



Department of **Planning,**  
**Lands and Heritage**

State Planning Policy 7.3 Residential Design Codes Volume 1



# Medium Density **Explanatory Guidelines**

Draft for public comment November 2020



**DESIGN** For a  
**WA** Better Built  
Environment

The Department of Planning, Lands and Heritage acknowledges the traditional owners and custodians of this land. We pay our respect to Elders past and present, their descendants who are with us today, and those who will follow in their footsteps

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# Purpose, format and application

## Purpose

These guidelines aim to explain and assist with the interpretation and application of *Part C (Medium Density Code)* of State Planning Policy 7.3 – Residential Design Codes Volume 1 (R-Codes Vol.1).

The guidelines have been prepared by the Western Australian Planning Commission (**WAPC**) and should be read in conjunction with the Medium Density Code. These documents will provide advice and guidance for the assessment of **development** proposals against the **design principles** and **deemed-to-comply** provisions of the Medium Density Code in Western Australia. The guidelines may be amended from time to time.

*NOTE: Throughout this document, **bolded** words have the corresponding definition listed in Appendix 1 of the R-Codes Vol. 1. Where a defined word occurs multiple times in a section, only the first occurrence is marked.*

## Format

The format of the guidelines is as follows:

### **PART A. PURPOSE, FORMAT AND APPLICATION**

Identifies the purpose and intended audience for the guidelines and explains the relationship of the Medium Density Code with State Planning Policy 7.0 – *Design of the Built Environment*.

### **PART B. DESIGN PROCESS**

Outlines a design process that will result in good medium density **development** outcomes.

### **PART C. DESIGN AND ASSESSMENT GUIDANCE**

Includes the following guidance for the Medium Density Code design elements.

#### *Design guidance*

Provides guidance for each design element to assist designers and assessors understand available design responses and solutions for meeting the requirements of the code.

#### *Assessment guidance*

Provides advice for the technical interpretation of the **deemed-to-comply** provisions for each design element.

#### *Design tips*

Provides design responses that may assist in addressing the requirements of the **design principle** pathway. These are examples and may not be appropriate for all **sites** and **development** contexts.

## Application

The guidelines have been created to provide a practical guide to support the Medium Density Code. The guidelines do not provide quantitative measures in addition to the Medium Density Code – it is the ‘how to’ guide for the code.

It is intended to be used:

- by landowners, developers, professional town planners, urban designers, architects, landscape architects, builders and other professionals when designing housing **developments** and preparing an application for development approval
- by **decision-makers** and town planning professionals in local and state government with assessment of **development** proposals and in advancing strategic planning through **local planning policy** and design guidance, and
- to support communities by raising awareness of the principles of good design and promoting quality housing that will make a positive contribution to local neighbourhoods.

**Development** outcomes are **site**-specific and often do not rely on a standard approach or measure. The guidelines seek to clarify the use of discretion by **decision-makers**, however, it is not possible to cover all scenarios and contexts.

Design guidance provides ideas and assists with understanding the various design solutions that can be applied to satisfy the requirements of the Medium Density Code. Assessment guidance provides technical advice for the application of **deemed-to-comply** provisions for the various design elements. This includes interpretations and calculation methods to clarify requirements.

# Purpose, format and application (cont.)

## State Planning Policy 7.0 and the Medium Density Code

As Western Australia’s cities, towns and suburbs grow, change and become more complex, the need to accommodate a greater diversity of housing types is increasing. Achieving this requires a thoughtful approach to **residential development**, with increased attention to design quality. State Planning Policy 7.0 *Design of the Built Environment* (SPP 7.0) (WAPC, 2019), includes 10 Design Principles to guide the design and assessment of built environment proposals through the Western Australian planning system. These principles inform the design, review and decision-making processes for all **development** under the Medium Density Code of the R-Codes Vol.1. The below table outlines how these design principles apply to medium density development.

*SPP 7.0 Design Principles applied to medium density housing*

1	Context and character	Medium density housing responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place. New development is integrated into its setting and is shown to respond positively to the intended future character of an area.
2	Landscape quality	Medium density development incorporates landscape design that contributes to neighbourhood character and community wellbeing. Local environments are enhanced through: <ul style="list-style-type: none"> <li>– effective water management and water sensitive urban design (WSUD) measures;</li> <li>– vegetation and tree canopy enhancement; and</li> <li>– consideration of microclimate and urban heat island impact.</li> </ul>
3	Built form and scale	Built form height and massing is compatible with the intended character of the area. Buildings are fit for purpose and contribute positively to the character and amenity of the public realm.
4	Functionality and build quality	Medium density housing meets the needs and expectations of the community and is adaptable. Development is well-detailed, robust, and easy to maintain, with appropriate attention given to services, storage and waste management.
5	Sustainability	The built environment delivers economic, environmental and community sustainability outcomes, including: <ul style="list-style-type: none"> <li>– protection and enhancement of the tree canopy;</li> <li>– WSUD;</li> <li>– passive environmental design;</li> <li>– a diverse range of housing types commensurate with housing need; and</li> <li>– promotion of active and public transport modes.</li> </ul>
6	Amenity	Medium density housing provides indoor and outdoor spaces that are comfortable and enjoyable throughout all seasons and times of the day.
7	Legibility	Access to and within medium density development is easy to navigate, with clear connections and priority access for pedestrians and cyclists.
8	Safety	Medium density housing development applies Crime Prevention through Environmental Design (CPTED) principles and incorporates appropriate safety measures.
9	Community	Medium density housing responds to community need with an appropriate mix of dwellings, including affordable housing, flexible and adaptable housing, universally accessible housing, and housing conducive to social interaction.
10	Aesthetics	The scale, arrangement, articulation and material quality of medium density development contributes to attractive and inviting communities with a coherent identity and cultural relevance.

# Design process

## Delivering good design outcomes

Design process involves progressing a proposal from an idea to a resolved design. This includes developing a brief, identifying **site** opportunities and constraints, and working collaboratively within project teams and with **decision-makers** towards a common goal. A thorough and well-considered design process is key to supporting great design outcomes.

A good resource, *Your Home: Australia's guide to environmentally sustainable homes* (Australian Government), can be found at: <https://www.yourhome.gov.au/you-begin/design-process>.

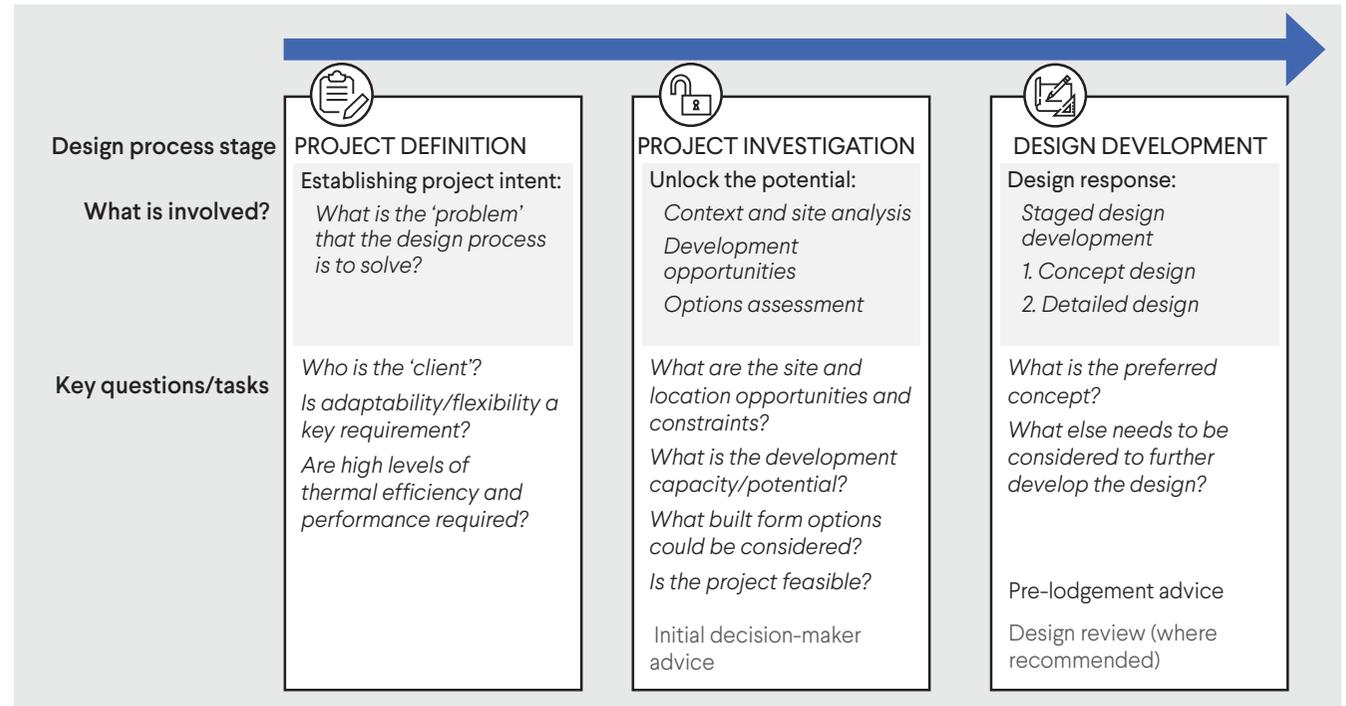
Outlined below is a recommended design process involving three key stages:

- Stage 1 - Project Definition
- Stage 2 - Project Investigation
- Stage 3 - Design Development.

## Design process stages

### Stage 1 - Project definition

At the beginning of every medium density **development** is an idea or concept. This idea needs to be refined and developed into a project brief. The project brief is a written description of the objectives and requirements of a project. The brief should have regard to the zoning of the land (including applicable R-Coding), the requirements of the **local planning framework**, and the client's objectives. Preparing a project brief should be a collaboration between client and architect or building designer, and requires investigation, analysis and discussion to ensure that the client's requirements and the development opportunities and constraints presented by the **site** are well understood.



### Stage 2 - Project investigation

#### Context and site analysis

Good medium density **residential development** responds to the **site**, **streetscape** and neighbourhood context, as well as to the requirements of the Medium Density Code and relevant **local planning framework**. To support this, context and site analysis should be undertaken early in the design process.

Context and site analysis involve investigating the physical and cultural characteristics of the locality and **development site**, so **development** opportunities and constraints are understood. Analysis should also include consideration of statutory planning requirements, including relevant provisions of the **local planning framework**.

Outcomes from context and **site** analysis can then inform the design development phase, so that the design response:

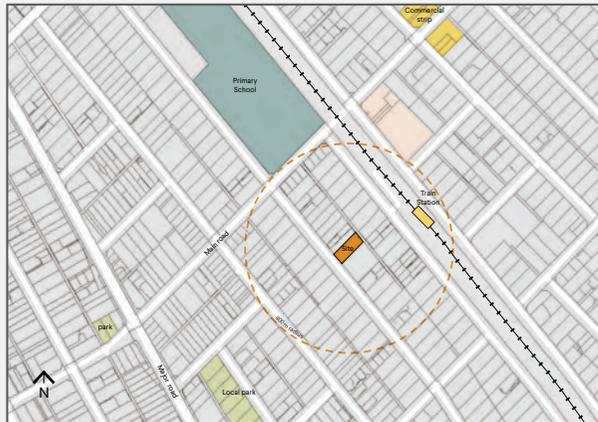
- capitalises on-site opportunities and addresses constraints and
- contributes to the existing or desired **streetscape** and **local character**.

*Appendix 2 Context and site analysis* of the R-Codes Vol.1 recommends a list of documentation for the context and **site** analysis. Further investigations and documentation to address relevant provisions of the **local planning framework** or site-specific considerations may also be required by the **decision-maker**.

The figure on the following page identifies important considerations for various scales of context analysis, from the neighbourhood level through to the immediate **site** context.

# Design process (cont.)

## Context and Site Analysis



### Neighbourhood context plan

The neighbourhood context plan considers local planning framework and urban structure of the locality (within 400 metres of the site). The analysis should outline the zoning, land use, and the built and landscape features of the neighbourhood. This includes street layout and nearby open spaces; topography, drainage and vegetation patterns that impact on the site; services and future infrastructure requirements (if known); nearby public transport services (to determine Location A or B status), and heritage places / local landmarks.



### Street context plan

This plan identifies the character of the street(s) in the immediate vicinity of the development site, including landscape, land use (including public space), street design and proportions, footpaths, subdivision pattern, and building scale and design.

Analysing the street context should involve reference to the local planning framework as it may identify an intended character. For areas undergoing change, this may mean development is to be designed to 'fit' with a planned future character rather than the existing streetscape. Where local character is not defined in the local planning framework, the street context analysis should inform a reasoned assessment of character and an appropriate design response.



### Site context plan

This plan provides the site details relative to neighbouring properties, including adjacent buildings and public spaces. It considers existing vegetation and trees (including verge trees), fences/walls (including retaining), on-street parking, and overshadowing and privacy considerations.

At this scale site specific factors such as orientation, views, slope, geology, infrastructure, easements, and stormwater management can be understood to inform site responsive design.

### Site analysis legend

- |   |   |   |
|---|---|---|
|  Proposed development site |  Development site boundary |  Railway line  |
|  Local shops               |  Existing buildings        |  Train station |
|  Education facility        |  Public open space         |  Bus route     |

# Design process (cont.)

## Development options

Each **development site** can typically support a variety of built form types and land tenure arrangements.

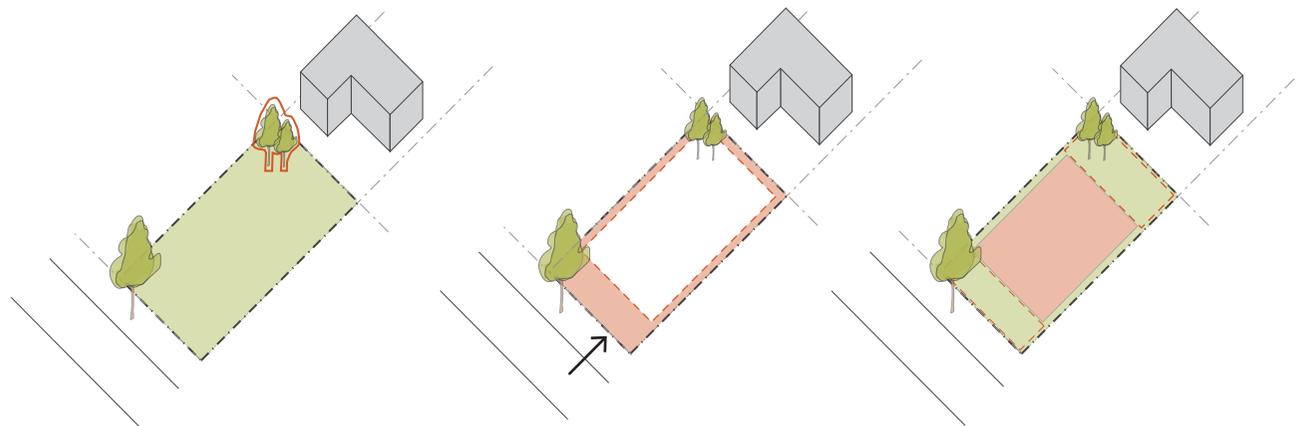
The zoning for the **site** and **site area** concessions and requirements available under the Medium Density Code for different **dwelling** types, including **single houses**, **grouped dwellings** and **multiple dwellings**, determine the potential dwelling yield (refer element 1.1 Site Area for site area provisions).

Testing a range of built form options will help determine the best **development** response for a **site**. Built form types, tenure arrangements, **dwelling** yield and feasibility, site conditions, and **streetscape** character should all weigh into the decision process of a preferred option. Different approaches will deliver different outcomes for **amenity**, gardens, site-responsiveness, and streetscape character compatibility.

## Stage 3 - Design Development

The design development phase takes the project brief, the context and **site** analysis, and early design thinking, and begins to shape a built form design response. Design development may include early sketches for concept design and pre-lodgement meetings with the **decision-maker**, or design review where available.

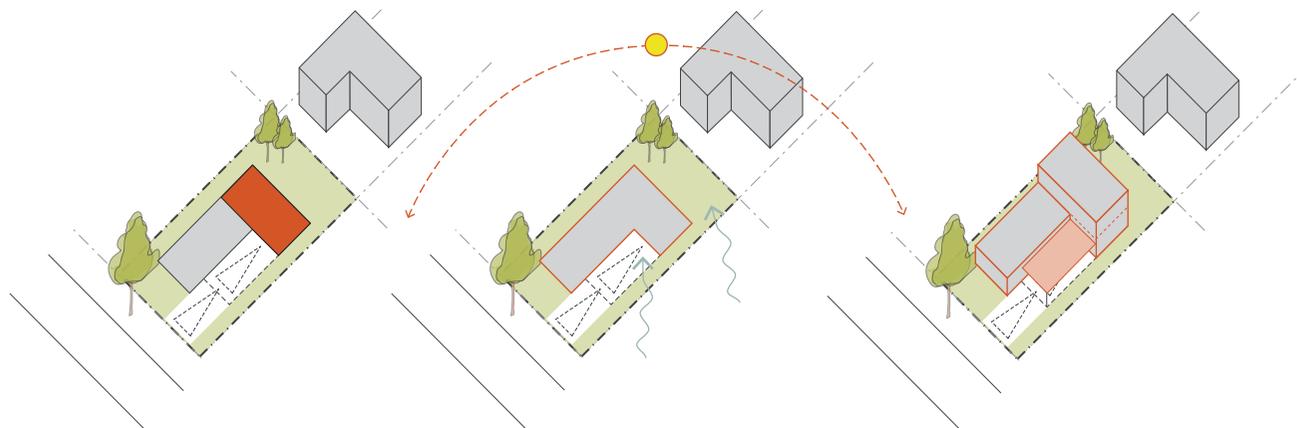
### Testing development options



1. Site characteristics  
- lot size  
- tree retention

2. Setbacks and access

3. Siting the primary garden area and deep soil areas



4. Locating the primary living space

5. Building performance and orientation

6. Three-dimensional built form

## Design process (cont.)

### Concept design

At concept design stage, plans are typically unresolved sketches and conceptual drawings, showing details such as **building** footprint, zones for living areas and bedrooms, and garden areas. The aim at this stage is to provide enough information to communicate the proposal effectively for the purpose of feedback, rather than to have fully resolved drawings.

The concept design should respond to findings from the project investigation phase and identify a preferred design response for the **site** that can achieve the relevant Medium Density Code provisions, including **site coverage**, **building setbacks** and **deep soil areas**.

### Early engagement

#### *Pre-lodgement engagement with decision-maker*

Pre-lodgement engagement with the **decision-maker** is highly recommended. Depending on the complexity of the proposal, pre-lodgement engagement could range from a phone conversation, over-the-counter advice, or a meeting. In the case of an application that is to be determined by a Development Assessment Panel, pre-lodgement advice should be sought from the relevant local government or agency undertaking the assessment.

During pre-lodgement engagement, the **decision-maker** may advise the proponent of specific considerations, requirements, or processes that apply under the adopted **local planning framework** and that will require further resolution by the proponent to achieve a compliant **development** application. This may include design review for large-scale or more complex development proposals.

Initial pre-lodgement engagement is recommended during the project investigation phase, with further advice sought prior to lodgement of the **development** application to confirm the application meets submission requirements.

### *Design Review*

Design review is a process of independent critique of a **development** proposal, carried out by a panel of multi-disciplinary built environment professionals, providing objective and constructive design advice. It can offer feedback and observations that improve the quality of the design and may be appropriate for more complex medium density developments, or where there are specific **streetscape** character, heritage or other requirements to be met.

For complex **developments** that adopt a **design principle** pathway, design review may also assist in the assessment of the proposal. It can also be helpful to both the proponent and **decision-maker** when creative and innovative design solutions are proposed. For design review, proponents are encouraged to submit a design statement that demonstrates how the proposal responds to the 10 Design Principles of SPP 7.0.

Design review, undertaken early in the design process has the most potential to contribute to better design outcomes, without significantly impacting on the cost or delaying **development**.

For further information regarding design review, refer to SPP 7.0, the *Design Review Guide* (WAPC, 2019), or consult the relevant **decision-maker**.

### Design Resolution

At design resolution stage, the design is finalised for lodgement with the **decision-maker**. This will include a drawing package consisting of **site** plans, elevations, sections and preliminary details indicating **building** structure and materials, **landscaping**, and servicing requirements. The design resolution phase should build upon the concept design to 'firm up' the proposal in preparation for **development** assessment.

The application for **development** approval should be accompanied by all of the documentation and other material required by the **decision-maker** to facilitate the assessment, refer to *Appendix 3 Application documentation* of the R-Codes Vol.1.



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# Design and assessment guidance

Proposals for medium density **development** submitted for assessment under the Medium Density Code will be assessed via the **deemed-to-comply** provisions, the **design principles** pathway, or a combination of the two.

The **deemed-to-comply** provisions are specific requirements that provide certainty for a straightforward pathway for compliant **development** proposals. The **design principle** provides an alternative pathway that allows more flexibility for proponents to pursue design innovation and contextually responsive solutions. In some circumstances - for example, **sites** with steep terrain or views - applying a design principle can lead to better design outcomes than might otherwise be achieved through meeting the corresponding deemed-to-comply standard. It is the responsibility of the proponent to demonstrate to the **decision-maker** how a proposed design meets the relevant objectives and provisions of the Medium Density Code and **local planning framework**.

The *DESIGN GUIDANCE* in this section explains the intent underpinning the Medium Density Code provisions and provides alternative approaches for meeting design requirements.

The *ASSESSMENT GUIDANCE* supports the interpretation of the **deemed-to-comply** provisions for each design element.

*DESIGN TIPS* suggest design solutions that may be appropriate to address the requirements of a **design principle**. This guidance is not exhaustive and may not be appropriate in all circumstances.

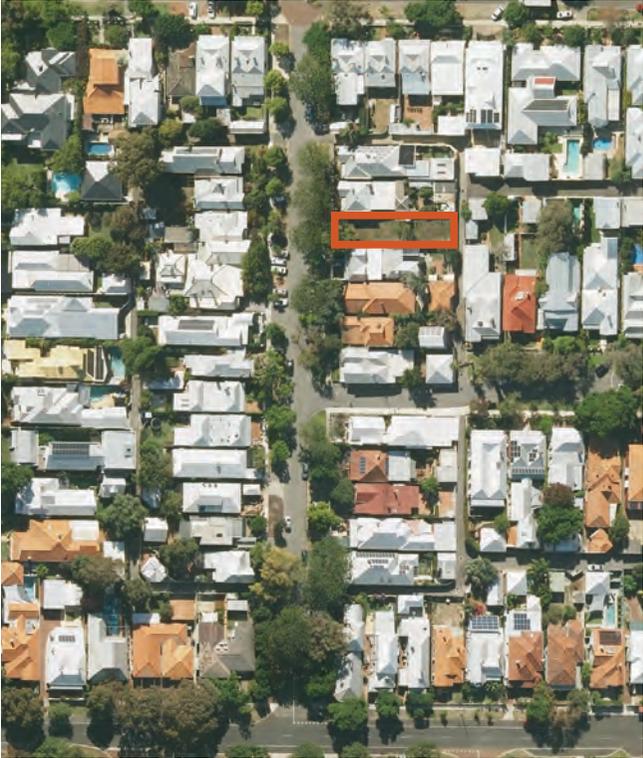


# 1.0 LAND

*Subdivision is the process of dividing land into freehold (green title), strata or survey-strata lots, and/or amalgamation of two or more lots into a single lot. Lot frontage widths, orientation, and lot size and shape can have a significant impact on medium density built form outcomes, with improved outcomes able to be achieved when subdivision and development design are considered together.*



1.1 Site area



# 1.1 Site area

## ◆ INTENT

The **site area** requirements are determined by the density coding allocated to land through the **local planning framework**. **Lots** and **strata lots** created through subdivision and amalgamation processes must comply with these requirements. This ensures that the density and type of residential **development** are appropriate for its context.

## DESIGN GUIDANCE AND ASSESSMENT GUIDANCE

Subdivision involves the creation of **green title** or **survey strata lots** from an original **parent lot**. **Lot** design achieved through subdivision will influence yield and built form typology. For example, the creation of multiple lots with narrow **street frontages** could promote a terrace **dwelling** typology, whereas the creation of a wider frontage lot may be more suited to a low-rise **apartment building**. It is therefore important that the desired built form outcome informs subdivision design and is considered in advance of commencing the subdivision process.

Amalgamation is the process of combining two or more **lots** into a larger lot. This can have positive built form benefits, including more coordinated **development** outcomes and design efficiencies, such as those achieved through shared vehicle access and communal spaces. Larger, amalgamated lots are also capable of supporting diverse projects, including a combination of **grouped** and **multiple dwellings** or **mixed-use development**.

### Calculation of dwelling yield

The density coding applicable to a **site** and the corresponding **site area** provisions of **C1.1.1** determine the **dwelling** yield potential of a **development**.

The **dwelling** yield of a **lot** can be calculated by dividing the lot area by the average **site area** requirement for the relevant dwelling type and density coding (refer **Table A**).

$$\frac{\text{lot area}}{\text{average site area}} = \text{dwelling yield}^*$$

*\*rounded down to nearest whole number.*

**Table G1.1a** provides scenarios for calculating **dwelling** yields, applying *Site Categories 1, 2 and 3* requirements. These scenarios assume there are no **site** constraints that would otherwise limit or prohibit a **development** from achieving its yield potential.

Medium density **development** can consist of a mix of **dwelling** types. For example, a development may include **grouped dwellings** and **multiple dwellings** on the same **lot**. To calculate the dwelling yield potential of a lot that includes both grouped and multiple dwellings, apply the following formula:

$$\text{lot area} \geq \left( \frac{\text{number of grouped dwellings}}{\text{grouped dwelling ave site area}} \right) + \left( \frac{\text{number of multiple dwellings}}{\text{multiple dwelling ave site area}} \right)$$

**Table G1.1c** provides scenarios for calculating **dwelling** yield for **developments** consisting of **grouped** and **multiple dwellings** on the same **lot**.

### Multiple dwellings

**Table A** introduces an average **site area** requirement for calculating the yield of medium density **multiple dwellings** (R30-60). This is different to the **plot ratio** method used for higher density **apartments** in R-Codes Vol. 2. Plot ratio can have the unintended consequence of delivering mostly smaller apartments (one and two bedrooms) to maximise **development** yield. The average site area approach allows consideration of a mix of apartment types, including larger apartments suitable for families, without foregoing yield.

The average **site area** approach also simplifies yield calculations for mixed **development** proposals consisting of **grouped** and **multiple dwellings** on the same **lot**; further encouraging diversity and affordability in the medium density housing market.

# 1.1 Site area (cont.)

## Site Category 1, 2 and 3 site area requirements (C1.1.1 to C1.1.5)

**Table A site area** requirements includes minimum and average site area requirements for three different **site** categories.

All residential zoned land is eligible for the *Site Category 1* minimum and average **site area** requirements (refer **Table A** and **C1.1.2**).

To be eligible for the reduced **site area** requirements of *Site Category 2* and *3*, **lots** must be larger (amalgamation is encouraged) and located in areas with reliable, **high-frequency** public transport (refer **Figure G1.1a**). Each **dwelling site** must also be provided with individual frontage to a **public street**. Sites that satisfy these criteria are better suited to accommodating the higher **dwelling** yields attainable under the reduced site area requirements of *Site Category 2* and *3* without compromising design quality.

When contemplating subdivision of land, proponents should first consider whether the **lot** is eligible for *Site Categories 2* or *3* and whether the yield potential achievable under these categories will benefit the project. There is no mandate to develop to the full potential of *Site Category 2* or *3* and in some cases **development** in accordance with *Site Category 1* **site areas** may be more appropriate.

Proposals that apply *Site Category 2* or *3* minimum and average **site area** requirements must satisfy the design provisions of the Medium Density Code applicable to the density coding of the **lot**.

To qualify for the *Site Category 3* minimum and average **site area** requirements, a **local development plan**, approved by the relevant local government, is required as a pre-condition to **development** approval. In assessing the local development plan, the **decision-maker** should be satisfied that:

- the proposal will achieve coordinated development and quality **streetscape** outcomes compatible with the existing and/or intended **local character**
- the **site** layout addresses site opportunities and constraints, including orientating **dwelling**s for optimum **solar access** (for the climatic zone), minimising vehicle access points onto **primary streets**, and tree retention
- provisions are included in the local development plan to ensure subsequent development achieves the minimum development standards of **C1.1.4(iv)(g)**
- the development achieves all minimum required standards of the Medium Density Code, and
- any amendments proposed to R-Codes **deemed-to-comply** provisions are consistent with *Section 3.0 Local planning framework of Part A* of the R-Codes Vol.1

## Measuring the minimum site area (C1.1.8)

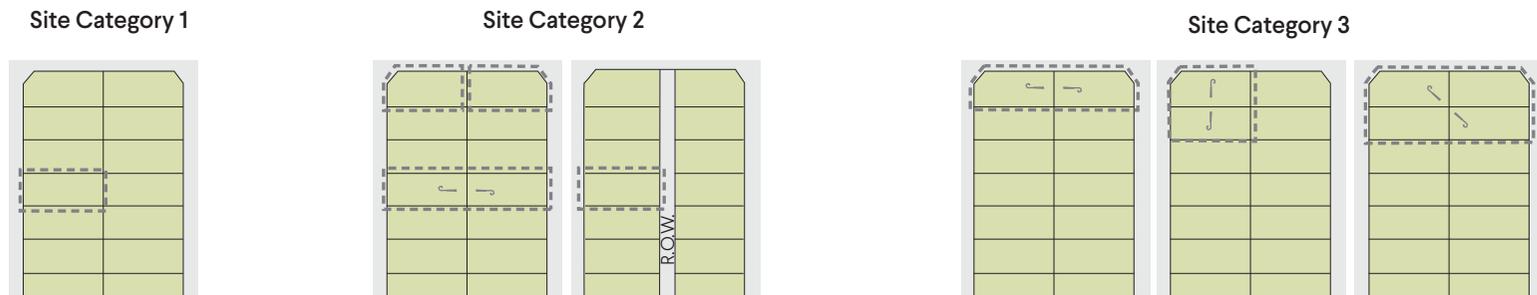
The area of a **development site** should be adjusted to ascertain the minimum useable **site area**. This accounts for factors that may reduce or increase its capacity to accommodate **residential development**, including:

- the area lost to corner truncations (to a maximum of 20m<sup>2</sup>), as these may be indistinguishable from the lot itself, and can be visually part of the **development** and
- in the case of **battleaxe lots**, exclude the **vehicle** and **pedestrian access leg** and associated truncations.

For **grouped dwelling developments**, the minimum **site area** excludes areas of **common property** (although common property is included for the purpose of calculating average site area).

## Variations to minimum and average site area requirements (C1.1.7)

The minimum and average **site areas** in **Table A** may not be varied except where the **WAPC** is satisfied that the proposal addresses **P1.1.2** and **P1.1.3** and approves the application. This provides some flexibility to accommodate minor reductions to minimum and average site areas and includes the creation of a **green title lot**, **survey-strata lot**, or **strata lot** for an existing authorised **grouped** and **multiple dwelling development** that does not meet the minimum and average site area requirements specified in **Table A**.



**Figure G1.1a** Site Area Categories

## 1.1 Site area (cont.)

The subdivision of land and ability to vary minimum and average **site area** requirements is also subject to other **WAPC** policies, in particular *Development Control Policy 2.2. Residential Subdivision*.

### Site area concessions (small dwellings and aged or dependent persons' dwellings)

To promote **dwelling** diversity, **C1.1.7(i)** enables the *Site Category 1* minimum and average **site area** requirements for **small dwellings** and **aged or dependent persons' dwellings** to be reduced by up to 35 per cent, subject to the **development** meeting the built form controls of elements *3.11 Small dwellings* and *3.12 Aged or dependent persons' dwellings*. These site area concessions recognise these types of dwellings are typically smaller, have fewer occupants, and lower parking requirements. The 35 per cent site area concession is not available to *Site Category 2* or *3* developments due to the already reduced minimum and average site area requirements that apply. It is not necessary for the whole of a particular development to comprise small dwellings or aged or dependent persons' dwellings to qualify for the 35 per cent site area concession.

For **sites** created for **small dwellings**, appropriate measures (such as a notification under section 70A *Transfer of Land Act 1893* registered on the Certificate of Title) to limit **development** of the **site** to a small dwelling should be considered.

To encourage **dwelling** diversity, **small dwellings** should generally not constitute more than 50 per cent of the total dwellings within the same **development site**, or 50 per cent of **lots** created within the same **street** block.

To calculate the minimum and average **site area** for **small dwellings** or **aged or dependent persons' dwellings**, apply the following formula:

$$\text{Concession min or ave site area} = \left( \text{min or ave site area} \times 0.65 \right)$$

To calculate the **dwelling** yield of a **lot** that includes either **small dwellings** or **aged or dependent persons' dwellings**, together with non-concessional dwellings, apply the following formula:

$$\text{lot area} \geq \left( \begin{array}{l} \text{no. of concession} \\ \text{dwellings} \end{array} \times \begin{array}{l} \text{concession ave} \\ \text{site area} \end{array} \right) + \left( \begin{array}{l} \text{no. of dwellings} \\ \end{array} \times \begin{array}{l} \text{ave site area} \\ \end{array} \right)$$

**Table G1.1b** provides scenarios for calculating **dwelling** yield when including **site area** concessions.

### Mixed use development sites

The Medium Density Code does not apply to **mixed-use developments**. Design standards for the residential component of mixed-use developments are addressed in R-Codes Volume 2.

#### Lots less than 100m<sup>2</sup> (C1.1.9)

**Dwelling developments** on **lots** less than 100m<sup>2</sup> are to be selectively used as a transitional **building** typology between high-density urban environments (i.e. multi-storey commercial, **mixed-use** and **apartment** developments) and low-density suburban environments (i.e. single and two-storey **single house** and **grouped dwelling** developments). They should be located close to public open space and other high **amenity** areas, with ready access to active transport modes.

**Lots** less than 100m<sup>2</sup> can only be created where an approved **structure plan** and **local development plan** provides for this form of **development**.

In considering any **structure plan** that includes **lots** less than 100m<sup>2</sup>, the assessment should examine:

- if **green title** subdivision of land into small lots is the best and highest use of the land, or if other options (e.g. larger sites suitable for **apartments** or **mixed-use development**) would be more appropriate
- if the location has infrastructure, amenities and services to support the density of housing proposed and
- if the proposal is consistent with the orderly and proper planning of the area.

The **structure plan** will need to demonstrate that **lots** less than 100m<sup>2</sup> can be integrated into the wider neighbourhood and that there will be a continuous activated **street frontage** capable of accommodating on-**street** visitor parking, street trees, shared use paths/footpaths, refuse collection, water management and utility services (in accordance with **local planning framework** and Liveable Neighbourhoods requirements, as applicable).

The **structure plan** will need to show the lots occupying a street corner or an entire block-end, including any **laneway**.

In addition to the above, the approved **structure plan** should only make provision for **lots** less than 100m<sup>2</sup> in locations that satisfy the below criteria.

## 1.1 Site area (cont.)

Strategic metropolitan centre:

- Located between 800 metres and 1000 metres of the **lot boundary** of the core or largest commercial landholding using the walkable catchment technique (refer Liveable Neighbourhoods, WAPC, 2009). Lots less than 100m<sup>2</sup> are not to be within 800 metres of a strategic metropolitan centre or within the strategic metropolitan centre itself.

Secondary or District Centre as identified in SPP 4.2 *Activity Centres* (WAPC, 2020):

- Located between 200 and 800 metres, using the walkable catchment technique of the lot boundary of the core or largest commercial landholding in any existing or proposed secondary or district centre. Lots less than 100m<sup>2</sup> are not to be within 200 metres of the **activity centre** or within the activity centre itself (refer **Figure G1.1b**).

Neighbourhood Centre as identified in a **local planning framework**:

- Located within 200 and 400 metres, using the walkable catchment technique, of the lot boundary of the core or largest commercial landholding in any existing or proposed local and neighbourhood centre respectively. Lots less than 100m<sup>2</sup> are not to be within 200 metres of the activity centre or within the activity centre itself (refer **Figure G1.1c**).

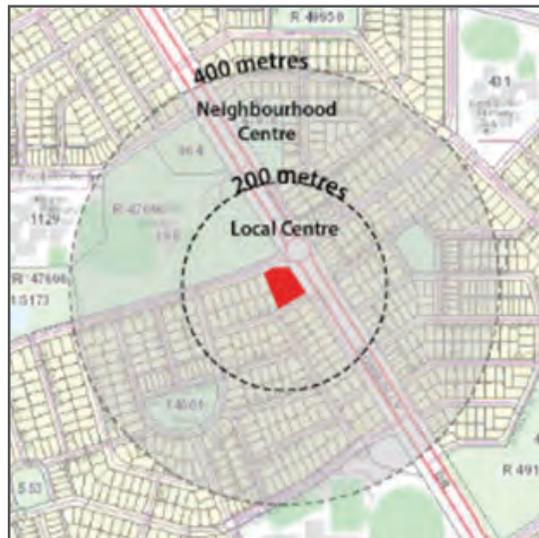
Local or neighbourhood public parkland:

- Located either directly fronting or overlooking parkland or within 150 metres of parkland using the walkable catchment technique.

Where the WAPC has approved a **structure plan** for lots less than 100m<sup>2</sup>, the **local development plan** will not require WAPC approval unless the proposal seeks to modify provisions of the Medium Density Code for which WAPC approval is required in **Table 3.2b** of *Part A* of the R-Codes Vol. 1.



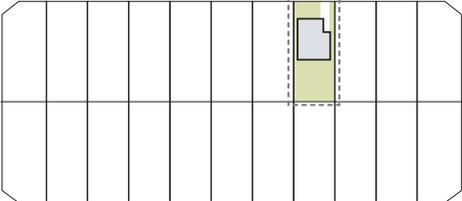
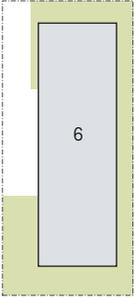
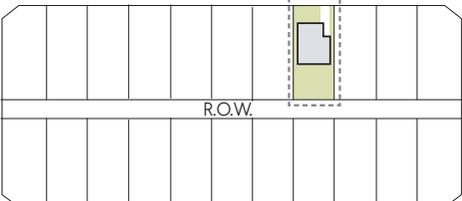
**Figure G1.1b** Location in relation to a secondary or district centre



**Figure G1.1c** Location in relation to a local and neighbourhood centre

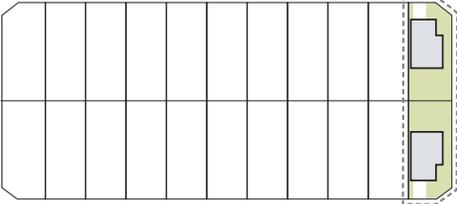
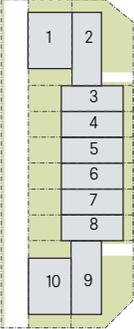
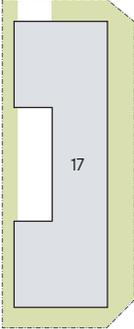
# 1.1 Site area (cont.)

**Table G1.1a** Calculating dwelling yield for Site Categories 1, 2 and 3

Lot characteristics	Single house or grouped dwelling yield	Multiple dwelling yield
<p><b>Scenario 1</b>                      Coded R40                      Lot area = 728m<sup>2</sup>, 20m frontage                      Located mid-block, no rear laneway access                      Site Category 1 site area requirements apply</p> 	<p>Site Category 1                      Min = 180m<sup>2</sup>                      Ave = 220m<sup>2</sup></p> $\frac{728m^2}{220m^2} = 3.3 \text{ dwellings}$ <p>Dwelling yield = 3 lots/dwellings (rounded down)</p> <p>Note: A mix of sites can be created provided each site meets the minimum site area requirement of 180m<sup>2</sup>.</p> 	<p>Site Category 1                      Min = N/A                      Ave = 115m<sup>2</sup></p> $\frac{728m^2}{115m^2} = 6.3 \text{ dwellings}$ <p>Dwelling yield = 6 dwellings (rounded down)</p> 
<p><b>Scenario 2</b>                      Coded R40                      Lot area = 728m<sup>2</sup>, 20m frontage                      Located mid-block with rear access to a constructed laneway.                      Site Category 2 site area requirements apply</p> 	<p>Site Category 2                      Min = 160m<sup>2</sup>                      Ave = 180m<sup>2</sup></p> $\frac{728m^2}{180m^2} = 4 \text{ dwellings}$ <p>Dwelling yield = 4 lots/dwellings</p> <p>Note: A mix of sites can be created provided they meet the minimum site area requirement of 160m<sup>2</sup>.</p> 	<p>Site Category 2                      Min = N/A                      Ave = 100m<sup>2</sup></p> $\frac{728m^2}{100m^2} = 7.3 \text{ dwellings}$ <p>Dwelling yield = 7 dwellings (rounded down)</p> 

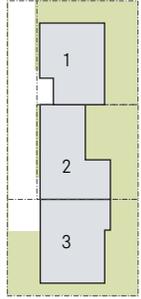
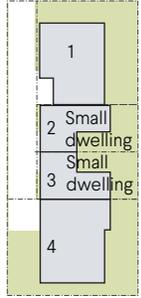
# 1.1 Site area (cont.)

**Table G1.1a** Calculating dwelling yield for Site Categories 1, 2 and 3 (cont.)

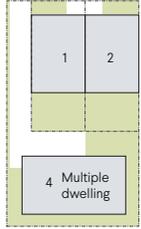
Lot characteristics	Single house or grouped dwelling yield	Multiple dwelling yield
<p><b>Scenario 3</b>                      Coded R40                      Located on a corner lot and amalgamated to create a new lot area of 1,500m<sup>2</sup>                      Approved local development plan over the sites                      Site Category 3 site area requirements apply</p> 	<p>Site Category 3                      Min = 120m<sup>2</sup>                      Ave = 150m<sup>2</sup></p> $\frac{1,500m^2}{150m^2} = 10 \text{ dwellings}$ <p>Dwelling yield = 10 lots/dwellings (rounded down)</p> <p>Note: A mix of sites can be created provided each site meets the minimum site area requirement of 120m<sup>2</sup>.</p> 	<p>Site Category 3                      Min = N/A                      Ave = 85m<sup>2</sup></p> $\frac{1,500m^2}{85m^2} = 17.6 \text{ dwellings}$ <p>Dwelling yield = 17 dwellings (rounded down)</p> 

# 1.1 Site area (cont.)

**Table G1.1b** Calculating dwelling yield with site area concessions

Lot characteristics	Development options	Single house or grouped dwelling yield		
Coded R40 (Site Category 1) Lot area of 728m <sup>2</sup> with a 20m frontage	<b>Scenario 1</b> Development without site area concessions	Site Category 1 Ave = 220m <sup>2</sup>	$\frac{728m^2}{220m^2} = 3.3 \text{ dwellings}$ <p>Dwelling yield = 3 lots/dwellings (rounded down)</p> <p>Note: A mix of sites can be created provided meet the minimum site area requirement of 180m<sup>2</sup>.</p>	
	<b>Scenario 2</b> Development with site area concessions	Site Category 1 35% concession (applied to 2 x dwellings): Ave = 143m <sup>2</sup>	$\text{Lot area required} \geq (2 \times 143m^2) + (2 \times 220m^2) = 726m^2$ <p>Dwelling yield = 4 lots/dwellings (rounded down)</p> <p>2 x small dwellings (single house or grouped)                      2 x single house/grouped dwelling</p> <p>Delivers one (1) additional dwelling compared to Scenario 1.</p>	

**Table G1.1c** Calculating yields for mixed dwelling types

Lot characteristics	Single house or grouped dwelling yield		
Coded R40 (Site Category 1) Lot area = 1,012m <sup>2</sup> , 20m frontage	Grouped dwellings: Min = 180m <sup>2</sup> Ave = 220m <sup>2</sup>	$\text{Lot area required} \geq (2 \times 220m^2) + (4 \times 115m^2) = 900m^2$ <p>As the lot area is 1,012m<sup>2</sup>, can accommodate a total yield of 6 including 2 grouped dwellings and 4 multiple dwellings.</p>	
	Multiple dwellings: Min = N/A Ave = 115m <sup>2</sup>		

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# 2.0 THE GARDEN

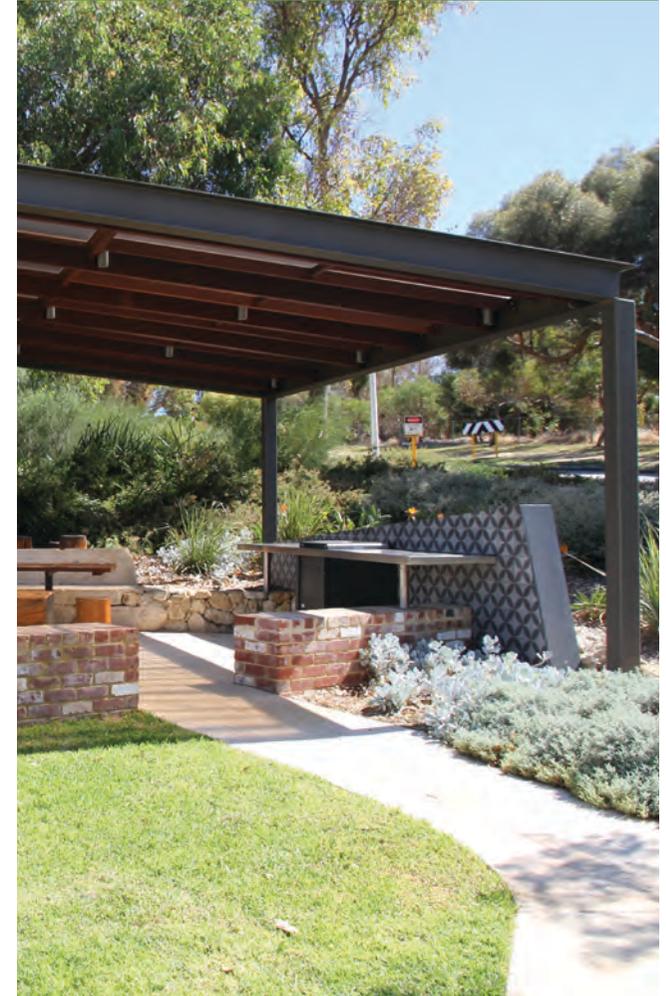
*The garden connects the home to the outdoors, bringing in sunlight, natural ventilation and an attractive outlook that contributes to the liveability and amenity of the dwelling. Gardens can be private, like a backyard, or communal space, such as a shared roof terrace or courtyard for apartments.*

*The elements in the garden section work together to encourage site planning that prioritises space for trees and dwelling orientation to suit climate*





- 2.1 Primary garden area
- 2.2 Private open space
- 2.3 Trees, deep soil area and landscaping
- 2.4 Communal open space
- 2.5 Water management and conservation



## 2.1 Primary garden area

### ▶ INTENT

The **primary garden area** is a consolidated, landscaped, outdoor space, located to support passive solar design principles. When directly connected to the **primary living space** of the **dwelling**, it works to integrate the indoors with the outdoors, providing a usable space for recreation and socialising.

*The **primary garden area** applies to **single houses** and **grouped dwellings** only. Outdoor areas for **multiple dwellings** are provided as **private open space** (refer element 2.2) and **communal open space** (refer element 2.4).*

### DESIGN GUIDANCE

The location of the **primary garden area** should respond to the **climate zone** and **lot** orientation, and inform the siting and orientation of the **dwelling**.

Locating the **primary garden area** to the north or east of the **dwelling** in **climate zones** 4, 5 and 6 enables effective control of **solar access** to the dwelling through eaves and shading devices to an adjacent **primary living space**. This can assist passive solar heating and cooling for energy efficient house designs. In climate zones 1 and 3, primary garden areas should be located to capture prevailing breezes and to enable **natural ventilation** through the dwelling. Refer **Figure G2.1a**.

The **primary garden area** should be of sufficient size and dimension to be used in a flexible way for different functions, including socialising, recreating and **landscaping**.

Designing for comfort is important as **primary garden areas** may be used for extended periods and during different seasons and times of the day. Designing for comfort may entail providing weather protection and shading structures, such as **pergolas** (with or without planting), shade sails and **patios**. In **climate zones** 4, 5 and 6, these structures should be designed

and located to maintain **solar access** into the **primary living space** of the **dwelling**.

In **climate zones** 4, 5 and 6, **primary garden areas** may be provided within the **street setback area** if this is necessary to achieve the required northern orientation. A primary garden area within the **street setback** should be designed to have a relationship with the **street**. Appropriate levels of privacy can be maintained by **screening** portions of the space and **landscaping**, without creating a barrier to the street. Refer to element 4.9 *Street fences* for acceptable front fence profiles.

For some **developments** it may be appropriate to provide a secondary outdoor space to the **primary garden area**, such as a front **porch** or **verandah**. Multiple outdoor areas with different orientations allows usability during different seasons and times of the day, as well as provides spaces for simultaneous use by different members of the same household. The provision of multiple outdoor areas may be particularly beneficial in certain **climate zones**.



**Photo G2.1a** This primary garden area provides an indoor outdoor connection to the dwelling and space to support tree planting (PC)



**Photo G2.1b** This efficiently planned small garden includes productive garden beds, water storage and a decked area (PC)

## 2.1 Primary garden area (cont.)

### DESIGN TIPS

The following design responses may assist in addressing a design principle(s):

Where the **primary garden area** cannot be provided as a consolidated space due to **site** constraints, it may be appropriate to divide the space into separate areas. Site planning should however aim to provide at least one space that:

- is of sufficient size to be functional for the intended number of **dwelling** occupants;
- is connected with the **primary living space**; and
- allows daylighting and **natural ventilation** into the dwelling.

Where the **primary garden area** cannot be located to the north of the **dwelling** due to **lot** orientation or **site** constraints, providing a north facing **courtyard** or **lightwell** (of an adequate size) to the **primary living space** may assist in providing **solar access** to the dwelling.

### ASSESSMENT GUIDANCE

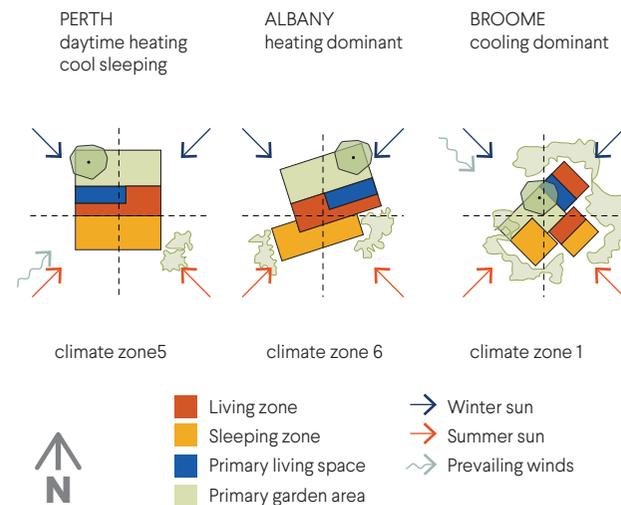
When assessing the location of the **primary garden area** in accordance with **C2.1.2**, more than 50 per cent of the primary garden area is to be located within the northern half of the **site** (refer **Figure G2.1b**). Where it is not possible to achieve **deemed-to-comply C2.1.2**, **solar access** and **natural ventilation** to the area should be maximised (refer to **P2.1.2**).

When calculating the area of the primary garden area, the following spaces can be included:

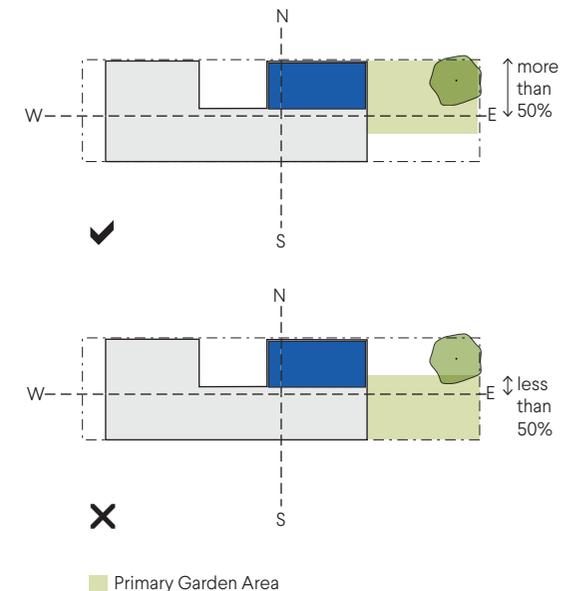
- **deep soil areas** and **landscaped** areas (refer **Figure 2.1a**)
- **pergolas**, **patios**, unenclosed alfresco dining/living areas, unroofed **terraces**, areas under eaves and **balconies**, decks and steps with a floor level not greater than 0.5m above **natural ground level**
- any **outbuilding** that does not exceed a gross **floor area** of 10 square metres or
- swimming pools and spas.

The following spaces should be excluded:

- **setbacks** and **service areas** that are not capable of recreational use.



**Figure G2.1a** Optimum siting of the primary garden area for regional climate zones



**Figure G2.1b** Primary garden area located in the northern half of the site

## 2.2 Private open space

### ► INTENT

Well-designed and oriented **private open spaces** (including **courtyards, terraces** or **balconies**) connect occupants to the outdoors through outlook and connection to **landscape**. A private open space that is accessible from the **primary living space** extends the **dwelling's** living area. Private open spaces should be designed for comfort and to support good climate performance of the dwelling.

*Private open space requirements apply to multiple dwellings only. For single houses, refer to the primary garden area (element 2.1). For grouped dwellings refer to the primary garden area (element 2.1) and communal open space (element 2.4).*

### DESIGN GUIDANCE

An area of **private open space**, connected to the **primary living space**, should be provided for the exclusive use of each **multiple dwelling**. It may be in the form of a **balcony, terrace, courtyard** or equivalent.

An appropriate size, location and configuration for the **private open space** will depend on the site context, **dwelling** size, site orientation, and relationship to **landscape** and views - as well as market expectations. As a minimum, the dimensions of the space should be enough for a table and chairs for the likely maximum number of dwelling occupants.

#### Orientation and climatic considerations

In **climate zones** 4, 5 and 6, the location and size of covered **private open space** areas should balance functionality with the thermal performance of the dwelling. The following design solutions may assist:

- locating covered private open space areas to the east or west of the dwelling to limit low angle summer sun entering the **primary living space**, and
- incorporating open roofed structures, such as **pergolas** or operable screens and awnings, to admit winter solar gain and **daylight** to north facing primary living spaces

#### Outlook versus privacy

The design of **private open space** should balance the need for occupant and neighbour privacy, while providing an outlook from the **dwelling** to external spaces. Consider orientating **balconies** to minimise the need for visual privacy **screening** as this can restrict **daylight** access and outlook from the private open space and adjoining **habitable rooms**.

**C2.2.2** limits the extent of **screening** of **balconies** to a maximum of 75 per cent of the total perimeter of the balcony to ensure **solar access, natural ventilation** and outlook is maintained to the **dwelling**. For a recessed balcony with **walls** on three sides (which equate to  $\frac{3}{4}$  of the balcony's perimeter), this provision would result in the remaining fourth side needing to be completely **unscreened**. In this case, alternative

effective methods to screening would need to be considered to satisfy the visual privacy provisions of element 4.12 *Visual privacy*.

#### Functionality and use

Design of **private open spaces** should be functional. Consider providing:

- a tap for plants/pets, a gas outlet for a barbeque, and power point for accessories, and
- additional space and screening for clothes drying, **storage** and air conditioning units.

Where possible, avoid locating air conditioning units on **balconies**. Where this cannot be achieved, orientate the exhaust away from the functional areas of **private open space**, especially seating areas.



**Photo G2.2a** Apartments with ground floor access have the opportunity to open out to a courtyard garden rather than a balcony as private open space

## 2.2 Private open space (cont.)

### DESIGN TIPS

The following design responses may assist in addressing a design principle(s):

Where the ability to provide **private open space** is constrained (for example, an adaptive re-use **building** or **apartments** fronting busy roads), providing an alternative secondary living space and/or increasing the **communal open space** may be acceptable. A larger area of communal open space to offset decreased private open space may also be appropriate where the **development** aims to facilitate communal living, such as student, supported or co-operative housing.

In cooler climates and for **buildings** exposed to extreme weather or noise, **balconies** may not be appropriate and providing winter gardens to **apartments** could be a suitable alternative.

### Design integration

Integrate **balconies** and **private open space** into the overall form and aesthetic of the **development**. For example:

- projecting balconies should be compatible with the **building** design, including the design and finish of soffits and fascias
- operable screens, shutters, hoods and **pergolas** should complement the main building materials, and
- balcony drainage should be integrated with the building façade

### ASSESSMENT GUIDANCE

#### Location and screening of private open space (P2.2.2; C2.2.2)

Ideally, **private open space** in the form of a courtyard would not be located in the **street setback area**, however, in some circumstances, this may be the only possible location. In these cases, partial **screening** of the courtyard area for privacy with dense planting and/or a front fence (refer to element 4.9 *Street fences* for acceptable front fence profiles) may be appropriate.

Where **private open space** is in the form of a **courtyard** for a ground floor **apartment**, the **deep soil area** within the courtyard can be included in the calculations for meeting deep soil area requirements of **C2.3.1**.



**Photo G2.2b** This apartment's generously sized balcony functions as an extension to primary living area



**Photo G2.2c** Early planning can make private open spaces function well by making provision for a gas point for a barbecue, a screened space, and a tap for watering (PC)

## 2.3 Trees, deep soil area and landscaping

### ▶ INTENT

**Landscape** designs that respond to climate, topography, soil conditions and existing significant landscape features allows **developments** to contribute positively to **local character** and neighbourhood **streetscape** appeal.

Retaining existing **trees** and providing space for new trees benefits the urban ecology as well as the **development**. Trees provide shade, fauna habitat, and support **sustainable** urban **stormwater** management. They also enhance **dwelling** outlook and can contribute to privacy.

Where **development** approval is required, a **landscaping** plan should be included with the application for a **single house, grouped dwelling** or, **multiple dwelling** proposal under the R-Codes. Refer to Appendix 3 Application documentation of the R-Codes Vol.1.

### DESIGN GUIDANCE

#### Deep soil areas

**Deep soil areas** are to be located and of sufficient depth and dimension to protect and sustain healthy root systems for new and retained trees and to receive rainwater infiltration. Deep soil areas should be identified as part of initial **site** planning, with prioritisation given to co-locating deep soil areas with retained trees. Refer to **Table G2.3a** and **Figure G2.3a** for further guidance on sizing of deep soil areas for different tree sizes.

**Impervious surfaces** of up to 30 per cent may encroach into each **deep soil area**. (refer **Figure 2.3a** of the Medium Density Code) The purpose of allowing impervious surfaces into deep soil areas is to provide space for **landscaping** and trees while allowing flexibility for external shading and paving. This allows for the functional and recreational use of outdoor areas, while maintaining adequate **root protection areas** to sustain healthy tree growth.

Impervious surface encroachments may include;

- paving
- **patios, pergolas** and **verandahs**
- **outbuildings** (sheds)

**Impervious surface** encroachments do not include the main **floor area** of the **dwelling**, including any footings greater than 200mm.

Consider the use of semi-permeable ground and roof cover for alfresco areas to avoid exceeding the maximum impervious surface encroachments of **C2.3.4** (refer **Table G2.3b**).

The use of **permeable pavers** for pedestrian/vehicle access and parking will assist in maximising **deep soil areas**.

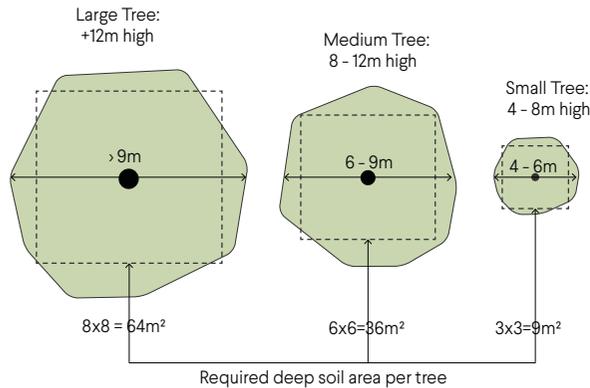
**Table G2.3a** Tree size and deep soil areas

Tree size	Indicative canopy diameter at maturity	Nominal height at maturity	Root protection area	Recommended minimum deep soil area required per tree	Recommended minimum deep soil area width
Large	>9m	>12m	4x4m	64m <sup>2</sup>	4m
Medium	6-9m	8-12m	3 x 3m	36m <sup>2</sup>	3m
Small	2-6m	3-8m	1.5 x 1.5m	9m <sup>2</sup>	1.5m

**Table G2.3b** Surface permeability guide

Tree size	Permeable	Semi-permeable	Impervious
Ground surface cover examples	lawn mulch garden	grass pavers decking permeable paving systems	brick and other solid paving materials when laid concrete
Roof materials examples	pergola trellis	shade cloths fixed open louvres	solid roof sheeting

## 2.3 Trees, deep soil area and landscaping (cont.)



**Figure G2.3a** Recommended deep soil area by tree size

### Retaining existing trees

Retention of **significant existing trees** should be prioritised, as small, newly planted trees are usually no substitute for larger retained trees.

Where an existing tree within a site (or adjacent to the **lot boundary**) is identified for retention or on-site relocation, advice from an arboriculturalist is recommended to ensure the tree is protected during and post construction. Australian Standard 4970-2009 outlines the recommended approach for retaining and protecting trees within **developments sites**, including during construction.

### Landscaping

**Landscaping** design and installation should have regard to the following:

- meeting occupant requirements, including the need for security and safety (**sightlines**, lighting), comfort and low maintenance
- using durable and sustainable surface materials for vehicle driveways and parking areas; **primary garden areas; communal open spaces; and private open spaces** (examples include light coloured materials and **permeable paving**)
- minimising potential impacts on **amenity** (visual, odour, noise) from outdoor equipment such as barbecues and lighting
- bushfire risk management where located in an identified bushfire prone area (refer SPP 3.7 Planning in bushfire prone areas), and
- safety, including incorporation of Crime Prevention Through Environmental Design principles

A range of planting of various scales, including shade trees, shrubs and groundcovers, should be identified on **landscape** plans. Local native plants are encouraged as they can benefit the local urban ecology and, once established, generally require less water and maintenance than exotic species. Refer to relevant local government species lists (where available) for guidance on suitable plant selection.

**Landscaping** should be designed to be **sustainable**, with

consideration to enhancing the micro-climate and improving the thermal performance of **buildings**. Strategies to consider include:

- providing a balance between evergreen and deciduous trees for shading in summer and **solar access** in winter, and using shrubs and vines/creepers to shade east and west facing windows (**climate zones 4, 5 and 6**) to reduce heat load on buildings
- locating trees to ameliorate building bulk and scale
- incorporating shade structures, such as **pergolas**, to complement trees and enhance the microclimate
- greening roofs or walls/façades to shade and cool the building
- using materials with high reflectivity and low heat conductivity
- minimising turf unless sustainable water harvesting, and reuse systems are used
- maximising **permeable surfaces** to allow infiltration of rainwater and irrigation, and
- eco-zoning and hydro-zoning plants, and subsurface irrigation to minimise irrigation needs

Water Corporation provides a range of online resources for waterwise **landscaping**. ([www.watercorporation.com.au/Waterwise](http://www.watercorporation.com.au/Waterwise))

### Streetscapes

**Landscaping** within **street setback areas** should enhance **streetscape** character and complement the built form. Aim to maximise planting areas and limit **impervious surfaces**. This includes making provision for trees and landscaping in and around vehicle access and parking, while maintaining safety **sightlines**.

Consider tree planting and **landscaping** within the verge where **local planning frameworks** allow this. This can make a significant contribution to local area tree canopy targets, water infiltration, and **streetscapes**.

### Planting on structure

## 2.3 Trees, deep soil area and landscaping (cont.)



**Photo G2.3a** Waterwise planting contributes to the streetscape and creates an effective transition between the public realm of the street and private realm of the apartment site



**Photo G2.3b** Planting on structure – a green wall at the entry to an apartment building

Planting on structure can be a **landscaping** solution for constrained spaces and includes:

- **wall** supported planting (including trellis structures attached to walls)
- green roofs, particularly where roofs are visible from the public domain or other parts of the **development**
- large scale planter boxes suited to small or medium trees, and
- green walls, living walls and/or vertical gardens

Planting on structure solutions need to respond to local climatic conditions, as some solutions may not be viable. Plant species selection should have regard to micro-climates and plant longevity. Soil profile and volume should facilitate good plant growth. Consider modifying depths and widths to suit plant species and irrigation frequency, and providing sufficient volume for tree anchorage. Refer to **Table G2.3c** for more guidance.

Depending on scale, successful planting on structure may require technical expertise. Planters may need to be supported by reinforced structures to deal with additional saturated soil weight.

**Table G2.3c** Planting on structure: recommended minimum soil standards for plant types and sizes

Planting type	Definition	Soil volume	Soil depth	Soil area (as per table G1.2a)
<b>Large tree</b>	Over 12m high, crown spread at maturity	76.8m <sup>3</sup>	1200mm	64m <sup>3</sup> with minimum dimension
<b>Medium tree</b>	8-12 m high, crown spread at maturity	36m <sup>3</sup>	1000mm	36m <sup>3</sup> with min dimension 5m
<b>Small tree</b>	4-8m high, crown spread at maturity	7.2m <sup>3</sup>	800mm	3m x 3m
<b>Small ornamental</b>	3-4 m high, crown spread at maturity	3.2m <sup>3</sup>	800mm	2m x 2m
<b>Shrub</b>	-		500-600mm	-
<b>Ground cover</b>	-		300-450mm	-
<b>Turf</b>	-		200mm	-

## 2.3 Trees, deep soil area and landscaping (cont.)



**Photo G2.3c** Planting on structure – a green roof on a rear addition to a terrace house



**Photo G2.3d** Permeable pavers planted with hardy waterwise plants can provide trafficable areas

### ASSESSMENT GUIDANCE

#### Deep soil areas (P2.3.3 to P2.3.4; C2.3.1 to C2.3.4)

A **deep soil area** can be an irregular shape, provided the minimum required dimension of 1.5m is achieved. Minimum dimension refers to the minimum length and width of all areas that contribute to the deep soil area (refer **Figure G2.3b**). **Impervious surfaces** may encroach into the minimum dimension of 1.5m provided the 30 per cent limit of **C2.3.4** is not exceeded.

**C2.3.1** requires a minimum of 20 per cent of each **site** and **common property** area to be provided as **deep soil area**. This **deemed-to-comply** provision should always apply when **sites** are created from the **parent lot** (e.g. **survey-strata lots**) that will be developed separately. This is to ensure the 20 per cent deep soil area is achieved across the parent lot.

However, where a **development** application is submitted for the full development of the **parent lot**, the flexibility exists under **C2.3.2** for the required 20 per cent **deep soil area** to be redistributed between **dwelling sites** and **common property**, provided that the total allocation of deep soil area meets the minimum 20 per cent requirement for the parent lot. This allows flexibility for some sites to take on a greater share of deep soil area than others.

The following may be included in the calculation of **deep soil areas**:

- areas under eaves, fascias and gutters that do not exceed a total projection of 900mm
- **permeable** and semi-permeable **surfaces** (refer **Table G1.2b**), and
- encroachments, to a maximum of 30 per cent of the deep soil area (in accordance with **C2.3.4**), in the form of **impervious surfaces** and roofing

#### Tree canopy (P2.3.2; C2.3.5 to C2.3.8)

Submitted plans should clearly identify unimpeded **root protection areas**, consistent with the dimensions specified in **Table 2.3c**, or the locations where trees are proposed. The **root protection areas** should be free from encroachments and underground structures, including soakwells and any semi-permeable surfaces.

#### DESIGN TIPS

*The following design responses may assist in addressing a design principle(s):*

It may be difficult to establish/support successful tree growth and provide the required deep soil area within highly urbanised or constrained sites. Constraints may include:

- natural site features
- **basement** parking, or
- existing underground services

In these situations, planting on structure may be a viable alternative. Planting on structure should be provided with an area equivalent to two times the shortfall in **deep soil area** required.

In **climate zones** 1 and 3, where it may be difficult to accommodate the deep soil area and tree requirements, alternative **landscaping** responses and shading devices may be appropriate.

Where an **outbuilding** (such as a shed) is proposed that impacts the ability of the **development** to achieve the **deep soil area** requirements of **C2.3.1**, it may be appropriate to include portion or all of the outbuilding as part of the **impervious surfaces** encroachments of the deep soil area (refer **C2.3.4**), provided that the:

- footings or slab of the outbuilding do not exceed 200mm dimensions, and
- outbuilding does not impede the growth of a tree, including the **root protection area** and canopy

## 2.4 Communal open space

### ▶ INTENT

**Communal open space** provides occupants of **grouped and multiple dwelling developments** with space for recreation and socialisation beyond their **private open space** and **primary garden areas**. It also creates room between **buildings** for trees and **landscaping**.

#### DESIGN TIPS

*The following design responses may assist in addressing a design principle(s):*

Where a **development** is located close to a high **amenity** area (within approximately 200m) that offers a choice of accessible recreation and community facilities for the residents of that development, it may be appropriate to reduce the amount of **communal open space**. In such instances, at least one useable communal open space area should be provided within the development site where communal open space is required under the **deemed-to-comply** provisions of the Medium Density Code.

**Developments** with larger than required **primary garden areas** or **private open space** may also consider a reduction in the amount of **communal open space** provided with an agreed reduction being at the discretion of the **decision-maker**.

The requirement for 50 per cent direct **sunlight** to the **communal open space** (refer **C2.4.2**) may not be appropriate for **climate zones** 1 and 3, and shaded areas may be more suitable.

### DESIGN GUIDANCE

**Communal open space** may include outdoor spaces that are unenclosed, semi-enclosed and/or partially covered. Spaces can be located at ground or on upper levels, such as **terraces** and useable flat roofs.

**Communal open space** should be sized and designed to be functional, attractive and accessible to all occupants of the **development**.

**Communal open space** may include improvements such as:

- seating, shared BBQs, and play areas connected to high **amenity landscaping** and **deep soil areas**
- vegetable gardens
- planting on structures, and
- recreation facilities

For smaller **sites**, **communal open space** should be provided as a single consolidated area to maximise its functionality. On larger sites, a series of well-integrated, communal open spaces offering complementary uses may be more appropriate.

**Communal open space** should be well-lit for evening use (with consideration given to potential light impacts for nearby dwellings) and be open to passive surveillance from adjoining dwellings and/or the public realm.

The cost for maintaining **communal open space** is typically shared by owners. The design of communal open space should therefore have regard to ongoing maintenance costs and programming.

### ASSESSMENT GUIDANCE

**Communal open space** may be co-located with **deep soil areas**.

**Communal open space** may be provided in multiple areas, provided the minimum dimension of 4m is achieved. Minimum dimension refers to the minimum length and width of all areas that contribute to the **communal open space**.

Refer to 3.2 *Solar access and natural ventilation* assessment guidance for more information on assessing direct sunlight into **communal open space**.



**Photo G2.4a** A rooftop communal open space to an apartment building provides opportunities for social interaction (PC)



**Photo G2.4b** This communal open space incorporates shared gardening facilities and is located with open communal parking area

## 2.5 Water management and conservation

### ▶ INTENT

Water sensitive urban design (WSUD) measures should be considered at all stages of the **development** process, from **site** planning for on-site or off-site **stormwater** disposal, though to **building** design to capture and recycle stormwater for gardens and occupant use. WSUD measures should also respond to regional variations.



**Photo G2.5a** Compact rainwater tanks can be located within the primary garden area

### DESIGN GUIDANCE

It is necessary to address **stormwater** when planning a medium density **development**, as this will be easier than retrofitting a system post-development.

Urban water management solutions will need to respond to the wide variation in rainfall patterns and **site** conditions across Western Australia.

In locations where on-**site stormwater** retention is required, designs should maximise **deep soil areas** for infiltration and groundwater recharge at source. Consideration should also be given to diverting and recovering stormwater for use within the site, such as for garden areas and rainwater tanks, rather than directing runoff to soakwells. Refer to the Department of Health for guidance on the use of rainwater tanks (<https://www1.health.gov.au/internet/main/publishing.nsf/Content/ohp-enhealth-raintank-cnt.htm>).

Where groundwater depth is less than 1.5m below **natural ground level**, on-**site** retention is not recommended. **Stormwater** should be directed to a district or local stormwater drainage system where permitted by the local government. This approach limits unnecessary fill on site and ensures that stormwater is managed to avoid potential flooding. For **development** within Perth, refer to the Department of Water and Environmental Regulation's Perth Groundwater Map for depth to groundwater data (<https://www.water.wa.gov.au/maps-and-data/maps/perth-groundwater-atlas>).

Where off-**site** disposal is required, **stormwater** management should ensure that the quality of water leaving the site is equivalent to if not improved from the quality of water received, with consideration given to potential sources of pollution and sediment control.

When designing a medium density **development**, consider opportunities to incorporate WSUD measures, including within **buildings**, gardens, vehicle access areas, and verges. This may include:

- incorporating raingardens, tree pits and vegetated swales into the **landscape** design for infiltration and groundwater recharge at source
- reducing runoff and peak water flows by minimising **impervious surfaces** and/or substituting impervious surfaces with **permeable paving** and **landscaping**, and
- minimising potable water use through water efficient appliances and irrigation, low-water gardens, rainwater tanks and greywater reuse

Greywater reuse systems must be approved for use in Western Australia and comply with the *Code of Practice for the Reuse of Greywater in Western Australia* (Department of Health, 2010).

The Department of Water and Environmental Regulation and Water Corporation provide online resources for urban water management. (<https://www.water.wa.gov.au/urban-water/urban-development/urban-water-design>) (<https://www.watercorporation.com.au/Our-water>)

### ASSESSMENT GUIDANCE

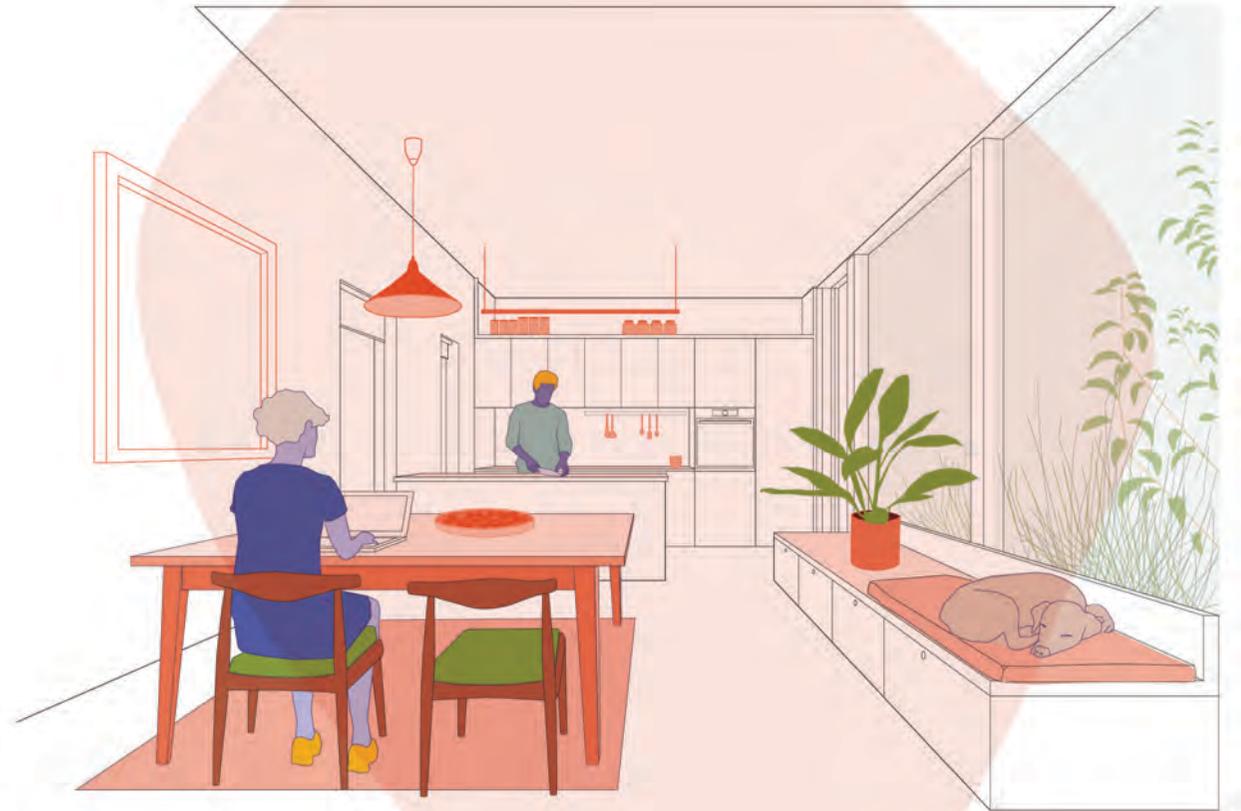
The water management and conservation requirements will vary between local government jurisdictions and may depend on soil type, climatic conditions or the capacity of local drainage and water management systems. For some localities it will be appropriate for **stormwater** to be retained on-**site**, however in other jurisdictions, drainage to off-site stormwater systems may be required. The **deemed-to-comply** provisions provide for both scenarios.

# 3.0 THE BUILDING

*'The building' includes the dwelling and the associated structures that make up a home. Designing the building to ensure living spaces have optimal orientation and connection to the outdoors, bringing in sunlight, natural ventilation and an attractive outlook, contributes to the liveability, amenity and sustainability of a home.*

*As lot sizes decrease, the need for efficient and flexible dwelling design increases, and providing spaces that can do more than one thing or that can adapt to changing needs becomes more important.*

*The elements in the building section work together to guide design of dwellings that perform well, feel good, and allow occupants to use their homes flexibly.*



## INDOOR AMENITY

- 3.1 Primary living space
- 3.2 Solar access and natural ventilation
- 3.3 Size and layout of dwellings



*The elements within this sub-section promote internal dwelling spaces that are well proportioned, functional and integrated with gardens and open space. These attributes contribute to occupant amenity and support climate-responsive dwellings that are comfortable throughout the year.*

## FUNCTION

- 3.4 Parking
- 3.5 Storage
- 3.6 Waste management
- 3.7 External fixtures
- 3.8 Outbuildings



*As lots get smaller, the spaces within and around dwellings need to work harder and be more efficient. Designing functional dwellings means considering how spaces and uses can work simultaneously or adaptively, depending on the need, time of day, week or year.*

## HOUSING DIVERSITY

- 3.9 Universal design
- 3.10 Ancillary dwellings
- 3.11 Small dwellings
- 3.12 Aged or dependent persons' dwellings
- 3.13 Housing on lots less than 100m<sup>2</sup>



*The Medium Density Code aims to diversify housing and broaden the choice of housing available to Western Australians, including seniors, people with a disability and different household types.*

# 3.1 Primary living space

## INTENT

The **primary living space** is the main **habitable room** of the **dwelling** and the focus of life and indoor activity. When directly connected to the **primary garden area** or **private open space**, the spaces work together for enhanced flexibility, functionality and resident **amenity**.

## DESIGN GUIDANCE

The **primary living space** should be located for **natural ventilation** and optimal orientation for the **climatic zone**. The primary living space should also have physical and visual access (e.g. sliding glass door, bi-folds or alternative suitable **major opening**) to the **primary garden area** or **private open space**.

The shape and dimensions of the **primary living space** should consider the useability of the space, including furniture placement (e.g. outdoor tables and chairs) and circulation space.

## ASSESSMENT GUIDANCE

### Designated primary living space (P3.1.3; C3.1.1)

Where a **dwelling** has multiple living spaces, one of these areas should be designated as the **primary living space** in the application and shown accordingly in the accompanying plans.

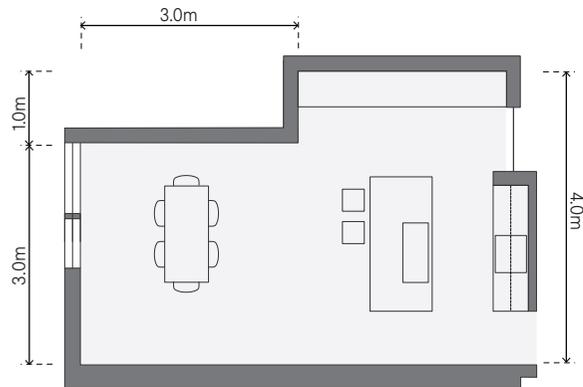
### Location and access for single houses and grouped dwellings (P3.1.2; C3.1.2)

Where direct physical access between the **primary living space** and **primary garden area** cannot be achieved, visual access using a **major opening** should be provided. The major opening should be translucent, of sufficient dimensions and be located to provide an outlook to the **primary garden area**.

Where it is not possible to achieve visual access between the **primary living space** and **primary garden area** for a **grouped dwelling**, a suitable alternative outlook (for the purpose of **P3.1.2**) could include a view to the **communal open space** or other **landscaped area** (including landscaped **street setback area**).

### Depth of primary living space (P3.1.3; C3.1.4)

There may be circumstances where it is appropriate to reduce the minimum 4m dimension for part of the **primary living space** or **private open space**, such as where the design must respond to a unique site feature or climatic conditions. Most of the primary living space should however achieve the minimum 4m dimension and the plans should demonstrate that the area of reduced dimension remains functional (refer **Figure G3.1a**).



**Figure G3.1a** The minimum 4 metre dimension is reduced in this example without compromising the functionality of the space



**Photo G3.1a** This well-proportioned and planned primary living space has been designed to flow to the private open space (PC)

## 3.2 Solar access and natural ventilation

### ► INTENT

Designing for the climate creates comfortable and more energy efficient living spaces. For medium density **dwelling**s, **solar access** and **natural ventilation** can offer the most affordable and effective way to manage indoor air quality, lighting and temperature, reducing or removing the need for mechanical ventilation and air-conditioning.

Requirements vary according to **climatic zones**, and this must be factored into the design process.

The **climate zones** referred to in the R Codes are those used by the Australian Building Codes Board (ABCB) for thermal design and published in the National Construction Code (NCC), available for download: <https://www.abcb.gov.au/Resources/Tools-Calculators/Climate-Zone-Map-Western-Australia>.

Western Australia has vastly different climate regions, leading to locations around the State having varied heating and cooling requirements. To account for these differences, the NCC energy efficiency provisions vary from location to location and, for simplicity, locations with approximately similar climates are combined to create eight climate zones across Australia. For ease of use, the **climate zone** boundaries are aligned with local government areas and may be amended from time to time by the ABCB. Refer to **Figure G3.2a** for Western Australian climate zone locations.

The **deemed-to-comply** provisions of the Medium Density Code respond to the regional variations in climate by differentiating between **climate zones 1** and 3, and climate zones 4, 5 and 6. No locations within Western Australia fall within climate zones 2, 7 or 8.

### DESIGN GUIDANCE

**Solar access** and **natural ventilation** requirements are dependent on climate:

- In **climate zones 4, 5 and 6**, the objective is to maximise solar access in winter and to minimise solar access in summer, while maintaining good natural ventilation
- In climate zones 1 and 3, the objective is to minimise solar access during all seasons, while maintaining daylighting and prioritising natural ventilation to keep dwellings cool

#### Solar access in climate zones 4, 5 and 6

To maximise winter sun entering the **building**, orientate the **dwelling** to the north and prioritise north facing **major openings**. Consider also:

- dual aspect dwellings or dwellings with shallow layouts to maximise northern orientation
- high ground floor ceilings and mezzanines
- tall north facing windows, bay windows, clerestory windows and **skylights** and
- planting deciduous trees and shrubs to allow **solar access** gain to dwellings in winter and to provide shade in summer.

To minimise summer sun entering the **dwelling** consider:

- horizontal shading devices such as eaves, shutters or hoods to **major openings**
- locating **patios, carports** and **garages** to the west of the dwelling
- tree planting and **landscaping** to the west and east of the dwelling, and
- minimising openings to the west and/or providing vertical shading devices to mitigate heat gain.

#### Shading in climate zones 1 and 3

To minimise sun entering the **dwelling** consider:

- deep eaves, awnings and **verandahs** to shade all windows and openings
- trees and **landscaping** to shade the dwelling and openings
- minimising glazing and providing vertical shading to the east and west of the dwelling, and
- locating **verandahs** and **carports** east and west of the dwelling



**Photo G3.2a** Adjustable louvres are an effective way to control sun, glare, privacy and ventilation through the day and year (PC)

## 3.2 Solar access and natural ventilation (cont.)

### DESIGN TIPS

The following design responses may assist in addressing a design principle(s):

Where a **primary living space** does not meet the orientation requirements of **C3.2.3** in order to capture a view/ outlook or to address quiet house requirements (refer SPP 5.4 Road and rail noise), a clerestory window or similar may be an appropriate alternative to capture northern **solar access**.

### Natural ventilation

Layout and depth are closely linked with the ability of a **dwelling** to be **naturally ventilated**. Generally, as a room or **building** gets deeper, effective airflow reduces. Reducing the dwelling depth can improve natural ventilation.

To allow for **natural ventilation**, **habitable room** windows need to be openable.

**Natural ventilation** can be achieved by locating openings towards prevailing breezes and dual aspect **dwelling**s designed for cross-flow ventilation (refer **Figure G3.2b**).

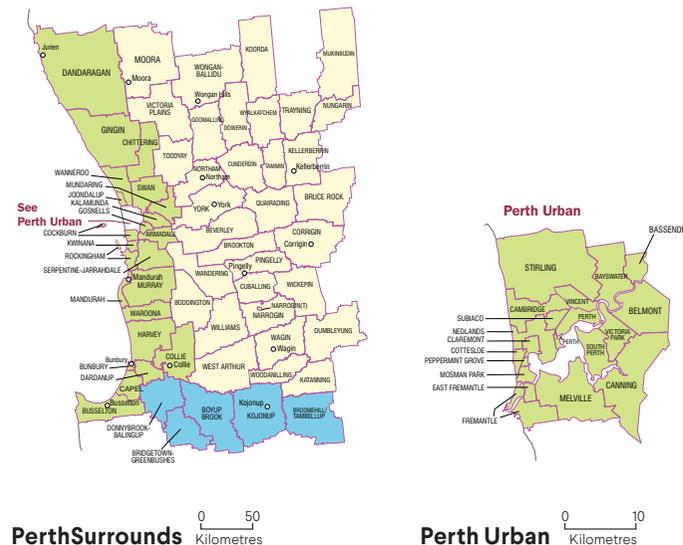
For **climate zones 1** and **3**, including openings, louvres and breezeways oriented towards prevailing winds assist with natural cooling. Consider also permeable fencing to allow breezes to enter the **site**.

An openable skylight or **lightwell** and/or mechanical ventilation are appropriate alternatives for bathrooms that do not have an external **wall** to accommodate an openable window.



Table G3.2a Vertical sun angles by latitude

City/Town	Latitude (S)	Vertical Sun Angle
Albany	35	31
Esperance	34	32
Bunbury	33	33
Perth	32	34
Kalgoorlie	31	35
Geraldton	28	38
Carnarvon	25	42
Karratha	21	45
Port Hedland	20	47
Broome	18	49
Wyndham	15	52



**Figure G3.2a** Climate zone locations in Western Australia. Extracted from Climatic Zone map of Australia published by ABCB (last amendment August 2015)

## 3.2 Solar access and natural ventilation (cont.)

### ASSESSMENT GUIDANCE

#### Solar access (P3.2.1; C3.2.1 to C3.2.4)

In **climate zones** 4, 5 and 6, covered **patios**, alfresco or equivalent within **primary garden areas** or **private open space** areas should be located and/or designed to allow the **solar access** requirements of **C3.2.3** for **primary living spaces** to be achieved.

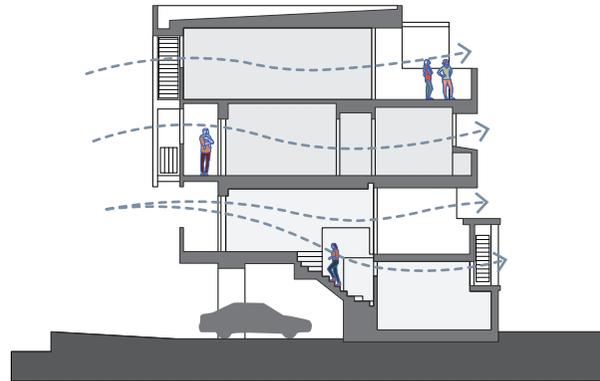
As **sunlight** angles can vary greatly across the state, local information should be used for each development proposal (refer **Table G3.2a** and **Figure G3.2c**).

No orientation requirements apply to **primary living areas** located in **climate zones** 1 and 3.

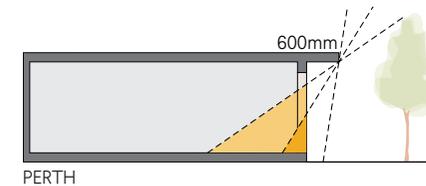
#### Natural ventilation (P3.2.1; C3.2.5 to C3.2.6)

To achieve compliance with **C3.2.5**, all **habitable rooms** require a minimum of two openings that are at least 2m apart. One of those openings may be a doorway to an internal part of the **dwelling** (other than a storage cupboard).

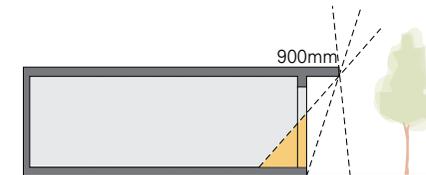
**C2.3.6** requires bathrooms with external **walls** to have an openable window for **natural ventilation**. Where the bathroom is internal to the **dwelling**, then mechanical ventilation in accordance with the requirements of the **NCC** is acceptable.



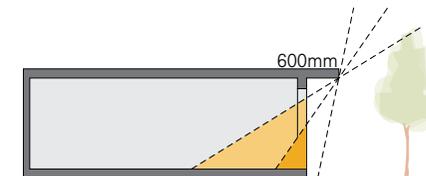
**Figure G3.2b** Natural ventilation for passive cooling



PERTH



BROOME



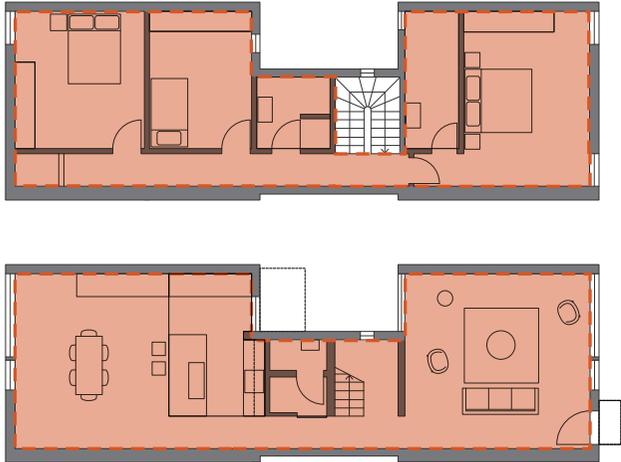
ALBANY

**Figure G3.2c** Regional variation of eave depths to achieve solar access and shading

## 3.3 Size and layout of dwellings

### ▶ INTENT

The size and dimensions of **habitable rooms** should be adequate for functional use of the space. Minimum **dwelling** size, and room area / dimensions aim to ensure each dwelling can accommodate required furnishings and provide for flexible use and resident **amenity**.



**Figure G3.3a** Measuring internal floor area

### DESIGN GUIDANCE

The **floor area** of the **dwelling** and the dimensions of individual rooms should allow for different furniture arrangements based on occupant needs. Doors, windows and circulation paths should support flexible and functional use of spaces, as well as have regard to the privacy needs of occupants.

Ceiling height contributes to the perceived spaciousness of interiors. Room width, depth and height should be considered together to create well-proportioned spaces. Correct proportions can also improve **daylighting** and facilitate good **natural ventilation**.

Limiting internal **dwelling** circulation (while meeting **universal access** requirements) can allow better use of spaces.

Techniques may include:

- integrating circulation spaces into the functional layout of rooms, and
- zoning rooms or areas within the dwelling that have compatible functions to minimise passageways

Avoid square and irregular open-plan living areas as this can create inefficiencies for furnishing and layout.

The **primary living space** and bedrooms should be sited and located to minimise the impact of noise from within the **dwelling** and external sources.

Light switches and power points should be located for convenience and safety and be adequate for future occupant needs.

### ASSESSMENT GUIDANCE

Measurements for internal **dwelling** and room **floor area** are to be taken from the finished internal surface of the **wall** (refer **Figure G3.3a**).

Where the minimum **floor areas** of **C3.3.1** and **C3.3.2** can not be achieved, applicants should demonstrate the **dwelling** and rooms will be functional and can be adequately furnished by providing a floorplan showing accurately scaled furniture arrangement(s) to address **P3.3.2**.



**Photo G3.3a** Smaller rooms can work as well as larger ones when efficiently planned (PC)

## 3.4 Parking

### › INTENT

Parking for medium density **development** should cater for a range of transport modes, including cars, bicycles and scooters/ motorbikes, and be commensurate with occupant and visitor needs.

Being efficient with how parking is designed, provided and used are important considerations for all medium density **developments**, as the space allocated to parking can be significant and compromise how much room is left for internal living, outdoor areas, trees and gardens.

*There is a long-accepted principle that the demand for car parking generated by a **residential development** should generally be accommodated on the **development site**. However, the space allocated to vehicles (for both parking and manoeuvring) occupies a significant proportion of a **site** and can be detrimental to the overall design and living quality of the **dwelling**. Extensive use of **garage doors** and wide **driveways** can also adversely affect **streetscapes**, neighbourhood character and pedestrian safety. Reducing private vehicle use by using alternative modes (including public transport and cycling) and providing on-site parking in alternative forms to garages can have both environmental and financial benefits.*

### DESIGN GUIDANCE

The design, layout and provision of parking should balance and respond to the following considerations:

- occupant and visitor needs
- access to available public transport and active transport infrastructure
- topography (e.g. sloping **sites** may be more conducive to **basement** parking)
- impact on **streetscape** and resident **amenity**
- site planning, in particular the preferred location and orientation of **dwellings** and associated **primary garden areas** and **private open space**, and
- built form typology and tenure

On-**site** car parking requirements may be provided underground in **basement** parking, as uncovered above-ground bays, or in **carports** or **garages**.

The following strategies can be considered to reduce the amount of space within **development sites** given over to car parking:

- designing **unenclosed** parking spaces for multiple purposes, such as locating parking adjacent to **primary garden areas** to extend available outdoor space
- combining parking spaces into a consolidated parking area and unbundling parking from tenure (unbundling parking refers to the practice of selling or leasing parking spaces separate from the **dwelling**)
- building over parking, for example undercroft, semi-basement or **basement** parking; and
- where communal parking or visiting parking is provided, consider adequate **screening** or locating car parking away from **major openings** to ground floor **habitable rooms** to avoid light and noise pollution
- consider incorporating or providing for future electric vehicle (EV) charging points for resident/visitor parking and universally-accessible charging points for electric bikes and mobility scooters.



**Photo G3.4a** Undercroft parking reduces the visual impact of parking on the street and provides an opportunity for flexible use of the space when not required for car parking



**Photo G3.4b** This secure communal parking area incorporates permeable paving and is co-located with other shared facilities, including community gardens and storage areas

## 3.4 Parking (cont.)

### 💡 DESIGN TIPS

The following design responses may assist in addressing a design principle(s):

For **grouped** and **multiple dwellings**, the Medium Density Code limits visitor parking bays in the **primary street setback area**.

When providing parking the **primary street setback area**, the design and number of parking spaces should not dominate the **development** or **streetscape**. Consider:

- providing parking as uncovered bays
- additional trees and **landscaping**, to soften the appearance of the parking, whilst addressing CPTED principles
- low walling (max. 900mm) along the **street boundary** to distinguish the private from the public realm, and
- constructing the parking and vehicle access area using **permeable pavement**

In Location B it may be appropriate for a **development** to provide less than the minimum parking requirements of **Table 3.4a** where parking is communal and shared between **dwellings**, recognising the efficiencies this arrangement can provide.

Parking should be integrated with the **landscape** design by extending planting and materials into the parking areas, planting shade trees, and incorporating **permeable paving** systems.

Ventilation grills or **screening** devices for car park openings or **basement** parking that protrude above ground should be integrated into the façade and **landscape** design of the **development**.

Address climate considerations in the location and design of parking. This may include weather-protected walkways between visitor parking and **building** entrances, and in the warmer climates, it may be appropriate to locate visitor parking centrally on the **development site** to reduce walking distances.

Where an additional car parking space is proposed forward of a **garage/carport** within the **street setback area**, the space should be of sufficient depth for the vehicle to be parked wholly within the lot and not to encroach into the adjacent verge and footpath.

The design and location of bicycle parking should respond to the type and intensity of **development**. For example, smaller medium density developments may make provision for bicycle parking within the **dwelling**, whereas for larger developments, shared bicycle parking in communal areas may be preferred. Refer **Figure G3.4a** for indicative bicycle parking dimensions.

The need for on-site car parking can relate to the availability of parking on the **street**. Where a street has a sufficiently wide verge or carriageway to accommodate on-street parking (and on-street parking is supported by the local government in that location), the actual need for on-site parking could potentially be reduced, although some owners will likely still prefer some on-site parking to be provided. This may also apply to older areas, where narrow **lots** and small **street setbacks** constrain on-site parking, and where verge and street parking is already permitted as an alternative to on-site parking. Reductions to minimum on-site parking standards will, however, be at the discretion of the **decision-maker**.

Narrow **lot** frontages with vehicle access from the **primary street** can limit opportunities for on-street parking and in these situations, it is usually necessary to provide all occupant and visitor parking **on-site**.



**Photo G3.4c** The visitor parking is easy to find, shaded, and located outside the development's security gate for accessibility



**Photo G3.4d** Providing a carport rather than a garage reduces the visual impact of vehicles on the street or communal area, is usually less expensive to construct, and can be located in the front setback area

## 3.4 Parking (cont.)

### ASSESSMENT GUIDANCE

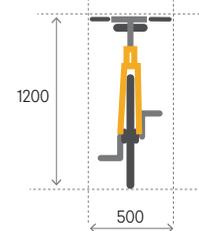
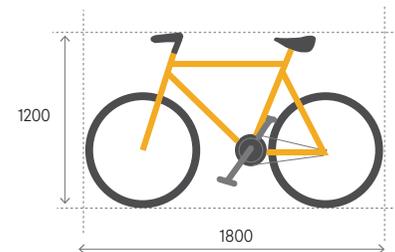
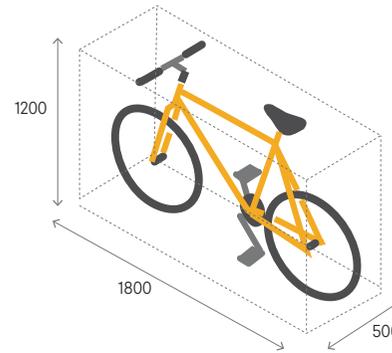
A **development** proposal is eligible for Location A parking standards (refer **Table 3.4a**) if all or portion of the lot is located within:

- 800m of a train station on a **high frequency** rail route, measured in a straight line from the pedestrian entry to the train station platform to any part of a **lot**
- 250m of a high frequency bus route, or multiple bus routes that if combined have timed stops every 15 minutes during weekday peak periods (7 – 9am and 5 – 7pm), measured in a straight line from along any part of the bus route to any part of the lot, and/or
- within the defined boundaries of an **activity centre**.

Location B parking standards (refer **Table 3.4a**) apply to **development** located outside Location A

Two cars bays in tandem can be counted as two bays only when designated for use by the same **dwelling**. A tandem garage constitutes a double **garage**.

Parking that is **unenclosed** and unroofed may be included in **deep soil area** calculations (refer to the **impervious surface** encroachment provisions of **C2.3.4**).



**Photo G3.4e** Incorporating EV charging stations and share vehicles in larger developments can contribute to reduced greenhouse gas emissions and reduced demand for car parking spaces



**Photo G3.4f** This bike parking has been provided in a covered, accessible location that is available to visitors and residents of the development

**Figure G3.4a** Indicative bicycle parking dimensions

## 3.5 Storage

### ► INTENT

Medium density **dwelling**s are generally more compact and require generous **storage**. Providing dedicated storage space can help preserve living spaces, reduce the need for off-site storage, and enable residents to pursue hobbies and lifestyle choices.

*Storage areas should be provided for all dwelling types, including **single houses, grouped, multiple and ancillary dwellings**.*

### DESIGN GUIDANCE

**Storage** areas should be proportionate to the size of the **dwelling** and be capable of accommodating larger items, such as sporting and gardening equipment. Storage should be secure, fit for purpose, weatherproof, and easily and safely accessed. Generally, the access to a storage area should be external to the dwelling.

**Storage** can be provided as a dedicated space within a **garage**, or as a secured, weatherproof space within or adjacent to a **carport**. Where located within a carport, careful consideration should be given to the manner and ease of accessibility to the storage area when the carport is occupied.

**Functional utilities** and services can be co-located within **storage** areas, provided they do not impact on the minimum dimensions and volume required for the storage (refer **Table 3.5a**).

In addition to providing an external **storage** area for bulky items, consideration should be given to providing adequate storage within the **dwelling**. Incorporating storage under stairs or within the roof can make efficient use of these spaces.

### ASSESSMENT GUIDANCE

When locating **storage** in a **garage** or **carport**, the plans should show a clear and dedicated storage space in addition to any space dedicated to parking.

Within a **garage, storage** (and its adjacent circulation space) should not serve as an additional parking space where the maximum parking limits of **Table 3.4a** have been reached.

Within a **grouped** or **multiple dwelling development, storage** areas can be located away from the main activity areas, provided access to and the location of the area is safe with good lighting and **passive surveillance**.

Dividing the required storage area into smaller, separate areas is discouraged. Where multiple storage locations are unavoidable, the total area should exceed that shown in **Table 3.5a** to ensure that the spaces are functional and appropriate.

Where minimum **storage** dimensions cannot be achieved, to address **P3.5.1** the applicant should demonstrate that a dedicated storage area can be provided for the use of each **dwelling** that is sufficiently sized to store bulky items.

The bike parking requirements of **C3.4.4** are in addition to the minimum storage requirements of **3.5 Storage**.



**Photo G3.5a and b** This storage area has been neatly integrated into the design of the balcony, is conveniently located, of useful size and proportions, weatherproof, and screened from view

## 3.6 Waste management

### ▶ INTENT

Storage areas for rubbish and recycling bins are to be located for convenience and accessibility, while limiting potential visual impacts.

*The Waste Avoidance and Resource Recovery Strategy 2030 (Waste Authority, 2012) sets targets to reduce waste going to landfill, the amount of waste generated per person and Western Australia's overall footprint.*

*For Perth and Peel, a three-bin Food Organics and Garden Organics (FOGO) system will be implemented for all dwellings by 2025. This is the preferred kerbside waste collection system and is considered the most suitable for achieving the target of 65 per cent diversion of waste from landfill by 2030.*

### DESIGN GUIDANCE

Storage areas for rubbish and recycling bins should be addressed as part of early **site** planning. Proponents should engage with the local government to establish the requirements that apply in the relevant jurisdiction.

Suitable locations for bin storage may include:

- in **garages**
- in a **screened** enclosure that is compatible with the **building(s)** or
- in **basement** car parks.

For **single** and small **grouped dwellings**, kerbside pick-up is preferred as it minimises the need for large vehicles to enter and manoeuvre within the **site**, which can have a negative impact on residential **amenity** and safety.

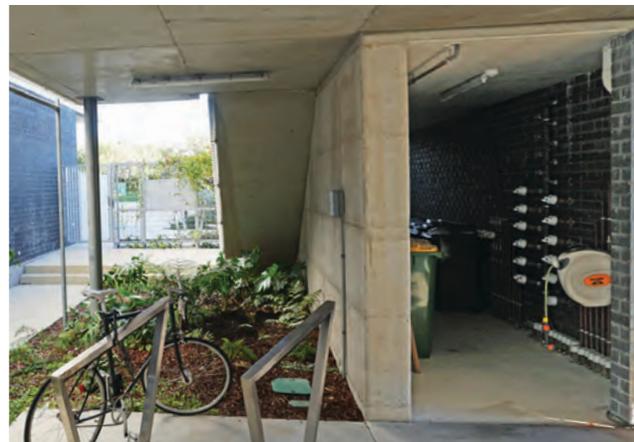
For large **grouped** and **multiple dwellings**, kerbside pick-up may not be possible or available. Where internal pick-up is required, a clear path of travel should be provided with sufficient clearance distances (horizontal and vertical) and **sightlines**.

Where **buildings** are built to both side **lot boundaries** and bin pick-up will be from the **primary street**, **screened** waste storage areas should be integrated into the design of the **development**.

*Refer to WALGA Waste Management Guidelines for further advice.*

### ASSESSMENT GUIDANCE

Plans should show a dedicated area for the storage of either a communal bin(s) or the required number of rubbish and recycling bins (depending on local government requirements). The area needs to be accessible, **screened** from public view and located in a secure and convenient location for residents and collection.



**Photo G3.6a and b** This bin storage area is conveniently located, neatly integrated into the service area and screened from view

## 3.7 External fixtures

### ▶ INTENT

Quality medium density **development** ensures that **external fixtures** are integrated into the design of the **building** and **landscape** to minimise the impact on the **streetscape**.

Early planning, coordination and design of **external fixtures** will ensure the siting and appearance of external fixtures does not compromise the **amenity** of the **development** and that fixtures can be safely accessed, maintained and used.

*External fixtures include the below sub-categories:*

- **essential service utilities**
- **functional utilities**
- **sustainability infrastructure, and**
- **fire service infrastructure**



**Photo G3.7a** Water meters are screened from view behind this street address panel

### DESIGN GUIDANCE

#### Essential service utilities

Where **essential service utilities** are located in the **street setback area**, ensure they are within or behind **landscaping** or **street** walls, beneath **driveways** with trafficable covers, or wall-mounted in vehicle access ways, while making sure required clearances are adhered to.

#### Functional utilities

Air conditioning units may be located within the **primary garden area** or **private open space** where this will not have a detrimental impact on the **amenity** or useability of the space.

Design solutions for the location of air conditioning units include:

- on roofs, where not visible from the public realm
- within **lot boundary setbacks**, where not visible from the public realm, or
- within **screened** recesses

Downpipes should be integrated with the façade of the **building**.



**Photo G3.7b** Landscaping effectively screens the essential service utilities in this communal street, whilst maintaining convenient and safe access

#### Sustainability infrastructure

The **NCC** encourages water and energy efficiency of all housing in Australia. It is therefore an objective of the R-Codes to assist in the widespread adoption of technologies that improve the **sustainability** of housing.

The positioning of **sustainability infrastructure**, such as **solar collectors**, roof vents and **rainwater tanks**, is **site-specific** and should maximise functionality and performance.

#### Fire service infrastructure

Where **fire service infrastructure** is required, engagement with the Department of Fire and Emergency Services (DFES) should occur prior to **development** application lodgement to identify a suitable location. The fire service infrastructure should not impede access to or egress from a **building** and must be located at the front or on the approach to the building. There should be unobstructed access between the booster and where the emergency vehicle needs to access the **site** (refer *GL-11: DFES site planning and fire appliance specifications* on DFES website).

### ASSESSMENT GUIDANCE

Where located on a **balcony**, the space that is required for the air conditioning unit and associated **screening** should be excluded from the minimum area and dimension calculations that apply to **balconies** under **C2.2.1**.

**Essential service utilities, functional utilities and sustainability infrastructure** may be located in the **primary garden area**, however, where relevant, will be subject to **deep soil area** encroachment provisions of **C2.2.5**.

## 3.8 Outbuildings

### ▶ INTENT

**Outbuildings** are an optional part of a **development** that may be required to provide additional space for **storage**, a workshop or equipment. The location and design of outbuildings should not detract from occupant, neighbour and **streetscape amenity**.

*Australia has a long tradition of backyard sheds, workshops, **garages** and other similar **outbuildings**. In a medium density **development**, the space available is more constrained and therefore the need to accommodate outbuildings is best addressed at the design stage as part of the overall development.*

### DESIGN GUIDANCE

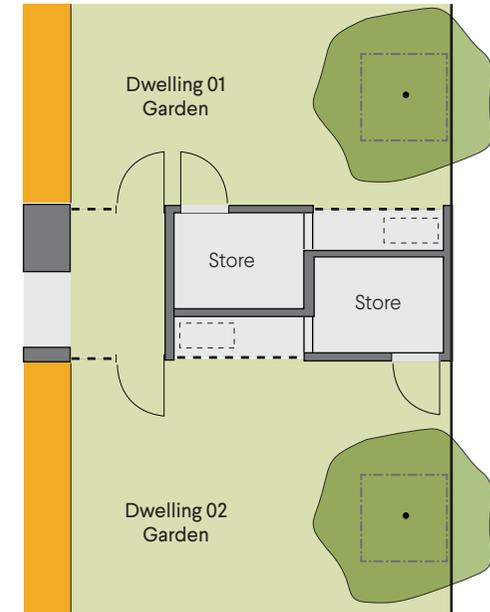
The **outbuilding** should be sited to maximise utility of the **primary garden area** and other outdoor spaces. For **site efficiency**, consider integrating outbuildings with **boundary walls** between **sites** (refer **Figure G3.8a**).

Design and positioning of **outbuildings** should not detract from the visual **amenity** of neighbours or the **streetscape**. An outbuilding should be relatively small in area, low in height and should generally not be in the **street setback area**.

### ASSESSMENT GUIDANCE

Other common private garden or backyard constructions such as cubby houses, play fixtures, and dog kennels have not been included in the definition of **building** and are not subject to the **deemed-to-comply** provisions. Refer to cl.61 in Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015* for works that do not require planning approval.

In regional areas, it may be appropriate to have a larger **outbuilding** or multiple outbuildings, which would not meet **deemed-to-comply**. In these circumstances, the **decision-maker** should be satisfied the proposed outbuilding(s) will be sited and designed to not have a detrimental impact on the **amenity** of the **streetscape** and neighbouring properties.



**Figure G3.8a** Outbuilding as a boundary wall

## 3.9 Universal design

### ▶ INTENT

There is a growing demand for **dwelling**s that incorporate design features for people with limited mobility and ageing in place. **Universal design** dwellings can enable people of all abilities to continue to live in the same home as they age by ensuring that dwellings can change with the needs of occupants. Universal design dwellings benefit all members of the community, including older people, visitors and those with a permanent or temporary disability.

While the **universal design** provisions apply to **grouped** and **multiple dwellings**, designers are encouraged to incorporate the principles of universal design in all **dwellings**.

### DESIGN GUIDANCE

The **deemed-to-comply** standards refers to minimum Silver, Gold and Platinum requirements from the publication, *Livable Housing Design*, prepared by Livable Housing Australia (2017) (<http://www.livablehousingaustralia.org.au/>).

#### 💡 DESIGN TIPS

The following design responses may assist in addressing a design principle(s):

The **design principle** pathway allows the option of **universal design** or **adaptable housing** (or a combination of the two), with the minimum number of **dwellings** to be proportionate to the size of the **development**. The expectation is that the greater the development dwelling yield, the more universal design and/or adaptable dwellings should be provided.

Design solutions for **adaptable housing** that may be acceptable to the **decision-maker** include:

- wider car parking spaces to allow for accessibility
- **universal access** to communal and public areas and
- ability to modify **dwelling** with minimal structural change or loss of **amenity**.

### ASSESSMENT GUIDANCE

More information on **universal design** homes can be found on the Livable Housing Australia website (<http://www.livablehousingaustralia.org.au/>).

**Adaptable housing** is different to **universal design** housing and is specifically designed to allow for the future adaptation of a **dwelling** to accommodate an occupant's changing needs. Refer to *Australian Standard 4299-1995 - Adaptable Housing* for design standards.



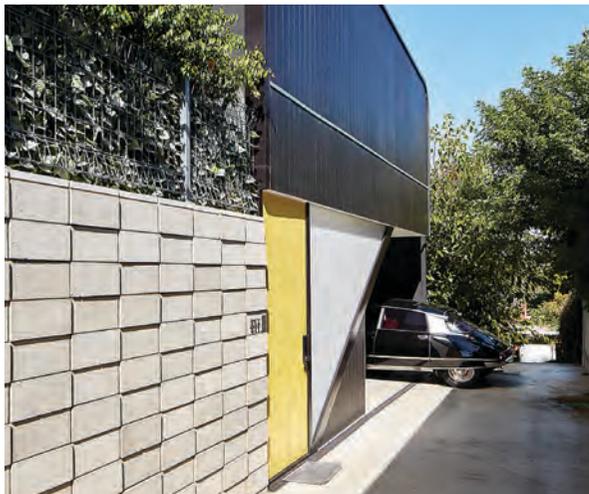
**Photo G3.9a** This development, designed for adaptability and universal access, has a well considered entry sequence with a wide, obstacle free path to the entry

## 3.10 Ancillary dwellings

### ▶ INTENT

An **ancillary dwelling** is an additional small, self-contained **dwelling** on the same **lot** as a **single house** or **multiple dwelling**. Ancillary dwellings have kitchen and bathroom facilities to allow occupants to live either **independently** or **semi-dependently** to the occupants of the main dwelling. They can assist in meeting different housing needs by providing for **dwelling diversity**, **housing affordability** and **ageing in place**.

*All types of **ancillary dwellings** may be provided in association with a **single house** however only a **dual-key dwelling** can be associated with **multiple dwellings**. **Ancillary dwellings** are not permitted on **grouped dwellings**.*



**Photo G3.10a** This ancillary dwelling is built above the garage (Fonzie Flat) and is independently accessed from the laneway (PC)

### DESIGN GUIDANCE

**Ancillary dwellings** may include 'granny flats' developed as separate structures to the main house; 'Fonzie flats' located above a **garage**; and **dual key dwellings** (sometimes referred to as 'dual occupancy') that are integrated into the design of main **dwelling**.

**Ancillary dwellings** should capitalise on the existing **amenity**, with openings, views and direct access to the **primary garden area**, **private open space**, or **communal open space**.

Where rear **laneway** access is available, a 'Fonzie flat' above the **garage** with its own **street** entrance may be a suitable option.

A **dual key dwelling** as part of a **multiple dwelling development** can offer an alternative living arrangement for multi-generational living.

An **ancillary dwelling** may be a self-contained **dwelling**, with the extent of facilities provided being to some extent at the discretion of the landowner. For example, the provision of a laundry would not be essential, however, a separate kitchen and bathroom would typically be provided. Meeting **NCC** requirements must also be considered.

Services also may be shared, with the rental of an **ancillary dwelling** functioning in a similar way to a boarder. Utility providers may, however, have specific requirements for the separate provision of services; for example, separate water, power, sewer, gas and telecommunications.

### ASSESSMENT GUIDANCE

Application plans must clearly identify an **ancillary dwelling** and its relationship to the primary **dwelling** on the **site**.

A **single house** (primary **dwelling**) and **ancillary dwelling** are considered two dwellings on one **lot**. Subdivision (for example, into **strata lots**, **survey-strata lots** or **green title lots**) to contain the ancillary dwelling on a separate lot or **site** from the main dwelling is not permitted under the R-Codes. Subdivision could only occur subject to both dwellings meeting the minimum **site area** requirements and other relevant R-Code provisions applicable to the density code of the lot, with the resultant **development** being regarded as two **grouped dwellings** or two single houses.

Only **dual key dwellings** are permitted for **multiple dwelling developments**. Dual key dwellings may provide shared areas such as a lobby/entry, kitchen and laundry. Similar to the above, a dual key dwelling must be shown on the **strata plan** on the same **strata lot** as the related **dwelling** and cannot be individually strata titled.

There is no restriction limiting occupancy of an **ancillary dwelling** to a family member that is related to the occupants of the primary **dwelling**.

## 3.11 Small dwellings

### › INTENT

One or two-person households now make up more than half of all households in Western Australia (ABS 2016). **Small dwellings** provide an alternative approach to meeting different housing needs, including providing for more affordable options and facilitating 'downsizing' opportunities. To encourage uptake, the Medium Density Code provides a **site area concession for small dwellings**.

*In earlier editions of the R-Codes, provision a **site area** concession was made available to was made for **single bedroom dwellings**. Changing lifestyles and needs has meant that space that could be used for a second bedroom or study is becoming more desirable, and efficient design enables this feature to be included within the same **dwelling floor area**. The removal of the single bedroom limit provides greater flexibility for these homes to provide for the needs of the occupants.*

### DESIGN GUIDANCE

When selecting a suitable **site** and designing a **small dwelling**, consider the following:

- small dwellings should diversify the housing choice available within a given locality and should not be the only or predominant **dwelling** type fronting the same **street** or within the same street block
- small dwellings should be located in areas with good access to public transport, open space, retailing and community facilities
- small dwellings should capitalise on and contribute to existing **local character** and **amenity**, such as views to open space and **streetscape**, and
- small dwellings should include flexible and adaptable spaces

The internal **floor area** limit of 70m<sup>2</sup> allows for a single or two-bedroom **dwelling**.

### ASSESSMENT GUIDANCE

A **small dwelling** can be provided in the form of a **single house** or a **grouped dwelling**.

**Small dwelling** concessions only apply to *Site Category 1 site areas* and areas coded R50 or less, refer to **C1.1.7(i)**.

**Small dwellings** should comply with all elements of the Medium Density Code as they apply to the **dwelling** type (**single house** or **grouped dwelling**).

For **sites** created for **small dwellings**, appropriate measures (such as a notification under section 70A *Transfer of Land Act 1893* registered on the Certificate of Title) to limit **development** of the site to a small dwelling should be considered.



**Photo G3.11a** Small dwellings may provide an opportunity for affordable housing

## 3.12 Aged or dependent persons' dwellings

### ▶ INTENT

**Aged or dependent persons' dwellings** provide a small scale, specialised housing option for Western Australians aged over 55 years that can be integrated into neighbourhoods as an alternative to larger scale retirement villages.

These **developments** should be located in areas that have good access to public transport, retailing, community facilities and open space.

### DESIGN GUIDANCE

The design of **aged or dependent persons' dwellings** must incorporate, or at the very least allow for the future incorporation of features to serve the special needs of aged or dependent persons, such as minimal floor level changes and stairs, ramps, slip resistant floors, and wider doorways and passageways, and handrails in bathrooms and toilets. Certain minimum standards, as set out in the relevant Australian Standards, must be part of the original construction, or can be retrofitted with ease in the future. **Universal design** considerations are also recommended, refer to *Livable Housing Design*, prepared by Livable Housing Australia (2017) (<http://www.livablehousingaustralia.org.au/>).

To prevent the **site area** concessions available to **aged or dependent persons' dwellings** from being misused to increase density for standard housing, aged or dependent persons' dwellings:

- are limited in size to 100m<sup>2</sup> for **single houses** or **grouped dwellings** and 80m<sup>2</sup> for **multiple dwellings**
- must be purpose-designed
- must consist of at least five dwellings in a single **development**, and
- must be subject to a legal agreement to restrict occupancy

The **development** of **aged or dependent persons' dwellings** is otherwise required to comply with all other relevant provisions of the R-Codes.

A **decision-maker** may make a **local planning policy** that reduces the minimum number of **aged or depended persons' dwellings** required in a single **development** where it is determined appropriate to facilitate additional aged or depended persons' dwellings.

### ASSESSMENT GUIDANCE

**Aged or dependent persons' dwelling** concessions only apply to *Site category 1 site areas* and areas coded R50 or less, refer to **C1.1.5(i)**.

**Aged or dependent persons' dwellings** should comply with all elements of the R-Codes applicable to the dwelling type (**single house, grouped or multiple dwelling**).

A notification under section 70A *Transfer of Land Act 1893* should be registered on the Certificate of Title to bind the owner and any successive owners in title to the occupancy restrictions that apply to **aged or dependent persons' dwellings**.

## 3.13 Housing on lots less than 100m<sup>2</sup>

### ▶ INTENT

Housing on **lots** less than 100m<sup>2</sup> provide an affordable option for occupants of smaller households that prefer to live in a **single house**, rather than a **grouped** or **multiple dwelling**.



**Photo G3.13a** An attached terrace house is an efficient built type for lots less than 100m<sup>2</sup>

### DESIGN GUIDANCE

**Local development plans** (LDPs) are required to coordinate **development** on **lots** less than 100m<sup>2</sup>. LDPs should address issues that result from the development of smaller, constrained **sites** and include controls to coordinate development, deliver good **streetscapes** and preserve local **amenity**, such as **building setbacks** and massing, **solar access** and **natural ventilation**, vehicle access, and location of services and bin storage areas.

Refer to *1.1 Site area* of these guidelines for more information on the subdivision component of housing on **lots** less than 100m<sup>2</sup>.

### ASSESSMENT GUIDANCE

**Lots** that are suitable for this type of **development** are identified through the **precinct** or **standard structure plan** process and coded R100.

An approved **local development plan**, consistent with **C1.1.7(v)**, is required as a pre-condition to the **development** of **lots** less than 100m<sup>2</sup>.

Modified **deemed-to-comply** standards applicable to housing on **lots** less than 100m<sup>2</sup> are set out in **Table 3.13a** of **C3.13**.

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# 4.0 NEIGHBOURLINESS

*Occupants live closer to neighbours in medium density housing than they do in lower density development.*

*Well-designed medium density housing can foster social interaction and good neighbourhood amenity.*

*It provides choice of housing that when, well located, benefits residents by providing access to high amenity areas, public transport, employment and community infrastructure.*

*The elements in this section work together to place the building within its neighbourhood context, having regard to the local streetscape and neighbourhood character, resident amenity and community connection.*



## BUILT FORM

- 4.1 Site cover
- 4.2 Building height
- 4.3 Lot boundary setbacks
- 4.4 Site works and retaining walls



*The elements considered within the built form sub-section address the primary controls for development. Site cover, building height and setback controls determine the maximum extent of development on a site. These elements operate together to ensure the building responds well to the site and its context.*

## CHARACTER

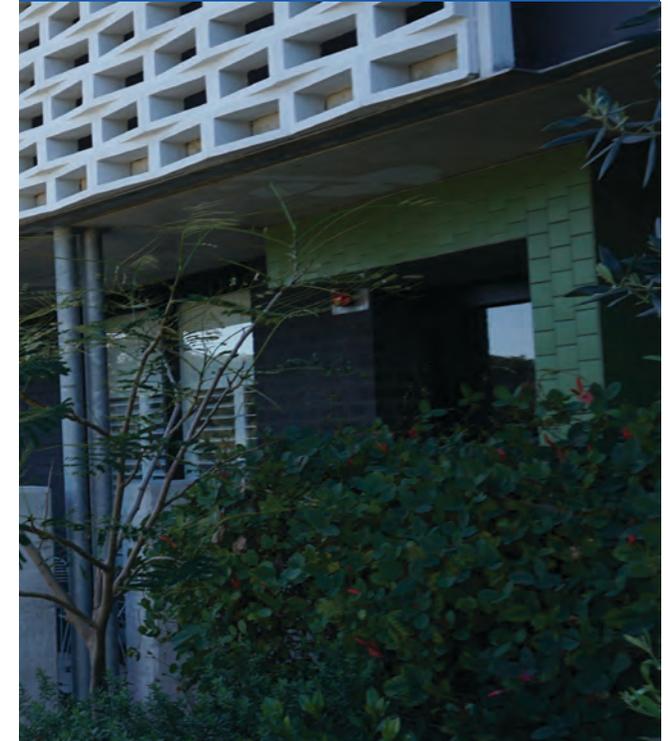
- 4.5 Streetscape
- 4.6 Street setbacks
- 4.7 Vehicle and pedestrian access
- 4.8 Communal streets
- 4.9 Street fences
- 4.10 Retaining existing dwellings



*The elements within the character sub-section establish and control the relationship between the building and the street. This relationship is of critical importance for well-designed places. The cumulative effect of a positive streetscape interface at each site leads to streets, precincts, neighbourhoods, towns and cities that are enjoyable to live in, walk through and visit.*

## COMMUNITY

- 4.11 Solar access for adjoining sites
- 4.12 Visual privacy



*This section is aimed at balancing medium density development with the amenity of adjoining properties, including in relation to solar access and privacy. As density increases in an urban context, it is important these considerations are adequately resolved through well-considered site planning, building layout and design.*

## 4.1 Site cover

### ▶ INTENT

**Site cover** is the extent of **building** that covers a **site**. Limiting site cover allows open space between buildings for **natural ventilation**, **daylight** and **solar access**, as well as space for gardens.

**Site cover** controls should respond to the desired character of the **streetscape** and neighbourhood and inform the bulk and scale of **development**. Maximum **deemed-to-comply** site cover percentages increase with density, leading to more urban **building** forms and streetscapes.

### DESIGN GUIDANCE

The design of a project should ensure the **site cover** proposed for the **development** is compatible with the desired **streetscape** character and achieves adequate space between **buildings** for **natural ventilation**, **solar access**, **landscape** and outdoor use.

Consider opportunities to limit **site cover**, recognising that over the lifecycle of a **development** it is probable site coverage will increase. Strategies include:

- limiting **building** footprints through multi-storey development
- efficient building design and internal layouts, and
- replacing **garages** with **carports** (carports are excluded from site cover calculations)



**Photo G4.1a** This grouped dwelling development with a retained dwelling has carefully managed site cover to create useable outdoor spaces around each house (PC)

### ASSESSMENT GUIDANCE

**Development** should not exceed the maximum **site cover** of **C4.1.1** and **Table B**. This **deemed-to-comply** provision should apply when **grouped dwelling sites**, created from the **parent lot** (e.g. **survey-strata lots**), will be developed separately. This is to ensure the maximum site cover area is not exceeded for each grouped dwelling site created from the parent lot. Calculating the percentage of a development's site cover is achieved by dividing the sum of all areas defined as site cover (as per the definition) by the **site area** and multiplying by 100.

See equation below:

$$\frac{\text{areas defined by site cover}}{\text{site area}} \times 100 = \text{percentage of site cover}$$

Where an application for **grouped dwellings** includes all **sites** within the same **parent lot**, **C4.1.2** provides some flexibility enabling **site cover** to be redistributed between grouped dwelling sites, provided that the total site cover across the combined sites (excluding **common property**) does not exceed the maximum percentage for the applicable density code in **Table B**. This allows flexibility for some sites within a grouped dwelling **development** to have greater site cover than others. Refer to **Table G4.1a** for an example of how this can be applied.

Where an application does not meet the **deemed-to-comply** provisions for **site cover**, a careful assessment of the variation is required. The circumstances where a variation to site cover may be warranted include the need to accommodate a particular **site** constraint or to facilitate a high quality, innovative design response. Generally, any variation should be minimal (not greater than 5 per cent) and **deep soil area** should be maintained (refer to **C2.3.1**).

## 4.1 Site cover (cont.)

**Table G4.1a** Applying site cover provisions

Lot characteristics	Site area calculations					
Coded R40 Parent lot area of 728m <sup>2</sup> 3 survey strata lots  Maximum 55% site cover permitted	<b>Scenario 1</b>		Site area	Site cover area	Site cover %	Meets DTC?
	Separate development applications lodged for 3 grouped dwellings	Dwelling 1	180m <sup>2</sup>	95m <sup>2</sup>	$\frac{95m^2}{180m^2} \times 100 = 53\%$	YES
	Application of C4.1.1	Dwelling 2	210m <sup>2</sup>	120m <sup>2</sup>	$\frac{120m^2}{210m^2} \times 100 = 57\%$	NO
		Dwelling 3	220m <sup>2</sup>	120m <sup>2</sup>	$\frac{120m^2}{220m^2} \times 100 = 55\%$	YES
	<b>Scenario 2</b>		Site area	Site cover area	Site cover %	Meets DTC?
	One development application lodged for 3 grouped dwellings	Dwelling 1	180m <sup>2</sup>	95m <sup>2</sup>	$\frac{95m^2 + 120m^2 + 120m^2}{610m^2} \times 100 = 55\%$	YES
	Application of C4.1.2	Dwelling 2	210m <sup>2</sup>	120m <sup>2</sup>		
		Dwelling 3	220m <sup>2</sup>	120m <sup>2</sup>		
		Common property	118m <sup>2</sup>			
		Parent lot	728m <sup>2</sup>			
	Parent lot less common property	610m <sup>2</sup>				

## 4.2 Building height

### ▶ INTENT

The height of medium density **development** should be appropriate to the intended **streetscape** and neighbourhood character and be responsive to topography.

**Building height** should also be used to define **street** edges and the proportions of streets and public spaces. It should also have regard to the visual and physical **amenity** of the public and private realms, with consideration to the potential for overlooking and overshadowing.

*Earlier editions of the R-Codes measured **building height** in metres rather than **storeys**. However, this can result in attempts to include additional storeys within the overall height limit which compromises the appearance and the **amenity** of a **building**. To address this, building height is now measured in both metres and storeys. By measuring in storeys, it allows more flexibility for designers and encourages generous floor to ceiling heights for improved internal amenity. The maximum height per storey in metres (**Table 4.2a**) provides certainty for community and clarity for assessors.*

### DESIGN GUIDANCE

Consider orientation, prevailing breezes, views and outlook when determining the height of a **building**, including the potential impact on **adjacent properties** in terms of **solar access** and visual privacy.

Where **development** is proposed for a sloping **site**, consider stepping the **building height** along the slope (refer **Figure G4.2a**).

For **development** of three or more **storeys**, consider increasing the **lot boundary setbacks** for the upper level to reduce the impact of **building** bulk on **adjoining properties**.

For **corner lots**, placing the highest **building** elements towards the **street** corner can create a defining edge to the street and result in less impact for the **amenity** of **adjoining properties**.

### ASSESSMENT GUIDANCE

**Development** should comply with the **building height** limits (expressed in **storeys**) set out in **Table B**, except where modified by the **local planning framework**, in which case development is to comply with minimum and/or maximum building height limits set out in the applicable local planning instrument.

The maximum **building height** per **storey** is the sum of the **wall** and **roof height** (refer **Table 4.2a**), and varies according to the following roof types:

- concealed, gable or skillion roof – these roof types typically locate their highest point towards the **lot boundary**, or
- pitched or hipped roof – these roof types typically locate their highest point towards the centre of the **building**, hence why more **building height** allowance is provided for these roof types

Where a roof type does not conform exactly with a nominated type, the **decision-maker** should determine the most appropriate roof type for assessment of that **development**.

## 4.2 Building height (cont.)

### DESIGN TIPS

The following design responses may assist in addressing a design principle(s):

Increasing maximum **building heights** may be acceptable in locations where there the proposed **development** would not unreasonably impact on the **amenity** of **adjoining properties** and **streetscape** character. This may include the following circumstances:

- larger **development sites** where taller **buildings** can be **setback** sufficiently from adjoining properties
- development sites that do not abut residential properties
- to enable an innovative and creative design response to a **site**
- where the development would provide an appropriate transition in scale from existing or planned high-rise development
- where the development would contribute to a unifying streetscape character, and/or
- where the development is compatible with a steeply sloping site

### Measuring building height

The calculation of **wall height** and total **building height** is to be measured as the vertical distance from **natural ground level** to the highest point at any part of the **building**.

Once maximum **wall** or **building height** (for the applicable roof type) for a nominated **storey** is exceeded, the excess height is to be counted as an additional storey for the purpose of calculating **lot boundary setbacks**.

On a sloping **site**, a **development** may have a **building** form that is “stepped”, with separate **storeys** stepping up with the slope of the land. This will be acceptable provided the development does not exceed the maximum **height** in **Table B** at any point along the slope. To determine building height on sloping sites, the height of a building is taken as the highest point of the development immediately above **natural ground level** (refer **Figure G4.2a** of the Medium Density Code).

Where the slope of the **site** is not uniform, the natural contours should be interpolated so as to modify or smooth out any anomalies in order to establish the deemed **natural ground level** (refer **Figure 4.2a** of the Medium Density Code).

**Minor projections** and plant equipment (including overruns) for lifts are excluded from the measurement of **building height**.

**Habitable rooms** within a roof space are not counted as an additional **storey**, provided the total **building height** does not exceed **Table 4.2a**.

Unroofed rooftop **terraces** are not counted as a **storey**, however provisions such as maximum **wall height**, **lot boundary setbacks** and visual privacy apply. Where the rooftop terraces propose a roofed structure including canopies or **pergolas**, a **design principle** pathway should consider **amenity** impact (for example visual, overshadowing) of the structure on neighbouring properties and the **streetscape**.

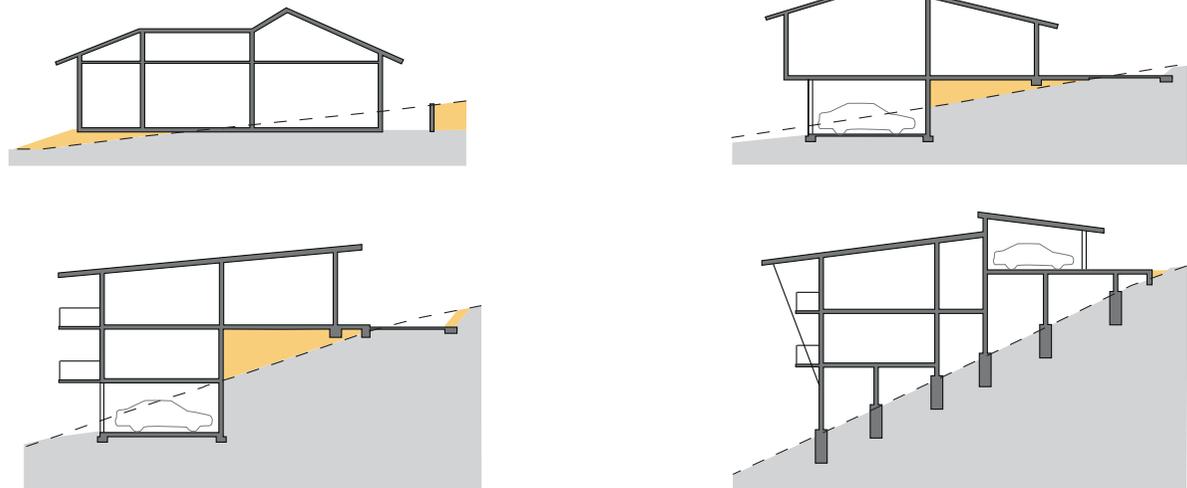


Figure G4.2a Building height for sloping sites

## 4.3 Lot boundary setbacks

### ► INTENT

**Lot boundary setbacks** govern the extent of the **building** footprint and are scaled according to **building height** to address perceptions of bulk and scale. Lot boundary setbacks are important for maintaining separation between buildings for **solar access** and **natural ventilation**, and for managing **amenity**, including overshadowing and the visual privacy of neighbouring properties. They are also important for moderating the visual impact of building bulk on a neighbouring property, creating usable outdoor space and preserving **deep soil areas** for trees, **landscape** and outdoor use.

Smaller **lot boundary setbacks** are typical for medium and high-density urban contexts, compared to larger setbacks in suburban contexts.

#### DESIGN TIPS

The following design responses may assist in addressing a design principle(s):

It may be appropriate to vary **lot boundary setbacks** and **boundary wall** provisions where the **development site** abuts non-residential land.

Reduction in **setbacks** may be necessary due to an irregular shaped **lot**, topography, or the nature of the proposed **development**. In such instances the **decision-maker** should have regard to the **amenity** of **adjoining properties**, including potential impact on existing trees, overshadowing and visual privacy.

### DESIGN GUIDANCE

Informed by **site** and context analysis, position and size **setbacks** to ensure adequate **daylight**, **solar access** and **natural ventilation** for **primary living spaces** and **active habitable spaces** within **developments** and on **adjoining properties**.

Consider **boundary walls** (where appropriate) to maximise **site** efficiency and free up useable outdoor spaces for gardens and recreation.

**Boundary walls** should be co-located with and match the alignment of existing boundary walls where possible to minimise the impact of overshadowing, visual privacy and to coordinate **building frontages** to **streetscapes**.

Consider deeper **setbacks** where required to retain trees within the **site** or to accommodate the **root protection area** of trees on **adjoining properties**.

Single storey **setbacks** are not usually problematic in terms of impact on **adjoining properties**.

### ASSESSMENT GUIDANCE

#### Lot boundary setbacks (P4.3.1 to P4.3.3; C4.3.1 to C4.3.4)

A reduction to the **deemed-to-comply setback** requirements should only be considered where it can be demonstrated this is preferable for practical or aesthetic reasons, and will not be to the detriment of the **amenity** of **adjoining properties**, particularly where the reduced **setback** may result in increased overshadowing, overlooking or lack of privacy. In these situations, the **building** design would need to address the **design principles** of this section.

**C4.3.2i**, enables structures including **carports**, **verandahs** and **patios** to be built to the **lot boundary** behind the **street setback line**, however it should be noted that **NCC** provisions apply.

**C4.3.4** ensures adequate separation is achieved between **dwellings** on the same **lot**.

#### Boundary Walls (P4.3.4; C4.3.5 to C4.3.9)

*Boundary Wall Types B and C* (**Table 4.3a**) have been included in the **deemed-to-comply** to accommodate **development** of two or more terrace type **dwellings**.

- *Boundary Wall Type B* allows for a two-storey **boundary wall** that is shared with an **adjoining property** outside the proposed development/plan of subdivision, provided that the subject **site** and adjoining site/s are created on a plan of subdivision submitted concurrently with the development application. The intent of this provision is to allow for terrace **building** types to be built through the deemed-to-comply provision. *Boundary Wall Type B* is limited to a maximum of 9m in length to minimise the impact on neighbouring **amenity**.
- *Boundary Wall Type C* allows for the highest boundary wall. It is only to be located on a **lot** boundary internal to the development so as to not impact on **adjoining properties** outside the proposed development/plan of subdivision.
- *Boundary Wall Type B and C* are only deemed-to-comply where overshadowing does not exceed the limits of **C4.11.1** to **C4.11.3**.

**Boundary walls** for **deemed-to-comply outbuildings** (in accordance with **C3.8.1**) are not included in the calculation of the total boundary wall lengths.

Where a **wall** is built on the boundary and does not abut an existing **boundary wall**, the surface of the wall facing a neighbouring property should be finished to the satisfaction of the **decision-maker**.

## 4.4 Site works and retaining walls

### ▶ INTENT

**Development** of sloping **sites** should respond to the natural topography and aim to minimise the amount of cut and fill required. This is because extensive earthworks remove vegetation, disturbs the soil profile and affects local character.



**Photo G4.4a** This row house development steps down with the slope of the site

### DESIGN GUIDANCE

**Development** of land should be designed to correspond with topography. Where this cannot be achieved, the result is often retaining **walls** that are visually prominent. Where retaining is unavoidable, the design of the walls should seek to minimise their height and length through terracing and articulation. Materials should be selected for walls that complement and can integrate with the surrounding **landscape**.

Significant filling above **natural ground level** can be visually prominent. Where it is necessary, consideration should be given to potential privacy and overshadowing issues.

Because much of the State's housing was built before accurate contour mapping was available, it may not be possible to know precisely the **natural ground level** that preceded **development**. In these cases, it may be necessary to refer to other evidence in order to establish as closely as possible the relevant natural ground levels.

Excavation rarely affects **adjoining properties** and may be beneficial to the **development** outcome, including allowing for undercroft / **basement** parking and **storage** areas. When excavation is proposed, it is necessary to address engineering requirements and account for essential services, particularly where protected by a registered easement.

### ASSESSMENT GUIDANCE

The height of retaining **walls**, excavation and fill are to be measured directly from the **natural ground level** (above or below).

Visual privacy provisions under element 4.12 *Visual Privacy* should be applied for fill and retaining **walls** greater than 0.5m above **natural ground level**.

Housing design which proposes extensive excavation, fill and re-contouring of a **site** without regard to neighbouring properties and their **amenity**, should not be supported.

Retaining **walls** that are provided as part of an approved subdivision or that formed part of a previous **dwelling** which established levels, are for the purposes of the Medium Density Code, to be regarded as representing the finished level of the **site** prior to new **development**.

## 4.5 Streetscape

### ▶ INTENT

A well-considered interface between **buildings** and the **street** ensures a successful transition from public to private space; and contributes to the **sense of place** and character of the street. Attractive and pedestrian-friendly street **frontages** incorporate well-considered arrangements of planting, fencing, **screening** and **site** entries.



**Photo G4.5a** Retained trees and visually permeable fencing contribute to attractive streetscapes

### DESIGN GUIDANCE

**Building** elevations fronting the **street** should be of a human scale and proportionate to the **streetscape**. This can be achieved by using the following design solutions:

- well composed horizontal and vertical elements
- variations in floor heights to enhance the human scale and
- design elements that are proportional and arranged in patterns.

Where **development** adjoins public parks, open space or bushland, the **dwelling** should positively address this interface. Potential design solutions that can be considered in consultation with the **decision-maker** include:

- pedestrian paths connecting the dwelling to the open space and clearly defined **building** entries
- low fences and planting that clearly delineate between **communal** and **private open space** and the adjoining public open space, or
- minimising the use of blank **walls**, solid fences and ground level parking

**Building** entries should be readily identifiable and accessible. Where there are multiple buildings and/or entries architectural detailing, materials, colours and **landscape** treatments can be used to differentiate **dwellings** and improve legibility for occupants and visitors.

Blank **walls** facing the **street frontage** should be avoided where possible. Blank walls can be broken up with entries, open screens, fencing, **landscaping** and other elements that provide visual interest when viewed from the street.

Raising the ground floor height of a **dwelling** by 0.5m to 1m from **natural ground level** at the **street boundary** can provide an appropriate balance between **passive surveillance** to the **street** and privacy for occupants.

Incorporating **verandahs**, **porches** and **balconies** in the **street setback area** can provide residents with **passive surveillance** and interaction opportunities with the wider community.

The integration of and access to **essential services utilities** such as power and water meters and **fire service infrastructure** requires careful consideration in the **building** design. Consult early with relevant authorities to resolve functional requirements through an integrated design solution. Refer to element 3.7 *Services, utilities and fixtures* for more information.

For **sites** that have more than one **street frontage**, it is important to address the **secondary street** through the built form and **landscaping**.

Consider single or tandem **garages** and **carports** instead of double garages, as they have less of a visual impact on the **streetscape**.

Recessing **garages** behind the **dwelling alignment** reduces the visual dominance of the garage and may also provide additional parking spaces between the garage and **street boundary**.

Where a **right-of-way** is proposed to be the **primary street frontage**, the **street setback area** should be treated in the same way as a primary **street setback** including provision of **landscaping** and clearly identifiable entries.

### ASSESSMENT GUIDANCE

**Unenclosed patios**, **porches** and **verandahs** designed in accordance with **C4.5.3**, are not included within the **site cover** calculations (refer to element 4.1 *Site cover*).

For **multiple dwellings**, it may not be possible for all **dwellings** to address the **street**, however, all dwellings which front the street are to address the street. Where **private open space** areas of ground floor **apartments** front the street, privacy can be achieved while maintaining a street presence. Refer element 4.9 *Street fences*.

**Table 4.5a** requires **garages** that face the **primary street** to not exceed the designated percentage of the **building width**, being the width of the **building** as view from the primary street.

## 4.6 Street setbacks

### ▶ INTENT

Consistent **street setbacks** establish a consistent **streetscape** and provide space for trees and other **landscaping**. As residential densities increase, street setbacks typically reduce to reinforce an urban condition.

The purpose of **street setbacks** (in accordance with **Table A**) is to:

- enable a clear view between the **dwelling** and the **street**
- provide a transition between the public and private realm
- provide an area for **landscaping**, and
- promote a consistent and harmonious **streetscape** reflective of the urban intensity

In the case of new residential areas, the desirable **street setback** may be fixed as part of **structure plan(s)** or **local development plan(s)**.

For established residential areas with valued **streetscapes**, there is often a consistent pattern of **street setbacks**. New **development** should respond to the established pattern. Where the pattern varies, a **setback** mid-way between that of the **buildings** on either side may be appropriate.

- In areas undergoing transition from low to medium density, **street setbacks** should respond to the intended future character of the **street**.

In established areas, the **decision-maker** may stipulate **setbacks** for a particular area in the **local planning framework**. The R-Codes **street setback** requirements apply in all other cases.

### DESIGN GUIDANCE

Whilst **Table B** provides a minimum **street setback line** with no averaging requirement, designers should aim to avoid blank and/or flat facades through the incorporation of:

- **verandahs, porches** and **balconies**
- **building** articulation, and
- entries and windows

**Carports, patio, porches, verandahs** and **balconies** built forward of the **street setback line** should be designed and built from materials compatible with the **dwelling**.

### ASSESSMENT GUIDANCE

Refer to **Figure G4.6a** for annotation of **street setback**, **street setback area** and **street setback line**. The actual street setback of a **dwelling** may be deeper than the street setback line prescribed in **Table B** of the Medium Density Code.

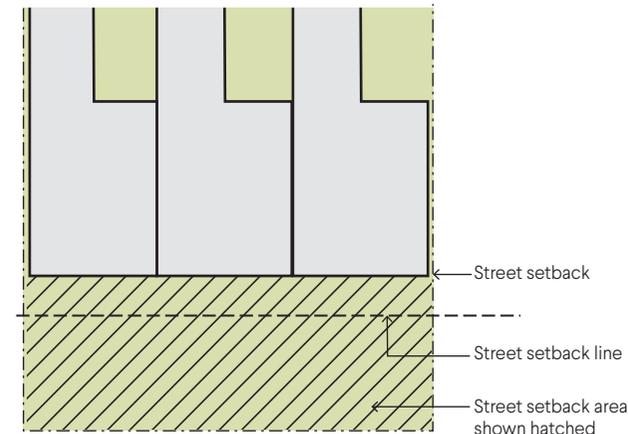
Where a **street setback** greater than 1.5m is required, the area can be included as **deep soil area** and be used for required tree planting and associated **root protection areas** (refer to **Tables 2.3a, 2.3b** and **2.3c** of Medium Density Code)

#### Setback of garages and carports (P4.6.3; C4.6.2, C4.6.5)

The **setback** of **garages** in areas coded R30 and R35 is designed to enable a vehicle to park in the **driveway** in front of the garage without overhanging the verge or obstructing an adjacent footpath (refer **C4.6.2**). Other than the garage, the rest of the **dwelling** should be set back in accordance with **Table B**.

The **setback** of **garages** in areas coded R40 and above is in accordance with the minimum **street setback** requirements of **Table B**.

The **street setback area** should generally be open and free from structures that obstruct views and **passive surveillance** of the **street**. However, **carports** may be acceptable in the **street setback** (refer **C4.6.5**) as they allow a clear view between a public street and a private **dwelling**.



**Figure G4.6a** Street setbacks, street setback areas and street setback lines

### 💡 DESIGN TIPS

The following design responses may assist in addressing a design principle(s):

**Buildings** forward of the **setback** may be appropriate where consistent with **adjoining properties** and the **streetscape**, or where necessary to retain an existing tree.

## 4.7 Vehicle and pedestrian access

### ▶ INTENT

Vehicle and pedestrian access connects the **street**, parking areas and the **development**.

Design of vehicle access points should balance the requirement for safe and efficient vehicle access with the needs of pedestrians, cyclists and other road users, and minimise the impact on the **streetscape**.

*Car parking spaces, manoeuvring areas and access ways are potentially intrusive - physically, visually and acoustically. This is particularly evident for **grouped and multiple dwelling developments** where multiple parking spaces and access are required. Vehicle access and parking consume space and do not generally make a positive contribution to the **streetscape**. Consequently, location and materials of vehicle access and car parking areas are major factors in **amenity** as well as security and safety.*



**Photo G4.7a** This shared driveway space has been designed and constructed to be fully permeable, and includes planted areas and a gravel surface

### DESIGN GUIDANCE

Consider design solutions to minimise the visual impact of vehicle entries and circulation areas within the **site**, while allowing for appropriate **sightlines** and safety considerations, such as:

- locating and designing vehicle entries to minimise the number and length of **driveways**
- where required, incorporating aesthetically pleasing and effective traffic calming devices that are integrated into the design, such as changes in paving material or textures
- minimising the visual impact of unavoidable long driveways through changing alignments and screen planting, and
- minimising the interruption to the verge by pairing vehicle access points (refer **Figure G4.7a**)

Where a separate pedestrian access is required (refer **C4.8.4**), consider using **landscape**, level changes and varied trafficable finishes, materials or patterns to clearly delineate from vehicle access.

Hardscaping across the **site** should be minimised and areas of **landscaping** maximised. The following strategies to reduce hardscaping are strongly encouraged:

- the use of strip paving or **permeable paving** in **driveways**
- using impermeable paving for the minimum area required for driveways, vehicle parking, circulation areas, and pedestrian access, and
- creating paths within garden beds from stepping stones

Minimising the number of vehicle access points along the **street** provides more opportunity for on-street parking and the retention or improvement of the **streetscape** character.

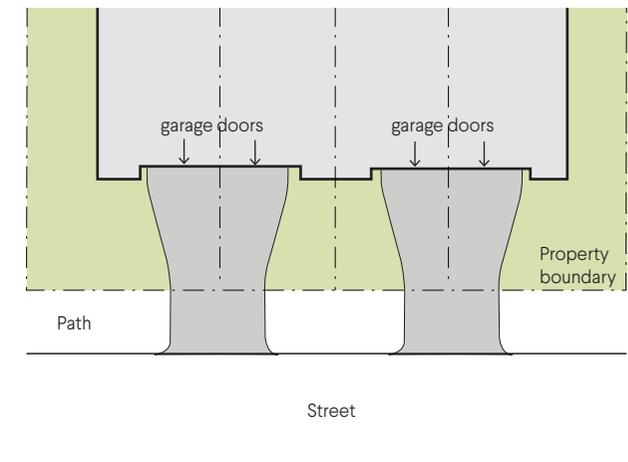
**Driveways** must maintain adequate **sightlines** where they intersect **streets, rights-of-way** and footpaths to ensure visibility and safety. Sightlines must be kept clear from obstructions – including fences, **walls, landscape** features and vegetation.

### ASSESSMENT GUIDANCE

**Driveways** can be provided as strip paving or **permeable paving** for vehicle access and manoeuvring areas.

For **corner lots** where the lowest hierarchy **street** is undefined, the **decision-maker** should determine which street **frontage** is most appropriate for vehicular access to the proposed **development**.

A **driveway** width of 3m is adequate for driveways serving four **dwellings** or less. **C4.7.3**, requiring driveways for **grouped and multiple dwellings** to be 6m wide at the **street boundary** (this may be reduce within the **site**), is included to ensure a vehicle can safely enter the **development** off a primary distributor or integrator arterial at the same time a vehicle is exiting the site. In some cases, a verge may not be sufficient depth to accommodate this and the driveway may need to be widened beyond the street boundary (refer **Figure 4.7d** of the Medium Density Code).



**Figure G4.7a** Pairing of vehicle access points

## 4.8 Communal streets

### ▶ INTENT

The **communal street** is a shared use, **landscaped** area designed to balance the movement and access needs of pedestrians, cyclists and vehicle, and limit the extensive paved **impervious surfaces**.

*Communal streets are created as part of a **grouped** or **multiple dwelling development**. They are in private ownership common to a number of **dwellings**, whose owners are also responsible for maintenance.*

### DESIGN GUIDANCE

As a semi-public space, **communal streets** share some of the characteristics of public **streetscapes** including the need to address visibility, security and privacy. They should be designed to provide clear demarcation between private and communal space and to create a consistent, attractive streetscape through appropriate use of **landscape** and pavement treatments.

**Communal streets** should be clear and legible, and designed to prioritise pedestrian and cyclist movement using different surface treatments to manage shared space.

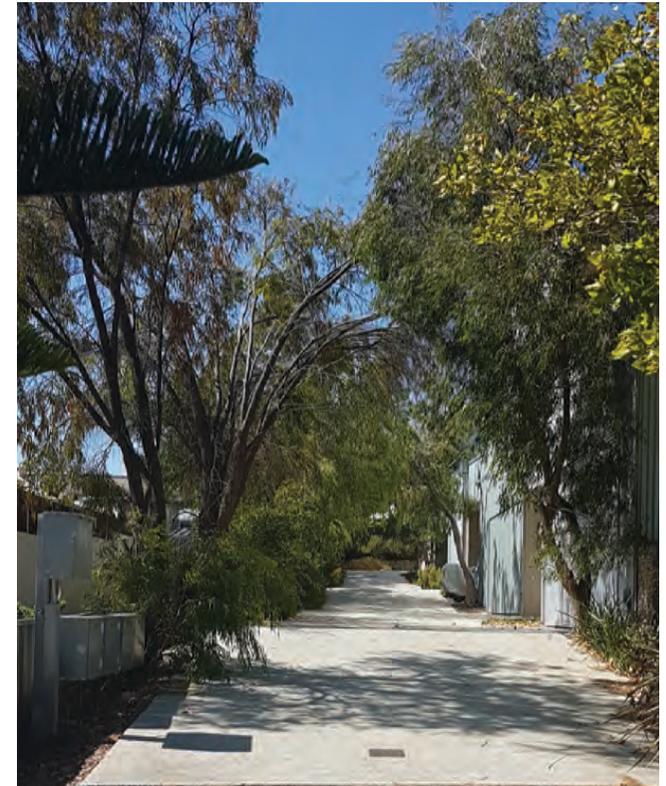
**Dwellings** should front the **communal streets** (where this is the principal **frontage**), in the same way they would address a public **street**.

For larger **development sites** or where existing block patterns are deep, **site** accessibility may be best served by introducing a network of new **communal streets** and **laneways**, rather than a continuous, long **street**.

Trafficable, semi-permeable, **permeable surfaces** or strip paving within **communal streets** are strongly encouraged.

### ASSESSMENT GUIDANCE

The **landscape** plan should incorporate the **communal street** and show details such as lighting, pavement treatments and planting areas, including **deep soil areas** for tree planting where proposed.



**Photo G4.8a** Incorporating landscaping contributes to attractive communal streets and outlook for residents, as well as provides environmental benefits

## 4.9 Street fences

### ▶ INTENT

**Street fences** delineate the private realm from the public realm, and contribute to **streetscape** character. They can frame gardens within the **street setback area** and assist with noise mitigation where the **dwelling** is located adjacent to busy transport corridors.

*The term **street fences** includes lightweight structures as well as masonry **walls** used to delineate between public and private realm located in the **street setback area**.*

### DESIGN GUIDANCE

All **street** fencing should be designed to balance the need for privacy and security with the promotion of strong community connection and **streetscape amenity**. This can be achieved through use of low **walls**, **visually permeable** materials and limiting the extent of walling/fencing.

Consider the incorporation of low fencing and **walls** (less than 900mm) along the **street boundary** to clearly demarcate public and private space. Ideally low walls should be integrated with **landscape** and letterbox design.

When the optimum location for the **primary garden area** and/or **private open space** is in the **street setback area**, **screening** with **landscaping** and/or **walling/** fencing that provides a balance of **visual permeability** and visual privacy is appropriate.

For **climate zones** 1 and 3, permeable fencing should be used for **street fences/walls** for **natural ventilation**.

Where non-permeable fencing to the height of 1.8m is necessary to attenuate traffic noise or headlight glare, anti-graffiti material or paint coating should be considered.

### ASSESSMENT GUIDANCE

Where **street** fencing incorporates a retaining **wall**, the height of a retaining wall (measured from **natural ground level**) is to be included in the calculation of the total wall/fence height.

A **street** fence, including all footings, is to be located wholly within the **lot boundaries**.



**Photo G4.9a** The fencing to this development is a mix of visually permeable and solid sections that achieve reasonable privacy to the ground floor whilst maintaining a degree of openness and visual connection to the street

## 4.10 Retaining existing dwellings

### ▶ INTENT

Retaining an existing **dwelling** can support housing diversity and reduce the embodied energy and waste impact associated with demolition and new construction. It may also help to maintain an established **streetscape** and **local character**, depending on the location and condition of the dwelling on the **lot**.

### DESIGN GUIDANCE

An existing **dwelling** is considered suitable to be retained if it:

- contributes to desired **streetscape** and **local character**
- is of a quality (both design and structural) that warrants its retention and/or upgrade
- is sited on a **lot** that facilitates its integration into the broader **development**, and
- supports housing diversity

Retaining an existing **dwelling** on a **development site** can be achieved through well-considered site and project planning.

### ASSESSMENT GUIDANCE

Upgrading the appearance of the existing **dwelling** can be required through a condition of **development** approval. **Decision-makers** may prepare a **local planning policy** to provide guidance on acceptable upgrade standards.

**C4.10.1** does not apply where the existing **dwelling** is to be retained as a **single house** (either **green title, strata** or **survey-strata** without **common property**) as there is no ability to require upgrading to a retained dwelling that is contained on a separate title (and potentially in different ownership) to that of the remainder of the **development**.

## 4.11 Solar access for adjoining sites

### ► INTENT

Siting and design of **dwelling**s should respond to climatic conditions and have regard to resident **amenity** both within the **development** and **adjoining properties**.

### DESIGN GUIDANCE

**Development** should be designed so that it does not seriously affect **solar access** for neighbours, in particular:

- north facing openings to **primary living spaces**, within 15 degrees of north in either direction
- outdoor **active habitable spaces** and
- roof mounted **solar collectors**.

As with overlooking, but even more so, the potential for a **building** to overshadow a neighbouring **site**, or be overshadowed itself, varies enormously from case to case. The variables include:

- the density of **development**
- the height of buildings, existing and proposed
- the position of buildings, existing and proposed, in relation to **lot boundaries**
- the orientation of the **development site** and its neighbours, that is, the relative position of the sun
- the relevant dimensions and shape of the development site and of affected neighbouring sites, and
- the degree and orientation of slope of the land

Early design analysis should be undertaken to optimise the orientation of the **buildings** on a **site** to achieve the objectives and provisions of the policy as they apply to **solar access**.

**Sites** that are most vulnerable to overshadowing are narrow east-west orientated sites, on the south side of a **development site**, especially if they are also lower or on a south facing slope. In such cases, even a relatively low **building** may cast mid-winter shadow over a greater proportion of the site than allowed under **deemed-to-comply** provisions.

In some instances, such a **lot** may abut two or more properties to the north, and would be subject to overshadowing by two or more properties. The **deemed-to-comply** provisions of the Medium Density Code therefore reduce the amount that some **lots** can overshadow proportionate to the **lot boundary** they share (refer **Figure 4.11c** of the Medium Density Code).

The Medium Density Code also provides **deemed-to-comply** provisions for diagonally-adjacent **lots**, recognising that at certain lot orientations, both the **adjoining property** and the diagonally-adjacent lot may be impacted by overshadowing (refer **Figure 4.11b** of the Medium Density Code).

In **climate zones** 4, 5 and 6, the siting and design of a **development** should aim to limit overshadowing of **adjoining properties**, particularly spaces used predominantly during the day (i.e. **primary living space** and outdoor **active habitable space**). Strategies can include:

- where possible, orientating and focusing **building height** so that it overshadows blank **walls**, car parking areas, **driveways** and roofs
- increasing **setbacks** of upper levels, and
- breaking up **building mass** and orientating development perpendicular to the adjoining **lot boundary**

In all **climate zones**, **development** should avoid overshadowing **solar collectors** within the development and on **adjoining properties**.

## 4.11 Solar access for adjoining sites (cont.)

### DESIGN TIPS

The following design responses may assist in addressing a design principle(s):

Due to lot orientation, it may be necessary in some cases to exceed the overshadowing limits of **Table 4.11a**. In such cases, careful consideration should be given to the types of spaces being overshadowed when judging merit and applying **design principles**. **Solar access** should be prioritised for spaces on **adjoining properties** that are likely to be used most frequently during the day, such as **primary living spaces** and outdoor **active habitable spaces**.

### ASSESSMENT GUIDANCE

The assessment of the shadow cast by a **building** at midday 21 June is and shown in in **Figure 4.11a** (of the Medium Density Code). The methodology for determining the shadow cast can be found in the *Sunshine and Shade Australasia*, Phillips, R.O., Commonwealth Scientific and Industrial Research Organisation (Australia), Division of Building Construction and Engineering, Canberra, ACT 1992. Reference should be made to the specific tables in this document.

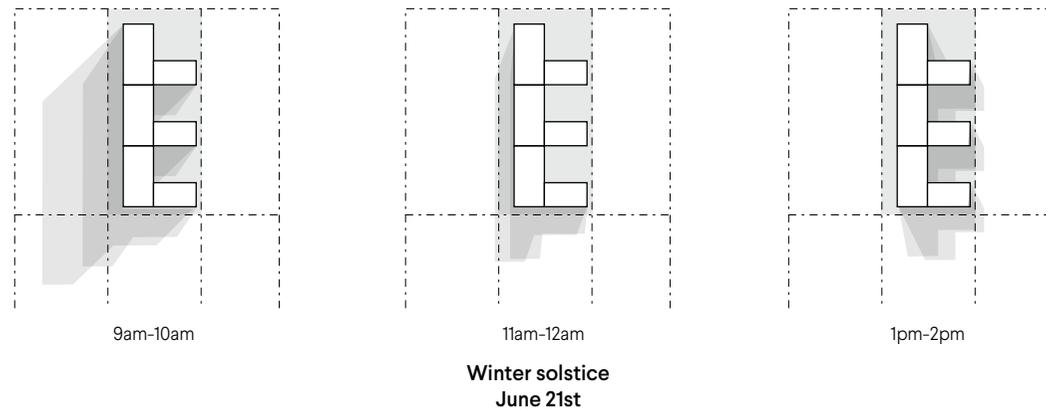
In general terms, shadow cast at midday 21 June is calculated by:

- selecting the vertical sun angle from the following chart that lists the major urban centres from Albany to Wyndham, and
- transposing the length of shadow on to the **site** plan, taking care to correctly orientate the **building** and allow for the slope of the land (refer **Figure 4.11b** of the Medium Density Code)

Drafting software also provides capabilities for demonstrating **solar access** to adjoining **sites** in accordance with the requirements of this element (refer **Figure G4.11**). There are benefits in using this software such as accuracy and convenience, particularly in calculating shadow cast for multiple times across the day.

**Table G4.11a** Vertical sun angles by latitude

City/Town	Latitude (S)	Vertical Sun Angle
Albany	35	31
Esperance	34	32
Bunbury	33	33
Perth	32	34
Kalgoorlie	31	35
Geraldton	28	38
Carnarvon	25	42
Karratha	21	45
Port Hedland	20	47
Broome	18	49
Wyndham	15	52



**Figure G4.11a** Software can assist when calculating overshadowing

## 4.12 Visual privacy

### ► INTENT

New **development** needs to balance the need and desire for outlook, **solar access** and **natural ventilation** from **major openings** with an appropriate level of visual privacy to the main living spaces of adjoining **dwellings**.

*Overlooking from areas on or close to **natural ground level** is not subject to control in terms of element 4.12. This applies equally to all outdoor spaces and **habitable rooms** which are less than 0.5m above natural ground level. The basis for this is that the view from such areas can be readily limited by a standard 1.8m high boundary fence, and while this may not restrict the **line of sight** in an upward direction, the impact of overlooking **major openings** to habitable rooms or **private open space** situated above natural ground level would be limited*



**Photo G4.12a** The upper level windows on this apartment have been oriented toward the communal space to help address visual privacy

### DESIGN GUIDANCE

**Setbacks** alone cannot achieve absolute visual privacy because the setback distances required to achieve this are much greater than those that can feasibly be provided in an urban area. A sufficient level of privacy must be reached by good design to satisfy reasonable concerns. It is not the intent of the Medium Density Code to require 100 per cent privacy at the expense of **building** orientation, access to **daylight**, winter sun, **natural ventilation** or poor relationship to neighbours.

Privacy **setbacks** should be accompanied by thoughtful design solutions, including the orientation, placement and design of openings to limit overlooking. **Screening** of openings may also be required but should be used carefully, as screens for privacy can create dark, constrained internal spaces that compromise resident **amenity**.

Overlooking from bedrooms, studies and other rooms that are used less frequently or mainly at night, without noise, and by relatively few people, can be tolerated more than overlooking from active areas. Of most importance for design is limiting overlooking from frequently used spaces including **active habitable spaces**, for example, living rooms, kitchens, activity rooms, **balconies** and **private open space** with a floor level 0.5m or more above **natural ground level**.

Recording the location of existing **major openings** and **active habitable spaces** on **adjoining properties** during the **site** analysis phase will assist in planning for appropriate levels of visual privacy.

Documented below are different approaches that may be appropriate to address visual privacy objectives and requirements.

#### Offsetting major openings

Opposite facing windows may be offset to limit overlooking. The distance between the edge of one window and the edge of other should be sufficient to limit the **line of sight** into adjacent windows.

When offsetting windows to interrupt the **line of sight** on upper levels, it is important to ensure that any overlooking of ground floor **major openings** and **active habitable spaces** in the **cone of vision** are also addressed.

#### Location and/or orientation of sources of overlooking

Where possible, **major openings** to **habitable rooms** and outdoor **active habitable space** should direct outlook away from other **dwellings**. Orienting windows away from the **lot boundary** can interrupt the **line of sight** while still providing **solar access** and **natural ventilation** for the **development** (refer **Figure G4.12a**).

#### Vertical or horizontal building elements, planter box or fins

The use of window hoods, vertical or horizontal fins, permanent planter boxes, wide bay windows and fixed angle louvres can minimise downward or side angle overlooking of **adjoining properties** while maintaining a clear outlook for occupants. These **screening** methods can restrict the **line of sight** in certain directions. The dimensions and positioning of screening will depend on the size and location of adjoining **major openings** or **active habitable space**, and the angle of the line of sight (refer **Figure G4.12b**).

Planter boxes incorporated into the design of **walls** and **balcony** balustrades can effectively limit the **line of sight** to lower levels of an **adjoining property**, while providing an opportunity for additional **landscaping** (refer **Figure G4.12c**).

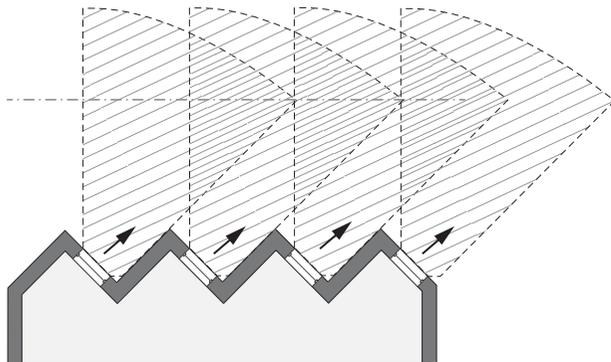
## 4.12 Visual privacy (cont.)

### Screening

Where **screening** is proposed, it should be permanent, integrated with the **building** design and have minimal impact on residents' or neighbours' **amenity**. Screening devices do not always need to cover the entire window and should be made from durable materials.

Excessive visual privacy **screening** is strongly discouraged as it can result in negative impacts such as reduced outlook, **solar access**, **natural ventilation** and internal **amenity**.

**Screening** may be perforated to some degree to allow the circulation of air, provided that it meets the objective of protecting visual privacy. In the absence of a prescriptive standard for partial screening, such proposals generally should be assessed against the **design principles** and in consultation with any potentially affected property owners. As a guide it is recommended that perforations should not constitute more than about 20 per cent of the total surface area. However, it also is important that the size of individual gaps do not compromise the visual privacy of **adjoining properties**, and a maximum 50mm visual gap is suggested as reasonable.



**Figure G4.12a** Window placement to avoid direct overlooking

In the case of lattice **screening**, 50mm slats, spaced at 50mm, would be appropriate. Where fixed louvres are used, either for vertical or horizontal screening, the spacing required to achieve acceptable screening will depend on the view angle and width of the louvre blades (refer **Figure G4.12d**).

Louvres intended for **screening** must be fixed or have a physical and permanent limitation on opening, to ensure the level of **visual permeability** does not exceed the specified standard. Such standards may be subject to a discretionary variation taking into consideration any comment and/or agreement from the relevant **adjoining property** owner.

### Obscure glazing

Obscure glazing can be used to limit the **line of sight** while maintaining a level of **solar access** into rooms, and when openable, **natural ventilation**. Whilst obscure glazing can be an effective means for addressing visual privacy, it can restrict outlook for occupants, and therefore alternative design solutions may be more appropriate.



**Photo G4.12b** The privacy screening on this development has been effectively integrated into the building design

The area of obscure glazing only needs to be provided to a minimum 1.6m above floor level. It is preferable that any glazing above this height is transparent to maximise **solar access** and maintain some outlook from the **dwelling**.

### Fences, walls and balustrades

Fences and balustrades are effective forms of **screening** and require little further explanation where they take the form of a solid **wall**. The design and location of such features must not infringe on other relevant requirements for **development**, such as **setbacks**, shading, **solar access**, and in the case of fences, the requirements of the *Dividing Fences Act 1961*, and associated local laws.

### Raised sill height

By raising the sill height of a window to a **habitable room** to at least 1.6m above floor level, it is no longer considered a **major opening** as per the definition. This results in the visual privacy requirements no longer being applicable. While this can provide an effective measure for mitigating visual privacy issues, raised windows limit outlook for occupants, and alternative design solutions may be preferred.

## 4.12 Visual privacy (cont.)

### Landscaping

**Landscaping** in the form of screen planting or selective placement of suitable trees or shrubs can provide **screening** for privacy, whilst enhancing residential **amenity**. However, as landscaping can be temporary the **decision-maker** needs to be satisfied as part of a **design principle** pathway assessment that the landscaping will remain in-situ. This may entail consultation with the relevant property owner(s).

### Visual privacy setbacks

A visual privacy **setback** involves setting the **development** back from the adjoining **dwelling** and **lot boundary**. Where development adjoins an existing dwelling, the **source of overlooking** should be separated so that the **cone of vision** does not capture a **major opening** or **active habitable space** on an **adjoining property**.

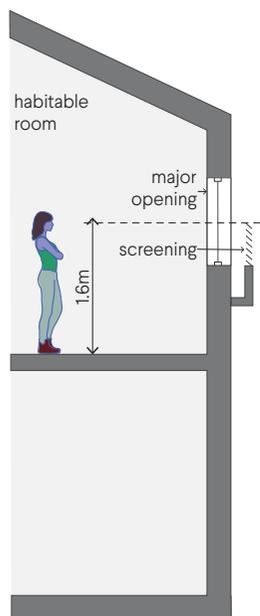


Figure G4.12b Window hoods and vertical and horizontal fins

### Building to boundaries

Privacy may be enhanced for both the **development** and its neighbour by building a portion of the **dwelling** up to the **lot boundary** as provided in **C4.3.5** to **C4.3.9**. This overcomes the problem of overlooking from that **wall**, and in most cases, allows more freedom of design on the **site** to ensure privacy for **private open space** and windows. However, the use of **boundary walls** does need to consider other aspects of design and neighbour **amenity**, such as the possibility of overshadowing **adjoining properties**.

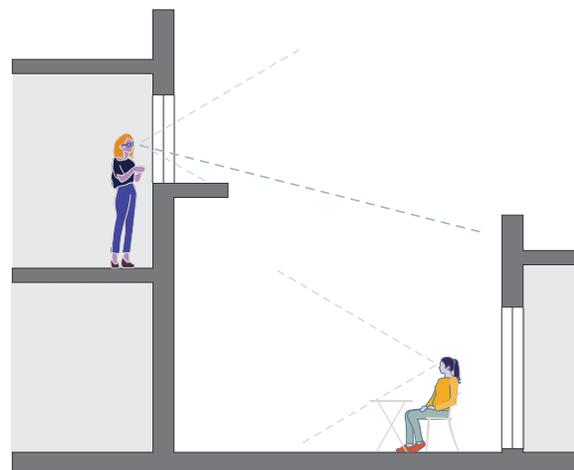


Figure G4.12c Balcony planter box

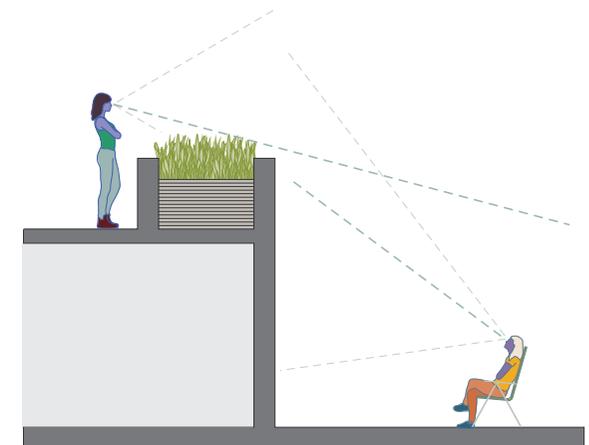
### Developing adjoining a vacant site

Where **development** adjoins a vacant residential **lot**, it may not be known how the land will be developed in the future. Visual privacy should be addressed by **major openings** from **active habitable spaces** (excluding bedrooms) being:

- set back from a **lot boundary** in accordance with **Table 4.12b**
- orientated at right angles to the lot boundary to direct outlook away from the **adjoining property**, or
- **screened**

There are no **deemed-to-comply** provisions for bedrooms facing a **lot boundary** of a vacant residential **lot** as future **development** can respond to privacy considerations through **C4.12.2**.

Where **development** abuts a vacant residential **lot** and the **balcony** is orientated 90 degrees from the **adjoining property lot boundary** in accordance with **C4.12.3(ii)**, consider extending **screening** beyond the balcony to increase visual privacy for the future development of the adjoining property (refer **Figure G4.12e**).



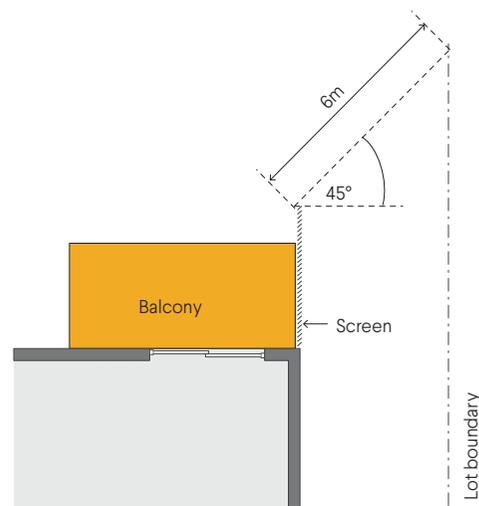
## 4.12 Visual privacy (cont.)

### ASSESSMENT GUIDANCE

The provisions of element 4.12 *Visual privacy* are applied in context to whether the **adjoining property** is vacant or has residential **development**.

- where the proposed **development site** adjoins an existing **dwelling**, the **cone of vision** assessment of **C4.12.1** and **C4.12.2** should be applied
- where the proposed development site adjoins a vacant residential **lot**, the **setback**, design and **screening** requirements of **C4.12.4** should be applied

When applying **Table 4.12b** and the **adjoining property** is dual coded, the lower coding will apply unless **development** has been approved or built to the higher coding.



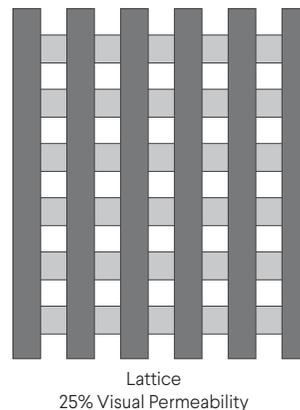
**Figure G4.12e** Screening considerations for future development of adjoining lots

### Sources of overlooking

While it may be possible to overlook an **adjoining property** from multiple vantages, the provisions of element 4.12 *Visual privacy* only seek to control overlooking between:

- **active habitable spaces** and **habitable rooms** with a floor level more than 0.5m above **natural ground level** of the **development site**, and
- the active habitable space and habitable rooms of the **adjoining residential properties**

Visual privacy requirements do not apply in the **street setback area**. The basis for this is that control of overlooking for areas visible from public places would be largely ineffective in terms of privacy protection and also could limit outlook over, and surveillance of the public places themselves, thus compromising safety and security.



**Figure G4.12d** Permeability of screening

### Protection from overlooking

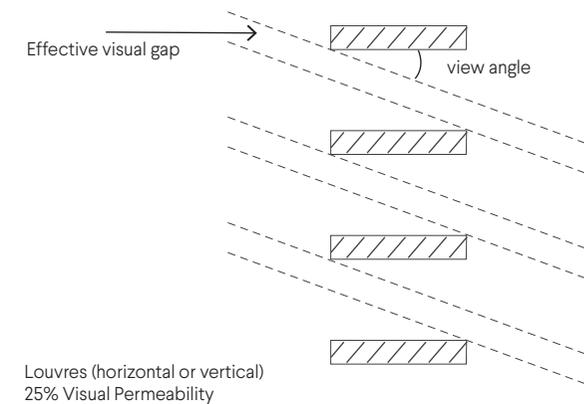
The **deemed-to-comply** provisions aim to maintain an adequate level of privacy to **major openings** to **habitable rooms** and **active habitable spaces** that are located behind the **street setback line** on **adjoining properties**. A **site** survey should be undertaken to establish the location, dimensions and levels of major openings and **unenclosed** outdoor active habitable spaces on adjoining properties.

For the purpose of visual privacy assessment, adjoining **active habitable space** may include:

- **habitable rooms** with a **floor area** greater than 10m<sup>2</sup> – typically living rooms, kitchens, dining rooms and bedrooms, and
- outdoor **private open space** – typically swimming pools, decks, **patios**, **verandahs**, courtyards, **balconies** etc that are likely to be occupied for extended periods of time.

The following are excluded:

- **service areas** and areas for **functional utilities** such as clothes drying, and
- other areas of **open space** such as lot boundary **setbacks** containing blank **walls** and/or minor openings



## 4.12 Visual privacy (cont.)

### DESIGN TIPS

The following design responses may assist in addressing a design principle(s):

When designing or assessing a **design principle** pathway, the focus should be on limiting direct overlooking and interrupting the **line of sight** into **major openings** and **active habitable spaces**. It is not necessary to achieve complete visual privacy. Consider what constitutes a reasonable level of privacy in the circumstances, and what is realistically achievable.

Suitable established trees, hedges and other **screening** plants may provide an acceptable means of interrupting the **line of sight** into a **major opening** or **active habitable space** of an adjoining **dwelling** for the purpose of satisfying visual privacy **design principle** requirements. Subject to consultation with the adjoining owner, the necessary planting on the **development site** would be the subject of a condition of planning approval to run with the land. As an alternative, arrangements may be made between the proponent and landowner of the affected property for the proponent to provide or contribute towards the cost of installing screen planting within the affected property, which would then become the responsibility of the landowner of the affected property to maintain.

### Cone of vision and line of sight

The impact of a **development** on the privacy of an **adjoining property** should be assessed by applying the **cone of vision** from the **source of overlooking**. The three-dimensional cone of vision is measured from the source of overlooking towards the affected **site** in accordance with **C4.12.1**.

The three-dimensional **cone of vision** will be a wedge shape that captures what is being overlooked on the **adjoining property**. Privacy only becomes an issue for design and assessment where the cone of vision captures all or a portion of either a **major opening** or **unenclosed active habitable space**.

The design of the **development** can then respond by limiting or interrupting the **line of sight** to the **major opening** or **active habitable space** within the **cone of vision** (refer **C4.12.2**). The line of sight refers to what a person can see from the source of overlooking (within the cone of vision), measured from 1.7m above floor level (refer **Figure G4.12f**).



**Photo G4.12c** This window hood effectively restricts overlooking of the neighbouring property's rear garden without compromising amenity for the dwelling

Measurement of the **cone of vision** and **line of sight** should be taken from the external face of the opening.

To demonstrate that the **line of sight** has been limited in accordance with **C4.12.2**, a **cone of vision** assessment should include:

- clear identification of the **sources of overlooking** and the established cone of vision
- the position and level of any **major openings** and **unenclosed active habitable spaces** on the **adjoining property** within the established cone of vision
- provision of marked-up plans and sections showing the established cone of vision and line of sight, measured at a height of 1.7m above floor level across the width of the source of overlooking, as they relate to the adjoining property, and
- design solution/s, such as a horizontal fin, used to interrupt or limit the line of sight

Depending on the separation between **buildings** and size of the openings, the 1.5m offset (refer **C4.12.2(i)**) may not completely interrupt the **line of sight** between windows. This intervention however will ensure the main outlook from a **major opening** is not directly into an adjacent window and is included as an acceptable **deemed-to-comply** solution for medium density housing.

Refer **Figure G4.12f** for an example of a **cone of vision** assessment.

# Photo credits

## ACKNOWLEDGEMENT

The Department of Planning Lands and Heritage and the **WAPC** gratefully acknowledge the following contributors for allowing the use of these photographs to illustrate the document.

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G3.9a	38	DPLH	Cameron Chisholm Nichol/Iris Residential	Empire East/Dynevov Rise Floreat
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G4.9a	56	DPLH	Colin Moore Architect	Leicester Street
G4.12a	60	DPLH	Match/DevelopmentWA	M31 Terraces/North Coogee
G4.12b	61	DPLH	MDC Architects/Salander Property Group/ Bruce Construction Design	Carrington Street Palmyra
G4.12c	64	DPLH	-	-