GOOD SOLUTIONS GUIDE FOR APARTMENTS

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We welcome your feedback:
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Other documents to consult:
This Good Solutions Guide is not a statutory document but provides useful guidelines. It should be read in conjunction with the relevant territorial authority's District Plan that sets out objectives, policies, rules and assessment criteria for residential developments.

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INTRODUCTION

The aim of this guide is to promote the good design of apartment developments. It is based upon the principle that, through good design, we can improve the quality of life for everyone in our towns and cities. The guide is primarily intended for developers, designers, planners, council staff and others interested in raising the standards of apartment developments.

The Benefits of Good Apartment Design

The benefits of good apartment design for the public, and for the residents and developer of a development are numerous.

An innovative developer can gain a competitive advantage through good design, while the market will tend to penalise those developers who don't keep up with accepted levels of quality. As both 'buy-to-live' and 'buy-to-let' apartment investors in New Zealand increase their experience and knowledge of apartment living, they will demand better design and price it into apartment values. As a result, life cycle cost aspects and amenity will become as crucial as aesthetic quality, location and sales price in attracting potential investors and residents. Buyers place more emphasis on these factors when the real estate market is moderate or weak than when the market is buoyant.

Apartment developers are increasingly developing brands around their businesses. The success of these brands relies upon the developers' reputation for providing a quality product over the longer term.

Another important benefit of good design for the developer will be the reduction of statutory processing times - with more expeditious progress through council helping to reduce financing costs.

For the public, good design of apartment developments also has a variety of benefits. It contributes to the character and definition of public spaces and streets. Large developments, especially, have considerable effect on the character of a neighbourhood, its permeability and its connectedness to the rest of the city. Good design can also create sustainable buildings that efficiently use and manage building materials, energy and other limited resources.

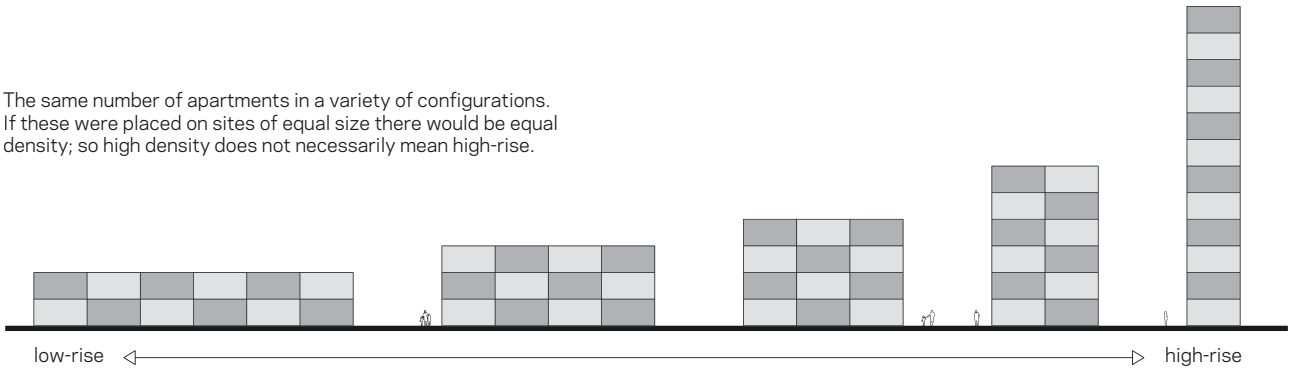
For owners and occupiers of apartment developments the benefits of good design are increased amenity from responsiveness to current and future living needs, and social benefits such as an increased sense of identity, community and ownership.

It is worth pointing out that one of the easiest ways to increase the quality of apartment design and reap consequent benefits is to use the best design professionals available. Proven design skills and successful projects in the specialist area of apartment design are a good indication of the potential to do further quality work.

The Importance of Apartments

In New Zealand over 85% of the population lives in places classified as urban. This high percentage of urban population has been maintained since the 1980s. As their populations have increased New Zealand cities have also expanded dramatically in physical size.

It is important that we respond to our urban growth in a coherent and sustainable manner. This includes addressing issues of urban sprawl, creating sustainable communities, efficiently using our infrastructure and public services and efficiently managing our waste. Increasing urban density is one means of attaining sustainable development,



The same number of apartments in a variety of configurations. If these were placed on sites of equal size there would be equal density; so high density does not necessarily mean high-rise.

and apartments are necessary for achieving desired density. As a result, apartment living must become a viable option for long-term housing for a greater number of people (including more families) in our urban areas.

It is important to note that:
"Although there is strong evidence about some of the benefits inherent in high urban density, it is clear that density alone does not deliver benefits unless other important design issues are addressed too. Successful intensification and higher density in cities requires good design that also meets other needs – for instance, adequate open space and pedestrian friendly streets."
[New Zealand Urban Design Protocol]

All of our towns and cities should be safe, healthy and comfortable environments where people are happy to live and work. The same should be true for all apartment developments.

Apartments Defined

For the purposes of this design guide, an apartment development can be characterised by two factors:

1. As a group of dwellings with vertical attachment: a residence located in a building that contains more than one household with some vertical attachment between individual apartments.

2. Apartments usually share access, circulation, parking, open space and other facilities. Because apartments sit on top of one another (vertical attachment) they are also effectively sharing the land they sit on.

Vertical attachment, common to both definitions, differentiates apartments from other forms of multi-unit housing such as terraced housing and townhouses. Because vertical attachment requires one to live in close proximity to one's neighbours, providing appropriate levels of privacy and amenity is paramount in ensuring a high quality environment for all residents.

Using the Guide

Parts 1 and 2 of this guide are structured to follow the design process from the large-scale to the small-scale. It begins with Context (Part 1) and moves through The Site to The Building and finishes with The Apartment (Part 2). Part 3 deals with other issues relevant to the development such as the consent process and post-occupancy management, while Part 4 contains analyses of existing developments in the form of case studies.

Each individual section leads logically into the next and as such the guide can be read in sequence from start to finish. However, as each section deals with a single topic, it is also possible to understand the content of a section independently and to use it as a checklist or topic refresher. Individual italicised terms are defined in a glossary at the end of the guide. Links are given to other relevant sections of the guide and very often 'Further Information' is provided for more information on a particular topic. It is recommended that you keep this apartment guide close at hand for every stage of the design process.

Readers should be aware that Rules of Thumb contained in this guide might conflict with the District Plan rules of some Territorial Authorities. It is therefore important to work with the relevant Council from early in the design process.

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PART 1
CONTEXT

PART 1
CONTEXT

Definition

Good design is informed by context: a well-designed development responds and contributes to its environment. For the purposes of this guide, context is considered to be all nearby natural and built physical features, as well as social, economic, transport and environmental factors that impact on a site.

Understanding context means understanding the interrelationships between the above factors, and between the site and the surrounding area. While the urban environment usually changes relatively slowly, new developments should respond to the potential future context as well as to the existing situation. In order to do this, one must identify desirable aspects of current character that are important to the future of the area.

Proposals for apartment developments should illustrate how design decisions are based on careful analysis of the context. A site plan, a plan of the surrounding area and a written statement that lists site constraints and opportunities and explains how the design relates to context analysis should accompany any drawings submitted for discussion or consent with the local council. The written statement should list and explain the designer's key influences.

New Zealand Urban Design Protocol

In order to understand the context of our cities and towns, one must understand the concept of urban design. Urban design is concerned with the buildings, places, spaces and networks that make up our towns and cities, and the way that people use them. It ranges in scale from a metropolitan region, city or town down to a street, public space or even a single building. Urban design is concerned not just with appearances and built form, but also with the environmental, economic, social and cultural consequences of design. It is an approach that draws together many different sectors and professions, and it includes both the process of decision making as well as the outcomes of design.

The New Zealand Urban Design Protocol is a voluntary commitment to specific urban design initiatives by signatory organisations and it seeks to ensure that the design of buildings, places, spaces and networks that make up our towns and cities work for all of us, both now and in the future.

The Urban Design Protocol identifies seven essential design qualities that create good urban design:

Context	seeing buildings, places and spaces as part of whole towns and cities
Character	reflecting and enhancing the distinctive character, heritage and identity of our urban environment
Choice	ensuring diversity and choice for people
Connections	ensuring that different networks link together
Creativity	encouraging innovative and imaginative solutions

Custodianship	ensuring design is environmentally sustainable, safe and healthy
Collaboration	communicating and sharing knowledge across sectors, professions and with communities

For more information see 'Urban Design Protocol' at www.mfe.govt.nz

Context Analysis

Context analysis can be undertaken at a variety of levels. The minimum required is an analysis of the surrounding area and an analysis of the site. Each level of investigation is important and should include, but is not limited to, the items listed below. The existing condition of each element should be recorded and it should be considered whether the element constitutes an opportunity or a constraint for the proposed development. Appropriate design responses to each item should be noted. The investigation could be undertaken at the same scale on the same drawing, or at various scales over several drawings.

Context analysis should identify the key natural and built features of the site and surrounding area. However, *Context Analysis* is more than just a record of existing conditions. By describing the physical elements of the site and surrounding area and the conditions impacting on the site, it identifies opportunities and constraints for future development, and allows them to be addressed in the design.

Analysis of Surrounding Area

The extent of surrounding area that requires analysis varies from site to site and depends primarily on the relative size and importance of the proposed development, and on the connections between the site and the surrounding area. For example, the area of analysis may change depending on whether the site will be accessed primarily by road, rail, footpath, dedicated cycle path, or some combination of them all. Items to note and respond to include:

Connections	street layouts and circulation routes (vehicle, pedestrian and cyclists)
Public transport	frequency of service and proximity to routes, stations and stops
Infrastructure & utilities	location of electricity connections, communications/data connections, water lines, sewer lines, stormwater drains, gas connections, electrical lines and connection points (underground and overhead), electricity poles, street lighting, traffic lights, natural drainage lines
Facilities	proximity and location (including directions and distances) of shops, schools and community facilities
Uses and activities	relationship between existing surrounding uses and activities and those proposed for the site
Streetscape	form, scale and character of surrounding urban environment
Adjacent buildings	character, location, uses and heights (including number of storeys and important parapet and/or datum heights)
Open spaces	character, location & uses of open spaces and natural resources

View shafts	any prominent views that may be affected
Major trees	location, type and condition
Acoustic or visual intrusion	motorways, railways, industrial sites, sporting venues
Surrounding lot sizes	general grain of lots and the degree of variability
Surrounding controls	development controls and rights of surrounding area: opportunities and constraints
Legal rights	easements, rights of way, covenants, etc.
Nearby topography	effects that this will have on site e.g. flood paths

Analysis of the Site

All of the site should be considered as part of the site analysis. The opportunities and constraints on the site itself, along with those of the immediate surrounding area that impact upon the site, should be noted and responses considered. They include:

Orientation	north point, sun path diagram
Topography	levels, contours and landforms
Wind	prevailing directions
Rainfall & drainage patterns	rain pattern and rainwater runoff across the site
Vegetation	significant vegetation offering shade, wind protection, and visual amenity
Views	into and out of the site
Site dimensions	size, shape and proportions
Natural features	existing natural resources and features such as watercourses
Existing built features	location, use and character
Site boundary conditions	fences, walls, retaining walls, buildings or natural features
Crossings	location of vehicle and pedestrian kerb crossings
Site access	vehicles, pedestrians and cyclists
Circulation	site circulation and movement patterns
Soil	quality and suitability, geotechnical restraints and natural hazards
Overlooking	overlooking and/or overshadowing
Heritage	archaeological, cultural, and heritage considerations

Rules of Thumb

A pedshed analysis, which maps the walking distance and time from a proposed building to nearby facilities, can be a very useful tool for analysing a site's surrounding area. For example, an average person walks 450m in 5 minutes. An older person (65+) walks 375m in 5 minutes. This can be shown on the context plan by drawing a circle with a five-minute radius from the site boundary to establish the facilities within easy reach of the development. Such a diagram will show how the crow flies and the most direct route on the ground will probably take longer. Also, any physical obstacle – such as a motorway, river or steep hill – will reduce the ease of reaching facilities within the circle.

An example of a combined site and context analysis.


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PART 2
THE DEVELOPMENT

Once the site and surrounding area have been analysed, a range of other issues should be considered as the design of a new apartment project develops. These issues relate to three elements of every apartment development:

A. the site

B. the building

C. the apartment

SECTION A: THE SITE

A1 SITE PLANNING

Site planning is concerned with the way buildings are laid out on a site and with the resulting space between the buildings. Goals of site planning include responding to context, ensuring connectivity to surroundings, maintaining *permeability* with links to the surrounding area, creating good circulation within the site and controlling the impact of parking on the site.

A site plan will initially generate two clear conditions: built form and open space, neither of which should be considered as solely a by-product of the other. It is important to consider how these conditions relate to each other and to their context. Open space, including connections to the surrounding area, and built space should operate as an integrated system, resulting in greater *amenity* for occupants and the adjoining public domain.

Objectives

- To optimise solar access to residential apartments within the development and adjacent developments (respond to potential overshadowing from adjacent buildings or trees/topography).
- To lay out buildings so that privacy can be achieved for apartments & *private open spaces*.
- To contribute positively to desired streetscape character with *active frontages* to the street.
- To support landscape design of open space areas.
- To respond to the natural resources of the site, using and protecting natural features.
- To protect the amenity of existing adjacent developments.
- To provide enjoyable views while mitigating any negative aspects of the site such as visual intrusions or noise.
- To create a site with good connections, clear layout and internal wayfinding for all modes of transport.

Separation of buildings by public space increases the privacy of apartments that directly face one another, while the apartments contribute to public safety through casual surveillance.

→ To create a safe environment with good visibility and *casual surveillance*.

Better Design Practice

→ Plan the site to optimise solar access by:
- orientating buildings to maximise north-facing walls
- providing adequate building separation within the development and from adjacent buildings
- avoiding single aspect apartments with a southern aspect
- using *dual aspect apartments* when the long elevation of the building faces east and west.

→ Select building types and layouts that respond to the streetscape while optimising solar access. Where streets are to be edged and defined by buildings, design solutions include:
- aligning buildings to the street on east-west streets
- using courtyards on north-south streets, and L-shaped configurations with increased setbacks on north-facing side boundaries.

→ Increase privacy by avoiding apartments that directly face one another.

→ Enhance personal safety and perceptions of safety, and minimise potential for crime and vandalism by allowing housing and actively used facilities to overlook streets and open spaces. This is especially important on routes to and from schools, public transport stops and other routes used at night.

Rules of Thumb

Apartments that directly face one another should be at least 15m apart or, if possible, angled to avoid sight lines from one apartment into another.

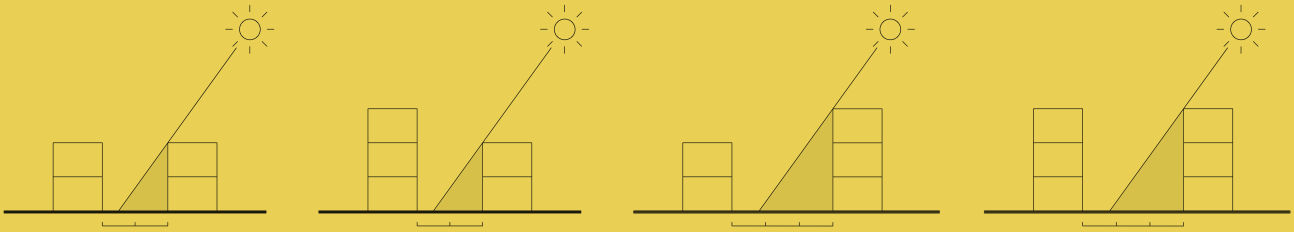
A1 Solid &Void

the buildings

the space between

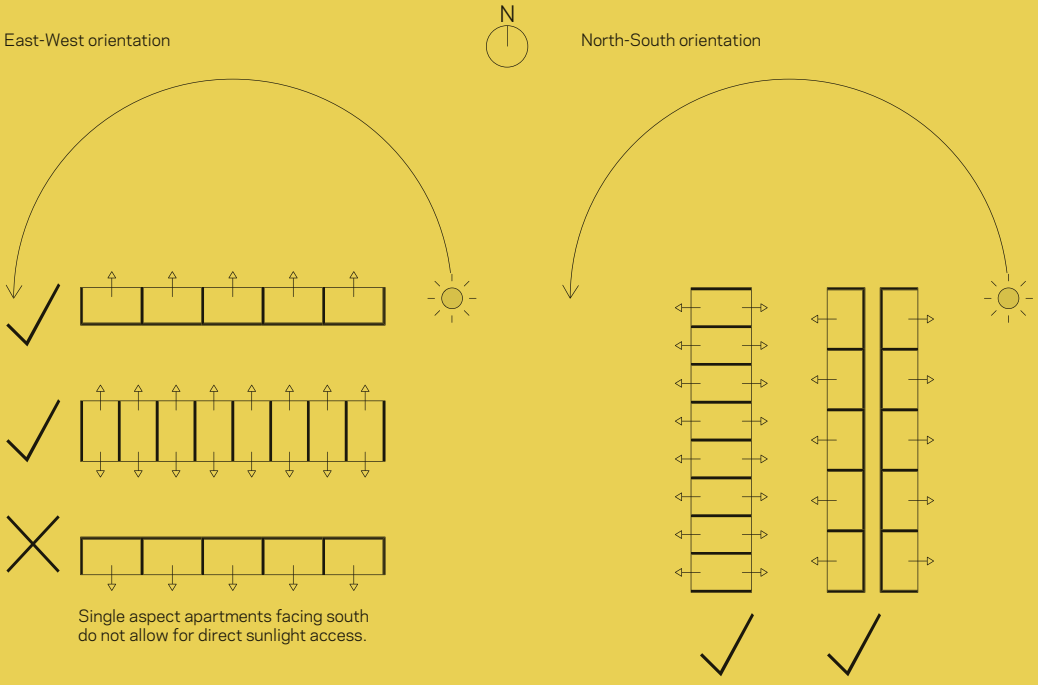
Site planning is concerned with built space and open space, neither of which should be just a by-product of the other.

A1 Sun Access



Distance between buildings must be proportional to their height for optimising access to sunlight. This is important for both open space and built space.

A1 Orientation



Single aspect apartments facing south do not allow for direct sunlight access.

Building & apartment types should be selected to ensure that every apartment receives direct sunlight at some point during the day.

A2 OPEN SPACE

Separation of cars and an enclosing low fence makes this public footpath feel more like a communal open space.

Open space, also called outdoor space, is an important environmental resource. It mitigates the effects of living in small dwellings and improves the liveability of a development. Open space may be public (accessible to members of the general public), communal (shared by residents) or private (associated with a single dwelling for the exclusive use of the occupants).

Open space plays an important role in fostering and maintaining a sense of identity for the residents of a development. Providing many communal open spaces within a residential development allows community identity to develop on many levels. For example, communal open space can be shared by residents of a small number of apartments, by residents on a single floor, or by residents in a whole building or development.

Objectives

- To provide open space for residents' use that contributes to a sense of identity & ownership.
- To provide safe and secure open spaces incorporating *casual surveillance*.
- To consider both soft (trees, shrubs, grass) and hard (paving, furniture, fixtures) landscaping opportunities.
- To ensure that communal open space is consolidated, configured and designed to be *accessible*, useable and attractive for all users.
- To provide a pleasant outlook and visual amenity for both residents and the public.
- To provide a clear hierarchy of outdoor spaces with well-defined boundaries and no ambiguity or leftover areas.
- To provide open space that is easy to maintain.
- To provide communal open spaces configured, sized, furnished and located so that they are suitable for children of different ages.

Better Design Practice

- Provide *private open spaces* for each apartment in the form of balcony, deck, terrace, garden, yard, courtyard or roof terrace (see C6 Private Open Space).
- Provide communal open space that is appropriate to the site (this may vary between urban and suburban areas). Consider the following:
  - the requirement for communal open space may decrease proportionately as site size decreases and allowable building coverage increases
  - where communal open space is difficult to accommodate on-site, the adequacy of existing public open space in the area becomes an important amenity factor
  - communal open space may be accommodated on a *podium* or roof provided it creates adequate amenity and access
  - communal open space may be reduced as a trade-off for increased private open space
  - an outdoor children's play area may be required as part of the communal open space.
- Where communal open space is provided, facilitate its use for the desired range of activities by:

The form of this open space is clearly defined and there is good casual surveillance.

- ensuring direct solar access and adequate shading
- consolidating open space on the site into well-defined areas where communal ownership is clear
- ensuring that spaces are of a suitable size, are appropriately landscaped and contain necessary facilities
- locating ventilation duct outlets from basement car parks to avoid contamination, noise and the loss of amenity of open space
- designing for both daytime and nighttime use – well-designed lighting helps ensure that communal spaces are attractive and safe after sundown
- ensuring accessibility for all members of the community.

→ On larger sites, consider providing public open space as it can:

- help integrate a larger development and its residents into an area
- enhance the amenity of a development for residents and the public
- reduce the perceived extent of a development and increase *site permeability*
- link into existing pedestrian and cycling routes (making existing routes more direct where possible)
- add to the amenity value of the entire neighbourhood.

→ Consider whether, for larger developments on specific sites or in specific locations, councils may require or reward public space benefits in the form of public walkways, arcades, plazas and parks.

Rules of Thumb

The area of communal open space required should generally be at least 25 to 30 percent of the site area. Larger sites and *brownfield sites* may have potential for more than 30 percent.

Where developments are unable to achieve the recommended area of communal open space, such as those in dense urban areas, they should demonstrate that residential amenity is provided in the form of increased private open space and/or in nearby public open space.

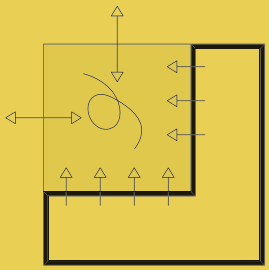
The minimum recommended area of private open space for each apartment at ground level, or for similar space at other levels, such as the roof of a *podium* or car park, is 25m^2; the minimum preferred dimension in one direction is 4 metres (see C6 Private Open Space for other private open space requirements).

When designing open space, think of it as an 'outdoor room' that requires the same amount of careful consideration of design and furnishing as any other room in a development.

Public open space should have the same qualities as a successful street:
- it should connect at least at two points
- it should be overlooked by residential or other active use
- it should generate activity.

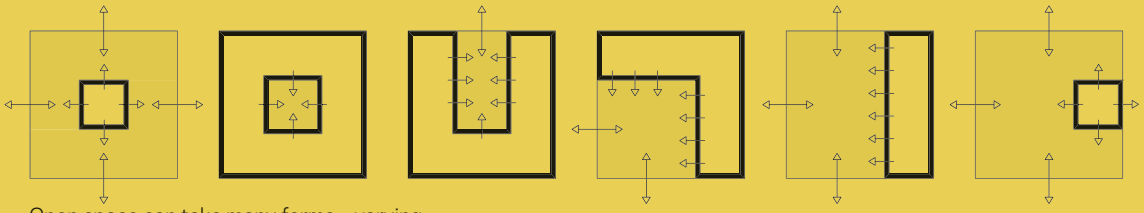
Ensure direct solar access to outdoor open space between March and September and provide appropriate shading in summer.

A2 Open Space



Open space can provide;
1. opportunities for recreation
2. a pleasant outlook for the residents
3. a sense of identity – for both residents and the public.

A2 Forms of Open Space



Open space can take many forms – varying between 'open' and 'enclosed' depending upon the nature of the boundary condition.

Outdoor Space

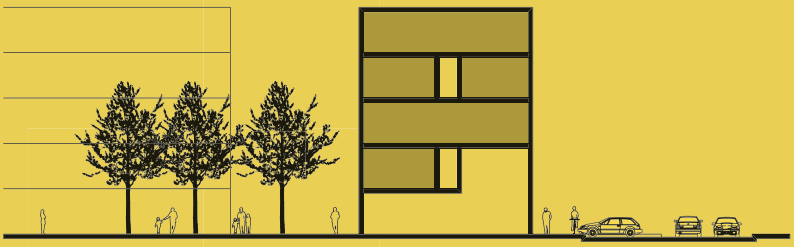
Building

Views can be desirable in both directions.

Views are desirable in one direction only.

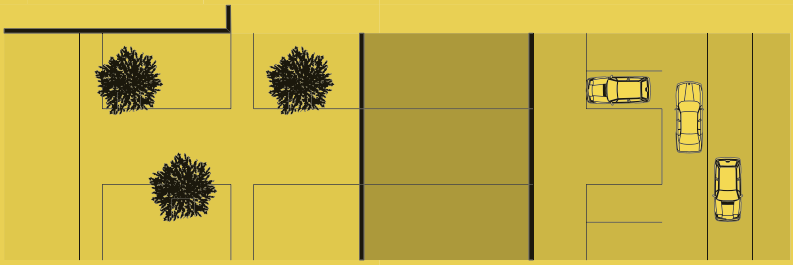
A2 Buildings Separating Open Spaces

Buildings can be used successfully to separate dissimilar types of open spaces.



partially enclosed, 'soft', recreational, communal, outdoor space

open, 'hard', public, outdoor space for traffic routes



A2.1 LANDSCAPE DESIGN: DESIGNING THE OPEN SPACE

Children need some paved open space for playing on bikes etc.

Landscape design covers the planning, design, construction and maintenance of all utility spaces, open spaces and garden areas. It includes hard landscaping (paving, furniture, fences, walls, pools, etc.) and soft landscaping (vegetative material). It is an integral part of the design of a residential development.

Landscape design can influence a development's usability, privacy, social cohesion, accessibility and stormwater management. It should relate to existing natural and cultural features. The long-term management & maintenance of any landscaping must be considered at the design stage.

The fence to the left has been designed to allow separation of private open space from a communal courtyard. Most occupants have used vegetation grown on the fence to give the required amount of privacy.

Communal open space including children's play area connects via stairs to another communal area above.

Objectives

→ To increase residents' quality of life in terms of privacy, outlook and views.

→ To optimise the microclimate, biodiversity, air quality and solar performance within the development.

→ To improve stormwater quality and reduce the quantity of water discharged off-site.

→ To contribute to streetscape character and the *amenity* of the public domain.

→ To design landscaped areas that cater for the potentially significant numbers of children living in apartment developments.

Better Design Practice

→ Improve the amenity of open space with landscape design that:
- provides appropriate shade with trees or structures
- provides direct & *accessible* routes
- screens cars, clothes drying areas, swimming pools, rubbish collection areas and *private open space*
- locates art works for viewing from open space and/or apartments
- provides outdoor play areas for residents' children and storage for their toys.

→ Contribute to streetscape character and the amenity of the public domain by:
- relating landscape design to the desired proportions and character of the streetscape
- using planting and landscaping elements appropriate to the scale of the development – for example to visually soften or break up the bulk of large blocks from the street.

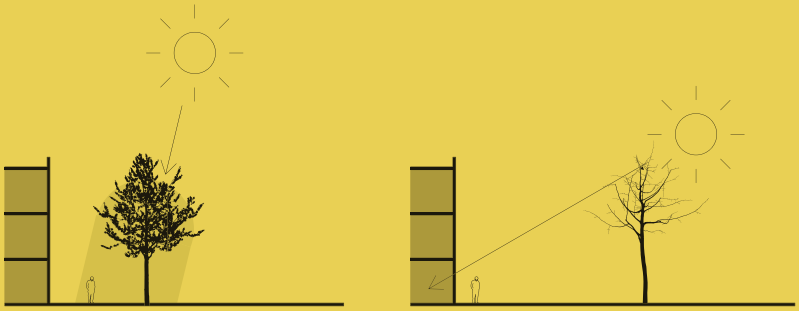
→ Improve the energy and solar efficiency of dwellings and the microclimate of private open spaces by using:
- trees for shading low-angle eastern and western sun
- appropriate trees to avoid unwanted shading of solar collectors
- deciduous trees for shading of windows and open space areas in summer
- evergreen trees well away from windows to permit winter sun access
- pergolas to create shaded areas in summer
- plants appropriately in relation to their size at maturity.

→ Provide opportunities for residents to:
- individualise their landscape
- grow herbs, vegetables or flowers.

→ Design landscape that contributes to the site's positive characteristics by:
- enhancing existing habitat and ecology
- retaining and incorporating trees, shrubs and ground covers endemic to the area, where suitable
- retaining and incorporating changes of level, visual markers, views and significant site elements.

→ Allow landscape design to contribute to water and stormwater management by using:
- plants with low water demand to reduce mains consumption
- plants with low fertiliser requirements to reduce nitrogen discharge into watercourses
- vegetation, permeable surfaces, swales, wetland filter systems and vegetation for stormwater detention and pre-treatment (see A7 Stormwater Management).

→ Minimise maintenance requirements by using robust landscape elements.



Landscape design can improve the interior environment of dwellings & improve the amenity of open space.

A2.2 PLANTING ON STRUCTURES: EXTENDING THE OPEN SPACE

Corten steel planters here contribute to a high quality roof garden.

Planting on structures should maximise the *amenity* of available open spaces such as the rooftops of buildings, *podiums* and car parks. Such planting may include planters (usually as part of a hard landscaped area) or green roofs (larger areas of roof with low vegetation on layers of growing media, filter fabric, drainage material, root barrier and waterproof membrane). Utilising these horizontal open spaces may greatly reduce stormwater discharge from the site and will, particularly in tall, high density structures, improve overall quality of life for residents.

Quality landscape design and open space amenity relies in part on the quality and health of the plants used. As rooftop plants are grown in total containment with artificial soils, drainage and irrigation, they are subject to a range of environmental stresses that affect their health and vigour. As a result, one must carefully consider the environment in which plants are expected to grow, and seek the advice of appropriately qualified professionals.

Objectives

→ To contribute to the quantity, quality and amenity of open space by landscaping on rooftops and podiums.

→ To encourage the establishment and health of vegetation in urban areas in order to improve environmental quality.

Better Design Practice

→ When planning green roofs, consider the following:
- soil depth, volume and area of planting must be appropriate to the size & species of plants and to the desired stormwater functions.
- plant selection must be suited to location, and to climatic conditions such as drying from exposure to wind and sun
- areas must be accessible for maintenance e.g. removing media and tending vegetation.

→ When designing planters, consider the following:
- drainage and the provision & frequency of irrigation
- anchorage requirements of large and medium trees
- structural requirements for support of extra load.

Green roofs can reduce and filter stormwater discharge from the site while providing additional amenity for residents.

This communal terrace on the first floor has a good view over communal landscaped areas below.

Rules of Thumb

Wind, insulation and evapotranspiration on rooftops can create extremely dry conditions that may greatly reduce runoff. When irrigation is required, a reservoir board layer or automatic drip irrigation system may be used.

Smaller shrubs, grasses and succulents (coastal or arid environment species) are more appropriate choices for green roofs given the normally dry conditions and the structural issues associated with larger trees.

A green roof acts as a soil filtration system. Runoff is generally calculated to remove 75% of suspended solids.

Minimum soil depths for planters will vary depending on a number of factors. Soil depths greater than 1.5 metres are unlikely to have any added benefits for tree growth.

The construction effort and cost of a green roof increases with its slope. Below 5° slope is best. Above 5°, rapid runoff must be prevented by increasing the retention capacity of the substrate. Slopes of over 20° require greater measures to avoid slippage or erosion.

Provide square or rectangular planting areas rather than long, narrow areas.

Soil requirements depend upon a number of factors. The following is a guide to minimum standards, and actual project specifications should be developed by an experienced professional.

Large trees (canopy diameter of up to 16m at maturity)
- minimum soil volume 150m^3
- minimum soil depth 1.3m
- minimum soil area 10m x 10m area or equivalent

Medium trees (8m canopy diameter at maturity)
- minimum soil volume 35m^3
- minimum soil depth 1m
- approximate soil area 6m x 6m or equivalent

Small trees (4m canopy diameter at maturity)
- minimum soil volume 9m^3
- minimum soil depth 800mm
- approximate soil area 3.5m x 3.5m or equivalent

Shrubs – minimum soil depths 500-600mm

Ground cover – minimum soil depths 300-450mm

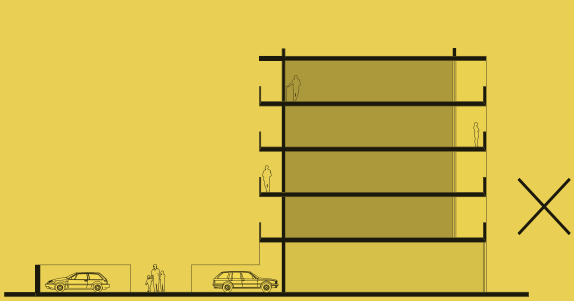
Turf – minimum soil depths 100-300mm

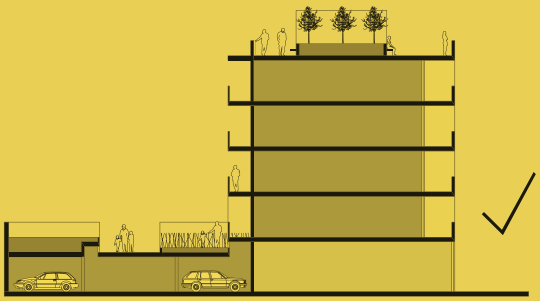
Please note that any subsurface drainage requirements are in addition to the minimum soil depths quoted above.

Further Information: Technical Publication TP10 Stormwater Management Devices: Chapter12 Green roof Design, Construction & Maintenance. Auckland: Auckland Regional Council. www.arc.govt.nz/arc/environment/water/stormwater-tp10.cfm

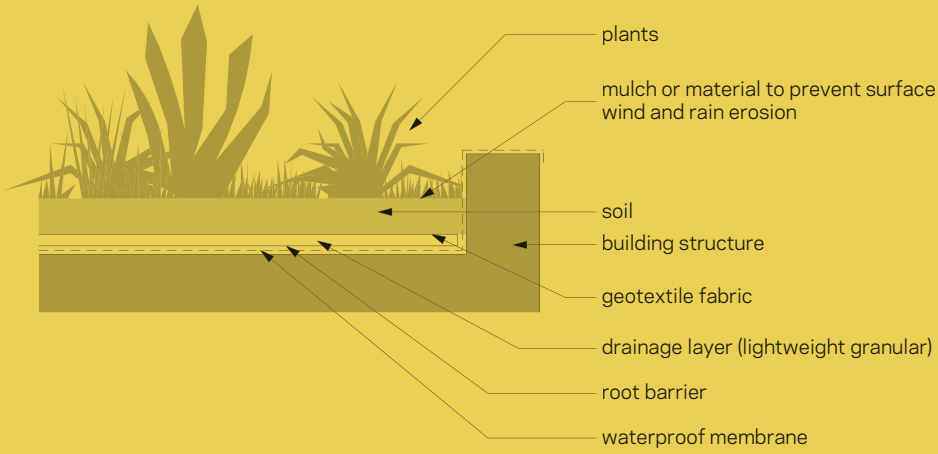
A2.2 Planting on Structures

All horizontal surfaces (such as over car parking areas and rooftops) have the potential to be transformed by planting for the benefit of the whole development: whether to provide a pleasant outlook or leisure and recreation space or reduction of stormwater discharge.





A2.2 Typical Structure of Green Roofs



A3 CONNECTIONS: FOOTPATHS, CYCLEWAYS AND ROADS

A combination of steps and ramps provides a good through-site accessway.

Pedestrian, cycle and vehicle routes should be convenient, safe, pleasant and allow for ease of movement within the development and the adjoining area. The success of a development depends not only upon its functional performance, but also on its contribution to the quality and character of the overall area. As a result, development design should consider circulation routes as a network of connected places rather than as a series of generic ribbon roads.

Car routes should not dominate pedestrian and cycle paths. The key to pedestrian safety is to tame rather than exclude the car. Cars should be slowed and, depending upon the volume of traffic, vehicle routes may be shared with pedestrians and cycles to provide further traffic calming.

An integrated design approach will consider opportunities for linking into existing movement patterns and for creating new, more efficient patterns.

Objectives

→ To create pedestrian and cycle routes that are not dominated by vehicle routes.

→ To create a network of distinctive places rather than standard ribbons of road.

→ To maintain safety and convenience for all types of movement.

→ To integrate the site into existing, external transport and pedestrian routes and facilities.

→ To improve choice among possible routes.

→ To consider parking – see B4 Parking.

Better Practice

→ Keep vehicle routes tight and consider them as a network of individual places/spaces rather than long ribbons of road.

→ Develop a traffic management plan that includes:
- pedestrians – including activities that will take place along the route
- cyclists – on-road or off-road, shared or separated
- public transport – including establishment of new stops where applicable
- vehicles – private (residents, visitors) and commercial (refuse collection and service vehicles)
- parking – vehicles and bicycles
- signage – orientation for visitors
- maximum choice of route without favouring private vehicles over walking, cycling and public transport where routes interact.

→ Integrate the site as much as possible with the external situation. For example:
- link to existing routes and provide through-routes for pedestrians and cyclists
- link pedestrian routes to public transport routes & stops
- make pedestrian, cyclist and vehicle routes work together
- use buildings and open spaces to help control the flow and density of traffic.

→ Emphasise safety and convenience for all routes using:
- direct routes (especially for pedestrians)
- adequate lighting and overlooking.

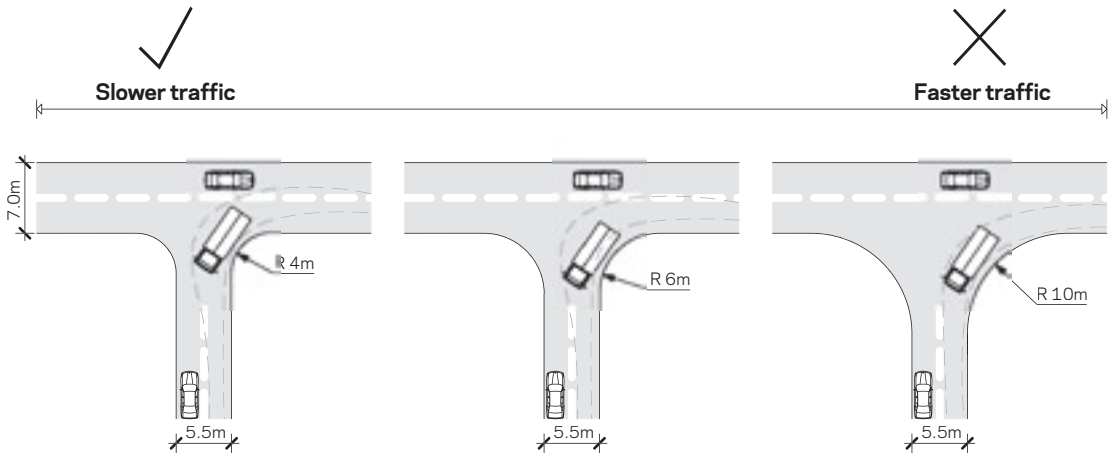
Cars are largely kept out of this public area between apartment blocks. This provides easy circulation for bicycles and pedestrians as well as a safe surface for children to play.

→ Develop site entries and exits that:
- minimise the number & width of vehicle entry/exit points while maximising options for pedestrians and cyclists
- allow direct pedestrian and cycle routes to shops, facilities and public transport stops
- do not read as a gated community from the outside.

Rules of Thumb

Keep road junctions tight to slow traffic and avoid vehicle domination. For a junction from a wider, priority road to a 5.5m-wide non-priority road, a variety of radii will allow a variety of speeds. For example:
- a 4m radius on the junction causes a truck turning the corner to swing out and block traffic on both roads (thus slowing traffic).
- a 6m radius causes the truck to block only traffic on the narrower road.
- a 10m radius allows the truck to turn faster, without affecting other traffic.

Be aware of traffic volume when mixing activities. For example:
- two-way streets with up to 500 vehicles per hour offer pedestrians easy opportunities to cross the road
- two-way streets with 500+ vehicles per hour require provision of specific crossing opportunities for pedestrians.



4m radius – refuse truck turning blocks movement for other vehicles on both main road and side road.

6m radius – refuse truck turning allows movement on main road but blocks movement on side road.

10m radius – refuse truck turning does not block movement for other vehicles.

A4
VEHICLES & PARKING

A narrow one-way road and shared zone for parking reduces the car priority in this development.

Accommodating parking on-site (within a building, underground or *on-grade*) is one of the most difficult issues of site layout because parking may have a significant impact on landscape design, stormwater permeability and management, and the quality of the entire development. Parking can, if poorly designed, overwhelm the best-designed buildings and open spaces, so its overall impact must be handled very carefully.

Although the required amount of parking depends on development controls and the size of the development, parking provision should also be considered in relation to the local context. The location of town centres, public transport facilities, services and recreational facilities within walking or cycling distance may reduce the need for parking spaces.

Vehicle/pedestrian interaction should be carefully analysed and should avoid privileging the car over the pedestrian. Vehicle access should also be carefully considered. The location, type and design of vehicle access points to a development will have a significant impact on the streetscape, the site layout and the building facade design. Vehicle access should be integrated with site planning from the earliest stages of design to avoid conflicts with streetscape requirements and traffic patterns, and to minimise potential conflicts between cars, pedestrians and cyclists.

Parking design must also allow for parking of alternate forms of personal transport such as cycles, motorcycles, micro cars and mobility scooters. Remote storage associated with parking should also be considered (see C8 Storage).

The garage entrance in this development is well integrated into the streetscape.

Car drivers will manoeuvre more slowly and carefully in a shared zone such as this where they don't have clear priority.

Objectives

→ To integrate appropriate car parking and service vehicle access without compromising street character, landscaping or pedestrian amenity and safety.

→ To encourage the active use of street frontages (i.e. not for vehicle access).

→ To provide car and bicycle parking that is adequate for the building's users and visitors, and appropriate to the building type and proximity to public transport.

→ To minimise dependency on cars for commuting and recreational transport and to promote alternative means of transport such as cycling, walking, and public transport.

→ To integrate parking location and design with site and building design.

→ To provide storage facilities that are integrated with parking.

Better Design Practice

→ Increase pedestrian safety and convenience by:
- minimising the width and number of vehicle access points
- ensuring clear sight lines at pedestrian and vehicle crossings
- utilising traffic calming devices
- separating and clearly distinguishing between pedestrian and vehicular accessways
- locating car park entry and exit on secondary streets and lanes.

→ Improve the appearance of car parking and service vehicle entries by:
- visually screening central garbage collection, loading and servicing areas from the street
- recessing car park entries from the main facade line
- avoiding 'black holes' in the facade by providing security doors to car park entries
- ensuring, where doors are not provided, that the visible interior of the car park is incorporated into the facade design and material selection and that the visual impact of building services (i.e. pipes and ducts) are considered
- considering the visual impact of the car park entry recess to the extent that it is visible from the street.

→ Consider the appropriate car parking space requirements in relation to:
- the development's proximity to public transport, shopping and recreational facilities
- the *density* of the development and of the local area
- the site's physical ability to accommodate car parking (as dependent on ground permeability, water table, topography, size and shape of the site, etc.).

→ Give preference to underground parking whenever possible. Design considerations include:
- retaining and optimising the consolidated areas of permeable ground
- facilitating natural ventilation to basement and sub-basement car parking areas, where possible
- integrating ventilation grilles and screening of car park openings into the facade design and landscape design

The availability of public transport links from a development can be a factor in decisions about parking provision.

Parking ranks are broken up here by trees and paving – that also serve to define the building entry.

- if parking is provided under a *podium*, designing the podium itself as landscaped open space (see A2.2 Planting on Structures)
- providing safe and secure access for building users, including direct access to residential apartments where possible
- providing a logical and efficient structural grid, as upper floors, particularly in slender residential buildings, do not necessarily need to replicate basement car parking widths.

→ Where above-ground parking cannot be avoided, ensure that design of the development mitigates any negative impact on streetscape and street amenity by:
- avoiding exposed parking on the street frontage
- hiding car parking behind the building facade, and ensuring wall openings are designed with respect to overall facade scale, proportions and detailing
- 'wrapping' the car parks with other uses, for example, with retail along street edges and parking behind
- locating parking on the side or rear of the lot away from the primary street frontage
- allowing for safe and direct access from parking to building entry points.

→ Incorporate parking into the landscape design of the site by including:
- vegetation between parking bays to ameliorate views
- canopy/shade planting
- interesting paving materials
- screening for communal and *private open space* areas.

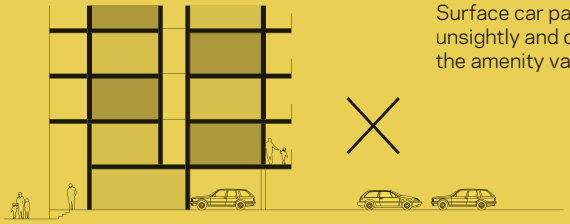
→ Provide private storage areas integrated with private car parking areas and consider including a parking space with a hose and power connection suitable for car cleaning (may be incorporated with a space for delivery/service vehicles).

→ Provide bicycle parking that is secure, weatherproof, and easily accessible from ground level and from apartments.

Rules of Thumb

Generally limit the width of two-way vehicle driveways to a maximum of six metres.

A4 Vehicles & Parking

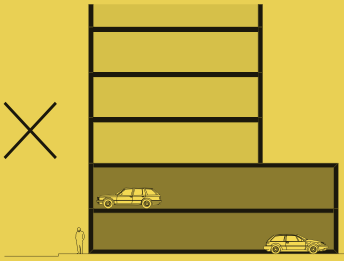


Surface car parks can be unsightly and do not contribute to the amenity value of a development.

Surface car parks can be improved by landscaping that screens vehicles and has direct footpaths to the building entries.

Building over a surface car park can increase the amenity value by providing useable outdoor landscaped areas.

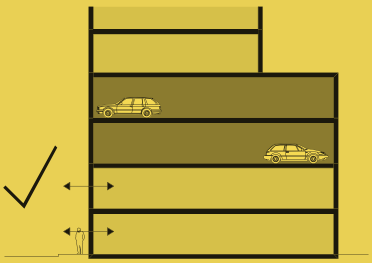
A4 Vehicles & Parking



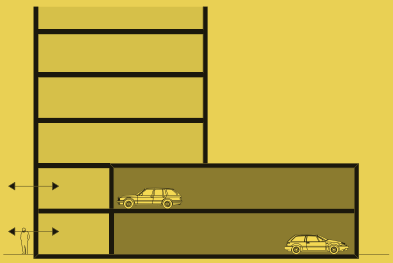
Buildings should provide active street frontages and contribute positively to the street. Car parking should never face directly onto the street.

Car parking should be either:
1. above – at least above the first two storeys,
2. behind
3. or below.

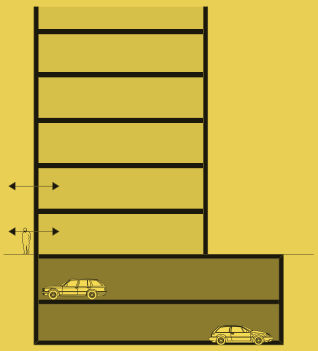
1. above



2. behind



3. below



A5 BOUNDARY CONDITIONS - FENCES, WALLS, SCREENS & PLANTING

A change in level, hedge and non-transparent glass balustrades all contribute to retention of privacy for these ground floor apartments.

In this situation a change in level and a water pond planted with rushes (to the left of photo) is used to define the boundary between the private open space of ground floor units and a public driveway that runs past. Occupants here have used planters and pot plants to increase privacy & further define their territory. Balconies have similarly been adapted with screens for greater privacy.

An important part of good urban design is the careful consideration of boundary elements. Good site design addresses the issue of how the edges of open space interface with buildings, the street and each other. These interfaces often include vertical elements such as walls, fences, screens, planting and changes in level, all of which define spaces and provide privacy.

Boundary design also has an impact on residents' real and perceived safety and security and may strengthen the identity of an apartment development.

Objectives

- To define the edges between public, communal and private open space.
- To define the boundaries between areas within the development that have different functions or owners.
- To provide privacy and security.
- To contribute positively to the public domain.

Better Design Practice

- Respond to the identified architectural character of the street and/or the area. Design considerations may include:
  - materials selection, including ratio of solid to transparent materials
  - height and depth of boundary
  - *vertical and horizontal rhythm* of street face details such as vertical entry elements, boundary markers and fence posts
  - location and frequency of entry openings or gates
  - distance from site boundary (alignment with boundary or 600 millimetres from boundary to provide planting along footpath).

Public circulation areas are separated by a hedge from communal open space for the building on the right.

→ Clearly delineate the private and public domain without compromising safety and security by:
- designing fences and walls that provide privacy and security while not eliminating views, outlook, light and air
- limiting the length and height of retaining walls along street frontages
- locating street-facing entries so that there is a clear view from the street.

→ Contribute to the amenity, beauty and usability of private and communal open spaces by incorporating some of the following into fence and wall designs:
- benches and seats
- planters
- pergolas and trellises
- barbecue areas
- water features
- lighting
- signage
- artwork
- letterboxes
- hidden storage areas for compost, rubbish bins, communal play equipment, etc.

→ Retain and enhance the amenity of & connectivity to the public domain by:
- avoiding continuous lengths of blank walls at street level
- using planting to reduce the scale of and to soften the edge of any street-facing raised terraces, such as over sub-basement car parking.

→ Select durable materials, that are easily cleaned and graffiti-resistant.

Rules of Thumb

Walls, fences and screens taller than 1m on street boundaries should be designed to be permeable.

A6
SITE AMENITY

The design of this open space includes children's play areas, seating, bicycle storage and circulation – all overlooked by apartment balconies.

Because people in apartment developments live in close proximity to their neighbours, occupants risk feeling a sense of overcrowding. The primary cause of this is a lack of visual and acoustic privacy. As a result, privacy issues must be carefully addressed in a development's design stage. Similarly, individual desires for privacy must be balanced with potentially conflicting communal desires for safety and security through *casual surveillance*.

A6.1 VISUAL PRIVACY

Planting will soon grow over the screen to provide added privacy for the ground floor apartment from the building entrance area. The garden provides added separation from the public footpath.

Visual privacy measures should aim to increase residents' privacy within all interior spaces and private open spaces without compromising views, outlook, ventilation, solar access or the functioning of internal and external spaces. The consideration of visual privacy requires an understanding of the adjacent context, the site configuration and topography, and the development's scale and layout.

→ Degrees of privacy are influenced by:
- the activities that take place in areas where overlooking may occur
- the times at which and frequency with which these spaces are being used
- the degree of proximity between areas
- the occupants' expectations of privacy and their ability to control overlooking with screening devices.

Objectives

→ To provide reasonable levels of external and internal visual privacy at all times of day and night.

→ To maximise views from principal rooms and private open space without compromising visual privacy.

Curtains provide additional privacy options both to the side and to the front of balconies.

Balustrades in this building are not providing sufficient privacy for some residents.

Better Design Practice

→ Locate and orientate new development to maximise visual privacy between buildings on the development site and adjacent sites by:
- utilising the site layout to optimise building separation
- offsetting openings in new buildings from those in neighbouring buildings
- orientating new building blocks so that they do not directly face neighbouring buildings.

→ Consider potential future development on adjacent sites.

→ Design building layouts to minimise direct overlooking of adjacent rooms and private open spaces by:
- screening balconies and ground level private open space
- separating, offsetting or screening apartment windows from communal open space, common areas and circulation routes
- introducing a change in level between ground floor private space (both indoor and outdoor) and the public domain or communal open space (see C7 Ground Floor Apartments)
- angling adjacent blocks so that they do not directly face each other.

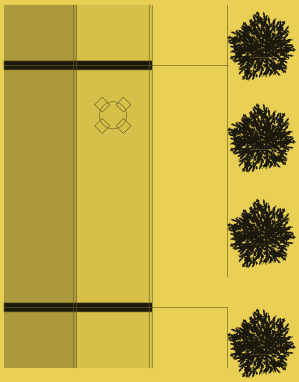
→ Use detailed site and building design elements to increase privacy without compromising access to light and air. Design options may include:
- offset windows or balconies on elevations that face each other
- recessed balconies and/ or vertical fins between adjacent balconies
- solid or semi-solid balustrades on balconies
- louvres or screen panels on windows and/or balconies
- fencing (see A5 Boundary Conditions)
- vegetation as a screen between spaces
- incorporation of planter boxes into walls or balustrades to increase the visual separation between areas
- utilisation of pergolas or shading devices to limit overlooking onto lower apartments and their private open space.

Rules of Thumb

Apartments with unscreened living areas directly facing each other should be at least 15m apart.

There is no standard measurement for angling of facing elevations in order to provide visual privacy but sight lines should be overlaid on plans and sections to ascertain the level of privacy that will be achieved.

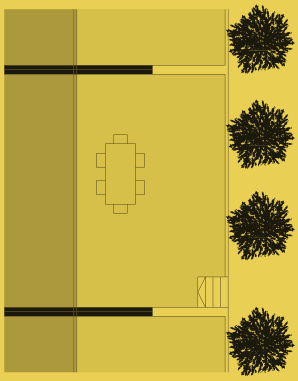
A6.1 Visual Privacy



upper floors

Ways of increasing privacy on upper floors can include;
- solid balustrades
- recessed balconies

The need for visual privacy should be balanced against other issues such as the need for casual surveillance and a sense of openness.



ground floor

Ways of increasing privacy on ground floors can include;
- planting
- raised ground floor
- solid balustrades
- extended outdoor space and extended party walls

In the example above, the ground floor is raised an excessive amount and the wall enclosing the outdoor space is excessively high, creating an undesirably high, blank wall to the communal area.

section

In the example above, the ground floor is raised above the footpath level thus reducing the excavation required for the basement garage.

A6.2 SAFETY & SECURITY

An outdoor area with good lighting and well overlooked by apartments.

A built environment will not only influence people's perceptions of safety and security, but will create or impede actual opportunities for crime. Good design can achieve a great deal in terms of ensuring safety and security. This may make it unnecessary to implement organised (e.g. security guards & patrols) or mechanical (e.g. burglar alarms & closed circuit television) security measures. Furthermore, a development that is safe and feels safe attracts people, activity and investment.

Designing for safety and security means:
- **enabling *casual surveillance* of communal/public areas from both public and private areas**
- **managing access by providing safe entry, circulation and exit, and by restricting entry to some areas**
- **clearly defining boundaries and encouraging a sense of community ownership**
- **maintaining the development to convey community care and attention.**

Objectives

→ To ensure residential developments are safe and secure for residents and visitors, and are perceived as such.

→ To contribute to the safety of the neighbouring public domain.

Better Design Practice

→ Improve the opportunities for casual surveillance by:
- locating windows and balconies to provide views onto the street or other open spaces
- orientating living areas to have views over public or communal open spaces
- locating family-friendly units to overlook communal outdoor play areas
- using corner windows, bay windows and balconies that project beyond the main facade to enable a wider angle of vision to the street
- providing casual views of common internal areas, such as lobbies and foyers, hallways, recreation areas and car parks
- creating clear sight lines through the development
- providing good lighting in communal areas.

→ Reinforce the development's boundary to strengthen the distinction between public and private spaces. Boundary definition may be actual or symbolic and may include:
- employing a level change at the site and/or building threshold (subject to accessibility needs)
- signage
- entrance canopies
- fences, walls, screens and gates
- changes in paving materials between the street and the development.

→ Optimise the visibility, functionality and safety of pedestrian entrances by:
- orientating entrances towards the main street
- providing clear lines of sight between entrances, foyers and the street
- providing direct entry to ground level apartments from the street rather than through a common foyer
- providing direct and well-lit access between car parks, lift lobbies and all unit entrances.

→ Minimise opportunities for concealment by:
- avoiding blind or dark alcoves near entrances, lifts and stairwells, and within car parks, corridors and walkways
- providing well-lit routes throughout the development
- providing appropriate levels of illumination for all common areas

Bay windows and balconies help provide better casual surveillance of the street.

- providing illumination higher than minimum acceptable standards to car parks and entrances.

→ Control access to the development by:
- making apartments inaccessible from the balconies, roofs and windows of neighbouring buildings
- separating the car parking for the residential component of a development from the parking for other uses, and controlling residential car park access from public and common areas
- providing direct access from residential car parks to apartment lobbies
- providing separate resident access in mixed-use buildings
- providing an audio or video intercom system in entrances or lobbies for residents to communicate with visitors
- providing key-card access for residents.

→ Provide a well-maintained environment that discourages crime by:
- ensuring that management and maintenance systems are operational and that any vandalism is promptly repaired
- ensuring that the design facilitates maintenance
- using materials and fixtures that are wear- and vandal-resistant.

Rules of Thumb

The more windows overlooking public and communal spaces, the better.

Crime and antisocial behaviour are more likely to occur if:
- pedestrian routes are indirect, poorly lit, and away from traffic
- streets, footpaths and alleyways provide access to the rear of buildings
- circulation through the development allows people to become easily lost or disorientated
- places are untidy or unattractive, giving the impression that residents/ management tolerate disorder and crime.
- signs of disorder and neglect, such as broken windows, abandoned vehicles or graffiti, are not removed at the earliest opportunity.

Further Information: Design Against Crime – Annexure 16: Auckland City Council Central Area District Plan. Auckland City Council.

National Guidelines for Crime Prevention through Environmental Design in New Zealand. Wellington: Ministry of Justice, 2005.

www.justice.govt.nz/pubs/reports/2005/cpted-part-1/index.html

A7 STORMWATER MANAGEMENT

Stormwater from this site is collected and percolates down through stepped levels of reed beds that filter suspended particles and contaminants.

Stormwater is the rainwater runoff from buildings and the areas surrounding them. The main goals of stormwater management are to minimise runoff (particularly at peak times) and to prevent the discharge of pollutants/ contaminants (suspended in the runoff) into the environment. The design and implementation of appropriate management practices during construction, and during the life of the building, can reduce the potentially significant impact of development upon natural waterways.

During construction, the predominant stormwater issue is the movement of eroded sediment into natural aquatic environments. After construction, the primary concern is the increase in runoff from impermeable surfaces and the suspended pollutants contained in this runoff.

In the past, stormwater management has simply meant stormwater disposal. However, a new approach called "low impact design" seeks to minimise harmful effects on the total water cycle by preventing stormwater runoff from ever becoming a problem. Low impact design also seeks to avoid the expense and long-term ineffectiveness of commonly used structural solutions to stormwater runoff.

Objectives

- To minimise stormwater volumes and flow rates from urban developments and to maximise the amount of runoff dealt with on-site.
- To minimise the discharge of sediment and other pollutants/contaminants to the urban stormwater drainage system, both during and after construction.
- To minimise the impact of residential development and associated infrastructure on natural waterways.
- To preserve existing topographic and natural features, including watercourses and wetlands.
- To consider and design for maintenance of systems at an early stage of development.

Stormwater reticulation incorporated into landscape design.

Better Design Practice

→ Reduce the impact of stormwater on infrastructure by retaining it on-site. Design solutions may include:
- minimisation of impervious areas by using permeable or open pavement materials
- retaining roof/balcony runoff for landscaped water features or for reuse in activities such as toilet flushing, car washing and site irrigation
- green roofs (see A2.2 Planting on Structures)
- replacement of formal drainage systems (pipes) with vegetated flowpaths (grass swales), infiltration or biofiltration trenches and subsoil collection systems
- water pollution control ponds or constructed wetlands (on larger developments).

→ Protect stormwater quality by:
- providing appropriate water quality treatment systems (such as settlement basins and biofiltration practices)
- selecting appropriate building materials.

→ Utilise erosion and sediment controls during construction to reduce sediment discharge from the site by:
- minimising the area of site disturbance and earthworks
- incorporating appropriate vegetation into landscaping
- creating stable flowpaths to convey water at non-erosive velocities
- utilising sediment and erosion control measures such as silt fences, sediment ponds and mulching.

→ Provide a maintenance plan that considers:
- actions required for maintenance of the system
- frequency of inspections.

Rules of Thumb

Steep slopes contribute a disproportionately large level of sediment for the area disturbed.

Sand and gravel erode more easily than silt and clay, but silt and clay, once in suspension, are difficult to trap with sediment control practices.

The most harmful contaminants in urban stormwater are suspended solids, a range of heavy metals, organochlorines, polynuclear aromatic hydrocarbons and human pathogens.

Further Information: The stormwater section of ARC website includes a large amount of information:

www.arc.govt.nz/arc/environment/water/stormwater/stormwater_home.cfm

For more specific information, see:

On-site Stormwater Management (OSM) Manual. Auckland City Council. www.aucklandcity.govt.nz/council/documents/onsite/default.asp

Auckland Regional Plan: Sediment Control. Auckland Regional Council. www.arc.govt.nz/arc/library/z22953_2.pdf

Technical Publication TP10 Stormwater Management Devices. Auckland Regional Council. www.arc.govt.nz/arc/environment/water/stormwater-tp10.cfm

Technical Publication TP124 Low Impact Design Manual. Auckland Regional Council. www.arc.govt.nz/arc/environment/water/stormwater/low-impact-design.cfm

Or contact: Auckland Regional Council: Sediment Control Team, telephone 09-366 2000.


B-

SECTION B: THE BUILDING

B1 BUILDING TYPOLOGIES

Characteristics that define an apartment building typology include:
- **type of access to apartments (individual access, horizontal access, vertical access)**
- **height/number of storeys (usually low-rise up to 4/5 storeys, high-rise from 6 storeys up)**
- **physical shape (long block, short block, perimeter block, courtyard, point block, tower)**
- **position of the building on the site (street front, rear of site).**

During the design process, building typologies are adapted to a building design that is site- and context-specific. Building typologies will be dependent upon the apartment typologies chosen and vice versa (see C1 - Apartment Typologies).

A mix of building typologies should always be considered as an option for an apartment development. This allows for the most appropriate response to varied conditions on the site (e.g. low-rise terrace-type buildings facing existing detached houses on an adjoining site, with taller buildings in the centre of the site) while also increasing diversity of housing choice.

B1.1 INDIVIDUAL ACCESS

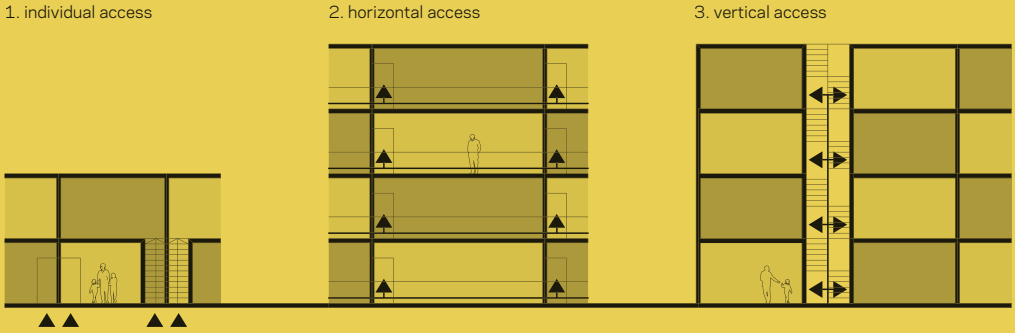
Individual access apartments are entered directly from an exterior area rather than from a common circulation route. This configuration is usually used in low-rise buildings where apartments are directly entered from outside (sometimes up private entry steps), or in taller buildings for the lowest level of apartments. Individual entries are generally limited to one to two levels above ground because of the cost and space requirement of individual staircases and lifts.

Individual access buildings are desirable because:
- **they give occupants a greater sense of privacy than in buildings where one must enter through a common area**
- **people used to living in detached homes may find this added privacy more familiar**
- **multiple entries animate & articulate the face of a building.**

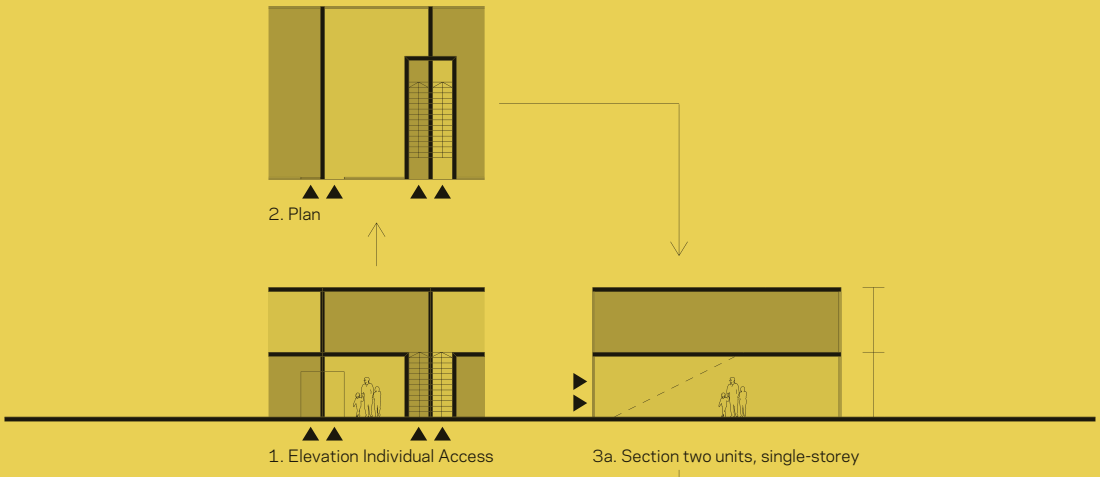
Further Information www.housingprototypes.org

B1 Building Access Types

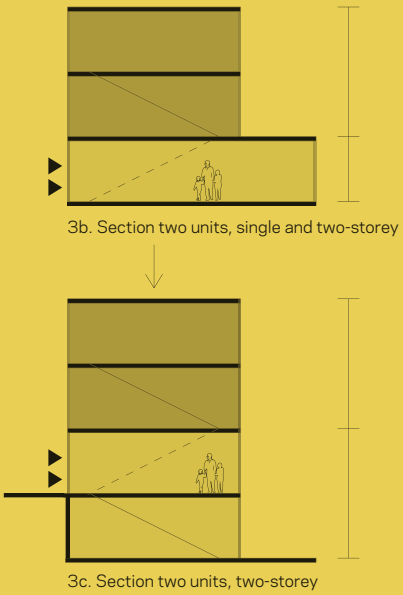
The access system can be used to classify an apartment building as one (or more) of the following:



B1.1 Individual Access



The options for Individual Access can be combinations of single-storey and two-storey units (3a, 3b, 3c).



B1.2 HORIZONTAL ACCESS

These horizontal access decks have been pulled away from the building face to give extra privacy and light to this side of dual aspect apartments.

In a horizontal access building apartments are accessed from a horizontal corridor that is either external or internal. Horizontal access may utilise single-loaded or double-loaded corridors, as well as a variation of these known as *Skip-Stop*.

Single-Loaded Corridor

→ In a single-loaded corridor situation, the apartment block is one apartment deep, and apartments are accessed from one side of a corridor that runs along the external face of the building.

→ Benefits of a single-loaded corridor include:
- all apartments may address a preferred view or orientation
- all apartments may turn their back on undesirable acoustic or visual intrusions
- cross-ventilation of apartments is possible if access is on the exterior of the building
- because it is on the exterior face of the building, the corridor may be naturally lit and therefore more pleasant than the corridor in a double-loaded building.

→ Drawbacks of a single-loaded corridor may include:
- circulation area per apartment is usually greater than for double-loaded corridors
- pairing external single-loaded corridors with dual aspect apartments may lead to a conflict between apartment privacy and common access at the corridor end of the apartment (see page 71).

Double-Loaded Corridor

→ In a double-loaded corridor situation, apartments are accessed from both sides of an internal corridor. All apartments along the corridor are necessarily single aspect. This results in a deeper building block than that of a single-loaded corridor building.

→ Benefits of a double-loaded corridor include:
- more economical than a single-loaded corridor because there is typically less corridor space per apartment.
- may lead to more apartment variety and therefore greater diversity of housing choice

→ Drawbacks of a double-loaded corridor include:
- corridor must run north-south in order to have no south-facing apartments
- cross ventilation of apartments is more difficult
- internal corridors require artificial lighting and ventilation.

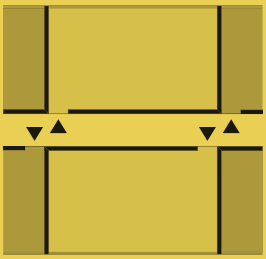
Skip-Stop Corridors

→ Another variation of corridor system is the arrangement in which a horizontal corridor does not occur at every level and, as a result, the lift skips a floor – hence the term 'skip-stop'.

→ Benefits of a skip-stop corridor arrangement include:
- a variety of apartment types can be used within a single block
- dual aspect apartments may be combined with double-loaded corridors by having the dual aspect apartments on non-corridor floors.
- minimal common circulation space per apartment.
- the potential for further variations, such as having a corridor on every third floor, or using split-levels and having a half-level of stairs up or down from the corridor.

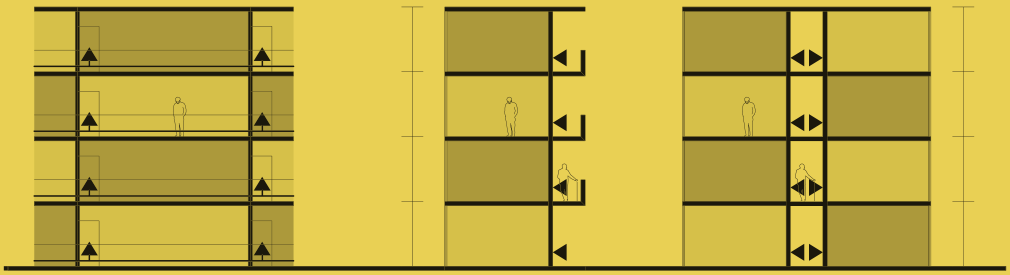
→ A drawback of a skip-stop arrangement can be that resulting two-storey apartments require individual internal circulation which can add cost and increase the space required.

B1.2 Horizontal Access



2b. Plan: double-loaded corridor

2a. Plan: single-loaded corridor

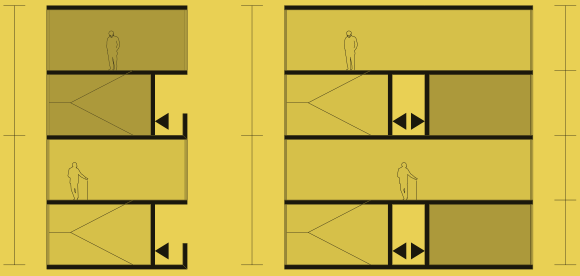


1. Elevation: Horizontal Access

3a. Section:
single-loaded corridor

3b. Section: double-loaded corridor

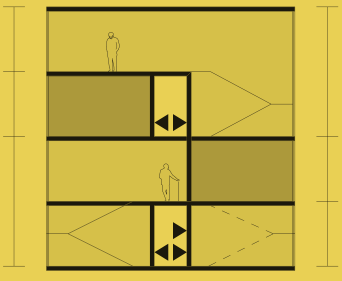
Horizontal access can be divided into single-loaded corridors (2a, 3a, usually external) and double-loaded corridors (2b, 3b). A further variation is the skip-stop arrangement (4a, 4b, 5b).



4a. Section:
single-loaded corridor

4b. Section: double-loaded corridor

The skip-stop arrangement (4a, 4b) allows for a variety of apartment types – single-storey and two-storey, single aspect and dual aspect – within a repetitive structural system.



5b. Section: skip-stop arrangement

Further variation with skip-stop arrangement.

B1.3 VERTICAL ACCESS

Vertical access here serves four corner aspect apartments on each floor.

In a vertical access building, apartments are accessed directly from the vertical core of the building that contains common stairs and lifts. A building with a single core is called a 'point-block' building, or a tower. A vertical access building with a number of vertical cores is called a 'long-block' building. In this type of building, the cores are often expressed on the elevation as architectural elements or placed at internal corners or junctions where there is less external wall available for apartments.

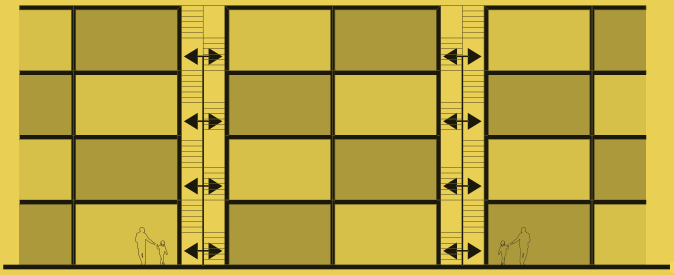
A variation on the 'point-block' arrangement is to slightly extend the circulation space outside the lift and stair core (essentially a short corridor) so that additional single aspect apartments per floor may be accessed from the same core.

→ Benefits of vertical access include:
- cores may be internal or external to the building and, if external, may be enclosed or open
- the core is a space conducive to social interaction among residents as it serves relatively few apartments per floor
- vertical cores may become strong architectural elements that visually reduce the scale of a long building
- a mix of single, corner and *dual aspect apartments* can be accommodated on a single floor, allowing a diversity of plans.

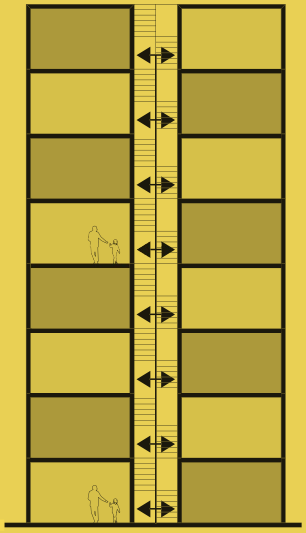
→ A drawback of a vertical access arrangement can be that logical repetition of the same plan on each floor can produce little variety of apartments within a building.

B1.3 Vertical Access

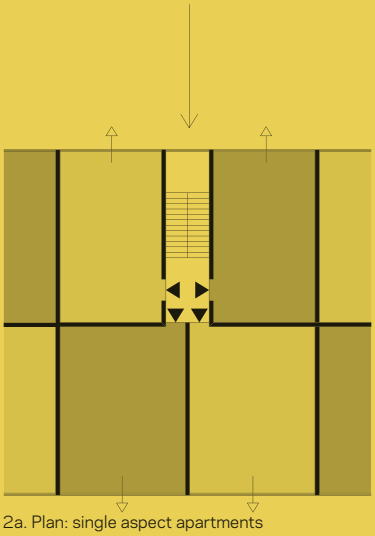
A vertical access arrangement can consist of a single vertical circulation core or multple vertical circulation cores.
a. Slab block with multiple circulation cores, below.
b. Point block with a single circulation core, right.



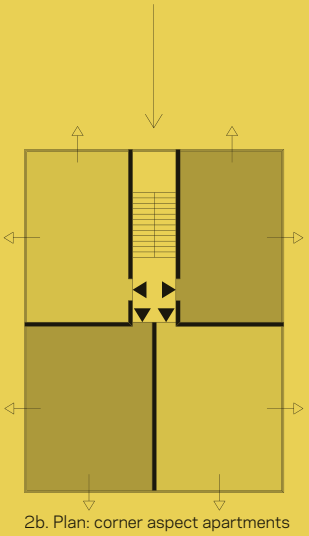
1a. Elevation: Vertical Access



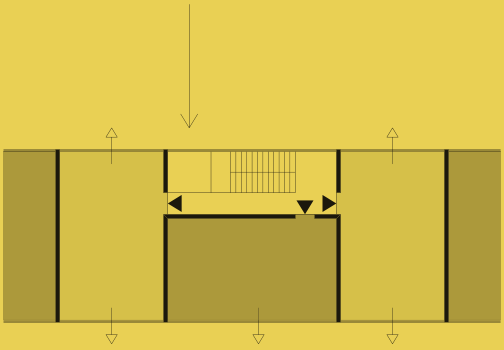
1b. Elevation: Vertical Access



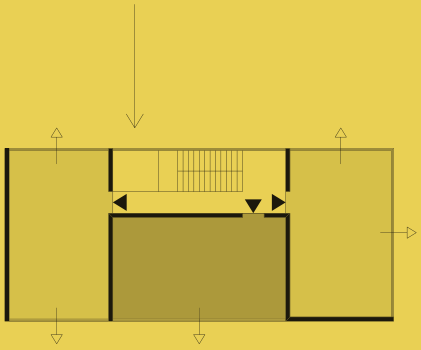
2a. Plan: single aspect apartments



2b. Plan: corner aspect apartments



3a. Plan: a mix of single aspect and dual aspect apartments can be used on each floor



3b. Plan: a mix of single aspect, dual aspect and corner aspect apartments can be used on each floor

B2 BUILDING ENTRY

The corner location, generous steps and large canopy all help clearly signal the entry to this apartment development.

A building's entrance is the threshold between exterior and interior that can mark arrival and allow a moment of pause. An entrance may lead into a common entry foyer or directly into the private space of an apartment. Where a building borders the street, its entrance provides an interface with the public domain, and therefore contributes to the overall identity of the development.

Objectives

→ To create entrances that establish a desirable residential identity for the development.

→ To orientate the visitor.

→ To contribute positively to the streetscape/landscape and building facade design.

→ To provide functional and safe common areas.

Better Design Practice

→ When designing street entries, improve the presentation of the building by:
- locating entries so that they relate to the existing street and subdivision pattern, street tree planting and pedestrian access network
- making the entry a clearly identifiable building element
- using multiple entries (i.e. main entry plus private ground floor apartment entries) to animate the street edge and create a rhythm of openings along the street
- ensuring that the entrance space is of an appropriate size and scale for the building.

→ Clearly define transitions between the outside, common circulation areas and the private apartment.

→ Ensure equal access for all (see B3 Pedestrian Circulation and Accessibility).

→ Provide safe and secure access by:
- avoiding ambiguous and publicly accessible blind spaces near entries
- providing a direct physical and visual connection between the street and building entry
- providing a clear line of sight between one circulation space and the next
- providing sheltered, well-lit and highly visible spaces in which to enter the building, meet visitors and collect mail.

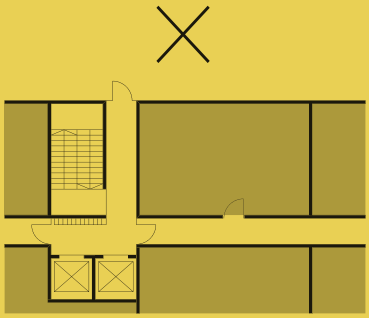
→ To avoid conflict provide separate entries, especially from the street, for:
- pedestrians and vehicles
- different uses (residential and commercial uses in a mixed-use development)
- ground floor apartments, where applicable (see C7 Ground Floor Apartments)
- recycling, waste collection and removal (see B4 Building Performance).

→ Ensure that entries and their associated circulation spaces are of an adequate size to allow movement of furniture between public and private spaces.

→ Make mailboxes safe and convenient for residents and ensure that they do not clutter the appearance of the development from the street by:
- locating them adjacent to the major entrance and integrating them into a wall
- setting them at 90 degrees to the street, rather than facing it
- allowing mail to be picked up from a common collection area
- making the public side of mailboxes vandal-resistant.

→ Provide clearly visible orientation signage in character with the building and the context.

B2 Building Entry

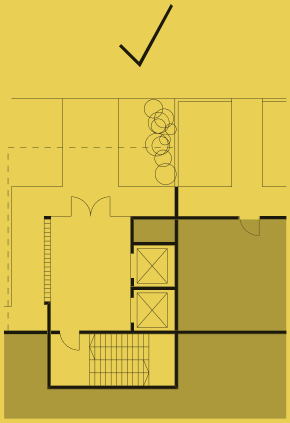


Narrow entrance with no presence and blind corners

No canopy

Mailboxes inconveniently located opposite lifts and conflicting with narrow circulation route

Internal corridors to ground floor apartments that could have direct street access



Generous, safe entrance contributes positively to the streetscape and the building facade

Canopy marks entry and provides shade and protection from rain

Mailboxes unobtrusive from street and conveniently located

Ground floor apartments have direct access from the street

B3 PEDESTRIAN CIRCULATION AND ACCESSIBILITY

Ramps allow bicycles and prams to be pushed up and down stairs more easily.

Designing for pedestrian access should focus on delivering safe and pleasant walking environments. Achieving this goal requires a viewpoint that is person-centred rather than just vehicle-centred. Pedestrian access should also be equitable access, providing a barrier-free environment where all people who live in and visit the development can access apartments, communal areas and open spaces.

Lobbies, stairs, lifts and corridors make up the circulation spaces within a building. The location, proportion, and frequency of these elements have a direct relationship with the building's form, layout and *articulation*. Important design considerations include safety, amenity and durability.

Objectives

- To create safe, pleasant and convenient spaces for the circulation of people and their personal possessions.
- To contribute positively to the form and *articulation* of the building facade and its relationship to the urban environment.
- To encourage interaction among residents, to contribute to a sense of community and to improve perceptions of safety.
- To create residential buildings that are well connected to the public domain.
- To ensure that residents and visitors, along with their strollers, wheelchairs and mobility scooters are able to enter their apartment and use communal areas via minimum grade ramps, paths, access ways or lifts that are integral to the overall development design.

Better Design Practice

- Utilise the site and site planning to optimise accessibility to buildings.
- Provide *accessible* routes to public and semi-public areas of the building and the site, including major entries, lobbies, communal open space, site facilities, parking areas, public streets and internal roads.
- Promote equitable access by:
  - ensuring the main building entrance is accessible from outside the development and from car parking areas
  - integrating ramps, where necessary, into the overall building and landscape design.
- Design ground floor apartments to be accessible from outside and from their associated private open space (see C7 Ground Floor Apartments).
- Maximise the number of *accessible, visitable* and *adaptable apartments* in a development.
- Increase amenity and safety in circulation spaces by:
  - providing generous corridor widths and ceiling heights, particularly in lobbies, outside lifts and apartment entry doors

Atrium provides natural light to accessways and communal recreation space at ground floor.

Level building access with disabled parking in close proximity.

- avoiding tight corners so as to allow easy movement of furniture
- providing appropriate levels of lighting, including the use of natural daylight where possible
- minimising corridor lengths to give short, clear sight lines
- providing legible signage noting apartment numbers, common areas and general wayfinding
- offsetting apartment entries in a double-loaded corridor to increase privacy
- providing adequate ventilation
- allowing *casual surveillance* from other areas.

→ Design buildings with multiple cores in order to:
- increase the number of entries along a street
- increase the number of vertical circulation points
- allow greater articulation of the facade
- limit the number of units per level accessed off a single circulation core in order to aid recognition and interaction between occupants.

→ Articulate longer corridors by:
- including a series of foyer areas
- providing windows along or at the end of a corridor.

→ Minimise maintenance and maximise durability by using robust materials in common circulation areas.

→ Integrate common circulation areas with common open space.

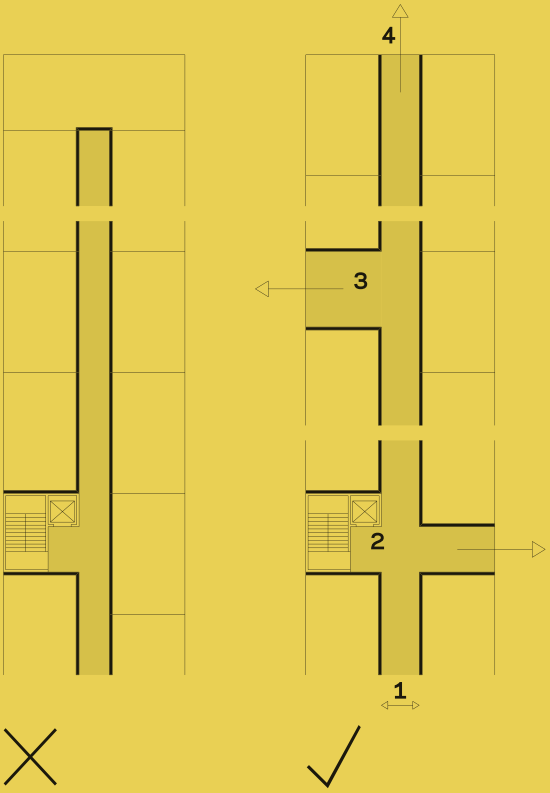
Rules of Thumb

Provide barrier-free access to at least 20 percent of dwellings in a development.

To facilitate occupants recognising and remembering other occupants, limit the number of units accessed from a single corridor (horizontal access) or from a single vertical core (vertical access) to eight.

Corridor widths in common areas should be a minimum of 2m to allow people to easily pass each other.

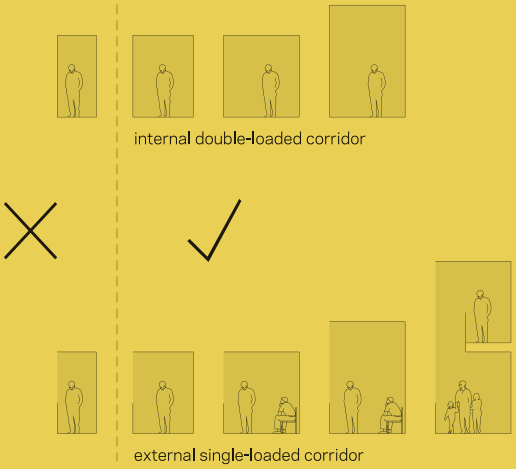
B3 Circulation



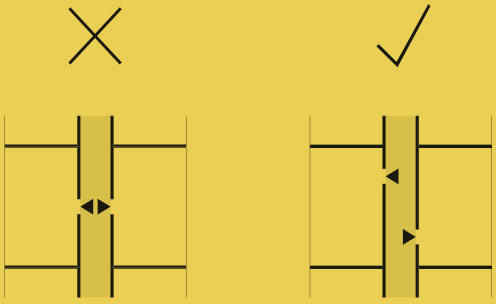
Circulation space is also communal space; it should do more than just deliver residents to their apartments efficiently. Circulation spaces should facilitate interaction and allow a sense of community to develop. Opportunities to increase the amenity value of circulation areas include providing:
1- more generous corridor widths
2- more generous waiting areas outside lifts
3- a series of foyer areas on longer corridors
4- windows at the end of a corridors

Connection of the circulation space to the exterior allows for daylight access and natural ventilation, thus reducing the need for artificial illumination and mechanical ventilation, and therefore overall energy consumption.

A small increase in width or height can dramatically affect the amenity of the circulation spaces.



A small increase in corridor width or ceiling height can have a dramatic effect upon amenity and sense of space within the circulation areas. This in turn can influence the feeling of quality within the development.



Offsetting apartment entrances across a corridor provides some privacy and personal space for residents at the junction between communal circulation space and private apartment.

B4
BUILDING PERFORMANCE

B4.1
BUILDING ENVELOPE

The building envelope can have a major effect on both the surrounding environment's character and the interior physical environment.

The building envelope is the skin of the building. It consists of the external walls, doors, windows, roof and lowest floor of the building. It has the important functional role of ensuring internal spaces are healthy and pleasant environments for the inhabitants, as well as contributing to the image and character of the building within the public realm.

The building envelope must balance ventilation and daylight requirements while providing moisture and thermal protection appropriate to the climatic conditions of the site. It is a major factor in determining the operational energy use, and therefore the lifecycle costs, of a building. The success of the building envelope depends upon selection of appropriate materials and components, and how these are brought together. Also increasingly important today is the source and manufacturing processes of the materials involved.

Consideration should be given to provision of higher levels of quality than New Zealand Building Code (NZBC) minimums, as many environmental and economic benefits can accrue over the life of the development.

Objectives

- To achieve a high level of construction quality in apartment developments.
- To enhance buildings' performance and amenity for occupants.
- To enhance the desired character of the area.

Better Design Practice

- Use durable, low-maintenance materials that are compatible with each other and will weather well. This will minimise maintenance costs and enhance the image of the development and the surrounding area.
- Avoid unnecessary external painting that will require regular maintenance.
- Coordinate and integrate building service elements, such as drainage pipes, grilles, screens, ventilation louvres and car park entry doors with overall facade and balcony design.
- Ensure a weathertight envelope and consider using cavity wall construction, even when not required by NZBC, to reduce risk of water damage over the longer term.

Junctions, especially between dissimilar materials, require a commitment to careful detailing.

External fixtures are used here to provide both sun protection and privacy.

→ Ensure correct deflection and drainage of rainwater and drying of the envelope for better weathering, to avoid unnecessary staining, and to reduce cleaning and maintenance.

→ Design the building envelope to ensure a healthy and comfortable environment inside the building by:
- providing sufficient daylight access
- allowing controllable natural ventilation through the use of adjustable vents or operable windows
- insulating walls, floors and ceiling above minimum standards in order to reduce long-term heating and cooling costs
- draught-proofing around external openings to reduce unnecessary heat loss
- double-glazing external windows and doors to improve the acoustic and thermal performance of the envelope
- providing an accessible connection for all residents to their private open space (see C6 Private Open Space).

→ Increase the efficiency of the building and reduce lifecycle costs by:
- designing facades using environmental control elements such as sun shading, light shelves and bay windows that suit facade orientation
- using high-mass elements to absorb solar gain during the day and release heat to internal spaces in the evening (elements must receive adequate direct sunlight)
- using green roofs to contribute positively to on-site stormwater management and to maximise the amenity value of horizontal surface such as rooftops and podiums (see A2.2 Planting on Structures)
- using solar panels to harness solar energy for water heating or electricity generation
- choosing materials and colours that reflect or absorb radiant heat where required.

→ Building fixtures such as TV aerials and sky dishes can compromise the building envelope in terms of weatherproofing and aesthetics. Ensure that the position and attachment details of such building fixtures are considered in the early design stages. Incorporating equipment to be shared by all occupants will avoid duplication of equipment by individual occupants.

B4.2 ENERGY EFFICIENCY

The use of folding glazed panels and high-mass structure allows these balconies to act as heat stores in colder months.

The ability of an apartment development to optimise thermal performance, thermal comfort and daylighting will contribute to the energy efficiency of buildings, provide increased amenity to occupants and reduce greenhouse gas emissions and, with them, the cost of supplying energy. The increased public awareness of green issues and potential energy use certification of apartments (as in Australia) should continue to make this an important aspect of apartment design.

Aspects of energy use to consider for apartment developments are:
- **building envelope**
- **space heating & cooling**
- **water heating**
- **lighting**
- **appliances**

Objectives

- To reduce energy use in order to reduce running costs, reliance on fossil fuels and greenhouse gas emissions.
- To provide a more comfortable internal environment for occupants.
- To use building materials that do not contaminate the environment and that come from sustainable sources.
- To ensure that required inspections and maintenance regimes are in place for any use of energy efficient technology.
- To utilise sustainable construction materials and methods.

Better Design Practice

- Reduce energy use in apartments by:
  - individually metering utilities for each apartment to encourage energy saving
  - including (private or at least common) areas for clothes to be dried by natural ventilation.
  - optimising daylight access and natural ventilation, reducing the need for energy-reliant alternatives.
  - reducing apartment depth, thus providing more solar access and minimising the number of internal rooms (see C2 Apartment Layout) that do not receive sunlight
  - providing draught-proofing measures around openings
  - providing greater levels of insulation than code minimums
  - using timed switches or movement sensors for common area lighting
  - providing operable windows that allow cross ventilation.

Refurbish, adapt and reuse existing buildings instead of demolishing them.

→ Reduce reliance on artificial lighting by:
- providing a mix of lighting fixtures, including dimmable lighting, to allow for a range of light level requirements (for example, low background lighting supplemented by task or effect lighting as required)
- using separate lighting circuits for flexibility of use
- using energy efficient lighting, such as compact fluorescent lights, in common areas
- using motion sensor switches in common areas, doorways, entrances, car parks, and for outdoor security lighting.

→ Maximise the efficiency of household appliances by:
- installing high efficiency refrigerators/freezers, clothes washers/dryers and dishwashers
- selecting an energy source with minimum greenhouse emissions.

→ Improve the efficiency of water systems by:
- insulating the hot water system
- installing water-saving devices, such as flow regulators, AAA rated shower heads, dual flush toilets and tap aerators.

→ Improve the efficiency of mechanical space heating and cooling by:
- designing heating/cooling systems to target only those spaces that require heating or cooling, rather than the whole apartment
- minimising the need for air conditioning by allowing for natural ventilation (this should be done even where air conditioning is deemed necessary, so as to minimise the amount of the year when air conditioning is required)
- designing apartments so that entries open into lobbies or vestibules that are separated from living areas.
- allowing for adjustable awnings and blinds on the outside of windows to reduce heat gain in summer.
- providing (reversible) ceiling fans for improving air movement in summer and for distributing heated air in winter.
- using solar hot water or heat pump technology for communal water heating.

→ Incorporate passive solar design techniques to optimise heat storage in winter and heat transfer in summer by:
- maximising thermal mass in floors and walls in northern rooms of dwelling/building where direct sunlight will warm them
- avoiding single aspect apartments with a southerly aspect (from southwest to southeast)
- insulating to a greater level than that required by the NZBC.

→ Provide or plan for future installation of photovoltaic panels by:
- designing the roof for optimal mounting
- locating trees to avoid shading existing or planned photovoltaic installations.

→ Ensure proper installation, inspections and maintenance when using energy efficient technologies.

→ Ensure raw materials come from renewal and sustainable sources. For example, specifying timber that is FSC (Forest Stewardship Council) certified will ensure that it comes from a managed and sustainable source.

→ Ensure materials have zero to low toxicity and emissions ratings.

→ Specify materials with low *embodied energy*. Embodied energy includes all of the energy used to create a material in its final state and includes extraction, manufacturing, transportation, installation, maintenance and disposal. A Life Cycle Assessment calculates the total embodied energy for a single material or for a complete building. It is a complex calculation due to the many variables involved. This complexity means it is unlikely that specifiers will be able to comprehensively compare options and there are currently few useful Life Cycle Assessment reference sources available. Some general guidelines for addressing the issue of low embodied energy include:

- specify durable, low-maintenance materials by considering future maintenance and repair costs associated with proposed materials at the design stage
- minimise use, consumption and waste, e.g. specify standard sizes and use recycled elements or materials
- specify materials that can be reused and recycled at the end of the building's life
- favour locally sourced materials for their reduced transportation costs
- high *embodied energy* solutions such as 'heavy' construction may be of benefit in the long term due to the thermal mass of the building reducing overall heating costs
- refurbish, adapt and reuse existing buildings instead of demolishing them
- consider energy consumption over the lifespan of the completed building (this is when most energy will be used)
- in general, design for durability and adaptability.

Further Information: Energy Efficiency & Conservation Authority www.eeca.govt.nz

See www.scionresearch.com for Life Cycle Assessment

BRANZ Bulletin – Solar Water Heating, October 2006 Issue 477

Forest Stewardship Council – www.fsc.org

Resource Efficiency in the Building and Related Industries www.rebri.org.nz

Efficiency ratings for appliances and tapware – www.waterrating.gov.au www.energyrating.gov.au

B4.3 WATER CONSERVATION

Water is a limited resource. Apartment design can contribute to environmental sustainability by integrating measures for improved water efficiency. Water can be conserved by reducing water demand from the mains and by re-using water, which would otherwise be lost as stormwater run-off or waste water.

Objectives

- To reduce consumption of potable water.
- To reduce the quantity of urban stormwater run-off.
- To increase reuse of wastewater and stormwater on-site.

Better Design Practice

- Install water-efficient appliances.
- Install water meters or check meters for individual apartments to discourage waste.
- Consider rainwater tanks for collecting non-potable stormwater for use in toilet flushing, laundry and garden irrigation.
- Consider grey water recycling.
- Avoid in-sink waste disposals and provide composting facilities at central waste disposal area.
- Ensure that inspection and maintenance regimes are in place for any stormwater systems.
- Avoid using building materials that contaminate the environment. For example, zinc and copper claddings increase contaminants in urban stormwater systems.

Rules of Thumb

Toilet flushing, laundry and garden irrigation make up 65% of total household water use.

Rainwater should not to be collected from roofs coated with lead or bitumen-based paints, or from asbestos-cement roofs. Normal guttering is sufficient for water collection provided that it is kept clear of leaves and debris. First flush water diverters should be used to divert the first part of each rainfall away from the collection system.

Further Information: AS/NZS 3500 1.2: Water Supply. Standards New Zealand, 2003. Acceptable Solutions provides guidance for the design of rainwater tanks with dual water supply systems.

Efficiency ratings for appliances and tapware – www.waterrating.gov.au

BRANZ Bulletin 478 Rainwater collection for domestic use.

Various Ministry of Health publications on collection of rainwater – www.moh.govt.nz/Publications

B4.4 MAINTENANCE

Brick claddings will require little maintenance.

Hardware is available that allows occupants to clean the exterior of windows from the inside.

Hard landscaping can require minimal ongoing maintenance.

Decisions made during the design phase as well as in the post-construction management of an apartment development will influence the amount of maintenance required and the cost of this maintenance. This section covers the design process while Part 3 - Managing Apartment Developments - covers post-construction issues. Maintenance includes the repair, cleaning and future upgrading of a development's components or systems.

Considered material selection and detail design can dramatically reduce the need for long-term maintenance. Designers should think about the likely longevity of building components that they choose and plan for their future maintenance. Designers should also be aware of the consequences of using complex mechanical systems. These typically require more extensive, costly maintenance regimes performed by technically specialised service staff. Design phase decisions should balance up-front costs against ongoing life cycle costs. With speculative projects there will always be the tendency to reduce up-front costs unless the market is sufficiently sophisticated to price future life cycle costs into the sales values of apartments.

Objectives

- To ensure long life and ease of maintenance of the development.
- To reduce ongoing maintenance costs to owners.

Better Design Practice

- Use construction methods and materials that have lower life cycle costs.
- Select durable materials that are graffiti-resistant and easily cleaned.
- Incorporate and integrate building maintenance systems (BMU's, anchor points, ladders, etc.) into the design of the building form, roof and facade.
- Design windows to enable cleaning from inside the building, where possible.
- Select manually operated systems, such as blinds, sunshades, pergolas and curtains, instead of mechanical systems.
- Select appropriate landscape elements and vegetation and provide appropriate irrigation systems (see A2.1 Landscape Design).
- Facilitate cleaning of common areas by providing storage, water and drainage.
- For developments with communal open space, provide convenient garden maintenance and storage areas with water and drainage connections.

B4.5 WASTE MANAGEMENT AND RECYCLING

The wooden slatted enclosures here hold individual rubbish (wheelie) bins for each unit. These are incorporated into and nicely articulate the garden walls improving the feel of the public space.

Minimisation and management of waste, which includes the way in which waste is stored and collected, contribute to the visual appearance of a development and limit potentially harmful impacts on the environment. Minimising waste should occur during all stages of the building's life cycle, from construction to demolition.

Objectives

- To avoid the generation of waste through design considerations, material selection and building practices.
- To plan for the type, amount and disposal of waste generated during demolition, excavation and construction of the development.
- To ensure well-designed storage facilities and collection services of occupant-produced waste and recycling.
- To encourage waste minimisation, including source separation, reuse and recycling.

Multiple waste receptacles near the building entry allow for separation of waste by occupants. The waste is conveyed to a central collection point by a suction system.

Better Design Practice

- During construction, give consideration to:
  - incorporation of existing built elements into the development (for example, the reuse of an existing heritage building as communal gym for a new development)
  - recycling and reusing demolished materials
  - specifying building materials that can be reused and recycled.

- During the design stage, support waste management by:
  - specifying project needs modestly to reduce wastage
  - utilising standard product/component sizes of materials
  - designing for durability, adaptability and ease of future upgrades.

- Prepare a waste management plan for green and *putrescible* waste, garbage, glass, plastic and paper.

- Locate storage areas for rubbish bins away from the front of the development where they may have a significant negative impact on the streetscape, on the visual presentation of the building entry and on the amenity of residents, building users and pedestrians.

- Provide every dwelling with a waste cupboard or temporary storage area to hold a single day's waste and to enable source separation.

- Incorporate on-site composting, where possible, in self-contained composting units on balconies or as part of the shared site facilities.

Rules of Thumb

Over a third of commercially produced waste comes from construction and demolition activities.

Designers should consult the Waste Management unit of the applicable territorial authority. The development of a waste management plan by councils is a statutory requirement in New Zealand.

Further Information: Waste Planning in Multi-Unit dwellings: Best Practice Design Guidelines. Inner Sydney Waste Board.

For example see: www.northshorecity.govt.nz/our_environment/waste_minimisation/default.htm

www.aucklandcity.govt.nz/council/documents/waste/default.asp

Resource Efficiency in the Building and Related Industries www.rebri.org.nz/

SECTION C: THE APARTMENT

C1
APARTMENT TYPOLOGIES

Just as there are a number of characteristics that can define a building typology, there are three key elements that can be used to describe an individual apartment (or unit) typology:

- **number of bedrooms: studio, one-bedroom, two-bedroom, three-bedroom**
- **number of storeys: single-storey, mezzanine, two-storey (duplex), three-storey (triplex)**
- **number and orientation of external walls: single aspect, dual aspect, corner aspect.**

All three elements can be combined to give a fuller description of an apartment, e.g. a two-bedroom duplex, with single aspect bedrooms on the lower floor and dual aspect living/dining above.

Variations to the above typologies depend upon the following:

- **positioning of core elements (kitchen, bathroom and stairs) within the apartment**
- **position of the apartment entrance**
- **apartment depth and width**

C1 Apartment Typologies: Classification of Apartments

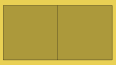
number of bedrooms

influenced by location, demographics, mix required

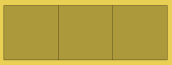
studio

one-bedroom

two-bedroom



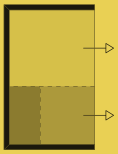
three-bedroom



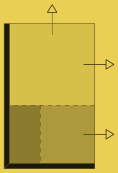
aspect

influenced by site opportunities and constraints, views, orientation, sunlight access, building access system

single aspect



corner aspect



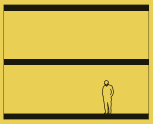
dual aspect

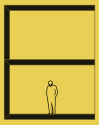
number of storeys

influenced by location, demographics, desired size of apartments

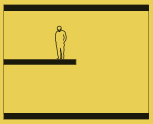
single-storey

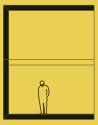
two-storey





mezzanine or double height spaces





C1.1 SINGLE ASPECT

Single aspect apartments have three closed sides (except for the entrance) and are typically used with a double-loaded corridor access arrangement. They can be a good option for hillside housing or when there is an undesirable site condition to one side or for a double-loaded corridor building that runs north-south.

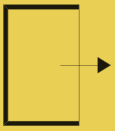
There are two types of single aspect arrangements:
- **core elements perpendicular to corridor**
- **core elements parallel to corridor (more common).**

C1.2 CORNER ASPECT

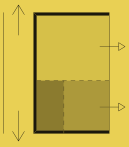
Corner aspect apartments have two sides that are exterior walls. They can be considered as a variation of single aspect apartments, with one extra wall opened up. This typology is often used in tower buildings or at the ends of slab buildings.

A premium would be normally charged for the corner type over the single aspect apartment and it is a common type for high-end/top floor/ penthouse apartments.

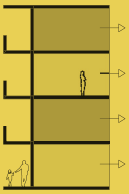
C1.1 Single Aspect



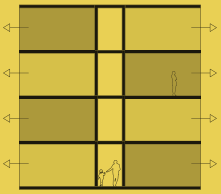
single aspect



single aspect apartment
and horizontal access



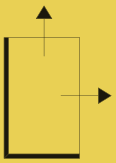
single aspect
apartment and single
loaded corridor



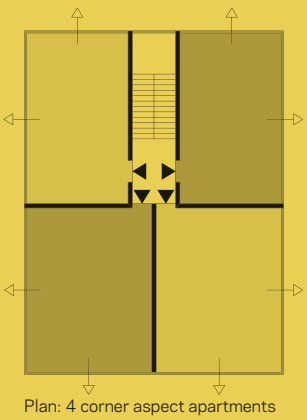
single aspect
apartment and double
loaded corridor

Horizontal access and the single aspect apartment work well together, whether the corridor is single-loaded or double-loaded.

C1.2 Corner Aspect



corner aspect



Plan: 4 corner aspect apartments

C1.3 DUAL ASPECT

Placing open-ended units side-by-side is perhaps the most common form of collective urban housing. It has the advantage of repeating units while also maintaining a maximum number of external faces.

There are many organisational options but if the unit is too deep, achieving adequate natural light to the centre of the plan can be difficult.

Entry to the dual aspect apartment is usually from an end or a side, and sometimes from above or below – for example with a skip-stop corridor access system.

This typology is often used in duplex (two storey) apartments and is suited to apartments with individual access.

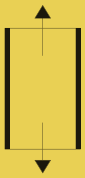
For multi-storey buildings this typology requires either a skip-stop corridor system or one vertical access for every two dual aspect apartments per floor (which can be combined with single aspect apartments sharing the same access – see diagram 3a page 49).

It is not common to have the core elements (kitchen, bathroom and stairs) on an external wall as they are at a premium and are normally reserved for habitable rooms with core elements relegated to the interior.

Further Information: Sherwood, Roger. Modern Housing Prototypes. Harvard University Press, 2002.

Schneider, Friederike. Floor Plan Manual: Housing. Basel: Birkhauser, 2004.

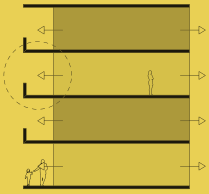
C1.3 Dual Aspect



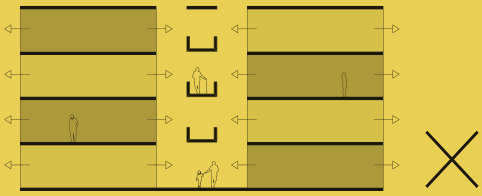
dual aspect

C1.3 Dual Aspect with Horizontal Access Issues

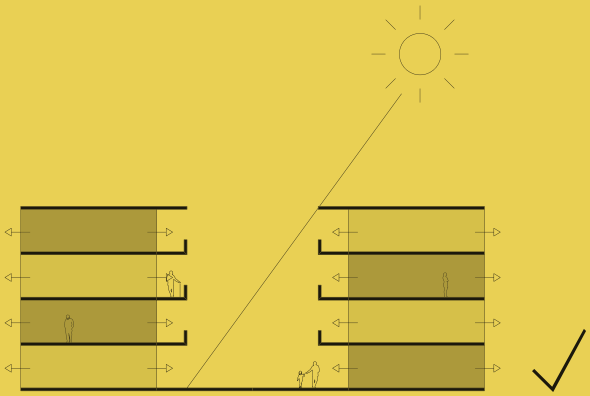
1. dual aspect apartment and horizontal access



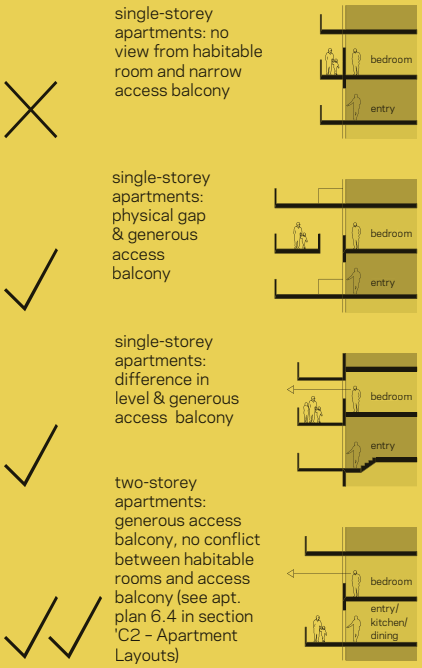
2. extra care is needed to provide an adequate level of amenity – natural light, natural ventilation, privacy – to a habitable room facing onto access balcony (see examples below)



3. dual aspect apartments are not compatible with double loaded corridors, or any variation thereof



4. there should be enough separation/open space between two opposing blocks of dual aspect apartments to allow direct sunlight to enter habitable rooms on the ground floor



Examples for improving the amenity value of both the access balcony and the habitable room/bedroom

Horizontal access paired with dual aspect apartments is less satisfactory due to a habitable room, usually a bedroom, looking out onto the access balcony. Extra care and effort is necessary at the design stage to ensure an adequate level of amenity for both the habitable room and the circulation running past.

With double loaded corridors, the combination is impossible as the habitable room facing onto the corridor becomes internal. Disconnection of the corridor from the dual aspect apartments to provide a clear void between them is not a desirable solution (fig. 3) and should be avoided; adequate daylight access and a reasonable outlook cannot be achieved in the habitable room.

C2
APARTMENT LAYOUT

The internal layout of an apartment establishes the spatial arrangement of rooms, the circulation between rooms, and the degree of privacy for each room. In addition, aspects of the layout such as access to daylight, natural ventilation, and acoustic and visual privacy directly impact the quality of residential amenity: the health of occupants, their ability to carry out normal household functions, to socialise and to feel safe and secure. Apartment layout also includes the private open space associated with an apartment.

Objectives

- To ensure spatial arrangements of apartments are functional and well organised.
- To ensure apartment layouts provide high standards of residential amenity.
- To maximise the environmental performance of apartments.
- To accommodate a variety of household activities and occupants' needs.

Better Design Practice

- Determine appropriate apartment sizes in relation to:
  - geographic location and market demands; for example, areas near universities may require more *studio apartments*
  - the spatial configuration of an apartment, not just its plan; for example, mezzanine type apartments are often small in square metres but have double height living spaces
  - affordability; a range of apartment sizes provides more choice for more people.

→ Ensure apartment layouts are flexible over time. Design issues to address may include:
- accommodation of a variety of occupants and lifestyles
- accommodation of a variety of furniture arrangements
- provision for a range of activities and privacy levels between different spaces within the apartment
- utilisation of flexible room sizes and proportions or open plan arrangements (see C9 Flexibility)
- ensuring circulation by stairs, corridors and through rooms is planned as efficiently as possible, therefore increasing the amount of usable floor space.

→ Design apartment layouts that respond to the natural and built environments, and optimise site opportunities, by:
- locating habitable rooms especially, and where possible kitchens and bathrooms, on external walls, thereby maximising the number of rooms with windows
- providing private open space in the form of a balcony, terrace, courtyard or garden for every apartment (see C6 Private Open Space)
- orientating main living spaces toward the primary outlook and away from neighbouring noise sources or windows
- locating main living spaces adjacent to main private open space
- maximising opportunities to facilitate natural ventilation and to capitalise on natural daylight, for example by providing:
  - corner apartments
  - two-storey apartments
  - dual aspect apartments
  - mezzanine type apartments
  - shallow single aspect apartments (see C4 Amenity).

→ Avoid locating the kitchen within the main circulation routes of an apartment (i.e. in a hallway or entry space).

→ Separate incompatible activities. For example, a toilet should not open directly off a kitchen or living area.

→ Include adequate storage space in apartment (see C8 Storage).

→ Ensure apartment layouts and dimensions facilitate easy furniture removal and flexible furniture placement options.

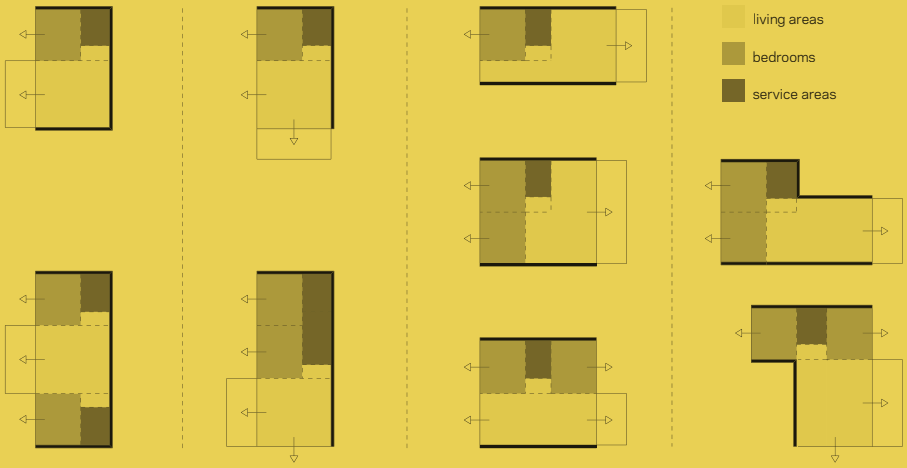
Rules of Thumb

Depth of apartments
- Single aspect apartments should be limited in depth to 8 metres from the glazing line.
- The back of a kitchen should be no more than 8 metres from a window.
- Dual aspect apartments over 15 metres deep should be at least 4 metres wide to avoid deep, narrow apartment layouts.
- Buildings not meeting the minimum standards stated above must demonstrate how satisfactory daylighting and natural ventilation will be achieved, particularly in habitable rooms (see C4.2 Daylight Access and C4.3 Natural Ventilation).

C2 Apartment Layout

Well-organised apartments with functional layouts and all habitable rooms on external walls allowing for daylight access, natural ventilation and aspect/view must be the goal for every apartment design.

Spatial arrangements must ensure all habitable rooms are on external walls.

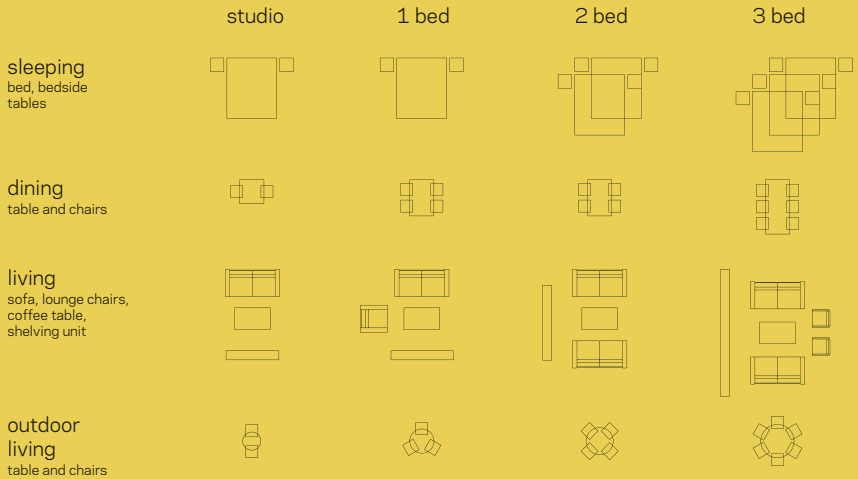


single aspect | corner aspect | dual aspect | mix of single, corner and/or dual aspect

C2 Apartment Layout: Furniture

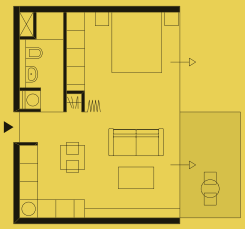
Loose furniture should be located on plans to ensure spaces are well proportioned and suitable for likely activities and layouts.

Furniture shown is in addition to storage already required in an apartment for specific uses – such as in the kitchen, hallway, bedroom or laundry. It should allow for common items such as books, magazines, files and folders, CDs, TVs, video/DVD players, music systems, computers/printers, photographs, ornaments, etc.



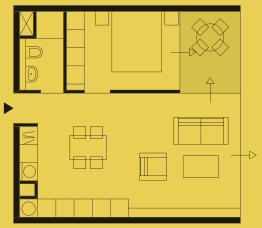
C2 Apartment Layout: Examples

1.0



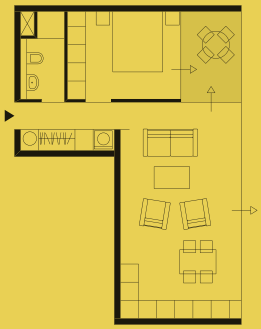
studio, single aspect

2.1



one-bed, single aspect

2.2

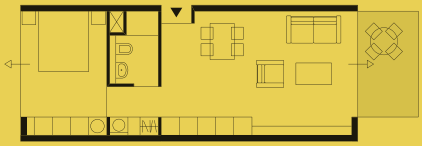


one-bed, single aspect

2.3

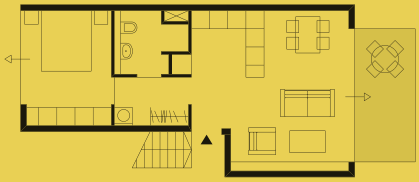
one-bed, single aspect, two-storey with mezzanine

3.1



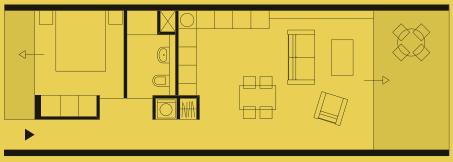
one-bed, dual aspect

3.2



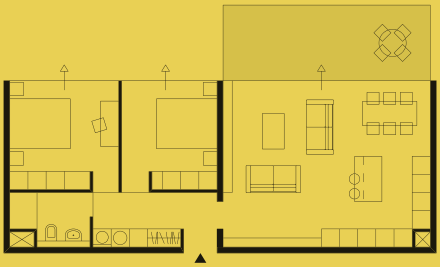
one-bed, dual aspect

3.3



one-bed, dual aspect

4.1

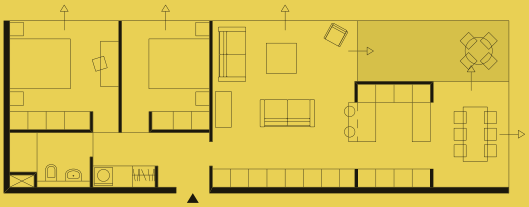


two-bed, single aspect

4.2

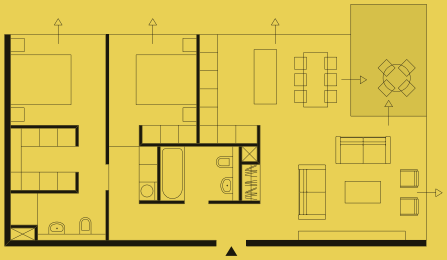
two-bed, single aspect with ensuite

5.1



two-bed, corner aspect

5.2

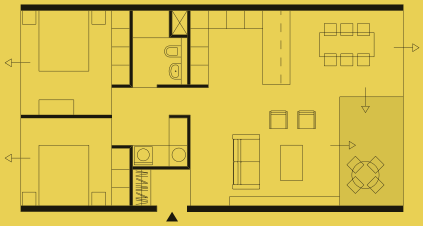


two-bed, corner aspect with ensuite

5.3

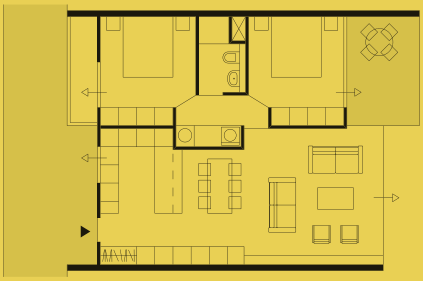
two-bed, corner aspect with ensuite and study

6.1



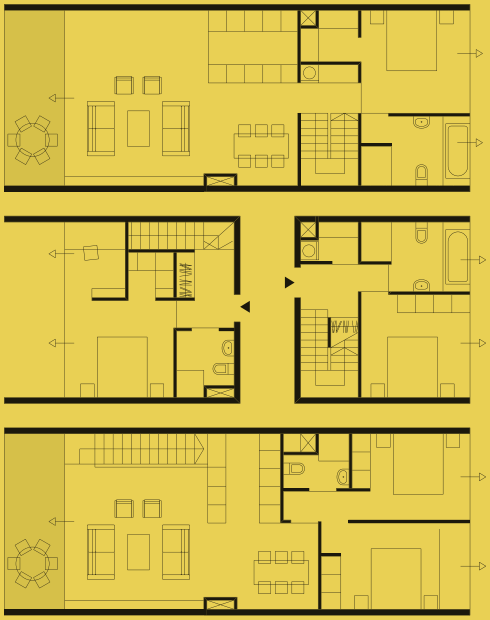
two-bed, dual aspect

6.2



two-bed, dual aspect

6.3



two-bed and three-bed, dual aspect, two-storey crossover

6.4

two-bed, dual aspect, two-storey

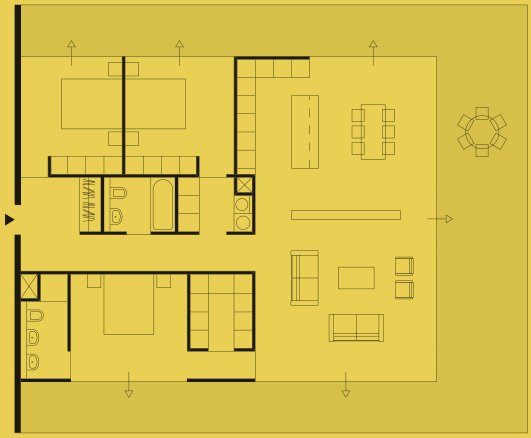
6.5

two-bed, dual aspect, with ensuite and study

7.1

three-bed, corner aspect

7.2



three-bed, penthouse type

C3 APARTMENT CEILING HEIGHTS

Ceiling heights are measured from finished floor to finished ceiling level. They define the three-dimensional space of an apartment, in conjunction with walls and floors. Well-designed and appropriately defined ceilings contribute to quality residential amenity creating spatial interest and spatial hierarchy in apartments.

Ceiling heights should be carefully considered as higher ceilings can compensate for restrictions imposed upon the apartment plan by creating the feeling of a more generous space. Ceiling heights also affect daylight access and natural ventilation and, as such, should be considered in conjunction with apartment depth (see C2 Apartment Layout).

Objectives

- To increase the sense of spaciousness in apartments and create well-proportioned rooms that establish a hierarchy of spaces within each apartment.
- To promote the penetration of daylight into the depths of the apartment.
- To contribute to flexibility of use.

Better Design Practice

- Create better quality spaces in apartments by using ceilings to:
  - enable better proportioned rooms (for example, smaller rooms often feel larger and more spacious when ceilings are higher)
  - define a spatial hierarchy among areas of an apartment by using double height spaces, raked ceilings, changes in ceiling heights and the location of bulkheads
  - maximise heights in *habitable* rooms by stacking wet areas from floor to floor. This ensures that services within lower bulkheads are located above bathroom and storage areas rather than above habitable spaces.
- Facilitate access to natural light by using ceiling heights that:
  - allow the use of taller windows, toplight windows and fanlights. This is particularly important for apartments with limited light access, such as ground floor units and apartments with deep floor plans
  - allow the use of light shelves to enhance daylight distribution into deep interiors.
- Design ceiling heights that promote building flexibility over time for a range of other uses where appropriate; for example retail or commercial use on the ground floor.

Rules of Thumb

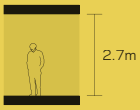
The following recommended dimensions are measured from finished floor level to finished ceiling level. They do not preclude higher ceilings if desired, or if floor plates are large.

- In mixed use buildings, 3.6 - 4.0 metres for ground floor retail or commercial and 3.3m for first floor residential, retail or commercial to allow future flexibility of use.
- In residential apartment buildings in mixed use areas, 3.3m for ground floor to promote future flexibility of use.
- In residential apartment buildings or residential floors in mixed use buildings:
- for all habitable rooms on all floors, generally 2.7m, and for all non-habitable rooms, 2.4m minimum
- for mezzanine-type two-storey units, 2.4m for the second storey is possible if 50 percent or more of the apartment has a 2.7m minimum ceiling height
- for two-storey units with a two-storey void space, a 2.4m ceiling height is acceptable
- for attic spaces, a 1.5m minimum wall height at edge of room with a 30° minimum ceiling slope.

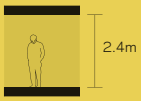
Developments that do not achieve these minimums must demonstrate that apartments will receive satisfactory daylight.

C3 Apartment Ceiling Heights

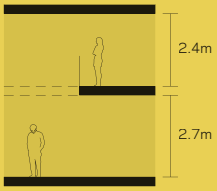
proportions – height



for all habitable spaces



for other spaces



for two-storey units
2.7 minimum on main living floor
2.4 minimum on other storey

C4 AMENITY

A defining characteristic of apartments is that, because dwelling units are attached to one another, occupants live in close proximity to each other and share common walls, floors and ceilings. As a result, two key conflicting environmental issues present themselves: keeping noise out and allowing light and air in. Each of these influence the quality of life for the occupants and the overall level of amenity achieved within the apartment.

These two issues are dealt with under the following three headings:
- **Acoustic Privacy**
- **Daylight Access**
- **Natural Ventilation**

C4.1 ACOUSTIC PRIVACY

Acoustic privacy deals with sound insulation between apartments, between rooms within individual apartments and between external and internal spaces. Designing for acoustic privacy must therefore take into account the development's local context, the location and separation of buildings within a development, the arrangement of apartments within buildings and the arrangement of internal spaces within apartments.

Acoustic privacy relies upon specification of construction systems and correct execution of these systems in order to achieve anticipated levels of noise reduction.

Objectives

→ To ensure a high level of amenity by protecting the privacy of residents both in their apartments and in their private open spaces.

Better Design Practice

→ Assess the current and likely future neighbourhood noise levels and design for the highest anticipated level.

→ Utilise the site and building layout to maximise acoustic privacy by providing adequate building separation within the development and from existing neighbouring buildings.

→ Arrange apartments within a development to minimise noise transmission between apartments by:
- locating busy, noisy areas next to each other and quieter areas next to each other. For example, living rooms should be adjacent to living rooms, bedrooms adjacent to bedrooms, service rooms adjacent to service rooms – both horizontally and vertically
- using storage or circulation zones within an apartment to buffer noise from adjacent apartments, mechanical services or corridors and lobby areas
- minimising the amount of intertenancy (shared) walls between apartments.

- Resolve conflicts between noise, outlook and views by using design measures including:
  - laminated or double glazing
  - operable screens on balconies and slab-to-slab fins between neighbouring decks
  - unbroken walls around ground level open space where this does not conflict with streetscape or other amenity requirements.

- Provide seals at entry doors to reduce noise transmission from common corridors and from outside the building.

- Reduce noise transmission between tenancies by:
  - not locating appliances (especially washing machines and driers) on inter-tenancy walls & using resilient mountings when placing appliances on the floor
  - not mounting TVs or speaker boxes on inter-tenancy walls or on partition walls within an apartment that separate living areas from quieter areas such as a study or a bedroom.

- Choose construction and acoustic insulation measures superior to the minimum measures required by New Zealand standards.

- Do not use single-frame timber systems for inter-tenancy walls; even with resilient rails they are highly susceptible to variations in standards of workmanship.

- Choose construction systems for inter-tenancy walls that correspond to available construction skill levels and procurement methods.

- Design wall and floor systems in tandem to achieve the desired acoustic performance.

- Select floor systems to comply with impact insulation in both vertical and horizontal directions.

Rules of Thumb

The New Zealand Building Code (NZBC) currently requires a sound transmission class of STC 55 (walls and floors) and an impact insulation class of IIC 55 (floors only) between *habitable* spaces of separate tenancies. The code requires that field test results shall be within 5dB of the performance requirements, thus a site measurement of STC/IIC 50 can be deemed compliant when a performance of STC/IIC 55 has been specified.

Although a site measurement of STC/IIC 50 may satisfy the NZBC, occupant requirements are much higher. Because of installation uncertainties, the best way to achieve better on-site performance is to initially specify a system with a higher rating e.g. STC/IIC 60 or higher.

Acoustic insulation levels between apartments (actual, not design levels):

	STC	IIC
Minimum:	55	55
Good:	60	60
Best:	65	65

Apartment developments in noisy environments, such as beside main roads or in town centres should be designed to ensure that noise from exterior sources is attenuated to levels not exceeding 35 dBA (10pm -7am) and 45 dBA (7am-10pm) in habitable rooms with all windows shut. Designers should check for any specific noise reduction standards required by the relevant Council. Where habitable rooms with openable windows are proposed, but which would need to be shut to achieve an acceptable reduction in external noise, then a positive supplementary source of fresh air ducted from the outside will need to be provided to achieve the performance standards of the NZBC and NZS4303, which currently (Jan 07) require a minimum of 7.5 litres per second per person.

Further Information: District Plan Change 23 – Central Area Noise Insulation Rules. Wellington City Council, February 2004.

http://wellington.govt.nz/plans/district/planchanges/pdfs/change23finalrevised.pdf

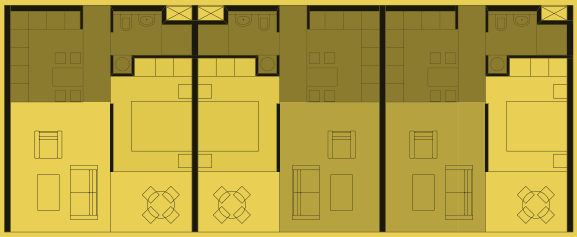
C4.1 Sound Insulation

Sound transmission

Airborne – through walls, ceiling and floors

Impact – mainly through floors (both vertically & horizontally), but also through walls

C4.1 Using the Apartment and Building Layout to Maximise the Potential for Acoustic Privacy



'quiet' bedrooms located back to back

'noisy' living rooms located back to back

service areas – kitchens and bathrooms – act as 'buffer zone' separating living and sleeping areas from communal circulation areas and vertical service cores

Note: these principles should apply vertically as well as horizontally

C4.2 DAYLIGHT ACCESS

Double height glazing on the upper levels of this development allow daylight to reach well back into a deep plan.

Daylight consists of skylight (diffuse light from the sky) and sunlight (direct beam radiation from the sun). These change with the time of day, season, and weather conditions. This variability contributes to pleasant living environments, as does having overall daylighting that is adequate without overheating. Within an apartment, daylighting reduces reliance on artificial light, improving energy efficiency and residential amenity.

Objectives

- To ensure that daylight access is always provided in all habitable rooms and is provided wherever possible in all other areas of apartment buildings.
- To provide adequate natural light and minimise the need for artificial light during daylight hours.
- To allow residents to adjust natural lighting to suit their needs.

Better Design Practice

- Plan the site so that apartment buildings are orientated to optimise northern aspect.
- Optimise the number of apartments receiving daylight access to *habitable* rooms and principal windows by:
  - ensuring daylight access to habitable rooms and private open space, particularly in winter
  - using skylights, clerestory windows and fanlights to supplement daylight access
  - considering two-storey and mezzanine arrangements to increase daylight access to the living rooms and private open spaces of apartments with limited daylight (e.g. ground floor apartments)
  - limiting the depth of single aspect apartments
  - locating living areas to the north and service areas to the south of apartments
  - avoiding south-facing apartments.
- Design for shading and glare control, particularly in summer by:
  - using shading devices, such as eaves, awnings, colonnades, balconies, pergolas, external louvres and planting
  - optimising the number of north-facing living spaces
  - providing external horizontal shading to north-facing windows
  - providing vertical shading to west windows.
- Consider minimising external glare off windows by:
  - avoiding reflective glass and films
  - avoiding tinted glass.
- Avoid using lightwells as a sole means of natural light to habitable rooms.

Rules of Thumb

At least 70% of living rooms and private open spaces in a development should receive a minimum of three hours direct sunlight between 9 am and 3 pm in mid-winter. In dense urban areas, a minimum of two hours may be acceptable.

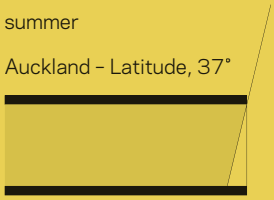
Limit single aspect apartments with a southerly aspect (southwest through to southeast) to a maximum of 10% of the total units proposed. Developments that do not meet this minimum should demonstrate how site constraints and orientation prohibit these standards from being achieved and how issues of energy efficiency will be addressed (see B4.2 Energy Efficiency).

See C2 Apartment Layout for additional rules of thumb.

C4.2 Sun Angles

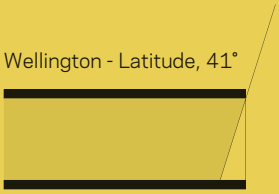
summer

Auckland – Latitude, 37°



76.5° angle at noon on
22 December, summer solstice

Wellington - Latitude, 41°



72.5° angle at noon on
22 December, summer solstice

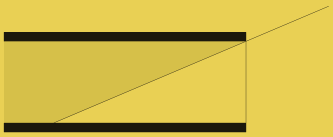
Christchurch - Latitude, 43.5°

70° angle at noon on
22 December, summer solstice

winter

29.5° angle at noon on
21 June, winter solstice

25.5° angle at noon on
21 June, winter solstice

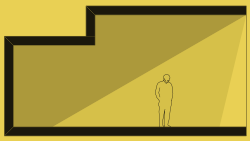


23° angle at noon on
21 June, winter solstice

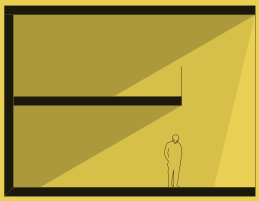
C4.2 Daylight Access

Increasing sunlight access into the depth of an apartment can be achieved by:

raising the head height of openings to the ceiling

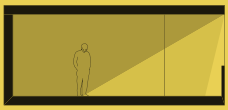


increasing the floor to ceiling height

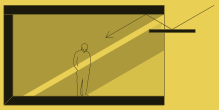


double height glazing

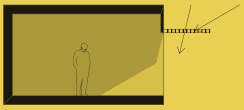
It may also be necessary to control the sunlight access into an apartment. This can be achieved by:



using recessed balconies



light shelves



or louvres

C4.3 NATURAL VENTILATION

Natural ventilation is the circulation of sufficient volumes of fresh air through an apartment to create a comfortable indoor environment. Designing for natural ventilation is an environmentally sustainable practice if it responds to the local climate and reduces or eliminates the need for mechanical ventilation. To achieve natural ventilation, building orientation, apartment configuration and external building envelope must all be carefully considered.

Objectives

- To ensure that apartments are designed to provide all habitable rooms with direct access to fresh air and to assist in promoting thermal comfort for occupants.
- To provide natural ventilation in *non-habitable* rooms, where possible.
- To reduce energy consumption and life cycle costs by minimising the use of mechanical ventilation, particularly air conditioning.

Better Design Practice

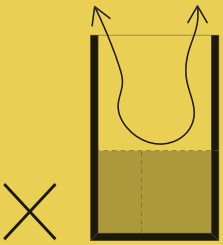
- Design the building layout and section to increase the potential for natural ventilation. Design solutions may include:
  - creating cross ventilation with narrow building depths, *dual aspect apartments* and corner aspect apartments
  - facilitating convective currents in two-storey or mezzanine-type apartments by including openings that allow warm air to escape at higher levels and cooler air to be drawn in at lower levels
  - considering alternative means for cross ventilating single aspect apartments.
- Design the internal apartment layout to promote natural ventilation by minimising interruptions in air flow through an apartment. The more corners or rooms that airflow must negotiate, the less effective the natural ventilation.
- Design openings to maximise natural ventilation opportunities inherent in the apartment layout. Design solutions include:
  - in apartments accessed off a single-loaded corridor or external access balcony, using a vent or openable window near the entrance door to allow for natural cross ventilation (corridor must be well ventilated and openings must comply with fire regulations)
  - using high casement or sash windows, clerestory windows or operable fanlight windows, including above internal doors (especially in single aspect apartments)
  - incorporating openings that allow occupants to funnel breezes into the apartment, such as louvred windows, casement windows and externally opening doors.
- As apartments are often uninhabited during the daytime, it is especially important that ventilation options be secure and rainproof when left open.
- Coordinate natural ventilation design with passive solar design (see B 4.1 Energy Efficiency).
- Explore innovative technologies such as stack ventilation and solar chimneys to naturally ventilate internal spaces such as bathrooms, laundries and underground car parks.

Rules of Thumb

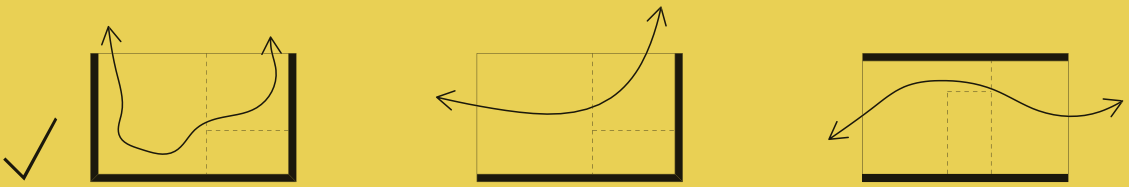
Apartment depths up to 18 metres can support natural cross ventilation if not single aspect.

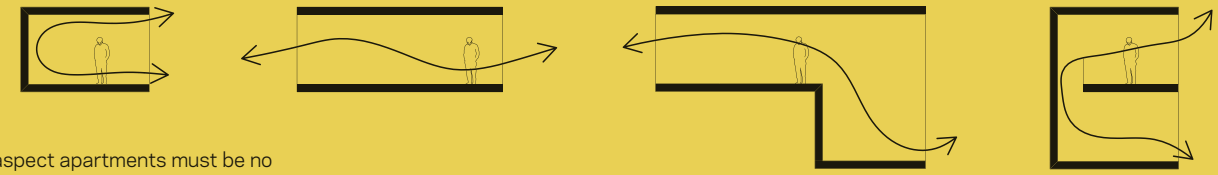
All apartment designs should indicate intended methods and flow paths of cross ventilation.

C4.3 Natural Ventilation

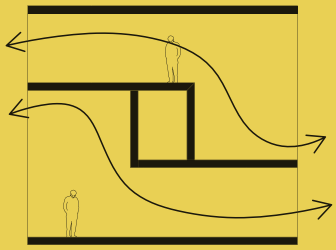


cross ventilation of rooms set deep in the plan is difficult





single aspect apartments must be no deeper than one habitable room for cross ventilation to occur



C5 APARTMENT MIX

A mix of apartment types and sizes within a development provides greater housing choice for a more diverse range of households. Mixing apartment types may require varied sales strategies, but it has the advantage of appealing to a larger percentage of the market. As apartment buildings begin to account for a significant portion of the urban fabric, their capacity to support the needs of a diverse society becomes particularly important. Mixing apartment types may also make an area more stable in the long run as occupants can suit changing needs by simply shifting apartments within the same neighbourhood.

Objectives

- To provide a diversity of apartments types that cater for different household requirements.

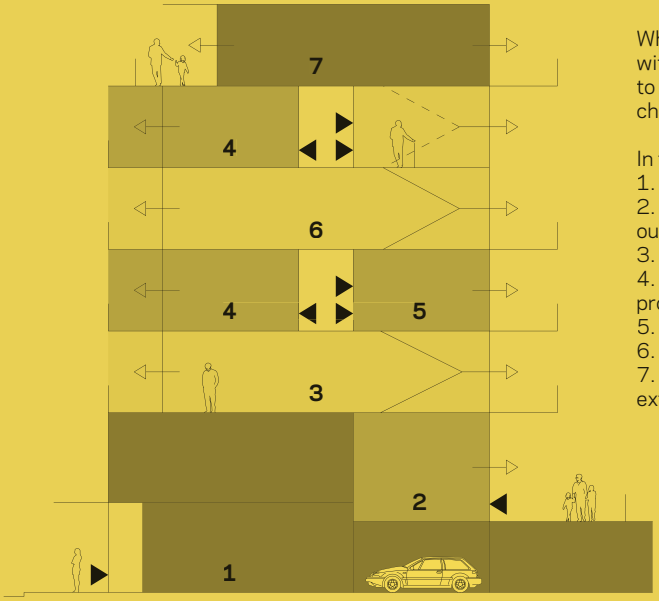
Better Design Practice

- Provide studio, one-, two-, three- and three-plus bedroom apartments, particularly in large apartment developments. Variety may not be possible in smaller developments, (i.e. 10 units or less).
- Refine the appropriate apartment mix for a location by:
  - considering population trends as well as current market demands
  - noting the apartment's location in relation to public transport, public facilities, employment areas, schools, universities and retail centres.
- Locate a mix of one and three-bedroom apartments on the ground level where units are more accessible for the disabled, the elderly and families with children.
- Consider the potential number of children that could be living in a development – in both double- and single-parent families, and design communal facilities appropriately.
- Maximise the number of accessible and *visitable apartments* to cater for a wide range of occupants.
- Investigate the possibility of flexible apartment configurations that will support a variety of uses in the future (see C9 Flexibility).

Rules of Thumb

Provide more than one apartment type in all developments of ten or more units.

C5 Apartment Mix



When a variety of apartment types and sizes are provided within a development, not only does it provide greater choice to potential purchasers, it can also adapt more easily to the changing social needs of the occupants.

In this example:
1. Retail unit, with tall ceilings. Access from the street.
2. Single aspect apartment with tall ceilings and large private outdoor space. Access via communal courtyard.
3. Dual aspect apartment accessed from corridor above.
4. Single aspect apartments, with recessed balconies providing protection against the busy street.
5. Single aspect apartment, facing quiet communal courtyard.
6. Dual aspect two-storey crossover apartment
7. Dual aspect 'penthouse' apartment with setback and extra deep balcony to the street.

C6 PRIVATE OPEN SPACE

Private balconies with sliding screens for potential extra privacy.

Private open (exterior) space enhances the amenity of an apartment, especially in temperate climates. As such, it should be considered an essential part of each residential unit, should extend and connect the unit to the outside environment and should provide useable outdoor living space. Private open space may take the form of a recessed balcony, a cantilevered or semi-cantilevered balcony, a terrace, or a ground level deck, patio or garden. When well designed, balconies and terraces become important architectural elements and contribute to the form and articulation of a building.

Objectives

- To provide all apartments with private open space.
- To ensure that balconies and terraces are functional, have adequate levels of privacy and are responsive to the environment.
- To ensure that balconies and terraces are integrated into the overall architectural form and detail of residential buildings.
- To contribute to the safety and liveliness of the street by creating casual overlooking and surveillance.

Better Design Practice

- Where other private open space is not provided, at least one primary balcony or terrace should be provided.
- Primary balconies or terraces should:
  - extend the main living space of the apartment by being located adjacent to living areas such as the living room, dining room and kitchen
  - promote indoor/outdoor living by being sufficiently large and well proportioned. A dining table and two chairs (smaller apartment) or a dining table and four chairs (larger apartment) should fit comfortably on each balcony or terrace
  - be sufficiently large so that access from the interior doesn't render the open space unusable.
- Recessed balconies should be opted for where possible because they provide better privacy, better weather protection and better architectural *articulation* and facade depth than cantilevered balconies.
- Balconies should be integral to the facade design of a building.
- Consider secondary balconies, including *Juliet balconies* or openable walls with balustrades in larger apartments, adjacent to bedrooms, and for clothes drying. For the latter purpose, situate the balcony off the laundry or bathroom if it can be screened from public view.
- Increase the usefulness of balconies by designing and detailing them in response to the local climate and context. Examples include:
  - locating balconies on north-, east- or west-facing facades to provide solar access
  - utilising sun screens, pergolas, shutters and operable walls to control sunlight and wind

A semi-recessed balcony that overlooks communal open space.

Private balconies raised above the level of the public open space.

- using Juliet balconies or designing balconies with operable screens/walls/sliding doors and a balustrade in special locations where noise or high wind prohibits other solutions (i.e. along rail corridors, on busy roads or in tower buildings)
- choosing balcony type (recessed, cantilevered or partially cantilevered) according to available daylight, wind, acoustic privacy and visual privacy (recessed balconies will generally have more advantages)
- ensuring balconies are not so deep that they prevent sunlight entering the apartment below.

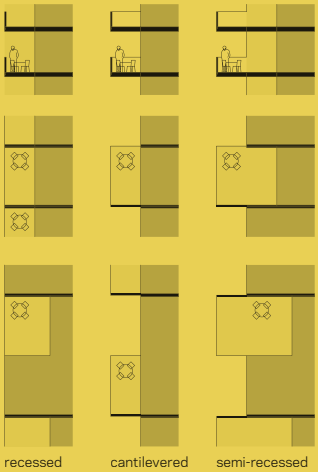
→ Design balustrades to allow views and *casual surveillance* of the street while ensuring safety and visual privacy. Design considerations include:

- detailing balustrades using solid/transparent materials to address sight lines from the street, public domain or adjacent development. For example, glass balustrades do not provide privacy for the balcony or the apartment's interior, especially at night
- designing balustrades to screen a seated balcony user from any visual intrusion such as the public, clothes drying areas, bicycle storage areas, or air conditioning units.

→ Coordinate and integrate building services such as drainage pipes with overall facade and balcony design. For example, downpipes from balconies visible from below detract from the appearance of the facade.

→ Consider supplying a hose tap and gas supply bayonet on primary balconies or terraces.

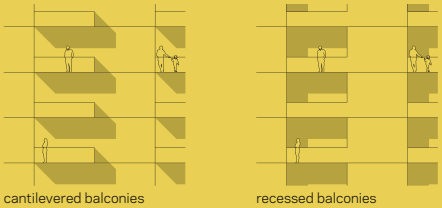
C6 Balconies



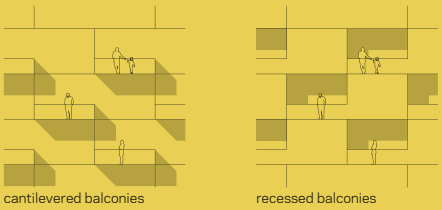
Balconies can be;
1. recessed,
2. cantilevered or
3. semi-recessed

Choice of balcony type should be a response to climate and context, as well as the level of privacy required.

Stacked apartments

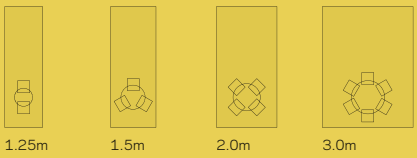


Staggered apartments

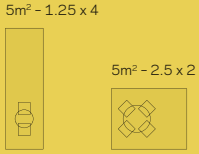


Staggered and mirrored apartments

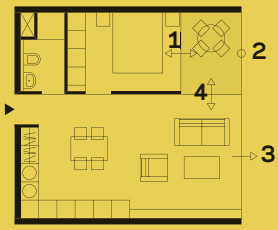
Balconies, in combination with apartment types and layouts, can be used to articulate a building facade.



The depth of a balcony will have a major impact upon its usability. Above are 4 examples, of various depths, with outdoor furniture.



With smaller balconies, the more square the plan the more usable the balcony.



Advantages of a Recessed Balcony

A recessed balcony provides greater shelter and privacy than a cantilevered balcony, can be accessed from 2 sides, has a ceiling and is more useful as a result. It essentially becomes another room, outside.

In this example, the bedroom can have direct access to the balcony (1) and privacy at the same time – especially if the balcony has a solid balustrade to the external elevation (2).

Also, the living room can have unobstructed views through a large window on the buildings facade (3) while also having direct access to the balcony from the side (4). Planning of this opening is important to avoid restricting balcony use.

C7 GROUND FLOOR APARTMENTS

Solid walls have been kept low against the public footpath and the combination of fence and hedge provide a good balance between privacy, visual interest and permeability.

Ground floor apartments offer the potential for direct access from the street and for *on-grade* private landscape areas. They also allow the apartment building and its landscaping to respond to the streetscape and the public domain at the pedestrian scale. Ground floor apartments improve choice and flexibility by offering easily accessible housing to the elderly, disabled, and families with small children, and by allowing activities such as gardening, outdoor play and pet ownership. Because it is often difficult to ensure privacy in ground floor apartments, it may be wise to select a non-residential use for ground floor spaces in buildings that front directly onto the street. (See the *Good Solutions Guide for Mixed Use in Town Centres* for more information).

Objectives

- To address the design requirements and issues that are specific to ground floor apartments.
- To create active, safe streets and to contribute to the desired streetscape.
- To increase housing and lifestyle choices available in apartment developments.

Better Design Practice

- Design front gardens and terraces to contribute to the spatial and visual amenity of the street by creating individual entries for ground floor apartments. This articulates the street edge and animates the street with more pedestrian activity.
- Maintain occupant privacy while allowing surveillance of the site or street. Pedestrians in the public domain should be able to see into a private garden or a terrace to a degree that is not intrusive. Views into apartment interiors should be kept to an absolute minimum. This can be achieved by:
  - using a fence, wall, hedge or planting that is sufficiently visually permeable to give passing pedestrians a sense of the private garden or terrace without a clear view into it
  - minimising direct sight lines by utilising a change in level from the street to the private garden or terrace
  - carefully designing the height of boundary walls to control views into a property
  - providing a screening device (may be adjustable) around an outdoor area rather than at the boundary (see A2 Open Space, A5 Boundary Conditions and A6 Building Amenity).
- Ensure adequate privacy and safety of ground floor units in urban areas with no street setbacks by:
  - lifting the ground floor from the level of the footpath a maximum of 1.2 metres (see A5 Boundary Conditions for detail considerations)
  - designing balustrades and window sill heights to minimise sight lines into apartments
  - determining appropriateness of individual entries (see B2 Building Entry and B3 Pedestrian Circulation & Accessibility)
  - ensuring safety bars or screens (only where absolutely necessary) are integrated into the overall elevation design and detailing

Ground floor apartments are here raised above street level and ventilation grilles for underground parking are well-incorporated into street edge design.

- providing clear views from the street to the apartment entry and avoiding the creation of potential hiding places for assailants.

→ Promote housing choice by:
- providing private gardens that support a variety of activities and that are directly accessible from the main living spaces of the apartment
- maximising the number of *accessible* and *visitable* apartments on the ground floor
- allowing a non-residential use on some ground floor units (e.g. a home office accessible from the street or a corner shop – see C9 Flexibility and C3 Apartment Ceiling Heights).

→ Increase opportunities for solar access in ground floor units by:
- incorporating higher ceilings, taller windows and *duplex* units with mezzanine floors (see C3 Apartment Ceiling Heights)
- choosing trees and shrubs that provide solar access in winter and shade in summer (see A2.1 Landscape Design).

Rules of Thumb

Provide ground floor apartments with access to private open space of at least 25m^2.

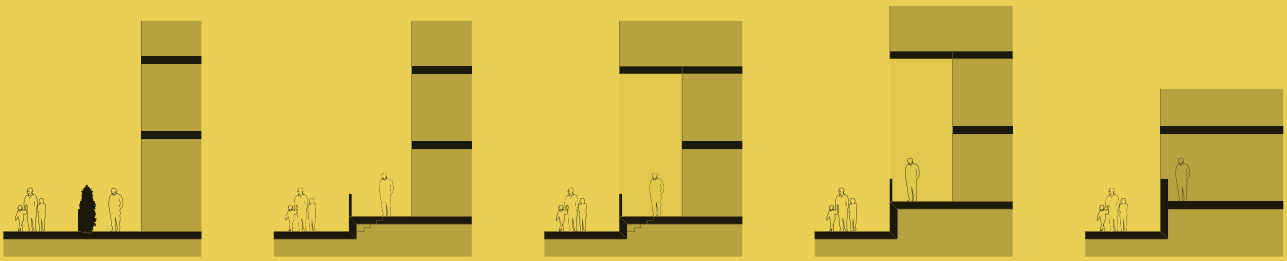
Optimise the number of ground floor apartments with separate entries and consider making them *accessible* or *visitable* units.

Direct views from the public street into a kitchen may be acceptable, but views deep into a living room are not.

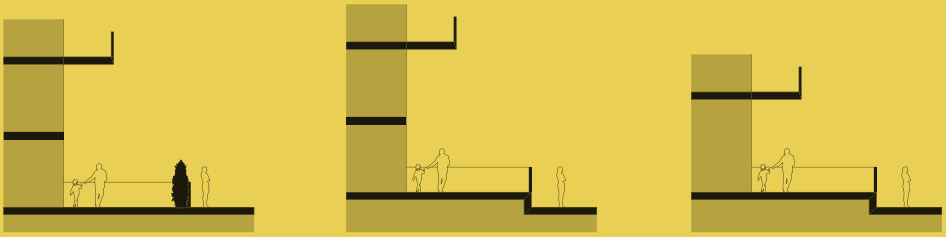
Set apartments back at least 3m from adjacent streets/public spaces when on same level.

Further Information: The Good Solutions Guide to Mixed Use in Town Centres. Auckland, North Shore City Council, 2005.

C7 Ground Floor Apartments



onto the street or public outdoor space



onto communal outdoor space

Solutions for providing an appropriate level of amenity for ground floor apartments may include:
- private front or rear garden
- planting
- solid balustrade
- street setbacks
- raised ground floor
- recessed entry
- higher ceilings

C8
STORAGE

The small building in the foreground doubles as bicycle storage and rubbish storage – as well as extending an entry roof for the apartment building behind.

Providing storage space for items ancillary to people's living needs is particularly important in apartment developments. Storage space should be provided outside the apartment for large items such as sporting equipment or bicycles. The size of this space should be proportional to the size of the apartment.

Storage space must be considered early in the design stages of a development. This is especially true of garage/remote lockup space. Ideally, interior storage spaces are built-in as this allows for the most efficient use of available space in each apartment. However, where spaces cannot be built-in, they should have a clearly identified place within the room and should form part of the furniture layout as shown on consent drawings. Owner-supplied freestanding storage units must also be allowed for in the apartment plan, including units for a television and its associated equipment, a stereo, books and CDs, and personal effects. The space allowed for all such units should be shown on the furniture layout.

Objectives

- To provide adequate storage for everyday household items within the apartment.
- To provide storage for sporting, leisure, fitness and hobby equipment in an easily accessible space elsewhere in the building.
- To provide readily accessible space (internal or external, depending on the circumstances) for equipment associated with children such as pushchairs and bicycles.

Better Design Practice

- Storage space required for each apartment can be broken down into a number of categories:

1.	Bicycles, children's toys, sports equipment, stored furniture, etc. *Garage/Outside storage*
2.	General household storage a. Large items: vacuum cleaner, ironing board, broom, pushchair. *Hallway* b. Smaller items: toys, books, sports equipment. *Hallway/Bedroom* c. Coats/shoes/umbrellas of guests and occupants. *Entry/Hallway*
3.	Refuse & recyclable material (before disposal). *Kitchen*
4.	Food, crockery, cutlery, cooking utensils, cleaning material and associated equipment. *Kitchen*
5.	Clothing, household linen a. Clothes for washing, soiled clothes. *Utility Room/Laundry* b. Bedding and household linen. *Ironing Area/Hallway* c. Personal clothing. *Bedroom*

Small storage units have been included here to use leftover space in front of diagonally parked cars.

- Provide storage within the apartment, keeping in mind that:
  - built-in cupboards in smaller apartments promote a more efficient use of small spaces
  - for convenience, locate storage areas off entries, hallways or the living area
  - less convenient storage in roof spaces, wall cavities and under stairs is still valuable to occupants for keeping irregularly used items such as suitcases.

- Provide storage outside the apartment ensuring that storage areas separated from apartments are secure.

- Locate each storage area so that it is convenient to the apartment it serves. Options include providing dedicated storage rooms on each floor or within internal or basement car parks. The latter option is often better as sports equipment is usually transported by car and may be difficult to move upstairs.

- Consider leasing additional on site storage to occupants to provide extra space while minimising the impact of storage on housing affordability.

- Ensure that basement storage does not conflict with fire regulations or compromise natural ventilation in car parks.

- Provide storage within the development that will accommodate larger items such as:
  - sporting equipment (skis, surfboards, golf clubs etc.)
  - bicycles
  - pushchairs.

- Lockable communal storage facilities may be useful but should not replace private individual storage for apartments. Such facilities may be useful for storing bicycles if there are hangers or racks to which bicycles may be securely fixed.

Rules of Thumb

Bedroom wardrobes should be a minimum 600mm deep internally and a minimum of 1m wide per person (i.e. 2m wide for double bedroom).

In addition to kitchen cupboards and bedroom wardrobes, provide minimum internal storage facilities of the following sizes:
- studio apartments 6m^3
- one-bedroom apartments 6m^3
- two-bedroom apartments 8m^3
- three plus bedroom apartments 10m^3

Storage outside the apartment should be adequately sized to accommodate bicycles.

Minimum dimensions for TV/DVD/Stereo unit should be 450mm deep x 900mm wide.

C9
FLEXIBILITY

Adaptive reuse with new residential maisonettes on the upper levels above three floors of retail and commercial.

Designing flexibility into apartment developments means creating buildings that will accommodate a wider range of occupants and needs such as:
- **different household structures (e.g. single person, couple, family, extended family)**
- **live/work arrangements**
- **varying mobility and access requirements (e.g. the elderly or young children in prams)**
- **different uses (e.g. residential, commercial, office).**

Flexibility strategies generally focus on designing buildings that have a built-in potential to cope with change, rather than designing buildings that may be physically altered or adapted in the future. A likely consequence of buildings designed for flexibility is that they are likely to have a longer life before requiring demolition, thus conserving resources and encouraging sustainable practice.

People generally have some degree of attachment to place; this may be to a single development, or it may be to a street or a neighbourhood. So the variety of residential accommodation available in the surrounding area should be assessed when considering issues of flexibility in an apartment development.

Objectives

→ To encourage housing designs that meet the broadest range of occupants' needs.

→ To promote 'long-life loose-fit' buildings that can accommodate whole or partial changes of use.

→ To encourage adaptive re-use (adaptation of existing buildings to new uses).

→ To save the embodied energy expended in building demolition by allowing for reuse.

Better Design Practice

→ Provide apartment layouts that accommodate the changing use of rooms. Design solutions include:
- windows in all *habitable* rooms and to the maximum number of non-habitable rooms
- adequate room sizes or open-plan apartments that provide a variety of furniture layout opportunities
- dual master-bedroom apartments that can support two independent adults living together or a live/work situation.

→ Promote accessibility and adaptability by ensuring:
- the number of *accessible* and *visitable* apartments is maximised
- adequate pedestrian mobility and access is provided (see B3 Pedestrian Circulation & Accessibility)
- consider designing to comply with objectives of *Lifetime Homes* (see Further Information).

→ Provide robust building configurations, which utilise multiple entries and *circulation cores*, especially in larger buildings together with:
- shallow building depth, suitable for residential or commercial uses
- a mix of apartment types (see C5 Apartment Mix)

High floor-to-floor heights on the ground floor of this apartment development allow for commercial uses.

- higher ceilings in particular on the ground floor and first floor (see C3 Apartment Ceiling Heights)
- separate entries for the ground floor level and the upper levels.

→ Utilise structural systems, which support a degree of future change in building use or configuration. Design solutions may include:

- a structural grid that accommodates car parking dimensions, retail, commercial and residential uses vertically throughout the building
- alignment of structural walls, columns and services cores between floor levels
- minimisation of internal structural walls
- the potential for addition or removal of partition walls to change configuration/ size of spaces
- higher floor-to-floor dimensions on the ground floor and possibly the first floor
- consideration of potential for future amalgamation of two adjacent apartments.

Rules of Thumb

Utilise multiple entries and vertical *circulation cores* rather than requiring occupant circulation past greater than three other apartments on the same floor level before reaching their own.

Provide measures that enable ease of use by disabled occupants such as:

- 810mm minimum width doors for entry and main floor
- levered handles rather than knobs on doors and faucets
- place electrical outlets at 450mm above floor level instead of 300mm
- non-skid flooring
- low threshold shower with grab bars or nogging for future installation
- bathrooms with turn-around space for wheelchair or walker (950x950mm)
- drawers instead of cupboards below benches in the kitchen.

Further Information: Housing Choices for Disabled New Zealanders. Housing New Zealand Corporation, March 2005.

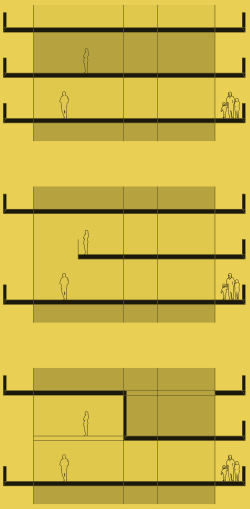
www.hnzc.co.nz/chr/pdfs/housing-choices-for-disabled-new-zealanders.pdf

Lifetime Homes www.jrf.org.uk

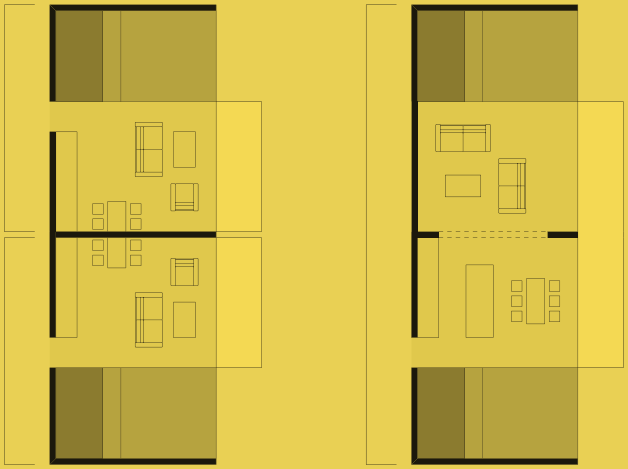
The Good Solutions Guide to Mixed Use in Town Centres. Auckland, North Shore City Council, 2005.

C9 Flexibility

flexibility of structure in section

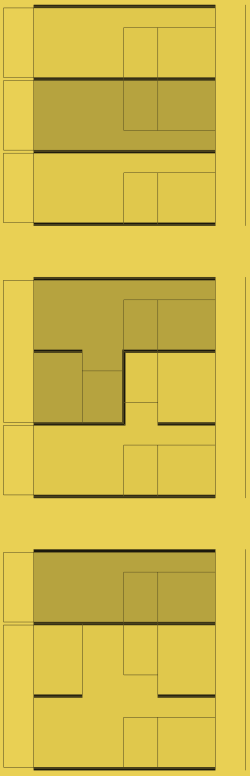


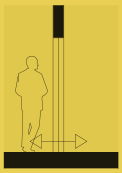
An apartment building can be designed to be flexible from the outset, left – where even the most regular of structural systems can accommodate a variety of apartment types.

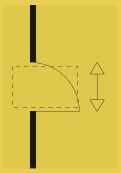


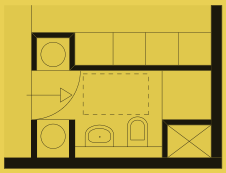
Alternatively it may allow for later alterations, above – two apartments combined to create a single, larger apartment.

flexibility of structure in plan









Three steps to a *visitable apartment*:
1. No step at entry.
2. Doorways wide enough for a wheelchair user.
3. A bathroom at entrance/main living level where a wheelchair user can enter and close the door.

3

PART 3
PRE & POST DESIGN ISSUES

FACILITATING PLANNING CONSENT

Expediting a project through the planning process in a timely and efficient manner benefits all parties involved in a development. Overall quality of design, a direct consequence of the skills and experience of the architect and development team's skill and experience, affects the speed of consent processing more than anything else. Development teams and architects should, therefore, initiate discussions with council regarding their overall design approach at an early stage in the development proposal process.

Objectives

- To expedite high quality development projects through the planning process as quickly and efficiently as possible.
- To encourage a dialogue between the development team and the Territorial Authorities as early as possible.
- To facilitate the design process and ensure communication of relevant, reliable information.

Better Design Practice

- Before beginning concept design for an apartment project, prepare a context analysis (see Part 1 Context Analysis). This should explain the site's constraints, opportunities, and capacity for development by relating the site to the surrounding area (planning controls, public transport networks, pedestrian networks, traffic issues, local open space, etc).
- Before beginning concept design, the development team should meet with a senior Council planner to discuss the context analysis. The senior planner will:
  - gather the appropriate Council officers, such as an engineer and an urban designer, to explain the consent process and identify significant issues specific to the project
  - answer general questions and discuss parameters of the proposed project
  - establish a relationship with the development planner who will see the project through the Resource Consent process
  - supply information on costs, levies and financial contributions that Council will impose.

Pre-application meetings can save developers and designers time and money through quicker expedition of the planning consent process.

→ When an initial concept design is complete, meet with the Council planner to discuss design concepts and alternatives that have been investigated. Materials should include:
- a written statement with drawings/diagrams showing how the context and site analyses have informed conclusions regarding development options that respond to the existing context
- analysis and indicative proposals for boundary areas, including the development's relationship to neighbouring streets/ public areas and to existing pedestrian and road networks
- indicative footprints of buildings on the site
- site entry points
- planned public open space, communal open space and private open space
- indicative design for parking, including number of car parks proposed
- indicative ground plane treatment, including location of permeable areas.

→ Consider taking advantage of services such as Urban Design Panels (where available), or having the concept design peer-reviewed by suitably skilled design consultants.

Rules of Thumb

Some councils may charge for the time involved in pre-application meetings, but developers should consider this a worthwhile investment, given the cost, both in time and money, of major revisions and modifications to designs.

The Council may require other levies or financial contributions in addition to the charges for processing a development's consent application.

The Auckland City Council Urban Design Panel offers free pre-application urban design advice. Using this service may indicate early on whether a proposal is likely to be supported throughout the consent process from an urban design perspective. Currently, some projects are obliged to go before the urban design panel and some are only encouraged to go before it (see below).

Further Information: General information on the Urban Design Panel is available on the Auckland City Council website:

www.aucklandcity.govt.nz/council/services/panel/default.asp

Information on projects that are required to use the service is also on the website:

www.aucklandcity.govt.nz/council/services/panel/members.asp

MANAGING APARTMENT DEVELOPMENTS

The smooth running and effective management of an apartment development is determined to a large extent by the quality of the initial design, especially in regard to issues covered in section B4 Building Performance (building envelope, energy efficiency, water conservation, maintenance and waste management). Another major factor in the efficient operation of apartment developments is whether or not a building manager is employed to deal with day-to-day issues.

A knowledgeable market will price ongoing management and maintenance costs into the market value of apartments, with these costs becoming easier to evaluate as a development ages and historical data accrues. Apartment buyers are increasingly aware of the potential hazard of levies (made up of maintenance and sinking funds, body corporate secretarial fees, land leases, etc.) being unrealistically low when developments first go on the market.

The legal ownership and management of apartment developments is currently dealt with under the Unit Titles Act 1972. This provides for the subdivision of land into units owned by individual proprietors (owners), and common property that is owned jointly by all the unit proprietors.

Under the current act, a body corporate is established when a developer deposits a unit plan for the development with the District Land Registrar at the local office of Land Information New Zealand. A valuer will have set the "unit entitlements" which define the relative value of all units and determine the share each owner has to pay toward the body corporate. At this point the body corporate might consist only of the developer, with new owners automatically becoming part of the body corporate as they complete settlement on their units. The body corporate will usually engage a professional management firm to perform the role of body corporate secretary – as apartment developments can have large financial turnovers, there should be skilled and experienced stewardship.

New legislation is currently under review to update the Unit Title Act, and should be passed by 2008. Among changes designed to protect consumers are likely to be: allowing bodies corporate to change rules with a 75% majority, putting in place a disputes resolution mechanism and requiring long-term maintenance funds to be in place.

Objectives

- To establish operational rules that allow for efficient operation of the body corporate.
- To have effective mechanisms for the day-to-day management of the development and to clearly communicate these to residents.
- To establish an effective annual and long-term maintenance programme with adequate funding from unit proprietors.

Better Practice

- Establish an effective body corporate with sound operational rules.
- Appoint a professional firm as body corporate secretary. Roles, on behalf of the body corporate, can include:
  - administration of accounts
  - completing "full, true and complete accounts of the affairs and transactions of the body corporate"
  - convening meetings of the body corporate and preparing minutes
  - ensuring the development is fully insured at all times
  - preparing budgets for the body corporate and maintaining a fund for all its expenses

Good management of apartment developments includes regular building maintenance.

- collecting levies from the owners and paying accounts
- reporting regularly to the body corporate - at least quarterly and preferably monthly
- organising the annual building warrant of fitness, if required
- maintaining a register of proprietors (owners) as required by the Act and supplying Section 36 certificates when a unit is sold or mortgaged
- coordinating maintenance of common property, usually through the appointment of a building manager
- setting up a sinking fund for future major common area maintenance
- responding promptly to requests for information from owners or owners' committees.

→ Engage qualified professionals to advise on a long-term maintenance programme and funding required. Advantages include:
- allows considered, planned decision-making
- safeguards occupant health and safety
- reduces the risk of over investment
- optimises the maintenance process
- reduces plant and equipment downtime
- lowers life cycle costs and enhances the building image.

→ Engage a building manager (on-site or off-site) for day-to-day building and property maintenance.

→ Deal with repairs and maintenance in common areas promptly to reduce the risk of vandalism.

→ Provide clear instructions to new owners (and their tenants) including:
- regular newsletters to keep residents generally informed
- names and contact details of owners' committee representatives, building manager and body corporate manager
- guidelines for owners and tenants on whom they should notify when repairs and maintenance are required
- instructions on location and use of waste disposal and recycling facilities
- rules on access to common areas, including permitted hours of use for recreation facilities
- instructions on emergency, fire and security systems
- information on location and use of parking (private and for visitors)
- limits on where satellite dishes and TV aerials can be placed (developments should use common aerials etc. as much as possible)
- rules regarding window boxes, the general appearance of balconies and gardens and drying of washing in publicly visible areas.

Rules of Thumb

A key issue in many developments is how water and wastewater are paid for. Most developments have a single meter for water use from which the water company bills the development as a whole. Water and wastewater bills are then shared between units and included in annual levies. In lieu of individual, official water company meters, some developments may have 'check meters' which allow water usage to be measured and the bill divided accordingly. Check-metering may be more time-consuming (meters have to be read, a spreadsheet of usage has to be maintained and owners billed separately by the body corporate secretary), but will encourage reduced consumption and may be preferred by some owners.

Further Information: The Mysteries of Bodies Corporate: A guide to the rights and responsibilities of apartment ownership. Auckland Regional Council, January 2003.

http://www.arc.govt.nz/arc/library/g94174_2.pdf

What to Look For When Buying a Terraced House or Apartment. North Shore City Council/ Auckland Regional Council.

http://www.arc.govt.nz/arc/library/x16658_2.pdf

The website of the Department of Building and Housing - www.dbh.govt.nz

4

PART 4
CASE STUDIES

Q CITY

Architect:	Clark Brown Architects
Developer:	Kitchener Investments
Location:	Corner Queen Street & City Road, Auckland Central
Site:	1,288m^2
Building:	13 storey tower on podium, 9 residential storeys above 2 retail storeys & 2 parking storeys
	90 x one-bed apartments, single aspect and corner aspect
	5 retail units over 2 floors
Apartments:	39m^2 with 5m^2 balconies
Car Parking:	71 internal spaces for apartments

Q City is located near the upper end of Queen Street, about 200m from Karangahape Road. Within a 10-minute walk are AUT and Auckland University. Several bus routes, including the Link service, run up Queen Street. The surrounding area contains a mix of building types, heights and uses, including a series of 19th Century two-storey retail terraces that step down Queen Street from the site. To the east is an open car park, beyond which is a multistorey residential block by the same developer.

The Site

The site slopes down very steeply westward to Queen Street. It is overlooked by other apartment buildings on the ridge behind. Access to the apartments is through a separate entrance off the City Road footpath. Access to car parking is a few metres further up the road, also across this footpath.

The Building

A podium – covering almost the entire site – consists of retail on the lower two floors, with two levels of car parking above. The tower is set back from the east and west boundaries and contains nine residential storeys. The profiled metal roof of the retail/parking plinth, visible from the apartments above, is a missed opportunity for rooftop landscaping. This would have increased the amenity of the development by providing common outdoor space (none is provided elsewhere), while also improving the outlook from the apartments.

The retail units form an active street edge and take advantage of the steep slope to give direct access from the footpath to both levels. The lower retail spaces continue the module of the neighbouring heritage buildings.

The parking areas contain 71 car parks and a rubbish room. A 'bike park' noted on the building consent drawings is currently used as a cleaners' store. No visitor parking or remote storage for residents is provided. A separate company manages the building's car parks as public parking. This indicates that some apartments were sold without car parks, or that apartment owners who let their apartments achieve a better return for the parks from public parking than from their tenants. While this situation creates more affordable apartments for residents without cars, it does not allow the choice of using the car parking area for storage.

The pedestrian entrance lobby is small and spartan, but without any hidden corners. Mailboxes are located in the car park, making them inconvenient, unsafe, and prone to being tampered with. Furthermore, residents checking their mailboxes obstruct the already narrow route from the car park to the entrance lobby.

The same small, naturally lit, lobby plan is repeated for all residential floors. The lobby leads to a double-loaded internal corridor with five single aspect/corner aspect apartments on each side. The end of each corridor has a window that, although it is not large enough to naturally light the entire corridor, does allow for a visual connection to outside and some natural ventilation. Corridor dimensions – 1.2m wide x 2.4m high – are not generous.

All habitable rooms are on external faces, ensuring access to daylight and natural ventilation and avoiding the need for mechanical air supply. Motion sensors in the communal areas ensure that artificial lighting is only provided when required.

The selection of external materials – painted pre-cast panels, aluminium windows, profiled metal roofs – gives

Far left: A public car park is contained within lower levels of the building.

Left: Entry to apartments is spartan & characterless.

Bottom far left: Apartments are set back from the Queen Street boundary.

Bottom left: The Queen Street elevation continues the retail module of existing heritage buildings.

the building a commercial feel, but allows for easy maintenance and should weather well.

Waste management within the development consists of wheelie bins stored in the garage rubbish room. No provision is made for recycling. As there is no obvious reason why this should be the case, it is probably due to management choice.

The Apartments

The same typical apartment plan is repeated for each of the 90 apartments. Units at the ends of the building have additional windows on end elevations. These improve natural lighting, but require relocation of the bedroom wardrobes, which in turn reduces the size and usability of the dining area. This highlights a lack of flexibility that often exists within tightly planned apartments.

Units are very small but functional. The recessed balconies provide sheltered outdoor space that is accessible from two sides. The solid balustrade increases privacy in the recessed bedroom.

In each unit the kitchen and bathroom are located at the rear of the apartment, allowing the bedroom, dining and living areas access to daylight and natural ventilation. The dimensions of the habitable rooms do not allow flexibility in furniture placement and therefore cannot accommodate varying or specific needs, such as the inclusion of a computer desk.

Kitchen cupboards and a built-in bedroom wardrobe provide the only storage in each apartment. Coats, umbrellas, vacuum cleaner, ironing board, sports equipment, dirty laundry, linen and clothes must therefore be accommodated in this single wardrobe. Because of the tight apartment plans, it is difficult to accommodate extra freestanding storage in the units.

Conclusion

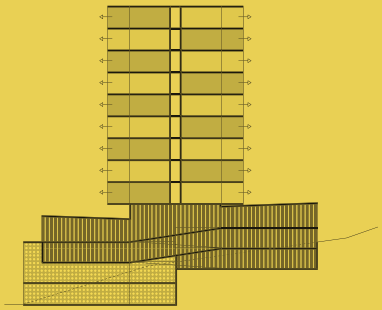
With its single, repeated apartment typology, Q City is an example of a development aimed at a very narrow sector of the housing market – renting students and young working people. Minimal common areas, tightly planned apartments with no storage, and a lack of character for the development as a whole mean that, while the development may suit its intended market, it is unlikely to attract long-term inhabitants or satisfy those whose needs change over time.

Q City

Site

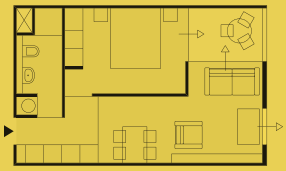
Open Space

Built Footprint

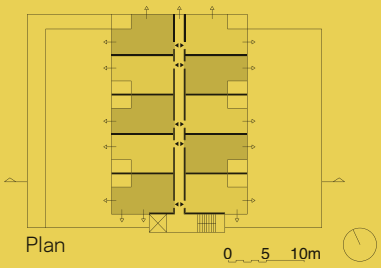


Section

residential
residential
parking
retail



Typical Apartment Plan



Plan

BEAUMONT QUARTER

Master plan:	Studio of Pacific Architecture
Architects:	Engelen Moore, S333, Jasmax and Studio of Pacific Architecture
Developer:	Melview Developments Ltd
Landscape:	Boffa Miskell
Location:	20 Beaumont Street, Auckland Central
Site:	2.4ha
Building:	Approximately 250 dwelling units in entire development Development also includes 3,100m^2 of retail space in refurbished heritage buildings Stage 3 includes 133 apartments
Apartments:	44m^2, 46m^2, 65m^2, 68m^2 (internal areas)
Car Parking:	Approximately 350 car parks

The development is located on a former industrial site immediately to the west of Victoria Park in central Auckland. To the east are views across Victoria Park to the city (including the elevated motorway that crosses the park). To the north is a large car park of a religious centre, to the west an escarpment with commercial buildings at the top, and to the south another apartment development. Other than the cliff at the western side, the site drops gently toward the east.

The site is well situated to allow residents to take advantage of Victoria Park. A major supermarket (120m along the road), Ponsonby Road and the CBD are all within a fifteen-minute walk. Beaumont Street has high levels of traffic going to the northern motorway and the marinas but at this point has a good streetscape character courtesy of the heritage buildings and mature trees that border the road.

The Site

Vehicle and pedestrian access to the site occurs at two main entry points – both situated on the eastern boundary on Beaumont Street. Refurbished brick character buildings run along this boundary housing commercial uses and it is also possible to enter the site through these during working hours. Another retained heritage building sits near the rear of the site and contains the development's pool and gym.

The site is very permeable with straightforward internal vehicle circulation that reads as public streets, and a comprehensive pedestrian network. Some car parking (including on-street three-hour visitor parking) is visible at street level, but cars are predominantly concealed within basement car parks. The relatively narrow streets and the multitude of pedestrian routes within the site, mean that the car does not dominate the development.

The site was originally master planned in its entirety, with buildings following in three stages, leading to a coherent, well-considered development. The landscaping generally is high quality, with a good mix of soft and hard landscaping and with integration of pre-existing trees into the scheme. There are no play areas specifically designed for children.

There is an additional pedestrian entry planned for the southwestern corner of the site but as it is not visible from below and connects to the driveway of a commercial building it will probably only be known by residents. With no highly public links through the site to draw people in, most open spaces in Beaumont Quarter tend to read more as communal than public - which has the likely benefit of supporting a sense of community among neighbours and strengthening the sense of identity of the development.

The Building

A number of typologies are used in the development in response to differing site conditions. In the earlier stages of the project the terrace house was the predominant type developed, while in Stage 3 blocks of apartments have been built (but still with no buildings over four storeys). Over a third of these apartment typologies use vertical cores with pairs of single-level, dual aspect apartments on each level. Another third are single aspect units off double-loaded corridors, with most of the balance being dual aspect with individual access.

In the areas of terrace housing there is a good mix of building designs giving variety to the streetscape. Amongst the Stage 3 apartment buildings on the south side of the site there is much more monotonous

Terrace housing (foreground) beside a four-storey apartment block.

Stage 3 apartment blocks. Privacy measures for ground floor private open spaces are not particularly effective.

repetition in the elevations. Entries in these buildings are not particularly generous and many ground floor apartments have less than optimal privacy. Landscaping around the apartment buildings is relatively high quality but with fewer trees and planting than in earlier stages. Parking has been incorporated well under the buildings and under landscaped open space, so that it does not compromise the development. These parking areas are accessible.

Communal bins collected by private contractors provide waste management for the apartment blocks in contrast to the terrace housing, which has individual wheelie bins.

The Apartments

Stage 3 apartments are a mix of single-level and duplex typologies. The blocks that run east-west have dual aspect apartment types with individual or vertical core access, while the two blocks that run north-south have mostly single aspect apartments accessed off double-loaded corridors.

While most apartments have reasonably tight planning they are all functional and well-organised with well-proportioned rooms and good penetration of daylight. Most apartments are entered off private open space (both ground floor and upper level decks), directly into the living area. There is generally adequate internal storage but no storage in the parking areas or other locations external to the apartment. Repetition of apartment plans within blocks gives back-to-back related functions from one unit to the next, increasing acoustic privacy. Habitable rooms in all units are located on external walls with access to natural ventilation and light.

Conclusion

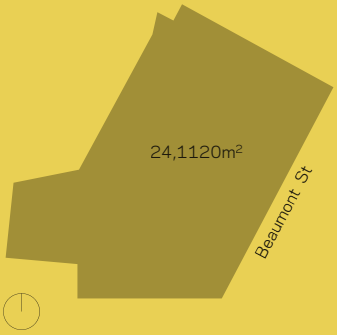
The excellent master planning and landscaping of the Beaumont Quarter got the project off to a very good start. The resulting urban environment within the site gives a character that is unusually people-scaled and pedestrian-focused for a New Zealand project. These aspects have been reinforced by the retention of pre-existing mature trees and heritage buildings that combine to give additional character and atmosphere to large parts of the site. Cars have been handled in a very considered way, with narrow streets, hidden parking garages, high quality pedestrian surfaces and edge definition, and shared pedestrian/vehicle areas all combining to reduce the dominance of cars.

At 2.4 ha and 250 units this is a large development and the design team has been willing to use a variety of building typologies to best match both physical site conditions and development goals. While this may have increased the design effort required, it has also brought a pleasing diversity to the site. Even with this diversity of building stock, the urban design and landscaping and the relatively enclosed nature of the site still allows a distinct identity and character for the development as a whole.

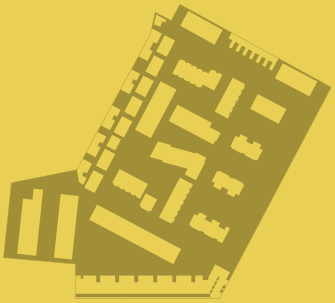
The four apartment blocks developed in Stage 3 keep to the four-storey scale of the rest of the development but have more repetition in their elevations. This repetition results in Block A especially seeming very long in relation to other buildings in the development.

Apartments are all well planned with good amenity, all habitable rooms are on exterior walls and all have private open space.

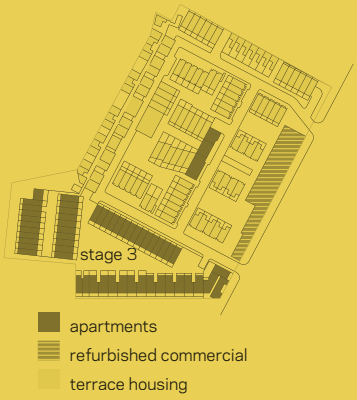
Site

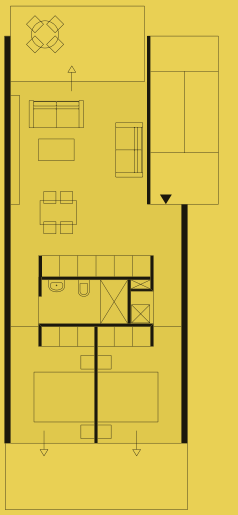


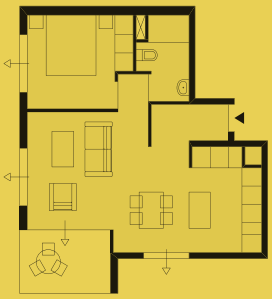
Open Space

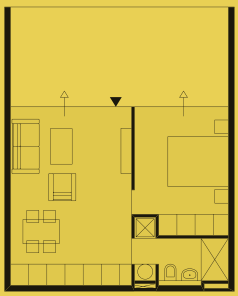


Built Footprint









FREEMANS PARK

Auckland City Council developed this site in the 1960s as public housing. In the 1990s the Council began to sell the units, 75% of which are now in private ownership with the balance held by an assortment of social agencies.

The site is located in an established residential area within ten minutes walk of Karangahape and Ponsonby Roads. Housing in the surrounding area is a mix of terrace units from the 1960s and 1970s, and detached villas. A good range of facilities exists close by, including a supermarket, public parks, tennis courts, schools and public transport routes.

The site is a full urban block, sloping gently toward the north. The street to the south is a quiet cul-de-sac while the other three boundary roads have a high volume of traffic. Mature trees are dotted throughout the site.

The Site

The Council initially developed vertical access apartment blocks (commonly referred to as 'Star Blocks') on the site. Nine of these buildings are spread across a large proportion of the site. Duplex and terrace blocks were developed later in the remaining empty areas.Overall, site planning is quite loose, with little definition of shaped open space. Vehicle access onto the site occurs in ten separate places with a couple of driveways meandering through the site. The resulting landscaped, leftover space is minimally defined at its edges.

At the site boundary, no distinction exists between public and communal areas. Public footpaths run straight onto common grassed areas without fences.

Architect:	Auckland City Council/Ministry of Works		
Developer:	Auckland City Council		
Location:	Howe, Wellington & Hepburn Streets, Freemans Bay, Auckland		
Site:	3.5ha		
Building:	162 apartments (80.6%) & 39 terrace houses (19.4%) 201 dwellings total		
Apartments:			
	Star Blocks (vertical access) Blocks, 1-9	3 - 4 storey	118 x 2 bed/1 bed
	Duplexes (horizontal access) Blocks 13, 14	4 storey	44 x 2 bed
	Terrace Housing (individual access) Blocks 15, 16	1 storey	9 x 1 bed
	Blocks 17, 20, 21	2 storey	22 x 2 bed
	Blocks 18,19	2 storey	8 x 3 bed
Density:	57.5 dwellings per hectare		
Car Parking:	214		

Pedestrian routes consist of concrete paths that connect public footpaths to each of the buildings and to the car park areas. Vehicle speed is generally very low, as driveways consist of meandering cul-de-sacs. Parking areas relate to specific buildings and are either open or contain rows of carports.

Waste management consists of communal skips and wheelie bins placed in car park areas with little screening in most cases. Separation for recycling happens in these areas.

The development creates the impression of an open arrangement of individual buildings in a park-like landscape. However, one could expect more public pedestrian connections through such a large, permeable site. There could also be greater definition of boundaries between public and private open space. For example, clotheslines are not screened from areas of open lawn, public footpaths or roads.

Outdoor areas provide a pleasant outlook from apartments, without providing many functional open spaces for residents. Star Block residents, who don't have balconies or terraces, would benefit from usable hard-landscaped areas at ground level.

On the other hand, the low percentage of building cover and high percentage of soft landscaping facilitates on-site stormwater management and strengthens the development's unique identity. Clear building signage and numbering aids visitors, although the overall irregularity of the site layout often confounds orientation. The most successful parking consists of carports situated at a distance from the site boundary, while the least successful are the open car parks that disrupt the streetscape in front of the duplex blocks.

The Buildings

The development consists of 18 blocks with five different building types. Eleven of the blocks accommodate just over 80% of the total units on-site in two different building types.

The nine Star Blocks contain 118 apartments. These three-storey blocks have four single-level, two- bedroom (mostly) corner apartments per floor, accessed from a top-lit central stairwell.

Star Block entrances lead directly from the outside to the stairwell. These entrances are modest but functional, with post boxes located in the external wall beside the entrance doors, and with a communal storeroom and laundry room nearby. Two of the ground floor units are smaller (one-bed units) to accommodate these facilities. In some instances, site contours allow for two additional units below entrance level. Vertical circulation is via the single staircase (no lifts). In some blocks, steps must be negotiated to gain access to the buildings.

In addition to the Star Blocks, two four-storey slab blocks contain 44 apartments per block. Each apartment is a dual aspect, two-storey (duplex), two-bed unit with external horizontal access. Upper units are accessed via a single-loaded external access balcony fed from exterior stairwells. These units also have private external balconies. Ground floor units are accessed from a landscaped footpath at ground level, and have enclosed gardens.

The development's mix of housing types allows residents to choose among several options. Many residents with changed circumstances sell one unit and buy another type within the development so that they may remain in the area.

Top left: Star Block four-storey blocks with four corner aspect apartments per floor.

Bottom left: Duplex apartments with horizontal access balcony.

Left: Duplex apartments with a private terrace for the apartments above and a private garden for the lower apartments.

In terms of energy use, the blocks generally perform well due to their high mass concrete or masonry construction and their orientation to the sun (rather than to the street). The southeast and southwest units in the Star Blocks are an exception: they have living rooms facing east and west respectively, giving less than optimum sun penetration in mid-winter. None of the units have central heating.

The Apartments

The Star Block apartments, typically 64m^2, are well organised with small, well-proportioned, useable rooms. All habitable rooms have access to natural light and ventilation, and some units have high-level glazing in internal walls to let natural light into the service areas. The small, functional kitchen runs off the main living/dining area and is also on an exterior wall. None of the Star Block apartments have balconies, and common grassed areas extend up to the buildings' exterior walls so that ground floor apartments have no private open space. Each apartment has a separate utility/laundry room and contains a good amount of storage space, including built-in units in the hall, living room and bedrooms. Locked common storage space is provided on the ground floor.

The 59.5m^2 dual aspect duplex units consist of an entry, kitchen/utility room, living and dining rooms on the lower level, with bedrooms and bathroom above. This room arrangement and the skip-stop horizontal access allow these units to function extremely well in terms of privacy. Although the kitchen in each unit faces the access balcony, it has a window of sufficient size and position to provide light and ventilation while maintaining privacy. The rooms on the upper floor have larger windows. The small size and square shape of the living/dining area makes it difficult to place furniture in these rooms. This is exacerbated by circulation through the living to the stairs and balcony. All rooms (including the bathroom) are on an external face, allowing for natural light and ventilation. Ground floor units have individual access and fenced private gardens on the west or north face. Although not large, all apartments are well planned and functional. The two separate bedrooms allow flexibility as one can be used as a study and, as in the Star Blocks, is well connected to the living areas. Storage is adequate in the duplexes and better in the Star Blocks, with additional common storage for bikes, strollers, sports gear, etc.

Sound insulation in apartments is generally good, although the Star Blocks would benefit from acoustic seals on apartment entry doors to reduce noise from the stairwell. Placing related use areas in neighbouring apartments back-to-back further helps acoustic privacy.

Service risers in the Star Blocks are large enough to allow a person to enter and are accessible from each level in the access core, helping maintenance and servicing.

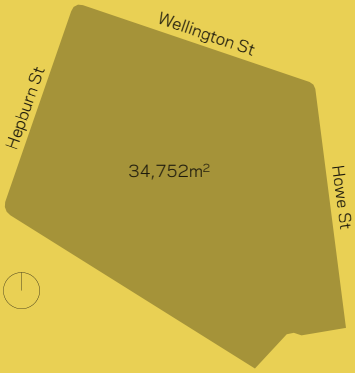
With all apartments being either dual aspect or corner aspect cross ventilation is easy to achieve.

Conclusion

The apartments in this development have stood the test of time. Although the site planning dates from a period when creating open space for residents was not considered a priority, the duplex design includes good private open space. The Star Blocks lack this amenity, although it could easily be provided for the ground floor units.

Road boundaries could be better defined with a low fence, wall or hedge. This would also give the entire development a stronger identity without restricting the airy character of the open spaces.

Site



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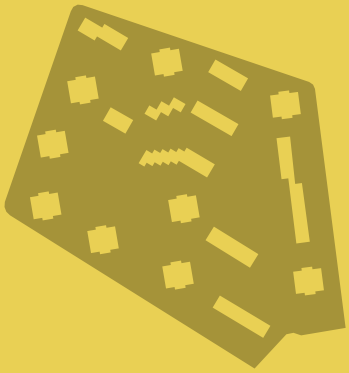
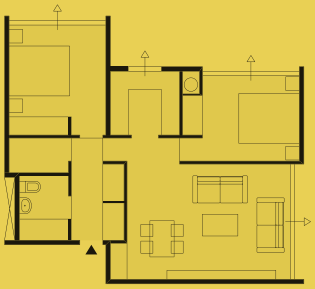


Built Footprint



corner aspect
Star Block apartments

dual aspect
duplex apartments

SCENE ONE APARTMENTS

Scene One is the first of three apartment buildings by the same developer that run eastward along Beach Road. The site is part of an Auckland CBD waterfront block directly to the east of the Britomart transport centre. In addition to apartment buildings, the block contains a supermarket to the northeast, and empty land to the northwest. The new Auckland Events Centre is a five-minute walk to the east and Queen Street is a similar distance to the west. Immediately to the north of the block are commercial wharfs, past which there are views to the harbour.

The site is flat and fronts onto Beach Road at its southern edge. Beach Road leads to the CBD and generally has heavy traffic. Britomart Place, a smaller road to the west, separates the site from the transport centre. An underground train tunnel runs beneath the northern half of the site.

The Site

The 16-storey building block has been orientated to run east/west along Beach Road, with most apartments facing north toward the harbour. The bulk of the building has been kept back from the underground tunnel, while the podium (containing car parks) spans across it. A small one-way access road has been created to the north of the building to serve the building's car parks and the supermarket's loading dock and car park. To date nothing has been built to the north of this road.

Integration with existing pedestrian networks is less than ideal and amenity for pedestrians is not high on the new northern access road. Many pedestrians use this as a route from the transport centre to the supermarket, but they must cross the road and dogleg twice in order to follow the footpath. On the south elevation of the building an active edge has been thwarted by commercial premises closing themselves

Architects:	Richard Priest Architects
Developer:	Redwood Group
Location:	Corner of Beach Road & Britomart Place, Auckland Central
Site Size:	3744m²
Building:	16 storey slab & podium block with skip-stop double-loaded access corridors. Commercial on part of ground floor & gym on top of podium.

Apartments:

Type	No.	Level	Comments
studios, SA	08	4, 5	
1 bed, SA	18	5, 6, 7	
1 bed + study, SA	09	9, 11, 13	study can fit single bed
2 beds, SA	36	5, 6, 7, 9, 11, 13	5 variations
2 beds, DA	28	8, 10, 12	4 variations
3 beds, DA, 2CO	20	14, 15, 16	2 variations
3 bed + study, DA	01	10	2x2 beds, study can fit single bed
TOTAL	120		

(SA = single aspect, DA = Dual Aspect, 2CO = two-storey crossover)

Density:	45 dwellings per hectare
Car Parking:	194 internal spaces, 7 visitor spaces

to this side, while three levels of car park have been positioned hard up to the footpath.

Apartment storeys begin four levels above the street, limiting overlooking of the public areas immediately surrounding the building. While this contributes little to public safety and security, it also creates fewer privacy issues for the apartments.

The Building

The building's lower four levels contain car parking, except for a ground level commercial space at the western end. A large gym and recreation facility occupies half of the fifth level. Single aspect apartments off double-loaded corridors (half north-facing and half south-facing) occupy the other half of the fifth level and the four levels above it. The upper nine storeys of the building contain a skip-stop access arrangement. Double-loaded corridors on every second level serve both single- and dual aspect apartments.

Pedestrians may enter the building from the main lobby on the north side of the building, or from a smaller entry on Beach Road. An Asian restaurant currently occupies the ground floor commercial space that runs through the building. The restaurant's proprietors have closed the southern access to their business and expanded to the north with temporary structures.

The northern side of the building has been treated as the 'front', although some features of this facade, such as the small entry signage and the dominance of the parking levels, deemphasise the entry. A large blue sign above the smaller door on the south side of the building emphasises the status of this secondary entry.

The building entrance allows a clear view of the doors, enhancing safety. Although postboxes dominate the approach, they are easy to access from a well-lit, generously sized lobby. Building circulation and orientation are straightforward. Positioning the vertical core at the centre of the building has allowed shorter corridors, but they are narrow (1.3m wide), have no natural light and no variability.

The skip-stop access has increased the variety of apartments, thereby improving choice for buyers. Combining double-loaded corridors with single-level apartments has, however, resulted in a large proportion of south-facing apartments that receive little direct sunlight.

The building's waste management system is effective, with rubbish chutes (accessible from all lift lobbies) directing rubbish to a room in the basement. Waste is then collected into wheelie bins and moved out through the garage for collection.

The Apartments

The building contains a mix of apartment types: studios to three-bedroom units, single and dual aspect, and two-storey crossovers. Rooms are generally functional, well planned, and generously sized, with ceiling heights of 2.7m. Two thirds of the apartments have entries directly into the living spaces, while the balance have separate entry areas. Many of the entries are offset from their neighbour's entry across the hall.

North-facing apartments receive good daylight and sunlight penetration. A 1.9m overhang on the north facade balances the amount of light received through extensive north glazing. South-facing single aspect apartments receive limited sunlight however, as their fully glazed external wall faces almost due south. One third of the apartments (40 out of 120) in the development have this issue.

Intertenancy walls are timber-framed double-stud to the NZBC's minimum specification of 55dB.

Car parks, closed commercial premises and blank walls border the public footpath and thwart an active edge to the south side of the building.

Nine apartments have bedrooms adjacent to their neighbour's living room, risking acoustic privacy issues.

Dual aspect apartments include adequate storage, but the single aspect types have minimal storage provision. No remote storage space exists elsewhere in the building for items such as bicycles, sports gear, etc.

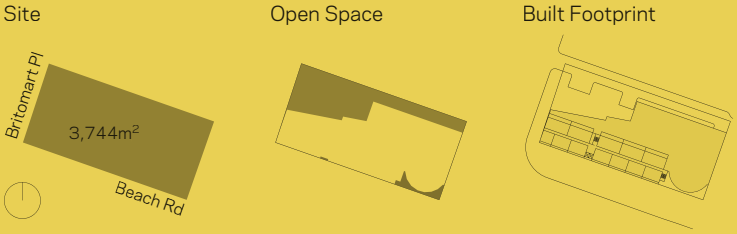
Apartments with a northern aspect have usable balconies. These are generally 1.9m wide, although some are made wider to modulate the facade. South-facing apartments contain sliding doors with an exterior offset glass balustrade. Balconies integrate well into the overall building form, and vertical concrete fins modulate the facade and provide good privacy from neighbours.

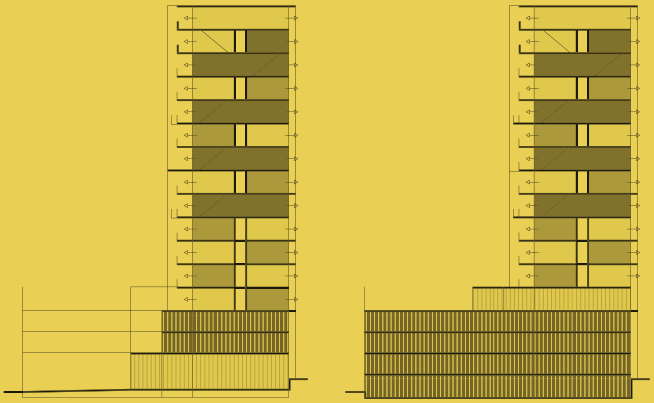
Conclusion

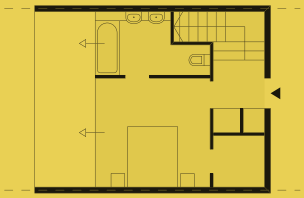
Scene One generally works well for residents with a good mix of well-planned apartment typologies. It is unusual in New Zealand in that it uses the dual aspect, crossover typology in some places. There are, however, a relatively large proportion of south-facing single aspect apartments.

The development does not work as well in the public domain, with a poor pedestrian environment around the perimeter of the building and poor through-site pedestrian connections.

Scene One


Site
Open Space
Built Footprint
Britomart Pl
3,744m²
Beach Rd





apartments
apartments
apartments
parking
commercial
0 5 10m
4
5, 6, 7
8, 10, 12, 16
9, 11, 13
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15

TRINITY APARTMENTS

Architect:	Architectus
Developer:	McConnell International Property
Location:	429 Parnell Road, Parnell, Auckland
Site:	3,510m^2
Building:	L-shaped block with 2 vertical access cores
Apartments:	31 apartments, ranging from: 88m^2 up to 360m^2 & 1 bedroom to 3 bedrooms
Density:	88.5 dwellings per hectare
Car Parking:	70 underground parks (including 5 visitor)

The development sits on the corner of Parnell Road and Birdwood Crescent. Birdwood Crescent is a quiet street and contains mostly older, detached houses, while Parnell Road has much traffic and both residential and commercial properties. The Parnell retail strip begins at this corner, Newmarket and the Auckland Domain are within ten minutes walk, and bus routes run along Parnell Road. The site slopes down from Parnell Road toward the west and neighbouring detached residences, over which there are views to the Domain and the Auckland War Memorial Museum. The Holy Trinity Cathedral is directly across Parnell Road to the east. To the south is a driveway serving rear sites.

The Site

The site has been planned with building blocks running along the two road boundaries forming an L-shaped building enclosing a west facing open space. The open space is built over (and hides) the underground parking and includes hard and soft landscaping, a communal lap pool and reflecting pond. Entry to the parking is separated from pedestrian entries and is accessed from the secondary street. Security gates separate visitor parking from resident parking and there is remote storage for every apartment in front of car parks.

There are no pedestrian networks requiring public links through the site but the northeastern corner of the site has been given over to public space with seating and an artwork.

The Building

The building has two vertical access cores with the main one entered off the public space mentioned above. A ramp here creates an accessible entry and postboxes are ingeniously incorporated into the rear of the public seating. Generous access cores penetrate through the building, gaining natural light from both east and west. The building has five storeys above ground, with the upper two set back and treated as structurally lighter to visually reduce the scale of the building from the road. The northern wing has only single or corner aspect apartments so that there is no overlooking of other apartments to the south and there are no south-facing apartments. Building construction employs concrete floors, masonry intertenancy walls and pre-cast concrete external panels.

The Apartments

The development has a mix of three general apartment types:

- single-storey, single aspect
- single-storey, dual aspect
- two-storey (duplex), single aspect.

Rooms are generously sized and there are 2.7m floor to ceiling heights on all levels. All habitable rooms, except for bedrooms on level 6, open onto recessed balconies between 2.5 and 2.9m wide. While giving a very high amenity level in general, the six dual aspect apartments are very deep in plan (14.2m from face of the building to the back of the living). There is acoustic glazing and mechanical ventilation to all rooms facing Parnell Road.

Ground floor apartments have generous private open space. A combination of low solid wall with a higher permeable fence and hedge mediates the road boundary well. On the courtyard side however, there is very little attempt to provide privacy between ground floor apartments and the communal open space. It may have been intended that owners would use planters or other temporary structures to mitigate this.

Site corner has been given over to public open space, including an artwork. This adds identity to the development & emphasises the main entry.

Letterboxes and a public bench are cleverly integrated at the entry.

Conclusion

The site planning works well to position building blocks that define the street and create a large common open space. This provides a pleasant outlook as well as communal garden and swimming pool facilities. The design also works well with the topography to enable parking at a lower level, with the structure then landscaped over and the rear part of the site retained as permeable ground. Vehicle entry is from the less-public street, where it has least effect on the streetscape.

The corner of the site contributes to and integrates with public space on the street, which in turn, accentuates the entry and the identity of the building.

Boundaries are well defined with a balance between privacy and visual permeability for the ground floor apartments, while extensive overlooking from upper apartments contributes to the safety of the public domain. The only exception is the public area on the street corner where the art work and entry are not overlooked. The ground floor apartments on the courtyard side could have been provided with more privacy from the common outdoor space.

Pedestrian access is good, well connected to the street and has generous dimensions allowing for the easy circulation of people and possessions. The access cores also contribute to the articulation of the building form. Building materials are long-life and low-maintenance with thoughtful detailing to modulate the facade.

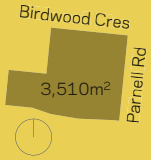
The apartments are generally well planned with functional layouts and good ceiling heights. There are no south facing apartments and provision of private open space is generous with all habitable rooms opening onto balconies or patios. This mostly results in good natural light and ventilation although the dual aspect apartment type has a relatively deep plan which may result in less than ideal natural light levels. Masonry walls give a good level of acoustic privacy although there are some situations where unrelated uses are back to back on inter-tenancy walls. The level of storage provision is good, with additional remote storage for each apartment in the basement garage.

A mix of apartment types and sizes, including several ground floor apartments with generous private open space, contributes to overall flexibility and housing choice. Ground floor apartments use common access rather than having individual entries off the street and this is reasonable given the use of basement parking and the lack of parking on the street in this section of Parnell Road. These factors may also have influenced the choice not to have other uses in the ground floor units on this street front.

Overall, Trinity Apartments is an extremely well-considered development, providing generous apartments in a building that works well and integrates well with its context.

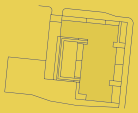
Trinity Apartments

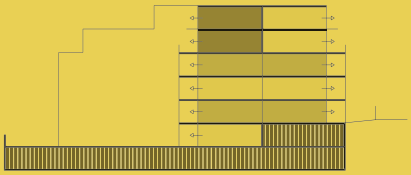
Site

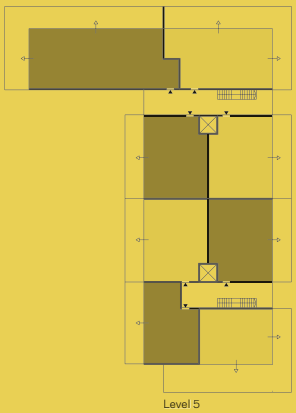


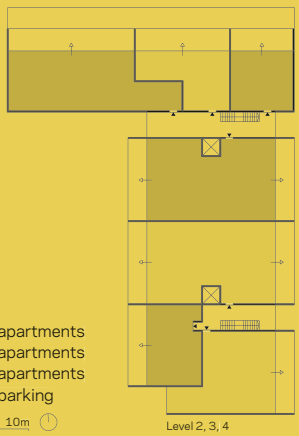
Open Space

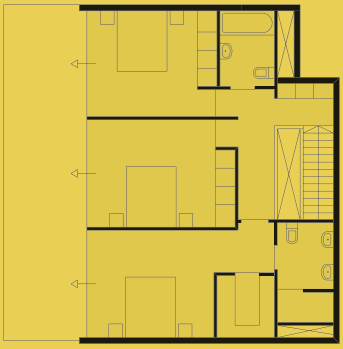
Built Footprint











WAITAKERE GARDENS

Waitakere Gardens is a housing development aimed at older adults. It includes extensive common facilities and 240 apartments. The developer retains a long-term interest in the development as units in the "Active Adult Community" are sold with the requirement that they be sold back when no longer needed. The site lies across the road from a supermarket and recreation/pool centre, and is a ten-minute walk from the Henderson train station, public bus routes and the town centre. The surrounding area contains mainly commercial buildings.

The main entrance to the site is from Sel Peacock Drive, a regional road on the outskirts of the town centre. The area has a fringe commercial character with buildings set well back from the road. The site slopes down toward the south and a small stream, with the supermarket and its car park on the far side. Other commercial buildings lie to the northeast and northwest, and another smaller apartment development sits on the western boundary. An extension of Wadier Place, undertaken as part of the development, divides the site into two unequal parts, and links Sel Peacock Drive to Great North Road.

The Site

The first building on the main (eastern) part of the site consists of an atrium building containing all common facilities and some apartments. Subsequent blocks have since been developed (in several phases) to form a perimeter block. An open space at the centre of the site contains both pedestrian and vehicle circulation and landscaped green areas. The smaller (western) portion of the site will contain more residential blocks, forming an edge to Wadier Place and allowing a landscaped area behind. This block will have a separate vehicle entrance, dedicated parking, and an aerial pedestrian link over Wadier Place that connects to the common facilities building.

The site plan integrates car parking well and does not allow street edges to be broken down by multiple vehicle entries. The stage one building conceals 68 car parks beneath. Remaining car parks (both covered and open) are on grade. Straightforward site circulation crosses sizeable, well-proportioned areas of soft landscaping. Pedestrians receive top priority, as numerous pedestrian crossings connect generous footpaths. Pedestrian connections to the roads allow for easy movement through the site and generate activity on Wadier Place, as residents take the shortest route to Great North Road. Site boundaries are well defined by tall, transparent fencing with planting behind. The boundary is therefore secure, yet transparent enough to connect the development to its surroundings, activate the street edge and provide a sense of openness.

Block orientation and separation grants most apartments a predominance of eastern or northern sun (although one side of the atrium block faces southwest). The four-storey perimeter block buildings give a sense of enclosure to the site, reinforce the identity of the development and create a sense of safety and security. The perimeter buildings also define the edge of both roads and shield the interior of the site from road noise. The main building entry is very clearly defined for visitors arriving by car and has a generous pick-up/drop off-area.

Hard and soft landscaping strengthens the development's identity. The prevalence of planting in private open spaces emphasises the prominence of soft landscaping. Most of the residents enjoy a good outlook, with the exception of those living in units on the southwestern boundary. Furthermore, residents

Architect:	Peter Eising – Pacific Environments Ltd
Developer:	Vision Senior Living
Location:	Sel Peacock Drive, Henderson
Site:	2.1ha
Building:	5 slab blocks with a mix of single- & double-loaded horizontal access
Apartments:	240 single-and dual aspect apartments 45% 1-bed, 45% 2-bed, 10% 3-bed
Density:	144 dwellings per hectare
Car Parking:	Car parking: 68 underground in stage 1, 2 and 4; approximately 65 on grade above ground, two-storey parking building to be built on western section of site.

The Buildings

The development contains five main blocks. All of these are horizontal access buildings with either single- or double-loaded corridors.

The main building accommodates a number of common facilities on half of the ground floor. The central atrium acts as an internal street and becomes an important space for social interaction, organised events and casual encounters. It includes a restaurant dining area and kitchen, common room, library, gym and pool. Other common areas include a workshop and gardening area located on the basement level with direct access to outdoor gardens. The balance of the ground floor and the upper three floors contain apartments accessed off horizontal corridors around the atrium.

In addition to this atrium model, two other building types exist on the site: double-loaded corridors with single aspect apartments, and single-loaded exterior access balconies with dual aspect apartments.

The apartments within the main atrium building are effectively dual aspect with a bedroom against the atrium. This creates issues with respect to privacy, ventilation and fire safety for this bedroom. These issues have been addressed with internal venetian blinds, mechanical ventilation and fire glazing, respectively. Designers resolved similar issues in later apartments by making the units single aspect. These later units do, however, still retain a single fixed window between the dining room and the double-loaded corridor. This allows occupants to interact with other residents passing through the corridor. This has proven successful in this development where many residents will also prop open their doors in order to feel

Three- and four-storey blocks have varied and articulated facades.

Top left: The development has extensive areas of common open space.

Bottom left: A room has been fitted out by residents as a common workshop.

The width of the west-facing horizontal access balconies allows a degree of occupation by residents.

Atrium spaces bring light into the centre of the building and provide a multi-use common area at ground level.

more connected to the community. Because the corridors receive large amounts of natural light, it also enables residents to receive borrowed light through this window.

Blocks with external access balconies experience fewer issues with the treatment of the rear wall between common areas and the private space of the apartment. Fire glazing is not required, allowing windows in the rear wall to be openable. Circulation and orientation through the building are straightforward. Internal corridors are very generously sized and receive ample natural light. Horizontal access balconies are wide enough (in later blocks, 2.1 meters wide) to sit on. These balconies would, however, benefit from greater definition of seating areas (which might require additional width).

Building construction generally consists of timber framing with plastered sheet claddings. Balcony construction is tile on membrane, and all roofs are tiled. Because timber framed structures clad with plastered sheet claddings need to be well maintained to ensure longevity, more robust materials could perhaps have been chosen. Maintenance for the development is likely to be well-planned, however, as the developers retain a long-term interest in the project.

Household waste is disposed of by way of chutes on each level that lead to a skip in the basement. Residents must separate recyclable waste into wheelie bins placed on each level. These bins are removed by staff and taken to the basement. The basement rubbish area is well situated so as not to be visible from the public road and to allow vehicle access separate from access to the rest of the development. This minimises disruption from rubbish trucks.

The Apartments

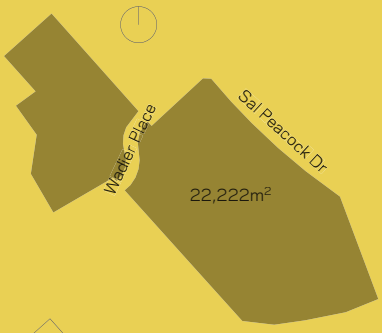
While modestly sized, both one- and two-bedroom apartments contain well-planned rooms. The one-bedroom unit has a small kitchen, little storage space and no balcony, while the two-bedroom unit has more generous proportions and allows the flexibility of having an extra bedroom.

One-bedroom units would benefit from more storage space, as remote storage in the garage is minimal and is only available to residents who have purchased an internal car park. Similarly, one-bedroom apartments do not include a private open space, an amenity that the generous provision of common areas cannot completely replace. In general, apartments receive good natural light due to the shallowness of units, the generous glazing and the light borrowed from the access side. Ceiling heights could be higher than their 2.4 meters.

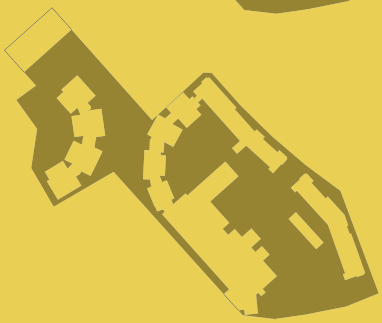
Conclusion

In general, Waitakere Gardens suits its specific occupants (older adults) but aspects of it may not suit other, more diverse, types of residents. The use of a timber floor structure and the inclusion of a rear window into the access corridor are examples of this. On the other hand, certain design decisions, such as the treatment of corridors (generous size, abundant natural light, and breakout spaces overlooking gardens) could serve as a model for other apartment developments.

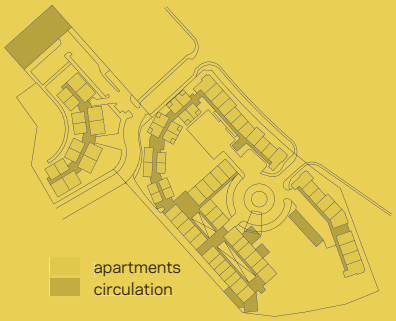
Waitakere Gardens



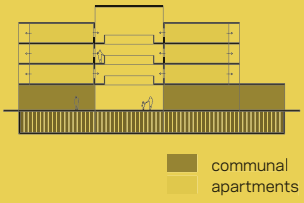
Site

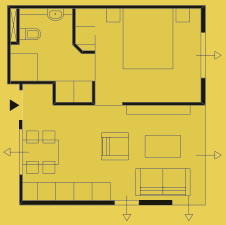


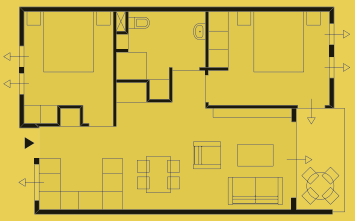
Open Space



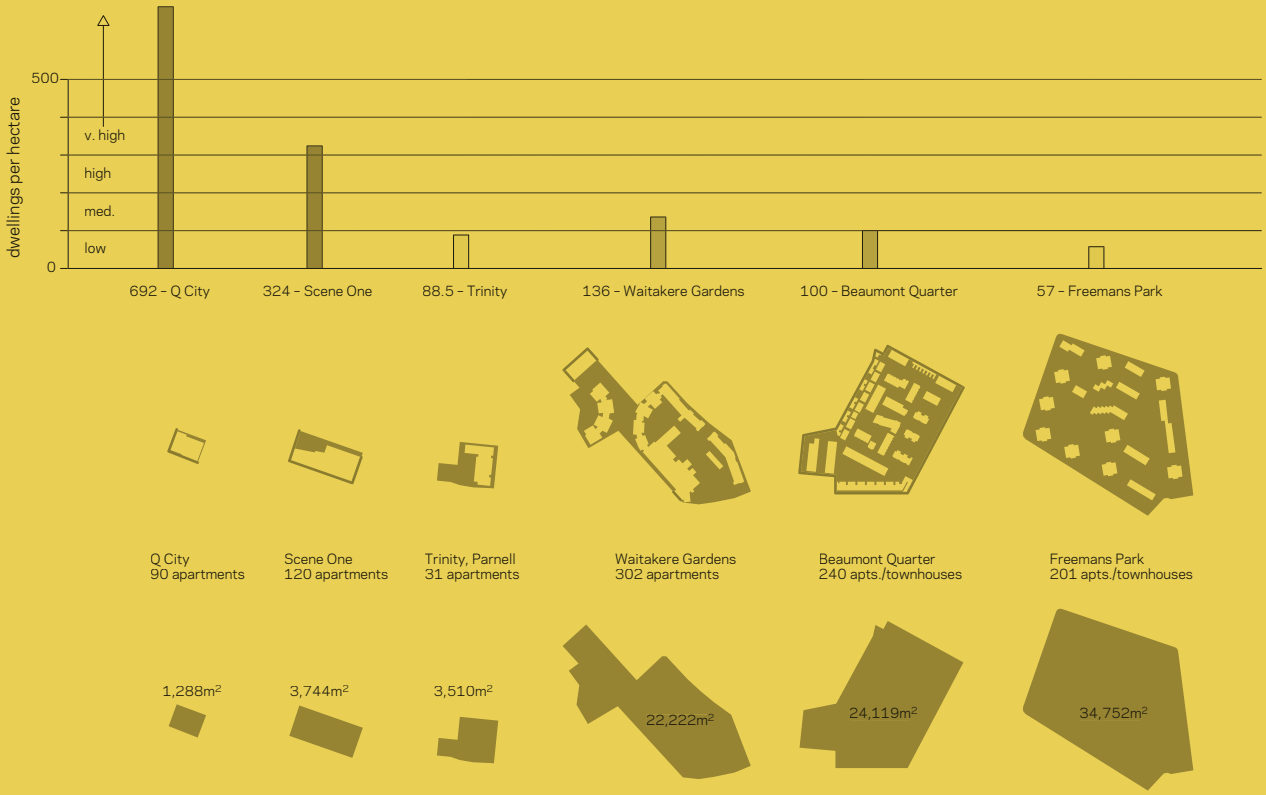
Built Footprint







Site Density Comparison



Glossary

Accessible	Designed to permit use by people with disabilities.
Active frontage	A street-side facade that reveals activity inside (a shopfront or window display), or that generates activity on the pavement (such as a cafe).
Amenity	The 'liveability' or quality of a place that makes it pleasant and agreeable for individuals and the community. Amenity is important in both the public and private domains and includes the enjoyment of sunlight, views, privacy and quiet.
Articulation	Defining the parts of a whole through form and detail.
Brownfield site	A development site that has had previous (generally commercial or industrial) development upon it.
Building coverage	Percentage of the site that is covered by building.
Casual surveillance	The ability to view public areas from other public and private areas. Casual surveillance deters crime, promotes personal safety in public areas and minimises opportunities for concealment.
Circulation core	A vertical space containing circulation routes, usually including stairs and lifts. Also commonly referred to as a core or a vertical core.
Communal storage facility	A storage facility shared by occupants of a development.
Corner aspect apartment	An apartment with openings on one end and one side. Also sometimes referred to as 'double orientation 90°.'
Datum or datum line	A significant line in space established by existing or desired context. For example, the cornice height of a heritage building.
Density	A unit of measurement in relation to a given area of land. Examples of density measurements include: - floor area ratio (floor area allowed per square metre of site). - number of units (DU) or habitable rooms per hectare (hr/ha).
Dual aspect apartment	An apartment that has openings on two sides, usually the ends. Also sometimes referred to as 'double orientation'.
Duplex apartment	An apartment that occupies two floors. Europeans refer to it as a 'maisonette,' Americans refer to it as a 'duplex.'
Embodied energy	All of the energy used to bring a material to its final product. Includes extraction, manufacturing, transportation, installation, maintenance and disposal.
Gallery access	A corridor that is open to the exterior (either within the volume of the building or as an external attachment) and that gives access to apartments.
Habitable rooms	All rooms in a dwelling except hallways, bathrooms, WCs, laundry rooms, garages and storage cupboards. For the purposes of density calculations, only kitchens above 13 m2 count as habitable rooms, and bedsitting rooms are counted as 1.5 habitable rooms where they can be easily subdivided to provide an additional bedroom. Rooms larger than 18m^2 are counted as two habitable rooms. For all other purposes, including daylighting, sunlighting, privacy and outlook, kitchens are counted as habitable rooms, whatever their size.
Juliet balcony	A small projecting balcony, generally ornamental or only large enough for one person to stand on.
Long-life loose-fit buildings	The concept that buildings can be designed to accommodate whole or partial changes of use.
On-grade	On the ground (not on a building structure).
Parapet	A horizontal low wall or barrier at the edge of a balcony or roof. Often refers to the decorative element that establishes the street wall height of heritage buildings.
Perimeter block	Situation in which buildings are aligned to the street, enclosing or partially enclosing an area in the middle of an urban block.
Podium	The base section of a tall building where it is larger in plan than the tower above it, and so has a roof that can be used for open space. The podium is often used to mitigate the effects of a tall building on the urban environment by relating to the height of the adjacent buildings.
Point access	Form of building access that consists of a vertical core of elevators and stairs serving one or more dwellings per floor.
Private open space	Exterior space attached to a single apartment. Usually a balcony or a patio/ garden.
Public open space	Open space accessible to the public. Usually includes roads and public walkways. Some landscaped areas in a development may be communal instead of public open spaces.
Putrescible	Liable to decay, spoil or become putrid.
Section 36 certificate	The Unit Titles Act (1972) requires under Section 36 a 'Certificate of proprietor's liability' to be supplied whenever a unit is sold or mortgaged. This certificate shows required contributions (levies), including any arrears and the rate of interest. It also states whether the body corporate has or is about to incur other liabilities for which the new owner might be liable. The Section 36 certificate also tells the purchaser whether any proceedings are outstanding against the body corporate. The vendor's lawyer should supply the certificate after obtaining it from the body corporate secretary.
Single aspect apartment	Apartment with openings on one side.
Sinking fund	An amount of money set aside by a body corporate to cover occasional, expensive items such as maintenance of lifts, heating, ventilation and air conditioning, repainting the exterior, major roofing or external cladding repairs, resealing of driveways and parking areas, rebuilding fences etc. An owner's share of the sinking fund is not paid to them when they sell their unit but stays with the property and is often a good selling point. Sinking fund use should be outlined in a long-term maintenance plan that is based upon professional advice.
Site permeability	Pedestrian routes available through a site – generally, the more the better.
Studio apartment /bedsitter	A dwelling with no bedroom in which the bed usually doubles as a couch. "Bedsitter" is the term commonly used in England.
Visitable apartment	An apartment that is capable of being visited by a person with disabilities. Features include: - doors that are wide enough to accommodate a wheelchair. - thresholds and steps do not form a barrier to an unaided visiting wheelchair user. - toilet facilities on the main floor and with space sufficient to enter in a wheelchair and close the door. See Further Information in section C9 Flexibility.