
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

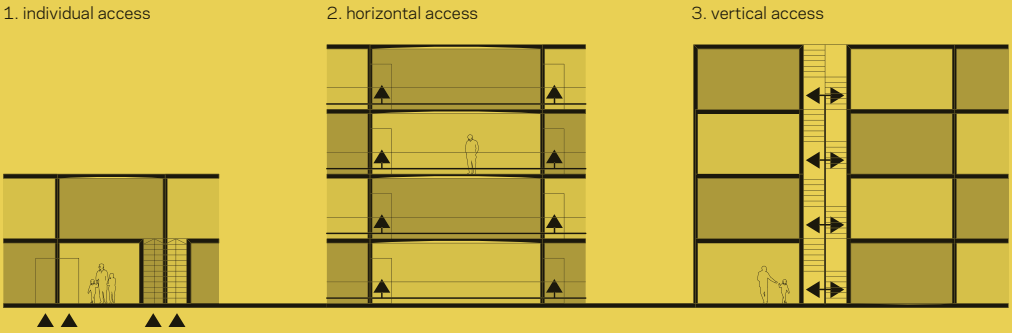
Individual access apartments are entered directly from an exterior area rather than from a common circulation route. This configuration is usually used in low-rise buildings where apartments are directly entered from outside (sometimes up private entry steps), or in taller buildings for the lowest level 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

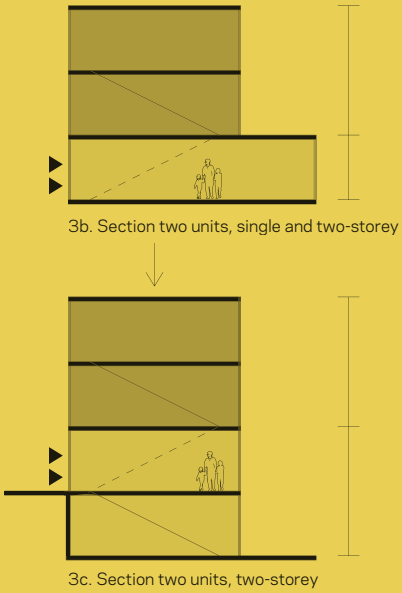
The access system can be used to classify an apartment building as one (or more) of the following:



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.

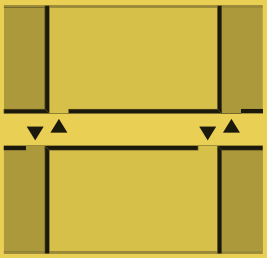
Skip-Stop Corridors

→ 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.

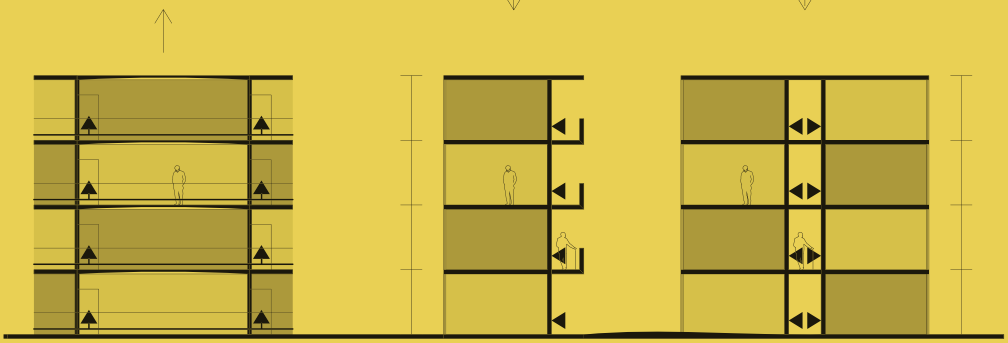
B1.2 Horizontal Access



2b. Plan: double-loaded corridor



2a. Plan: single-loaded corridor

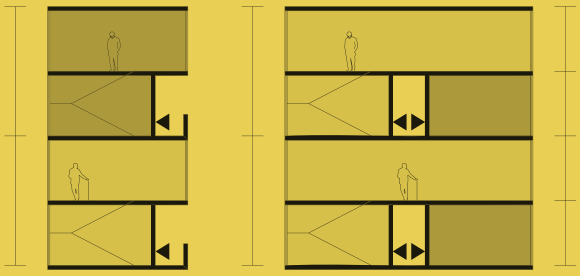


1. Elevation: Horizontal Access

3a. Section:
single-loaded corridor

3b. Section: double-loaded corridor

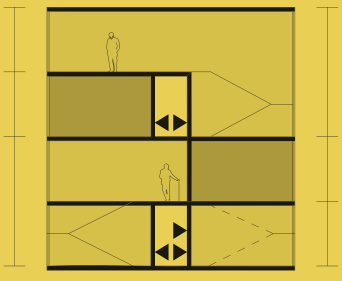
Horizontal access can be divided into single-loaded corridors (2a, 3a, usually external) and double-loaded corridors (2b, 3b). A further variation is the skip-stop arrangement (4a, 4b, 5b).



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.

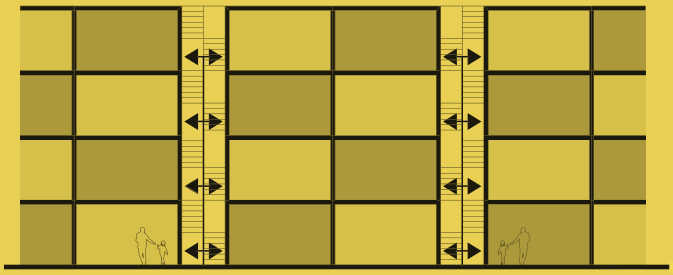
A variation on the 'point-block' arrangement is to slightly extend the circulation space outside the lift and stair core (essentially a short corridor) so that additional single aspect apartments per floor may be accessed from the same core.

→ 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.

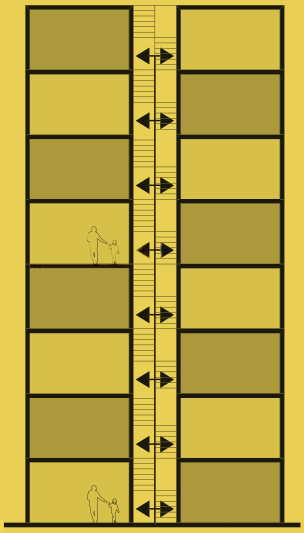
→ A drawback of a vertical access arrangement can be that logical repetition of the same plan on each floor can produce little variety of apartments within a building.

B1.3 Vertical Access

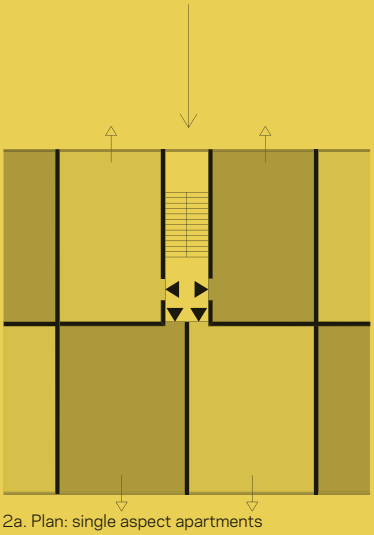
A vertical access arrangement can consist of a single vertical circulation core or multple vertical circulation cores.
a. Slab block with multiple circulation cores, below.
b. Point block with a single circulation core, right.



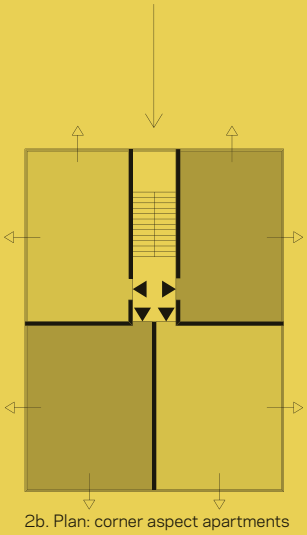
1a. Elevation: Vertical Access



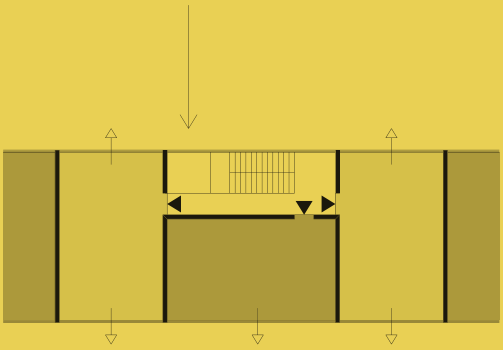
1b. Elevation: Vertical Access



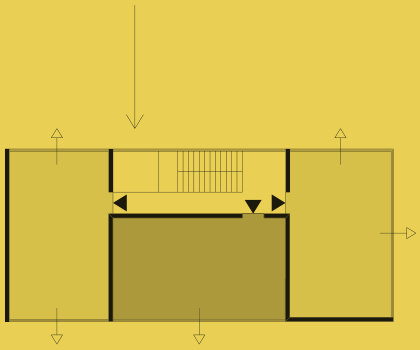
2a. Plan: single aspect apartments



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.

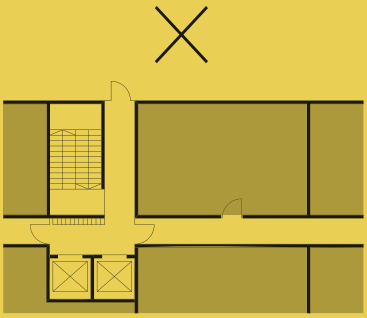
→ To avoid conflict provide separate entries, especially from the street, for:
- pedestrians and vehicles
- different uses (residential and commercial uses in a mixed-use development)
- ground floor apartments, where applicable (see C7 Ground Floor Apartments)
- recycling, waste collection and removal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

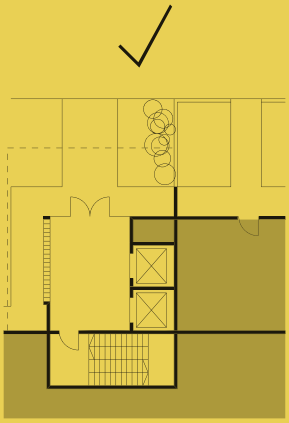


Narrow entrance with no presence and blind corners

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.

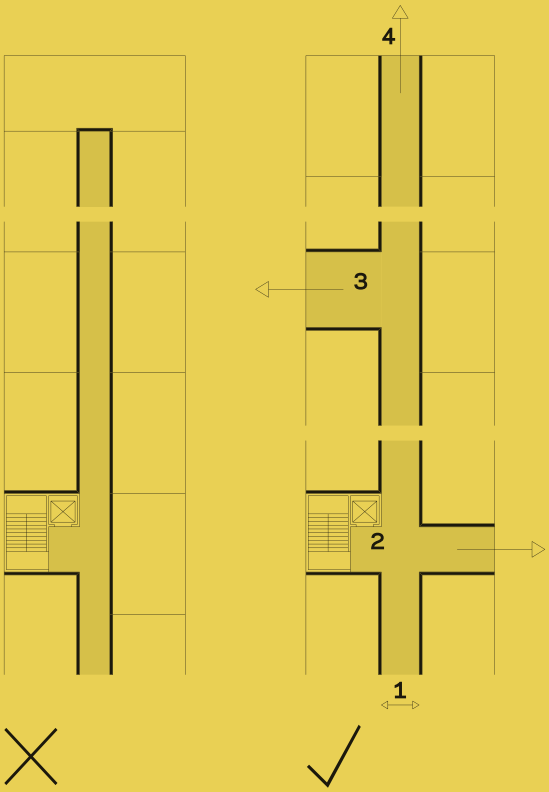
Rules of Thumb

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.

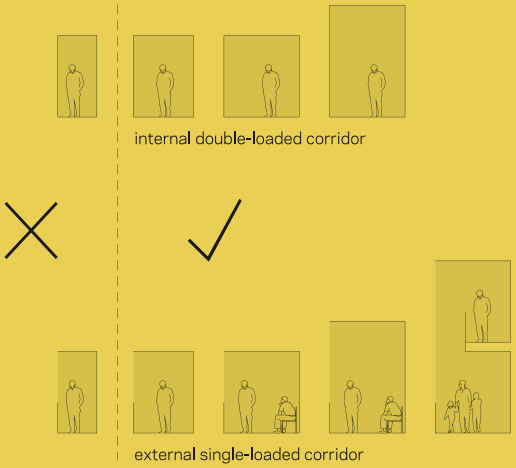
B3 Circulation



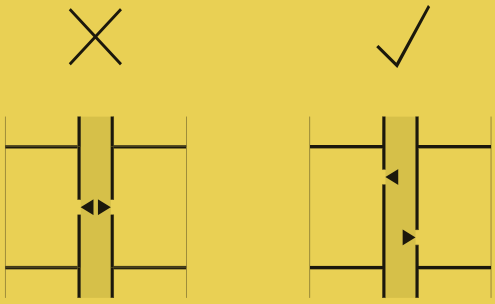
Circulation space is also communal space; it should do more than just deliver residents to their apartments efficiently. Circulation spaces should facilitate interaction and allow a sense of community to develop. Opportunities to increase the amenity value of circulation areas include providing:
1- more 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/