



Part 2

Developing the controls

- 2A Primary controls
- 2B Building envelopes
- 2C Building height
- 2D Floor space ratio
- 2E Building depth
- 2F Building separation
- 2G Street setbacks
- 2H Side and rear setbacks

This part explains the application of building envelopes and primary controls including building height, floor space ratio, building depth, separation and setbacks. It provides tools to support the strategic planning process when preparing planning controls

2A Primary controls

Primary development controls are the key planning tool used to manage the scale of development so that it relates to the context and desired future character of an area and manages impacts on surrounding development.

Primary development controls include building height, floor space ratio, building depth, building separation and setbacks (refer to in sections 2C-2H). When applied together, the primary development controls create a building envelope, which forms the three dimensional volume where development should occur.

Setting and testing the controls

Primary controls should be developed taking into account sunlight and daylight access, orientation and overshadowing, natural ventilation, visual and acoustic privacy, ceiling heights, communal open space, deep soil zones, public domain interface, noise and pollution.

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

The rationale for setting primary controls needs to be explained to the community, applicants and practitioners.

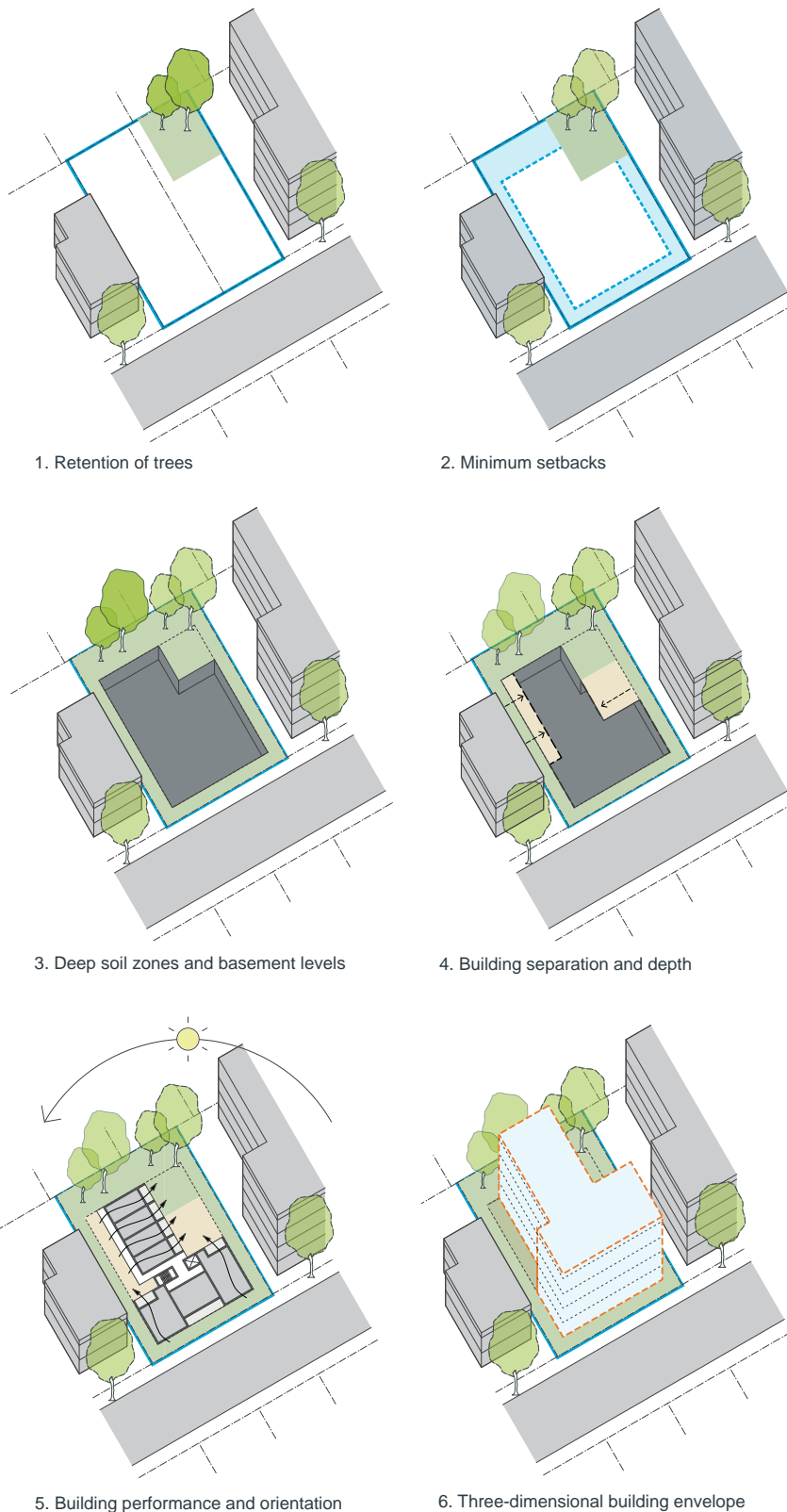


Figure 2A.1 Key considerations when testing development controls and establishing a three-dimensional building envelope

2B Building envelopes

A building envelope is a three dimensional volume that defines the outermost part of a site that the building can occupy.

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

A building envelope should be 25-30% greater than the achievable floor area (see section 2D Floor space ratio) to allow for building components that do not count as floor space but contribute to building design and articulation such as balconies, lifts, stairs and open circulation space.

Building envelopes help to:

- define the three dimensional form of buildings and wider neighbourhoods
- inform decisions about appropriate density for a site and its context
- define open spaces and landscape areas
- test the other primary controls to ensure they are coordinated and achieve the desired outcome
- demonstrate the future mass, scale and location of new development.



Figure 2B.1 Perspective of a proposed building design within the building envelope

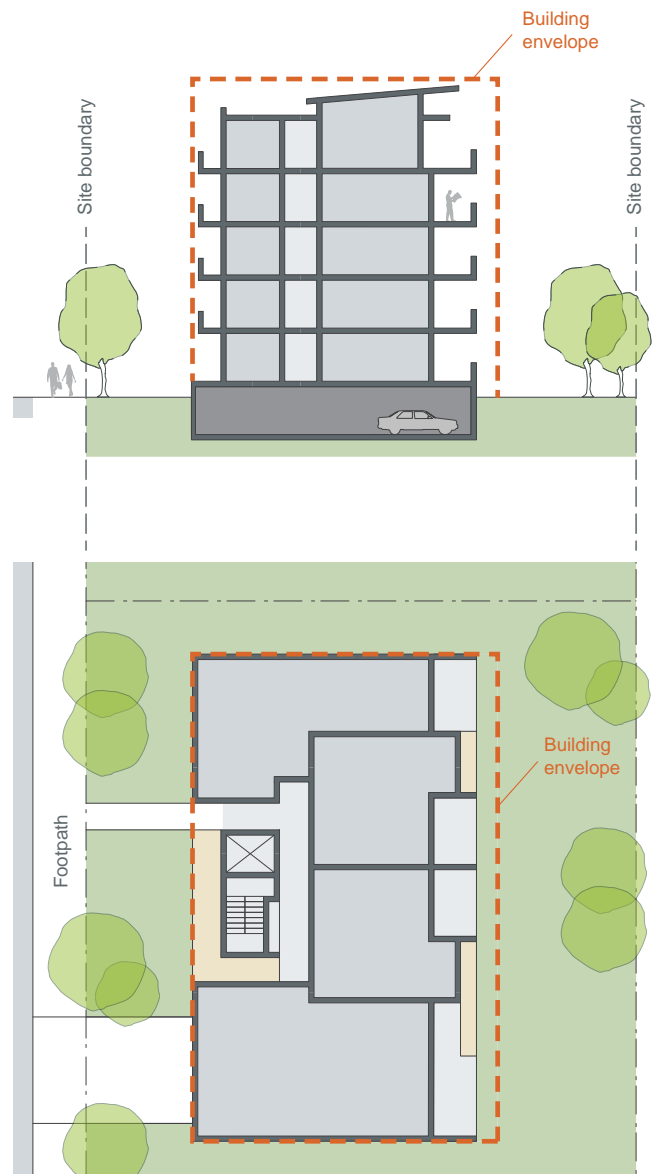


Figure 2B.2 Building envelopes define the 'container' within which a building is designed. They are a useful tool to gain an understanding of the future urban form and scale of an area. The gross floor area of the building is typically 25-30% less than that of the envelope

2C Building height

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

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

Aims

- building height controls ensure development responds to the desired future scale and character of the street and local area
- building height controls consider the height of existing buildings that are unlikely to change (for example a heritage item or strata subdivided building)
- adequate daylight and solar access is facilitated to apartments, common open space, adjoining properties and the public domain
- changes in landform are accommodated
- building height controls promote articulated roof design and roof top communal open spaces, where appropriate.

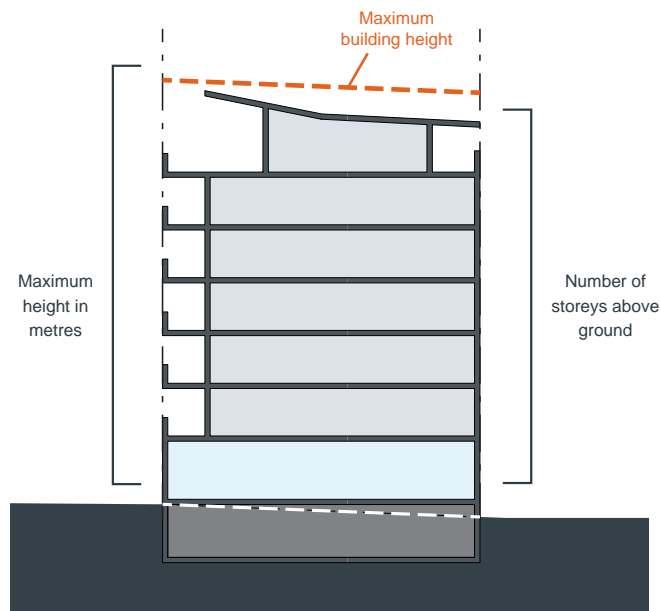


Figure 2C.1 The total height of a building informs the number of storeys possible in a development. Floor to floor heights vary depending on the use e.g. shops and offices are typically higher than residential apartments

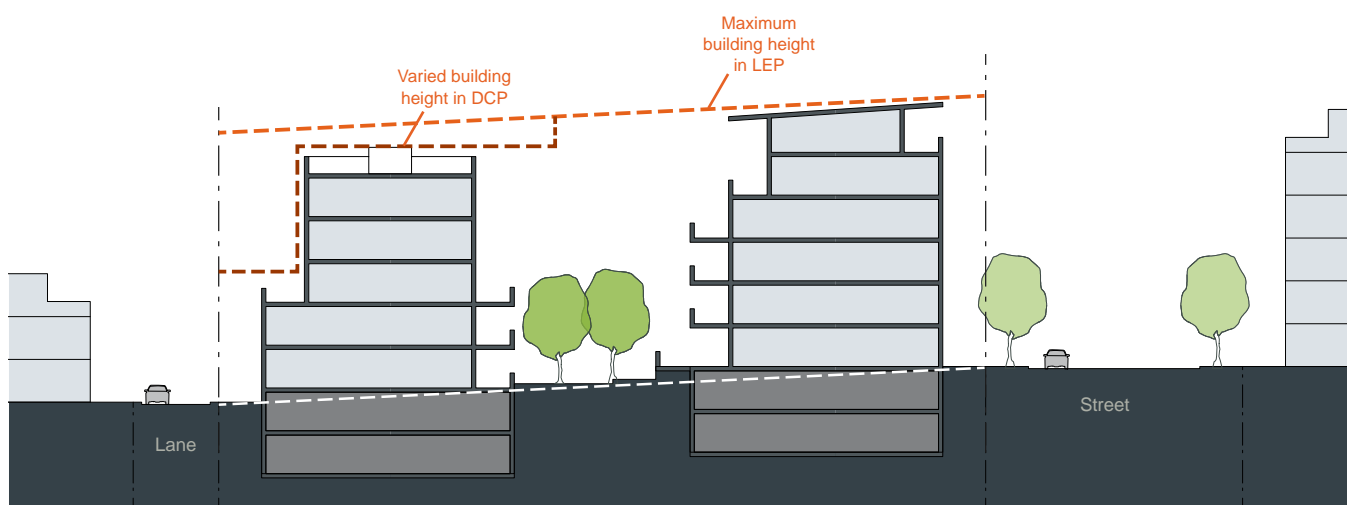


Figure 2C.2 Building height controls in a development control plan should reflect the existing or desired future character of an area. Height controls may need to step or change within a site while still being within the maximum set in the local environmental plan. This diagram shows how the height of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



Figure 2C.3 Building height in renewal areas should reflect the desired future character of the streetscape

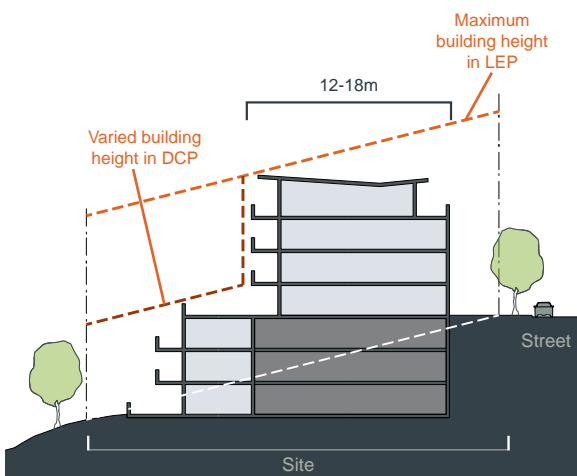


Figure 2C.4 On steep slopes across sites, a varied height control can be applied that steps down towards the lower level of the site and helps create useful residential floor plates (12-18m) addressing the street

Considerations in setting height controls

Set building heights by adding together the floor to ceiling heights for the desired number of storeys. Add 0.4m per floor for structure, services, set downs and finishes. Add 1m to the total to allow for rooftop articulation. Add 2m to the total to allow for topographic changes where required. Provide additional height in flood prone areas

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

Ensure that building height controls respond to the desired number of storeys, the minimum floor to floor heights required for future building uses and include generous ground floor heights

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

Where rooftop communal open space is desired, ensure adequate maximum height is provided and consider secondary height controls for lift/stair access and shade structures

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

It may be appropriate to determine heights by relating them to site-specific features such as cliff lines or heritage items. This may include:

- defining an overall height or street wall heights to key datum lines, such as eaves, parapets, cornices or spires
- aligning floor to floor heights of new development with existing built form

Consider secondary height controls to transition built form, for example:

- a street wall height to define the scale and enclosure of the street
- a step down in building height at the boundary between two height zones

The Building Code of Australia has certain requirements based on the effective height of a building. When setting height controls, consider these thresholds as it can have an impact on the feasibility of a development. Applicants should be able to design a building to the maximum height while achieving an economically viable development

2D Floor space ratio

Floor space ratio (FSR) is the relationship of the total gross floor area (GFA) of a building relative to the total site area it is built on. It indicates the intended density. FSR is a widely used method for estimating the development potential of a site.

However, it is important to note that FSR controls set the *theoretical maximum* capacity. It may not always be possible to reach the maximum allowable floor space due to other development controls or constraints specific to the site such as lot size or shape, existing landscape features, neighbouring properties or heritage considerations.

FSR is not a measure of the maximum capacity of the building envelope. The envelope provides an overall parameter for the design of the development. The allowable gross floor area should only 'fill' approximately 70% of the building envelope (see section 2B Building envelopes). In new urban areas or where an existing neighbourhood is undergoing change, building envelopes should be tested prior to setting FSR controls.

Aims

- ensure that development aligns with the optimum capacity of the site and the desired density of the local area
- provide opportunities for building articulation and creativity within a building envelope by carefully setting the allowable floor space.

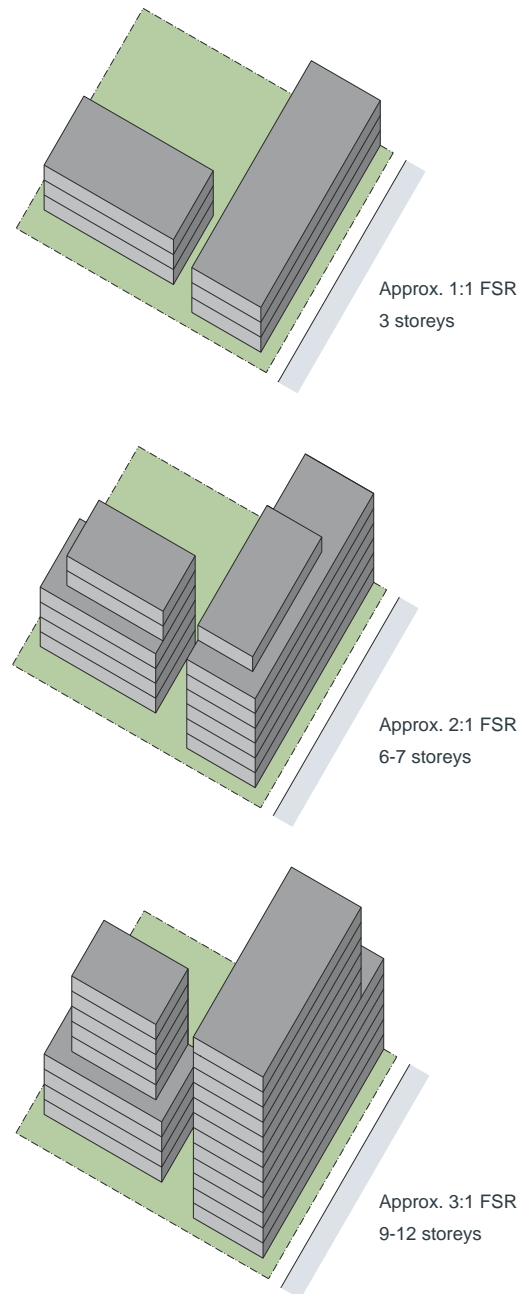


Figure 2D.1 Indicative built form massing for residential flat buildings with different floor space ratios

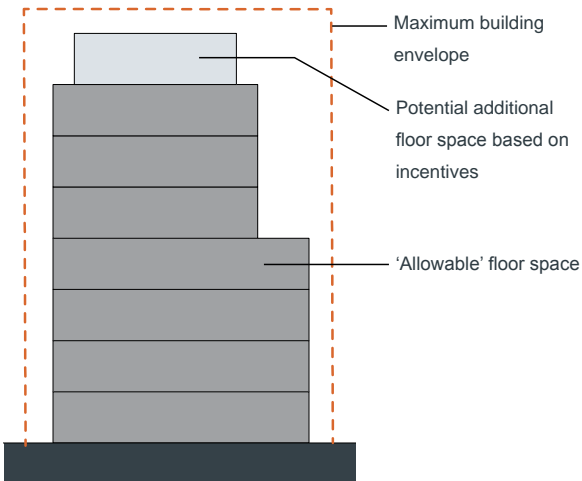


Figure 2D.2 When determining floor space ratio controls, maximum building envelopes can be used to test the FSR, including any potential incentives and bonuses

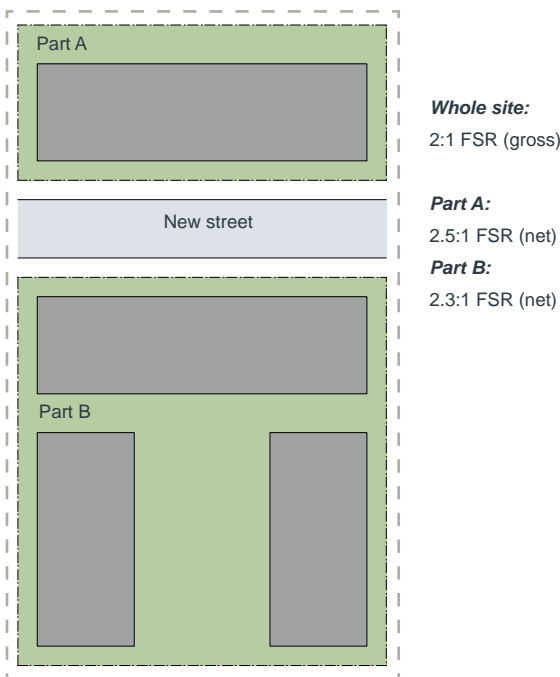


Figure 2D.3 On sites with subdivision and public domain dedication (e.g. a new street), the overall gross FSR is lower than the net FSR for each individual development parcel

Considerations in setting FSR controls

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

The GFA should fit comfortably within the building envelope as the envelope needs to also account for building elements and service areas that are not included in the GFA definition and to allow for building articulation (see section 2B Building envelopes)

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

- corner, mid-block or wide shallow sites tend to have different floor space capacities
- small sites with a single building may have greater floor space capacity than larger sites with multiple buildings
- large sites with multiple buildings require greater space between buildings and may have less floor space capacity

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

Where both residential and non-residential uses such as retail or commercial offices are permitted, develop FSR controls for each use. Commercial and retail generally fill 80-85% of their envelope. Allow for services, circulation, car park and loading requirements. Note that residential FSR tends to be lower compared with commercial or retail ratios. This is because residential buildings are typically less deep than commercial buildings to provide higher levels of internal amenity and to incorporate more non-GFA elements such as balconies

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

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

2E Building depth

Building depth is an important tool for determining the development capacity of a site. It is the overall cross section dimension of a building envelope. Building depth dimensions typically include articulation such as projecting balconies, gallery access, eaves, overhangs, sun hoods, blades and other architectural features.

Building depth influences building circulation and configuration and has a direct relationship to internal residential amenity by determining room depths, which in turn influences access to light and air. For residential development in general, narrower building depths have a greater potential to achieve optimal natural ventilation and daylight access than deeper floor plates. Depths of mixed use buildings transition from deeper commercial and retail uses at the lower levels to narrower building depths for the residential uses at upper levels.

Aims

- ensure that the bulk of the development relates to the scale of the desired future context
- ensure building depths support apartment layouts that meet the objectives, design criteria and design guidance within the Apartment Design Guide.

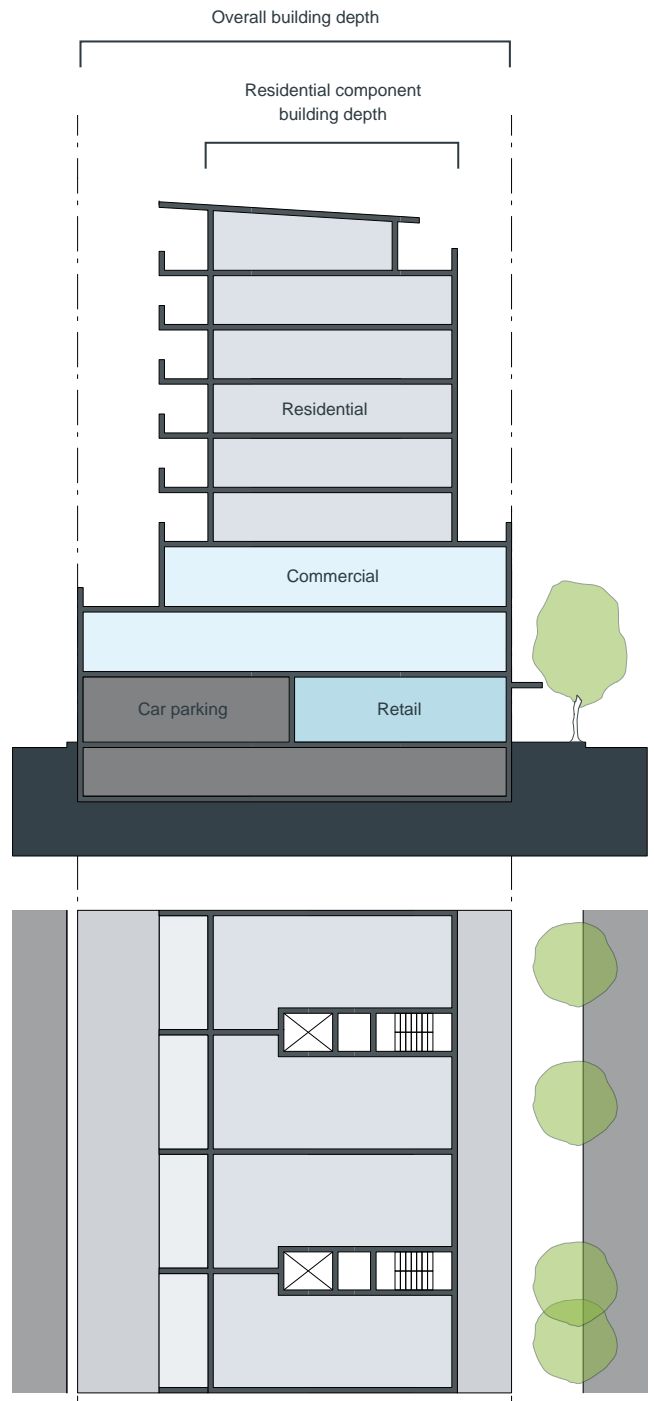


Figure 2E.1 A mixed used building showing the transition of building depth: deeper floors on lower levels dedicated to retail/commercial uses and narrower residential apartments on upper levels

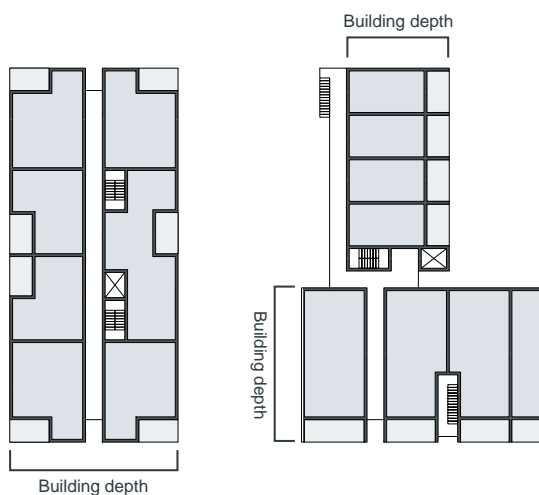


Figure 2E.2 These examples show how to measure building depth for different apartment building shapes



Figure 2E.3 Building depth dimensions should include articulation such as projecting balconies, gallery access, overhangs, blades and other architectural features

Considerations in setting building depth controls

Use a range of appropriate maximum apartment depths of 12-18m from glass line to glass line when precinct planning and testing development controls. This will ensure that apartments receive adequate daylight and natural ventilation and optimise natural cross ventilation

Test building depths against indicative floor plate and apartment layouts to ensure they can meet natural ventilation and sunlight requirements

Site constraints may require varied building depths to achieve good levels of residential amenity for residents and neighbours

Consider varying building depth relative to orientation. For example, buildings facing east-west capture sun from both aspects and may have apartments of up to 18m wide (if dual aspect), while buildings facing north-south should be narrower to reduce the number of south facing apartments that have limited or no direct sunlight access (consider relationship with section 4A Solar and daylight access)

Where greater depths are proposed, demonstrate that indicative layouts can achieve acceptable amenity with room and apartment depths. This may require significant building articulation and increased perimeter wall length

Coordinate building height and building depth:

- buildings that have smaller depths over a greater height deliver better residential amenity than those with greater depth and a lower height
- greater building depths may be possible where higher ceiling heights are provided, for example adaptive reuse of an existing building (see 4D Apartment size and layout)

For mixed use buildings, align building depth to the likely future uses. For example, transition deeper commercial or retail podium levels to a narrower residential tower above. For precinct planning, if the intended building use changes, the building depth needs to change accordingly

Set the depth control in metres. The building depth includes the internal floor plate, external walls, balconies, external circulation and articulation such as recesses and steps in plan and section

2F Building separation

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

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

Building separation controls should be set in conjunction with height controls and controls for private/communal open space and visual and acoustic privacy.

Aims

- ensure that new development is scaled to support the desired future character with appropriate massing and spaces between buildings
- assist in providing residential amenity including visual and acoustic privacy, natural ventilation, sunlight and daylight access and outlook
- provide suitable areas for communal open spaces, deep soil zones and landscaping.

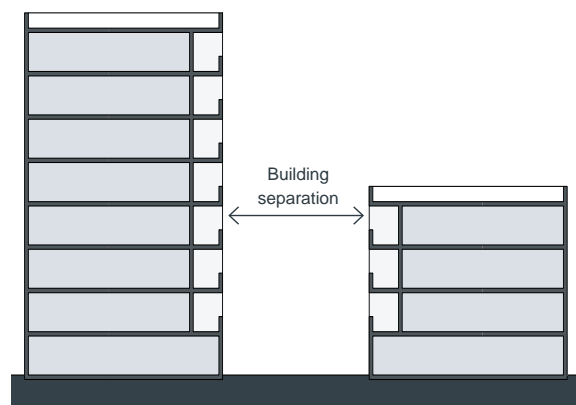


Figure 2F.1 Building separation is measured from the outer face of building envelopes which includes balconies

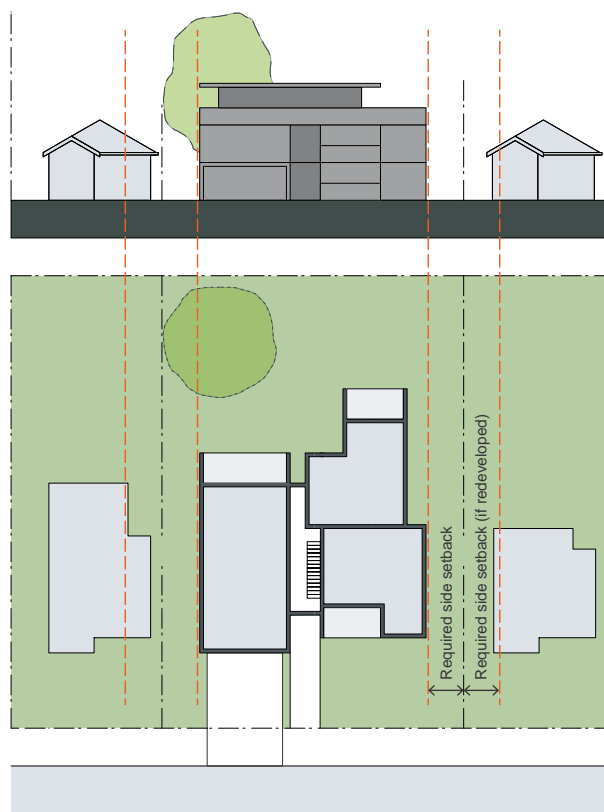


Figure 2F.2 In areas undergoing transition from low density to higher densities, minimum building separation distances may not be achieved until the area completes its transition



Figure 2F.3 Building separation supports residential amenity and helps to provide suitable communal open space areas

Table 1 Minimum building separation increases proportionally to the building height

Building height	Separation distance
9 storeys and above	12-24m
Up to 8 storeys	9-18m
Up to 4 storeys	6-12m

How to measure building separation

Gallery access circulation areas should be treated as habitable space, with separation measured from the exterior edge of the circulation space.

When measuring the building separation between commercial and residential uses, consider office windows and balconies as habitable space and service and plant areas as non-habitable.

Where applying separation to buildings on adjoining sites, apply half the minimum separation distance measured to the boundary. This distributes the building separation equally between sites (consider relationship with section 3F Visual privacy).

Considerations in setting building separation controls

Design and test building separation controls in plan and section

Test building separation controls for sunlight and daylight access to buildings and open spaces

Minimum separation distances for buildings are:

Up to four storeys (approximately 12m):

- 12m between habitable rooms/balconies
- 9m between habitable and non-habitable rooms
- 6m between non-habitable rooms

Five to eight storeys (approximately 25m):

- 18m between habitable rooms/balconies
- 12m between habitable and non-habitable rooms
- 9m between non-habitable rooms

Nine storeys and above (over 25m):

- 24m between habitable rooms/balconies
- 18m between habitable and non-habitable rooms
- 12m between non-habitable rooms

Building separation may need to be increased to achieve adequate sunlight access and enough open space on the site, for example on slopes

Increase building separation proportionally to the building height to achieve amenity and privacy for building occupants and a desirable urban form

At the boundary between a change in zone from apartment buildings to a lower density area, increase the building setback from the boundary by 3m

No building separation is necessary where building types incorporate blank party walls. Typically this occurs along a main street or at podium levels within centres

Required setbacks may be greater than required building separations to achieve better amenity outcomes

2G Street setbacks

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

In a centre, the street setback or building line may be set at the property boundary defining the street corridor with a continuous built edge. In a suburban context, the street setback may accommodate front gardens, contributing to the landscape setting of buildings and the street. Street setbacks provide space for building entries, ground floor apartment courtyards and entries, landscape areas and deep soil zones.

Aims

- establish the desired spatial proportions of the street and define the street edge
- provide space that can contribute to the landscape character of the street where desired
- create a threshold by providing a clear transition between the public and private realms
- assist in achieving visual privacy to apartments from the street
- create good quality entries to lobbies, foyers or individual dwellings
- promote passive surveillance and outlook to the street.



Figure 2G.1 For mixed use buildings with retail uses at the ground floor a zero setback is appropriate



Figure 2G.2 This example provides a landscaped setback which contributes to the residential character of the street

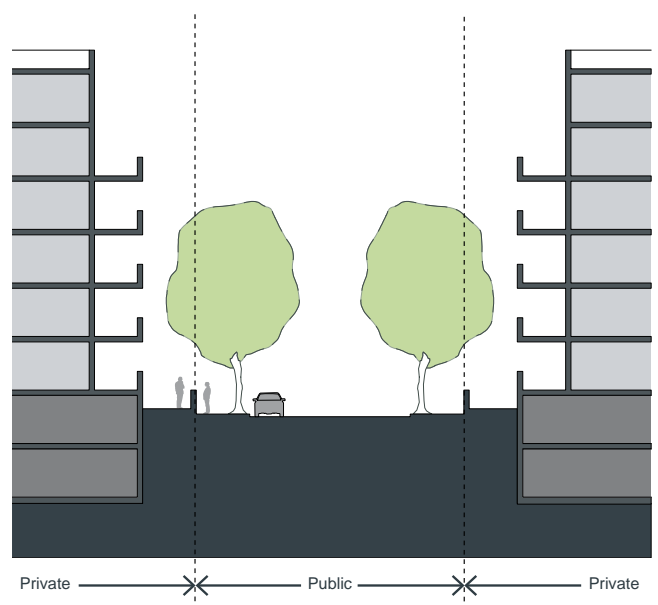
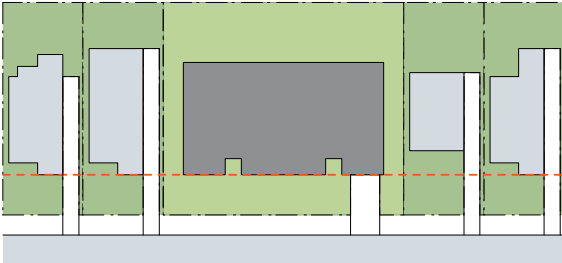
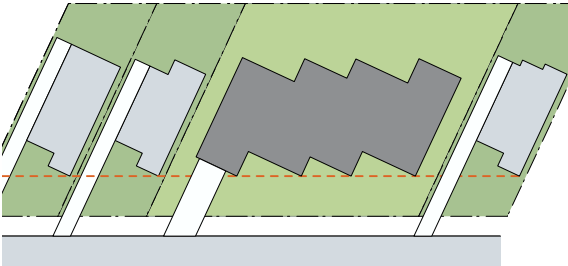


Figure 2G.3 Streetscapes are defined by a combination of public elements (carriageways, kerbs, verges and footpaths) and private elements (street setbacks, fences and building facades)

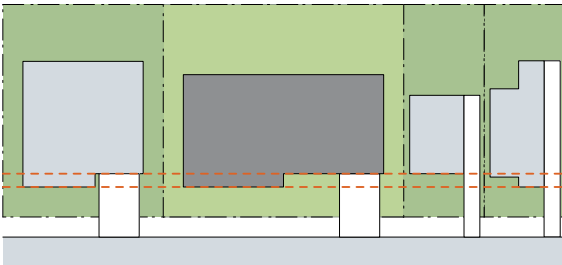
1. Predominant setback



2. Variation for angled subdivision



3. Setback range



4. Building line

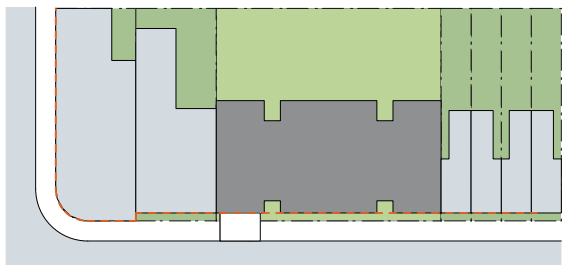


Figure 2G.4 Street setbacks should be consistent with existing setback patterns in the street or setbacks that achieve the desired future character of the area

Considerations in setting street setback controls

Determine street setback controls relative to the desired streetscape and building forms, for example:

- define a future streetscape with the front building line
- match existing development
- step back from special buildings
- retain significant trees
- in centres the street setback may need to be consistent to reinforce the street edge
- consider articulation zones accommodating balconies, landscaping etc. within the street setback
- use a setback range where the desired character is for variation within overall consistency, or where subdivision is at an angle to the street
- manage corner sites and secondary road frontages

Align street setbacks with building use. For example in mixed use buildings a zero street setback is appropriate

Consider nominating a maximum percentage of development that may be built to the front build-to line, where one is set, to ensure modulated frontages along the length of buildings

Identify the quality, type and use of open spaces and landscaped areas facing the street so setbacks can accommodate landscaping and private open space

In conjunction with height controls, consider secondary upper level setbacks to:

- reinforce the desired scale of buildings at the street frontage
- minimise overshadowing of the street and other buildings

To improve passive surveillance, promote setbacks which ensure a person on a balcony or at a window can easily see the street

Consider increased setbacks where street or footpath widening is desired

2H Side and rear setbacks

Side and rear setbacks govern the distance of a building from the side and rear site boundaries and are related to the height of the building. They are important tools for achieving amenity for new development and buildings on adjacent sites.

Setbacks vary according to the building's context and type. Larger setbacks can be expected in suburban contexts in comparison to higher density urban settings. Setbacks provide transition between different land uses and building typologies. Side and rear setbacks can also be used to create useable land for common open space, tree planting and landscaping.

Aims

- provide access to light, air and outlook for neighbouring properties and future buildings
- provide for adequate privacy between neighbouring apartments
- retain or create a rhythm or pattern of spaces between buildings that define and add character to the streetscape
- achieve setbacks that maximise deep soil areas, retain existing landscaping and support mature vegetation consolidated across sites
- manage a transition between sites or areas with different development controls such as height and land use.



Figure 2H.1 Side setbacks can contribute to the character of the street, for example by allowing views to existing vegetation at the rear of buildings

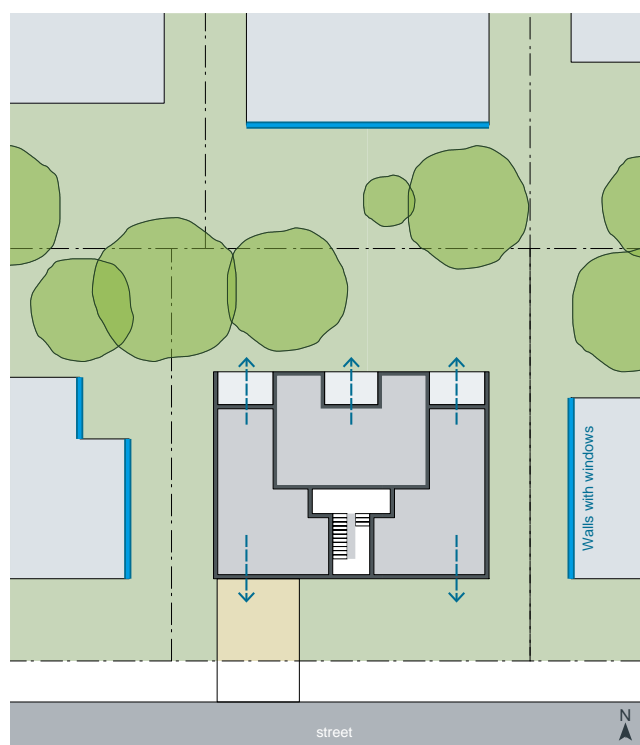


Figure 2H.2 On infill sites follow the existing open space patterns, limit side setbacks and locate habitable rooms to face the street and rear boundary to optimise amenity and privacy for all

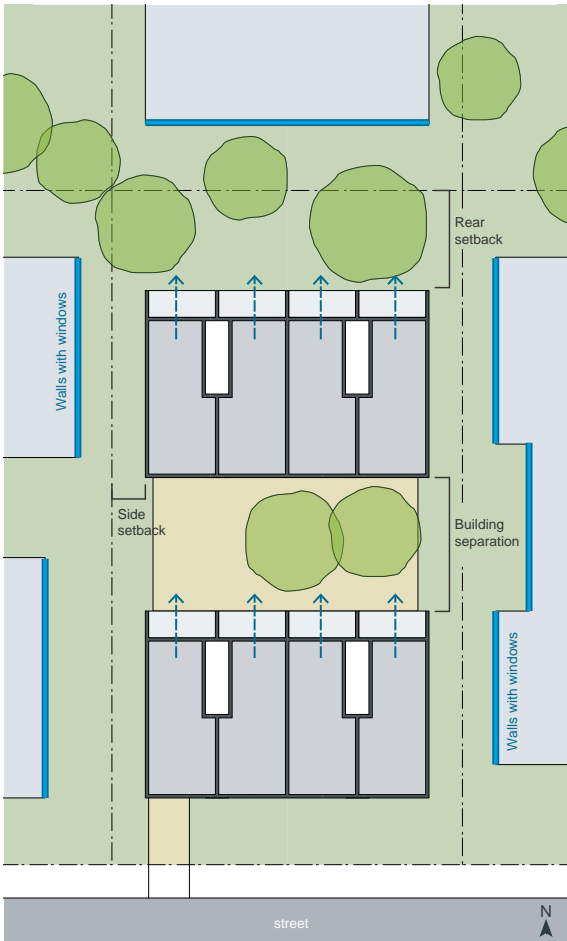


Figure 2H.3 On narrow infill sites select a building type that orientates habitable rooms to the street and rear, minimising required side setbacks

Considerations in setting side and rear setback controls

Test side and rear setbacks with height controls for overshadowing of the site, adjoining properties and open spaces

Test side and rear setbacks with the requirements for:

- building separation and visual privacy
- communal and private open space
- deep soil zone requirements

Consider zero side setbacks where the desired character is for a continuous street wall, such as in dense urban areas, main streets or for podiums within centres

On sloping sites, consider increasing side and rear setbacks where new development is uphill to minimise overshadowing and assist with visual privacy



Figure 2H.4 Side and rear setbacks vary according to the building context and type. In urban areas, setbacks are often guided by minimum building separation requirements

