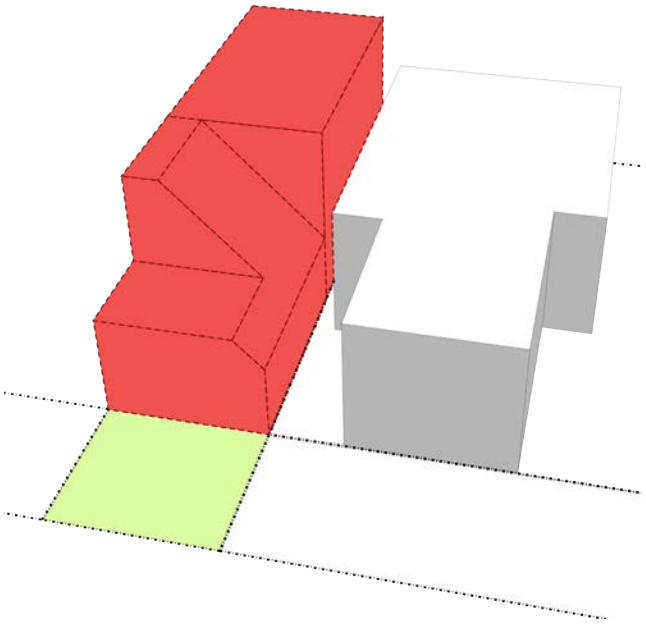


Figure 2-1 Building envelopes define the maximum container within which a building is designed. They are a useful tool to gain an understanding of the future urban form and scale of an area. The gross floor area of the building is typically 25-30% less than that of the envelope

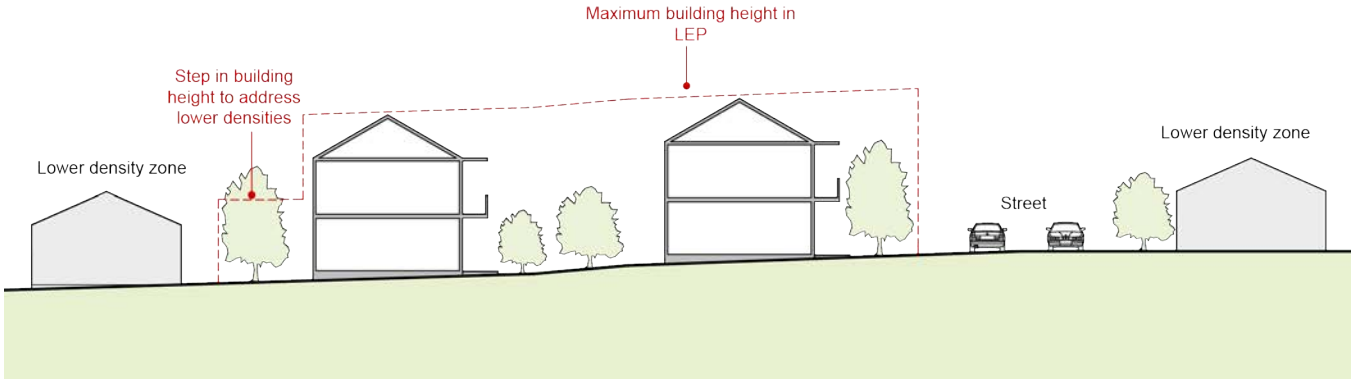


Figure 2-2 Building height controls in a development control plan should reflect the existing or desired future character of an area. Height controls may need to step or change within a site while still being within the maximum set in the local environmental plan. This diagram shows how the height of proposed buildings responds to the lower and higher densities along each street frontage

Strategic planning and design notes:

- Prepare precinct based building envelopes by testing envelopes in relation to various block sizes and proportions;
- Provide maximum building heights within the LEP;
- Provide setbacks and envelopes within the DCP; and
- The DCP can provide finer control of building heights on unique sites such as the interface with heritage or other land use zones.

Building Height

Building height is an important component of the building envelope. It helps shape the desired future character of a place relative to its setting and topography. It defines the proportion and scale of streets and public spaces and has a relationship to the physical and visual amenity of the public and private realms.

Height controls should be informed by decisions about daylight and solar access, roof design and use, wind protection, residential amenity, as well as landform and heritage.

Height controls must consider the scale of adjoining development.

Variations in building height create visual interest, respond to the topography and emphasise elements of the urban context.

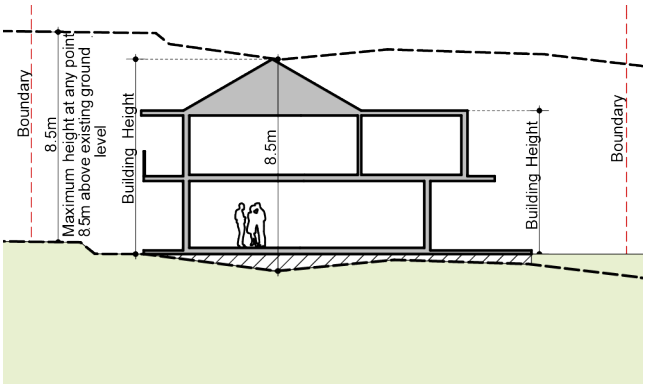


Figure 2-3 Height of building follows the topography.

Guidelines

1. Ensure maximum building height allows for articulated roof planes and building services or that architectural roof features are enabled by the LEP.

2. Building heights are calculated to include floor to ceiling heights, number of storeys, floor depths, roof articulation and changes in topography.

3. Typical dimensions:
   - Floor to ceiling heights: 2.7m
   - Floor depth: 0.4m per floor for structure, services, set downs and finishes.
   - Roof articulation: 1m to the total to allow for rooftop articulation.
   - Topography: 1-2m to the total to allow for topographic changes where required. Provide additional height in flood prone areas.

4. A building envelope should be 25-30% greater than the achievable floor area to allow for building components that do not count as floor space but contribute to building design and articulation such as balconies, lifts, communal stairs and open circulation space.

5. Develop site-specific building envelopes and heights within a development control plan for large or complex sites such as those on steep slopes and those with changing topography. These specific heights need to be achievable within the building height set in the LEP.

6. Ensure the height responds to the desired future scale and character of the street and local area.

7. Consider the height of existing buildings which are unlikely to change (for example a heritage item or strata subdivided building).

8. Building heights should respond to the landform.

9. Where a floor space ratio control is defined, test height controls against the FSR to ensure a good fit.

Setbacks

Setbacks govern space between proposed buildings and other elements in the environment. Usually, setbacks are expressed as distance of building from property boundaries. However, they can also refer to the separation between multiple buildings on a single site. They relate to the height of the building.

Setbacks are important to the amenity of new development and buildings on adjacent sites.

Setbacks vary according to the building's context and type. Larger setbacks are usual in suburban contexts compared to higher density urban settings.

A transition between different land uses and building typologies is provided by setbacks. Side and rear setbacks can also be used to create usable landscape space, preserving part of the site for tree planting, landscaping and outdoor recreation.

Figure 2-4 Building height in renewal areas should reflect the desired future character of the streetscape

Street Setbacks

Street setbacks establish the alignment of buildings along a street frontage, spatially defining the width of the street. Combined with building height and road reservation, street setbacks define the proportion and scale of the street and contribute to the character of the public domain.

A street setback which accommodates front gardens, contributes to the landscape setting of buildings and the street. Street setbacks provide space for building entries, ground floor dwelling courtyards and entries, landscape areas

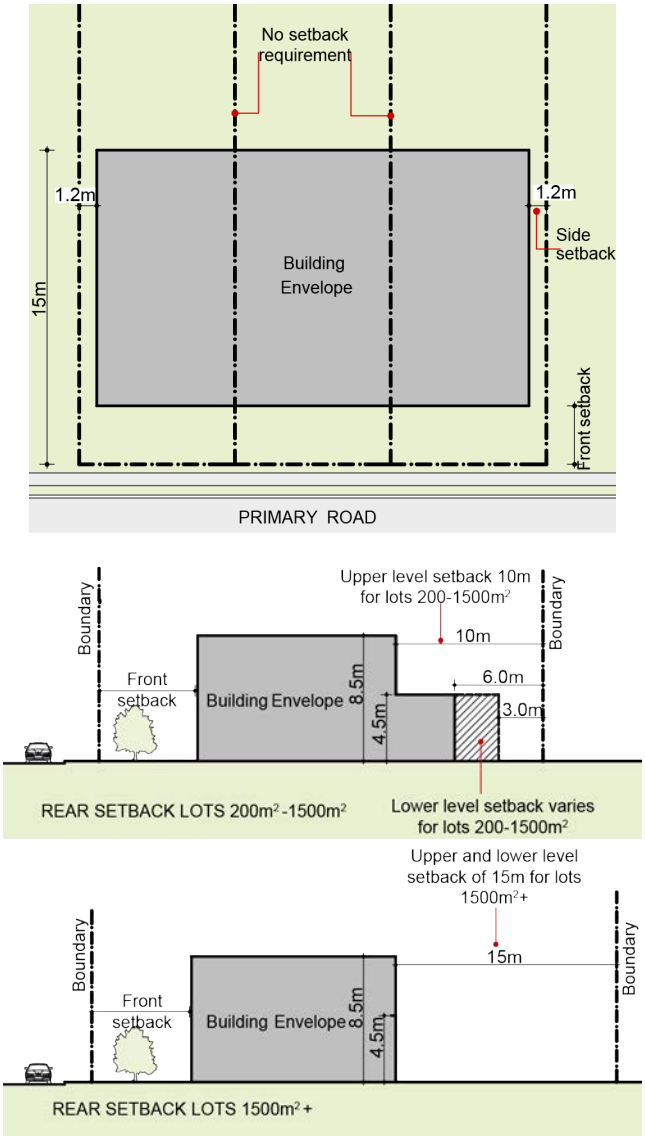


Figure 2-5 Rear setbacks vary according to lot sizes.

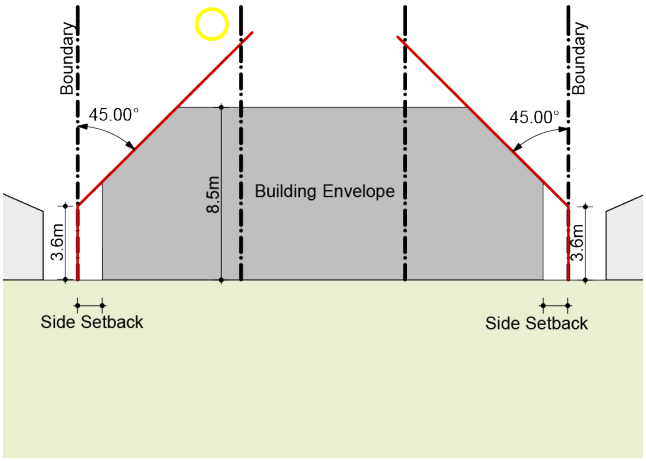


Figure 2-6 On steep slopes across sites, a varied height control can be applied that steps down towards the lower level of the site and helps create useful residential floor plates (12-18m) addressing the street

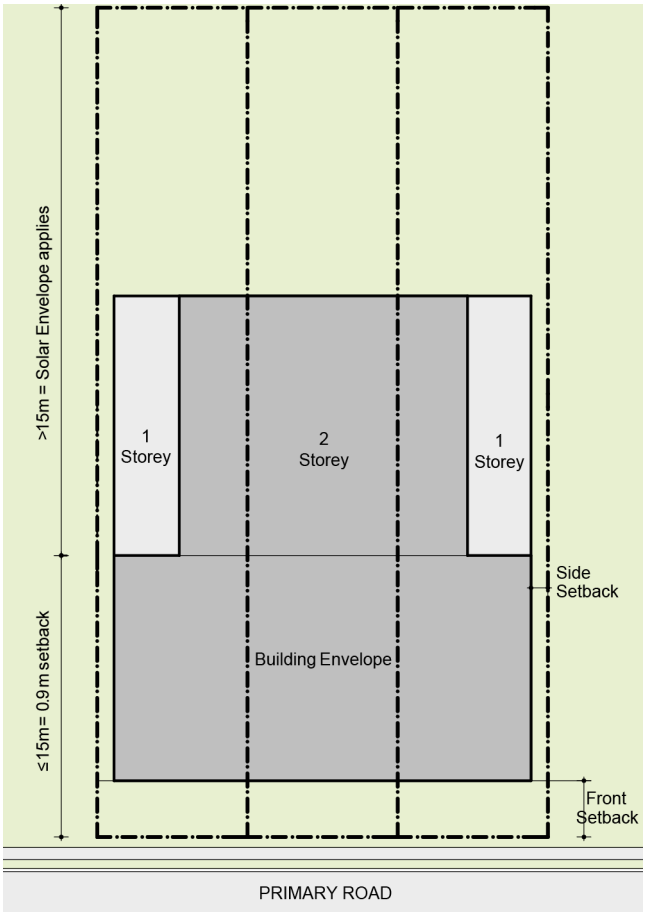


Figure 2-7 Setback to the first floor increase the longer the building envelope is to provide solar access to neighbouring properties

Guidelines

10. Building envelopes should take into consideration uses that have incentives which may increase the base floor space permissible. Test the envelope with the increased floor area to ensure optimal amenity can still be achieved.

11. It may be appropriate to determine heights by relating them to site-specific features such as cliff lines or heritage items. This may involve:
    - Defining an overall height or street wall heights to key datum lines, such as eaves, parapets, cornices or spires; and
    - Aligning floor to floor heights of new development with existing built form.

12. Building heights and setbacks should work together to allow for good daylight and solar access to key public open spaces, private living rooms and private open space.

13. Adequate setbacks between the building envelope and neighbouring properties allows for improved privacy avoiding the need for privacy screens.

14. Retain or create a rhythm or pattern of spaces between buildings to define and add character to the streetscape.

15. Achieve setbacks which maximise deep soil areas, retain existing landscaping and support consolidation of mature vegetation across sites.

16. Manage a transition between sites or areas with different development controls such as height, setbacks and land use.

17. Consider access around buildings for maintenance.

18. Consider secondary height controls to transition to built form, for example:
    - a street wall height to define the scale and enclosure of the street; and
    - a step down in building height at the boundary between two height zones.

19. When calculating existing ground level over existing structures and pools, draw a line between the edges of the structure.

2B Floor Space Ratio

Related Design Quality Principles
Design Principle 3. Density

Floor space ratio (FSR) is the relationship between the total gross floor area (GFA) of a building relative to the total area of the site it is built on. FSR indicates the intended density and is a way of managing the development potential of a site.

FSR is not a measure of the maximum capacity of the building envelope. The envelope provides an overall guide for the extent of development.

FSR controls determine only the *theoretical maximum* capacity. It may not be possible to reach the maximum allowable floor space due to other development controls or constraints specific to the site such as lot size or shape, existing landscape features, neighbouring properties or heritage considerations.

Particular development types are provided with incentives of additional floor space - such as boarding houses or seniors housing developments. When planning FSRs, ensure that these incentives can be accommodated within the building envelope.

Vehicle circulation and parking have a significant influence on the GFA achievable on a site.

In new urban areas or where an existing neighbourhood is undergoing change, building envelopes should be tested before setting FSR controls.

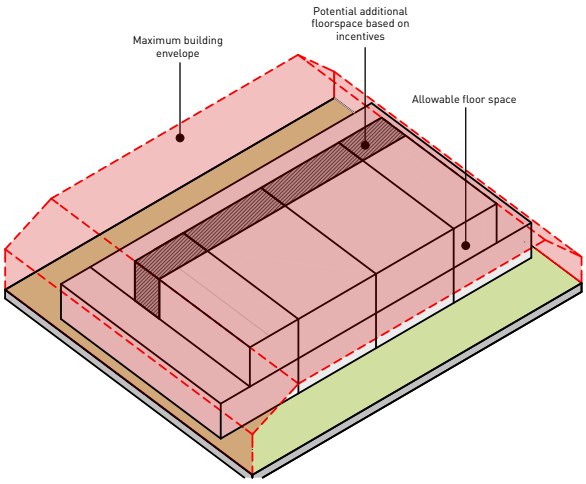


Figure 2-8 Maximum building envelopes including any potential incentives and bonuses can be used to test the built form outcome when determining FSR controls

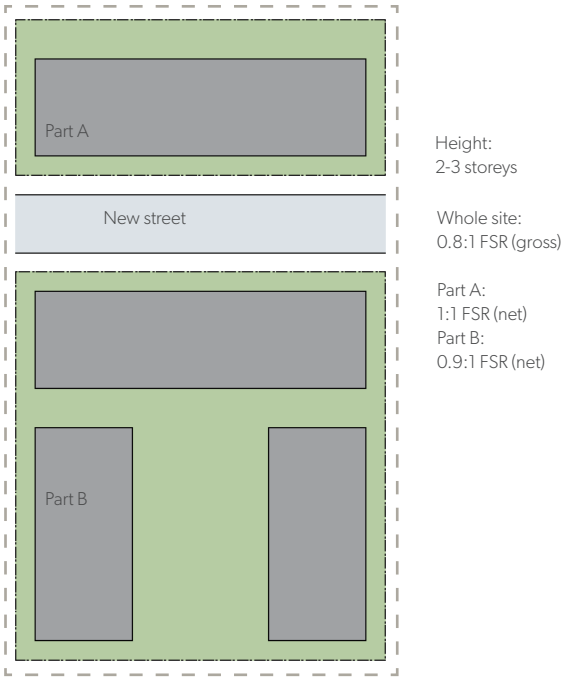


Figure 2-9 On sites with subdivision and public domain dedication (e.g. a new street), the overall gross FSR for each individual development parce is lower than its net FSR

Guidelines

1. Test the desired built form outcome against the proposed FSR to ensure it is coordinated with the building envelope, height, depth, setbacks and open space requirements.

2. The allowable GFA should 'fill' only approximately 70% of the building envelope.

   The GFA should fit comfortably within the building envelope because the envelope must accommodate building elements and service areas which are not included in the GFA definition, as well as allowing for building articulation.

3. Consider how floor space is implemented across larger sites. A single FSR may result in under or over development. For example, in an area with a consistent height control:

   - Corner, mid-block or wide shallow sites tend to have different floor space capacities;
   - Small sites with a single building may have greater floor space capacity than larger sites with multiple buildings; and
   - Large sites with multiple buildings require greater space between buildings and may have less floor space capacity.

4. On precinct plan sites with new streets and/or open spaces, both the gross FSR for the whole site and the net FSR for individual development parcels must be defined. The net FSR may be significantly higher than the gross FSR.

5. Ensure any incentives for additional floor space are considered and accommodated within the envelope.

6. Consider opportunities to achieve public benefits such as community facilities and public domain improvements, such as new streets, through-site links and open spaces

7. Consider car parking configuration and how that will influence the FSR. Using a two storey development with street level parking accessed from the primary road as a example case then:

   - Where there is only one building, underground car parking can increase the GFA on a site by 0.1:1;
   - Underground car parking under multiple buildings can increase the GFA on a site by 0.2:1; and
   - Multiple buildings connected by streets and lanes can reduce the GFA by 0.2:1.

8. In noisy or hostile environments, the impacts of external noise and pollution may necessitate enclosing balconies (e.g. wintergardens). When setting FSR controls in these situations, consider providing additional area to compensate for the enclosed balconies.

9. Appendix 5 provides examples of different FSRs for various types of medium density housing.

2C Landscaped Area

Related Design Quality Principles

Design Principle 5. Landscape

Landscaped area refers to the area of a site which is not built upon and contains deep soil for tree planting.

Landscaping of medium density developments plays an important role in their integration into the surrounding streetscape and context, which greatly increases the amenity for neighbours and future residents.

Landscape design involves the planning, design, construction and maintenance of all external spaces. Successful landscape design complements the existing natural and cultural features of a site and contributes to the building's setting.

Landscaping and in particular tree planting helps to clean the air, reduces urban heat, offers shade, provides habitat for wildlife and adds aesthetic appeal to the urban landscape. It can also assist the infiltration of rain water to the water table and reduce storm water runoff.

Landscaped areas can retain existing significant vegetation and enhance vegetation corridors.

The extent of landscaping varies according to the typology and intended density. In areas where there is greater density on private land, more tree planting can be provided in the public domain.

Incorporating landscape design early in the design process provides optimal outcomes for residential dwellings. Landscaping needs to be coordinated with other disciplines to ensure building design and service locations complement landscape and public domain.

In larger developments, landscaped areas can provide shade and amenity for residents in communal open spaces.

Strategic planning and design notes:

- Landscaped area is best controlled in the LEP for low and medium density development where it can effectively preserve the landscaped character; and
- The area for landscaping is often constrained by the size of the lot and the type of development. Refer to Appendix 5 for guidance on standards for particular development types.

Figure 2-10 Extensive landscape planting within private open spaces provides greater visual amenity and an enjoyable environment for occupants.

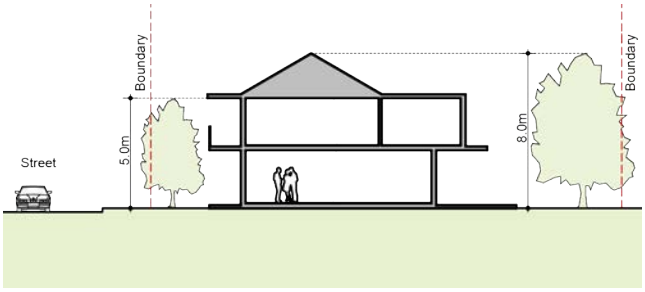


Figure 2-11 Front and rear setbacks provide opportunities for tree planting. Trees should be in scale with the development proposed.

Figure 2-12 Front and rear setbacks provide opportunities for tree planting. Trees should be in scale with the development proposed.

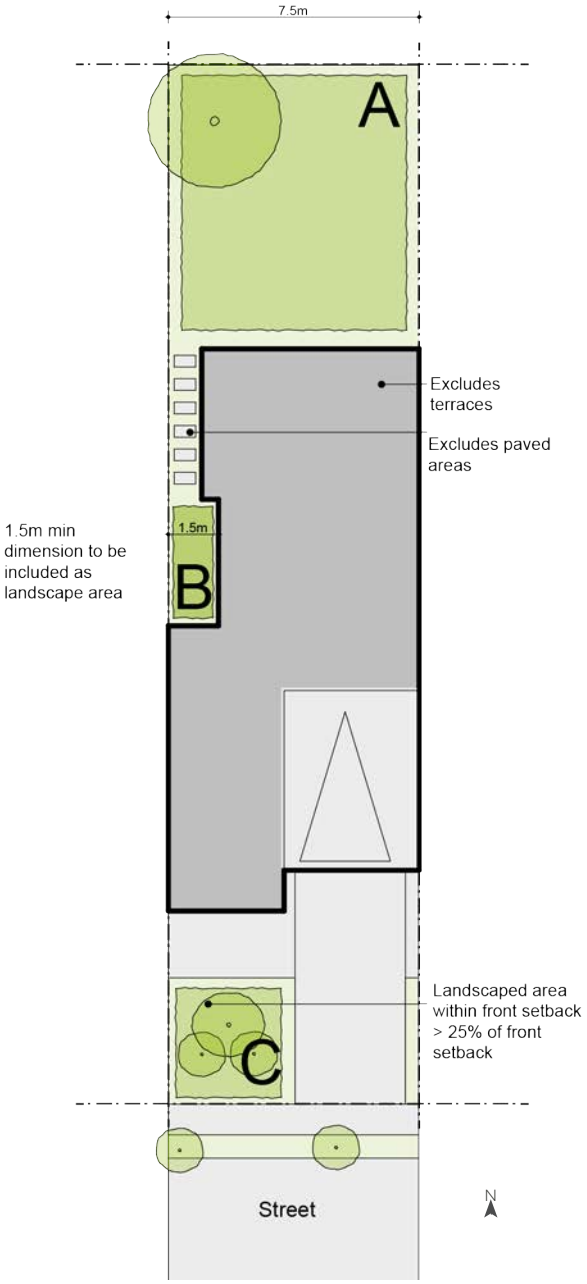


Figure 2-13 Landscaped areas distributed around the site. The minimum dimension ensures the space is sustainable for substantial planting

Guidelines

1. Natural features of the site, such as trees, rock outcrops, cliffs, ledges, indigenous species and vegetation communities should be identified in the local context plan and incorporated into the local strategy by council.
2. Develop a street tree masterplan and public domain plan which provide direction for the landscaped areas within the streets and front setbacks.
3. Identify existing stands of trees for retention, particularly in rear setbacks.
4. Landscaped areas are best proposed in large areas at both the front and rear of the development site. For large sites, a mid-block landscaped area may also be appropriate.
5. Tree species and size should respond to orientation, for instance - select deciduous trees in front of north facing living spaces.
6. Select tree species which will be suitable in size and scale with the development.
7. Landscaped areas should take advantage of existing site conditions when responding such as:
   - Changes of level;
   - Views; and
   - Significant landscape features including trees and rock outcrops.
8. Significant landscape features should be protected by:
   - Tree protection zones; and
   - Appropriate signage and fencing during construction.
9. The extent of the site to be landscaped is linked to the character of the area. An area defined by tree canopies with buildings set in a landscaped setting will have a larger landscaped area (40-60%) compared to an urban area where the tree canopy is largely in the public domain (10-20%)

Planting on structures

Planting on structures refers to landscaping atop built structures such as basement car parks, podiums, roofs and walls. Planting on structures can provide amenity, improve air quality and microclimate, while reducing direct energy use and storm water runoff. It can also supplement deep soil planting on sites where opportunities for this are limited or restricted, for example in high density areas.

Common methods of planting on structures include:

- Green roofs;
- Green walls;
- Raised planters; and
- Roof gardens.

Plants grown in these situations are subject to a range of environmental stresses which affect both their health and vigour. Designing soil profiles, irrigation and systems to provide adequate oxygen, water and nutrients is crucial for plant survival.

Figure 2-14 Green roof on terraces.

Table 1 Minimum soil standards for plant types and sizes

Plant type	Definition	Minimum soil volume	Minimum soil depth	Minimum soil area
Large trees	12-18m high, up to 16m crown spread at maturity	150m^3	1,200mm	10m x 10m or equivalent
Medium trees	8-12m high, up to 8m crown spread at maturity	35m^3	1,000mm	6m x 6m or equivalent
Small trees	6-8m high, up to 4m crown spread at maturity	9m^3	800mm	3.5m x 3.5m or equivalent
Shrubs			500-600mm	
Ground cover			300-450mm	
Turf			200mm	

Note: The above has been calculated assuming fortnightly irrigation. Any sub-surface drainage requirements are additional to the above minimum soil depths

Table 2 Suggested soil volumes on sites with sand, clay, alluvial, transition and disturbed soils

Tree size	Height	Spread	Soil volume
Large trees	13-18m	16m	80m^3
Medium tree	9-12m	8m	35m^3
Small tree	6-8m	4m	15m^3

Table 3 Recommended tree planting in landscaped areas

Site area	Recommended tree planting
Up to 850m^2	1 medium tree per 50m^2 of landscaped area
Between 850 - 1,500m^2	1 large tree or 2 medium trees per 90m^2 of landscaped area
Greater than 1,500m^2	1 large tree or 2 medium trees per 80m^2 of landscaped area

10. To reinforce local character, a successful landscape design blends local indigenous plants with plants cultural planting of the area.

11. Landscaped areas should be located to retain existing significant trees and to allow for the development of healthy root systems, providing anchorage and stability for mature trees. Design solutions may include:
    - Basement and sub-basement car park design consolidated beneath building footprints;
    - Use of increased front and side setbacks;
    - Adequate clearance around trees to ensure long term health; and
    - Co-location landscaping with other deep soil areas on adjacent sites to create larger contiguous areas of deep soil.

12. Where a proposal does not achieve the landscaped area requirements, acceptable stormwater management should allow for alternative forms of planting, such planting on structures.

13. Landscape design should be environmentally sustainable. It can enhance environmental performance by incorporating:
    - diverse and appropriate planting;
    - bio-filtration gardens;
    - appropriately planted shading trees;
    - areas for residents to plant vegetables and herbs;
    - composting; and
    - green roofs or walls.

14. Microclimate is enhanced by:
    - Appropriately scaled trees near the eastern and western elevations for shade;
    - A balance of evergreen and deciduous trees to provide shade in summer and sunlight access in winter; and
    - Shade structures such as pergolas for balconies and courtyards.

15. Structures need to be reinforced for additional saturated soil weight as appropriate.

16. Soil volume is appropriate for plant growth. Considerations include:
    - Modifying depths and widths according to the planting mix and irrigation frequency;
    - Free draining and long soil life span; and
    - Tree anchorage.

17. Minimum soil standards for plant sizes should be provided in accordance with Table 1 (Minimum soil standards for plant types and sites)

18. Plant species should be selected in accordance with site conditions. Considerations include:
    - Drought and wind tolerance;
    - Seasonal changes in solar access;
    - Modified substrate depths for a diverse range of plants; and
    - Plant longevity.

19. Irrigation and drainage systems should consider:
    - Changing site conditions;
    - Soil profile and the planting regime; and
    - Whether rainwater, stormwater or recycled grey water is used.

20. Building design incorporates opportunities for planting on structures. Design solutions may include:
    - Green walls with specialised lighting for indoor green walls;
    - Wall design that incorporates planting;
    - Green roofs, particularly where roofs are visible from the public domain; and
    - Planter boxes.
      Note: structures designed to accommodate green walls should be integrated into the building façade and consider the ability of the façade to change over time.

21. A landscape maintenance plan must be prepared by a suitably qualified landscape professional

Siting the Development

2D Local Character and Context

Related Design Quality Principles
Design Principle 1. Context and Neighbourhood Character

A detailed understanding of the overall site context is the starting point for designing a uniquely distinct and memorable place. Context is the character and setting of the area within which a scheme will sit. This character and setting is influenced by environmental/physical, economic and social factors.

By having an understanding of factors such as the history of the place, how it developed, the people who live there and how it functions developments can be more effectively and appropriately positioned.

A well-designed scheme will respond to the context appropriately and sensitively and form a positive contribution to the predominant character of the existing area.

The key priorities to be considered when responding to character and context are:

- **Communities** – understanding social dynamics can help developments reinforce local communities
- **Place** – drawing inspiration from the original native character and its heritage can strengthen local identity
- **Natural resources** – maximising use of the sites intrinsic resources can create more sustainable developments
- **Connections** – understanding existing street and road linkages can help develop an effective and integrated movement framework
- **Feasibility** – ensuring schemes are economically viable and deliverable
- **Vision** – understanding the aspirations of the site within the setting of the wider area

These elements are all inter-related and all rely on each other to make a well-designed sustainable place which responds well to context.

A key consideration in understanding context is an appreciation of the desired future character of an area.

Understanding the Existing Context

Strategic and site design planning both start with an understanding of the physical, historical and cultural context.

Appreciating a site and the contribution of a potential development on the site can make to an area needs to be undertaken through a detailed site analysis at the start of the process to understand all issues and considerations.

This analysis should identify the opportunities and constraints of the site, and the wider area in which it is located which will set a platform from which to develop a design. A site analysis provides the opportunity to design a dwelling that optimises site layout and context and contributes to its surroundings.

Local Character

Determining the character of an area involves an objective assessment of the physical aspects, along with a subjective assessment of the proposally ability to be in harmony with its context. Local character can be determined by:

- The relationship of the built form to the surrounding space created by building height, separation and setbacks;
- Building use or types;
- The architectural style and materials, with particular consideration in conservation and heritage areas; and
- The topography, landscape character; including significant tree planting and other significant natural features contribute to the character of the area.

The extent to which the local character is assessed is principally the visual character to which the development or precinct can be viewed.

In most instances, low rise medium density housing is proposed in areas that are undergoing a transition from lower density, single dwelling homes to a higher density. Where planning controls anticipate a change of character for an area, compatibility with the desired future character of the area should be regarded as more relevant than compatibility with the existing character.

Desired Future Character

The desired future character can vary from preservation of the existing look and feel of an area, to establishing a completely new character based on different uses, street patterns, subdivisions, densities and typologies.

Council establishes the desired future character through consultation with the community, industry and other key stakeholders. During this process, understanding the context is crucial to supporting change and determine relevant building types and planning controls.

Understanding Influence of Existing Subdivision

Subdivision and street patterns are very powerful influences on the existing urban fabric and potential future development.

The size, shape and form of the existing subdivision patterns may restrict certain form of development or result in negative impacts. Often existing low density areas have large blocks and street networks that do not encourage walkability and do not easily facilitate medium density housing.

Some lot shapes and sizes are more suitable for intensification whilst others will require amalgamation. Requiring lot amalgamation can add a significant cost to new development and may require higher densities to ensure the development remains feasible.

Design guidance

1. NEIGHBOURHOOD SCALE

The neighbourhood scale outlines the urban structure including streets and open spaces.

It is appropriate to address this scale when planning for individual or small groups of dwelling building sites. A radius of 400 metres to 1 kilometre should be considered when considering the neighbourhood scale.

At a neighbourhood scale, the priorities for inclusion are:

- street network and pattern
- subdivision patterns
- building types
- open space network
- existing vegetation patterns and drainage
- heritage and local landmarks
- zoning
- topography.

The subdivision of blocks and street patterns are very powerful influences in the existing urban fabric and potential future developments.

Corner sites, sites with two street frontages or sites that are relatively wide or shallow are more suitable for intensification.

In areas with deeper lots, consider how new streets and lanes could be introduced to increase permeability.

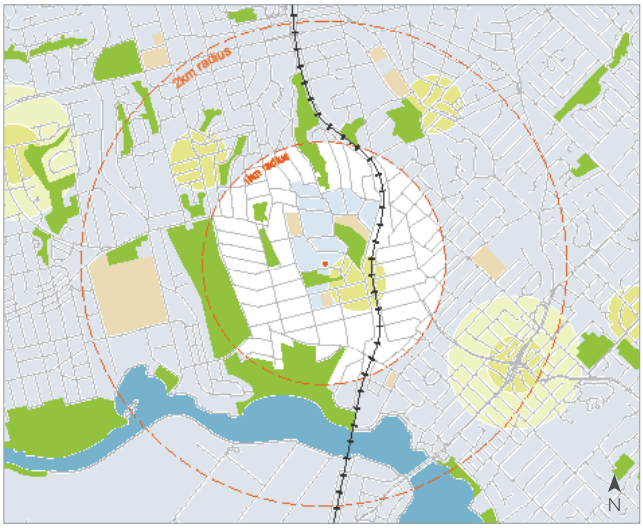


Figure 2-17 The wider scale should analyse the urban structure and broader landscape setting and identify the site's proximity to centres, transport and major public open spaces. Proposals for larger precincts and redevelopment sites should address this scale.

Figure 2-18 The neighbourhood scale outlines the urban grid and block structure including streets and open spaces, significant topography, heritage and civic and community uses. Proposals for individual or small groups of low rise medium density developement sites should address this scale.

Figure 2-19 The streetscape scale helps understand the impact of proposed development on streetscape quality and should show heights, setbacks, driveways and existing street trees. All proposals should address this scale.

Figure 2-20 The site scale is a detailed analysis of the development's immediate context and should include the site itself, the street it addresses and surrounding properties. All proposals should address this scale.

2. LOCAL SCALE

Understanding the local area scale is most relevant for strategic planning, precinct planning, and designing larger developments. This broader scale includes the urban structure, landscape setting and the land use patterns of the wider context and identifies the site's proximity to centres, transport and major public open spaces.

Planning and design should illustrate the future density and proposed change to the area.

As a guide, consideration of the local area should extend to a radius of 1 to 5 kilometres around the development site.

At a wider local level, the analysis includes identification of the following elements:

- Open space network – sports fields and local parks
- Physical infrastructure such as existing transport (private vehicles, buses and bicycles), community services, open spaces and areas of employment

3. STREETSCAPE SCALE

The streetscape scale responds to the character of the street(s) surrounding the site, and considers any spatial enclosure by surrounding buildings or landscape elements. It should identify:

- Building uses
- Building heights of surrounding buildings
- Subdivision pattern and lots widths
- How does the built form relate to the building grain – including the predominant pattern of building size – for instance smaller traditional buildings such as terraces with smaller building width and footprint making up a smaller building 'grain'
- Front setbacks
- Pedestrian access
- Driveways
- Public domain elements such as street trees, verges and footpaths.

4. SITE SCALE

The site scale involves detailed consideration of the individual development site relative to neighbouring properties, both directly adjacent, opposite, and to the rear of the site. It also includes consideration of:

- Relationship to the public domain
- Existing vegetation and trees
- Boundary treatments
- Retaining walls, overshadowing impacts and privacy considerations
- Orientation, taking advantage of solar access;
- Slope
- Geology
- Contamination
- Infrastructure
- Access easements
- Stormwater management.

Responding to these elements contributes to the unique identify of a place and have a significant impact on the form and function of existing and future development.

2E Public Domain Interface

Related Design Quality Principles

Design Principle 1. Context and Neighbourhood Character
Design Principle 2. Built Form and Scale
Design Principle 5. Landscape

The public domain interface is the transition area between the dwelling, its private or communal space at the street edge and the public domain. The built form at the edges defines the spatial proportions of the street and the street edge.

The interface of the development contributes to the quality and character of the street. Subtle variations through planting and boundary treatments such as walls and fencing can create an attractive and active public domain with a pedestrian scale. Long, high blank walls or fences can detract from the appearance of the public domain and impact on the safety of pedestrians and residents.

Direct access from the street to ground floor dwellings and windows overlooking the street can improve safety and social interaction.

Key components to consider when designing the interface include: entries, private terraces or balconies, fences and walls, changes in level, services locations and planting. The design of these elements can influence the real or perceived safety and security of residents, opportunities for social interaction and the identity of the development when viewed from the public domain.

Strategic planning and design notes:

- The desired future character should consider the character of the street, landscape within the public domain and the interface of the built form with the street
- Built form envelopes and front setback dimensions determine the character of the public domain interface. For example:
  - Large setbacks enhance buildings within a landscaped setting and widen the street; and
  - Reduced setbacks create a more intimate street with greater reliance on landscape within the public domain.
- Consider if any structures need to be incorporated into the interface zone.

Figure 2-21 Retention of existing trees and generous planting in front setbacks makes a positive contribution to the streetscape

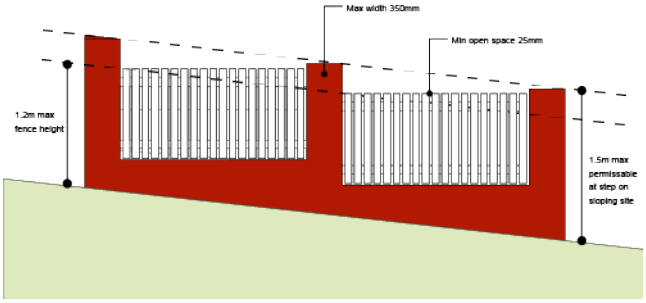


Figure 2-22 On sloping sites fences and walls should be stepped so that no part is higher than 1.5m above natural ground level.

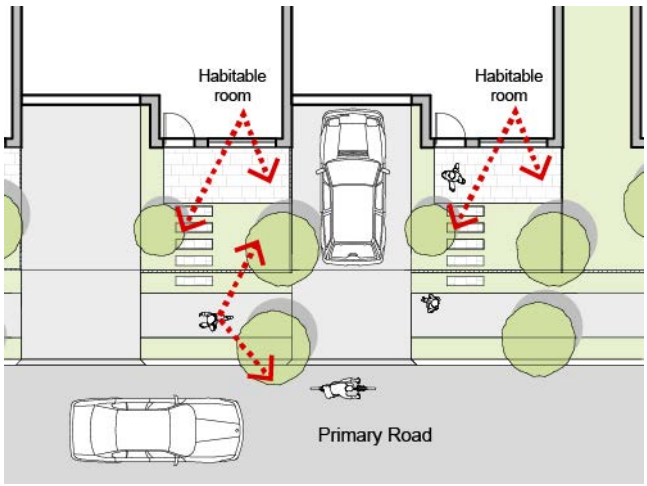


Figure 2-23 New buildings should contribute to and improve the existing streetscape. Windows and porches should be included in the street elevation to increase passive surveillance.

Design guidance

1. Create a threshold by providing a clear transition between the public and private domain.
2. In manor houses, provide clear definition of common building entries and common vs private open space.
3. Where private courtyards and terraces are provided in the front setback, they are to be within the articulation zone and have semi-transparent fencing. This provides opportunities for passive surveillance and avoids negatively impacting on the aesthetic and spatial quality of the street.
4. Provide a change in level of 0.5-1.2m between private terraces, the street and communal spaces to enable surveillance, while improving visual privacy for ground level dwellings.
5. Ground and upper level windows and balconies provide passive surveillance as well as visual interest to the streetscape.
6. Front fences and walls along street frontages should use visually permeable materials and treatments. To allow for sloping sites the average height should be 1.2m. The maximum height is 1.5m
7. Any solid portion should not exceed 40-60% of the area. (ie areas of full masonry or stone. Non-solid fences such as timber or aluminium picket fences should have appropriately proportioned spacing.
8. Hedges to a height of 1.2m can provide a soft boundary edge.
9. Where solid walls are provided within the street frontage to provide an acoustic buffer, they should be softened with landscaping.
10. Opportunities should be provided for casual interaction between residents and the public domain. Design solutions may include seating at building entries, near letter boxes and in private courtyards adjacent to streets.
11. Rear courtyard boundary treatments to secondary roads should have a similar treatment to the dwelling facade.
12. Areas where people can be hidden or concealed should be avoided.
13. In developments with multiple buildings and/or entries, pedestrian entries and spaces associated with individual buildings/entries should be differentiated to improve legibility for residents, using some of the following design solutions:
    - Variation in materials;
    - Plant species; and
    - Changes in colours.
14. To soften edges, incorporate planting to raised terraces to the street. For example: above sub-basement car parking.
15. The visual prominence of an underground car park should be minimised. Where it is more than 1m above ground level, ventilation should be integrated with the overall façade design by using 'hit and miss' brickwork or providing ventilation openings that considers the full composition of the facade.
16. Substations, pump rooms, garbage storage areas and other service requirements should be located in basement car parks. Alternatively if there is no basement, these services should be located in an area concealed out of public view.
17. Ramping for accessibility should be minimised by considering building entry locations and where ground floor levels are in relation to footpath levels.
18. Where development adjoins public parks, open space or bushland, the design should positively address this interface and adopt some of the following design solutions:
    - Clearly defined street access, pedestrian paths and building entries;
    - Paths, low fences and planting which delineate communal and private open space from adjoining public open space; and
    - Minimal use of blank walls, fences and ground level parking.

2F Internal Streets - Pedestrian and Vehicle Access

Related Design Quality Principles:
Design Principle 2. Built Form and Scale
Design Principle 5. Landscape
Design Principle 8. Housing Diversity and Social Interaction
Design Principle 7. Safety

The location, type and design of vehicle access points have significant impacts on streetscape, site layout and building façade design. The internal circulation network should be clear and legible. Internal streets in the form of mews and low traffic streets are to prioritise pedestrians with shared surfaces and use of different surface materials, landscaping and bollards.

For larger sites and where existing block and subdivision patterns are deep, site accessibility is best served by introducing a hierarchy of new streets and lanes, rather than by long driveways.

Dwellings should address the internal streets and lanes in the same way they address a public street.

Figure 2-26 Shared street

Figure 2-27 Internal pedestrian network

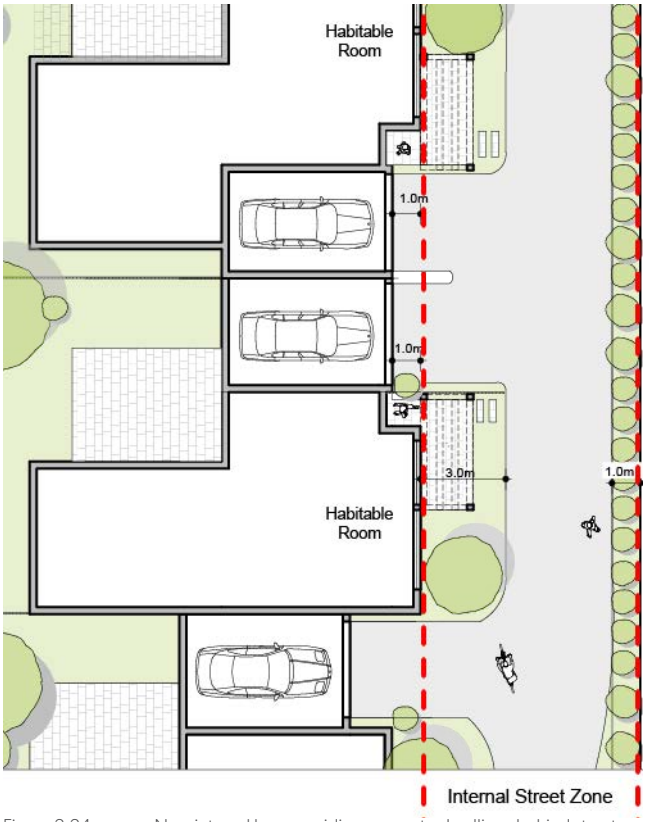


Figure 2-24 New internal lane providing access to dwellings behind street frontage and encouraging shared solutions

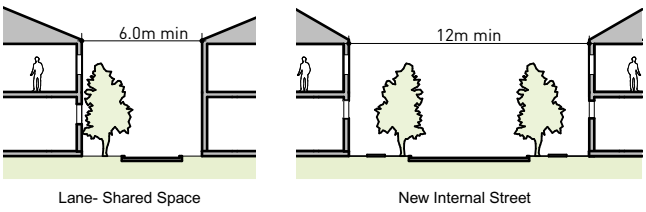


Figure 2-28 Minimum widths for shared lanes and internal streets

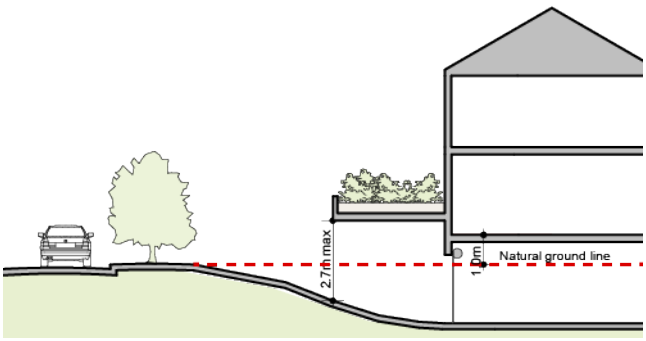


Figure 2-25 Reduce visual impact of basement entries by reducing scale of opening

Design guidance

INTERNAL STREETS

1. Create a hierarchy of streets and lanes.
    - Lanes: shared or pedestrian surfaces with a width of common area including landscape - minimum 6m wide
    - Streets: width of common area including landscape - minimum 12m.
2. Streets should not have dead ends - they connect to other streets or lanes. They have a footpath on at least one side, include tree planting at regular intervals and have a carriageway of at least 5.5m.
3. Lanes are shared zones or pedestrian only areas - they should have a maximum dead end of 40m for a sense of community and safety. All parts of the lane are to be visible from a street
4. Locate access point to prevent headlight glare into habitable rooms.
5. Provide adequate separations distances between vehicle entries and street intersections.
6. For safety purposes avoid areas where people can be hidden.
7. Allow turning circles for services vehicles.
8. Provide clear sight lines at pedestrian and vehicle crossings.
9. Where appropriate, use traffic calming devices such as changes in paving material or textures.
10. Separate and differentiate pedestrian and vehicle access. Design solutions may include:
    - Changes in surface materials;
    - Changes of level; and
    - Landscaped barriers.
11. Set back the garages behind the predominant building line to reduce their visibility from the street.
12. Terminate vistas with trees, vegetation, open space or the window of a dwelling, rather than garages or parking.
13. Use trees to provide structure and rhythm to the internal streets and landscaping to soften the edges.
14. Use trees to provide shade to the road pavement and footpath to reducing glare and heat in parked cars.
15. In smaller developments, limit street widths to single carriage width with passing points.
16. Separate pedestrian and vehicle circulation for user safety.
17. Surface treatments should favour pedestrians. In low traffic areas there is no need for a separate footpath.
18. Integrate surface material with landscape design.
19. Use different surface treatments to mark entrances. Textured surfaces enhance the pavement while serving as a traffic calming device.

BASEMENT ENTRIES

20. Locate car park entries behind the building line.
21. Integrate basement entries with the building's overall façade. Design solutions may include:
    - Choose materials and colour palette to minimise visibility from the street;
    - Adjust floor levels over garages to minimise the size of the void and recess in the facade;
    - Choose security doors or gates at entries which minimise voids in the façade; and
    - Where doors are not provided, ensure the visible interior reflects the façade design and the building services, pipes and ducts are concealed.
22. Reduce the width of the garage door to a single vehicle where possible.
23. Where possible, locate the driveway entry to one side at the lowest point on the site to reduce visual prominence.

2G Orientation and Siting

Related Design Quality Principles:
Design Principle 1. Context and Neighbourhood Character
Design Principle 2. Built Form and Scale
Design Principle 7. Safety

A site analysis of each site is an important part of the design process, ensuring appropriate orientation of the building. The site analysis will identify features of the site and their relationship to the surrounding context such as vegetation, topography and the location of buildings and adjoining land uses.

Orientation refers to the position of a building and its internal spaces in relation to the site, the street, the subdivision and neighbouring buildings, vistas and weather factors such as sun and wind. Building orientation influences the urban form of the street and building address. Building orientation directly affects residential amenity including solar access and influences other matters including visual and acoustic privacy for the development and neighbouring sites.

Designing the site layout to maximise northern orientation is an important consideration, but it must be balanced with:

- Responding to desired streetscape character;
- Capturing views and existing landform features;
- Promoting amenity for the proposed development and neighbouring properties;
- Providing for the enjoyment of significant views;
- Retaining trees and locating open spaces;
- Responding to the topography;
- Responding to noise; and
- Responding to sun and shadow.

The topography and existing land form of the site are important to the existing character of an area. The dwelling design, layout and subdivision pattern should respond to such features. Where the site has a sloped topography, dwelling design is often characterised by a split level approach where floor levels are stepped to follow the topography of the land.

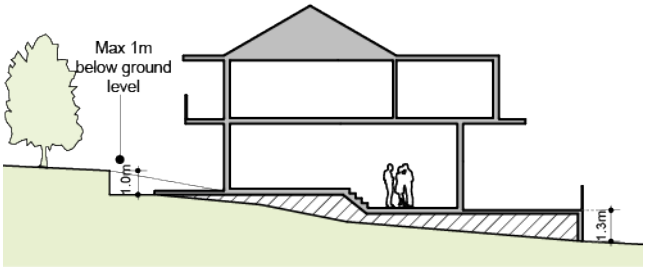


Figure 2-29 Reduce visual impact of basement entries by reducing the scale of the opening

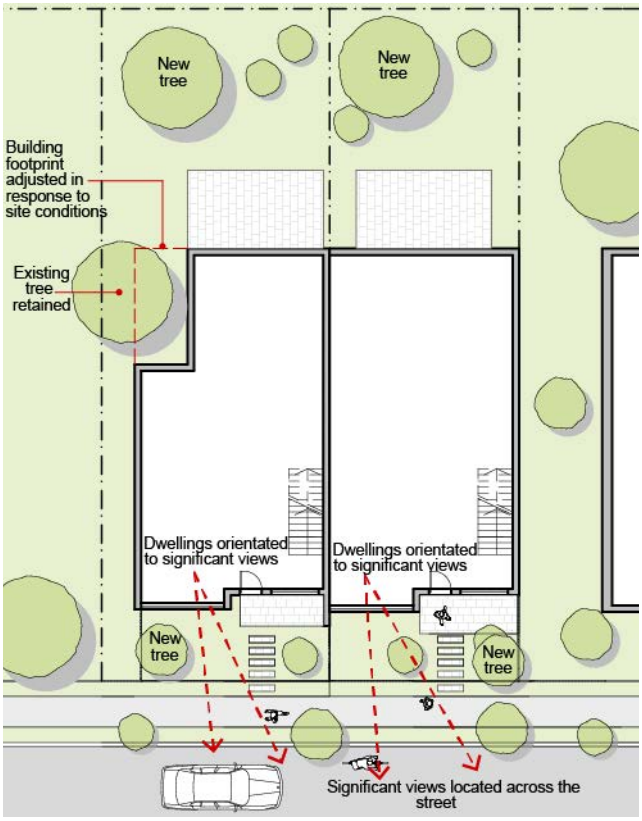


Figure 2-30 Reduce visual impact of basement entries by reducing the scale of the opening

Figure 2-31 Reduce visual impact of basement entries by reducing the scale of the opening

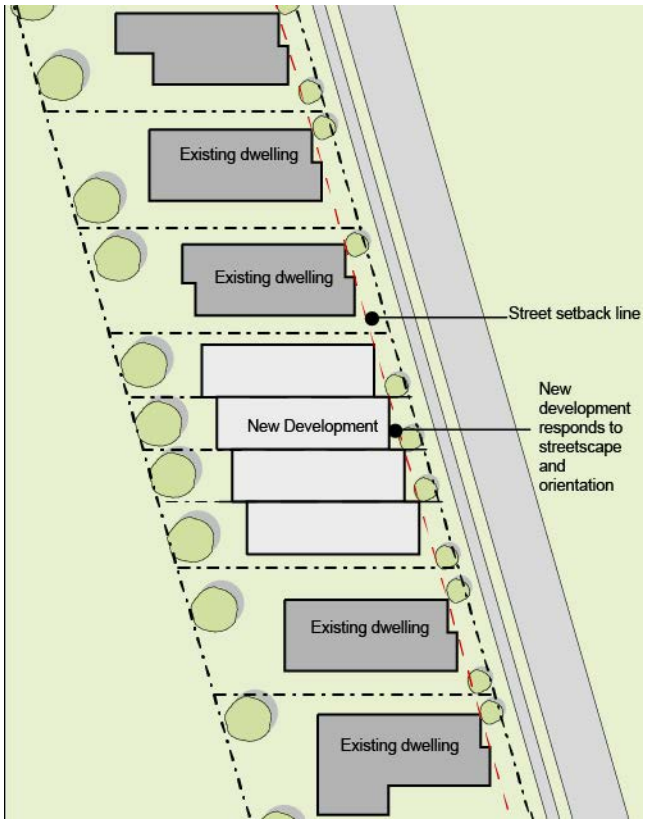


Figure 2-32 Built form responds to and compliments surrounding streetscape and setbacks.

Design guidance

1. Ensure buildings along the street frontage define the street by facing it and provide direct access from the street.
2. For developments with multiple buildings, where the street frontage is to the east or west, orient rear buildings to the north.
3. Orient dwellings to the street with the front door, house number and letter box clearly visible.
4. Where the street frontage is to the north, locate a living space fronting the street with a verandah for private open space. An additional private open space may be needed with a different orientation.
5. Orientate buildings to maximise solar access and daylight access to living rooms.
6. Ensure building separation does not impact on the solar access of neighbouring properties.
7. To avoid overshadowing to the south or properties downhill increase the upper level setback of the proposed development.
8. Step buildings to follow the fall of the land, avoiding large areas of cut and fill so that ground floor level can be close to existing ground level.
9. Utilise sloping sites to accommodate garaging under the dwelling footprint.
10. When providing internal streets, minimise cut and fill by following the existing ground levels.
11. To minimise overshadowing and privacy impacts at the rear of deep sites, it is optimal to orientate buildings at 90 degrees to their boundaries with neighbouring properties.
12. On sloping sites minimise protrusion of car parking above ground levels by using split levels to step underground car parking.

2H Building Separation

Related Design Quality Principles
Design Principle 2. Built Form and Scale
Design Principle 5. Landscape

Building separation is the distance measured between buildings or building envelopes. Separation between buildings contributes to the urban form of an area, the amenity within dwellings and provision of open space areas.

Amenity is improved by establishing minimum distances between dwellings within the site, between dwellings and non-residential uses and with boundaries to neighbours. Building separation ensures communal and private open spaces can have useable space with landscaping, adequate sunlight and privacy. Within dwellings, building separation optimises visual and acoustic privacy, outlook, natural ventilation and daylight access.

Building separation should consider communal space, visual and acoustic privacy and desired character.

The spaces between buildings are an important consideration as they:

- Ensure new development is scaled to support the desired future character with appropriate massing and spaces between buildings;
- Help provide residential amenity including visual and acoustic privacy, natural ventilation, sunlight, daylight access and outlook;
- Provide suitable areas for private open spaces, deep soil zones and landscaping; and
- Help definie the spatial character of the street.

The building envelope determines the spatial relationship of buildings to each other and to the site. It is important to provide space between buildings on the site and buildings on adjoining sites.

Strategic planning and design note:

- Use side setbacks to define breaks in the street wall and spatial character of the street; and
- With deeper blocks use a secondary side setback to increase solar access, landscape and visual privacy at the rear of blocks.

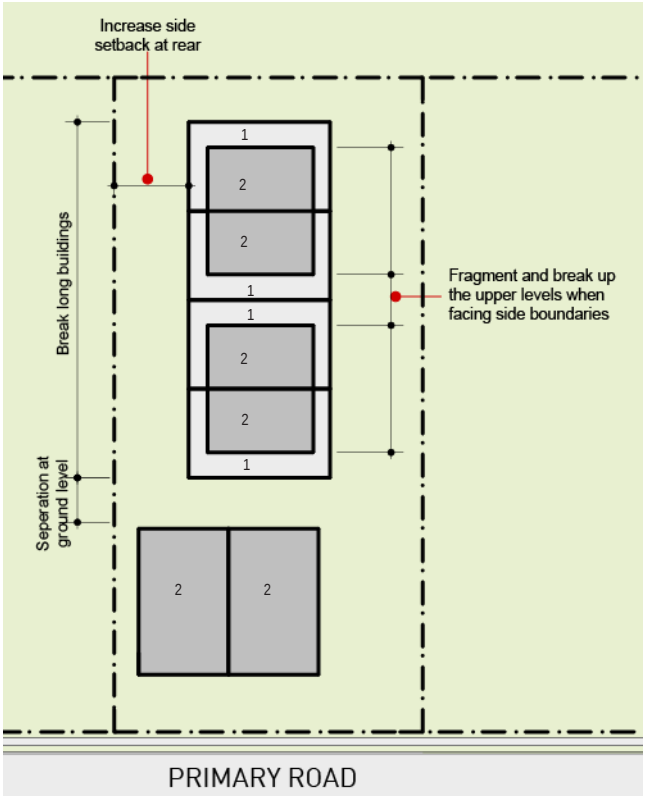


Figure 2-33 Increase side setbacks of rear buildings to help reduce overlooking and overshadowing. Provide breaks in upper levels to break up the massing and scale of the development.

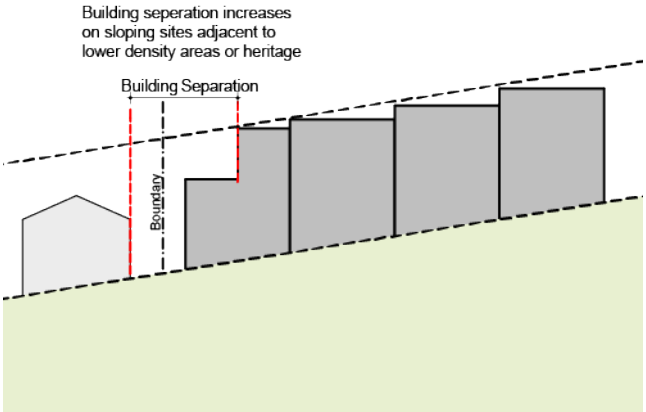


Figure 2-34 Increase seperation on sloping sites where there are surrounding lower density properties

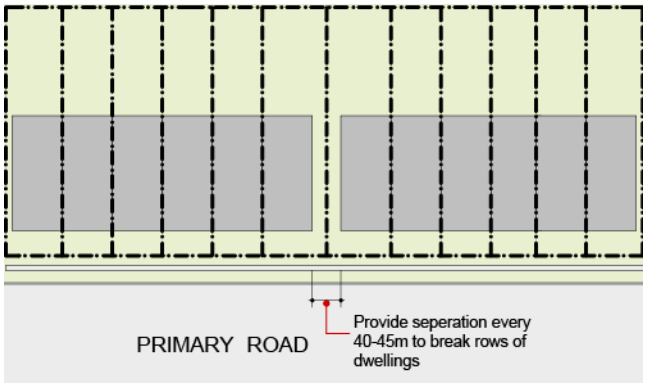


Figure 2-35 Reduce visual impact of long buildings by providing regular breaks in the built form

Figure 2-36 Breaks in the street wall provide views through to landscape and development beyond

Figure 2-37 Gaps between buildings can create view corridors and pleasant outdoor rooms

Design guidance

1. The space between buildings determines the character of the urban form.
2. Design and test building separation controls in plan and section to achieve solar access and privacy.
3. Building separation controls for sunlight and daylight access to buildings and open spaces.
4. Increase building separation proportionally to building height to achieve amenity and privacy for building occupants and a desirable urban form.
5. Building separation should be proportional to the scale of the buildings and the desired character of the built form.
6. Step buildings to achieve separation at different heights and create intimate spaces at ground level.
7. Provide breaks in rows of attached dwellings to reduce visual bulk.
8. Ensure the gaps between spaces are functional and side setbacks are wide enough to accommodate services, equipment and space to walk.
9. The space between buildings may need to increase on steeply sloping sites.
10. Appropriate minimum separation distances for buildings are:

1-2 storeys

- 2-3m between walls with no windows or windows to bathrooms, kitchens laundries and the like;
- 6m where privacy and solar access can be achieved; and
- 9m between windows of habitable rooms and/or balconies.

3-4 storeys:

- 3m between walls with no windows or windows to bathrooms, kitchens, laundries and the like; and
- 12m between windows of habitable rooms and/or balconies.

Amenity

2I Solar and Daylight Access

Related Design Quality Principles
Design Principle 4. Sustainability
Design Principle 6. Amenity

Solar and daylight access is important for dwellings, reducing reliance on artificial lighting and heating, improving energy efficiency and creating residential amenity through pleasant conditions to live and work.

Solar access occurs when rooms or private open spaces in a dwelling receive direct sunlight without obstruction from other buildings and natural features, not including trees. Sunlight is direct beam radiation from the sun. Daylight consists of sunlight and diffused light from the sky. Daylight and solar access change with the time of day, season and weather conditions.

Access to sunlight for habitable rooms and private open space is measured during winter solstice (June 21st) as this is when the sun is lowest in the sky, representing the 'worst case' scenario for solar access.

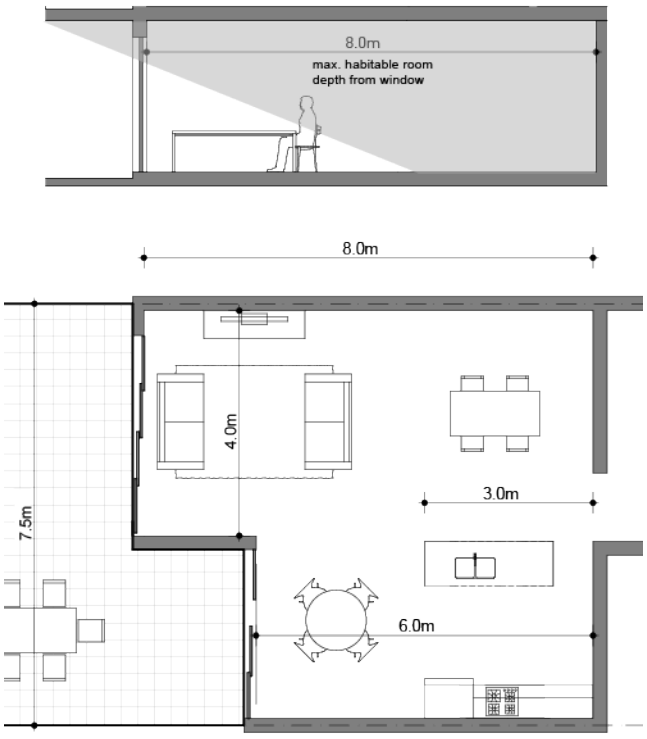


Figure 2-39 The depth of a single aspect dwelling relative to the ceiling height directly influences the quality of natural ventilation and daylight access. The maximum depth of open plan layouts combining living, dining and kitchen spaces is 8 metres

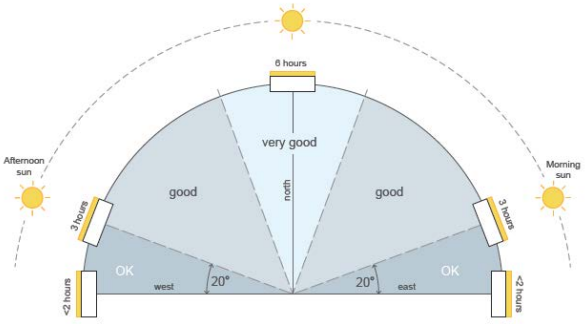


Figure 2-38 The hours of sunlight that can be expected in mid winter are directly related to the orientation of the façade. This diagram shows the optimal orientation for habitable rooms and balconies
Note: An additional design and assessment tool is provided at Appendix 5 to ascertain the level of sunlight access to dwellings

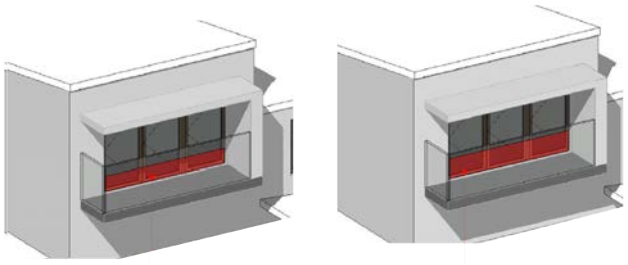


Figure 2-40 For solar access to be included, at least 1m ² of sunlight must remain in a window for a 15min period.

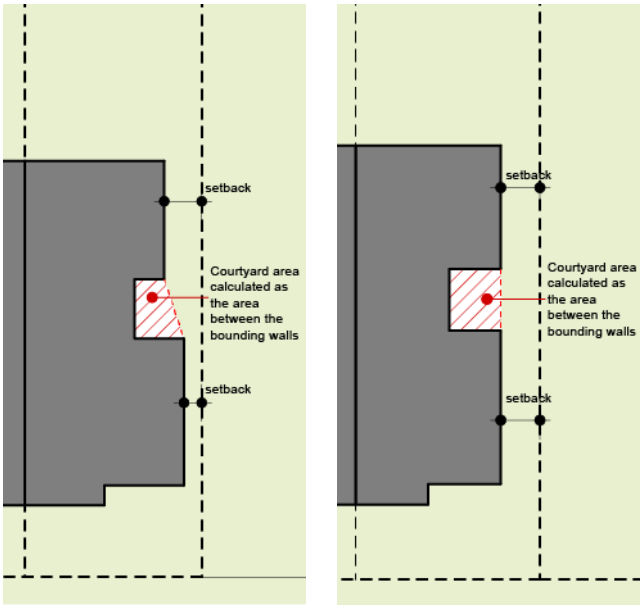


Figure 2-41 Courtyard used to increase daylight access are calculated by the areas between bounding walls.

Design guidance

1. Maximise northern aspect and minimise the number of single aspect south facing dwellings.

2. Single aspect, single storey dwellings should have a northerly or easterly aspect.

3. Locate living areas to the north and service areas to the south and west of dwellings.

4. Dwellings which have a street to the north side are best designed with dual living spaces - one fronting the street and the other opening to the rear garden.

5. To optimise daylight to habitable rooms and private open spaces, design features may include:
   - Dual aspect dwellings;
   - Shallow dwelling layouts;
   - Two storey and mezzanine level dwellings; and
   - Bay windows.

6. Locate windows and skylights in habitable rooms including kitchens to provide sufficient daylight so that artificial lighting is not needed during the day - typically around 200lux.

7. Achieving the design criteria may not be possible on some sites. For example:
   - Where greater residential amenity can be achieved along a busy road or rail line by orientating the living rooms away from the noise source;
   - On south facing sloping sites; and
   - Where significant views are oriented away from the desired aspect for direct sunlight.

8. Design drawings need to demonstrate how site constraints and orientation preclude meeting the design criteria and show how the development meets the objective.

9. Shallow room depths maximise daylight access

10. Courtyards can provide an excellent source of daylight and solar access deep into a dwelling. They can facilitate deep floor plates.

11. Use courtyards, skylights and high level windows (with sills of 1,500mm or greater) only as a secondary light source in habitable rooms.

12. In areas of higher density it is not reasonable to expect that windows close to the side boundary will retain solar access.

13. The design should anticipate future complying development on an adjoining site.

14. In calculating solar access, it is best to use 3-dimensional views as these show the influence of vertical and horizontal shading elements.

15. Where courtyards are used:
    - Use is restricted to kitchens, bathrooms and service areas;
    - Building services are concealed with appropriate detailing and materials to visible walls;
    - Courtyards are fully open to the sky;
    - Access for cleaning and maintenance is provided to the light well from a communal area;
    - Ensure a minimum dimension of one third of the perimeter wall heights, and an area of 3m²; and
    - Ensure acoustic privacy, fire safety and minimum privacy separations are achieved (see 2P Visual Privacy).

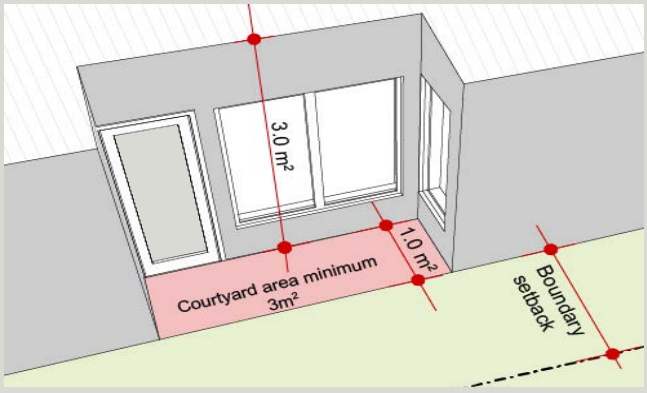


Figure 2-42 Calculating minimum courtyard areas and dimensions.

2J Natural Ventilation

Related Design Quality Principles
Design Principle 4. Sustainability
Design Principle 6. Amenity

Natural ventilation is the movement of sufficient volumes of fresh air through a dwelling to create a comfortable indoor environment. Sustainable design practice incorporates natural ventilation by responding to the local climate to reduce the need for mechanical ventilation and air conditioning. To achieve adequate natural ventilation, dwelling design must address the orientation of the building, the configuration of dwellings and the external building envelope.

Rather than relying on purely wind driven air, natural cross ventilation is achieved when dwellings have more than one aspect with direct exposure to the prevailing winds, or windows located in significantly different pressure regions.

Dwelling layout and building depth determine the ability of a dwelling to be naturally ventilated. Generally, as a building gets deeper, effective airflow reduces.

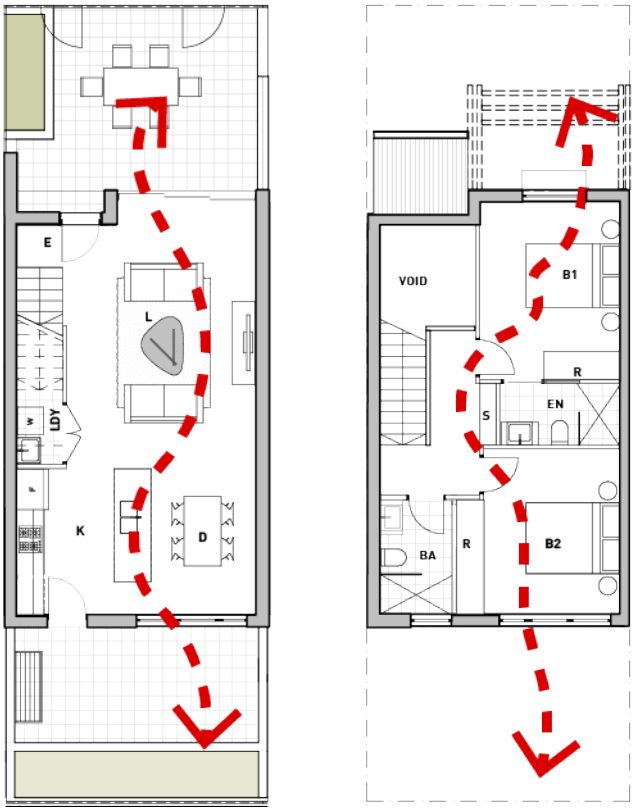


Figure 2-44 Cross ventilated dwelling

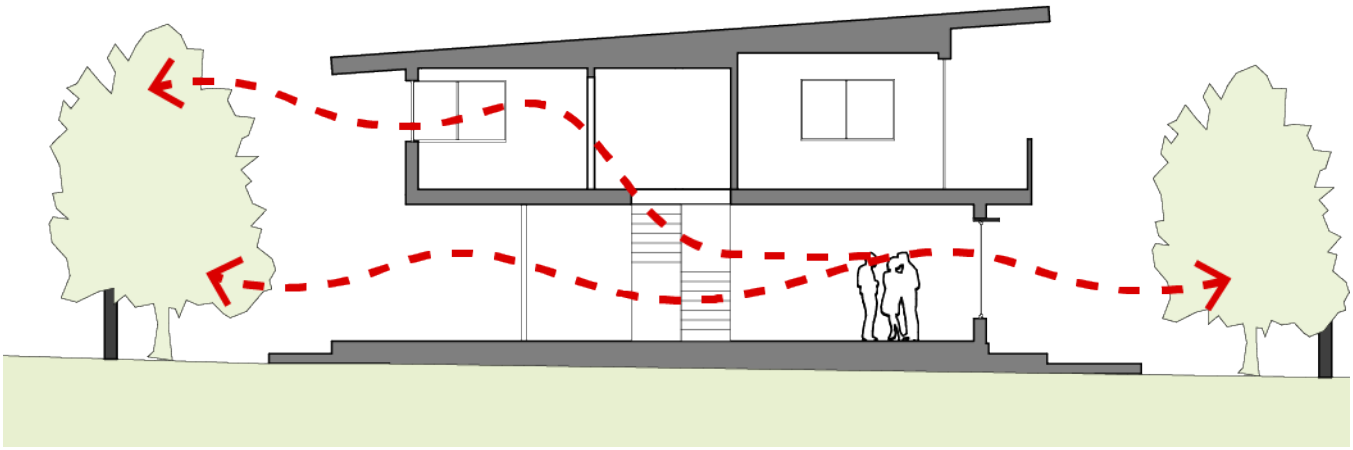


Figure 2-43 Effective cross ventilation is achieved when the inlet and outlet have approximately the same area, allowing air to be drawn through the dwelling using opposite air pressures on each side of the building

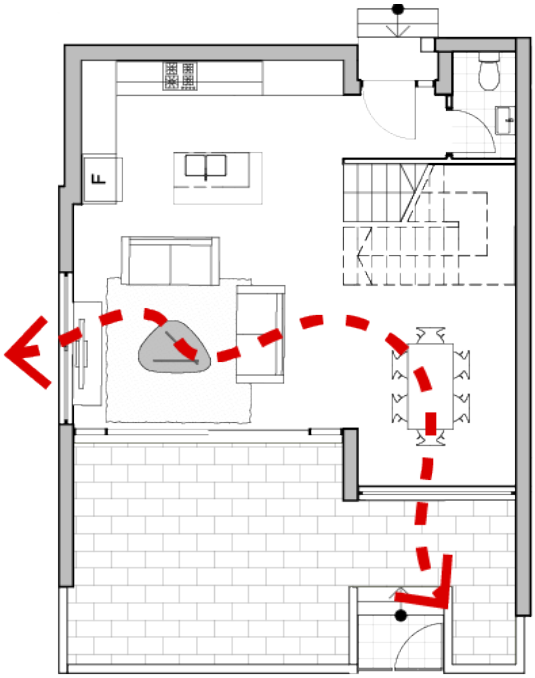


Figure 2-45 Corner cross ventilated dwelling

Figure 2-46 Operable louvres allow residents to regulate natural ventilation

Design guidance

1. The building's orientation maximises the capture and use of prevailing breezes for natural ventilation of habitable rooms.

2. For deeper buildings, increased ceiling heights assist with cross ventilation.

3. The area of unobstructed window openings should be equal to at least 5% of the floor area served.

4. Doors and openable windows maximise natural ventilation opportunities by using the following design solutions:
   - adjustable windows with large effective openable areas;
   - a variety of window types, such as awnings and louvres, provide safety and flexibility; and
   - windows which the occupants can reconfigure to funnel breezes into the dwelling, such as vertical louvres, casement windows and externally opening doors.

5. To maximise ventilation and airflow, limit dwelling depths.

6. Natural ventilation to single aspect dwellings is achieved with the following design solutions:
   - stack effect ventilation / solar chimneys or similar naturally ventilate internal building areas or rooms such as bathrooms and laundries;
   - courtyards or building indentations have a width to depth ratio of 2:1 or 3:1 to ensure effective air circulation and avoid trapped smells; and
   - Shallow depth dwelling (less than 5m).

7. The building should include dual aspect dwellings, cross-through dwellings, corner dwellings and limited dwelling depths.

8. In cross-through dwellings, external window and door opening sizes/areas on one side of an dwelling (inlet side) need to be approximately equal to the external window and door opening sizes/areas on the other side of the dwelling (outlet side) (see Figure 4B.4).

9. Ceiling fans can help create air movement.

2K Ceiling Heights

Related Design Quality Principle
Design Principle 6. Amenity

Ceiling height is measured internally from finished floor level to finished ceiling level. The height of a ceiling affects the amenity of a dwelling and the perception of space. Well designed and appropriately defined ceilings can create spatial interest and hierarchy in dwellings.

Ceiling height is directly linked to receiving sufficient natural ventilation and daylight access to habitable rooms. The ground and first floor levels of mixed use dwelling buildings should have increased ceiling heights to ensure their long term adaptability for other uses.

Although the BCA requires a minimum ceiling height of 2.4m, solar access, day lighting, ventilation and spatial quality is improved by higher ceiling heights.

Defining Ceiling Height

Ceiling height is measured from the finished floor surface to the underside of the finished ceiling.

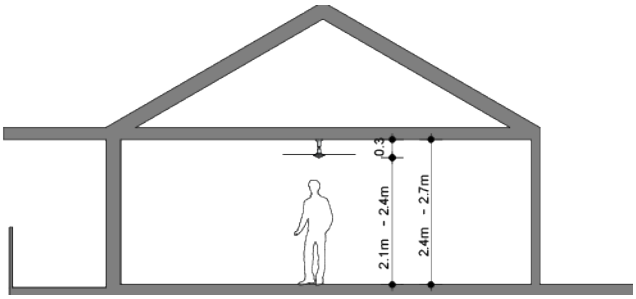


Figure 2-47 Operable louvres allow residents to regulate natural ventilation

Figure 2-49 Raked ceilings add visual and spatial interest and make a room feel larger.

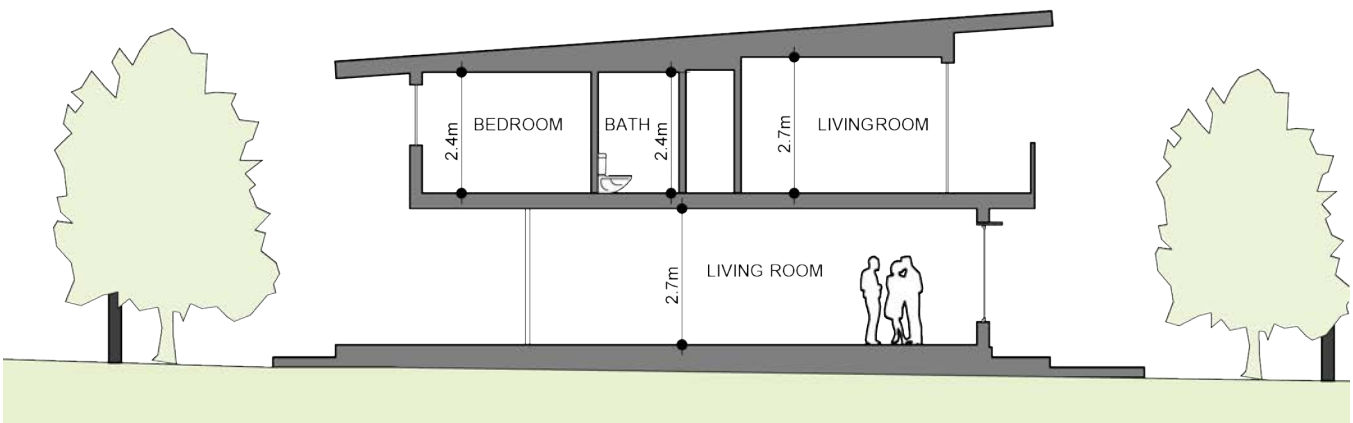


Figure 2-48 Operable louvres allow residents to regulate natural ventilation

Figure 2-50 Mezzanine spaces can overlook double height spaces. The change in ceiling height and define different functions.

Figure 2-51 Skylights and vaulted ceilings can add space and enhance daylight

Design guidance

1. To avoid injury with the use of ceiling fans, a ceiling height of 2.7m is recommended in living rooms. Where ceiling fans are used in bedrooms and the fan is located over the bed, the height can be reduced to 2.4m.
2. Ceiling heights allow for sufficient daylight penetration into the room. Where room depth exceeds ceiling height by 2.5 x, increases in ceiling height and window height can increase daylight access.
3. Where wet areas are located over living areas, floor to floor heights should be increased (allowing for plumbing) to ensure ceiling heights can be achieved.
4. Ceiling heights should be proportional to room size. Smaller rooms can feel more spacious with higher ceilings.
5. In attic spaces or rooms with sloping rooms, full ceiling heights should be achieved for at least 75% of the room.
6. Bulkheads may be located over kitchens, partially reduces ceiling height in combined living areas with a minimum ceiling height of 2.4m.
7. Bulkheads in other rooms should be avoided. Consider locating wardrobes, bookshelves and other fixed storage to conceal plumbing and ventilation.
8. Where bulkheads are unavoidable, they should not occupy more than 10% of the floor area, nor reduce the ceiling height by more than 0.3m. They should be designed to relate to other elements in the room.
9. Foor to floor heights should allow for carpet and ceiling finishes. Typical floor finish allowances include:
    - Carpet : 10 - 15mm;
    - Timber: 15 - 50mm;
    - Tiles: 10 - 30mm; and
    - Linoleum: 5mm.

2L Dwelling Size and Layout

Related Design Quality Principle
Design Principle 6. Amenity

The layout of a dwelling establishes the way rooms of different functions are arranged and located as well as the size of the rooms, the circulation between rooms and the degree of privacy in each room.

Room shapes and window designs can deliver daylight and sunlight, natural ventilation, and acoustic and visual privacy. The dwelling layout should provide private open space and conveniently located storage.

Defining Floor Area:

Floor area is the area of the room measured within the finished surfaces of the walls, but excluding any area occupied by wardrobes, kitchens or fixed storage, and any area where the ceiling height is less than 1.5m. Minimum dimensions are measured at the smallest part of the room.

Figure 2-52 This living area has a combined kitchen-dining area which opens directly on to the balcony

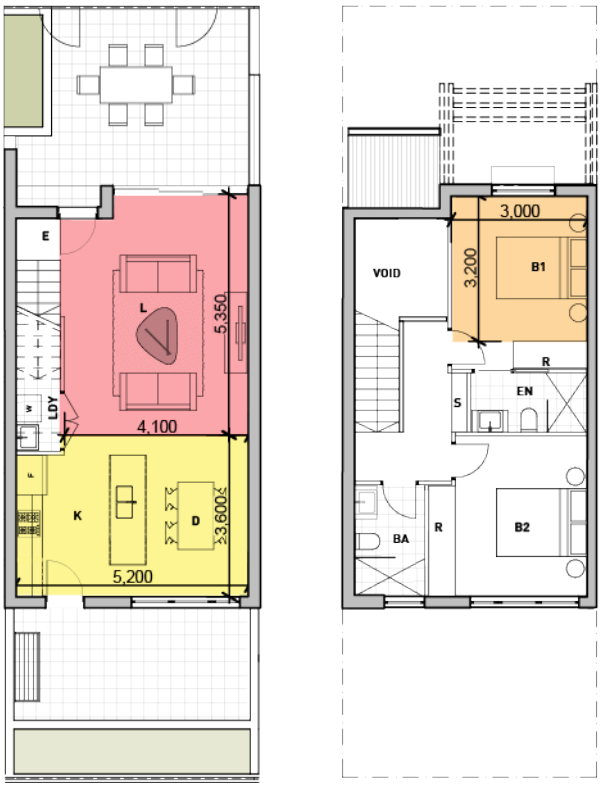


Figure 2-53 Calculation of minimum room areas and dimension.

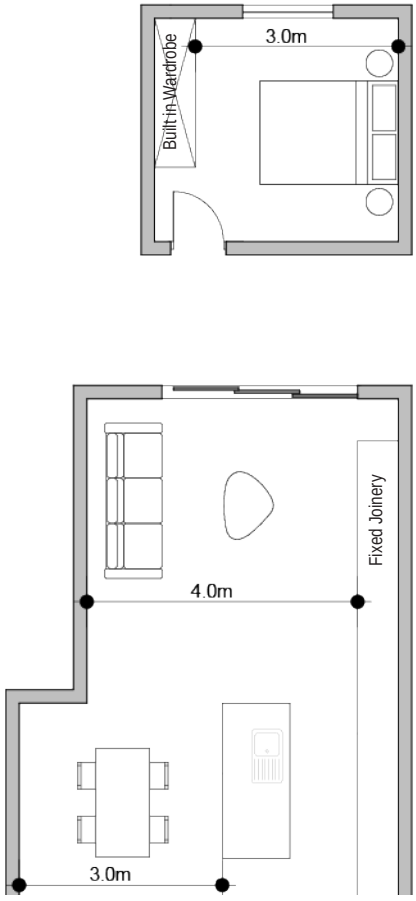


Figure 2-54 The minimum room dimension is the smallest dimension measured in any direction.

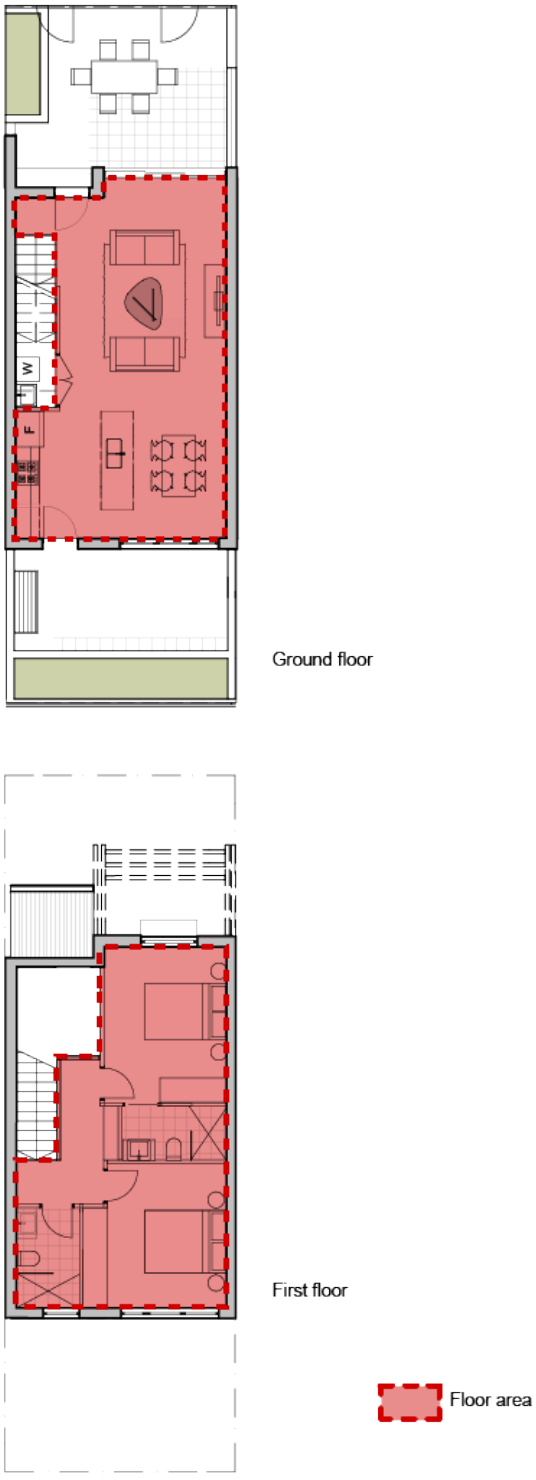


Figure 2-55 Area to include in floor area calculations

Design guidance

1. The dwelling must have sufficient space for the functions of contemporay living. Layouts which have long corridors and circulation spaces may need a larger overall area so other parts of the dwelling are not compromised.

2. Dwelling sizes should respond to dwelling types. In areas of lower density, dwellings are expected to have a larger floor area.

3. A window should be visible from any point in the main part of a habitable room, providing a vista and maximising daylight access.

4. Where the minimum dimensions are not met, dwellings must be shown to be well designed, usable and functional with realistically scaled furniture layouts and circulation areas. These circumstances are assessed on their merits.

5. All living areas and bedrooms should be located on the external perimeter of the building.

6. Where possible:

   - Bathrooms and laundries should have an external openable window; and
   - Main living spaces should be oriented toward the primary outlook and aspect and away from noise sources.

7. Kitchens should be located in areas of good natural daylight.

8. Designing for older persons or those with a disability will require increased circulation spaces around furniture and increased room sizes.

9. Provide space for study or work. This could be an alcove or a flexible use room.

Note: Refer to 2I Solar and Daylight Access and 2S Universal Design for further guidance closely related to room configuration.

2M Private Open Space

Related Design Quality Principles
Design Principle 6. Amenity

Private open spaces are outdoor areas, including balconies, courtyards and terraces for private use, which enhance the amenity and indoor/outdoor lifestyle of residents. Outdoor spaces benefiting from New South Wales' temperate climate provide areas for external activities and extended indoor living spaces.

Balconies that are safe and appropriately designed can provide space for children to play outdoors, and the opportunity for pet ownership.

Private open spaces are also important architectural features, contributing fences, balustrades and screens to the form and articulation of the building.

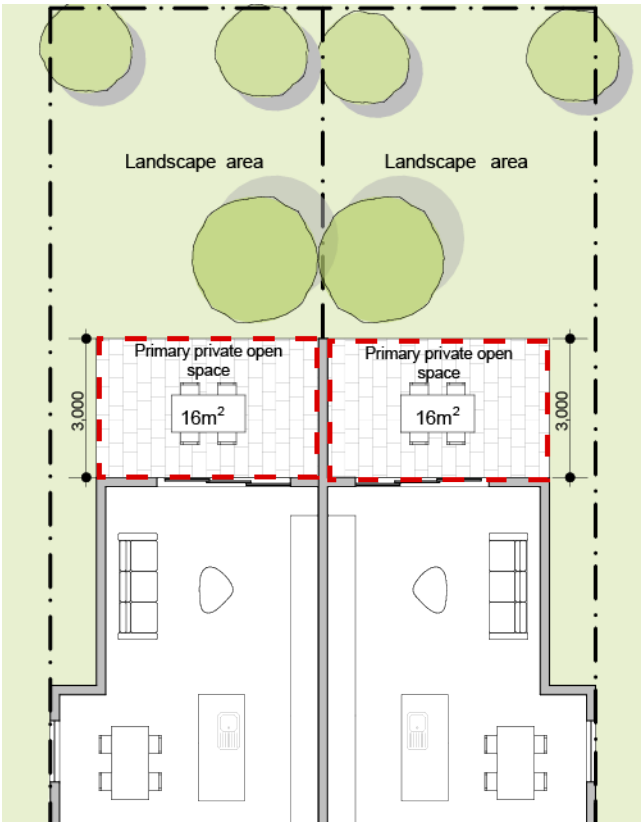


Figure 2-56 This combined kitchen-dining-living room a opens directly on to the balcony. Private open space must meet the required minimum dimensions and must be paved.

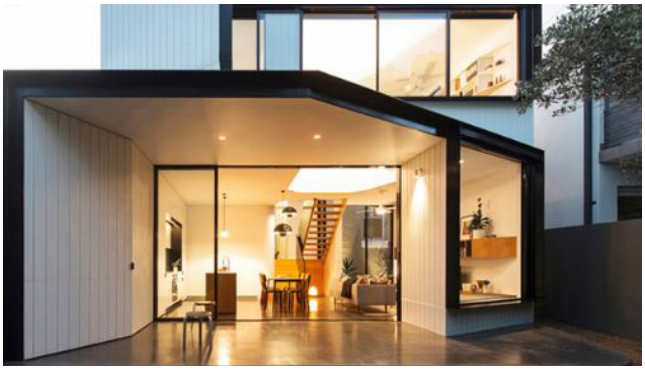


Figure 2-59 Space partially sheltered from weather and directly accessible from living rooms.

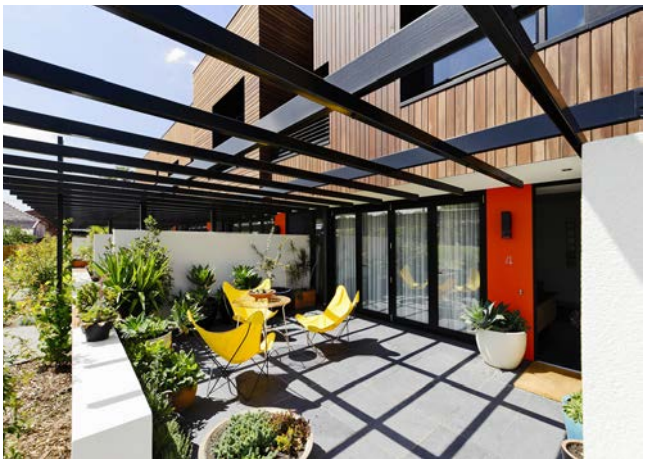


Figure 2-58 North facing space - room for plants and sitting area.

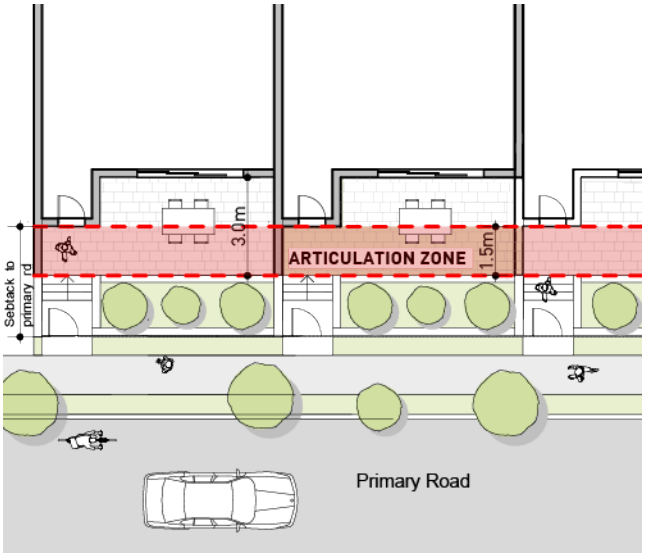


Figure 2-57 Private open space facing the street sits within the articulation zone or behind the front building line. It is separated from the street by landscaping and may include a low fences.

Design guidance

1. The size of private open space should be proportional to the size of the dwelling and allow all members of the household to sit around a table.
2. Primary open space and balconies should be located adjacent to the living room, dining room or kitchen to extend the living space.
3. Private open spaces and balconies should face predominantly north, east or west.
4. Private open space should not be located in the primary road setback where it has a negative impact on the streetscape (Refer to 2E Public Domain Interface). Private open space which faces the street should be within the articulation zone. Changes of level and landscaping can provide privacy. High fences are not permitted.
5. A large proportion of the primary private open space should be covered to provide shade and protection from rain.
6. Primary open space and balconies should be orientated with the longer side facing outwards or be open to the sky to optimise daylight access into adjacent rooms.
7. Solid, partly solid or transparent fences and balustrades allow views and passive surveillance of the street and communal open space while maintaining privacy.
8. Balconies should be integrated into the building design, with the design of soffits considered.
9. When located close to dwellings, increased communal open space can compensate for private open space being small.
10. Operable screens, shutters, hoods and pergolas can be used to control sunlight and wind.
11. Balustrades must be set back from the building or balcony edge if overlooking or safety are issues.
12. Downpipes and balcony drainage are integrated into the overall façade and building design.
13. Air-conditioning units and other equipment should be located on roofs, in basements, or fully integrated into the building design so as to not detract from Private open space.
14. Storage spaces should be provided to serve ground floor private open space.
15. Ceilings within a dwelling below a terraces or balcony should be insulated to avoid heat loss.
16. Water and gas outlets should be provided for primary balconies and private open space.

Figure 2-60 Private open space directly accessible from living rooms.

2N Storage

Related Design Quality Principles
Design Principle 6. Amenity

Adequate storage is an important component of dwelling design. Calculated by volume, rather than floor area, storage should be provided proportionally to the size of the dwelling.

Storage is required for small and large items including those used regularly. This typically includes: coat cupboards near entrances, linen cupboards near sleeping areas, spaces to store camping gear, suitcases and sporting equipment.

Providing built in storage increases the functionality of the dwelling and reduces the need for additional furnishings. Otherwise uninhabitable spaces such as under stairs and should be used for storage.

Figure 2-63 Storage space under stairs

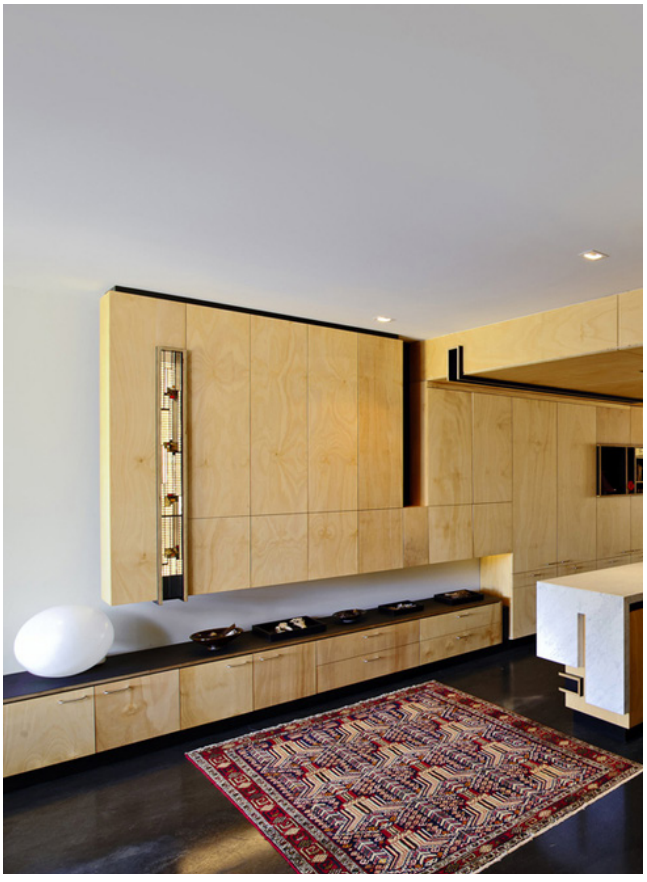


Figure 2-61 Storage integrated into living room design

Figure 2-62 Wardrobe space in bedrooms

Figure 2-64 Fold down stairs to attic storage

Figure 2-65 Useful size linen storage

Design guidance

1. Storage should be accessible from either circulation or living areas.
2. Storage on balconies, courtyards and rear gardens is additional to the minimum private open space. It should be integrated into the design of the building, weather proof and screened from view from the street.
3. Use space under stairs for storage
4. Any storage which is not located in a dwelling must be secure and clearly allocated to specific dwellings.
5. Storage needs to be provided for larger and less frequently accessed items.
6. Storage space in garages or basement car parks should be provided at the rear or side of car spaces or in cages so that allocated car parking remains accessible.
7. If communal storage rooms are provided, they should be accessible from common circulation areas of the building.
8. Storage not located in a dwelling must be integrated into the overall building design and is not visible from the public domain.
9. Storage is designed along with the layout to accommodate different purposes such as:
    - Coat cupboards near the entry;
    - Laundry and linen cupboards near the sleeping areas;
    - Larger spaces for storing bulky items such as suitcases or sporty equipment; and
    - Spaces for dirty items such as garden equipment.

20 Car and Bicycle Parking

Related Design Quality Principles
Design Principle 4. Sustainability
Design Principle 6. Amenity
Design Principle 7. Safety

In order to provide a diverse and attractive streetscape, the building façade should be dominant with garages as a recessive element on the street.

Car parking and garaging is particularly challenging in medium density housing as it often requires a large proportion of the building footprint.

Integrating car parking within buildings has a significant impact on site planning, landscaping and building design.

On site parking may be located:

- Underground in basement parking;
- Above ground fronting a primary road;
- Above ground fronting a rear lane; and
- Above ground fronting to a private street.

Parking requirements should be determined in relation to the availability, frequency and convenience of public transport or in regional areas proximity to a centre.

Rates for car parking are nominated by council to ensure that the rates reflect the demand for parking and availabilty of public tranport in an area. Local transport strategies may also include policies for reducing car use to encoourage public transport.

In larger developments provision of parking for alternative forms of transport such as car share vehicles, and secure and covered spaces for motorcycles and bicycles could be considered.

Figure 2-68 Bicycle parking for residents should be secure and easy to access from common areas

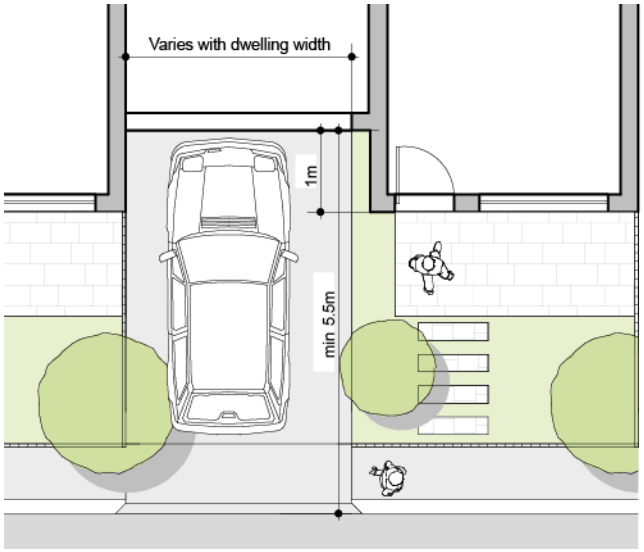


Figure 2-66 Bicycle parking for residents should be secure and easy to access from common areas

Figure 2-67 Garages are ressive elements in the streetscape

Design guidance

1. For small lot housing car parking is best located away from the primary street frontage to reduce the visual impact. Options include:
    - access from a rear lane
    - secondary frontage
    - basement parking (where feasible)
2. To facilitate passive surveillance of the lane, parking via the rear lane can be combined with detached studios.
3. To avoid parking dominating the streetscape, garages and carports should be located behind the main building façade. Windows and other elements of the dwelling design should dominate the streetscape.
4. Hard stand areas for parking should not be provided forward of the building line.
5. Driveways should be located and spaced to maximise on street parking. Typically one on-street parking space should be available in front of each dwelling.
6. The public domain can be designed to attractively accommodate parking by including use of trees and landscaping. Angle parking can increase on street car parking provision. This should be considered in areas undergoing a transition from low to medium density housing.
7. Garaging and car parking fronting the street is difficult to accommodate on frontages less than 7m in width.
8. On frontages less than 12.5m wide, limit the garage to a single width. If two spaces are desired this could be with a tandem garage, or the secondary car could park in front of the garage door.
9. On steeply sloping sites where car parking can be located in a basement, first floor living rooms can overlook the street and remain the dominant elements. This is not a suitable solution for a whole street as it would reduce opportunities for landscape at the street frontage and street parking and public domain resulting from continuous driveway crossings.
10. Provide safe and direct access to the building entry points.
11. Parking is incorporated into the landscape design of the site by extending planting and materials into the car park space. Use low level landscaping on two to three sides to soften and screen.
12. Use light coloured paving materials or permeable paving systems. Plant shade trees between every 4-5 parking spaces to reduce increased surface temperatures from large areas of paving.
13. Control stormwater quantity and quality using bio-swales, rain gardens or on site detention tanks where appropriate.
14. Secure undercover bicycle parking should be provided. It must be easily accessible from both the public domain and common areas.
15. Where basement car parking is provided facilities within car parks, including garbage, plant and switch rooms, should be accessed without walking across car parking spaces.
16. For larger car parks, safe pedestrian access should be clearly defined. Circulation areas should have good lighting, colour, line marking and/or bollards.
17. Excavation should be minimised while through efficient car park layouts and ramp design.
18. Car parking layout should be well organised, using a logical, efficient structural grid and double loaded aisles.
19. Protrusion of car parks should not exceed 1m above ground level. Design solutions may include stepping car park levels or using split levels on sloping sites.
20. Natural ventilation must be provided to basement and sub basement car parking areas.
21. Ventilation grills or screening devices for car parking openings should be integrated into the façade and landscape design.

2P Visual Privacy

Related Design Quality Principles
Design Principle 6. Amenity

Visual privacy allows residents within a multi-dwelling development and on adjacent properties to occupy their private space without being overlooked. It must balance the need for views and outlook with the need for privacy.

Visual privacy provides site and context specific design solutions for views, outlook, ventilation and solar access. Consider context, site configuration, topography, the scale of the development and the dwelling layout.

Degrees of privacy are influenced by other factors including:

- The activities in each of the spaces where overlooking may occur;
- The times and frequency these spaces are being used;
- The expectations of occupants for privacy.

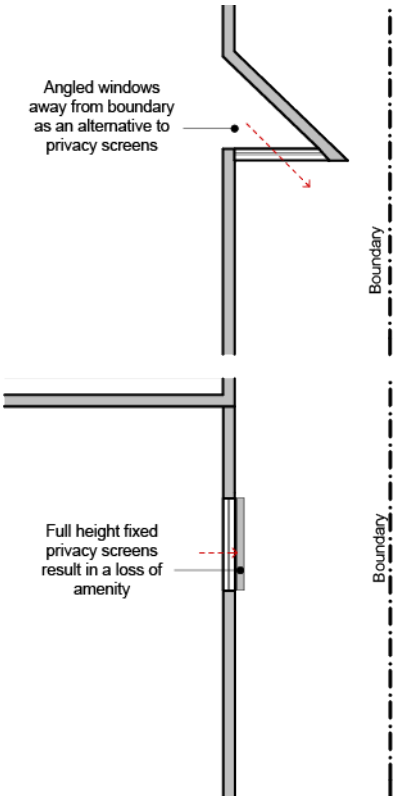


Figure 2-69 Privacy screens form part of the architectural expression

Figure 2-72 Privacy screens are integrated into the facade and provide part of the architectural expression

Figure 2-71 Wings of ears direct views away from the side boundary. They could also include bay windows

Figure 2-70 Poorly executed privacy screens. These block sunlight and daylight to windows.

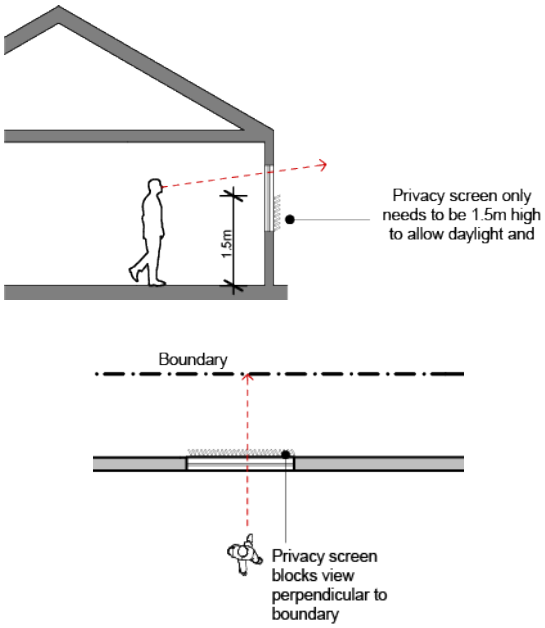


Figure 2-73 Privacy screens do not always need to cover the whole window.

Figure 2-74 Pop out windows low away from the boundary

Design guidance

1. Separation between windows and balconies is provided to ensure visual privacy is achieved. Minimum required separations from buildings to the side and rear boundaries are as follows:
   NOTE: Separation between buildings on the same site depends on the type of room.

2. Generally one step in the built form as the height increases due to building separations is desirable. Additional steps should be careful not to cause a 'ziggurat' appearance.

3. Privacy screens can be used to reduce privacy impacts. However, they should be used only where separation and orientation cannot achieve this.

   A privacy screen is a structure which provides a screen or visual barrier between a window of a habitable room or an outdoor area on a lot and an adjoining lot that:

   - has a total area of all openings that is no more than 30% of the surface area of the screen or barrier, or
   - a window, the whole of which has translucent glass and is fixed and cannot be opened.

4. New development should be located and oriented to maximise visual privacy between buildings on site and for neighbouring buildings. Design solutions include:

   - site layout and building orientation to minimise privacy impacts (see 2G Orientation and Siting); and
   - on sloping sites, dwellings on different levels have appropriate visual separations.

5. Direct lines of sight should be avoided for windows and balconies across corners.

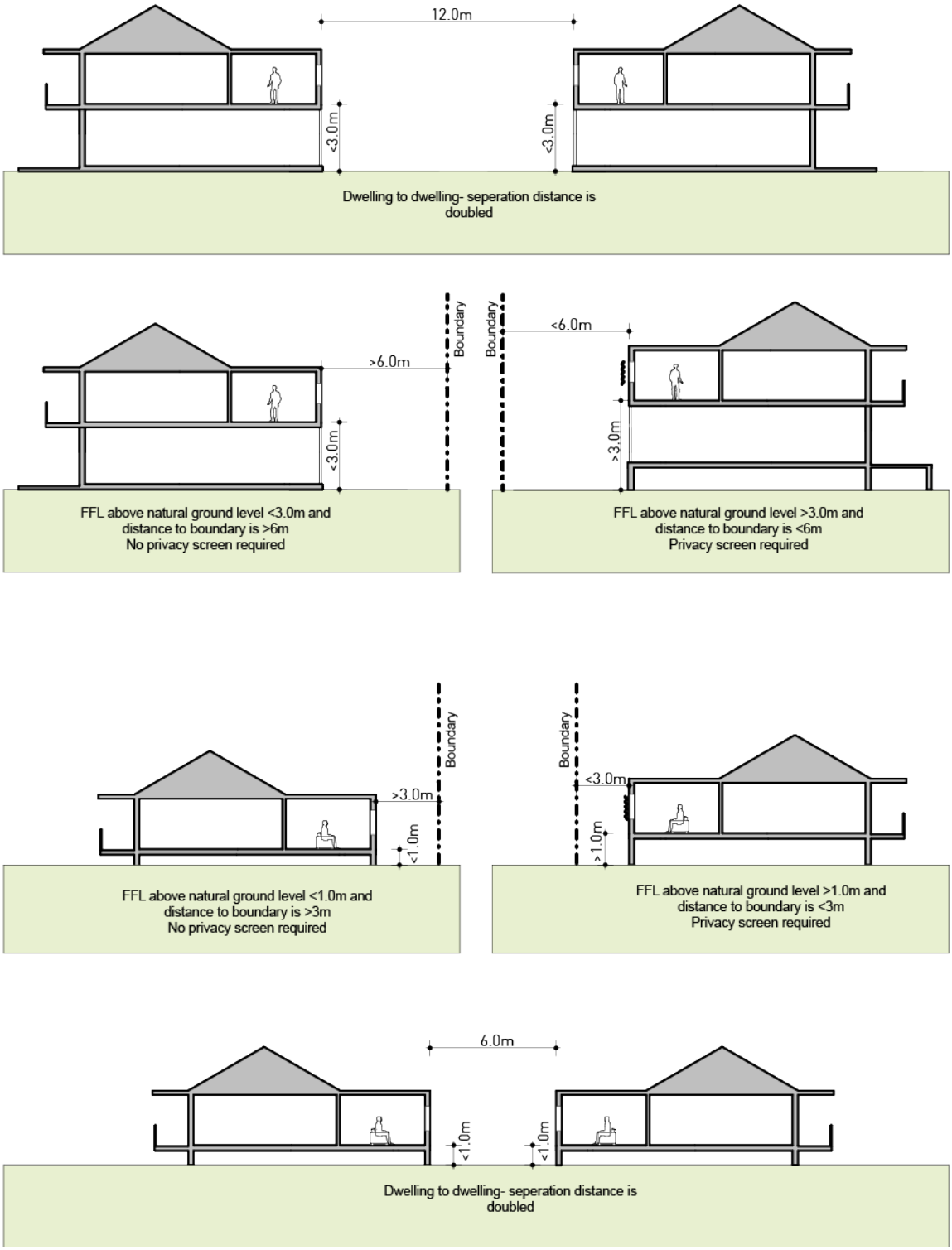


Figure 2-75 Diagrams showing different privacy interface conditions

Figure 2-76 Privacy screens can be decorative

Figure 2-77 Privacy screens can be an integral part of the articulation. Changing the pattern and direction of the screen adds visual interest and asymmetry to the facade

6. Communal open space, common areas and access paths should be separated from private open space and windows to dwellings, particularly habitable room windows. Design solutions may include:
    - setbacks;
    - solid or partially solid balustrades on balconies at lower levels;
    - fencing and/or trees and vegetation to separate spaces;
    - screening devices;
    - bay windows or pop out windows to provide privacy in one direction and an outlook in another;
    - raising dwellings/private open space above the public domain or communal open space;
    - planter boxes incorporated into walls and balustrades to increase visual separation;
    - pergolas or shading devices to limit overlooking of lower dwellings or private open space; and
    - on constrained sites where it can be demonstrated that building layout opportunities are limited, fixed louvres or screen panels to windows and/or balconies.
7. Balconies and private terraces should be located in front of living rooms to increase internal privacy as well as amenity.
8. Windows should be offset from the windows of adjacent buildings.
9. Recessed balconies and/or vertical fins should be used between adjacent balconies.
10. Living rooms more than 1.5m above ground or finished surface level should be orientated towards the public domain or internal streets where views to other habitable rooms or private open space could be impacted.
11. Privacy impacts are typically more sensitive in the rear half of the lot than a front part where reduced setbacks are common.

2Q Acoustic Privacy

Related Design Quality Principle
Design Principle 6. Amenity

Acoustic privacy involves reducing sound transmission between external and internal spaces, between dwellings and communal areas, and between dwellings within a building.

Designing for acoustic privacy considers the site context, surrounding uses, building separation, the location of public and private open spaces and the arrangement of internal spaces in a building.

This section outlines typical considerations for acoustic privacy. For constrained sites such as sites near a rail corridor, major roads or underneath flight paths, refer to 2R Noise and Pollution.

Figure 2-78 A poor acoustic outcome is achieved when driveways are in close proximity to bedrooms and living rooms and driveways are hard paved reverberating sound.

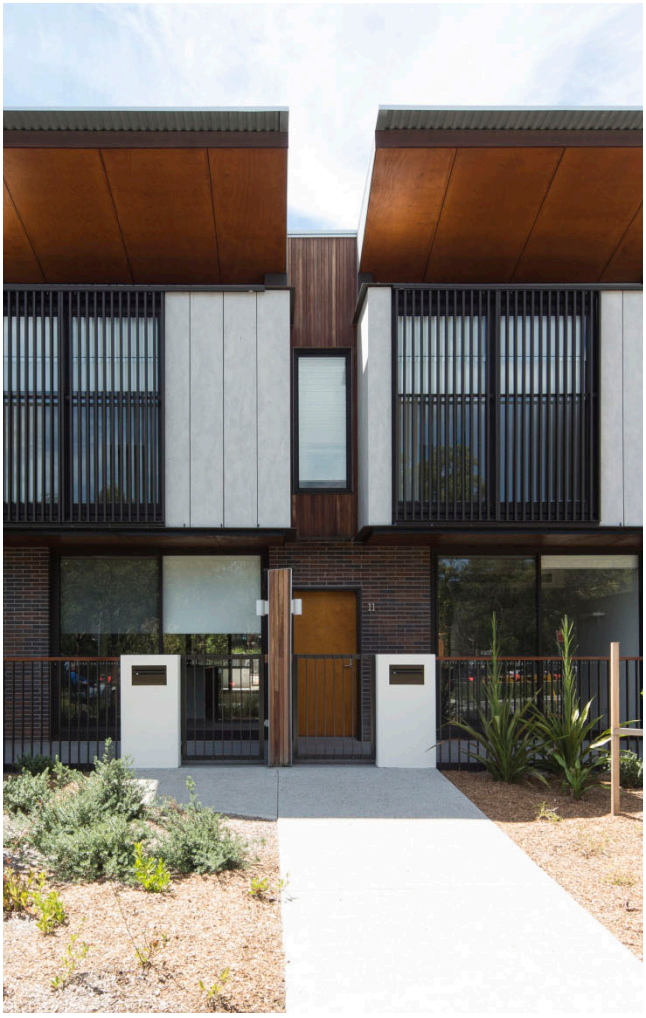


Figure 2-79a Living rooms setback from main circulation spaces by large landscape setback provides privacy

Design guidance

1. Adequate building separation is provided within the development and from neighbouring buildings/ adjacent uses (see also 2H Building Separation and 2P Visual Privacy).

2. Orient window and door openings away from noise sources.

3. Noisy areas within buildings, including building entries and circulation spaces, should be located next to or above each other and quieter areas next to or above quieter areas.

4. Storage, circulation areas and non-habitable rooms should be located to buffer noise from external sources.

5. Limit and insulate the number of party walls (walls shared with other dwellings).

6. Noise sources such as garage doors, driveways, service areas, plant rooms, building services, mechanical equipment, active communal open spaces and circulation areas should be located at least 3m from bedrooms.

7. Internal dwelling layout separates noisy spaces from quiet spaces, using the following design solutions:
   - rooms with similar noise requirements are grouped together;
   - doors separate different use zones; and
   - wardrobes in bedrooms are co-located to act as sound buffers.

2R Noise and Pollution

Related Design Quality Principles
Design Principle 6. Amenity

Properties located near major roads and rail lines, and beneath flight paths are likely to be subject to noise and poor air quality. Other hostile and noisy environments such as industrial areas, substations or sports stadiums may have impacts on residential amenity. Careful design solutions can help to improve quality of life in affected dwellings by minimising potential noise and pollution impacts.

This section addresses design responses to sites affected by significant noise and pollution sources. Section 2Q Acoustic Privacy deals with more typical residential developments that do not face such challenges.

Development near rail corridors and busy roads

The NSW Government's Development near Rail Corridors and Busy Roads - Interim Guideline as referenced by *State Environmental Planning Policy (Infrastructure) 2007* assists in the planning, design and assessment of development in, or adjacent to, rail corridors and busy roads. Development in these locations must have regard to this interim Guideline.

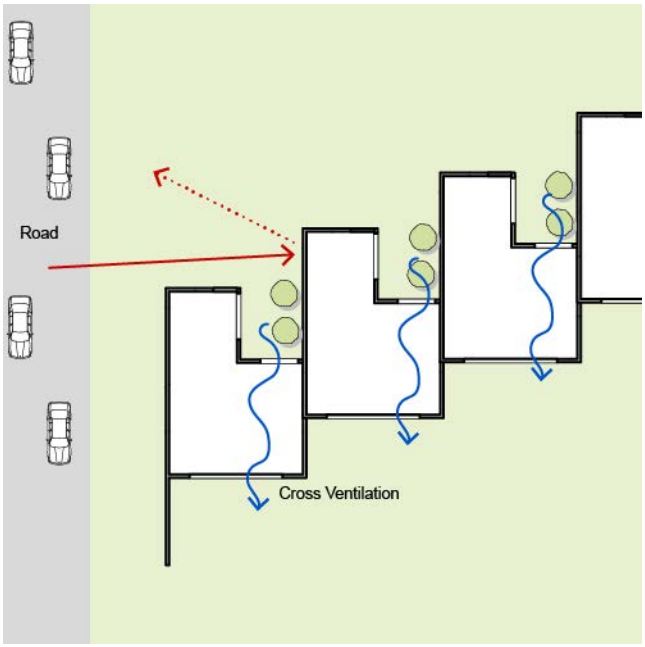


Figure 2-79 Staggered terrace houses can be arranged to shield windows from excessive traffic noise and still allow for cross ventilation

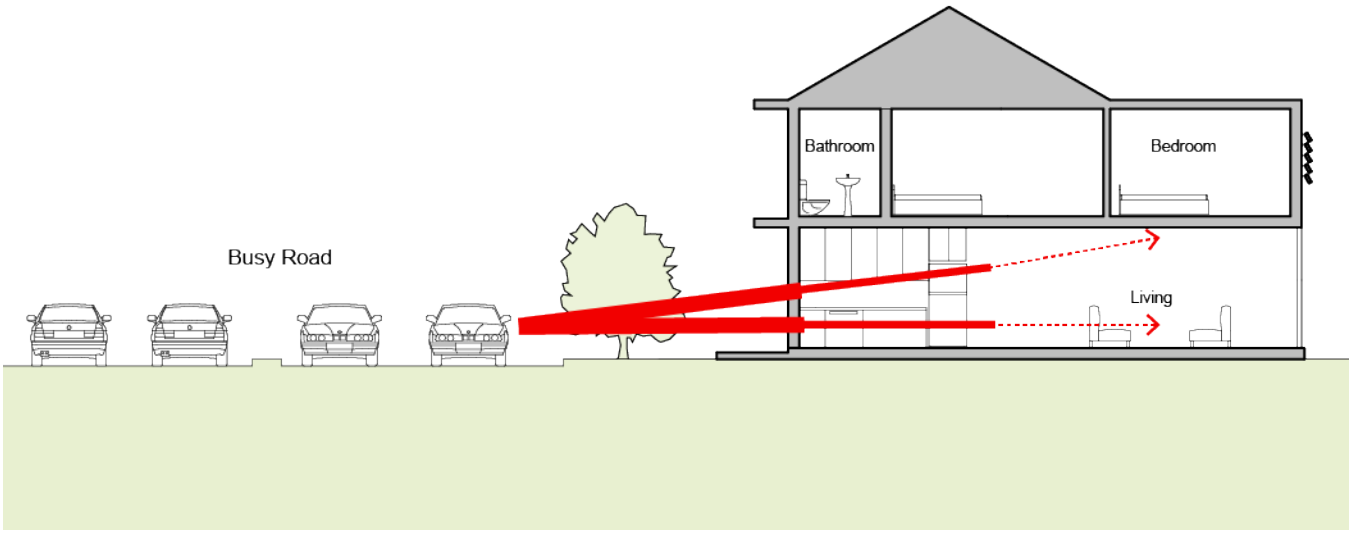


Figure 2-80 Locate noise sensitive rooms away from road noise

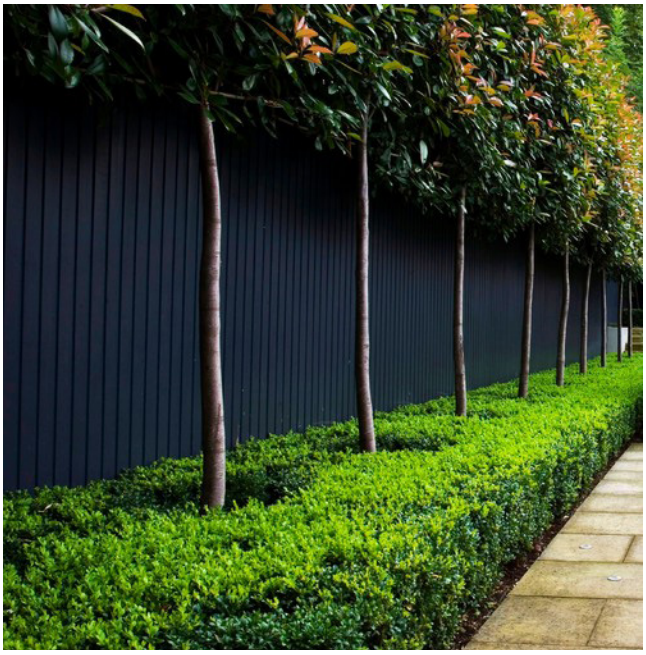


Figure 2-81a Landscaping in front of solid dark coloured fence reduces impact of sound walls

Design guidance

1. To minimise impacts from noise pollution the following design solutions may be applied:
   - create physical separation between buildings and the noise or pollution source;
   - orientate dwellings perpendicular to the noise source and where possible buffered by other uses;
   - provide buildings that respond to both solar access and noise. Where solar access is away from the noise source, non-habitable rooms can provide a buffer;
   - where solar access is in the same direction as the noise source, dual aspect dwellings with shallow building depths are preferable; and
   - landscaping to reduce the perception of noise and act as a filter for air pollution generated by traffic and industry.

2. Noise and pollution may prevent all the design criteria in the Design Guide being achieved. Where development cannot achieve the design criteria, alternatives may be considered in the following areas:
   - solar and daylight access;
   - private open space and balconies; and
   - natural cross ventilation.

3. Design solutions to mitigate noise include:
   - limiting the number and size of openings facing noise sources;
   - providing seals to prevent noise transfer through gaps;
   - using double or acoustic glazing, acoustic louvres or enclosed balconies (wintergardens); and
   - using materials with mass and/or sound insulation or absorption properties e.g. solid balcony balustrades, external screens and soffits.

4. Designed and construct to include acoustic attenuation to reduce noise levels from any off-site noise sources to:
   - Below 35dB(A) for bedrooms, assessed as an LAeq over 8 hours (from 10pm to 6am); and
   - Below 40dB(A) for living areas, assessed as an LAeq over 16 hrs (from 6am to 10pm).

Configuration

2S Universal Design

Related Design Quality Principles
Design Principle 8. Housing Diversity and Social Interaction

Universal design is an international design philosophy that enables people to continue living in the same home as they age by ensuring that dwellings are able to change with the needs of the occupants. Universally designed dwellings are safer and easier to enter, move around and live in. They benefit all members of the community, from young families to older people, their visitors, and those with permanent or temporary disabilities.

Incorporating universal design principles in multi-dwelling design is a step towards producing robust, flexible housing stock. It ensures that simple and practical design features are incorporated into new buildings that would be difficult and costly to retrofit at a later date.

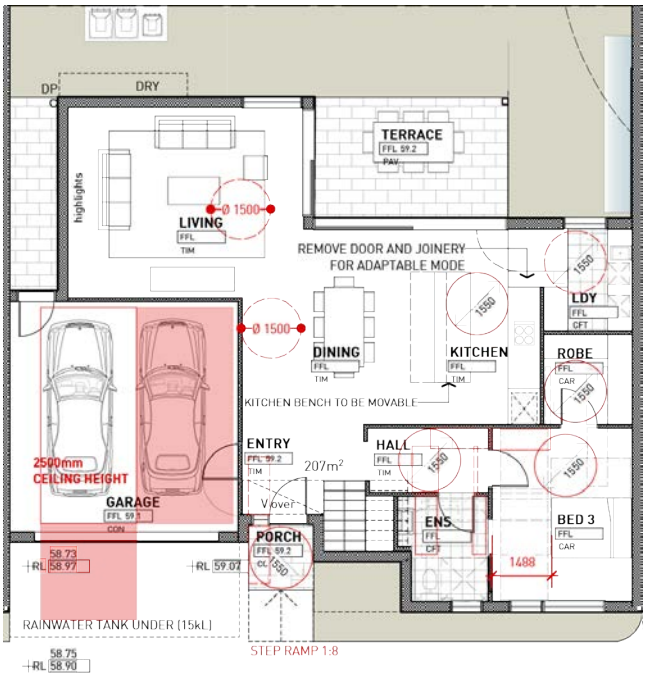


Figure 2-82 Accessible dwellings and universal designed dwellings require additional space for circulation.
Locating a bedroom on the ground floor of a two storey dwelling allows flexibility in accommodating a diverse range of needs

Universal design is different to adaptable housing which is governed by *Australian Standard AS 4299-1995 Adaptable Housing* and is specifically designed to allow for the future adaptation of a dwelling to accommodate the occupant's needs.

In addition, flexible dwelling design is also desirable to allow buildings to accommodate a diverse range of lifestyle needs such as different household structures, live/work housing arrangements and future changes in use.

This guide refers to Silver, Gold and Platinum ratings for universal design from the publication *Livable Housing Design*, prepared by Livable Housing Australia.

The publication can be found on the Livable Housing Australia website: http://www.livablehousingaustralia.org.au/

Incentives are provided for housing for seniors and those with a disability through *State Environmental Planning Policy (Seniors or People with a Disability)* 2004. This development is to achieve a higher standard and requires all dwellings to achieve a range of housing standards.

Figure 2-83 Additional floor space is requried to ensure circulation can be achieved once the dwelling is furnished.

Design guidance

1. All development should achieve the Silver Level as defined by Liveable Housing Australia. In larger developments a smaller proportion of dwellings will be able to achieve Platinum level or comply with the *Adaptable Housing standard AS 4299 - 1995.*

2. Where a dwelling achieves the Platinum level of Universal Design or is constructed to meet the Adaptable Housing Standard a condition of consent should be included.

   This should require notices to be placed next to the electricity meter so that future occupants are aware of the ability of the dwelling to be adapted and that they can contact Council for the approved plans that indicate how the dwelling can be adapted.

3. Design solutions for adaptable dwellings include:
   - Convenient access to communal and public areas;
   - High level of solar access;
   - Minimal structural change and residential amenity loss when adapted;
   - Larger car parking spaces to allow for accessibility; and
   - Parking titled separately from dwellings or shared car parking arrangements.

4. Multi-dwelling design incorporates flexible design solutions which may include:
   - Rooms with multiple functions;
   - Dual master bedroom dwellings with separate bathrooms;
   - Larger dwellings with various living space options; and
   - Ability to adapt a ground floor room into a bedroom or a workspace.

2T Communal spaces

Related Design Quality Principles
Design Principle 5. Landscape
Design Principle 8. Housing Diversity and Social Interaction

Communal space can be internal or external, and be circulation or recreation area, found in larger medium density developments.

Communal space is an important amenity resource that provides outdoor recreation opportunities for residents, connection to the natural environment and valuable 'breathing space' between dwellings in larger medium density development.

Communal space also contributes to the appeal of a development and the wellbeing of residents. Larger communal space may be accessible and usable by the general public and to avoid confusion are best dedicated for public use.

Communal spaces provide opportunities for casual social interaction among residents and can assist with social integration. Important design considerations include safety, amenity and durability.

The size, location and design of communal or public open space will vary depending on the site context and the scale of development. The function of open space is to provide amenity in the form of:

- landscape character and design;
- opportunities for group and individual recreation and activities;
- opportunities for social interaction;
- environmental and water cycle management;
- opportunities to modify microclimate; and
- amenity and outlook for residents.

The functional part of the communal space area may be supplemented by:

- Additional landscape area, circulation space and areas for passive use and views; and
- Public land used for open space and in or under the control of a public authority.

Figure 2-84 Low walls in landscape can be used for sitting

Figure 2-85 Usable grassed area for active play separated from dwellings by path and planting

Design guidance

1. Circulation spaces (internal and external) should provide direct clear access to the dwellings and a clear line of sight from public spaces.

2. Circulation spaces should provide an accessible path of travel - ramps and lifts should be integrated with landscape and building design.

3. Communal space should be consolidated into a well designed, easily identified and usable area and co-located with landscaped areas.

4. Direct, equitable access should be provided to communal open space areas from common circulation areas, entries and lobbies.

5. Facilities should be provided within communal open spaces and common spaces for a range of age groups, incorporating some of the following elements:
   - seating for individuals or groups;
   - barbecue areas;
   - play equipment or play areas; and
   - swimming pools, gyms, tennis courts or common rooms.

6. Communal open spaces should be located in areas where they do not impact on the privacy of dwellings.

7. Communal open space and the public domain should be readily visible from habitable rooms and private open space areas while maintaining visual privacy. Design solutions may include:
   - bay windows;
   - corner windows; and
   - balconies

8. Communal space should be well lit.

9. Where communal open space/facilities are provided for children and young people they are safe and contained.

10. Circulation spaces need to accommodate space for comfortable movement and access (particularly in entry lobbies, outside lifts and at dwelling entry doors) for furniture and people with disabilities.

11. Daylight and natural ventilation should be provided to all common circulation spaces that are above ground.

12. Legible signage should be provided for dwelling numbers, common areas and general wayfinding.

13. Provide incidental spaces, for example, space for seating in a corridor, or at a stair landing.

14. Communal space can provide opportunities for public art creating a sense of place and linking the built environment to the cultural fabric of the space.

    The public art can take the form of sculpture, architecture, landscape and is best when integrated with the overall design.

    The art can link a site to the past uses, significant people, cultural backgrounds, influences or future aspirations. It is a form of story telling.

15. The design of all communal spaces will need to address equitable access for persons with disabilities and obligations under the *Access to Premises Standard* and *Disability Discrimination Act 1 2*

16. Communal open spaces with an area more than 1000m^2 are best dedicated as public space.

17. A development located within 400m of public open space may have reduced or limited communal open space.

2U Architectural Form and Roof Design

Related Design Quality Principles

Design Principle 1. Context and Local Character
Design Principle 2. Built form and Scale
Design Principle 9. Visual Appearance

Architectural form of building design is one of the most important elements. It defines the building as viewed from a distance. Good form and proportion make a strong contribution to the local character

The architectural form is described by:

- building mass,
- its stepping elements,
- solid and void relationship; and
- the silhouette created by the roof form.

The form includes the patterns and proportion of the building and considers the three dimensions of the building mass - not just articulation of the facades.

The roof form can provide a sense of individual identity. Roof forms can be pitched, flat or a combination. The roof is an important element in the overall composition and design of a building. Quality roof design provides a positive addition to the character of an area and can form an important part of the skyline. Roofs also provide opportunities for open space where appropriate and can add to the sustainability of a building's performance.

Articulation and facade design are the finer details and provides additional visual interest and reinforces the architectural form.

The *Standard Instrument (Local Environmental Plans) Order 2006* allows for architectural roof features that can exceed the maximum building height. This is an important tool for achieving high quality roof design and articulation.

Figure 2-86

Figure 2-87

Figure 2-88

Figure 2-89

Figure 2-90

Figure 2-91

Design guidance

1. Good design has a rhythm and built form that is well proportioned and visually pleasing.

2. Design solutions may include:
   - special roof features and strong corners;
   - use of skillion or very low pitch hipped roofs;
   - breaking down the massing of the roof by using smaller elements to avoid bulk;
   - using materials or a pitched form complementary to adjacent buildings;
   - use of flat roof and parapet forms;
   - steps in plan to identify different dwellings; and
   - articulation of the roof form or a roof form that is integrated with the mass of the building.

3. Define the top of the building by setting back upper levels behind the front building facade or expressing the shadow of an overhanging roof.

4. Reduce the apparent bulk and visual impact by breaking down the roof into small roof elements.

5. Roof treatments should be integrated with the building design. Design solutions may include:
   - roof design proportionate to the overall building size, scale and form (eg. eaves should increase with height);
   - roof materials compliment building materials; and
   - service elements are integrated.

6. Good roof design maximises solar access to dwellings during winter and provides shade during summer. Design solutions may include:
   - the roof rises to the north; and
   - eaves and overhangs shading walls and windows from summer sun.

7. The form should provide a balanced composition of solid and void.

8. A building that has a simple architectural form often needs a higher level of articulation, one that has a complex or more sculpted architectural form can have simple detailing.

2V Visual Appearance and Articulation

Related Design Quality Principles

Design Principle 9. Visual Appearance

The design of facades contributes greatly to the visual interest of the building and the character of the local area. While facades that face the street have an impact on the public domain, side and rear facades often influence the amenity of neighbouring buildings and communal and private open spaces.

The aesthetics and articulation of a building add further detail and complement the architectural form. The articulation can assist in refining the form and enhancing it with scale and proportion.

High quality facades are a balanced composition of building elements, textures, materials and colour selections. Well designed facades also reflect the use, internal layout and structure of an dwelling building.

The composition and detailing of a facade is not only important to the appearance of the building, they also influence the perceived scale. The pattern and repetition of elements in the facade, the proportions and articulation of external walls and the detailed design of facade elements are all important considerations.

Streetscape results from the inter-relationship between buildings, landscape and open spaces in the street scene. The quality of the streetscape impacts on local amenity and identity. In order to contribute to the character of the local area, development should recognise predominant streetscape qualities, such as building form, scale, materials and colours.

Careful design and material selection can reduce the long term maintenance obligations of multi-dwelling development. In addition, effective maintenance of the development ensures the longevity of buildings.

Figure 2-93 Varied building forms and a mixed palette of materials adds interest to the streetscape

Figure 2-92 Asymmetrical design for semi-detached dwellings adds interest to streetscape

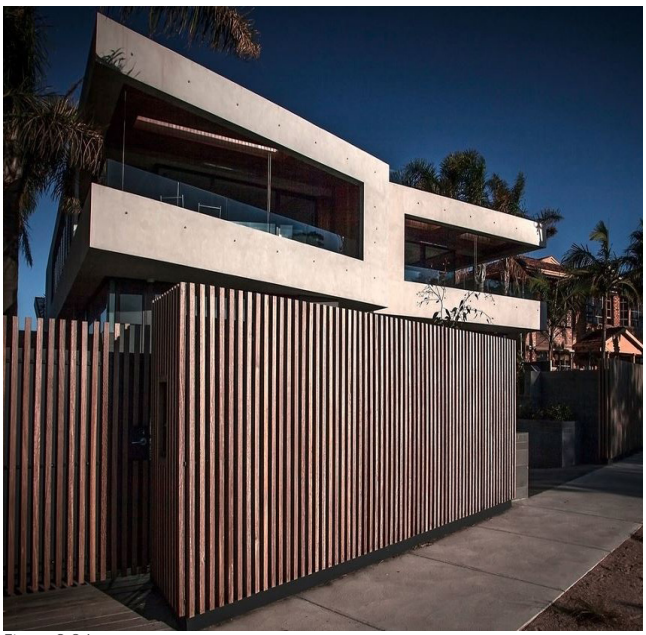


Figure 2-94

Figure 2-95 Example of transparent fencing landscaping in front setback and asymmetrical facade design

Design guidance

1. The facade should provide a balanced composition of elements including a mix of solid and void.

2. Facades are a composition of various elements including:
   - balconies;
   - windows;
   - porches;
   - front doors; and
   - bay windows.

3. Facade elements should have a consistent design language throughout the development and be integral to the architectural idea.

4. Design solutions for front building facades may include:
   - a composition of varied building elements;
   - a defined base, middle and top of buildings;
   - revealing and concealing certain elements; and
   - changes in texture, material, detail and colour to modify the prominence of elements.

5. Design solutions may include:
   - providing roof overhangs to protect walls;
   - providing hoods over windows and doors to protect openings;
   - detailing horizontal edges with drip lines to avoid staining of surfaces;
   - detailing to eliminate or reduce planter box leaching; and
   - selecting appropriate design and material for hostile locations.

6. Use variation in materials, colours and key elements such as doors windows and balconies to order building facades with scale and proportions that respond to the contextual character.

7. Create shadows on the facade throughout the day with building articulation, balconies and deeper window reveals.

Figure 2-96 Awnings provide shelter and add articulation

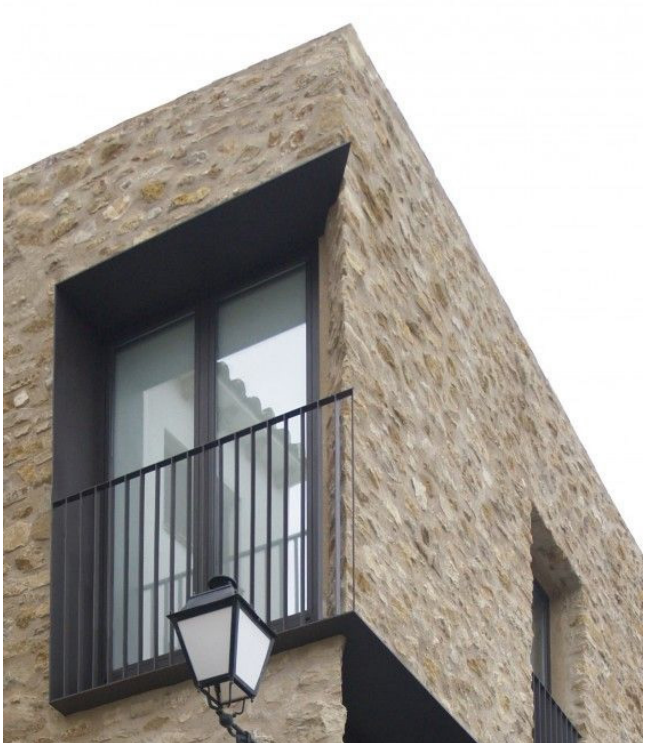


Figure 2-97 Contrast texture with sharply defined openings and fine steel balustrades

Figure 2-98 Use of screens provides privacy and sunscreening to balconies.

Figure 2-99 Brick patterns create visual interest and add detail and texture. Consider how facade and landscape treatments integrate

Figure 2-100 Eaves, awnings and shutters provide screening from the sun

Design guidance

8. Building services should be integrated within the overall façade.

9. Use colour to provide accent and texture changes to provide visual interest.

10. Building facades should be well resolved with an appropriate scale and proportion to the streetscape and human scale. Design solutions may include:
    - well composed horizontal and vertical elements;
    - variation in floor heights to enhance the human scale;
    - elements that are proportional and arranged in patterns;
    - public artwork or treatments to exterior blank walls; and
    - grouping of floors or elements such as balconies and windows on taller buildings.

11. Building facades relate to key datum lines of adjacent buildings through upper level setbacks, parapets, cornices, awnings or colonnade heights.

12. All building elements, including shading devices and awning are coordinated and integrated into the overall facade design

13. For lots located on the southern, eastern and western side of a street, the articulation zone may be designed to incorporate private open space, including principal private open space.

14. The facade composition and articulation can provide a response to the context through:
    - material selection;
    - proportion of openings;
    - datum lines; and
    - pitch and form of roof.

    In some instances it is more appropriate to by sympathetic to the context, in other instances a well designed contrast is appropriate.

15. The front of the dwelling is layered to provide visual interest to the public domain and amenity and privacy to the dwelling.

16. Building entries should be clearly defined. Include a covered porch area to define the front entry and provide weather protection - this could be a recessed or projecting element.

17. Important corners are given visual prominence through a change in articulation, materials or colour, roof expression or changes in height.

18. Consider long term maintenance in the selection of external materials - minimise use of painted and rendered surfaces.

19. Consider the environmental impacts of material selected - use timber from sustainable sources.

20. Consideration should be given to expressing the third storey of a dwelling in a lighter weight manner than the structure below, through the use of material and colours and the like. [Development Applications only]

21. Where the development consists of a number of dwellings some variation in colour, stepping with the topography of variation in external treatment can provide visual interest.

22. Window design should enable cleaning from the inside of the building.

23. Facilitate maintenance by reducing the need for external scaffolding access.

24. Building maintenance systems should be incorporated and integrated into the design of the building form, roof and facade.

25. Manually operated systems such as blinds, sunshades and curtains should be used in preference to mechanical systems.

26. For larger developments centralised maintenance, services and storage should be provided for communal open space areas within the building.

2W Pools and Ancillary Development

Related Design Quality Principles

Design Principle 6. Amenity

Ancillary development consists of structures that are detached and independent of the main dwelling house. It include structures such as garden sheds, detached studios, cabanas, swimming pools and cubby houses.

These structures are generally low in scale, typically located in a rear garden and support the uses of the dwelling by adding amenity and functionality.

A detached studio adjoining a laneway is a common development type found on smaller lots. The building is separate from the dwelling house and often contains a garage. The detached studio is a habitable room, but not a separate dwelling. The detached studio can provide visual surveillance to rear lane ways to create safe spaces.

Additional consent could be obtained to allow the studio to be used as a secondary dwelling.

In larger developments, communal facilities can include pools, spas and other recreational facilities.

Small swimming pools, spas or plunge pools are sometimes provided within medium density housing developments.

These need to be located with care to avoid noise impacts and be integrated into the landscape design

Most ancillary development is exempt development. Details of exempt development can be found in Part 2 of the Codes SEPP.

Figure 2-101 Detached studios are separated from the dwelling house. Privacy needs to be considered to avoid overlooking into adjoining properties by restricting inward facing windows and limiting the size of openings to the lane way.

Figure 2-102 Swimming pools and spas integrated with the landscape design.

Figure 2-103 Swimming pools and spas can also be integrated to compliment the architecture of the dwelling

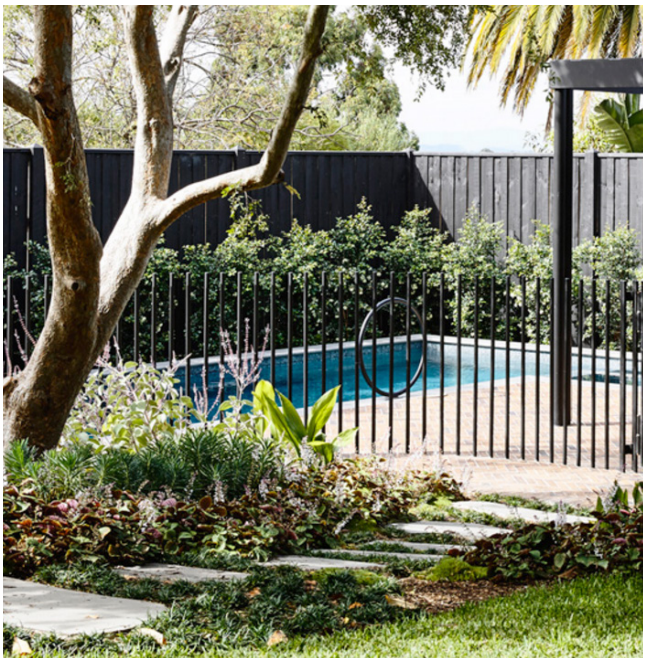


Figure 2-104 Pool fencing should be integrated with the landscape design.

Figure 2-105 Rear outbuildings such as studios should be orientated to the lane to allow for passive surveillance and security

Design guidance

1. To ensure that the noise generated by the pool pump complies with the requirements of *Protection of the Environment Operations (Noise Control) Regulation 2008,* pool equipment should be contained in a sound proof enclosure.
2. To provide passive surveillance to the lane, detached studios should be located on rear laneways adjacent or over garages.
3. Consider privacy and solar access impacts of detached studios over garages.
4. Spas, pools and garden sheds should be located only in the rear garden to avoid visual impact on the street.
5. Garden sheds in the rear garden can provide useful storage of garden equipment, bike storage, toys and furniture as well as bins. They should be designed to match the dwelling.
6. The swimming pool and spa should be integrated with the landscape design and consider the topography of the site.
7. To minimise noise and visual impacts, decking around pools should be located away from property boundaries.
8. To avoid privacy and noise conflicts, communal spas, pools and recreational facilities should be located away from the bedrooms and private outdoor spaces of the dwelling.
9. To avoid noise impacts, locate pool and spa equipment away from the dwelling house and neighbouring house.

Environment

2X Energy Efficiency

Related Design Quality Principles
Design Principle 9. Sustainability

Energy efficient design is about the ability of a dwelling to manage thermal performance (thermal comfort), reduce energy consumption and provide for sustainable energy sources. It can provide increased amenity to occupants and reducing energy costs.

Passive solar design relates to the orientation and layout of the dwelling, of the dwelling, materials in the external skin providing insulation and the size, location and protection of the windows.

Provision of alternate sources of energy such as solar hot water, photovoltaics for energy generation and batteries for storage will reduce overall energy consumption of the dwelling.

This section offers guidance on meeting BASIX sustainability requirements and other rating systems through better design practice. For additional design practice linked to passive environmental design and energy efficiency see sections 2A Solar and daylight access, 2J Natural ventilation and 2L Dwelling size and layout.

Figure 2-107 Light shelves can reflect sunlight deeper into rooms and provide shade from summer sun.

Figure 2-106 Roof mounted photovoltaics should be integrated into the design of the dwelling

Figure 2-109 Adjustable screens allow control of sunlight.

Figure 2-108 Battery storage saves energy generated during the day for use in the evening

Design guidance

1. It is preferable to use natural light and natural ventilation to habitable and non-habitable rooms.
2. Well located, screened outdoor areas should be provided for clothes drying.
3. Living areas should be orientated to the north.
4. Design eaves and awnings to provide shade for windows during summer.
5. Reduce the size or provide adjustable shading to east and west facing windows.
6. Provide substantial insulation in walls, ceilings, floor (for timber framed construction) and roof spaces.
7. Select mid to light coloured roofs which absorb less heat in summer.
8. Provide ceiling fans in bedrooms and living rooms to assist with cooling and increase comfort.
9. Recommended design solutions:
    - use of smart glass or other technologies on north and west elevations;
    - maximise thermal mass in the floors and walls of north facing rooms is maximised;
    - provide polished concrete floors, tiles or timber rather than carpet in living areas;
    - insulate roofs, walls and floors and provide seals on window and door openings; and
    - provide overhangs and shading devices such as awnings, blinds and screens.
10. Install photovoltaics on roofs to generate electricity for common or individual use. Batteries can be used to store energy for use in the evenings.

2Y Water Management & Conservation

Related Design Quality Principles
Design Principle 4. Sustainability

Water sensitive urban design includes the integrated management of water in urban areas. It takes into account all of the elements of the urban water cycle including potable (drinking quality) water, rainwater, wastewater, stormwater and groundwater.

Best practice water management considers water measures at all stages of a project, from initial site planning measures that maximise deep soil areas for water infiltration, to detailed building design that captures and recycles stormwater and wastewater for building services.

The Building Sustainability Index (BASIX) ensures all new dwellings are designed to minimise potable water use and reduce greenhouse gas emissions. There are a number of planning and design considerations that are relevant to multi-dwelling developments to support BASIX.

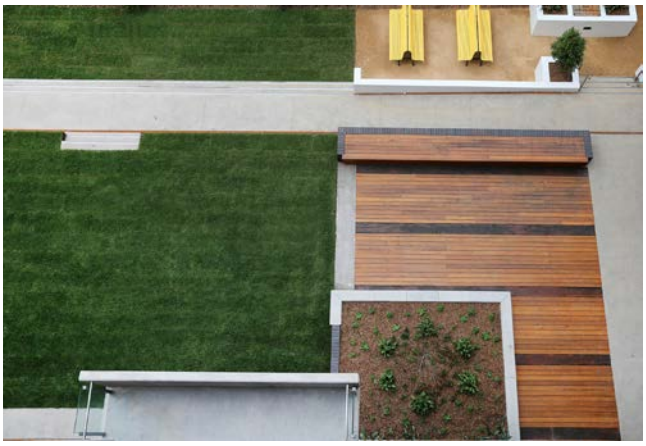


Figure 2-112 Tanks can be hidden under decks in private and communal landscapes.

Figure 2-110 Rain gardens integrated into the landscape can filter the stormwater from roads

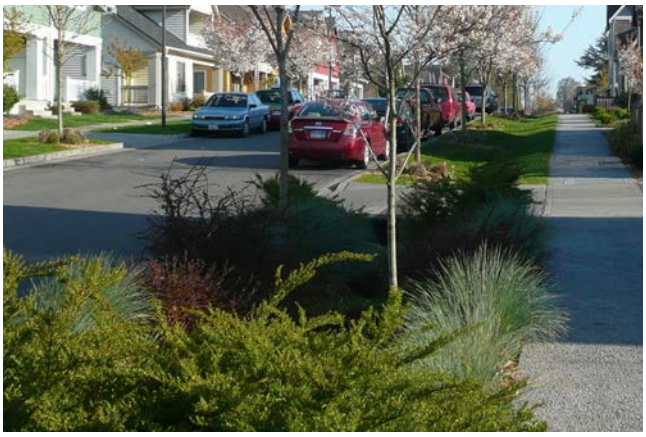


Figure 2-111 Swales can be attractive, filter and collect the stormwater

Figure 2-116 Integrate rainwater tanks into the landscape

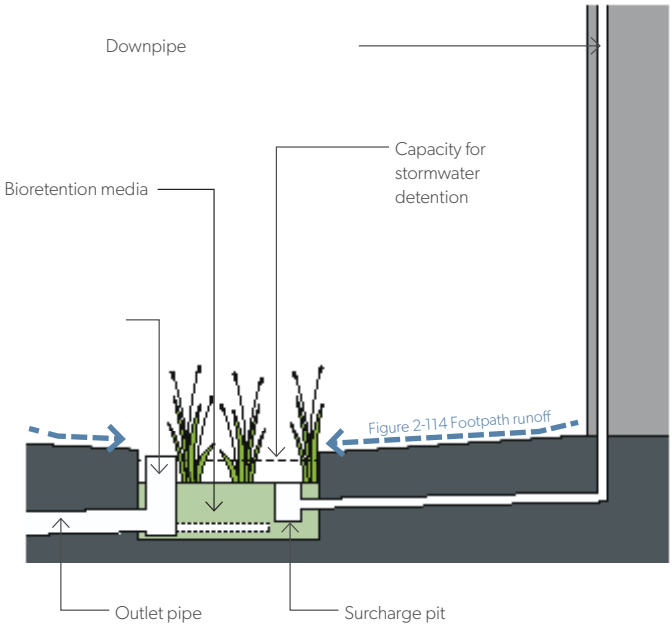


Figure 2-115 A bioretention garden improves water quality by using plants to treat roof and surface water runoff

Design guidance

1. Potable water reduction can be achieved by installing water efficient fittings, appliances, individual metering and rainwater reuse.
2. Provide drought tolerant, low water use plants within landscaped areas.
3. Water sensitive urban drainage systems are designed by a suitably qualified professional.
4. Recommended design solutions:
   - runoff is collected from roofs and balconies in water tanks and plumbed into toilets, laundry and irrigation;
   - porous and open paving materials are maximised; and
   - on site stormwater and infiltration, including bio-retention systems such as rain gardens or street tree pits.
   - rainwater reused for landscape and pools
5. Locate detention tanks under paved areas, driveways or in basement car parks.
6. On large sites parks or open spaces are designed to provide temporary on site detention basins - active areas to have a maximum depth of 300mm to avoid fencing.
7. Reusing rainwater for toilet flushing requires the most pipe work to feed all the toilets. Filtered rainwater can be easily used for hot water or laundry use and result in significant reductions in water use.
8. Incorporate rainwater tanks should be into the overall site design. Where located along a side boundary they should not obstruct access.
9. Locating tanks under decks allows for easy access while hiding the tank from view.

2Z Waste Management

Related Design Quality Principles
Design Principle 4. Sustainability

The minimisation and effective management of domestic waste from dwellings contributes to the visual and physical amenity of the building while limiting potentially harmful impacts on the environment.

Minimising waste is relevant to all stages of the building's life cycle and also includes safe and convenient collection and storage of waste and recycling. Waste management should be considered early on in the design process.

The storage of waste can have significant visual impacts on the private and public domain and should be located away from key areas such as entries and habitable room windows.

On larger developments, waste collection is often required to be on-site and space for vehicle access needs to be provided to the centralised collection point.

Figure 2-117 Alternative waste disposal, such as composting, can be incorporated into the design of communal open space areas

Figure 2-119 Even where bin areas are provided fronting the street they can be designed and incorporated into the building or landscape elements

Figure 2-118 Provide bin areas that are screened and incorporated into the landscape or building design

Figure 2-120 Well designed, easily accessible and clean waste and recycling rooms improve the collection and management of household waste

Figure 2-121 Waste and recycling areas should allow for sufficient space to manoeuvre bins and sort waste for recycling

Design guidance

1. Provide adequately sized storage areas for recycling, general and garden waste located discreetly away from the front of the development or in the basement car park.
2. Provide waste and recycling storage areas that are well ventilated.
3. Circulation design allows bins to be manoeuvred easily between storage and collection points.
4. For larger developments where a waste collection vehicle needs to access internal streets or basement car parking use the smallest waste vehicle possible to reduce heights and space required for turning paths.
5. Temporary storage for bulky items is provided in an area that is not visible from the street.
6. A waste management plan should be prepared.
7. Where access to the collection point is required on site, consider the use of a smaller collection vehicle to reduce space for circulation and head clearances in basements.
8. Locate bin storage away from habitable room windows.
9. Ensure communal waste and recycling rooms are in convenient and accessible locations related to each vertical core.
10. Screen garbage collection, loading and servicing areas behind structures which are integrated into the overall design.
11. Provide green waste composting.

Part 3

Design Criteria

This part provides the specific objectives and design criteria that relate to a particular type of medium density housing.

Only the elements relevant to each development type are included.

A complying development certificate must comply with each of the design criteria.

A development application must demonstrate how they the objectives and design criteria have been achieved.

3.1 Two Dwellings Side by Side

This part provides the objectives and design criteria for development that contains two dwellings on a single lot.

This section contains objectives and design principles:

Objectives : relate to the design principles and set out what the design is trying to achieve.

Design criteria: the measurable standards for how an objective can be achieved.

A complying development certificate must comply with each of the design criteria.

A development application can comply with the design criteria or use an alternate solution that satisfies the objective.

For guidance and explanation of the design criteria refer to Part 2 - Design Guidance

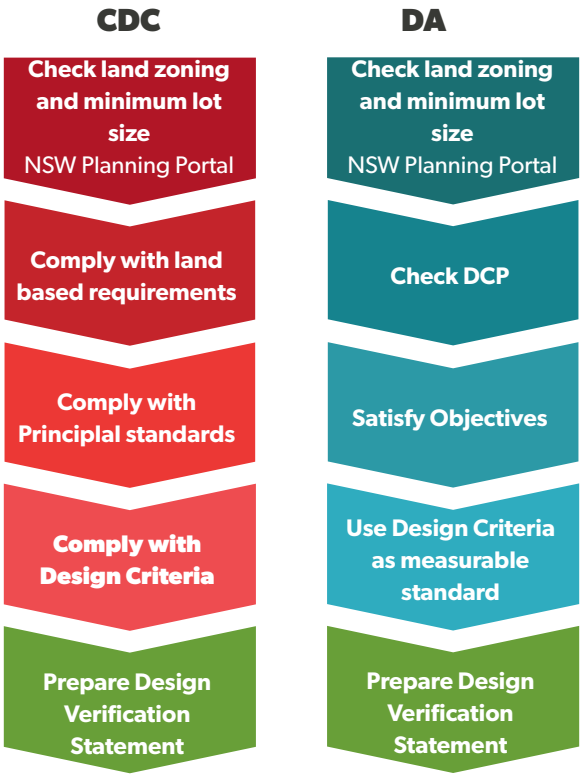


Figure 3-1 Workflows: Preparing a DA or CDC

Key characteristics of a development which includes two dwellings are:

- Each dwelling has private open space generally located near or at ground level;
- There are no other dwellings above or below; and
- Dwellings can be arranged as adjacent to each other or one in front of the other.

Strata titled development

Two dwellings can be carried out on one lot of land as a strata titled development.

These are commonly referred to as a dual occupancy.

They are strata titled either because the individual dwellings do not meet the minimum lot size requirements, or they have a basement car parking that does not enable simple Torrens titling.

The dwellings can be attached or detached.

Car parking can be located to the front, off a rear lane, or within an under ground car park.

A **c**omplying development application can be submitted where:

- Each dwelling has a frontage to a primary or a secondary road; and
- There are no dwellings above or below another dwelling.

A development application will be required where a dwelling does not have a frontage to a road (also known as a battle-axe lot) or the development does not comply with the development standards under complying development.

Strata subdivision can be carried out as complying development.

Torrens titled development

Two dwellings are constructed on one lot of land, however at the completion of the development each dwelling is located on a separate Torrens title lot.

This form of development is commonly referred to as semi-detached dwellings or two dwelling houses.

The dwellings are constructed as a single development.

They can also be part of a community titled development where the roads and common spaces are part of a community title.

A complying development application can be submitted where:

- Each dwelling has a frontage to a primary or secondary road; and
- There is only one dwelling on a lot at the completion of the development.

Concurrent subdivision and development consent may be obtained to enable each dwelling on its own Torrens title Lot.

Each lot must comply with the minimum lot sizes.

A development application will be required where a dwelling does not have a frontage to a road (also known as a battle-axe lot) or the development does not comply with the development standards under complying development.

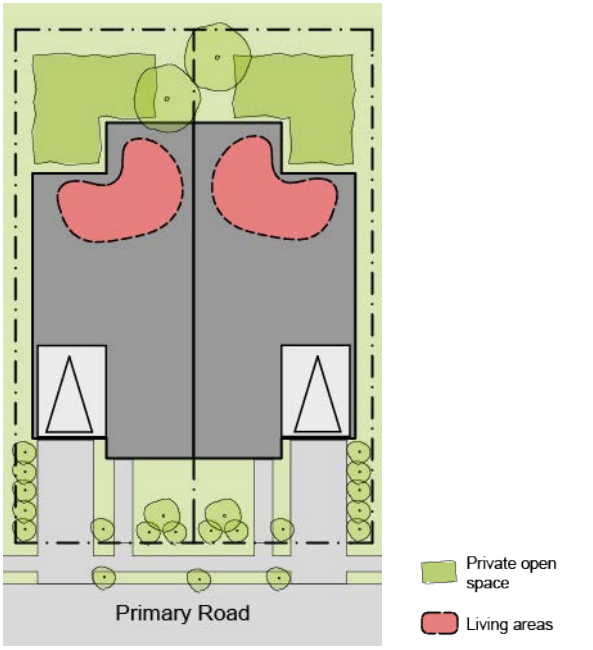


Figure 3-2 Semi-detached or two dwelling houses can be approved under a DA or CDC

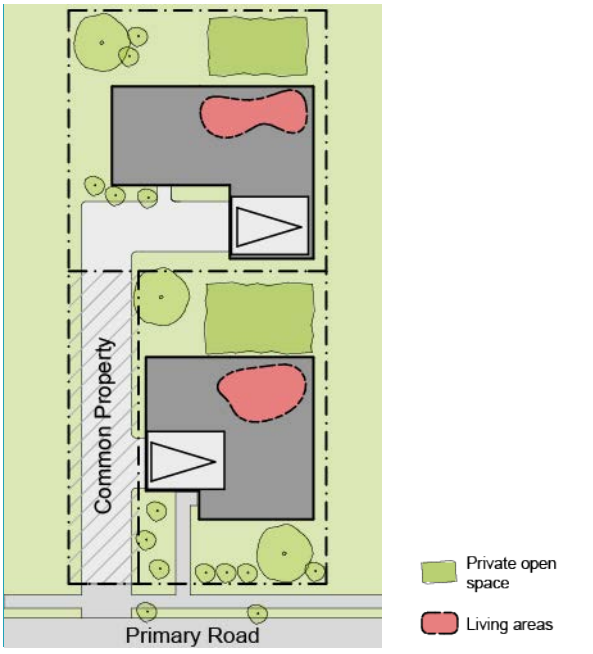


Figure 3-3 The rear dwelling does not have a frontage to the street. This development can only be approved under a DA

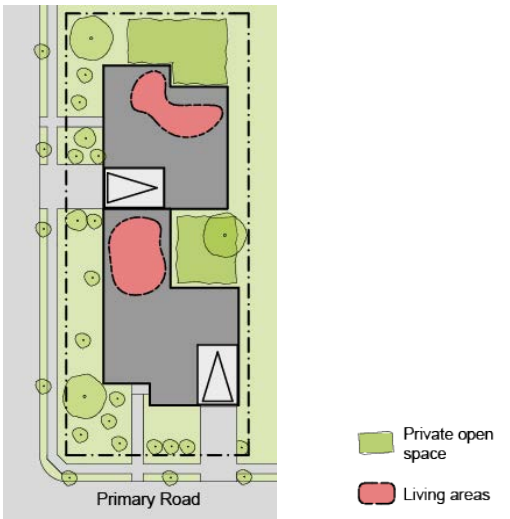


Figure 3-4 Both dwellings have a frontage to a road so can be approved as a CDC or DA

Principal Controls

3.1A. Building Envelopes

Development Application

The local building envelope controls are to be found in the LEP and DCP that applies to the land. This may include:

- Maximum height of building; and
- Front, rear and side setbacks.

The DCP may also provide direction on the character of the precinct and siting of the building.

Complying Development

The building envelope standards for complying development can be found in Medium Density Housing Code within ***State Environmental Planning Policy (Exempt and Complying Codes) 2008 (Codes SEPP).*** A summary is in the table below.

Element	Summary Development Standard
Min lot size for each dwelling	200 m² 6m wide
Height of Building	8.5m
Primary Road Setback	Where existing dwellings are within 40m - average of two closest dwellings. Where no existing dwellings are within 40m then: **LOT AREA (m²) SETBACK** 200 - 300 3.5m >300 - 900 4.5m >900 - 1500 6.5m >1500+ 10m
Secondary Road setback	**LOT AREA (m²) SETBACK** 200 - 900 2m >900 - 1500 3m >1500+ 5m
Side Setbacks Applies only to the side boundary of the development site – not each individual lot.	Front half of the lot • up to 15m - 1.2m • if adjoining property is built to boundary - 0m Rear half of the lot, or distance >15m from front boundary; • Building envelope defined by 45° plane projected from a height 3.6m above the boundary.

Rear setback	Where the part of a development has a height of building less than 4.5m **LOT AREA (m²) SETBACK** 200 - 600 3m >600 - 1500 6m >1500+ 15m Where the part of a development has a height of building of 4.5m or more: **LOT AREA (m²) SETBACK** 200 - 1500 10m >1500+ 15m
Lane Setback	0m

3.1B Floor Space Ratio

Development Application: Refer to LEP or DCP that applies to the land.

Complying Development: Refer to *Codes SEPP* and summary table below:

Standard	Summary Development Standard
Maximum floor space ratio for each lot	**LOT AREA (m²) FSR** 200 - 300 0.75:1 >300 - 400 0.70:1 >400 - 500 0.65:1 >500 + 0.60:1

3.1C Landscaped Area

Development Application: Refer to LEP or DCP that applies to the land for minimum area.

Complying Development: Refer to ***Codes SEPP*** and summary table below for minimum area.

Element	Summary Development Standard
Minimum Landscaped Area for each lot	**LOT AREA(m^2)** — **LANDSCAPED AREA AS PERCENTAGE OF LOT** 200 - 300 — 20% >300 - 400 — 25% >400 - 500 — 30% >500+ — 35% Minimum dimension of any landscaped area included in calculation - 1.5m
Proportion of area forward of building line that contains landscaped area.	25% minimum

Objective 3.1C-1	Design criteria
Landscape design is viable and sustainable and supports healthy plant and tree growth	1. Ongoing maintenance plan is provided as part of the landscaped plan. 2. Minimum soil standards for plant sizes are provided in accordance with Table 1 in Section 2C.

Objective 3.1C-2	Design criteria
Landscape design contributes to the streetscape and amenity	3. Landscape features including trees and rock outcrops are retained (except those where approval is granted under a CDC or Tree Preservation Order). 4. At least 1 medium sized tree with a minimum mature height of 8m is to be provided to the rear of the dwelling. 5. Where the front setback exceeds 3m a medium sized tree with a minimum mature height of 5m is to be provided within the front setback.

Siting the Development

3.1D Local Character and Context

Objective 3.1D-1	Design criteria
The built form, articulation and scale relates to the local character of the area and the context	6. Provide in the design statement a description as to how the built form of the development contributes to the character of the local area, using the guidance in Section 2D Local Character and Context .

3.1E Public Domain Interface

Objective 3.1E-1	Design criteria
Transition between private and public domain is achieved without compromising safety and security	7. Private courtyards within the front setback are only to be located within the articulation zones and / or behind the required front building line. 8. Windows and upper level balconies or terraces are to overlook the public domain. 9. Direct visibility is to be provided to the front door and garage door along paths and driveways from the public domain.

Objective 3.1E-2	Design criteria
Front fences do not dominate the public domain instead they respond to and compliment the context and character of the area	10. Front fences and walls within the front setback are to use visually permeable materials and treatments. 11. The maximum fence height within the front setback is 1.5m, with an average no greater than 1.2m. 12. No more than 50% of the allowable fence area should be solid (masonry, timber, metal or stone). 13. High solid acoustic fencing is only to be used to shield the dwelling from the noise from classified roads. The walls are to have a maximum height of 2.1m and be setback at least 1.5m from the property boundary with landscape planting provided between the wall and the boundary, with a mature height of at least 1.5m. 14. Unfinished timber paling and metal panel fences are not located within the setback to primary, secondary or parallel roads. 15. Courtyard fences and walls to secondary street frontages are to align with the facade fronting the street. Where solid it should be the same material as the building facade.

Objective 3.1E-3	Design criteria
Amenity of the public domain is retained and enhanced	16. Retaining walls greater than 0.6m within the front setback are to be softened by planting for a minimum depth of 600mm on the low side of the retaining wall 17. Mail boxes are to be located at each dwelling entry not in a central location. 18. Where development adjoins public parks, open space or bushland, or is a corner site, the design positively addresses this interface using at least one of the following design solutions: • street access, pedestrian paths and building entries which are clearly defined • paths, low fences and planting that clearly delineate between communal/private open space and the adjoining public open space • walls fronting the public spaces are to have openings not less than 25% of the surface area of the wall.

3.1F Internal Streets - Pedestrian and Vehicle Access

Objective 3.1F-1	Design criteria
Car park design and access is safe and minimises impact on habitable spaces	19. Parking spaces and circulation to comply with AS2980.1 20. Where driveways are provided as a battle-axe the: • setback from a fence is to be at least 1m • setback from another dwelling is to be at least 1m • setback from a habitable room window is to be at least 3m if the window exceeds 1m^2.

Objective 3.1F-2	Design criteria
Visual and environmental impacts of car parking are minimised	21. Upper most level of basement car parking not to protrude more than 1m above finished ground level except at the entrance to the car park. 22. The maximum height of the facade opening for the car park entry is to be 2.7m 23. Where a driveway is adjacent a tree, it is either outside the drip line or complies with the recommendations in a report prepared by a qualified arborist.

3.1G Orientation and Siting

Objective 3.1G-1	Design criteria
Building types and layouts respond to the streetscape and site while optimising solar access within the development and maximise street surveillance and connectivity	24. Each dwelling has a frontage to a primary, secondary or parallel road. 25. (Development Applications Only) A dwelling on a battle-axe block does not need a frontage to a road, but has an access to the primary road of at least 3m. 26. Every wall that faces the street has a window to a habitable room at each level.

Objective 3.1G-2	Design criteria
Overshadowing of neighbouring properties is minimised during mid winter	27. The window to a living room of an adjoining dwelling that is more than 3m from the boundary is to receive more than 2hrs of solar access between 9am and 3pm on the winter solstice (June 21). 28. Where the above criteria is not satisfied, the proposed development ensures solar access to neighbouring properties is not reduced by more than 20%. 29. Where living room windows of an adjoining dwelling cannot be verified the proposed development is accommodated within a building envelope defined by a 35° plane at 3.6m above the boundary.

Objective 3.1G-3	Design criteria
The development responds to the natural landform of the site, reducing the visual impact and minimising earthworks	30. On sloping sites the buildings are to respond to the topography with changes in floor level to minimise cut and fill. Unless a dwelling is over a basement, the ground floor is not to be more than 1.3m above ground level, and no more than 1m below ground level. 31. Excavation must not exceed a maximum depth measured from ground level (existing) if: • located nor more than 1m from any boundary - 1m • located more than 1m from any boundary - 3m 32. Fill outside the building footprint must not exceed a maximum height measured from ground level (existing) if: • located nor more than 1m from any boundary - 0.6m • located more than 1m from any boundary - 1m

Note: For complying development the Codes SEPP contains development standards for earthworks, retaining walls and structural support.

3.1H Building Separation

Objective 3.1H-1	Design criteria
Provide adequate space between buildings to allow for landscape, provide visual separation and daylight access between buildings	33. The minimum separation between two or more buildings on the same lot is 3m.

Note:

- Building separation may need to be increased to provide adequate privacy (Section 3.1P) or solar access (Section 3.1I)
- The minimum separation between the development and dwellings on adjoining land will be determined by the side and rear setbacks

Amenity

3.1I Solar and Daylight Access

Objective 3.1I-1	Design criteria
To optimise the number of dwellings recieving sunlight to habitable rooms and private open spaces. Solar access enables passive solar heating in winter and provides a healthy indoor environment	34. A living room or private open space in each dwelling is to receive a minimum of 2 hours direct sunlight between 9 am and 3 pm on the winter solstice. 35. Direct sunlight is achieved when 1m² of direct sunlight on the glass is achieved for at least 15 minutes. To satisfy 2hrs direct sunlight, 8 periods of 15 minutes will need to be achieved - the periods do not need to be consecutive.

Objective 3.1I-2	Design criteria
To provide good access to daylight suited to the function of the room and to minimise reliance on artificial lighting and improve amenity	36. Every habitable room must have a window in an external wall with a total minimum glass area of not less than 15% of the floor area of the room. 37. Daylight may not be borrowed from other rooms, except where a room has a frontage to a classified road. 38. No part of a habitable room is to be more than 8m from a window. 39. No part of a kitchen work surface is to be more than 6m from a window or skylight. 40. Where courtyards are used : • Courtyards are fully open to the sky • the courtyard is to have a minimum dimension of one third of the perimeter wall height, and area of 4m².

3.1J Natural Ventilation

Objective 3.1J-1	Design criteria
All habitable rooms are naturally ventilated	41. Natural ventilation is available to each habitable room. 42. Each dwelling is to be cross ventilated.

3.1K Ceiling Height

Objective 3.1K-1	Design criteria
Ceiling height achieves sufficient natural ventilation and daylight access and provides spatial quality	43. Measured from finished floor level to finished ceiling level, minimum ceiling heights are: • 2.7m to ground floor habitable rooms • 2.7m to upper level living rooms • 2.4m to upper level habitable rooms (excluding living rooms)

3.1L Dwelling Size and Layout

Objective 3.1L-1	Design criteria
The dwelling has a sufficient area to ensure the layout of rooms are functional, well organised and provide a high standard of amenity	44. Dwellings are required to have the following minimum internal floor areas: • 1 bed 65m² • 2 bed 90m² • 3+ bed 115m²
	45. The minimum internal areas include only one bathroom. Additional bathrooms increase the minimum internal area by 5m² each.
	46. A fourth bedroom and further additional bedrooms increase the minimum internal area by 12m² each.
	47. Kitchens should not be part of a circulation space, except in 1 bedroom dwellings.
	48. A window is visible from any point in a habitable room.

Objective 3.1L-2	Design criteria
Dwelling layouts are designed to accommodate a variety of household activities and needs and is appropriate for the number of occupants	49. One bedroom has a minimum area of 10m² and other bedrooms 9m² (excluding wardrobe space).
	50. Bedrooms have a minimum dimension of 3m (excluding wardrobe space).
	51. Combined living and dining rooms are to have a minimum area of: • 1 and 2 bed 24m² • 3+ bed 28m²
	52. Living room or lounge rooms are to have a minimum width of 4m (excluding fixtures).

3.1M Private Open Spaces

Objective 3.1M-1	Design criteria
Dwellings provide appropriately sized private open space and balconies to enhance residential amenity	53. All dwellings are required to have a primary private open space of at least 16m^2. 54. The minimum dimension of the included area is 3m, and excludes any storage space.

Objective 3.1M-2	Design criteria
Primary private open space and balconies are appropriately located to enhance liveability for residents	55. The primary private open space is to be located adjacent to the living room, dining room or kitchen to extend the living space. 56. 50% of the primary private open space should be covered to provide shade and protection from rain.

3.1N Storage

Objective 3.1N-1	Design criteria
Adequate, well designed storage is provided in each dwelling	57. In addition to storage in kitchens, bathrooms and bedrooms, the following storage is provided: • 1 bed 6m^3 • 2 bed 8m^3 • 3+ bed 10m^3 58. At least 50% of the required storage is to be located inside the dwelling. 59. Storage not located in dwellings is secure and clearly allocated to specific dwellings if in a common area.

3.1O Car and Bicycle Parking

Objective 3.1O-1	Design criteria
Car parking is provided appropriate for the scale of the development	60. Where parking is provided above ground, at least one car space is to be provided per dwelling. 61. [Development applications only] Car parking is to be provided at the rate required for a dual occupancy within a Development Control Plan that applies to the land. If there is no rate in a DCP - 1 space is to be provided.

Objective 3.1O-2	Design criteria
Parking and facilities are provided for other modes of transport	62. Covered space is to be provided for the secure storage of at least 1 bicycle per dwelling.

Objective 3.1O-3	Design criteria
Visual and environmental impacts of on-grade car parking and garages do not dominate the streetscape and have an appropriate scale relationship with the dwelling	63. On-grade car parking, garages and car ports are setback from the boundary to the primary or secondary road by: • If the setback of dwelling is less than 4.5m - 1m behind building line • If the setback of dwelling is less than 4.5m – 5.5m 64. The maximum aggregated garage door width that has a frontage to a primary road is – **Lot width** — **Aggregate garage door width** 7.5- 12.5m — 3.2m wide >12.5m — 6.0m wide 65. Where the lot width is less than 7.5m the car space and / or garage is provided from a secondary road, parallel road or lane.

3.1P Visual Privacy

Objective 3.1P-1	Design criteria
Adequate building separation distances are shared equitably between neighbouring dwellings to achieve reasonable levels of external and internal visual privacy while retaining amenity for the dwelling	66. A privacy screen is required where the distance from the window of a habitable room to the boundary is : • less than 3m, and the habitable room has a FFL greater than 1m above existing ground level, or • less than 6m, and the habitable room has a FFL greater than 3m above ground level Note: This does not apply to bedroom windows that have an area less than 2m^2 67. A privacy screen is not required on any window that has a sill height greater than 1.5m, or any window that has a frontage to a road or public open space. 68. A privacy screen is required where the distance of a terrace, balcony or verandah to the boundary is : • less than 3m, and the habitable room has a FFL greater than 1m above existing ground level, or • less than 6m, and the habitable room has a FFL greater than 2m above ground level Note: The privacy screen is only required to the edge of the terrace that faces the boundary. 69. A privacy screen is not required to a balcony or terrace that has an area less than 2m^2, or a balcony or terrace of any size that has a frontage to a road or public space. 70. Separation distances between windows and balconies of dwellings on the same site are double the distances above.

Objective 3.1P-2	Design criteria
Site and building design elements increase privacy without compromising access to light and air and balance outlook and views from habitable rooms and private open space	71. Where privacy screens are provided to windows, they must not cover part of the window required to meet the minimum daylight or solar access requirements, or restrict ventilation.

3.1Q Acoustic Privacy

Objective 3.3Q-1	Design criteria
Noise transfer is minimised through the siting of buildings and building layout	72. All noise generating equipment such as air conditioning units, swimming pool filters, fixed vacuum systems and driveway entry shutters must be designed to protect the acoustic privacy of residents and neighbours. All such noise generating equipment must be acoustically screened. The noise level generated by any equipment must not exceed an LAeq (15min) of 5dB(A) above background noise at the property boundary.

3.1R Noise and Pollution

Objective 3.1R-1	Design criteria
Ensure outside noise levels are controlled to acceptable levels in living and bedrooms of dwellings	73. Any development within the 20 ANEF contour is to be constructed to comply with AS/NZS Acoustics – aircraft noise intrusion. 74. Dwellings that are within 100m of a road corridor with an annual daily traffic (AADT) volume of more than 1,000 vehicles (based on traffic volume data published on the website of the RMS) or 80m from a rail corridor are to have LA_{eq} measures are not exceeding: • in any bedroom: 35dB(A) between 10pm-7am • anywhere else in the building (other than a kitchen, garage, bathroom or hallway): 40dB(A) at any time This can be achieved by: • a full noise assessment prepared by a qualified acoustic engineer • complying with relevant noise control treatment for sleeping areas and other habitable rooms in Appendix C of Draft Guide to Infrastructure Development Near Rail Corridors Busy Roads. 75. Dwellings within 25m of a rail corridor are required to have a vibration assessment carried out by a qualified structural engineer.

Configuration

3.1S Universal Design

Objective 3.1S-1	Design criteria
Universal design features are included in dwelling design to promote flexible housing for all community members	76. All dwellings are to include the Liveable Housing Design Guideline's Silver level universal design features.

3.1U Architectural Form and Roof Design

Objective 3.1U-1	Design criteria
The architectural form is defined by a balanced composition of elements. It responds to internal layouts and desirable elements in the streetscape. It is a considered 3- dimensional form	77. Provide in the design statement a description as to how the architectural form reduces the visual bulk and responds and provides a cohesive design response. Note: Refer to Part 2 for guidance.

Objective 3.1U-2	Design criteria
The roof treatments are integrated into the building design and positively respond to the street	78. The roof design is integrated harmoniously with the overall building form. 79. Skylights and ventilation systems are to be integrated into the roof design.

3.1V Visual Appearance and Articulation

Objective 3.1V-1	Design criteria
To promote well designed buildings of high architectural quality that contribute to the local character	80. Provide in the design statement a description as to how the aesthetics and articulation contribute to the character of the local area. 81. An articulation zone of 1.5m is provided forward of the building line. The articulation zones includes one or more of the following: • Veranda / Porch • Balcony • Pergola • Entry feature or portico • Awnings or other features over windows • Eaves and sun shading • Window box treatment • Recessed or projecting architectural elements • Bay windows

3.1W Pools and Ancillary Development

Objective 3.1W-1	Design criteria
The location of swimming pools and spas minimise the impacts of adjoining properties	82. Swimming pools and spas are located in the rear yard
	83. The coping around a swimming pool or spa is not be more than 1.4m above ground level (existing)
	84. The decking or paved area around a swimming pool or spa (excluding a coping less than 300mm wide) is not be more than 0.6m above ground level (existing).
	85. Water from a swimming pool or spa must be discharged in accordance with an approval under the Local Government Act 1993 if the lot is not connected to a sewer main.
	86. The pump is housed in an enclosure that is soundproofed.

Note: A child-resistant barrier must be constructed or installed in accordance with the requirements of the Swimming Pools Act 1992

Objective 3.1W-2	Design criteria
Detached studios, and outbuildings should not dominate the rear garden. They are useful to activate rear lanes providing visual surveillance	87. A detached studio or outbuilding must not have a building height of more than: • 3.6m or • if the studio is located within 0.9m of a lane - 6.5m
	88. The side and rear setbacks for an outbuilding or detached studio are: • if the building is located within 0.9m of a lane - 0m to side and rear boundaries, otherwise, • 0m to side boundaries, and 3m to rear boundaries
	89. The floor area of a detached studio or outbuilding must not be more than 36m² and is included in the overall gross floor area of for the site.
	90. Any window in a detached studio where the floor level is more than 1.5m above ground level must not be greater than 2m² in any wall face.

Note: Privacy and building separation and other design criteria still apply

Environment

3.1X Energy Efficiency

Objective 3.1X-1	Design criteria
Development incorporates passive environmental design	91. Provide an outdoor area for clothes drying that can accommodate at least 16 lineal metres of clothes line for each dwelling
	92. Any clothes drying area should be screened from public and communal areas.

Note: A CDC or DA for a dwelling is required to have a BASIX Certificate that applies a minimum energy consumption target.

3.1Y Water Management and Conservation

Objective 3.1Y-1	Design criteria
Urban stormwater is treated on site before being discharged to receiving waters	93. All stormwater drainage collecting as a result of the erection of the development must be conveyed by a gravity fed or charged system to: • a public drainage system • an inter-allottment drainage system • an on-site disposal system
	94. All stormwater drainage systems within a lot and the connection to a public or an inter-allotment drainage system must: • if approval is required under section 68 of the Local Government Act 1993, be approved under that Act • if an approval is not required under section 68 of the Local Government Act 1993, comply with any requirements for the disposal of stormwater drainage contained in a development control plan that is applicable to the land.

Objective 3.1Y-2	Design criteria
Flood management systems are integrated into site design	95. Detention tanks are to be located under paved areas, driveways or in basements

Note: A CDC or DA for a dwelling is required to have a BASIX Certificatate that applies a minimum water consumption target.

3.1 Z Waste Management

Objective 3.1Z-1	Design criteria
Waste storage facilities are designed to minimise impacts on the streetscape, building entry and amenity of residents	96. Storage areas for rubbish and recycling bins should be provided • within garages, • in screened enclosure that is part of the overall building design discreetly, or • in the basement car park 97. The number and type of bins provided is to be in accordance with Council policy

3.2 Terrace Houses

This part provides the objectives and design criteria for development that contains more than two dwellings and each dwelling has a frontage to the street.

This section contains objectives and design principles:

Objectives : relate to the design principles and set out what the design is trying to achieve.

Design criteria: the measurable standards for how an objective can be achieved.

A complying development certificate must comply with each of the design criteria.

A development application can comply with the design criteria or use an alternate solution that satisfies the objective.

For guidance and explanation of the design criteria refer to Part 2 - Design Guidance

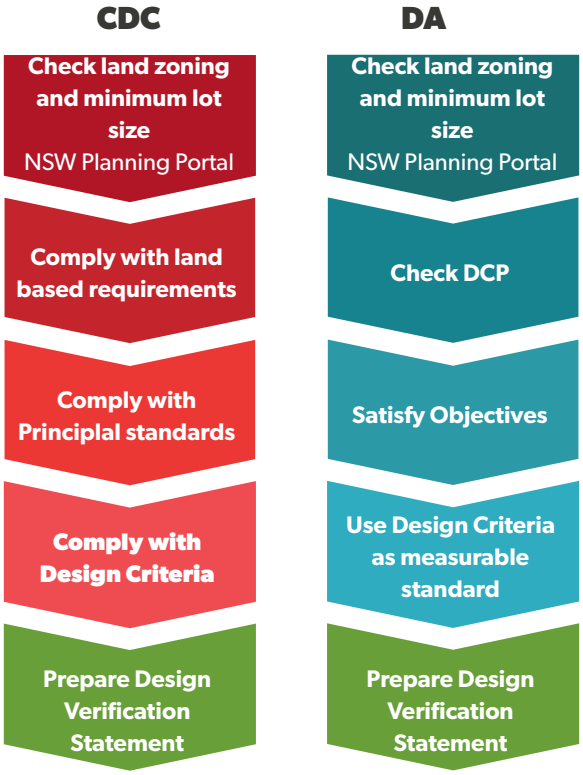


Figure 3-5 Workflows: Preparing a DA or CDC

Key characteristics of developments that includes terrace houses are:

- Each dwelling is typically built to both side boundaries;
- Dwellings must have a frontage to a road;
- Carparking can be located to the front, off a rear lane, or within and underground carpark;
- The private open space is generally located at or near ground level; and
- There are no other dwellings located above or below.

Strata titled development

More than two dwellings can be carried out on one lot of land as a Strata titled development.

These are also referred to as a multi-dwelling terraces.

They are strata titled either because the individual dwellings do not meet the minimum lot size requirements, or they have a basement car parking that does not enable simple Torrens titling.

A complying development application can be submitted where:

- Each dwelling has a frontage to a primary or a secondary road; and
- There are no dwellings above or below another dwelling.

Strata subdivision can be carried out as complying development.

Torrens titled development

More than two dwellings are constructed on one lot of land, however at the completion of the development each dwelling is located on a separate Torrens title lot.

They are commonly known as attached dwellings where they share a party wall, or dwelling houses where they have independent party walls.

The dwellings are constructed as a single development.

A complying development can be submitted where:

- each dwelling has a frontage to a primary or secondary road
- there is only one dwelling on a lot at the completion of the development

Concurrent subdivision and development consent may be obtained to enable each dwelling on its own Torrens title Lot.

Each lot must comply with the minimum lot sizes.

A development application will be required where the development does not comply with the development standards under complying development, or where they are part of a community titled development where the roads and common spaces are part of a community title.

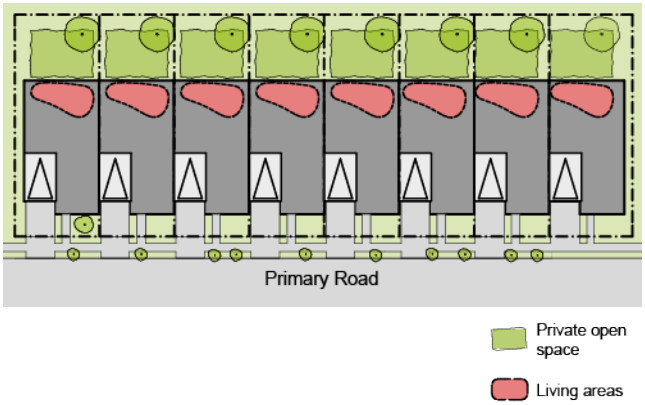


Figure 3-6 Terraces with garages fronting the street need a wider frontage but can be approved as a CDC or DA. This development could be torrens title subdivided

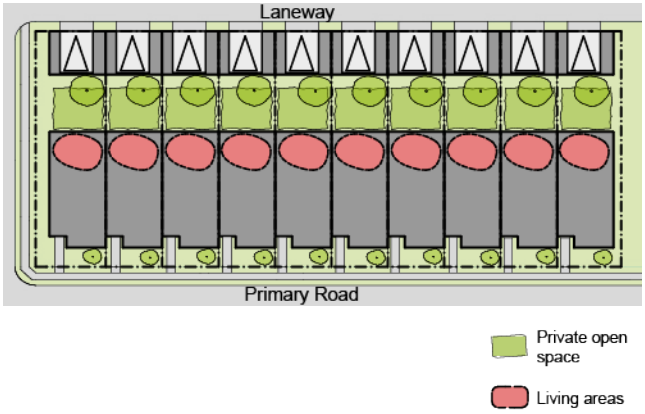


Figure 3-7 Terraces with garages on a rear lane can be approved as a CDC or DA. This development could be torrens title subdivided

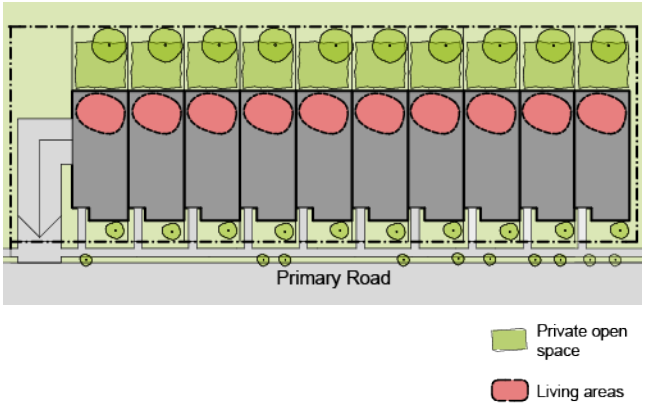


Figure 3-8 Terraces with a basement car park will be strata tiled and can be approved as a DA or CDC

Principal controls

3.2A Building Envelopes

Development Application

The local building envelope controls are to be found in the LEP and DCP that applies to the land. This may include:

- Maximum height of building
- Front, rear and side setbacks

The DCP may also provide direction on the character of the precinct and siting of the building.

Complying Development

The building envelope standards for complying development can be found in Medium Density Housing Code within ***State Environmental Planning Policy (Exempt and Complying Codes) 2008 (Codes SEPP).*** A summary is in the table below.

Standard	Summary Development Standard
Min lot size for each dwelling	200 m² 6m wide
Height of Building	9m
Primary Road Setback	Where existing dwellings are within 40m - average of two closest dwellings. Where no existing dwellings are within 40m then: **LOT AREA (m²) SETBACK** 200 - 300 3.5m >300 - 900 4.5m >900 - 1500 6.5m >1500+ 10m
Secondary Road setback	**LOT AREA (m²) SETBACK** 200 - 900 2m >900 - 1500 3m >1500+ 5m
Side Setbacks Applies only to the side boundary of the development site – not each individual lot.	Front half of the lot • up to 15m - 1.2m • if adjoining property is built to boundary - 0m Rear half of the lot, or distance >15m from front boundary; • Building envelope defined by 45° plane projected from a height 3.6m above the boundary.

Rear setback	Where the part of a development has a height of building less than 4.5m **LOT AREA (m²) SETBACK** 200 - 600 3m >600 - 1500 6m >1500+ 15m Where the part of a development has a height of building of 4.5m or more: **LOT AREA (m²) SETBACK** 200 - 1500 10m >1500+ 15m
Lane Setback	0m

3.2B Floor Space Ratio

Development Application: Refer to LEP or DCP that applies to the land.

Complying Development: Refer to *Codes SEPP* and summary table below:

Standard	Summary Development Standard
Maximum floor space ratio for each lot	**LOT AREA (m²) FSR** 200 - 300 0.80:1 >300 - 400 0.75:1 >400 - 500 0.75:1 >500 + 0.70:1

3.2C Landscaped Area

Development Application: Refer to LEP or DCP that applies to the land for minimum areas,

Complying Development: Refer to ***Codes SEPP*** and summary table below for minimum areas.

Standard	Summary Development Standard
Minimum Landscaped Area for each lot	**LOT AREA (m²)** — **LANDSCAPED AREA AS PERCENTAGE OF LOT** 200 - 300 — 20% >300 - 400 — 25% >400 - 500 — 30% >500+ — 35% Minimum dimension of any landscaped area included in calculation - 1.5m
Proportion of area forward of building line that contains landscaped area.	25% minimum

Objective 3.2C-1	Design criteria
Landscape design is viable and sustainable and supports healthy plant and tree growth	1. Ongoing maintenance plan is provided as part of the landscaped plan. 2. Minimum soil standards for plant sizes are provided in accordance with Table 1 in Section 2C

Objective 3.2C-2	Design criteria
Landscape design contributes to the streetscape and amenity	3. Landscape features including trees and rock outcrops are retained (except those where approval is granted under a CDC or Tree Preservation Order). 4. At least 1 medium sized tree with a minimum mature height of 8m is to be provided to the rear of the dwelling. 5. Where the front setback exceeds 3m a medium sized tree with a minimum mature height of 5m is to be provided within the front setback.

Siting the development

3.2D Local Character and Context

Objective 3.2D-1	Design criteria
The built form, articulation and scale relates to the local character of the area and the context	6. Provide in the design statement a description as to how the built form of the development contributes to the character of the local area, using the guidance in Section 2D ***Local Character and Context*** .

3.2E Public Domain Interface

Objective 3.2E-1	Design criteria
Transition between private and public domain is achieved without compromising safety and security	7. Private courtyards within the front setback are only to be located within the articulation zones and / or behind the required front building line. 8. Upper level balconies and / or windows are to overlook the public domain. 9. Direct visibility is to be provided to the front door and garage door along paths and driveways from the public domain.

Objective 3.2E-2	Design criteria
Front fences and walls do not dominate the public domain instead they respond to and compliment the context and character of the area	10. Front fences and walls along street frontages are to use visually permeable materials and treatments. 11. The maximum fence height within the front setback is 1.5m, with an average no greater than 1.2m. 12. No more than 50% of the allowable fence area should be solid (masonry, timber, metal or stone) 13. Unfinished timber paling and metal panel fences are not located within the setback to primary, secondary or parallel roads. 14. High solid acoustic fencing is only to be used to shield the dwelling from the noise from classified roads. The walls are to have a maximum height of 2.1m and be setback at least 1.5m from the property boundary with landscape planting provided between the wall and the boundary, with a mature height of at least 1.5m 15. Courtyard fences and walls to secondary street frontages are to align with the facade fronting the street. Where solid it should be the same material as the facade.

Objective 3.2E-3	Design criteria
Amenity of the public domain is retained and enhanced	16. Retaining walls greater than 0.6m within the front setback are to be softened by planting for a minimum depth of 600mm on the low side of the retaining wall 17. Mail boxes are to be located at each dwelling entry not in a central location. 18. Where development adjoins public parks, open space or bushland, or is a corner site, the design positively addresses this interface using at least one of the following design solutions: • street access, pedestrian paths and building entries which are clearly defined • paths, low fences and planting that clearly delineate between communal/private open space and the adjoining public open space • walls fronting the public spaces are to have openings not less than 25% of the surface area of the wall.

3.2F Internal Streets - Pedestrian and Vehicle Access

Objective 3.2F-1	Design criteria
Car park design and access is safe and minimises impact on habitable spaces	19. Vehicle access for a development that has a frontage to a classified road is to be by a rear lane or secondary frontage or a single driveway fronting the classified road, 20. Where the single driveway services a development with three or more dwellings vehicles must enter and leave in a forward direction. 21. Parking spaces and circulation to comply with AS2980.1

Objective 3.2F-2	Design criteria
Visual and environmental impacts of car parking are minimised	22. Basement car parking not to protrude more than 1m above finished ground level except at the entrance to the car park. 23. Basement car park entrances to have a maximum width of 3.5m where there are less than 10 dwellings being serviced by the car park. 24. The maximum height of the facade opening the car park is to be 2.7m 25. Where driveways are adjacent a tree, it is either outside the drip line or complies with the recommendations in a report prepared by a qualified arborist.

3.2G Orientation and Siting

Objective 3.2G-1	Design criteria
Building types and layouts respond to the streetscape and site while optimising solar access within the development and maximise street surveillance and connectivity	26. Each dwelling has a frontage to a primary, secondary or parallel road. 27. Every wall that faces the street has a window to a habitable room at each level.

Objective 3.2G-2	Design criteria
Overshadowing of neighbouring properties is minimised during mid winter	28. The window to a living room of an adjoining dwelling that is more than 3m from the boundary is to recieve greater than 2hrs of solar access between 9am and 3pm on the winter solstice (June 21) 29. Where the above criteria is not satisfied, the proposed development ensures solar access to neighbouring properties is not reduced by more than 20%. 30. Where living room windows of an adjoining dwelling cannot be verified the proposed development is accommodated within a building envelope defined by a 35° plane at 3.6m above the boundary.

Objective 3.2G-3	Design criteria
The development responds to the natural landform of the site, reducing the visual impact and minimising earthworks	31. On sloping sites the buildings are to respond to the topography with changes in floor level to minimise cut and fill. Unless a dwelling is over a basement, the ground floor is not to be more than 1.3m above ground level, and no more than 1m below ground level. 32. Excavation must not exceed a maximum depth measured from ground level (existing) if: • located nor more than 1m from any boundary - 1m • located more than 1m from any boundary - 3m 33. Fill outside the building footprint must not exceed a maximum height measured from ground level if: • located nor more than 1m from any boundary - 0.6m • located more than 1m from any boundary - 1m

Note: For complying development the Codes SEPP contains development standards for earthworks, retaining walls and structural support.

3.2H Building Separation

Objective 3.2H-1	Design criteria
Provide adequate space between buildings to allow for landscape, provide visual separation, reduce visual bulk and daylight access between buildings	34. The minimum separation between two or more buildings on the same lot is 3m. 35. Provide a break of 3m between rows of terraces more than 45m long.

Note:

- Building separation may need to be increased to provide adequate privacy (Section 3.2P) or solar access (Section 3.2I)
- The minimum separation between the development and dwellings on adjoining land will be determined by the side and rear setbacks

Amenity

3.2I Solar and Daylight Access

Objective 3.2I-1	Design criteria
To optimise the number of dwellings recieving sunlight to habitable rooms and private open spaces. Solar access enables passive solar heating in winter and provides a healthy indoor environment	36. A living room or private open space in each dwelling is to receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at the winter solstice. 37. Direct sunlight is achieved when 1m^2 of direct sunlight on the glass is achieved for at least 15 minutes. To satisfy 2hrs direct sunlight, 8 periods of 15 minutes will need to be achieved - the periods do not need to be consecutive.

Objective 3.2I-2	Design criteria
To provide good access to daylight suited to the function of the room and to minimise reliance on artificial lighting and improve amenity	38. Every habitable room must have a window in an external wall with a total minimum glass area of not less than 15% of the floor area of the room. 39. Daylight may not be borrowed from other rooms, except where a room has a frontage to a classified road. 40. No part of a habitable room is to have any part more than 8m from a window 41. No part of a kitchen work surface is to be more than 6m from a window or skylight 42. Where courtyards are used : • Courtyards are fully open to the sky • the courtyard is to have a minimum dimension of one third of the perimeter wall height, and area of 3m^2

3.2J Natural Ventilation

Objective 3.2J-1	Design criteria
All habitable rooms are naturally ventilated	43. Natural ventilation is available to each habitable room 44. Each dwelling is to be cross ventilated.

3.2K Ceiling Height

Objective 3.2K-1	Design criteria
Ceiling height achieves sufficient natural ventilation and daylight access and provides spatial quality	45. Measured from finished floor level to finished ceiling level, minimum ceiling heights are: • 2.7m to the ground habitable rooms • 2.7m to upper level living rooms • 2.4m to first floor bedrooms

3.2L Dwelling Size and Layout

Objective 3.2L-1	Design criteria
The dwelling has a sufficient area to ensure the layout of rooms are functional, well organised and provides a high standard of amenity	46. Dwellings are required to have the following minimum internal areas: • 1 bed 65m² • 2 bed 90m² • 3+ bed 115m²
	47. The minimum internal areas include only one bathroom. Additional bathrooms increase the minimum internal area by 5m² each.
	48. A fourth bedroom and further additional bedrooms increase the minimum internal area by 12m² each
	49. Kitchens should not be part of a circulation space, except in 1 bedroom dwellings.
	50. A window is visible from any point in a habitable room.

Objective 3.2L-2	Design criteria
Dwelling layouts are designed to accommodate a variety of household activities and needs and is appropriate for the number of occupants	51. Master bedrooms have a minimum area of 10m² and other bedrooms 9m² (excluding wardrobe space).
	52. Bedrooms have a minimum dimension of 3m (excluding wardrobe space).
	53. Combined living and dining rooms are to have a minimum area of: • 1 bed and 2 bed 6m³ • 3+ bed 8m³
	54. Living rooms or combined living/dining areas are to have a minimum width of 4m (excluding fixtures).

3.2M Private Open Spaces

Objective 3.2M-1	Design criteria
Dwellings provide appropriately sized private open space and balconies to enhance residential amenity	55. All dwellings are required to have a primary private open space of at least 16m².
	56. The minimum dimension of the included area is 3m, and excludes any storage space.

Objective 3.2M-2	Design criteria
Primary private open space and balconies are appropriately located to enhance liveability for residents	57. Primary open space and balconies is to be located adjacent to the living room, dining room or kitchen to extend the living space. 58. 50% of the primary private open space should be covered to provide shade and protection from rain.

3.2N Storage

Objective 3.2N-1	Design criteria
Adequate, well designed storage is provided in each dwelling	59. In addition to storage in kitchens, bathrooms and bedrooms, the following storage is provided: • 1 bed 6m³ • 2 bed 8m³ • 3+ bed 10m³ 60. At least 50% of the required storage is to be located within the dwelling. 61. Storage not located in dwellings is secure and clearly allocated to specific dwellings if in a common area.

3.2O Car and Bicycle Parking

Objective 3.2O-1	Design criteria
Car parking is provided appropriate for the scale of the development	62. Where parking is provided above ground, at least one car space is to be provided per dwelling 63. [Development applications only] Car parking is to be provided at the rate required for a multi-dwelling housing within a Development Control Plan that applies to the land. If there is no rate in a DCP - 1 space is to be provided per dwelling 64. Visitor parking is to be provided where a basement car park serves more than 10 dwellings. Provide 1 space per 5 dwellings.

Objective 3.2O-2	Design criteria
Parking and facilities are provided for other modes of transport	65. Covered space is to be provided for the secure storage of at least 1 bicycle per dwelling.

Objective 3.2O-3	Design criteria
Visual and environmental impacts of on-grade car parking and garages do not dominate the streetscape and have an appropiate scale relationship with the dwelling	66. On-grade car parking is to be setback from the boundary to the primary or secondary road by: • If the setback of dwelling is >4.5m - 1m behind building line • If the setback of dwelling is <4.5m – 5.5m
	67. The maximum aggregated garage door width that has a frontage to a primary road is: **Lot width** — **Aggregate garage door width** 7.5- 12.5m — 3.2m wide >12.5m — 6.0m wide
	68. Where the lot width is <7.5m the car space and / or garage is provided from a secondary road, parallel road or lane.
	69. Shade trees are planted between every 4-5 parking spaces to reduce increased surface temperatures from large areas of paving. A shade tree has a minimum mature height of 8m and mature spread of 6m.
	70. Car space are to be separated by not less than 3m from windows or doors to habitable rooms of dwellings that are not associated with the parking space.

Objective 3.2O-4	Design criteria
Provision is made for short stay parking for delivery vehicles	71. For developments with 40 or more dwellings and served by basement car parking - provide 1 short stay parking space for a Small Rigid Vehicle (SRV) Note: Space is not required to be in basement

3.2P Visual Privacy

Objective 3.2P-1	Design criteria
Adequate building separation distances are shared equitably between neighboring dwellings to achieve reasonable levels of external and internal visual privacy while retaining amenity for the dwelling	72. A privacy screen is required where the distance from the window of a habitable room to the boundary is : • less than 3m, and the habitable room has a FFL greater than 1m above existing ground level, or • less than 6m, and the habitable room has a FFL greater than 3m above ground level Note: This does not apply to bedroom windows that have an area less than 2m^2
	73. A privacy screen is not required on any window that has a sill height greater than 1.5m, or any window that has a frontage to a road or public open space.

74. A privacy screen is required where the distance of a terrace, balcony or verandah to the boundary is :
    - grester than 3m and the habitable room has a FFL less than 1m above existing ground level, or
    - greater than 6m and the habitable room has a FFL less than 2m above ground level

    Note: The privacy screen is only required to the edge of the terrace that faces the boundary.

75. A privacy screen is not required to a balcony or terrace that has an area less than 2m^2, or a balcony or terrace of any size that has a frontage to a road or public space.

76. Separation distances between windows and balconies of dwellings on the same site are double the distances above.

Objective 3.2P-2	Design criteria
Site and building design elements increase privacy without compromising access to light and air and balance outlook and views from habitable rooms and private open space	77. Where privacy screens are provided to windows, they must not cover part of the window required to meet the minimum daylight or solar access requirements, or restrict ventilation.

3.2Q Acoustic Privacy

Objective 3.2Q-1	Design criteria
Noise transfer is minimised through the siting of buildings and building layout	78. Noise sources not associated with the dwelling such as service areas, plant rooms, building services, mechanical equipment, should be located at least 3m away from bedrooms 79. All noise generating equipment such as air conditioning units, swimming pool filters, fixed vacuum systems and driveway entry shutters must be designed to protect the acoustic privacy of residents and neighbours. All such noise generating equipment must be acoustically screened. The noise level generated by any equipment must not exceed an LAeq (15min) of 5dB(A) above background noise at the property boundary.

3.2R Noise and Pollution

Objective 3.2R-1	Design criteria
Ensure outside noise levels are controlled to acceptable levels in living and bedrooms of dwellings	80. Any development within the 20 ANEF contour is to be constructed to comply with AS/NZS Acoustics – aircraft noise intrusion.
	81. Dwellings that are within 100m of a road corridor with an annual daily traffic (AADT) volume of more than 1,000 vehicles (based on traffic volume data published on the website of the RMS) or 80m from a rail corridor are to have LA_{eq} measures are not exceeding: • in any bedroom: 35dB(A) between 10pm-7am • anywhere else in the building (other than a kitchen, garage, bathroom or hallway): 40dB(A) at any time This can be achieved by: • a full noise assessment prepared by a qualified acoustic engineer • complying with relevant noise control treatment for sleeping areas and other habitable rooms in Appendix C of Draft Guide to infrastructure development near rail corridors busy roads.
	82. Dwellings within 25m of a rail corridor are required to have a vibration assessment carried out by a qualified structural engineer

Configuration

3.2S Universal Design

Objective 3.2S-1	Design criteria
Universal design features are included in dwelling design to promote flexible housing for all community members	83. All dwellings are to include the Liveable Housing Design Guideline's silver level universal design features.

3.2U Architectural Form and Roof Design

Objective 3.2U-1	Design criteria
The architectural form is defined by a balanced composition of elements. It responds to internal layouts and desirable elements in the streetscape. It is a considered 3- dimensional form	84. Provide in the design statement a description as to how the architectural form reduces the visual bulk and responds and provides a cohesive design response. Note: Refer to Part 2 for guidance.

Objective 3.2U-2	Design criteria
The roof treatments are integrated into the building design and positively respond to the street	85. The roof design is integrated with the overall building form.
	86. Skylights and ventilation systems are to be integrated into the roof design

3.2V Visual Appearance and Articulation

Objective 3.2V-1	Design criteria
To promote well designed buildings of high architectural quality that contribute to the local character	87. Provide in the design statement a description as to how the aesthetics and articulation contribute to the character of the local area. Refer to Section 2 for guidance.
	88. An articulation zone of 1.5m is provided forward of the building line. The articulation zones includes one or more of the following: • Veranda / Porch • Balcony • Pergola • Entry feature or portico • Awnings or other features over windows • Eaves and sun shading • Window box treatment • Recessed or projecting architectural elements • Bay windows

3.2W Pools and Ancillary Development

Objective 3.2W-1	Design criteria
The location of swimming pools and spas minimise the impacts of adjoining properties	89. Swimming pools and spas are located in the rear yard
	90. The coping around a swimming pool or spa is not more than 1.4m above ground level (existing)
	91. The decking or paved area around a swimming pool or spa (excluding a coping less than 300mm wide) is not more than 0.6m above ground level (existing)
	92. Water from a swimming pool or spa must be discharged in accordance with an approval under the Local Government Act 1993 if the lot is not connected to a sewer main.
	93. The pump is housed in an enclosure that is soundproofed.

Note: A child-resistant barrier must be constructed or installed in accordance with the requirements of the Swimming Pools Act 1992.

Objective 3.2W-2	Design criteria
Detached studios, and outbuildings should not dominate the rear garden. They are useful to activate rear lanes providing visual surveillance	94. A detached studio or outbuilding must not have a building height of more than: • 3.6m or • if the studion is located within 0.9m of a lane - 6m
	95. The side and rear setbacks for an outbuilding or detached studio are: • if the building is located within 0.9m of a lane - 0m to side and rear boundaries, otherwise, • 0m to side boundaries, and 3m to rear boundaries
	96. The floor area of a detached studio or outbuilding must not be more than 36m^2 and is included in the overall gross floor area of for the site.
	97. Any window in a detached studio where the floor level is more than 1.5m above ground level must not be greater than 2m^2 in any wall face.

Note: Privacy and building separation and other design criteria apply to ancillary development

Environment

3.2X Energy Efficiency

Objective 3.2X-1	Design criteria
Development incorporates passive environmental design	98. Provide an outdoor area for clothes drying that can accommodate at least 16 lineal metres of clothes line
	99. Any clothes drying area should be screened from public and communal areas.

Note: A CDC or DA for a dwelling is required to have a BASIX Certificatate that applies a minimum energy consumption target.

3.2Y Water Management and Conservation

Objective 3.2Y-1	Design criteria
Potable water use is minimised	100. Provide individual meters for hot and cold water consumption.

Objective 3.2Y-2	Design criteria
Urban stormwater is treated on site before being discharged to receiving waters	101. All stormwater drainage collecting as a result of the erection of the development must be conveyed by a gravity fed or charged system to: • a public drainage system • an inter-allottment drainage system • an on-site disposal system
	102. All stormwater drainage systems within a lot and the connection to a public or an inter-allotment drainage system must: • if approval is required under section 68 of the Local Government Act 1993, be approved under that Act • if an approval is not required under section 68 of the Local Government Act 1993, comply with any requirements for the disposal of stormwater drainage contained in a development control plan that is applicable to the land.

Objective 3.2X-3	Design criteria
Flood management systems are integrated into site design	103. Detention tanks are to be located under paved areas, driveways or in basements
	104. On large sites parks or open spaces are designed to provide temporary on site detention basins

Note: A CDC or DA for a dwelling is required to have a BASIX Certificatate that applies a minimum water consumption target.

3.2 Z Waste Management

Objective 3.2Z-1	Design criteria
Waste storage facilities are designed to minimise impacts on the streetscape, building entry and amenity of residents	105. Storage areas for rubbish and recycling bins should be provided • within garages, • in screened enclosure that is part of the overall building design discreetly, or • in the basement car park 106. The number and type of bins provided is to be in accordance with Council policy 107. A temporary collection space at the street frontage may be un-screened if only used on the day of collection

3.3 Multi-dwelling Housing and Master Planned Communities

This part provides the objectives and design criteria for development that contains more that two dwellings - there is no requirement for each dwelling to have a frontage to a public street.

This section contains objectives and design principles:

Objectives : relate to the design principles and set out what the design is trying to achieve.

Design criteria: the measurable standards for how an objective can be achieved.

A development application can comply with the design criteria or use an alternate solution that satisfies the objective.

For guidance and explanation of the design criteria refer to Part 2 - Design Guidance

Figure 3-9 Workflows: Preparing a DA

Key characteristics of multi-dwelling housing and master planned communities are:

- Each dwelling typically has its entry and private open space located at or near ground level; and
- There are no other dwellings above or below a dwelling.

This form of development is best utilised where the creation of new streets and lanes provides the most efficient use of land.

The new network of streets and lanes is to have a clear hierarchy creating safe and connected environments. It is preferred if new streets are public and connect through to other streets or create a ring.

Strata titled development

Multi-dwelling housing is a form of medium density development that is strata titled. This form of development is differentiated from other medium density housing in that there is common area that consists of communal open space, private streets and internal circulation networks

These are commonly referred to as townhouses or villas.

They are strata titled either because the individual dwellings do not meet the minimum lot size requirements, they have basement car parking, or a configuration of the lot that does not enable simple Torrens titling.

The dwellings can be attached or detached.

Car parking can be located to the front, off a rear lane, an internal street or within an under ground car park.

This form of development cannot be carried out as complying development.

A development application is required for consent.

Strata subdivision can be carried out as complying development.

Master planned communities

Medium density housing is often carried out on large lots in the form of a master planned community. The individual buildings or groups of buildings containing dwellings are often on separate lots as strata plans or torrens title.

A community title will link the separate titles and contain the private roads and common open space in common ownership.

For larger lots it is preferable that internal roads area created as public roads in increase the permeability of the overall neighbourhood and provide flexibility in servicing and subdivision.

A development application is required for community title subdivision and may be approved concurrently.

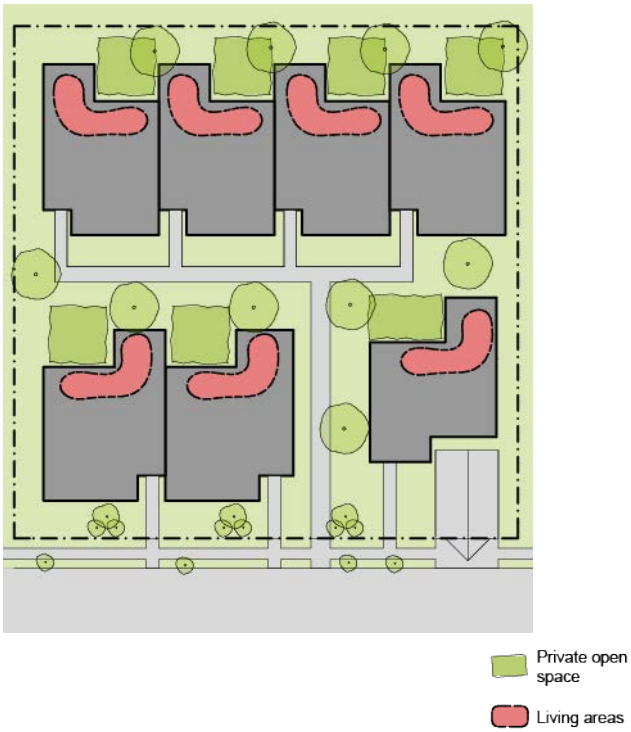


Figure 3-11 Town house development with basement car park

Figure 3-12 Town house development with basement car park

Figure 3-10 Master planned community with internal streets and multiple buildings

Principal controls

3.3A. Building Envelopes

Development Application

The local building envelope controls are to be found in the LEP and DCP that applies to the land. This may include:

- Maximum height of building
- Front, rear and side setbacks

The DCP may also provide direction on the character of the precinct and siting of the building.

3.3B Floor Space Ratio

Development Application

Refer to LEP or DCP that applies to the land for the floor space ratio.

3.3C Landscaped Area

Development Application

Refer to LEP or DCP that applies to the land for minimum areas. Where the DCP or LEP does not provide a landscaped area, then the minimum landscaped area is 30% of the development site.

Objective 3.3C-1	**Design criteria**
Landscape design is viable and sustainable and supports healthy plant and tree growth	1. Ongoing maintenance plan is provided as part of the landscaped plan.
	2. Minimum soil standards for plant sizes are provided in accordance with Table 1 in Section 2C.
	3. A landscaped area with a minimum dimension of 3m is to be provided along the rear boundary for tree planting.

Objective 3.3C-2	**Design criteria**
Landscape design contributes to the streetscape and amenity	4. Landscape features including trees and rock outcrops are retained (except those where approval is granted under a CDC or Tree Preservation Order).
	5. Provide 1 large tree or 2 medium sized trees per 90m² of landscaped area.
	6. Where the front setback exceeds 3m a medium sized tree with a minimum mature height of 5m is to be provided within the front setback.

Siting the development

3.3D Local Character and Context

Objective 3.3D-1	Design criteria
The built form, articulation and scale relates to the local character of the area and the context	7. Provide in the design statement a description as to how the built form of the development contributes to the character of the local area.

3.3E Public Domain Interface

Objective 3.3E-1	Design criteria
Transition between private and public domain is achieved without compromising safety and security	8. Private courtyards within the front setback are only to be located within the articulation zones and / or behind the required front building line. 9. Windows and upper level balconies are to overlook the public domain. 10. Direct visibility is to be provided along paths and driveways from the public domain.

Objective 3.3E-2	Design criteria
Front fences and walls do not dominate the public domain instead they respond to and compliment the context and character of the area (including internal streets)	11. Front fences and walls along street frontages (including internal streets) are to use visually permeable materials and treatments. 12. The maximum fence height within the front setback is 1.5m, with an average no greater than 1.2m. 13. No more than 50% of the allowable fence area should be solid (masonry, timber or metal). 14. Unfinished timber paling and metal panel fences are not located within the setback to primary, secondary or parallel roads. 15. High solid walls are only to be used to shield the dwelling from the noise from classified roads. The walls are to have a maximum height of 2.1m and be setback at least 1.5m from the property boundary with landscape planting provided between the wall and the boundary, with a mature height of at least 1.5m. 16. Retaining walls greater than 0.6m within the front setback are to be softened by planting for a minimum depth of 600mm on the low side of the retaining wall.

Objective 3.3E-3	Design criteria
The secondary frontage of a dwelling positively contributes to the streetscape	17. Where development adjoins public parks, open space or bushland, or is a corner site, the design positively addresses this interface using at least one of the following design solutions: • street access, pedestrian paths and building entries which are clearly defined • paths, low fences and planting that clearly delineate between communal/private open space and the adjoining public open space • walls fronting the public spaces are to have openings not less than 25% of the surface area of the wall.

3.3F Internal Streets - Pedestrian and Vehicle Access

Objective 3.3F-1	Design criteria
Internal vehicle and pedestrian circulation should function like a street, minimise the dominance of the driveway, and minimise impact on habitable spaces	18. All internal streets and lanes are to be overlooked by windows from habitable rooms and or private open space. 19. Create a hierarchy of streets and lanes. • Lanes: shared or pedestrian surfaces with a width of common area including landscape - minimum 6m • Streets: width of common area including landscape - minimum 12m 20. Where less than 20 car spaces are provided reduce width to 3.5, with passing areas as required by AS 2890.1 21. Internal vehicle circulation must be • setback from a fence is to be at least 1m • setback from another dwelling is to be at least 1m • setback from a habitable room window is to be at least 2.5m if the window exceeds 1m^2. • The setbacks should contain plants to soften edges 22. Terminate driveways and streets with trees, open space or the window of a dwelling - not a garage or car space. 23. Where pedestrian circulation is separated from vehicle circulation the paths are still to function like streets with pavement at least 1.5m wide, clearly identifiable dwelling entrances and clear lines of sight to create a legible and safe network.

Objective 3.3F-2	Design criteria
Ensure there is adequate space for vehicle circulation without visually dominating the streetscape	24. Parking spaces and circulation to comply with AS2890.1
	25. Carparking not associated with a dwelling must be: • setback from a fence is to be at least 1m • setback from another dwelling is to be at least 1m • setback from a habitable room window is to be at least 3m if the window exceeds 1m². • The setbacks should contain plants.
Objective 3.3F-3	**Design criteria**
Provide safe, connected environment for pedestrians	26. Provide safe shared spaces for vehicles, cyclists and pedestrians by including measures that reduce vehicle speeds such as changes in pavement texture at entries or key nodes, reduce demarcation between pedestrian and vehicle spaces
	27. Pedestrian paths that are separated from an internal road or lane by a kerb or landscaped area are to be provided where there are more than 20 dwellings
	28. Roads and pedestrian spaces are to have lighting designed in accordance with A1158.3.1 that avoids light spill in to private spaces.
	29. The maximum length of a dead end lane is 40m and contain no more than 10 dwellings
	30. Lanes including pedestrian paths are straight and all parts have a clear line of sight from internal or public streets.

Note: Approval for a driveway crossing will be required under the Roads Act 1993, from Council. If the development has a frontage to a classified road, driveway frontages may be restricted and concurrence will be required from Roads and Maratime Services (RMS)

Objective 3.3F-4	Design criteria
Visual and environmental impacts of car parking are minimised	31. Basement car parking not to protrude more than 1m above finished ground level except at the entrance to the car park.
	32. Basement car park entrances to have a maximum width of 3.5m where there are less than 10 dwellings being serviced by the car park.
	33. The maximum height of the car park entry is to be 2.7m
	34. Where driveways are adjacent a tree, it is either outside the drip line or complies with the recommendations in a report prepared by a qualified arborist.

3.3G Orientation and Siting

Objective 3.3G-1	Design criteria
Building types and layouts respond to the streetscape and site while optimising solar access within the development and maximise street surveillance and connectivity	35. Each dwelling has a frontage to a public street or internal street or lane. 36. Every wall that faces the street has a window to a habitable room at each level. 37. Dwelling orientation layout is to maximise potential for solar access

Objective 3.3G-2	Design criteria
Overshadowing of neighbouring properties is minimised during mid winter	38. The window to a living room of an adjoining dwelling that is more than 3m from the boundary is to receive greater than 2hrs of solar access between 9am and 3pm on the winter solstice (June 21). 39. Where the above criteria is not satisfied, the proposed development ensures solar access to neighbouring properties is not reduced by more than 20%. 40. Where private open space and living room windows of an ad joining dwelling cannot be verified the proposed development is accommodated within a building envelope defined by a 35° plane at 3.6m above the boundary.

Objective 3.3G-3	Design criteria
The development responds to the natural landform of the site, reducing the visual impact and minimising earthworks	41. On sloping sites the buildings are to respond to the topography with changes in floor level to minimise cut and fill. Unless a dwelling is over a basement, the ground floor is not to be more than 1.3m above ground level, and no more than 1m below ground level. 42. Excavation must not exceed a maximum depth measured from ground level (existing) if: • located nor more than 1m from any boundary - 1m • located more than 1m from any boundary - 3m 43. Fill outside the building footprint must not exceed a maximum height measured from ground level (existing) if: • located nor more than 1m from any boundary - 0.6m • located more than 1m from any boundary - 1m

3.3H Building Separation

Objective 3.3H-1	Design criteria
Provide adequate space between buildings to allow for landscape, provide visual separation, reduce visual bulk daylight access between buildings	44. The minimum separation between two or more buildings on the same lot is: • where a wall height is less than 7.5m - 3m • where a wall height is 7.5m or greater - 6m
	45. The building length does not exceed 45m

Note:

- Building separation may need to be increased to provide adequate privacy (Section 3.3P) or solar access (Section 3.3I)
- The minimum separation between the development and dwellings on adjoining land will be determined by the side and rear setbacks

Amenity

3.3I Solar and Daylight Access

Objective 3.3I-1	Design criteria
To optimise the number of dwellings recieving sunlight to habitable rooms and private open spaces. Solar access enables passive solar heating in winter and provides a healthy indoor environment	46. The living room and private open space in 70% of dwellings is to receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at the winter solstice. 47. Direct sunlight is achieved when 1m² of direct sunlight on the glass is achieved for at least 15 minutes. To satisfy 2hrs direct sunlight, 8 periods of 15 minutes will need to be achieved - the periods do not need to be consecutive.

Objective 3.3I-2	Design criteria
To provide good access to daylight suited to the function of the room and to minimise reliance on artificial lighting and improve amenity	48. Every habitable room must have a window in an external wall with a total minimum glass area of not less than 15% of the floor area of the room. 49. Daylight may not be borrowed from other rooms, except where a room has a frontage to a classified road. 50. No part of a habitable room is to have any part more than 8m from a window. 51. No part of a kitchen work surface is to be more than 6m from a window or skylight. 52. Where courtyards are used : • Courtyards are fully open to the sky • the courtyard is to have a minimum dimension of a third of the perimeter wall height, and area of 3m²

3.3J Natural Ventilation

Objective 3.3J-1	Design criteria
All habitable rooms are naturally ventilated	53. Natural ventilation is available to each habitable room. 54. Each dwelling is to be cross ventilated. 55. The area of unobstructed window openings should be equal to at least 5% of the floor area served.

3.3K Ceiling Height

Objective 3.3K-1	Design criteria
Ceiling height achieves sufficient natural ventilation and daylight access and provides spatial quality	56. Measured from finished floor level to finished ceiling level, minimum ceiling heights are: • 2.7m to the ground floor bedrooms • 2.7m to all living rooms • 2.4m to first floor bedrooms

3.3L Dwelling Size and Layout

Objective 3.3L-1	Design criteria
The dwelling has a sufficient area to ensure the layout of rooms are functional, well organised and provide a high standard of amenity	57. Dwellings are required to have the following minimum internal areas: • 1 bed 65m² • 2 bed 90m² • 3+ bed 115m²
	58. The minimum internal areas include only one bathroom. Additional bathrooms increase the minimum internal area by 5m² each.
	59. A fourth bedroom and further additional bedrooms increase the minimum internal area by 12m² each.
	60. Kitchens should not be part of a circulation space, except in 1 bedroom dwellings.
	61. A window is visible from any point in a habitable room.

Objective 3.3L-2	Design criteria
Dwelling layouts are designed to accommodate a variety of household activities and needs and is appropriate for the number of occupants	62. One bedroom has a minimum area of 10m² and other bedrooms 9m² (excluding wardrobe space).
	63. Bedrooms have a minimum dimension of 3m (excluding wardrobe space).
	64. Combined of living and dining rooms are to have a minimum area of: • 1 and 2 bed 24m² • 3+ bed 28m²
	65. Living rooms or combined living/dining areas are to have a minimum width of 4m (excluding fixtures).

3.3M Private Open Spaces

Objective 3.3M-1	Design criteria
Dwellings provide appropriately sized private open space and balconies to enhance residential amenity	66. All dwellings are required to have a primary private open space of at least 16m^2.
	67. The minimum dimension of the included area is 3m, and excludes any storage space

Objective 3.3M-2	Design criteria
Primary private open space and balconies are appropriately located to enhance livability for residents	68. Primary open space and balconies is to be located adjacent to the living room, dining room or kitchen to extend the living space.
	69. 50% of the primary private open space should be covered to provide shade and protection from rain.

3.3N Storage

Objective 3.3N-1	Design criteria
Adequate, well designed storage is provided in each dwelling	70. In addition to storage in kitchens, bathrooms and bedrooms, the following storage is provided: • 1 bed 6m^3 • 2 bed 8m^3 • 3+ bed 10m^3
	71. At least 50% of the required storage is to be located within the dwelling.
	72. Storage not located in dwellings is secure and clearly allocated to specific dwellings if in a common area.

3.3O Car and Bicycle Parking

Objective 3.3O-1	Design criteria
Car parking is provided appropriate for the scale of the development	73. Car parking is to be provided at the rate required within a Development Control Plan that applies to the land. If there is no rate in a DCP: • Residential: 1 space per dwellings • Visitor: 1 space per 10 dwellings (where development has 10 or more dwellings)
	74. Facilities should be provide for car washing this could be by way of dedicated car wash bay for larger developments.

Objective 3.3O-2	Design criteria
Parking and facilities are provided for other modes of transport	75. Covered space is to be provided for the secure storage of at least 1 bicycle per dwelling.

3.3P Visual Privacy

Objective 3.3P-1	Design criteria
Adequate building separation distances are shared equitably between neighbouring dwellings to achieve reasonable levels of external and internal visual privacy while retaining amenity for the dwelling	76. A privacy screen is required where the distance from the window of a habitable room to the boundary is: • less than 3m, and the habitable room has a FFL greater 1m above existing ground level, or • less than 6m, and the habitable room has a FFL greater than 3m above ground level Note: This does not apply to bedroom windows that have an area greater than $2m^2$
	77. A privacy screen is not required on any window that has a sill height greater than 1.5m, or any window that has a frontage to a road or public open space.
	78. A privacy screen is required where the distance of a terrace, balcony or verandah to the boundary is : • <3m, and the habitable room has a FFL >1m above existing ground level, or • <6m, and the habitable room has a FFL >2m above ground level Note: The privacy screen is only required to the edge of the terrace that faces the boundary.
	79. A privacy screen is not required to a balcony or terrace that has an area less than $3m^2$, or a balcony or terrace of any size that has a frontage to a road or public space.
	80. Separation distances between windows and balconies of dwellings on the same site are double the distances above.

Objective 3.3P-2	Design criteria
Site and building design elements increase privacy without compromising access to light and air and balance outlook and views from habitable rooms and private open space	81. Where privacy screens are provided to windows, they must not cover part of the window required to meet the minimum daylight or solar access requirements, or restrict ventilation.

3.3Q Acoustic Privacy

Objective 3.3Q-1	Design criteria
Noise transfer is minimised through the siting of buildings and building layout	82. Noise sources not associated with the dwelling such as garage doors, driveways, service areas, plant rooms, building services, mechanical equipment, should be located at least 3m away from bedrooms
	83. All noise generating equipment such as air conditioning units, swimming pool filters, fixed vacuum systems and driveway entry shutters must be designed to protect the acoustic privacy of residents and neighbours. All such noise generating equipment must be acoustically screened. The noise level generated by any equipment must not exceed an LAeq (15min) of 5dB(A) above background noise at the property boundary.

3.3R Noise and Pollution

Objective 3.3R-1	Design criteria
Ensure outside noise levels are controlled to acceptable levels in living and bedrooms of dwellings	84. Any development within the 20 ANEF contour is to be constructed to comply with AS/NZS Acoustics – aircraft noise intrusion.
	85. Dwellings that are within 100m of a road corridor with an annual daily traffic (AADT) volume of more than 1,000 vehicles (based on traffic volume data published on the website of the RMS) or 80m from a rail corridor are to have LA_{eq} measures are not exceeding: • in any bedroom: 35dB(A) between 10pm-7am • anywhere else in the building (other than a kitchen, garage, bathroom or hallway): 40dB(A) at any time This can be achieved by: • a full noise assessment prepared by a qualified acoustic engineer • complying with relevant noise control treatment for sleeping areas and other habitable rooms in Appendix C of Draft Guide to infrastructure development near rail corridors busy roads.
	86. Dwellings within 25m of a rail corridor are required to have a vibration assessment carried out by a qualified structural engineer.

Configuration

3.3S Universal Design

Objective 3.3S-1	Design criteria
Universal design features are included in dwelling design to promote flexible housing for all community members	87. All dwellings are to include the Liveable Housing Design Guideline's silver level universal design features.

3.3S Communal areas and Open Space

Objective 3.3S-1	Design criteria
Adequate area for communal open space is provided that enhances residential amenity	88. Where more than 10 dwellings are proposed a communal space with minimum area of 5% of the site area with a minimum dimension of 8m is to be provided for active communal open space. 89. The active communal space is no less than 3m from private open space or 6m from windows of a habitable room. 90. The active communal open space is to receive at least 2hrs of direct sunlight between 9am and 3pm at the winter solstice to 50% of the required area.

Objective 3.3S-2	Design criteria
Communal areas are designed to maximise safety	91. Communal areas and open space are visible from habitable rooms and private open space while maintaining visual privacy. 92. Where open space is provided as public open space it has a direct connection to the internal street along the longest edge. 93. Public through site links should have direct line of site between public streets.

Objective 3.3S-3	Design criteria
Common circulation spaces achieve good amenity and promote safety and social interaction between residents	94. Daylight and natural ventilation is provided to all common circulation above ground. 95. Provide lighting to common spaces .

Note: The design of all communal spaces will need to address equitable access for persons with disabilities and obligations under the Access to Premises Standard and Disability Discrimination Act 1992.

3.3U Architectural Form and Roof Design

Objective 3.3U-1	Design criteria
Roof treatments are integrated into the building design and positively respond to the street	96. The roof design should be integrated with the overall building form. 97. Skylights and ventilation systems should be integrated into the roof design.

Objective 3.3U-2	Design criteria
The visual bulk of the development is reduced by breaking up the building massing	98. Provide in the design statement a description as to how the architectural form reduces the visual bulk and responds and provides a cohesive design response. Note: Refer to Section 2 for guidance.

3.3V Visual Appearance and Articulation

Objective 3.3V-1	Design criteria
To promote well designed buildings of high architectural quality that contribute to the local character	99. Provide in the design statement a description as to how the visual appearance and articulation contribute to the character of the local area. Note: Refer to Section 2 for guidance.

Objective 3.3V-1	Design criteria
To integrate building elements into the overall building form and facade design	100. An articulation zone of 1.5m is provided forward of the building line. The articulation zones includes one or more of the following: • Veranda / Porch • Balcony • Pergola • Entry feature or portico • Awnings or other features over windows • Eaves and sun shading • Window box treatment • Recessed or projecting architectural elements • Bay windows

3.3W Pools and Ancillary Development

Objective 3.3W-1	Design criteria
The location of swimming pools and spas minimise the impacts of adjoining properties	101. Swimming pools and spas must be located in the rear yard
	102. The coping around a swimming pool or spa must not be more than 1.4m above ground level (existing)
	103. The decking or paved area around a swimming pool or spa (excluding a coping less than 300mm wide) must not be more than 0.6m above ground level (existing)
	104. Water from a swimming pool or spa must be discharged in accordance with an approval under the Local Government Act 1993 if the lot is not connected to a sewer main.
	105. The pump must be housed in an enclosure that is soundproofed.

Note: A child-resistant barrier must be constructed or installed in accordance with the requirements of the Swimming Pools Act 1992.

Objective 3.3W-2	Design criteria
Detached studios, and outbuildings should not dominate the rear garden. They are useful to activate rear lanes providing visual surveillance	106. A detached studio or outbuilding must not have a building height of more than: • 3.6m or • if the studion is located within 0.9m of a lane - 6m
	107. The side and rear setbacks for an outbuilding or detached studio are: • if the building is located within 0.9m of a lane - 0m to side and rear boundaries, otherwise, • 0m to side boundaries, and 3m to rear boundaries
	108. The floor area of a detached studio or outbuilding must not be more than 36m² and is included in the overall gross floor area of for the site.
	109. Any window in a detached studio where the floor level is more than 1.5m above ground level must not be greater than 2m² in any wall face.

Note: Privacy and building separation and other design criteria still apply

Environment

3.3X Energy Efficiency

Objective 3.3X-1	Design criteria
Development incorporates passive environmental design	110. Provide an outdoor area for clothes drying that can accommodate at least 16 lineal metres of clothes line
	111. Any clothes drying area should be screened from public and communal areas.

Note: A DA for a dwelling is required to have a BASIX Certificatate that applies a minimum energy consumption target.

3.3Y Water Management and Conservation

Objective 3.3Y-1	Design criteria
Potable water use is minimised	112. Provide individual meters for hot and cold water consumption.

Objective 3.3Y-2	Design criteria
Urban stormwater is treated on site before being discharged to receiving waters	113. All stormwater drainage collecting as a result of the erection of the development must be conveyed by a gravity fed or charged system to: • a public drainage system • an inter-allottment drainage system • an on-site disposal system
	114. All stormwater drainage systems within a lot and the connection to a public or an inter-allotment drainage system must: • if approval is required under section 68 of the Local Government Act 1993, be approved under that Act • if an approval is not required under section 68 of the Local Government Act 1993, comply with any requirements for the disposal of stormwater drainage contained in a development control plan that is applicable to the land.

Objective 3.3Y-3	Design criteria
Flood management systems are integrated into site design	115. Detention tanks are to be located under paved areas, driveways or in basements
	116. On large sites parks or open spaces are designed to provide temporary on site detention basins

Note: A DA for a dwelling is required to have a BASIX Certificatate that applies a minimum water consumption target.

3.3Z Waste Management

Objective 3.3Z-1	Design criteria
Waste storage facilities are designed to minimise impacts on the streetscape, building entry and amenity of residents	117. Storage areas for rubbish and recycling bins should be provided • Within garages; • Away from windows to habitable rooms; • In screened enclosure that is part of the overall building design; or • In the basement car park. 118. A temporary collection space at the street frontage my be unscreened if only used on the day of collection. 119. Screened enclosures are not to be provided within the front setback. 120. Communal compost and green waste facilities are to be provided. 121. The number and type of bins provided is to be in accordance with Council policy.

3.4 Manor Houses and Dual Occupancies

This part provides the objectives and design criteria for development that contains dwellings on top of each other as well as side by side.

This section contains objectives and design principles:

Objectives : relate to the design principles and set out what the design is trying to achieve.

Design criteria: the measurable standards for how an objective can be achieved.

A complying development certificate must comply with each of the design criteria.

A development application can comply with the design criteria or use an alternate solution that satisfies the objective.

For guidance and explanation of the design criteria refer to Part 2 - Design Guidance

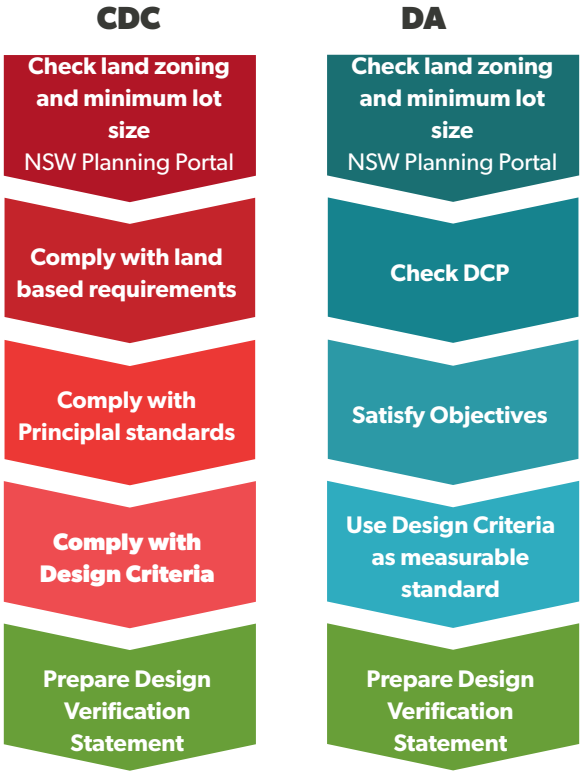


Figure 3-14 Workflows: Preparing a DA or CDC

Key characteristics of Manor Houses are:

- The private space for each dwelling is adjacent to the living room; and
- Private open space can be located on the first floor; and
- Dwelling entry can be located on the first floor.

The controls anticipate that this development fit in a context with single dwelling houses.

Because one or more dwellings is over another, the building is Class 2 classification under the National Construction Code.

Two Dwellings

Two dwellings can be carried out on one lot of land as a strata titled development.

These are also referred to as a dual occupancy (attached).

This development type is suitable where single level dwellings are desired. Car parking can be located to the street frontage, off a rear lane, or within an under ground car park.

A complying development can be submitted where it meets the requirements of the standards.

A development application will be required where the development does not comply with the development standards under complying development.

They are strata titled either because they have common area and are located over each other. Strata subdivision can be carried out as complying development.

Figure 3-15

Three or Four dwellings

Three or four dwellings located in one building where one or more dwelling is over another

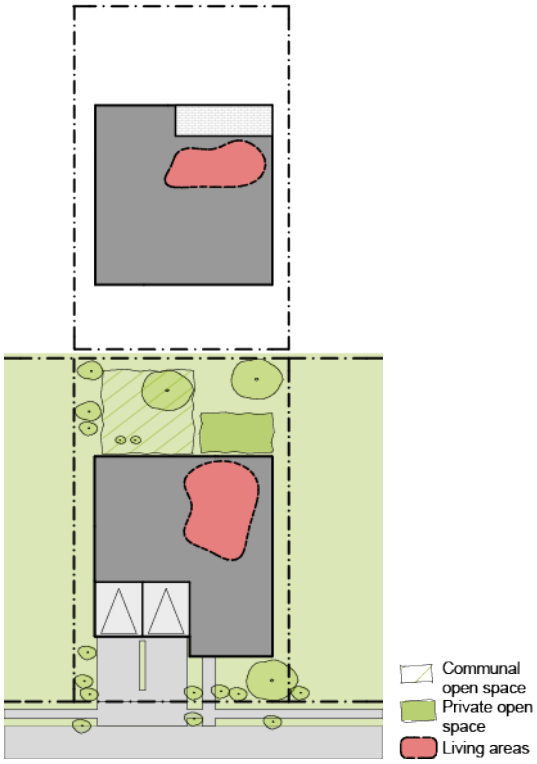
The dwellings are constructed as a single development.

This can provide for a more affordable housing type and can contain smaller apartments within the envelope of a typical dwelling house. To accommodate car parking they are best located on a corner or where there is rear lane access.

A complying development can be submitted where it meets the requirements of the standards.

A development application will be required where the development does not comply with the development standards under complying development.

They are strata titled either because they have common area and are located over each other. Strata subdivision can be carried out as complying development.



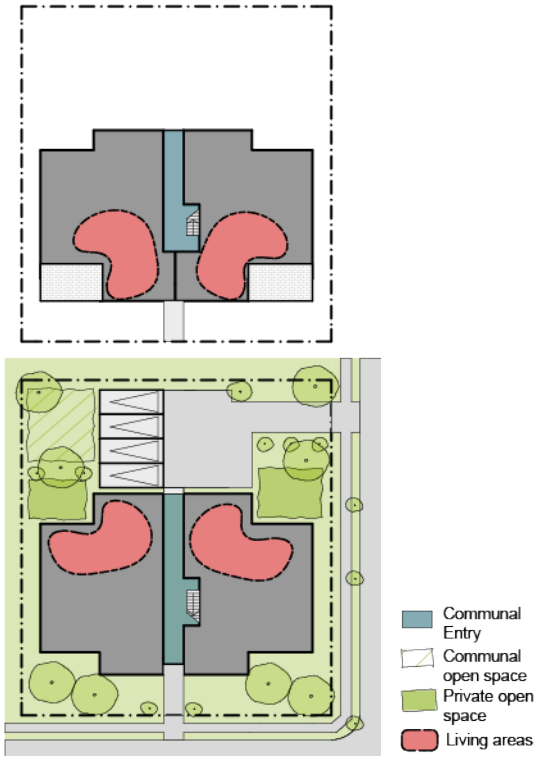


Figure 3-16 Manor House development

Principal controls

3.4A. Building Envelopes

Development Application

The local building envelope controls are to be found in the LEP and DCP that applies to the land. This may include:

- Maximum height of building
- Front, rear and side setbacks

The DCP may also provide direction on the character of the precinct and siting of the building.

Complying Development

The building envelope standards for complying development can be found in Medium Density Housing Code within ***State Environmental Planning Policy (Exempt and Complying Codes) 2008 (Codes SEPP).*** A summary is in the table below.

Standard	Summary Development Standard
Min site area.	600 m² 15m wide
Height of Building.	8.5m
Primary Road Setbackz(	Where an existing dwelling is within 40m - average of two closest dwellings. Where no dwellings are within 40m then: **LOT AREA** **SETBACK** 600 - 900 4.5m >900 - 1500 6.5m >1500+ 10m
Secondary Road setback	**LOT AREA** **SETBACK** 600 - 1500 3m >1500+ 5m
Side Setbacks Applies only to the side boundary of the development site.	Front half of the lot up to 15m from front boundary - 1.5m Rear half of the lot, or distance >15m from front boundary; • Building envelope defined by 45° plane projected from a height 3.6m above the boundary.

Rear setback	Where the part of a development has a height of building at less than 4.5m: **LOT AREA** **SETBACK** >600 - 1500 6m >1500+ 15m Where the part of a development has a height of building of 4.5m or more: **LOT AREA** **SETBACK** 200 - 1500 10m >1500+ 15m
Lane Setback	0m

3.4B Floor Space Ratio

Development Application: Refer to LEP or DCP that applies to the land.

Complying Development: Refer to ***Codes SEPP*** and summary table below:

Standard	Summary Development Standard
Maximum floor space ratio for the site	**LOT AREA** **FSR** >600 - 700 m^2 0.60:1 >700 - 920m^2 0.50:1 >920m^2 0.40:1

3.4C Landscaped Area

Development Application: Refer to LEP or DCP that applies to the land for minimum areas.

Complying Development: Refer to ***Codes SEPP*** and summary table below for minimum areas.

Standard	Summary Development Standard
Minimum Landscaped Area for the site	**LOT AREA** **LANDSCAPED AREA AS PERCENTAGE OF LOT** >600 - 750 30% >750 - 900 35% >900 - 1500 40% >1500 45% Minimum dimension of any landscaped area included in calculation - 1.5m
Proportion of area forward of building line that contains landscaped area	25% minimum

Objective 3.4C-1	Design criteria
Landscape design is viable and sustainable and supports healthy plant and tree growth	1. Ongoing maintenance plan is provided as part of the landscaped plan. 2. Minimum soil standards for plant sizes are provided in accordance with the guidelines in Part 2

Objective 3.4C-2	Design criteria
Landscape design contributes to the streetscape and amenity	3. Landscape features including trees and rock outcrops are retained (except those where approval is granted under a CDC or Tree Preservation Order). 4. At least 1 medium sized tree with a minimum mature height of 8m is to be provided to the rear of the dwelling. 5. Where the front setback exceeds 3m a medium sized tree with a minimum mature height of 5m is to be provided within the front setback.

Siting the development

3.4D Local Character and Context

Objective 3.4D-1	Design criteria
The built form, articulation and scale relates to the local character of the area and the context	6. Provide in the design statement a description as to how the built form of the development contributes to the character of the local area.

3.4E Public Domain Interface

Objective 3.4E-1	Design criteria
Transition between private and public domain is achieved without compromising safety and security	7. Private courtyards within the front setback are only to be located within the articulation zones and / or behind the required front building line. 8. Upper level balconies and / or windows are to overlook the public domain. 9. Direct visibility is to be provided to the front door and garage door along paths and driveways from the public domain.

Objective 3.4E-2	Design criteria
Front fences and walls do not dominate the public domain instead they respond to and compliment the context and character of the area	10. Front fences and walls along street frontages are to use visually permeable materials and treatments. 11. The maximum fence height within the front setback is 1.5m, with an average no greater than 1.2m. 12. No more than 50% of the allowable fence area should be solid (masonry, timber, metal or stone). 13. Unfinished timber paling and metal panel fences are not located within the setback to primary, secondary or parallel roads. 14. High solid walls are only to be used to shield the dwelling from the noise from classified roads. The walls are to have a maximum height of 2.1m and be setback at least 1.5m from the property boundary with landscape planting provided between the wall and the boundary, with a mature height of at least 1.5m.

Objective 3.4E-3	Design criteria
Amenity of the public domain is retained and enhanced	15. Retaining walls greater than 0.6m within the front setback are to be softened by planting for a minimum depth of 600mm on the low side of the retaining wall. 16. Where development adjoins public parks, open space or bushland, or is a corner site, the design positively addresses this interface using at least one of the following design solutions: • street access, pedestrian paths and building entries which are clearly defined • paths, low fences and planting that clearly delineate between communal/private open space and the adjoining public open space • walls fronting the public spaces are to have openings not less than 25% of the surface area of the wall.

3.4F Internal Streets - Vehicle and Pedestrian Access

Objective 3.4F-1	Design criteria
Car park design and access is safe and minimises impact on habitable spaces	17. Parking spaces and circulation to comply with AS2980.1 18. Where driveways are provided as a battle-axe the: • setback from a fence is to be at least 1m • setback from another dwelling is to be at least 1m • setback from a habitable room window is to be at least 3m if the window exceeds 1m^2.

Objective 3.4F-2	Design criteria
Visual and environmental impacts of parking are minimised	19. Basement car parking not to protrude more than 1m above finished ground level except at the entrance to the car park. 20. Basement car park entrances to have a maximum width of 3.5m where there are less than 10 dwellings being serviced by the car park. 21. The maximum height of the facade opening the car park entry is to be 2.7m. 22. Where driveways are adjacent a tree, it is either outside the drip line or complies with the recommendations in a report prepared by a qualified arborist.

3.4G Orientation and Siting

Objective 3.4G-1	Design criteria
Building types and layouts respond to the streetscape and site while optimising solar access within the development and maximise street surveillance and connectivity	23. Each dwelling has a frontage to a primary, secondary or parallel road. 24. Every wall that faces the street has a window to a habitable room at each level.

Objective 3.4G-2	Design criteria
Overshadowing of neighbouring properties is minimised during mid winter	25. The window to a living room of an adjoining dwelling that is more than 3m from the boundary is to recieve greater than 2hrs of solar access between 9am and 3pm on the winter solstice (June 21) 26. Where the above criteria is not satisfied, the proposed development ensures solar access to neighbouring properties is not reduced by more than 20%. 27. Where living room windows of an adjoining dwelling cannot be verified the proposed development is accommodated within a building envelope defined by a 35° plane at 3.6m above the boundary.

Objective 3.4G-3	Design criteria
The development responds to the natural landform of the site, reducing the visual impact and minimising earthworks	28. On sloping sites the buildings are to respond to the topography with changes in floor level to minimise cut and fill. Unless a dwelling is over a basement, the ground floor is not to be more than 1.3m above ground level, and no more than 1m below ground level. 29. Excavation must not exceed a maximum depth measured from ground level (existing) if: • located nor more than 1m from any boundary - 1m • if located more than 1m from any boundary - 3m 30. Fill outside the building footprint must not exceed a maximum height measured from ground level if: • located nor more than 1m from any boundary - 0.6m • located more than 1m from any boundary - 1m

Note: For complying development the Codes SEPP contains development standards for earthworks, retaining walls and structural support.

3.4H Building Separation

Objective 3.4H-1	Design criteria
Provide adequate space between buildings to allow for landscape, provide visual separation and daylight access between buildings	31. The minimum separation between two or more buildings on the same lot is 3m.

Note:

- Building separation may need to be increased to provide adequate privacy (Section 3.4P) or solar access (Section 3.4I)
- The minimum separation between the development and dwellings on adjoining land will be determined by the side and rear setbacks

Amenity

3.4I Solar and Daylight Access

Objective 3.4I-1	Design criteria
To optimise the number of dwellings recieving sunlight to habitable rooms and private open spaces. Solar access enables passive solar heating in winter and provides a healthy indoor environment	32. A living room or private open space in 75% of dwellings is to receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at the winter solstice. 33. Direct sunlight is achieved when 1m^2 of direct sunlight on the glass is achieved for at least 15 minutes. To satisfy 2hrs direct sunlight, 8 periods of 15 minutes will need to be achieved - the periods do not need to be consecutive.

Objective 3.4I-2	Design criteria
To provide good access to daylight suited to the function of the room and to minimise reliance on artificial lighting and improve amenity	34. Every habitable room must have a window in an external wall with a total minimum glass area of not less than 15% of the floor area of the room. 35. Daylight may not be borrowed from other rooms, except where a room has a frontage to a classified road. 36. No part of a habitable room is to have any part more than 8m from a window. 37. No part of a kitchen work surface is to be more than 6m from a window or skylight. 38. Where courtyards are used : • Courtyards are fully open to the sky • the courtyard is to have a minimum dimension of a third of the perimeter wall height, and area of 3m^2

3.4J Natural Ventilation

Objective 3.4J-1	Design criteria
All habitable rooms are naturally ventilated	39. Natural ventilation is available to each habitable room. 40. Each dwelling is to be cross ventilated. 41. The area of unobstructed window openings should be equal to at least 5% of the floor area served.

3.4K Ceiling Height

Objective 3.4K-1	Design criteria
Ceiling height achieves sufficient natural ventilation and daylight access and provides spatial quality	42. Measured from finished floor level to finished ceiling level, minimum ceiling heights are: • 2.7m to the ground floor bedrooms • 2.7m to all living rooms • 2.4m to first floor bedrooms

3.4L Dwelling Size and Layout

Objective 3.4L-1	Design criteria
The dwelling has a sufficient area to ensure the layout of rooms are functional, well organised and provide a high standard of amenity	43. Dwellings are required to have the following minimum internal areas: • Studio 35m² • 1 bed 50m² • 2 bed 90m² • 3+ bed 115m²
	44. The minimum internal areas include only one bathroom. Additional bathrooms increase the minimum internal area by 5m² each.
	45. A fourth bedroom and further additional bedrooms increase the minimum internal area by 12m² each.
	46. Kitchens should not be part of a circulation space, except in 1 bedroom dwellings.
	47. A window is visible from any point in a habitable room.

Objective 3.4L-2	Design criteria
Dwelling layouts are designed to accommodate a variety of household activities and needs and is appropriate for the number of occupants	48. One bedroom has a minimum area of 10m² and other bedrooms 9m² (excluding wardrobe space).
	49. Bedrooms have a minimum dimension of 3m (excluding wardrobe space).
	50. Combined living and dining rooms are to have a minimum area of: • 1 and 2 bed 24m² • 3+ 28m²
	51. Living rooms or combined living/dining areas are to have a minimum width of 4m (excluding fixtures).

3.4M Private Open Spaces

Objective 3.4M-1	Design criteria
Dwellings provide appropriately sized private open space and balconies to enhance residential amenity	52. All dwellings are required to have a primary private open space of at least : • 1 bed - 8m^2 • 2 -3+ bed - 12m^2 • Ground floor dwellings - 16m^2
	53. The minimum dimension of the included area is 2m, and excludes any storage space

Objective 3.4M-2	Design criteria
Primary private open space and balconies are appropriately located to enhance liveability for residents	54. Primary open space and balconies is to be located adjacent to the living room, dining room or kitchen to extend the living space.
	55. 50% of the primary private open space should be covered to provide shade and protection from rain.
	56. Balconies and terraces above ground floor must orientate towards the street or rear and not to a side boundary.

3.4N Storage

Objective 3.4N-1	Design criteria
Adequate, well designed storage is provided in each dwelling	57. In addition to storage in kitchens, bathrooms and bedrooms, the following storage is provided: • 1 bed 6m^3 • 2 bed 8m^3 • 3+ bed 10m^3
	58. At least 50% of the required storage is to be located within the dwelling.
	59. Storage not located in dwellings is secure and clearly allocated to specific dwellings if in a common area.

3.4O Car and Bicycle Parking

Objective 3.4O-1	Design criteria
Car parking is provided appropriate for the scale of the development	60. Where parking is provided above ground, at least one car space is to be provided per dwelling
	61. [Development applications only] Car parking is to be provided at the rate required for a dual occupancy within a Development Control Plan that applies to the land. If there is no rate in a DCP - 1 space is to be provided.

Objective 3.4O-2	Design criteria
Parking and facilities are provided for other modes of transport	62. Covered space is to be provided for the secure storage of at least 1 bicycle per dwelling.

Objective 3.4O-3	Design criteria
Visual and environmental impacts of on-grade car parking and garages do not dominate the streetscape and have an appropiate scale relationship with the dwelling	63. On-grade car parking is to be setback from the boundary to the primary or secondary road by: • If the setback of dwelling is 4.5m or more - 1m behind building line • If the setback of dwelling is less than 4.5m – 5.5m
	64. The maximum aggregated garage door width that has a frontage to a primary road is : **Lot width** — **Aggregate garage door width** 7.5- 12.5m — 3.2m wide >12.5m — 6.0m wide
	65. Where the lot width is <7.5m the car space and / or garage is provided from a secondary road, parallel road or lane.
	66. Shade trees are planted between every 4-5 parking spaces to reduce increased surface temperatures from large areas of paving (A shade tree has a minimum mature height of 8m and mature spread of 6m).
	67. Car space are to be separated by not less than 3m from windows or doors to habitable rooms of dwellings that are not associated with the parking space.

3.4P Visual Privacy

Objective 3.4P-1	Design criteria
Adequate building separation distances are shared equitably between neighbouring dwellings to achieve reasonable levels of external and internal visual privacy while retaining amenity for the dwelling.	68. A privacy screen is required where the distance from the window of a habitable room to the boundary is : • less than 3m, and the habitable room has a FFL greater than 1m above existing ground level, or • less than 6m, and the habitable room has a FFL greater than 3m above ground level Note: This does not apply to bedroom windows that have an area <2m^2
	69. A privacy screen is not required on any window that has a sill height greater than 1.5m, or any window that has a frontage to a road or public open space.
	70. A privacy screen is required where the distance of a terrace, balcony or verandah to the boundary is : • less than 3m, and the habitable room has a FFL greater than 1m above existing ground level, or • less than 6m, and the habitable room has a FFL greater than 2m above ground level Note: The privacy screen is only required to the edge of the terrace that faces the boundary.
	71. A privacy screen is not required to a balcony or terrace that has an area less than 3m^2, or a balcony or terrace of any size that has a frontage to a road or public space.
	72. Separation distances between windows and balconies of dwellings on the same site are double the distances above.

Objective 3.4P-2	Design criteria
Site and building design elements increase privacy without compromising access to light and air and balance outlook and views from habitable rooms and private open space	73. Where privacy screens are provided to windows, they must not restrict daylight and ventilation to the habitable room.

3.4Q Acoustic Privacy

Objective 3.4Q-1	Design criteria
Noise transfer is minimised through the siting of buildings and building layout	74. Noise sources not associated with the dwelling such as garage doors, driveways, service areas, plant rooms, building services, mechanical equipment, should be located at least 3m away from bedrooms
	75. All noise generating equipment such as air conditioning units, swimming pool filters, fixed vacuum systems and driveway entry shutters must be designed to protect the acoustic privacy of residents and neighbours. All such noise generating equipment must be acoustically screened. The noise level generated by any equipment must not exceed an LAeq (15min) of 5dB(A) above background noise at the property boundary.

3.4R Noise and Pollution

Objective 3.4R-1	Design criteria
Ensure outside noise levels are controlled to acceptable levels in living and bedrooms of dwellings	76. Any development within the 20 ANEF contour is to be constructed to comply with AS/NZS Acoustics – aircraft noise intrusion.
	77. Dwellings that are within 100m of a road corridor with an annual daily traffic (AADT) volume of more than 1,000 vehicles (based on traffic volume data published on the website of the RMS) or 80m from a rail corridor are to have LA_{eq} measures are not exceeding: • in any bedroom: 35dB(A) between 10pm-7am • anywhere else in the building (other than a kitchen, garage, bathroom or hallway): 40dB(A) at any time This can be achieved by: • a full noise assessment prepared by a qualified acoustic engineer • complying with relevant noise control treatment for sleeping areas and other habitable rooms in Appendix C of Draft Guide to Infrastructure Development near Rail Corridors and Busy Roads.
	78. Dwellings within 25m of a rail corridor are required to have a vibration assessment carried out by a qualified structural engineer

Configuration

3.4S Universal Design

Objective 3.4S-1	Design criteria
Universal design features are included in dwelling design to promote flexible housing for all community members	79. 25% of all dwellings are to include the Liveable Housing Design Guideline's Silver level universal design features. 80. At least one ground floor dwelling is to provide Platinum level universal design features.

3.4S Communal areas and Open Space

Objective 3.4S-1	Design criteria
Communal areas are designed to maximise safety	81. Communal areas and open space are visible from habitable rooms and private open space while maintaining visual privacy. 82. Where open space is provided as public open space it has a direct connection to the public street along one edge. 83. Public through site links should have direct line of site between public streets.

Objective 3.4S-2	Design criteria
Common circulation spaces achieve good amenity and promite safety and social interaction between residents	84. Daylight and natural ventilation is provided to all common circulation above ground. 85. Provide lighting to common spaces.

3.4U Architectural Form and Roof Design

Objective 3.4U-1	Design criteria
Roof treatments are integrated into the building design and positively respond to the street	86. The roof design should be integrated with the overall building form. 87. Skylights and ventilation systems should be integrated into the roof design.

Objective 3.4U-2	Design criteria
The visual bulk of the development is reduced by breaking up the building massing	88. Provide in the design statement a description as to how the architectural form reduces the visual bulk and responds and provides a cohesive design response. Note: Refer to Section 2 for guidance.

3.4V Visual Appearance and Articulation

Objective 3.4V-1	Design criteria
To promote well designed buildings of high architectural quality that contribute to the local character.	89. Provide in the design statement a description as to how the aesthetics and articulation contribute to the character of the local area. Note: Refer to Section 2 for guidance.
	90. An articulation zone of 1.5m is provided forward of the building line. Elements are to occupy not more than 25% of the area of the articulation zone. The articulation zones includes one or more of the following: • Veranda / Porch • Balcony • Pergola • Entry feature or portico • Awnings or other features over windows • Eaves and sun shading • Window box treatment • Recessed or projecting architectural elements • Bay windows

3.3W Pools and Ancillary Development

Objective 3.3W-1	Design criteria
The location of swimming pools and spas minimise the impacts of adjoining properties	91. Swimming pools and spas must be located in the rear yard
	92. The coping around a swimming pool or spa must not be more than 1.4m above ground level (existing)
	93. The decking or paved area around a swimming pool or spa (excluding a coping less than 300mm wide) must not be more than 0.6m above ground level (existing)
	94. Water from a swimming pool or spa must be discharged in accordance with an approval under the Local Government Act 1993 if the lot is not connected to a sewer main.
	95. The pump must be housed in an enclosure that is soundproofed.

Note: A child-resistant barrier must be constructed or installed in accordance with the requirements of the Swimming Pools Act 1992.

Environment

3.4X Energy Efficiency

Objective 3.4X-1	Design criteria
Development incorporates passive environmental design	96. Provide an outdoor area for clothes drying that can accommodate at least 16 lineal metres of clothes line
	97. Any clothes drying area should be screened from public and communal areas.

Note: A CDC or DA for a dwelling is required to have a BASIX Certificatate that applies a minimum energy consumption target.

3.4Y Water Management and Conservation

Objective 3.4Y-1	Design criteria
Potable water use is minimised	98. Provide individual meters for hot and cold water consumption.

Objective 3.4Y-2	Design criteria
Urban stormwater is treated on site before being discharged to receiving waters	99. All stormwater drainage collecting as a result of the erection of the development must be conveyed by a gravity fed or charged system to: • a public drainage system • an inter-allottment drainage system • an on-site disposal system
	100. All stormwater drainage systems within a lot and the connection to a public or an inter-allotment drainage system must: • if approval is required under section 68 of the Local Government Act 1993, be approved under that Act • if an approval is not required under section 68 of the Local Government Act 1993, comply with any requirements for the disposal of stormwater drainage contained in a development control plan that is applicable to the land.

Objective 3.4Y-3	Design criteria
Flood management systems are integrated into site design	101. Detention tanks are to be located under paved areas, driveways or in basements.
	102. On large sites parks or open spaces are designed to provide temporary on site detention basins.

Note: A CDC or DA for a dwelling is required to have a BASIX Certificatate that applies a minimum water consumption target.

3.4 Z Waste Management

Objective 3.4Z-1	Design criteria
Waste storage facilities are designed to minimise impacts on the streetscape, building entry and amenity of residents	103. Storage areas for rubbish and recycling bins should be provided • within garages, • in screened enclosure that is part of the overall building design discreetly, or • in the basement car park
	104. The number and type of bins provided is to be in accordance with Council policy.

Part 4

Delivery

This part provides guidance on the delivery of medium density housing across NSW, including information to assist with strategic planning, preparing a development application or complying development application and also the assessment of the application.

It can be useful for applicants to assist them to prepare an application.

It is useful for planners to assist in preparing strategic plans and assessing development applications.

It is useful for certifiers to assess applications for complying development certificates.

4.1 Strategic Planning

The Design Guide is intended to help councils prepare design-led strategic planning for local precincts.

Design-led strategic planning is based on an understanding of the existing features of an area, subdivision patterns, dwelling types, and demand for new dwellings. It involves designing and testing possible solutions. It is about thinking beyond what is currently done and transforming. It is outcome focused.

Starting the strategic planning process by understanding the existing natural and built environment is vital when exploring how an area can transform to a higher density. A fine grained and directed approach that tests scenarios should be used to find the best outcome.

Planning Proposals

The Design Guide should also be used by proponents preparing a planning proposal requiring a change to the strategic plan for a site or precinct.

It can help with selecting the appropriate dwelling types for a site. It provide guidance for establishing new principal controls and for developing a strategy for the future site character and how it will fit with the existing context.

'Salt and Pepper'

When working in both existing and new subdivisions it is important that dwelling types are not grouped together in one location, but 'salt and peppered' in a variety of locations.

The term 'salt and pepper' refers to development which incorporates a number of housing types and sizes. It will provide a better outcome for housing diversity, provides interest and variety in housing forms and can respond to existing subdivision patterns.

The existing subdivision pattern and lot sizes, including width and depth, will in part determine the block size.

While corner sites provide opportunities to create rear lanes, wide/deep sites allow opportunities for new internal streets, and shallow sites are best for traditional terrace housing forms.

A variety of tenure options will help meet people's changing needs at different stages of their lives. Housing diversity will help provide for renters, homeowners, investors and social housing tenants. It will also provide choice at different life stages.

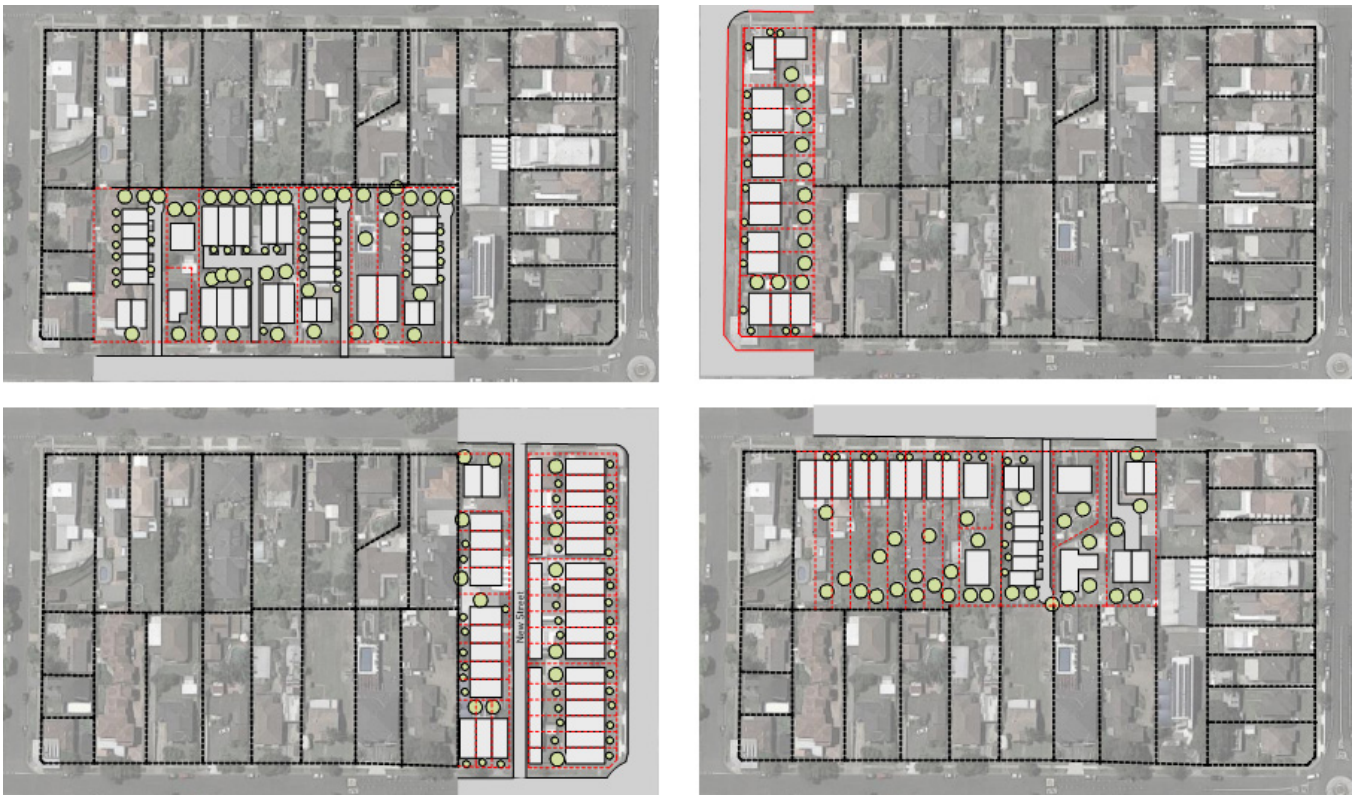


Figure 4-1 Different solutions are needed for lots of different sizes and orientation - rather than encourage one form of housing, the block size design based planning can select housing types and envelopes that suit the subdivision pattern - resulting in diversity. Consistency can be achieved by street setbacks and frontage

4.2 Pre-Application Meetings

It is important to receive good advice when preparing an application for consent. It is recommended that early in the design phase, a pre-application meeting be held to focus on achieving the best siting, built form and design outcomes.

For complying development, this meeting should be with your accredited certifier and building designer.

For a development application, this meeting should be with the local council and building designer.

The pre-application meeting provides opportunities for feedback on specific concept plans for the site. At the meeting relevant planning policies and site constraints can be discussed.

It is recommended that the meetings be documented and written advice be provided to the applicant and designer.

Working closely with a council and the private certifier may help avoid unnecessary delays with the application.

Often other specialised consultants will also need to provide information for the Pre-DA such as engineers, arborists or landscape architects.

Complying Development

For complying development the certifier can obtain the necessary pre-information to ensure that complying development can be carried out on the site. You should be aware of any pre-conditions that must be met and information needed to accompany the application.

As every complying development proposal must meet the predetermined development standards in the Codes SEPP, - it is important that the certifier understanding the proposed design and that the architect or building designer understand the development standards that need to be met.

Development Applications

For development applications, a meeting with council allows the concept design, site layout, relationship to context and relevant planning policies to be discussed.

Any aspects of the proposal that may not comply with the controls can be discussed, and the council can provide advice on alternative solutions that achieve the Objectives.

To ensure design outcomes are integrated and balanced it is recommended that council provide urban design and architectural advice as well as planning, engineering and landscape comments on the proposal.

A checklist is provided in Appendix 1 to assist with the preparation of documents for a pre-application meeting.

4.3 Development Application

This Design Guide applies to development applications where it has been adopted by council.

Principal Controls

The LEP and DCP set out the principal controls that apply to the site.

The DCP may also articulate desired future character and provide controls additional to those within this guide.

The design guide refers to Council policies with respect to waste collection, car parking and stormwater management.

Design Controls

Part 3 contains Objectives and Design Criteria. The Design Criteria set a clear and measurable standard for how the objective can be practically achieved. Alternate solutions which achieve the Objectives can be considered by the consent authority.

Where the Design Guide has been adopted by Council controls take precedence over controls in a DCP.

Preparation of the Application

A well prepared application package assists the consent authority in making a quick determination. The documentation package should provide sufficient information in order to verify that:

- the proposal meets the relevant Objectives and development standards, and
- the impacts of the development on the surrounding environment are acceptable

Plans, sections and elevations should be accompanied by 3-dimensional views of the development within its context.

Submission requirements for development applications are set within the *Environmental Planning and Assessment Regulation 2000.* Appendix 2 provides more detail on these submission requirements.

A Design Verification Statement must support the application for medium density development proposals.

Design Verification Statement

The Design Verification Statement is to be prepared by the person who designed the development.

The statement must:

- explain how the design quality principles are achieved;
- illustrate how the development is suited to its context; and
- demonstrate how the design Objectives have been achieved using the Design Criteria as a measure.

The Design Verification Statement must indicate where the documents illustrate how the proposal meets the Design Criteria.

Where the Design Criteria are not met, the statement should describe how an alternate solution achieves the Objectives, in some instances this may require supporting reports or diagrams.

The Design Verification Statement will assist the assessment process by clarifying how the proposed development meets the criteria and Objectives.

A template for the statement is provided in Appendix 3

Assessment

Consistent with the *Environmental Planning and Assessment Act* in assessing the application the consent authority:

- should not require a more onerous standard with respect to the development than is provided in the Design Criteria; and
- if the development does not comply with the Design Criteria it is to be flexible in applying those provisions. It is to consider alternative solutions that achieve the Objectives of the criteria for dealing with that aspect of the development.

Council should use the guidelines in Part 2 to help it apply the Design Criteria and Objectives and assess alternate solutions.

4.4 Complying Development

Complying Development

The following medium density development can be undertaken as complying development under the Medium Density Housing Code within *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* (Codes SEPP):

- Dual occupancies – where both dwellings have a frontage to the street
- Multi-dwelling terraces
- Manor houses

Complying development under this code is not permitted on certain land in a heritage conservation area, environmentally sensitive land, a heritage item and on certain other land listed in Part 1 of the Codes SEPP.

Principal Controls

The proposed development must comply with the development standards contained within the Codes SEPP.

Design Controls

The Codes SEPP requires compliance with the Design Criteria contained in Part 3 of this guide.

Compliance with Design Criteria is not required where a particular feature is not required or proposed - For example if a pool is not proposed, compliance with Design Criteria relating to swimming pools is not required.

Development Controls

The Codes SEPP requires compliance with other standards such as:

- retaining walls and earthworks;
- bushfire prone land; and
- flood prone land.

The submission requirements for complying development applications are set within the *Environmental Planning and Assessment Regulation 2000.* Appendix 2 provides more detail on these submission requirements.

A Design Verification Statement is also required.

Design Verification Statement

The statement is to be prepared by the person who designed the development.

The statement must:

- explain how the design quality principles are achieved;
- illustrate how the development is suited to the context; and
- provide evidence as to where and how the Design Criteria have been achieved.

Where necessary consider providing supporting drawings or diagrams that assist in demonstrating compliance such as:

- Gross floor area - included area coloured
- Landscaped area - included area coloured
- Solar access - 3D axonometric views

A template for the statement is provided in Appendix 3.

Assessment

The assessment can be carried out by a council or private certifier. The development must comply with all the standards and Design Criteria.

The certifier should ensure that they have all the required information with respect to land based exclusions.

The certifier must check the design statement against the plans to ensure the designer has referenced all the relevant Design Criteria and the evidence for compliance visible on the plans.

The certifier must visit the site to inspect the existing features and ensure that any pre-approvals such as tree removal and driveway crossings have been obtained

Neighbour Notification

The notification requirements will be the same as they are currently for complying development. In metropolitan areas there is a 14 day pre-approval notification requirement. In regional areas of NSW there is no requirement to notify neighbours prior to approval of the CDC.

Appendices

This part includes checklists for information required at different stages in the planning process

Appendix 1 Pre-application design proposal checklist

	Required information
Development details	A summary of the proposal that establishes the: • Floor space ratio • Building height in metres and storeys • Number and mix of dwellings • Number of car parking spaces
Design Criteria	Undertake a quick check against the principal controls and the design criteria
Precedents	Images of precedents relevant to the proposal such as: • streetscape concept • landscape design • communal open spaces use • building elements such as entries, balconies, materials
Site analysis	Prepared consistent with Appendix 1 of the Multiple Density Design Guide
Site plan	A drawing to scale showing: • any proposed site amalgamation or subdivision • the indicative footprint of the proposal • setbacks and building separation dimensions • site entry points • areas of communal open space and private open space • indicative locations of landscaped areas including retained or proposes significant trees • interface with public domain
Floor plans	Drawings to scale showing: • typical car park layout - if a basement is provided • sample dwelling plans with furniture layouts, key room depth dimensions and balcony sizes
Building mass elevations	Drawing to scale showing the basic massing of the proposal in the context of the adjacent three properties, or for 50m in each direction, on each elevation. This drawing should show, in diagrammatic form: • the composition of the elevations including ground level, roof form, and articulation of massing of the overall building • pattern of buildings and spaces between buildings along the street • the profile of any existing buildings
Sections	A drawing to scale showing: • the proposal and adjacent buildings • the relationship of the proposal to the ground plane, streets, open spaces and landscaped areas

Appendix 2 Application documentation checklist

Information required in a development application is established in Schedule 1 of the *Environmental Planning and Assessment Regulation 2000*.

The following table is a guide that suggests detailed and well resolved drawings to assist with demonstrating good design practice. The consent authority may also identify additional information that is required for the assessment of a development. All plans, elevations and sections should be drawn to scale and include a graphic scale bar and true north point. A cover page with drawing list and BASIX commitments should be included.

Documentation	Required information	Provided	
		Yes (✓)	No (x)
Design Verification Statement	Use template provided in Appendix 3 to prepare the Design Verification Statement including: • Description of the development • Context & Site Analysis • Discuss how Design Quality Principles have been achieved • Provide evidence how Design Criteria or Objectives have been achieved.		
Statement of Environmental Effects (For development applications only)	Prepared in accordance with the regulations. Should outline any planning arguments need to support non-compliances Design Verification Statement should be separately prepared by designer.		

Documentation	Required information	Provided	
		Yes (✓)	No (x)
Site plan	A scale drawing showing:		
	• any proposed site amalgamation or subdivision		
	• location of any proposed buildings or works in relation to setbacks, building envelope controls and building separation dimensions		
	• proposed finished levels of land in relation to existing and proposed buildings and roads		
	• pedestrian and vehicular site entries and access		
	• interface of the ground floor plan with the public domain and with open spaces within the site		
	• areas of communal open space and private open space		
	• indicative locations of planting and deep soil zones including retained or proposed significant trees		
Landscape plan	A scale drawing showing:		
	• the building footprint of the proposal including pedestrian, vehicle and service access		
	• trees to be removed shown dotted		
	• trees to remain with their tree protection zones (relative to the proposed development)		
	• landscaped area and associated tree planting		
	• areas of planting on structure and soil depth		
	• proposed planting including species and size		
	• details of public space, communal open space and private open space		
	• external ramps, stairs and retaining wall levels		
	• security features and access points		
	• built landscape elements (fences, pergolas, walls, planters and water features)		
	• ground surface treatment with indicative materials and finishes		
	• site lighting		
	• water management and irrigation concept design		

Documentation	Required information	Provided	
		Yes (✓)	No (x)
Floor plans	A scale drawing showing:		
	• all levels of the building including roof plan		
	• existing and finished surface levels at each building corner		
	• layout of entries, circulation areas, lifts and stairs, communal spaces, and service rooms with key dimensions and RLs shown		
	• dwelling plans with all fenestration, typical furniture layouts for each apartment type, room dimensions and intended use and private open space dimensions		
	• accessibility clearance templates for accessible units and common spaces		
	• visual privacy separation shown and dimensions where necessary		
	• vehicle and service access, circulation and parking		
	• storage areas		
Elevations	A scale drawing showing:		
	• proposed building height and RL lines		
	• building height control		
	• setbacks or envelope outline		
	• the detail and features of the facade and roof design		
	• any existing buildings on the site		
	• materials annotated		
	• profile of buildings on adjacent properties or for 50m in each direction, whichever is most appropriate		
Sections	A scale drawing showing:		
	• proposed building height and RL lines		
	• building height control		
	• setbacks or envelope outline		
	• adjacent buildings		
	• ceiling heights		
	• the relationship of the proposal to the ground plane, the street		
	• building separation within the development and between neighbouring buildings		

Documentation	Required information	Provided	
		Yes (✓)	No (x)
Solar access study	Where required, 3D graphic documentation at winter solstice (21 June) at regular intervals showing compliance with the design criteria. The results are to be sumarised in a schedule.		
Material and finishes board	A sample board of the proposed external materials, finishes and colours of the proposal, keyed to elevations.		
Illustrative views	Photomontages or similar rendering or perspective drawings illustrating the proposal in the context of surrounding development. ***[Only required for development applications where more than 10 dwellings are proposed]***		
Models	• A three dimensional computer generated model showing views of the development from adjacent streets and buildings, if required by the consent authority.		
	• A physical model that shows the massing of the proposal that includes relevant context (particularly for developments of 20 dwellings or more, or on contentious sites) if required by the consent authority		
Schedules	• Dwelling internal and external areas		
	• Storage Areas		

Appendix 3 Design Verification Statement Template

This template is to be used as a guide to assist designers in preparing the design statement, required as part of a complying development application and development application. A version in Microsoft Word (.doc) format can be downloaded from www.planning.nsw.gov.au

Design Verification Statement

Project:	Design Criteria Section: 3.1 | 3.2 | 3.3| 3.4
Project Address:	
Building Designer / Architects Name:	

I confirm that I was responsible for designing the development, and that the development as designed achieves the Design Quality Principles and that the relevant Design Criteria have been achieved.

Signature of Designer

[Designers name]

Context Analysis

[Insert context analysis including: Aerial photo with development in a 200m radius]

The context can be described as:.....

Streetscape and Local Character Analysis

[Insert a panoramic streetscape photo that includes development within 20m on each side of the development site on both sides of the street]

The character of the streetscape can be described as:……

The intended future character of the area can be described as…..

Site Analysis

[Insert an aerial photo of the site and development within 10m of the boundary, provide annotations that indicate:

- Vegetation
- Access points
- Neighbouring buildings and their uses
- Potential areas that need protection
- Natural features – waterfeatures, rock outcrops
- Topography
- Services
- Views to and from the site
- Front setback dimensions

Use the checklist in Appendix 4 to assist with completion of the site analysis.

Design Quality Principles

The development as designed achieves the design quality principles:

Section 2 of the design guide makes reference to the design quality principles. Use the guidances in Part 2 to assist in the preparation of this statement.

1. Context and Neighbourhood Character

2. Built Form and Scale

3. Density

4. Sustainability

5. Landscape

6. Amenity

7. Safety

8. Housing Diversity and Social Interaction

9. Visual Appearance

Design Criteria

The development as designed achieves the relevant design criteria.

In the table below describe how the proposed development satisfies the criteria. It also needs to direct the certifier or assessing planner to where they can find the evidence. (eg drawing number / part of drawing)

This could be a reference to part of the drawings, a table or some other report. Evidence can also be provided in this table.

PRINCIPAL STANDARDS

Standard	Proposed	Complies
Minimum lot size for each dwelling		
Height of Building		
Maximum gross floor area for each lot		
Minimum landscaped area for each lot		
Proportion of area forward of building line that contains landscaped area		
Primary road setback		
Secondary road setback		
Side setback		
Rear setback		

DESIGN CRITERIA

Design Criteria	Proposed	Complies
[list relevant design criteria]		

Appendix 4 Site analysis checklist

Use this checklist to prepare a site analysis in preparation for a pre-application meeting and to assist in preparing the Design Verification Statement. The checklist is not required to be submitted with a DA or CDC.

Documentation	Required information	Provided	
		Yes (✓)	No (x)
Site location	Broad map or aerial photo showing site location in relation to surrounding centres, shops, civic/community facilities and transport		
Aerial photograph	Colour aerial photographs of site in its context		
Local context plan	Plan(s) of the existing features of the wider context including adjoining properties and the other side of the street, that show:		
	• pattern of buildings, proposed building envelopes, setbacks and subdivision pattern		
	• land use and building typologies of adjacent and opposite buildings in the street		
	• movement and access for vehicles, servicing, pedestrians and cyclists		
	• topography, landscape, open spaces and vegetation		
	• significant views to and from the site		
	• significant noise sources in the vicinity of the site, particularly vehicular traffic, train, aircraft and industrial noise		
Site context and survey plan	Plan(s) of the existing site based on a survey drawing showing the features of the immediate site including:		
	• boundaries, site dimensions, site area, north point		
	• topography, showing relative levels and contours at 0.5 metre intervals for the site and across site boundaries where level changes exist, any unique natural features such as rock outcrops, watercourses, existing cut or fill, adjacent streets and sites		
	• location and size of major trees on site and relative levels where relevant, on adjacent properties and street trees		
	• location and use of existing buildings or built features on the site		
	• location and important characteristics of adjacent public, communal and private open spaces		
	• location and height of existing windows, balconies, walls and fences on adjacent properties facing the site, as well as parapet and ridge lines		
	• pedestrian and vehicular access points, driveways and features such as service poles, bus stops, fire hydrants etc.		
	• location of utility services, including easements and drainage		
	• location of any other relevant features		

Documentation	Required information	Provided	
		Yes (✓)	No (x)
Streetscape elevations and sections	Photographs or drawings of the site in relation to the streetscape and along both sides of any street that the development fronts, that show:		
	• overall height (storeys, metres) and important parapet/datum lines of adjacent buildings		
	• patterns of building frontage, street setbacks and side setbacks		
	• planned heights		
Analysis	Plan that synthesises and interprets the context, streetscape and site documentation into opportunities and constraints that generate design parameters, including the following information:		
	• orientation and any overshadowing of the site and adjoining properties by neighbouring structures (excludes vegetation). The winter sun path should also be shown between 9 am and 3 pm on 21 June		
	• identification of prevailing wind		
	• the geotechnical characteristics of the site and suitability of the proposed development		
	• the public domain interface and street setback		
	• relationship to and interface with adjacent properties, including side and rear setbacks		
	• ventilation for the subject site and immediate neighbours		
	• proposed building footprint location		
	• retained and proposed significant trees and deep soil zones		
	• proposed communal open space		
	• proposed car park footprint and depth		
	• proposed building entries		
	• supporting written material - this should include technical advice from specialists involved in the development process including landscape architects, arborists, geotechnical engineers and/or contamination specialists where applicable		

Appendix 5 Recommended Principal Controls for Different Types

Medium density housing occurs in a variety of arrangements, configurations and types. Dwellings can occupy different sized lots from small infill sites , redevelopment of existing areas, and greenfield housing developments. They can consist of a mix of building types or uses and be situated in suburban, transitional or inner city locations.

When adopting this Design Guide councils are still required to set the principal development controls for the development. This should be done as a design-led strategic planning process. This resource is provided to assist during the strategic planning phase to:

- determine the appropriate scale of future built form
- communicate the desired character of an area
- assist when testing envelope and development controls to achieve high amenity and environmental performance of future buildings
- provide typical principal development standards for different typologies
- provide an example of each type in order to understand the application of the design criteria.

The recommended principal controls may not be appropriate for every context. For example areas where it is desired to have buildings set within a landscaped setting the development standards may require greater landscaped area and larger side setbacks.

Certain planning outcomes may also require additional primary standards to support the desired future character.

Each of these types are examples of development that could be carried out under the Design Guide either as a development application or as complying development

The medium density housing types in this section include:

- Two Dwellings Detached
- Two Dwellings Side by Side

Relevant design criteria can be found in Part 3.1

- Terrace houses - Car parking to primary road
- Terrace houses - Rear lane access
- Terrace houses - Basement car parking

Relevant design criteria can be found in Part 3.2

- Multi-dwelling - Row houses
- Multi-dwelling - Mews
- Multi-dwelling - Basement
- Multi-dwelling - Courtyard housing
- Multi-dwelling - Large lot masterplan and communities

Relevant design criteria can be found in Part 3.3

- Manor house

Relevant design criteria can be found in Part 3.4

Two Dwellings Detached

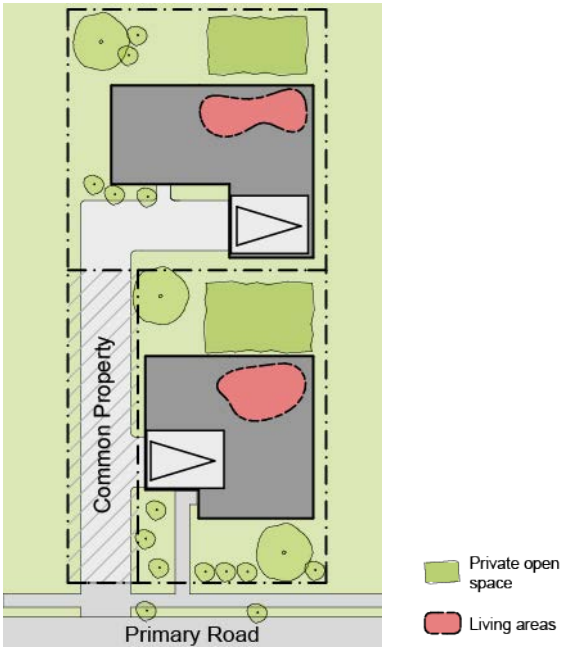
Design qualities

Detached Dual occupancies consist of two dwelling on one lot. They are usually characterised by two dwellings arranged in a linear order with one dwelling facing the street scape and the second dwelling located behind. On corner blocks the second dwelling can face the secondary road.

Where these developments are located between neighbouring lots, one driveway serves as an access point to the rear property. (known as a battle-axe) Poor design outcomes can result from this typology when a majority of the site and subsequent landscaping is given over to driveway access.

Rear detached dual occupancies tend to have minimal impact on the streetscape due to the small scale nature of the development, however more care and consideration needs to be given to the rear dwelling in terms of privacy, overlooking and overshadowing for both the dwelling and the neighboring property.

Detached dual occupancies tend to have limited impact on the streetscape as it largely remain in tact. Significant care needs to be taken to reduce tree canopy loss in the rear garden and manage privacy and overshadowing impacts



Context and subdivision

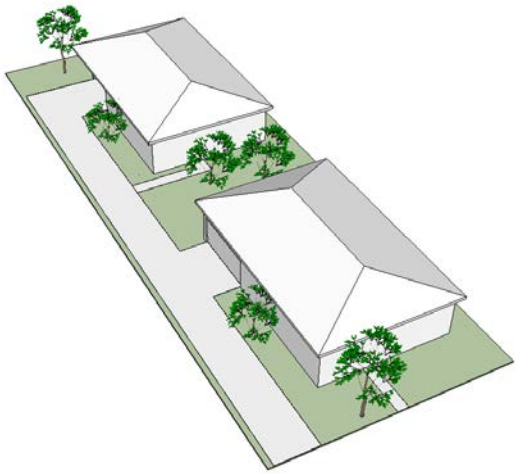
This building type is best used when:

- Blocks are narrow and long in proportion
- Can be carried out as a Strata titled development when individual lots do not meet the minimum size requirement
- Most commonly these developments are carried out as a Torrens titled development due to the small scale nature of this typology.
- Ideal for corner blocks where rear dwelling faces secondary street frontage
- Battle-axe - minimum width 18m
- Corner site - minimum width 15-18m depending on street setback.

Key considerations for developing controls

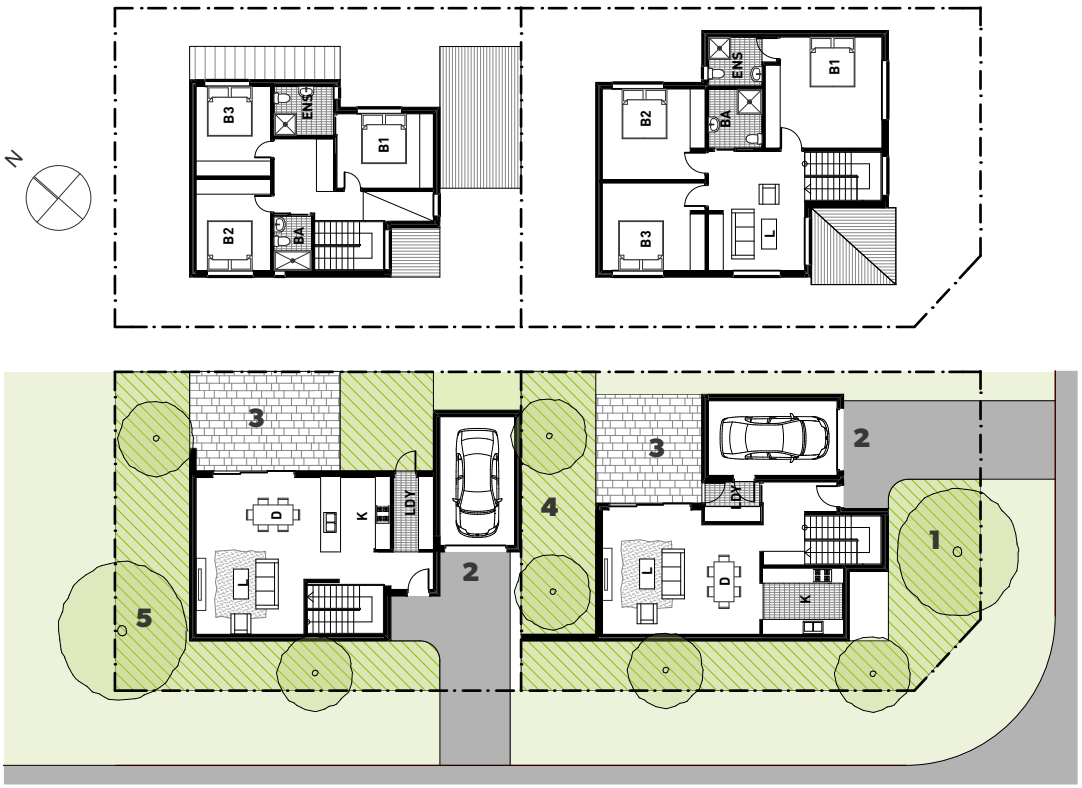
Detached dual occupancies tend to have limited impact on the streetscape and surrounds due to the small scale nature of the development. Generally good natural light and private open space can be achieved if there is appropriate spacing between dwellings and the size of the dwellings are appropriate to the size of the block.

- Allow on land zoned for low density residential development
- Controls for setback, bulk, scale, FSR , building height, landscape and private open space should be kept the same as what is prescribed for a single dwelling house in the area.
- On single frontage blocks, design criteria should encourage any two storey development to the front of the site, with single storey to the rear to prevent overlooking and privacy issues to neighbouring properties.
- In cases where it can be proven to have minimal privacy issues, the resulting dwellings can both be two storeys.
- Minimise impact of driveways by limiting one driveway per street frontage
- Allow for Torrens titling of lots if they meet the minimum lot size.
- This model works very well for corner sites as it provides one dwelling with a frontage to the primary road and a second dwelling with a frontage to the secondary road.



Typical principal development controls	
Land title:	Torrens or strata
Minimum Lot size	Corner: 200m² (each lot) Battleaxe: 300m² (each lot)
FSR:	0.4 - 0.5:1
Landscaped area	20 - 50% increases with lot size
Building height	8.5m
Front setback	Average of neighbourhood or 5.5m
Rear setback	3 - 6m
Side Setbacks	Front 15m: 1.2m at front Rear: 2.5m plus 45° height plane
Car parking	1-2 spaces

Two Dwellings Detached - Example Plan



1. Tree planting in front setback

2. Garage Setback from building line

3. Private open space

4. 3m seperation between buildings

5. Tree planting in rear setback

Two Dwellings Side by Side

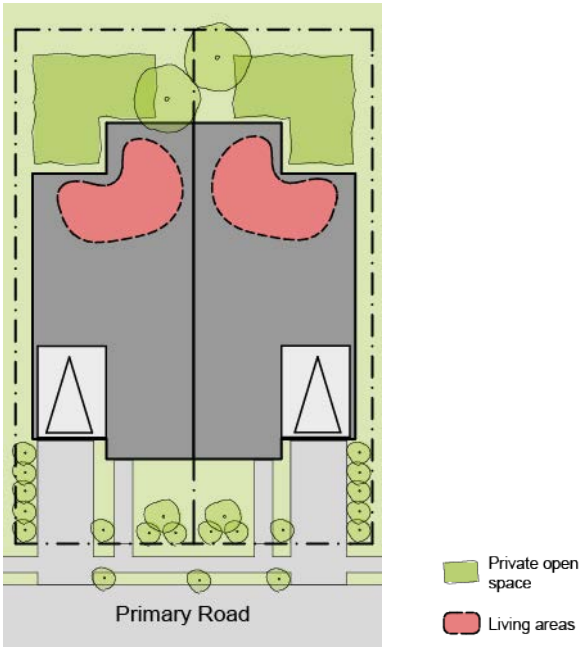
Side attached dual occupancies consist of two dwelling on one lot. They are characterised by two dwellings sharing a common wall in a semi-detached configuration. Both dwellings are arranged to face the primary street frontage. Dwelling can be single or double storey.

Side attached dual occupancies tend to have limited impact on the streetscape and surrounds as the scale of the development is consistent with that of a large freestanding house.

This typology of housing maintains a suburban pattern of front setback and large rear yard and is popular in suburban settings where the block sizes are wider and shallower.

Dwellings tend to be symmetrical in both layout and architectural form, however occasionally architectural expression can vary between both dwellings in a response to add individuality.

Basement parking can be provided - but is rare except on steep terrain.



Context and subdivision

This building type is best used when:

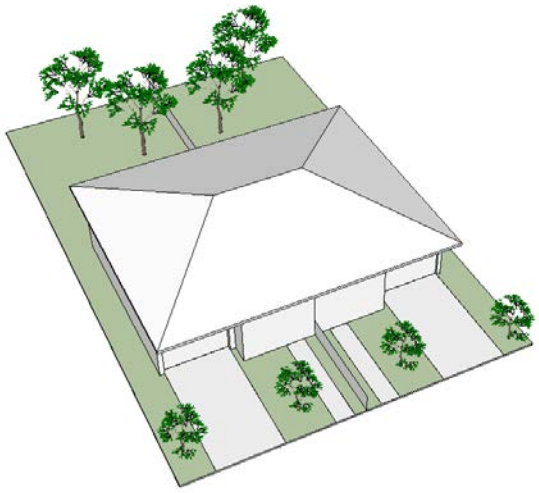
- Block are wide and shallow in proportion
- Can be carried out as a Strata titled development when individual lots do not meet the minimum size requirement
- Most commonly these developments are carried out as a Torrens titled development due to the small scale nature of this typology.
- Highly desirable mid block form of subdivision
- Minimum lot width high dependent on vehicle access.

Key considerations for developing controls

Good natural light is achieved as both dwellings have the same front/back orientation. There is good opportunity for front and rear landscaping with larger areas of private open space located in the rear of both dwellings.

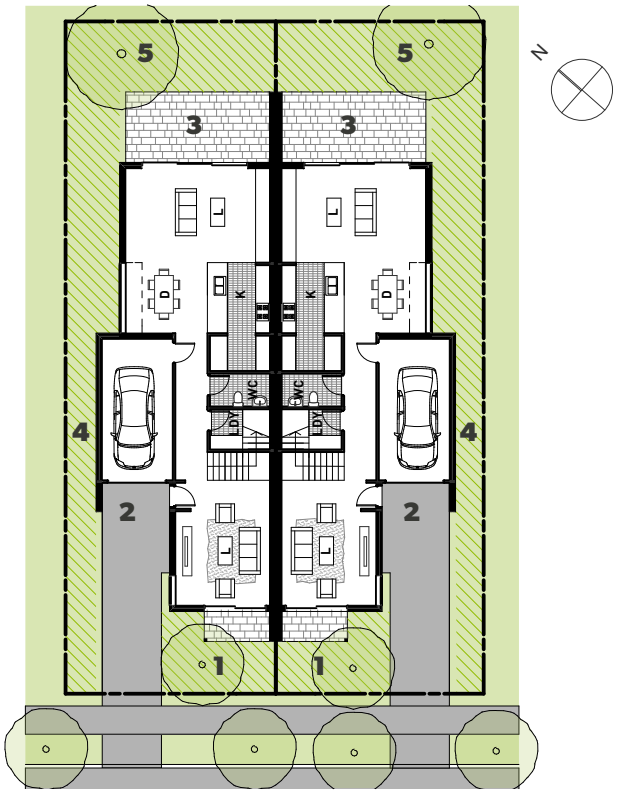
- Allow on land zoned for low and medium density residential development
- Controls for setback, bulk, scale, FSR , building height, landscape and private open space should be slighly more than a single dwelling house as there is a common boundary.
- Minimise impact of driveways and garages by limiting all driveways and garages to single width.
- Allow for Torrens titling of lots if they meet the minimum lot size.
- Minimum lot width where garages face the primary road should be 15m (7.5m each)
- Minimum lot width where garages and car parking is from the rear is typically 12m to allow for adequate side setbacks and good internal planning.

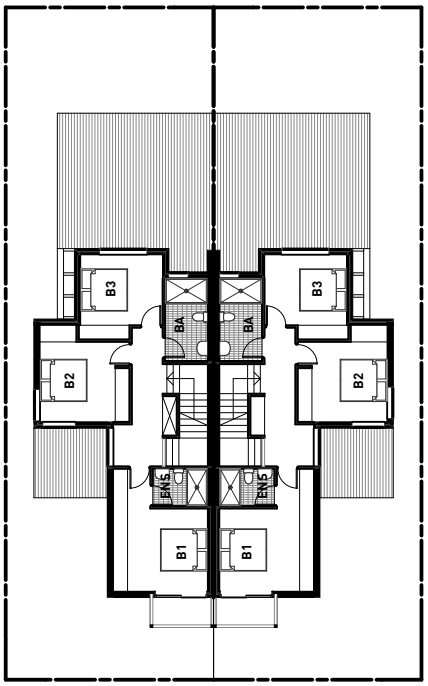
Figure A-1



Typical principal development controls	
Land title:	Torrens or strata
Minimum Lot size	200m²
FSR:	0.55 - 0.70:1
Landscaped area	20 - 50% increases with lot size
Building height	8.5m
Front setback	Average of neighbourhood or 5.5m
Rear setback	3 - 6m
Side Setbacks	Front 15m: 1.2m at front Rear: 3.6m plus 45° height plane
Car parking	1-2 spaces

Two Dwellings Side by Side - Example Plan





1. Tree planting in front setback
2. Garage Setback from building line
3. Private open space
4. 1.2m side setback
5. Tree planting in rear setback

Terrace Houses - Car Parking to Primary Road

Terrace houses with front access consist typically of a row of two or three storey houses in a traditional terrace style form.

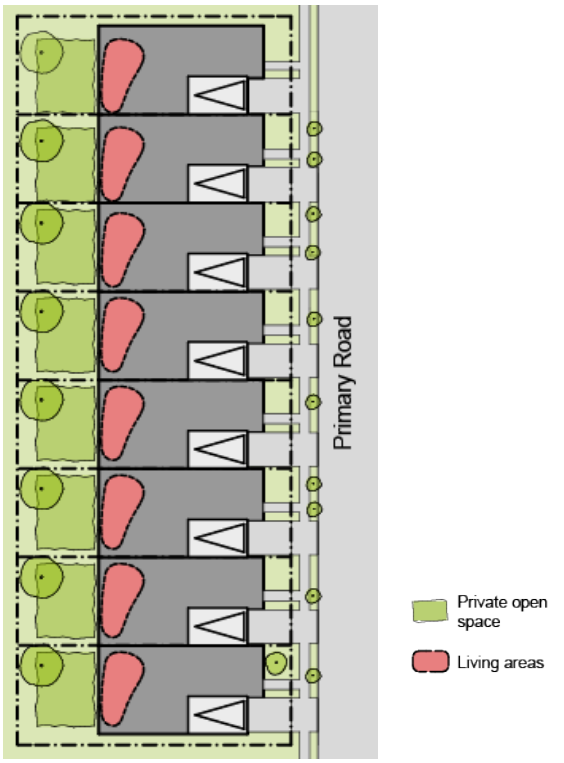
Car parking for this typology comes from the primary street frontage. A pattern of driveway, garden and entry path forms the streetscape.

In order to achieve an effective internal layout including garaging, the widths of each dwelling normally needs to be 7.5m. If each individual lot meets the minimum lot area, Torrens titling can be achieved with this type of development

Each dwelling is orientated front to back, with private open space typically arranged at the rear of the property. Good outcomes of visual privacy between dwellings is achieved with this typology, and privacy issues such as overlooking into adjoining neighbouring properties is reduced.

Use courtyards to provide solar access and natural daylight into the middle of the dwelling.

Care needs to be given to the impact of numerous driveways onto the streetscape and the potential for this to remove or reduce street parking.



Context and subdivision

This building type is best used when:

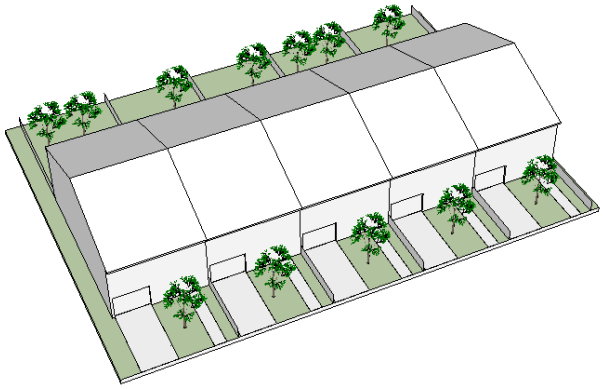
- Wide shallow blocks and amalgamated sites.
- Highly desirable mid block subdivision - deep lots result in larger rear gardens and more generous courtyards.
- Suits areas where there is a higher level of housing density and can blend in with the streetscape or in urban infill areas.
- Most commonly these developments are carried out as a Torrens titled.
- Can be carried out as a Strata titled development when individual lots do not meet the minimum size requirement

Key considerations for developing controls

Good natural light is achieved as both dwellings dual orientation, but will often require a courtyard so light can penetrate the plan. There is good opportunity for front and rear landscaping with larger areas of private open space located in the rear of both dwellings.

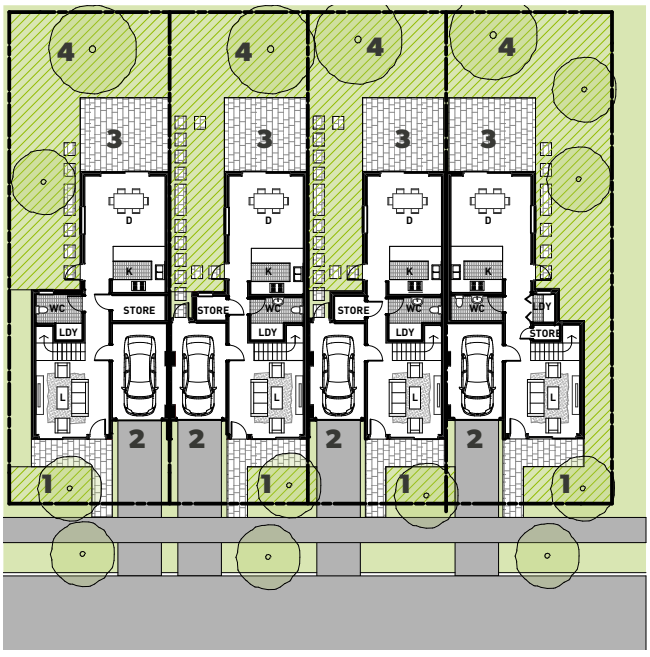
- Allow on land zoned for low and medium density residential development
- Minimise impact of driveways and garages by limiting all driveways and garages to single width.
- Allow for Torrens titling of lots if they meet the minimum lot size.
- Minimum lot width where garages face the primary road should be 15m (7.5m each)
- Minimum lot width where garages and car parking is from the rear is typically 12m to allow for adequate side setbacks and good internal planning.

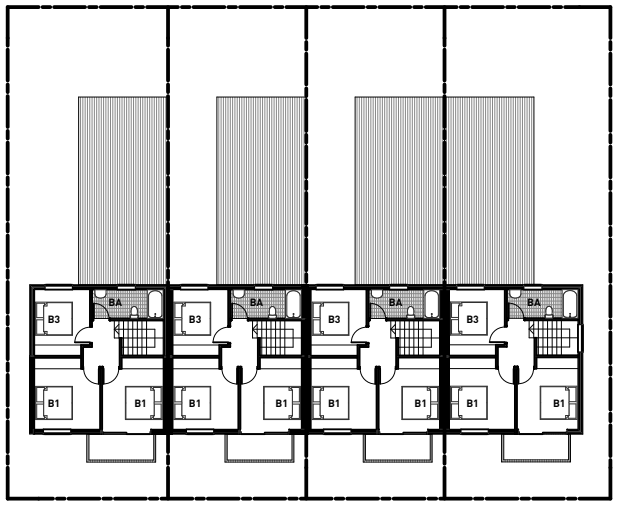
Figure A-2



Typical principal development controls	
Land title:	Torrens or strata
Minimum Lot size	150m²
FSR:	0.55 - 0.75:1
Landscaped area	20 - 50% increases with lot size
Building height	8.5m (2 storey) - 10m (3 storey)
Front setback	Average of neighbourhood or 5.5m 3.5m min allows for landscaped front setback.
Rear setback	3 - 6m
Side Setbacks	Front 15m: 1.2m at front Rear: 3.6m plus 45° height plane Om setbacks for internal boundaries
Car parking	1-2 spaces

Terrace Houses - Car Parking to Primary Road- Example Plan





1. Tree planting in front setback
2. Garage Setback from building line
3. Private open space
4. Tree planting in rear setback

Terrace Houses - Rear Lane Access

Terrace houses with rear lane access consist typically of a row of two or three storey houses in a traditional terrace style form.

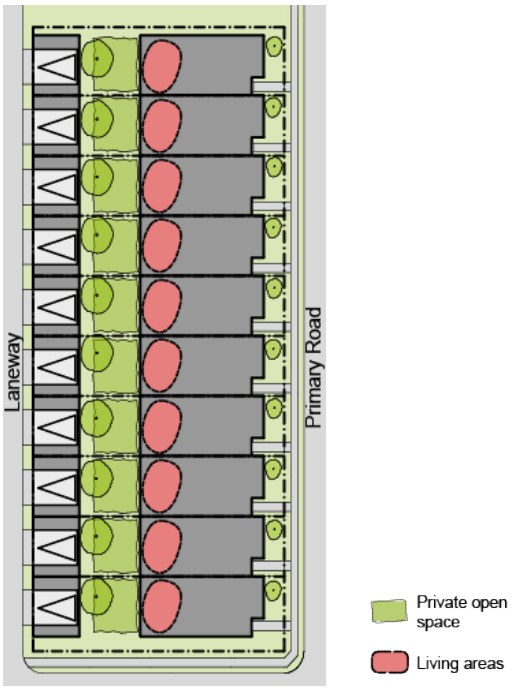
Car parking for this typology comes from the rear lane with access to rear garaging. By removing car parking from the front streetscape a more aesthetically pleasing repetitive pattern of terrace house with front garden and entry path forms the streetscape. .

By locating the garaging to the rear dwelling widths can be reduced down to 4.6m - but work better around 5 - 7m in width.

Each dwelling is orientated front to back, with private open space typically arranged at the rear of the property. Good outcomes of visual privacy between dwellings is achieved with this typology, and privacy issues such as overlooking into adjoining neighbouring properties is reduced.

Use courtyards to provide solar access and natural daylight into the middle of the dwelling.

Care needs to be given to how the garages front the laneway whilst still promoting passive surveillance for safety and security of this lane - deeper lots allow opportunities for



Context and subdivision

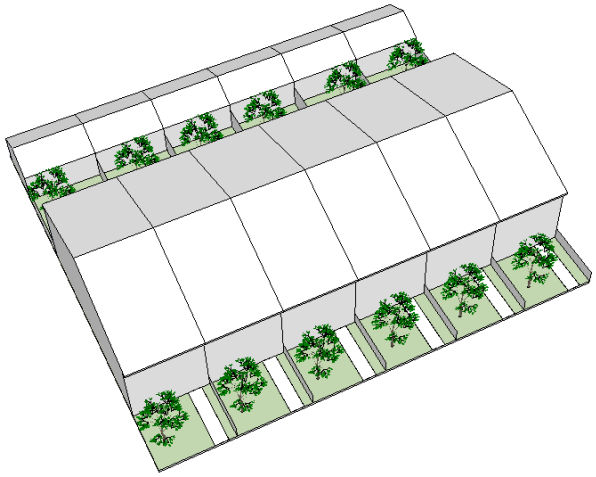
This building type is best used when:

- Wide shallow blocks and amalgamated sites.
- Suits areas where there is a higher level of housing density and can blend in with the streetscape or in urban infill areas??
- Suited for new subdivisions where laneway access can be designed into the project such as corner blocks
- Most commonly these developments are carried out as a Torrens titled when minimum size requirement is achieved development due to the small scale nature of this typology.

Key considerations for developing controls

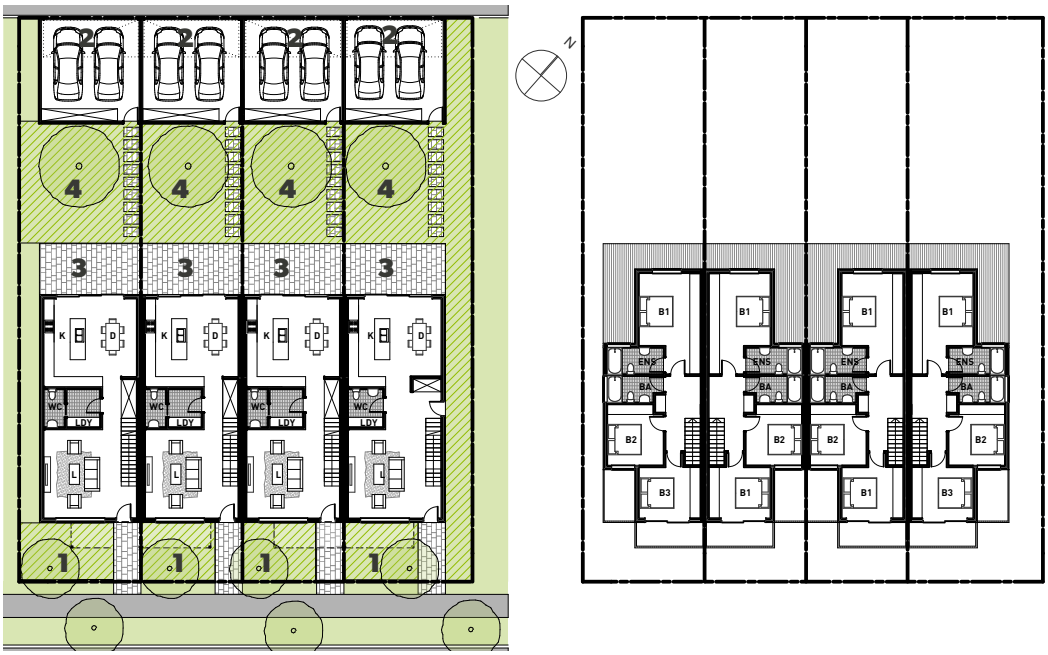
Good natural light is achieved as both dwellings have the same front/back orientation. There is good opportunity for front and rear landscaping with larger areas of private open space located in the rear of both dwellings.

- Allow on land zoned for low and medium density residential development
- Allow for Torrens titling of lots if they meet the minimum lot size.
- Additional block depth is needed to accommodate landscaped area in the middle of the site, garaging and private open space.



Typical principal development controls	
Land title:	Torrens or strata
Minimum Lot size	130m²
FSR:	0.65 - 0.75:1
Landscaped area	20 - 50% increases with lot size
Building height	8.5m (2 storey) - 10m (3 storey)
Front setback	Average of neighbourhood or 5.5m 3.5m min allows for landscaped front setback.
Rear setback	3 - 6m
Side Setbacks	Front 15m: 1.2m at front Rear: 3.6m plus 45° height plane Om setbacks for internal boundaries
Car parking	1-2 spaces

Terrace Houses - Rear Lane Access - Example Plan



1. Tree planting in front setback

2. Garage access of rear lane

3. Private open space

4. Tree planting in rear setback

Terrace Houses - Basement Car Parking

Terrace houses with basement parking consist typically of a row of two or three storey houses in a traditional terrace style form.

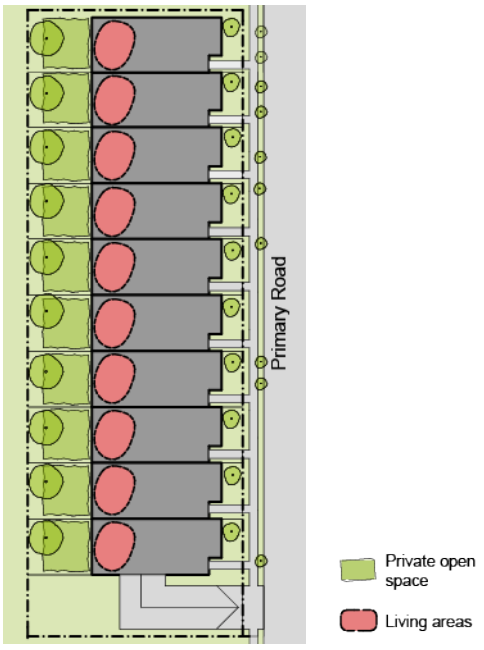
Car parking for this typology is located in a basement under the development and accessed off the street. Direct access from the garage is provided to the dwelling. By removing car parking from the front streetscape to the basement, a more aesthetically pleasing repetitive pattern of terrace houses with front garden and entry path forms the streetscape.

This is ideal for areas where there is no rear lane access and areas with sloping terrain where car park entrance can be located at the lowest point on the block.

Each dwelling is orientated front to back, with private open space typically arranged at the rear of the property. Good outcomes of visual privacy between dwellings is achieved with this typology, and privacy issues such as overlooking into adjoining neighbouring properties is reduced.

Use courtyards to provide solar access and natural daylight into the middle of the dwelling.

Further care needs to be given to the design of the entry to the basement car park to ensure it does not dominate the street scape.



Context and subdivision

This building type is best used when:

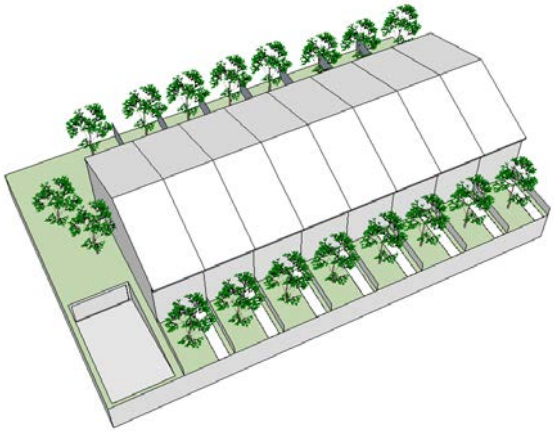
- Wide shallow blocks and amalgamated sites.
- Suits areas where there is a higher level of housing density and can blend in with the streetscape or in urban infill areas??
- Usually more expensive to construct, this style of development has some of the best outcomes for streetscape and landscaping.
- A popular typology in areas of high property values where the costs of the basement construction can be offset by the higher price of the dwelling.
- This development is typically strata titled due to the use common access and circulation through the basement car parking, however if car parking aligns with the dwellings above Torrens titling is possible with the use of easements in smaller developments.

Key considerations for developing controls

Most efficient form of terrace housing. Good natural light is achieved with dual orientation. There is good opportunity for front and rear landscaping with larger areas of private open space located in the rear of both dwellings.

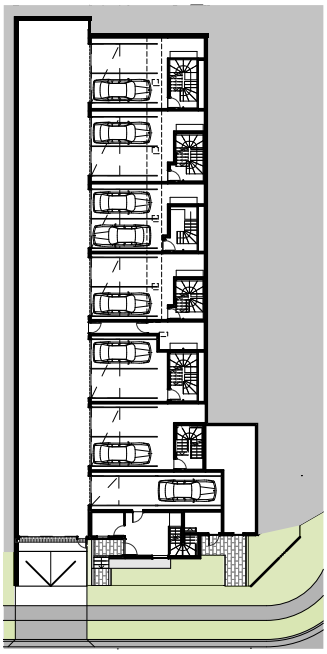
- Allow on land zoned for low and medium density residential development
- Allow for Torrens titling of lots if they meet the minimum lot size.
- Increased side setbacks may be required in areas of steep terrain to minimise impact if basements are raised above ground
- Consider impacts of basement when setting landscaped area , side and rear setbacks

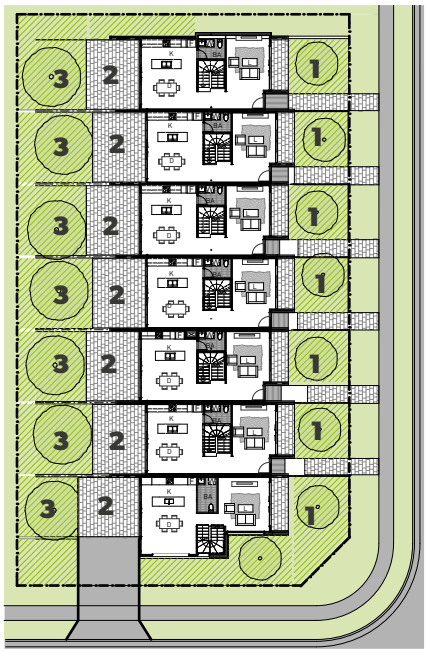
Figure A-3

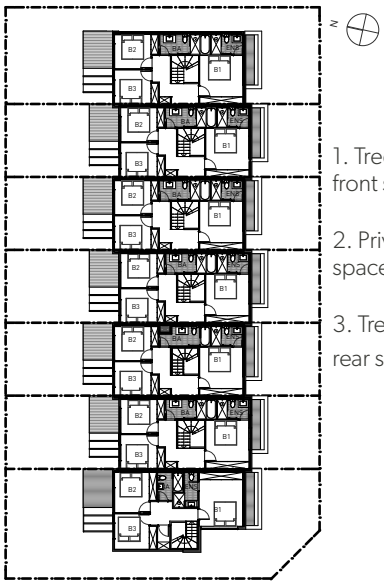


Typical principal development controls	
Land title:	Torrens or strata
Minimum Lot size	100m²
FSR:	0.70 - 1.0:1
Landscaped area	20 - 50% increases with lot size
Building height	8.5m (2 storey) - 10m (3 storey)
Front setback	Average of neighbourhood or 5.5m No less than 3.5m
Rear setback	3 - 6m
Side Setbacks	Front 15m: 1.2m at front Rear: 3.6m plus 45° height plane Om setbacks for internal boundaries
Car parking	1-2 spaces

Terrace Houses - Basement Car parking - Example Plan







1. Tree planting in front setback

2. Private open space

3. Tree planting in rear setback

Multi Dwelling Housing - Row housing

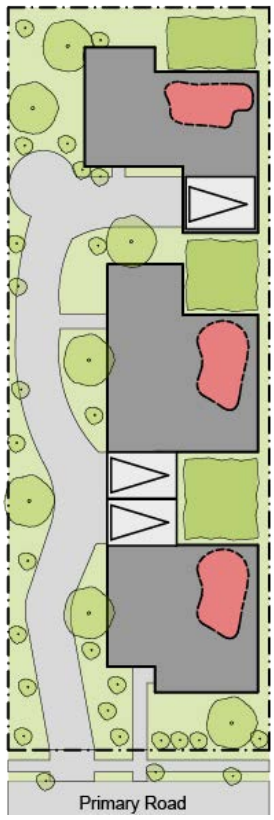
Multi Dwelling row housing consists of three or more detached/semi detached dwellings arranged on a site, with the front dwelling usually two storey.

For long narrow sites, dwellings are arranged in a linear order with a single driveway running down one side of the block. On wider blocks a radial arrangement is common with a centralised driveway with villas arranged around.

Multi dwelling villas can have a minimal impact on the surrounding suburb depending on the number and size of the development; however serious consideration has to be given to privacy, overlooking and overshadowing of the neighbouring properties when double storey developments are proposed.

Poor design outcomes can result from this typology when a majority of the site and subsequent landscaping is given over to driveway access.

Compared to other small scale medium density types a large proportion of the site used for driveway and side setbacks.



Context and subdivision

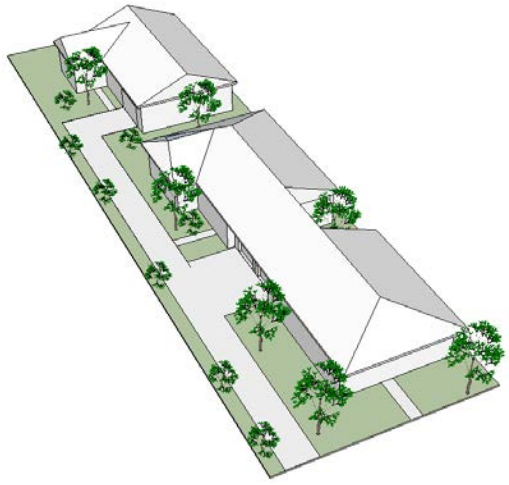
This building type is best used when:

- lots are long and narrow and amalgamation would increase property values and make development not feasible.
- It enables the preservation the streetscape as only one dwelling typically has a frontage to the street
- Generally a minimum lot width of 17-20m is needed to efficiently plan the site.
- Strata titled development

Key considerations for developing controls

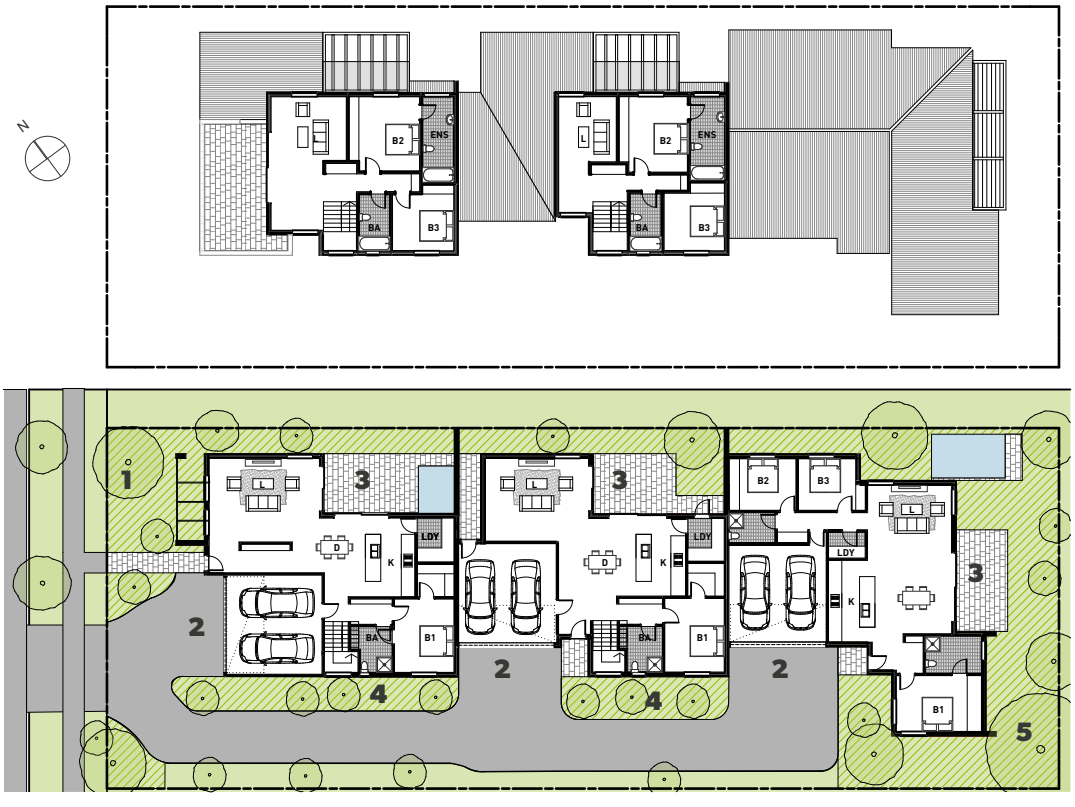
Special attention needs to be given to the design of multi dwelling villas to address privacy and overshadowing impacts on adjoining properties

- Promote the use of courtyard designs to improve private open space
- Ensure setbacks between dwellings on site is sufficient to ensure privacy with larger setbacks at the rear for landscaping and privacy separation
- Setbacks at upper levels should be set to mimimise need for privacy screens
- Allow for the use of communal open space
- Minimise impact of driveways by limiting one driveway per street frontage and keep width to a minimum
- Consider in character statement how landscaped area should be distributed around site - consolidated in communal space or distributed in larger landscaped courtyards.
- Provide rear setback for tree planting in communal ownership
- Long blocks should have significant gaps between dwellings for landscaped area
- Not recommended that this form exceeds 2 storeys due to overshadowing and privacy impacts.
- Avoid dwellings



Typical principal development controls	
Land title:	Torrens or strata
Minimum Lot size	on average about 300m² per dwelling
FSR:	0.45-0.5:1
Landscaped area	20 - 50% increases with lot size
Building height	8.5m
Front setback	Average of neighbourhood or 5.5m
Rear setback	3 - 6m
Side Setbacks	Front 15m: 1.2m at front Rear: 4m
Car parking	1-2 spaces

Multi-dwelling Housing - Row Housing- Example Plan



1. Tree planting in front setback

2. Garage Setback from building line

3. Private open space

4. 2.5m separation from internal road

5. Tree planting in rear setback

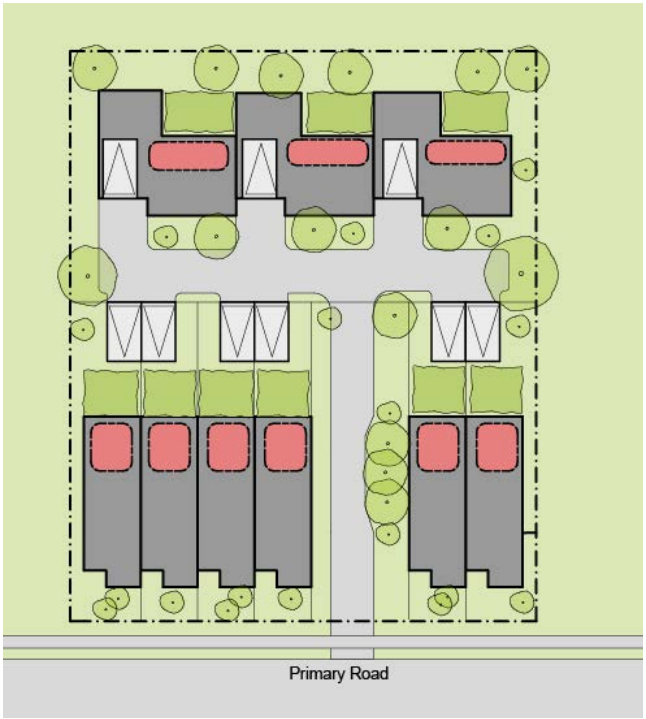
Multi Dwelling Housing - Mews

Mews style multi-dwellings developments are characterised by dwellings arranged around an internal centralised road which provides access to dwellings and carparking. They are different from row housing as the block is wider and dwelling have a frontage to the primary street as well as internal street networks

Dwellings at the front of the lot are arranged to face the street, with garage parking located at the rear off the internal street.

Dwellings located at the rear of the property are arranged with parking in the front off the internal street. Care must be given that the garages of the rear dwellings are not seen from the primary streetscape, instead when viewing down the centralised internal road, it is front doors which are seen.

Care needs to be given when arranging the dwellings on the site to ensure there is ample separation between the dwellings at the front and rear to allow for landscaping and to prevent privacy concerns. Poor outcomes result from trying to fit this typology on shallow sites where the ability for landscaping of the internal roadway is compromised.



Context and subdivision

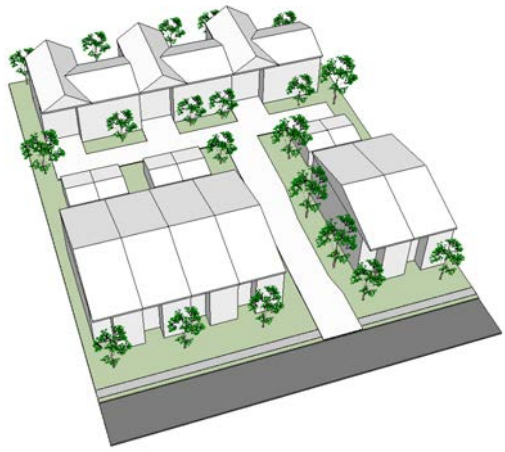
This building type is best used when:

- Wide and deep sites
- Areas where house prices do not justify the construction of basement car parking
- Often requires site amalgamation to obtain a large enough site
- Minimum lot depth is generally around 45-50m
- Minimum lot width is around 25m, however this layout is not an efficient use of land until the lot with exceeds 40m

Key considerations for developing controls

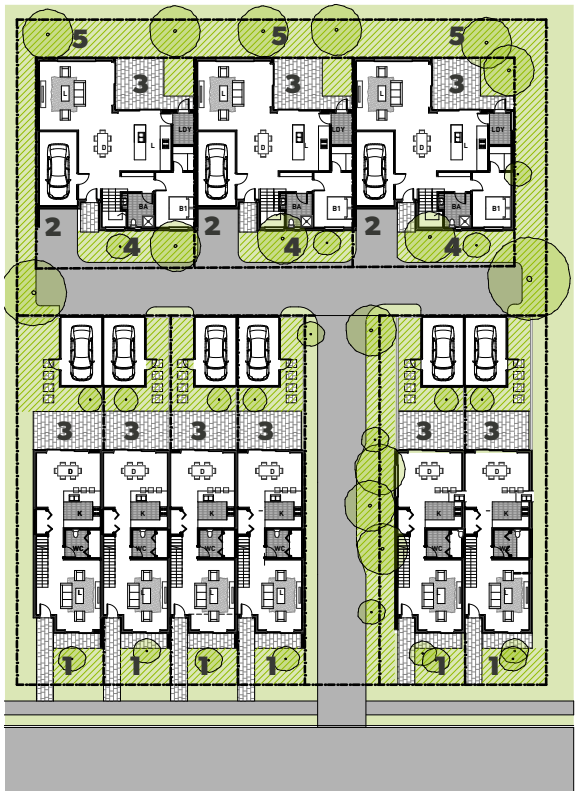
Similar to row housing special attention needs to be given to the design of multi dwelling villas to address privacy and overshadowing impacts on adjoining properties

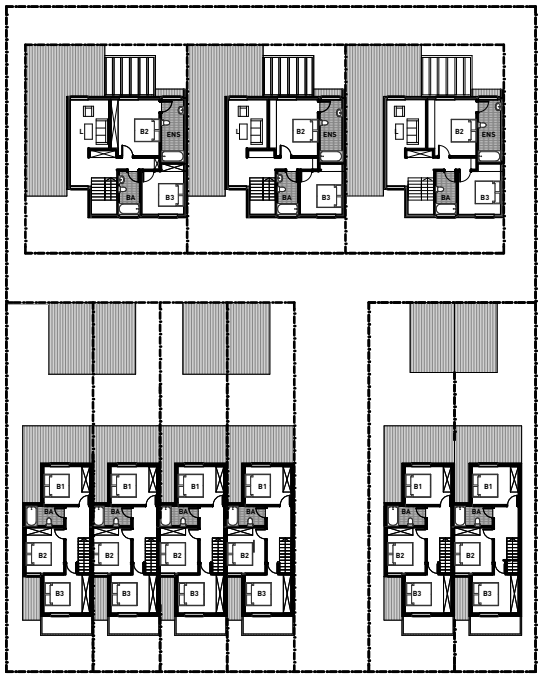
- Promote the use of courtyard designs to improve private open space
- Smaller sites often result in lower densities as a greater proportion of the site is taken up with vehicle circulation.
- Setbacks at upper levels should be set to mimimise need for privacy screens
- Test densities to ensure space is provided for landscaped area, separations around driveways
- Consider rear setback and side setback and the opportunity to provide vegetation and tree canopies.
- Provide rear setback for tree planting in communal ownership
- Long blocks should have significant gaps between dwellings for landscaped area
- 3 storeys is possible at the street frontage with 2 storeys at the rear.
- A hierarchy of streets and lane should be provided for larger development sites
- Prepare local precinct plans that indicate where there are opportunities to create new lanes and streets that can create new cross -site links. This can enable sharing of the new internal streets. Consider making these public streets



Typical principal development controls	
Land title:	Torrens or strata
Minimum Lot size	1250m²
FSR:	0.45-0.7:1
Landscaped area	20 - 50% increases with lot size
Building height	8.5m (2 storey) - 10m (3 storey)
Front setback	Average of neighbourhood or 5.5m
Rear setback	3 - 6m
Side Setbacks	Front 15m: 1.2m at front Rear 15m: 2.5m plus 45° height plane
Car parking	1-2 spaces

Multi-dwelling Housing - Mews - Example Plan





1. Tree planting in front setback

2. Garage Setback from building line

3. Private open space

4. 2.5m separation from internal road

5. Tree planting in rear setback

Multi Dwelling Housing - Basement Car Parking

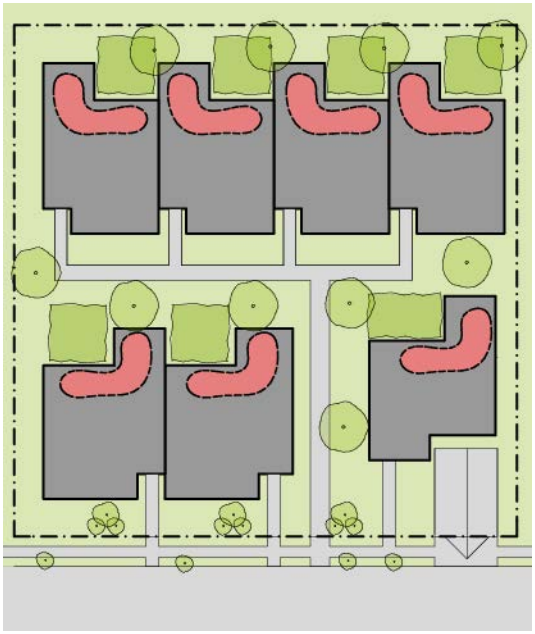
Multi dwellings with basement consists of the arrangement of dwellings within a landscaped environment with all site parking located in a basement below.

This style of development has the potential to reduce the amount of landscaped area that would normally be given over to driveway and circulation roads on site.

Pedestrian access at ground level is achieved through pathways throughout the landscaped site. This area is usually common property and the development is Strata titled.

Care and consideration has to be given to the location and orientation of the dwellings on site to reduce the impacts of shadowing and overlooking to neighboring properties and surrounding dwellings and a clear pedestrian network is available so that visitors can identify how to access dwellings.

Further care needs to be given to the design of the entry to the basement car park to ensure it does not dominate the street scape.



Context and subdivision

This building type is best used when:

- Blocks will needs to by greater than 13m wide - but dependent on landscape context and landscape provided along the side boundary
- The development is Strata titled, with a portion of the site containing communal landscaping.
- Usually more expensive to construct, this style of development has some of the best outcomes for streetscape and landscaping.
- A popular typology in areas of high property values where the costs of the basement construction can be offset by the higher sale price of the dwelling.

Key considerations for developing controls

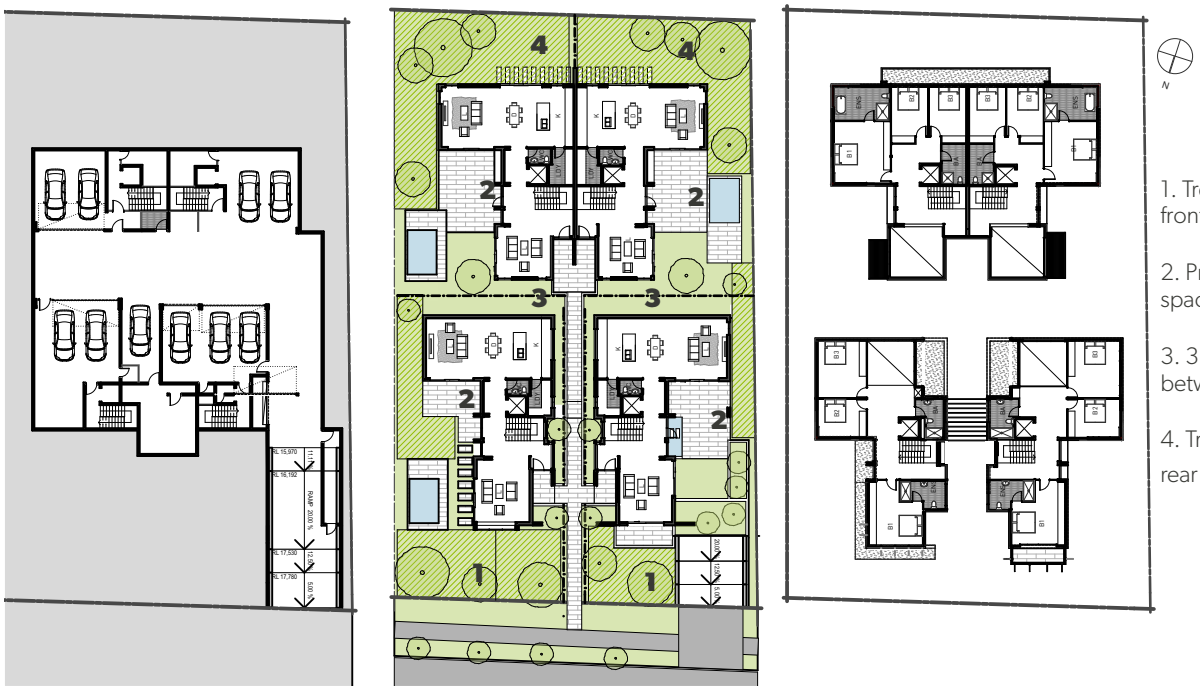
With the driveway located under ground greater space is available at ground level for pedestrian circulation and landscape. Achieved densities can be 0.1 - 0.2:1 higher than mews housing on the same block of land.

- Minimum lot widths should consider car parking circulation and if landscaped areas are required along the side boundaries
- If landscaping is desired along boundaries minimum dimension of 3m should be provided. This will allow for small - medium tree planting. Large tree planting will require 6m setbacks.
- Test sites of different configurations with the basement layouts, landscaped areas and setback controls to determine appropriate landscaped area, lot size and FSR.
- Minimum lot size needs to consider landscaped setbacks

Figure A-4

Typical principal development controls	
Land title:	Torrens or strata
Minimum Lot size	600m²
FSR:	0.6 - 1.0:1
Landscaped area	20 - 50% increases with lot size and side and rear setbacks
Building height	8.5m (2 storey) - 10m (3 storey)
Front setback	Average of neighbourhood or 5.5m
Rear setback	3 - 6m
Side Setbacks	If landscape desired on side boundary: 3 - 6m Where more urban context is desired: - Front 15m: 1.2m at front - Rear 15m: 2.5m plus 45° height plane

Multi-dwelling Housing - Basement Carpark- Example Plan



1. Tree planting in front setback

2. Private open space

3. 3m separation between buildings

4. Tree planting in rear setback

Multi Dwelling Housing - Courtyard housing

Multi-dwelling courtyard housing consists of dwellings arranged around courtyards which provide the private open space, ventilation, natural lighting and views to the dwellings. Unlike row houses this development has no setbacks to the side or rear boundaries and is a more urban form of development

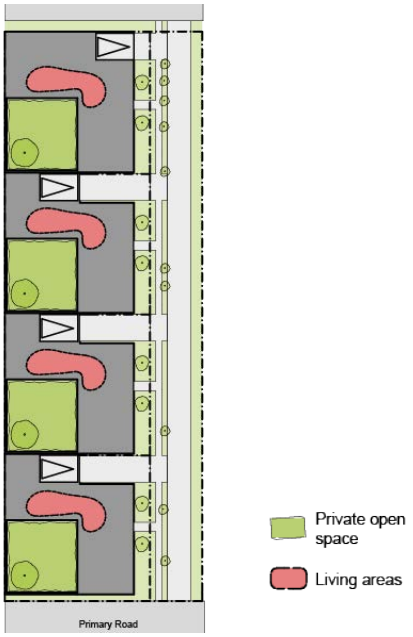
This type of development is suited to urban infill areas where setbacks are not the desired character and the development can be built up the the boundary.

The dwellings are usually arranged in a linear style with a driveway running down one side of the block. Special attention needs to be given to the driveway to ensure it resembles an internal street, with setbacks for planting and landscaping provided.

Excellent levels of privacy and amenity is given to each of the dwellings with an inward focus towards each of the landscaped courtyards.

This design can suffer when the buildings turn their backs to the streetscape and surrounding areas and become too inwardly focused. This can result in poor streetscape outcomes and a lack of passive surveillance to the streetscape.

This development form should be located in areas with generous public open space and high quality public domain.



Context and subdivision

This building type is best used when:

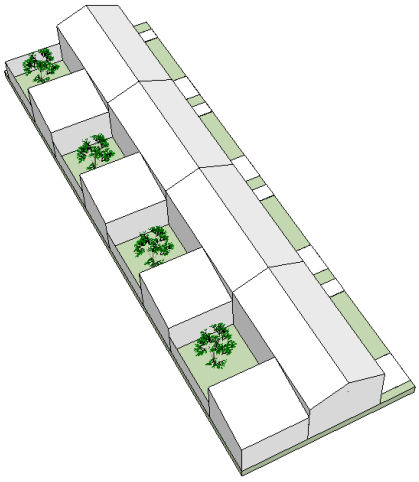
- Long narrow urban infill sites.
- Has the highest utilisation of land
- Corner urban sites where access is available on the secondary street frontage
- Lot width can be as little as 12.5m if a basement car park is provided
- Landscaped area is provided within each of the courtyards or consolidated at the front or rear.

Key considerations for developing controls

An urban form of medium density housing used in contexts in close proximity to town centres and areas with high quality public domain due to the limited amount of landscaped area on the site.

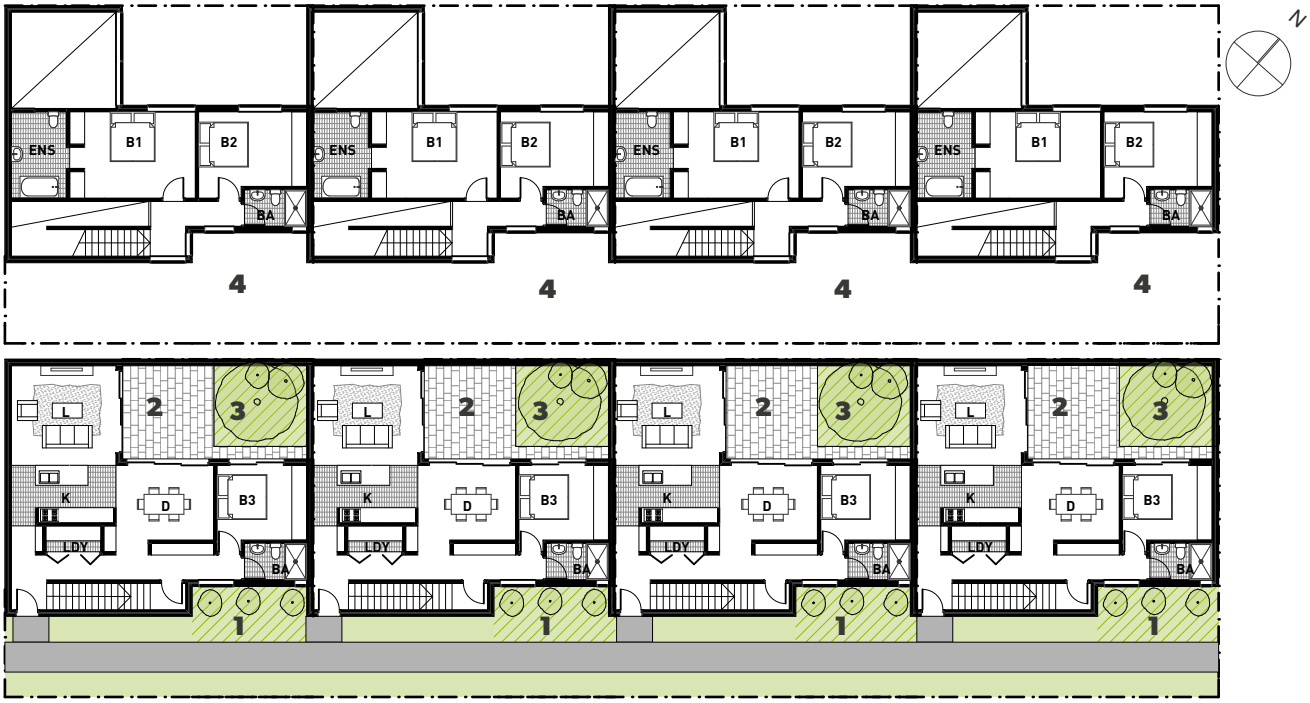
- Lot sizes can be small due to the compact nature - considered on the merits of the location and proportion of the site.
- Side and rear setbacks should allow for privacy with limited use of privacy screens and consider solar access.
- The reduced site area

Figure A-5



Typical principal development controls	
Land title:	Torrens or strata
Minimum Lot size	120m² per dwelling
FSR:	0.8 - 1.2:1
Landscaped area	10- 15%
Building height	8.5m (2 storey) - 10m (3 storey)
Front setback	Average of neighbourhood or 3.5m
Rear setback	3 - 6m
Side Setbacks	Ground floor - 0m First floor - 3m
Car parking	1 spaces

Multi-dwelling Housing - Courtyard Housing - Example Plan



1. Seperation between path and habitable room

2. Private open space

3. Landscape area for small tree

4. Upper level setback from boundary

Multi Dwelling Housing - Large Lot Masterplan and Communities

Large lot masterplans and communities are large developments of medium density dwellings usually arranged in rows of townhouses and terraces throughout the site.

These developments could be larger containing a few hundred dwelling or small containing only 15-20 dwellings.

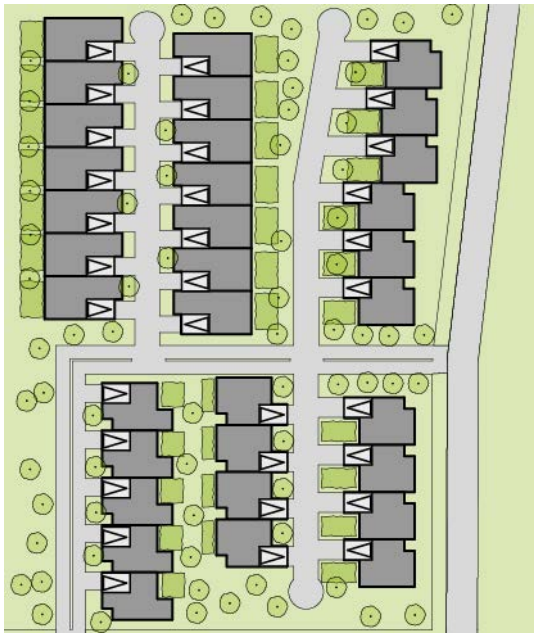
The type of dwelling used and its arrangement should follow and work with the terrain and existing landscape and landforms of the site.

Care and consideration needs to be given to road layouts, on site parking, landscaping and the location of dwellings. Where possible extend public roads into the site.

Design consideration also needs to be given to the surrounding suburbs to ensure there is proper integration with surrounds.

Larger central communal open space can be provided often co-located with water sensitive urban design features.

Good outcomes of privacy, landscaping, daylighting, private open space and amenity can result within this development as every aspect can be planned and resolved from the onset.



Context and subdivision

This building type is best used when:

- Greenfield sites and larger infill sites
- Areas of large growth and a high demand for large quantities of housing
- Usually built as a staged development with the site growing over time.
- Provide a variety of housing choices across the neighborhood. Built form intensity should change across the neighborhood with more intense development around the open space and less intense development around the perimeter at the interface

Key considerations for developing controls

The key consideration with this form of development is to start with the streets and the spaces and not with the buildings. Larger development are often best planned as part of a staged consent where the new street and open space network is designed and the detail of the dwelling layouts subsequently finalized. The following issues need to be considered above the

- Traffic impacts and increase in population- public transport links
- Landscaped areas for both individual dwellings and the whole site.
- Create a street hierarchy with a network of shared spaces, streets and lanes.
- Car parking requirements have a substantial impact on the density achieved or the scale of the development
- Stormwater should be integrated with the landscape design across the site.
- Communal open space should be consolidated in central areas on the site
- Primary street networks and larger communal open space should be dedicated to Council.

Typical principal development controls	
Land title:	Torrens or strata
Minimum Lot size	On average about 300m² per dwelling
FSR:	Highly variable dependant, open space road network - and typologies selected within. Gross densities around 25 -30 dwellings / ha are achievable. Net density is typically 30-40 dwellings per hectare.
Landscaped area	20 - 50% increases with lot size
Building height	8.5m (2 storey) - 10m (3 storey)
Front setback	Average of neighbourhood or 5.5m
Rear setback	3 - 6m
Side Setbacks	Front 15m: 1.2m at front Rear 15m: 2.5m plus 45° height plane
Car parking	1-2 spaces Visitor spaces provided in street network.

Manor House

This form of development contains 2,3 or 4 dwellings in a single two storey building. A 2 dwelling development is also known as a dual occupancy (attached)

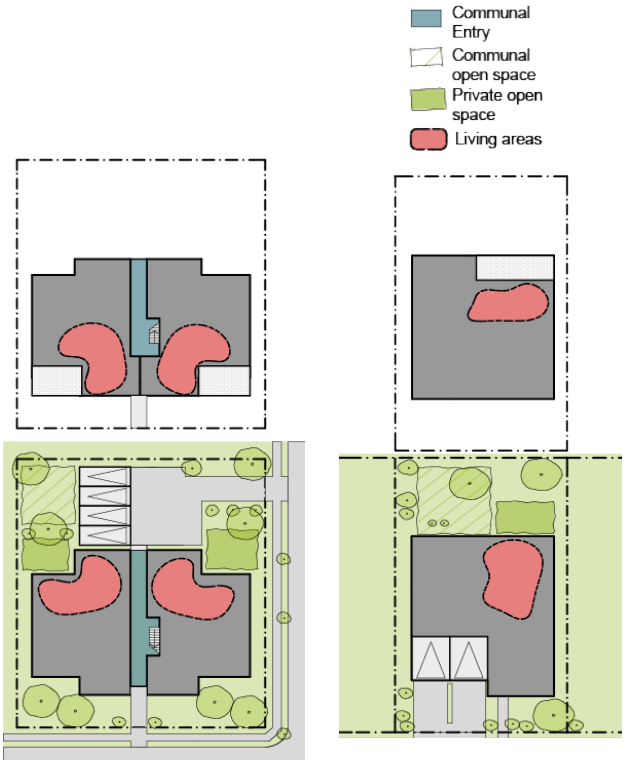
They are different from other medium density housing in that one dwelling is above another.

They often have a common entry, however the entry to the ground floor and upper level apartments may also be separate.

This form of dwelling is useful to accommodate affordable housing within a low and medium density context. The level floor plates also provide good accessibility for seniors or persons with a disability.

To reduce impact on the streetscape and surrounds, the scale of a manor house is designed to be similar to an oversized double storey single dwelling.

Private open space can be obtained by the use of balconies and communal private open space in the rear of the development.



Context and subdivision

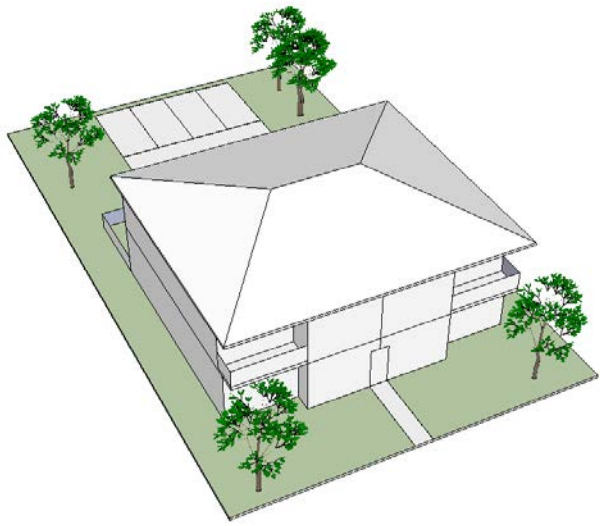
This building type is best used when:

- Best when on corner blocks or blocks with rear lane access to accommodate garages and car parking
- Development is Strata titled, with a common entry and internal hallway.
- Site width of 15m is typically required to achieve setbacks and sufficient space for parking.

Key considerations for developing controls

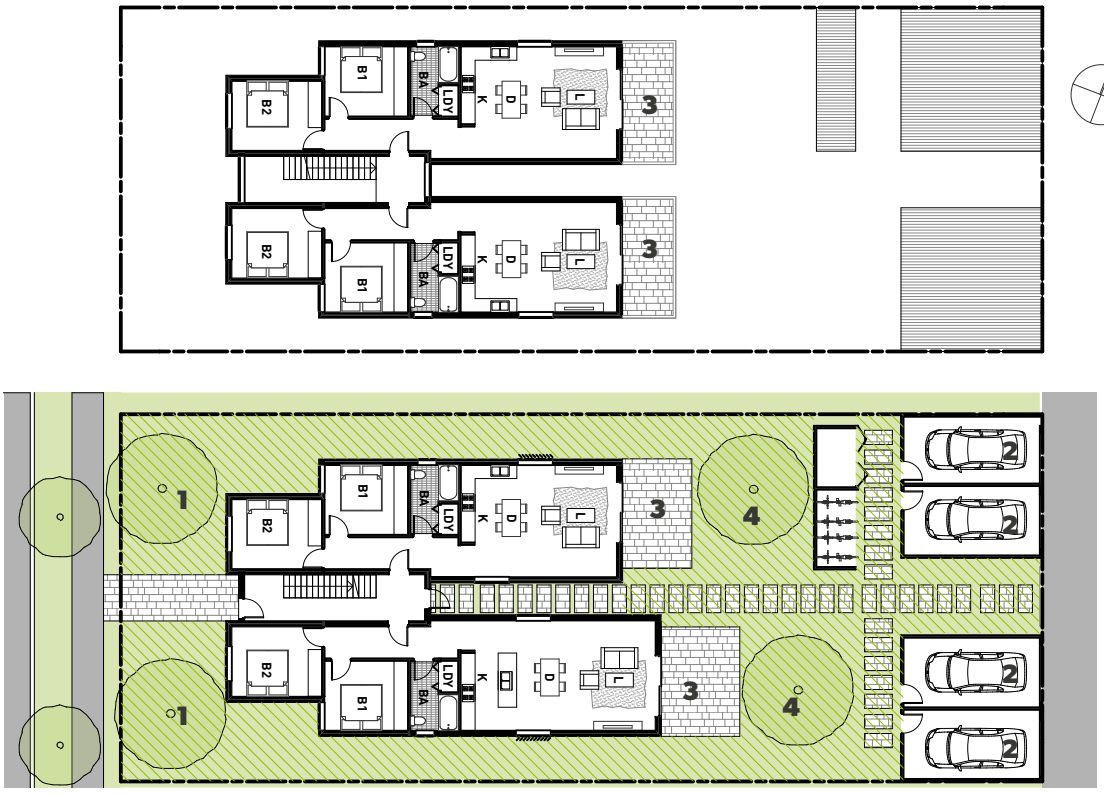
Special attention needs to be given to the design of manor houses to address privacy issues for neighbouring properties and for adequate private open space.

- Allow for the use of communal open space
- Allow on land zoned for low and medium density residential development
- Controls for setback, bulk, scale, FSR, building height, landscape and private open space should be kept the same as what is prescribed for a single dwelling house
- Locate all driveway access to rear lane or side street



Typical principal development controls	
Land title:	Torrens or strata
Minimum Lot size	600m²
FSR:	0.45 - 0.60:1
Landscaped area	20 - 50% increases with lot size
Building height	8.5m
Front setback	Average of neighbourhood or 5.5m
Rear setback	3 - 6m
Side Setbacks	Front 15m: 1.2m at front Rear 15m: 3.6m plus 45° height plane
Car parking	0.5 - 1 space per dwelling

Manor House - Example Plan



1. Tree planting in front setback

2. Garage access of rear lane

3. Private open space

4. Tree planting in rear setback

Glossary

Acoustic privacy

a measure of sound insulation between dwellings, between dwellings and communal areas, and between external and internal spaces

Adaptable housing

housing that is designed and built to accommodate future changes to suit occupants with mobility impairment or life cycle needs

Adaptive reuse

the conversion of an existing building or structure from one use to another, or from one configuration to another

Amenity

the 'livability', comfort or quality of a place which makes it pleasant and agreeable to be in for individuals and the community. Amenity is important in the public, communal and private domains and includes the enjoyment of sunlight, views, privacy and quiet. It also includes protection from pollution and odours

Aircraft noise

aircraft noise is identified as contours on the Australian Noise Exposure Forecast (ANEF) Map. The higher the ANEF contour value, the greater the exposure to aircraft noise

Articulation zone

an area in front of the building line that may contain porticos, balconies, bay windows, decks, patios, pergolas, terraces, verandahs, window box treatments, window bays, awnings and sun shading features

Attached dwelling

as defined in the *Standard Instrument - Principal Local Environmental Plan*

Attic

as defined in the *Standard Instrument - Principal Local Environmental Plan*

Bay window

window element which projects a short way past the face of the building. It can have windows on the return walls and sometimes incorporates a seat

BCA

Building Code of Australia

Building line

the predominant line formed by the main external face of the building. Balconies or bay window projections may or may not be included depending on desired streetscape

Building height

as defined in the *Standard Instrument - Principal Local Environmental Plan*

Building depth

is the overall cross section dimension of a building envelope. It includes the internal floor plate, external walls, balconies, external circulation and articulation such as recesses and steps in plan and section

Business zones

land identified on a Land Zoning Map within a local environmental plan as a B1 Neighbourhood Centre, B2 Local Centre, B3 Commercial Core, B4 Mixed Use, B5 Business Development, B6 Enterprise Corridor, B7 Business Park or B8 Metropolitan Centre zone

Note: residential multi-dwelling development may not be permissible or appropriate in all Business zones

Busy road or rail line

as defined in *State Environmental Planning Policy (Infrastructure) 2007* and Development Near Rail Corridors and Busy Roads – Interim Guideline

Cadastre

the current subdivision pattern of a locality on the ground e.g. boundaries, roads, waterways, parcel identifiers and names

Clerestory

high level windows that can be part of a wall above a lower roof

Communal open space

outdoor space located within the site at ground level or on a structure that is within common ownership and for the recreational use of residents of the development. Communal open space may be accessible to residents only, or to the public

Core

vertical circulation (lift and/or stairs) within a building. A single core may include multiple lifts serving the same floor area

Cornice

decorative horizontal moulding at the top of a building which 'crowns' or finishes the external facade

Courtyard

communal space at ground level or on a structure (podium or roof) that is open to the sky, formed by the building and enclosed on 3 or more sides

Datum point or datum line

a significant point or line in space established by the existing or desired context, often defined as an Australian Height Datum. For example, the top of significant trees or the cornice of a heritage building

Daylight

consists of both skylight (diffuse light from the sky) and sunlight (direct beam radiation from the sun). Daylight changes with the time of day, season and weather conditions

Dense urban area

an area where the permitted floor space ratio for development under a local environmental plan is 2.5:1 or greater

Director-General's Design Excellence Guidelines

the Design Excellence Guidelines issued by the Director-General in October 2010

Dual aspect dwelling

cross ventilating dwellings which have at least two major external walls facing in different directions, including corner, cross-over and cross-through dwellings

Effective Openable Area (EOA)

the minimum area of clear opening of a window that can take part in providing natural ventilation. The effective openable area of a sliding or hung sash window can be measured in elevation. Hinged windows such as casement, awning and hopper windows may measure the diagonal plane from the sash to the jamb and add the triangles at either end up to a total area of the window opening in the wall. Obstructions within 2m of a window reduce the effective openable area as measured in elevation. Fly screens and security screens will reduce the effective openable area by half

Facade

the external face of a building, generally the principal face, facing a public street or space

Floor Area - room

is measured within the finished surfaces of the walls, but excludes any area occupied by wardrobes, kitchens or fixed storage.

Floor Area - dwelling

is measured within the finished surfaces of the walls, but excludes any area occupied by voids or stairs but includes area occupied by cupboards, wardrobes and fixtures.

Floor area - private open space

is measured within the finshed surface of any bounding walls, balustrades or handrails or the edge of hard surface but excludes any fixed storage.

Floor Space Ratio

as defined in the *Standard Instrument - Principal Local Environmental Plan*

Gallery access

an external corridor, generally single loaded, which provides access to individual dwellings along its length

Glass line

inside face of windows on the external walls of a building

Guide to Traffic Generating Developments

Guide to Traffic Generating Developments, published by Roads and Maritime Services (formerly RTA) and available on its' website

Green roof

a roof surface that supports the growth of vegetation,comprised of a waterproofing membrane, drainage layer, organic growing medium (soil) and vegetation. Green roofs can be classified as either extensive or intensive, depending on the depth of substrate used and the level of maintenance required. Intensive green roofs are generally greater than 300mm deep and are designed as accessible landscape spaces with pathways and other features. Extensive green roofs are generally less than 300mm deep and are generally not trafficable

Gross residential density

The ratio of the number of dwellings to the area of land they occupy. The area includes internal public streets, all areas of local open space (including parks, sports fi elds, drainage reserves, landscape buffers, bushfi re asset protection zones) local or neighbourhood shops, primary and secondary schools, local community services, local employment areas and half the width of adjoining arterial roads

Green wall

a wall with fixtures to facilitate climbing plants. It can also be a cladding structure with growing medium to facilitate plant growth

Habitable room

a room used for normal domestic activities, and includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room and sunroom; but excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes-drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods, as defined by the BCA

Juliet balcony

a small projecting balcony, generally ornamental or only large

enough for one person standing

Landscaped Area

as defined in the *Standard Instrument - Principal Local Environmental Plan*

Livable Housing Design Guidelines

Livable Housing Design Guidelines, published by Livable Housing Australia and available on its' website

Living room

Includes a living, lounge room, dining room, family room, rumpus or any combination of the above. It excludes the kitchen component of a combined living / dining / kitchen spaces.

Master bedroom

the main bedroom within the dwelling, often the largest with an ensuite bathroom

Mid winter

is 21 June (winter solstice) when the sun is lowest in the sky

Multi dwelling housing

as defined in the *Standard Instrument - Principal Local Environmental Plan*

Multi dwelling terrace

as defined in the *Standard Instrument - Principal Local Environmental Plan*

Natural cross ventilation

natural ventilation which allows air to flow between positive pressure on the windward side of the building to the negative pressure on the leeward side of the building providing a greater degree of comfort and amenity for occupants. The connection between these windows must provide a clear, unobstructed air flow path. For an dwelling to be considered cross ventilated, the majority of the primary living space and n-1 bedrooms (where n is the number of bedrooms) should be on a ventilation path

Net residential density

The ratio of the number of dwellings to the area of land they occupy including internal public streets, plus half the width of adjoining access roads that provide vehicular access to dwellings.

Non-habitable room

a space of a specialised nature not occupied frequently or for extended periods, including a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom or clothes-drying room, as defined by the BCA

On-grade

on ground level

Open plan

dwelling layouts where spaces are not divided into discrete rooms, but are open and connected to allow flexibility of use (typically living, dining, kitchen and study areas)

Operable screening device

sliding, folding or retractable elements on a building designed to provide shade, privacy, and protection from natural elements

Operable walls

walls which can be moved, for example by sliding, folding, or pivoting, to allow for different room configurations or a balcony

Parapet

a horizontal low wall or barrier at the edge of a balcony or roof. Often taken to refer to the decorative element which establishes the street wall height of heritage buildings (see cornice)

Perimeter block

development where buildings generally define the street edge and enclose or partially enclose an area in the middle of the block

Plenum

a duct or chamber, usually with grilles, that air passes through. Plenums of small cross section tend to limit the passage of air and are not equivalent in performance to standard windows

Podium

the base of a building upon which taller (tower) elements are positioned

Potable water

water which conforms to Australian Standards for drinking quality

Principal private open space

the principal area of private open space, usually the largest consolidated area that is paved

Private open space

outdoor space located at ground level or on a structure that is within private ownership and provided for the recreational use of residents of the associated dwelling

Primary windows

windows to habitable rooms located on the external wall of a buildings; primary windows may be supplemented by windows in courtyards, skylights, notches and along galleries

Principal usable part of communal open space

a consolidated part of the communal open space that is designed as the primary focus of recreational activity and social interaction

Public open space

public land for the purpose of open space and vested in or under the control of a public authority

Silhouette

a building outline viewed against the sky

Sloping site

a site with a slope of 15% or greater

Small lots

sites with an area of less than 650 square metres

Soffit

the undersurface of a balcony or other projecting building element

Solar access

is the ability of a building to continue to receive direct sunlight without obstruction from other buildings or impediments, not including trees

Stack effect ventilation / solar chimney

air convection resulting from hot air being pushed up and out by colder denser air which is drawn in at a lower level

Street setback

the space along the street frontage between the property boundary and the building. Refer to building line or setback as defined in the *Standard Instrument - Principal Local Environmental Plan*

Studio apartment

an apartment consisting of one habitable room that combines kitchen, living and sleeping space

Sunlight

direct beam radiation from the sun

Terrace

an outdoor area, usually paved and unroofed, that is connected to a dwelling and accessible from at least one room. May be on-grade or on a structure (podium or roof)

Universal design

international design philosophy that enables people to carry on living in the same home by ensuring dwellings are able to change with the needs of the occupant

Wintergarden

an enclosed balcony, typically glazed and can be used to minimise noise impacts along busy roads, railway lines and from aircraft noise

Image Reference List

Cover Image	Putney Hill, Architect: Cox Architects, developed by Frasers Property Australia, Photographer: Tom Ferguson Photography.

Part 2

Figure 2-10	North Bondi House, Architects: MCK Architecture, Photographer: Douglas Frost.
Figure 2-12	Alphington Townhouses, Architect: Green Sheep Collective, Photographer: Unknown.
Figure 2-14	88 Angel Street, Architects: Steele Associates, Photographer: Oliver Steele.
Figure 2-27	Linwood Shores, Designer: Wincrest Homes, Photographer: Google Streetview.
Figure 2-28	The Peninsula, Architect: Mirvac.
Figure 2-31	Paddington Green, Architect: Allen Jack + Cottier, Photographer: Bart Maiorana.
Figure 2-36	Coburg Hill, Architect: DKO. Photographer: Peter Bennetts
Figure 2-37	Newhall Be, Architect: Alison Brooks.
Figure 2-51	House Bruce Alexander, Architect: Tribe Studio, Photographer: Katherine Lu.
Figure 2-58	Heller Townhouses, Architect: Six Degrees, Photographer: Patrick Rodriguez.
Figure 2-59	Unfurled House, Architect: Christopher Polly, Photographer: Brett Boardman.
Figure 2-60	Green House, Architect: Carterwilliamson, Photographer: Brett Boardman.
Figure 2-61	Heller Townhouses, Architect: Six Degrees, Photographer: Patrick Rodriguez.
Figure 2-71	10 Wylde Street, Architect: SJB, Photographer: Unknown.
Figure 2-74	Fairbairn House, Architect: Inglis Architects, Photographer: Derek Swalwell.
Figure 2-76	Stillman Street Townhouses, Architect: Rothe Lowman, Photographer: Unknown.
Figure 2-77	Park Road Terrace, Architect: Matt Gibson Architecture+ Design, Photographer: John Wheatley
Figure 2-78	Portland Street Duplex, Architect: MPR Design Group, Photographer: Unknown.
Figure 2-84	South Beach Townhouses, Architect: Fox Johnston, Photographer: Simon Whitbread
Figure 2-85	Spectrum, Architect: Stanisic, Photographer: Peter Smith
Figure 2-86	Glebe Harbour, Architect: SJB, Photographer: Unknown
Figure 2-87	Bell Romero Houses, Architect: Chenchow Little, Photographer: John Gollings

Figure 2-88 Catherine Booth College, Architect: SJB, Photographer: Peter Clarke

Figure 2-89 Townhouses, Architect: EJE Architects, Photgrapher: Unknown

Figure 2-90 AE2, Architect: DKO, Photographer: Rory Gardiner

Figure 2-91 Realm Townhouses, Architect: Rothe Lowman, Photographer: Jamie Diaz-Berrio

Figure 2-92 2 Semi's Camperdown, Architect: David Boyle, Photographer

Figure 2-93 Alphington Townhouses, Architect: Green Sheep Collective, Photographer: Unknown.

Figure 2-94 Beach Road Townhouses, Architect: CBG Architects, Photographer: Unknown.

Figure 2-95 100 Albert Sreet, Architect: DKO, Photographer: Dan Hocking.

Figure 2-96 South Coast House, Architect: Clare Design, Photographer: Unknown

Figure 2-97 CL House, Architect: ADI Architectura, Photographer: Unknown.

Figure 2-98 AE2, Architect: DKO, Photographer: Rory Gardiner.

Figure 2-99 Four Room cottage, Architect: Vokes and Peters, Photographer: Jon Linkins.

Figure 2-100 Double courtyard house, Architect: Vokes and Peters, Photographer: Christopher Frederick Jones.

Figure 2-101 Spiegal House, Architect: Carterwilliamson, Photographer: Brett Boardman

Figure2-102 Randwick Garden, Landscape Architect: Secret Garden Landscape, Photographer: Unknown

Figure 2-103 Spiegal House, Architect: Carterwilliamson, Photographer: Brett Boardman

Figure 2-104 Kew II House, Architect: Kennedy Nolan, Photographer: Unknown

Figure 2-105 Spiegal House, Architect: Carterwilliamson, Photographer: Brett Boardman

Figure 2-106 Roxbury E Townhouses, Architect: Urbanica Design, Photographer: Unknown

Figure 2-107 Brise Soleil, Architect: Carterwilliamson, Photographer: Brett Boardman

Figure 2-119 Green House, Architect: Carterwilliamson, Photographer: Brett Boardman

Figure 2-112 The Platform-North Everleigh Affordable Housing, Landscape Architect: Arcadia Landscape Architecture, Photographer Unknown.

Figure 2-1198 Ferguson Putney Hill, Architect: Cox Architects, developed by Frasers Property Australia, Photographer: Tom Photography.

Part 3

Figure 3-313 Heller Townhouses, Architect: Six Degrees, Photographer: Patrick Rodriguez.

Figure 3-315 Thornton, Architect: DKO

Appendix

Figure A-1 Putney Hill, Architect: Cox Architects, developed by Frasers Property Australia

Figure A-2 Realm Townhouses, Architect: Rothe Lowman, Photographer: Jamie Diaz-Berrio

Figure A-3 Paddington Green, Architect: Allen Jack + Cottier, Photographer: Bart Maiorana.

Figure A-4 Trevellyan Townhouses, Architect: Smith & Tzannes.

Figure A-5 Twin Peaks, Architect Durbach Block Jaggers, Photographer: Unknown