Appendix B: Cross-Sectional Comparison of Global Apartment Design Policies & Guidelines

An extraction of information from 'Hope in High-Rise: An Exploration of Urban Density and Apartment Design' by Hugo Chan, 2021.

Although in past epochs, urban apartment developments occurred naturally and were the products of individual architects or unique conditions, apartment design today, like much of contemporary architecture more broadly, is governed across different jurisdictions by minimum standards, codes and guidelines. Policy making lies at the core of housing provision across most jurisdictions as a formalised way of developing urban housing. But inevitably a question arises as to whether better design outcomes can in fact be mandated through policies in an ultimately capitalist society. Through codification and the drive to keep construction costs low in American metropolitan centres for example, it has been found that "there is a tendency to rubber-stamp structure's that have already proven themselves, leading to a formulaic feel." As a starting point, this cross-sectional comparison highlights how six standards and guidelines, taken from Canada, New Zealand, Singapore, United Kingdom and Australia have been structured highly variably, prioritising different values, standards and agendas, all with the shared aim of delivering higher standards of apartment housing. Ultimately, the question is perhaps twofold – hinging on whether policies can in fact drive better design outcomes but more polemically, whether we can codify and quantify design to guarantee positive outcomes.

The bibliography and image credits for this appendix can be found in the main document.

British Columbia - Design Guidelines and Construction Standards (Housing)

3 Building Design Principles

3.1 Building Design Considerations

Provide a building that is spatially efficient and designed to maximize the ratio of residential areas to required programme, support, circulation and service areas. Standardize unit types, kitchen and bathroom layouts within a project as much as possible. Co-ordinate and plan for amenity and support service spaces to maximize efficiency of circulation for both tenants and staff. The amenities should be located centrally and grouped for efficiency and to encourage social interaction. The project team shall avoid unnecessary amenity spaces and consider the use of multi-use amenity spaces.

Building configuration, building size and building envelope will be the most critical components informing the efficiency and sustainability of the project. Buildings should be simple, efficient and easy to build. Avoid numerous small projections or recesses. Keep the foundation plan simple. Maintain continuity of load bearing walls between floors.

Provide building forms and design that integrate the use of passive energy and sustainable design principles. Optimize envelope design, building massing and orientation, low-demand fixtures, use of renewable sources of energy to reduce demand on fossil-fuel based energy, and reduce greenhouse gas emissions. Consider external shading for south and west facing windows and low solar heat gain coefficient. Landscape with natural and drought resilient vegetation.

Provide building materials and finishes that are durable and require low maintenance. Consider the requirements of the users, availability of maintenance products, and overall life cycle costs.

In addition to addressing sustainability concerns, design the building envelope to current code and industry best practices to prevent water penetration and envelope failure.

Consider the principles of Crime Prevention through Environmental Design (CPTED) in the design of the building to ensure the security of the residents and staff, e.g., natural surveillance, activity support and access control as well as other recognized CPTED principles.

All areas of the site and all parts of the building used by the residents shall be accessible and shall be designed to consider the safety of people of all ages and degrees of abilities.

For renovation/capital improvement or conversion projects, provide accessibility to areas where persons with disabilities could be reasonably employed or are expected to use and where providing such access would be practical. Confirm acceptance with Owner and Authorities Having Jurisdiction.

4 Building Common Areas

Common areas for buildings consist of:

- Indoor amenity spaces for residents use
- Administration and Program Support Services for administrative and support staff use
- Service Areas for maintenance and building services and storage
- Circulation and Access in the building
- Outdoor Spaces for recreation and services

Provision for these spaces will depend on program objectives, the level of support services to be provided for the residents, project size, location and budget parameters. These guidelines may not apply to renovation projects.

4.2 Indoor Amenity, Program and Office Spaces

Amenity spaces are an important element of BC Housing projects. These spaces shall be designed to offer residents the option for social interaction and to encourage a sense of community within the project.

Amenity spaces should be centrally located, adjacent to outdoor common space and ideally located at grade level. Below grade amenity spaces are not acceptable. It is desirable to cluster the amenity space with other common facilities such as the laundry and project office. For family projects, the amenity space should be located adjacent to the children's play area.

Program spaces are used to provide additional supports, training opportunities and/or recreational activities to the residents within a supportive housing environment.

Office spaces are for use by administrative and support staff. Office spaces must be designed to provide security, acoustic privacy and must consider the furniture and office equipment required by project staff.

Office and administration areas shall have visual connection to the main entry door, elevator lobby, resident amenity and program areas.

All amenity and program spaces must be wheelchair accessible. Door swing and doorways shall have appropriate wheelchair accessible maneuvering area on either side of the door. Provide an accessible route to outdoor common amenity spaces.

Maximize glazing in staff offices and common room doors such as lounges, TV rooms , children play area, and laundry rooms for improved visibility.

4.3 Service Areas

Underground/Enclosed Parking

Bicycle Parking

Garbage / Recycling Rooms

Receiving

Equipment Storage and Maintenance

Tenant Storage

Janitor Closets

Postal Services

Utility Lock Boxes

Scooter Storage

Mechanical and Electrical Rooms

The Owner shall review the location, space and technical requirements with the mechanical and electrical consultants as part of the integrated design process to ensure the most effective design. Ensure that the mechanical and electrical rooms are located as close as possible to the entry point for utilities. Locate for efficient distribution, including space and access for servicing.'

Mechanical and electrical rooms shall have an access path and adjacent areaway of sufficient size to allow for the removal of the largest piece of equipment without disassembly of the equipment.

Where service rooms are located adjacent to tenant suites, additional noise and vibration measures must be incorporated to ensure that the noise and vibration from the systems do not disrupt the residents living in those particular units.

Where air handling equipment is located outside on roofs or decks, engage an acoustic consultant to recommend mitigation measures to prevent noise transmission both internally within the building and to the neighbouring area.

Weather-tightness is required for all construction surrounding mechanical, electrical, or water vulnerable equipment if the room is located below grade. Mechanical and electrical room, switchgear or panel must be located above a Flood Construction Level (FCL).

All mechanical rooms shall have adequately primed floor drains located in close proximity to those pieces of equipment most likely to leak or require draining for servicing or replacement. Slope floors to drains.

Mechanical room door width must be 915 mm (3'-0) at a minimum, 1015 mm to 1067 mm (3'-4 to 3'-6) is preferred.

4.4 Circulation and Access

Entrance Lobby

.1 Provide a clear and level area minimum of 1500 mm x 1500 mm (5'-0 x 5'-0) at the main entrance door, both outside and inside.

.2 Provide level or roll-over (flush or beveled) at all entrance doors, threshold shall be no more than 13 mm (1/2) high, with beveled edges with a slope no more 1:2.

.3 Provide a clear accessible path from the main entrance to all parts of the building. Finish floor surfaces shall be stable, firm, slip-resistant.

.4 A building enterphone system shall be installed with easy to use controls, and installed to meet accessibility requirements and in consultation with the AHJ. Ensure that the system is compatible with the security system and any auto door openers. For row-house projects, provide a door bell at the entrance door with controls at an accessible height.

.5 Provide mailboxes and shelf with adequate lighting levels and adequate font / label sizes located at an accessible location and height.

.6 Provide a vestibule to prevent heat loss and drafts to the lobby area. Review ASHRAE requirements for vestibules. Provide walk off mats to prevent outside dirt and debris from tracking in to the building. For multi-unit buildings, consider a recessed walk off mat with drainage.

.7 For assisted living and independent seniors projects, provide a sitting area in the main lobby or close to the elevators with a view to pick up and drop off areas.

Consider a level mobility aid space of at least 2250 mm x 2250 mm (7'-5 x 7'-5) in front of the main entrance as a vehicle drop off point for vehicles.

Corridors

.1 Corridors shall have no steps or level changes and finished floor surfaces shall be stable, firm and slip resistant.

.2 Common corridors serving more than four units shall be at least 1525 mm (5'–0) wide.

.3 Provide visual interest to common corridors using features such as colour, provision of outside views and well designed lighting.

.4 Provide colour contrast between floor and wall finishes with minimal glare and not be heavily textured.

.5 Avoid complex and long stretches of corridors.

.6 Maximize glazing in public corridors including doors at fire separations, exit stairs and common areas as permitted by code to enhance personal security of residents.

.7 Provide wall protection or corner guards in high traffic areas.

.8 For assisted living projects, in addition to the above, provide for the following:

- provide handrails on one side of the corridor or as required by the code.
- Travel distance should be minimized and not exceed 30 m (98'–5) from any suite entry door to the elevator.
- Consider integrating hand rail design with parcel shelf at suite entry and elevator entrance.
- Dead end corridors shall be limited to 2 m (6'–7) in length.

Exit Stairs

.1 For assisted living projects lighting at exit stairs and primary egress routes shall be 100 lx average illumination at floor and tread levels. Emergency lighting shall provide minimum 50 lx at stair treads and 20 lx in level paths of travel. These light levels are double the minimum building code requirements to accommodate the high percentage of tenants with visual impairment.

.2 Incorporate day lighting from exterior windows in stairwells, and hallways, whenever possible.

Elevators

.1 Multi-unit buildings of two or more storeys above grade without direct grade access must have at least one elevator conveniently located near the main entrance. All underground parking levels must be served by at least one elevator.

.2 Ensure that floor levels are clearly identified. Investigate use of colour coding and/or graphics to assist wayfinding.

Interior Stairs

For 2 storey residential units, consider a minimum 1067 mm (3'-6) clear for the passage of queen-size beds and furniture without damage to walls. For interior stairs in 2 storey family projects, add solid reinforcing at the top of stairs for future installation of a child safety gate. Consider adding reinforcement to stair walls and electrical outlets for future chair glider.

Access Hatches

For security reasons, attic access and access hatches shall be lockable and located in common areas such as corridors and lobbies.

4.5 Outdoor Spaces

Site Drainage

A comprehensive site water management strategy should be developed by the project team at an early stage. Erosion control, and storm water management should be addressed. Investigate measures such as pervious paving, rain gardens, bio swales, storm water retention and storm water treatment.

Ensure that site grading is designed to slope away from the building areas.

Ensure that appropriate drainage systems are put in place to deal with run-off from adjacent sites.

Ensure that area drainage is provided to avoid water and ice accumulation particularly in areas used by the residents.

Where feasible, retain the maximum amount of existing planting materials and top soil. If trees and vegetation are removed investigate the impact on the site drainage.

Parking

Provide on-site parking as required by the municipality. Where possible provide surface parking.

Based on client type, need and proximity to the rapid transit or transit hub, a request for parking relaxation from the municipality should be investigated. Where required, engage a traffic consultant to prepare a Traffic Demand Study which will analyze the current and future parking requirements.

Consider providing designated parking for alternate fuel vehicles, carpools, vanpools or car co-ops.

Where outdoor parking is provided, do not exceed 25 m (82'-0) as the exposed walking distance from the parking lot to the building entrance.

Where possible and allowed by the municipality, provide a vehicular drop-off point that is designed with a height clearance for Handy Dart or over height vans. Provide a weather- protected route to the building entry.

Parking Space Identification

Accessible Parking Spaces

Block Heater Outlets

Electric Vehicle Charging

Outdoor Recreation Areas

Projects should incorporate a conveniently located outdoor open area near amenity space that is universally accessible from the main building and promotes positive social interaction.

The exterior recreation area should permit residents to relax and sit in the sun or shade, out of the wind, in quiet spots or with a large group. To facilitate these activities consider the following:

- A hard surface patio
- Weather protected areas at the common patio through the use of an awning, canopy, building overhang or gazebo.

Resident Garden

Outdoor Smoking Area

Outdoor Play Spaces for Families and Women's Transition and Second Stage Housing

Outdoor Spaces for Seniors

Bicycle Parking

Outdoor Storage Areas

5 Dwelling Unit Design

5.2 Dwelling Unit Floor Areas

Apartments - Studio 33 sqm / 1 Bedroom 49 sqm / 2 Bedroom 67 sqm / 3 Bedroom 86 sqm / 4 Bedroom 112 sqm

Net Unit Areas may be increased by up to 12% to achieve wheelchair accessibility and by up to 5% for adaptable units.

Owner / operators should carefully review the demand for unit types in their community to avoid overbuilding. For instance, avoid renting out 2 bedroom units to single occupants. At a minimum each bedroom should be occupied by a tenant.

5.3 Living-Dining Areas

Suite Entrance

.1 Provide a defined, primary entrance area to the suite. Provide a coat closet close to the entrance. Size of the closet is a function of the suite size but should be a minimum of 915mm (3'-0).

.2 The entry coat closet must have a minimum effective depth of 600 mm (2'-0) and be equipped with a coat rod and a 300 mm (1'-0) deep shelf.

Living Area

.1 Living areas should be designed to provide for seating capacities in accordance with the requirements noted below. Seating capacity may be provided by any reasonable combination of sofas, love seats and armchairs. Confirm with furniture plan. (Studio -2 seats / 1 Bedroom - 4 seats / 2 Bedroom - 5 seats / 3 Bedroom - 6 seats / 4 Bedroom - 7 seats)

Dining Area

.1 Dining areas should be designed to provide for seating capacities in accordance with the requirements noted below. (Studio -2 seats / 1 Bedroom - 4 seats / 2 Bedroom - 4 seats / 3 Bedroom - 6 seats / 4 Bedroom - 8 seats)

5.4 Bedrooms

Locate bedrooms and sleeping areas so that they are visually separated from the unit entrance.

Avoid Designs that locate beds under windows. Avoid conflicts with baseboard heaters

Locate doors so that they are able to open a full 110 degrees.

Allow access to both sides and the foot of the beds.

Avoid possible conflict between the placement of beds and access to the clothes closet.

Bedroom Types - A (2 Single) / B (1 Double) / C (1 Single) - [1 Bedroom / B / Two Bedroom - A-B / Three Bedroom - A-B-C / Four bedroom - A-B-C-C]

Bedroom Sizes A (11.2sqm / 2.8m Depth / 1.5m Closet) / B (9.3sqm / 2.8m Depth / 1.5m Closet) / C (8.5sqm / 2.6m Depth / 0.9m Closet)

5.5 In-Suite Storage

.1 Provide a total of 2.3 m2 (25.0 ft2) of general storage for each dwelling unit. This can be provided in-suite or in combination with storage lockers elsewhere in the building. Review Owner's and municipal requirements for additional storage requirements.

.2 For studio units, this storage requirement may be relaxed if acceptable to the owner and the municipality.

.3 Provide three, 400 mm (1'- 4) deep adjustable shelves along one wall of all in-suite storage areas.

Linen Closet

Provide linen storage with four adjustable shelves in a location readily accessible to the main bathroom and bedrooms.

Bedroom Closets

Equip all clothes closets with one shelf and integral coat rods with an unsupported span of less than 1000 mm (3'-3). Install to barrier free design heights in all wheelchair accessible units.

6.0 Kitchens and Bathrooms

6.1 Kitchens

Fixtures and appliances

Counter Frontage

Kitchen Cabinet Design

6.2 Bathrooms

Fixtures and Accessories

Studios and 1 Bedroom Units

Two Bedroom Units

Three or More Bedroom Units

Seniors Units

7.0 Finishes and Materials

7.2 Interior Finishes

Interior Walls

Interior Ceilings

Floor Finishes

7.3 Doors

Exterior and Suite Entry Doors

Seniors, Wheelchair Accessible Units and Adaptable Units

Other Interior Doors

Common Area Doors

7.4 Windows, Side Hinged and Sliding Glass Doors

Acoustic Considerations

Window Cleaning

Window Coverings

7.5 Exterior Finishes

Roofing

Exterior Wall Cladding

7.6 Operating Controls

8.0 Wheelchair Accessible and Adaptable Dwelling Units

8.1 General

8.2 Wheelchair Accessible Units

Circulation

Unit Entrance Weather Protection

Doors

Windows

Kitchen

Bathroom

Operable Fixtures

Storage

Clothes Closets

Electrical Items

8.3 Adaptable Units

Access Requirements

Doorways to Adaptable Dwelling Units

Adaptable Dwelling Unit Bathrooms and Kitchens

Electrical

Window Hardware

9.0 Building Systems

9.1 Building Envelope

Massing

Building Orientation

Effective Building Envelope Thermal Performance

Window Location, Quality and Quantity

Solar Shading

Reduction/Elimination of Thermal Bridging

Air Tightness

9.2 Elevators

9.3 Building and Energy Performance, Mechanical and Electrical Systems

9.4 Fire and Life Safety Measures

9.5 Building Systems Commissioning

10.0 Landscape Design

10.1 Landscaping

10.2 Hard Landscaping

10.3 Building Signage

10.4 Exterior Lighting

10.5 Fencing

10.6 Retaining Walls

Auckland Design Manual Apartment Building Design

1.0 Introduction

1.1 What are apartments?

1.2 Why Choose apartments?

1.3 Location of Apartment Developments

2.0 Site Design

2.1 To create a quality apartment development, the site design and placement of the apartment building should be completed together. This approach will lead to a coherent residential place with good quality buildings and open spaces, and with a consistent character and distinctive identity.

2.2 Site ecology and habitats

Part of the unique appeal of urban Auckland is its highly valued views of the natural environment and its wide variety of native and exotic species. Urban development will bring change, but this change should not lead to a permanent loss of ecosystems or habitat.

Avoid building on important habitat areas. The building location should be used to help protect these.

As part of the site analysis, consider stormwater issues like flow paths, gullies, streams, floodplains and the position of the site in the wider stormwater catchment.

2.3 Design for the Topography

The building works with the existing topography to maximise views, privacy and other site opportunities

Retaining elements are carefully integrated as a part of the design

The design proposal maintains the important natural features within the site

The building and site design respond to the land form; minimising the extent of earthworks

2.4 Built Environment

The building and basic organisation of the development demonstrate an understanding of the immediate street and wider neighbourhood – future or existing

The development supports and enhances route, street and open space connections

The proposal embraces the Māori cultural values related to Whakapapa and Tohu

3.0 Placing the Building

3.1 The placement of the building can impact on so many issues, that inevitably a trade-off will need to be made. So what issues should be considered and how can they be prioritised?

3.2 Building Placement

The development has a clear network of routes and spaces through the site that are shaped by clearly defined private and communal space

The buildings are located to contribute to a positive streetscape character, with building frontages and entries onto the street

The design responds positively to the existing site conditions, such as views, orientation, natural features and surrounding buildings

The building placement demonstrates a clear public front and private back

3.3 Building Separation and Outlook

There is a good standard of visual and acoustic privacy within the apartments and their private open spaces (ground floor courtyards or above-ground balconies)

The building minimises overshadowing of private or communal outdoor spaces of adjacent properties, including potential future development

3.4 Designing for Privacy

All habitable rooms have a good level of privacy in relation to the street, public spaces and neighbouring properties

The building arrangement enhances privacy for the residents and neighbours

The views from principal rooms and private open space are maximised without compromising visual privacy

3.5 Designing for light and sun

The building is located and orientated to make the best use of sunlight to apartments and open spaces, and provides a good balance between maximising winter sun, and providing shade from summer sun

Daylight access is always provided in all habitable rooms and is provided wherever possible in all other areas of apartment buildings

The development allows residents to adjust natural lighting to suit their needs

3.6 Site Access

All access points to the site are located and designed to integrate effectively with the street or movement network beyond the site

4.0 Street to Front Door

4.1 A successful city has streets that people feel connected with. The way a street looks and feels is determined by everything from the front of its buildings forwards.

4.2 Relating the Building to the Street

The design of the apartment frontage responds to the context of the wider street

The apartment building and any associated private spaces on the street front (e.g. a privacy strip or setback) are located next to the street boundary

The building entrance is safe, welcoming and clearly visible from the street

The space or spaces between the building and the street are designed as an integral part of the overall design

4.3 Boundary Treatments

The design of any street or public boundary contributes to a positive, attractive and safe public realm

The boundary treatment balances appropriate views into any adjacent public realm, while maintaining privacy for building occupant

There is a defined edge between public, communal and private open space

There are defined transitions between areas within the development that have different functions or owners

4.4 Safety, activity and overlooking

The apartment development is safe and secure for residents and visitors, and is perceived as such

The apartment development contributes to the safety of the surrounding public space

5.0 Outdoor Spaces

5.1 The design of the outdoor space is as important as the building. It helps to meet people's fundamental expectation to be able to enjoy the outside environment. The arrangement and quality of the spaces will have a significant impact on residents and neighbours.

5.2 Communal outdoor spaces

Communal outdoor spaces are overlooked by adjacent apartments and provide for residents' recreation

Outdoor spaces are designed to be accessible, useable and attractive for all residents

Outdoor spaces are easy to maintain and have well defined boundaries with no ambiguity or leftover areas

Outdoor spaces provide a pleasant outlook and visual amenity for all users

5.3 Balconies and Private Outdoor spaces

All apartments have usable private open space (for dining, clothes drying etc)

Balconies and terraces are well designed, have adequate levels of privacy and are responsive to the environment

Balconies and terraces are integrated into the overall architectural form and detail of the building

Balconies and terraces contribute to the safety and liveliness of the street by creating opportunities for natural surveillance

5.4 Service areas

Service areas are well located in relation to street access and scheme design

The service areas are well designed and located for ease of use, encourage waste minimisation and facilitate composting

5.5 Landscape design and biodiversity

The landscape is designed to provide opportunities for outdoor activity (particularly for families and children), enhanced privacy, and improved outlook and views into natural and landscaped settings

The micro-climate, biodiversity, air quality and solar performance are optimised within the development

Stormwater quality is improved through plant filtration (e.g. reed beds), reducing the quantity of water discharged off-site

Landscape design contributes to local streetscape character and the amenity of the wider area

5.6 Stormwater management

Existing topographic and natural features are preserved, including watercourses and wetlands, to ensure the long term resilience of the ecosystem to manage stormwater

Stormwater volumes and flow rates are minimised from urban developments and the amount of runoff managed on-site is maximised

Minimum amounts of sediment, pollutants or contaminants are discharged to the urban stormwater drainage system, both during and after construction

The impact of residential development and associated infrastructure on natural waterways is minimised

6.0 Accommodating Cars

6.1 The arrangement and accessibility of parking, as well as its impact on the street and public spaces, are major considerations when designing an apartment building. As such, parking should be one of the first aspects of a development to be considered. Parking requires careful consideration to ensure it is integrated into the overall design of the building, has a good relationship with the street, and is functional, attractive and safe.

6.2 Vehicle Access

The location and design of the site access enhances the apartment development, integrates with the desired character of the street and is convenient, safe and pedestrian and cycle-friendly

6.3 Car Parking

Car parking location and design are successfully integrated into the design of the apartment building, the overall site design and the design of the street

The building maximises opportunities for the active use of street frontages, not for vehicle access

The development provides appropriate car parking without compromising street character, landscape quality or pedestrian amenity and safety

6.4 Surface Parking

Surface parking is integrated into the building, is designed as a positive space and does not have a negative impact on the street

6.5 Alternative Parking Solutions

The design of the building has considered the full range of parking options

There are many options that can increase the efficiency of car parking provision and access, including car lifts, stackers and turntables.

7.0 The Building

7.1 The term 'apartment building' refers to a multi-storey building that is primarily residential and that has individual residential units (apartments), on all or most floors. In certain locations such as town and metro centres it is not uncommon for apartment buildings to have commercial uses on the ground and/ or lower floors.

7.2 Apartment Building Types

7.2.1 Basic Forms

The Block

A block apartment type is usually wider than it is tall. The apartments are arranged off a corridor which can be single, or double-loaded.

The Tower

A tower apartment building has a vertical form and is generally free standing, and often has slimmer, more elegant proportions. This building type generally has a single centralised core and a limited number of apartments per floor.

Courtyard Apartments

A courtyard apartment building provides the 'sides' that enclose one or more open spaces (courtyards) on the site. The open spaces are generally communal and should provide a high quality landscaped environment and outlook.

7.2.2 Building Access Arrangement

Individual 'own front door' access

This type of access arrangement is for a dwelling that is entered into directly from the street, courtyard or private stair. There is no communal circulation. This type of access is generally limited to one or two levels above ground. In some instances a penthouse dwelling on a taller building may have its own access but the cost and space requirements of this are limiting factors. The benefits of individual access are:

Vertical Shored Access

Vertical access allows for a building that is organised around a vertical core of stairs, lifts or both. Apartments are accessed directly off the core or from an extended circulation area around the core that allows for additional apartments per floor.

Horizontal (corridor) access results in buildings that may be wider than they are tall.

The corridor can be placed internally, externally or around an atrium. Externally located corridor access should be designed to avoid long runs of eight apartments or more.

Single-loaded corridor access

A single loaded corridor runs along an external (or atrium) face of the building.

Double-loaded corridor access

The double-loaded arrangement locates the corridor within the building. Apartments are accessed off both sides of the corridor and are therefore predominantly single aspect. Corner and multi-level apartments are generally double aspect and require corridors on alternate levels. The overall building depth is deeper than a single-loaded arrangement and solutions for a dual-fronted building will be required.

7.2.3 Individual Apartment Types

Single aspect apartments

Single aspect apartments have three closed sides (except for the entrance) and are typically used with a double-loaded (central) corridor access arrangement.

Double aspect apartments

Placing double aspect (open-ended) units side by side is a common form of arranging individual apartments within a building. It has the advantage of being able to repeat apartments while also maintaining the maximum amount of external facade.

Corner aspect apartments

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

7.3 Principal Components controlling building form

7.3.1 Building height and massing

The height and massing of the apartment development contribute to a built form of a high standard that is designed to respond to its context

7.3.2 Building depth

The building provides a reasonable level of daylight, natural ventilation and solar access for apartment occupants

The building's depth is appropriate for the intended apartment type

Minimise earthworks on sloping sites through building depth and orientation

7.3.3 Building setbacks (yards)

The building responds positively to the immediate context and street environment, and the design is informed by the existing or desired character

7.4 Primary Building Elements

7.4.1 Building Entrance

Entrances establish a desirable and strong residential identity for the development, which contribute positively to the streetscape and integrate into the overall building facade design

The entry is a functional, accessible, safe area with good shelter and lighting

7.4.2 Building Façade

Buildings demonstrate a high architectural quality including visual richness and coherence

The apartment building makes a positive contribution to the existing or desired future street character, and to the public realm

7.4.3 Integrated Facades

The façade is designed as an integrated part of the building

7.5 Universal Design and Lifemark Standards - Accessible and Adaptable Apartments

The building and apartments are designed to be used by people of all ages and abilities

7.6 Apartment Layout

7.6.1 Apartment Mix and Designing for Families

Apartment buildings provide a diversity of apartment types and sizes that cater for different household requirements

Ensure that apartment developments cater for families and other large household groups. Provide good levels of amenity both inside and outside for larger groups and children

Provide a mix of housing tenure including affordable housing.

The ground floor apartments in a development maximise the opportunity to provide for a range of lifestyle options, particularly families with children and people with limited mobility

7.6.2 Apartment Space

The apartments are functional, well organised and have enough space to meet the needs of the intended number of occupants

The layout is flexible and adaptable and allows for a variety of household activities

The following space for new apartment developments should be met and considered as a minimum. The guidance provides for apartments ranging from studios to four bedroom (six person) apartments. For occupancy greater than six people, allow approximately 10sqm per extra person.

Studio apartments, up to two persons 40sqm

One bedroom apartments, two persons 50sqm

Two bedroom apartments, four persons 75sqm

Three bedroom apartments, six persons 100sqm

Bedroom layout should provide for the following as a minimum:

- A bed space 2m long by 1.6m (minimum) wide, or - two bed spaces side-by-side 2m long by 900mm wide.

Bedroom layout should provide a wardrobe with a minimum dimension of 2m long x 0.6m deep with adequate access space in front

(E.g. taking clothes from a wardrobe drawer or chest of drawers requires a space of 710 - 990mm).

Bedroom layouts should provide for a desk / study or dressing table space of at least 800mm wide by 500mm deep with 500mm width access space in front. An access space from the entry door to the foot of the bed no less than 800mm wide.

Note: Access space requirements for different elements in bedroom spaces may overlap.

A bed space should be available at the entry level of a multi-level apartment.

Convenient wheelchair access should be available between a main bedroom and the bathroom.

7.6.3 Storage and Utility Space

Provide adequate storage for everyday household items within the apartment

Suitable space is provided for a washing machine, for drying clothes, and for waste and recycling bins within the home

Provide storage for sporting, leisure, fitness and hobby equipment in an easily accessible space elsewhere in the apartment building

Provide readily accessible space (internal or external, depending on the circumstances) for equipment associated with children such as pushchairs and bicycles

Bedroom wardrobes should be a minimum 600mm deep internally and 2m wide.

In addition to kitchen cupboards and bedroom wardrobes, provide internal storage facilities of the following sizes: • Studio apartments (one to two people) 6m3 • One-bedroom apartments (one to two people) 6m3 • Two-bedroom apartments (three to four people) 8m3 • Three plus bedroom apartments (five to six people) 10m3

Storage outside of apartments should be adequately sized to accommodate bicycles.

Minimum dimensions for an audio-visual unit should be 450mm deep and 900mm wide.

7.7 Sustainable Design

7.7.1 Energy Efficiency - Fixtures and Fittings

Improve the efficiency of water systems

Reduce reliance on artificial lighting

Maximise the efficiency of household appliances

7.7.2 Energy Efficiency - Home Management

The façade is designed as an integrated part of the building

7.7.3 Energy Efficiency - Space Heating, Cooling and the Use of Solar Energy

Optimise heat storage in winter and heat transfer in summer by incorporating passive solar design techniques

7.7.4 Energy Efficiency - The Building 'Envelope'

Design the building envelope to ensure a healthy and comfortable environment inside the building

7.7.5 Material Selection

New developments use sustainable construction materials and methods

7.7.6 Water Conservation

The design of the building reduces the consumption of potable (drinkable) water, the quantity of urban stormwater run-off and increases the reuse of wastewater and stormwater on-site

Apartment Design Guidelines for Victoria

Urban Context and Design Response

Section 1 - Siting and Building Arrangement

1.1 Building Setbacks Respond to Existing or Preferred Urban Context

1.2 Establish setbacks to adjacent buildings and uses to ensure adequate amenity.

1.3 Establish the street frontage setback alignment of buildings to contribute to the character and amenity of the public realm.

1.4 Establish internal setbacks to achieve daylight, privacy and outlook objectives between dwellings within a site.

1.5 In streets where buildings have zero side setback, such as in dense urban contexts, main streets or for podium forms within centres, continue the built form pattern.

1.6 Provide side setbacks in contexts where they contribute to the landscape character of the street.

1.7 Typically, on narrow infill sites, minimise side setbacks and face habitable rooms towards the street and the rear of the site.

1.8 Where habitable spaces and balconies face towards side boundaries, increase side setbacks to allow access to daylight and outlook, while maintaining privacy.

1.9 Where contexts allow for buildings in landscaped areas, configure the building setbacks to retain existing mature trees and to accommodate deep soil areas.

1.10 Ensure building setback is responsive to the adjoining building form and height to deliver adequate daylight, privacy and outlook for dwellings.

1.11 Avoid use of light wells as the primary source of daylight to a habitable room.

1.12 Use building setbacks and the relationship between buildings on a site, as the primary method of limiting views into habitable room windows and private open spaces.

1.13 When habitable room windows and private open spaces in separate dwellings directly face each other, generally provide greater building separations than where one dwelling faces the side of another dwelling.

1.14 Arrange building setbacks to control direct views into habitable room windows or private open spaces from public and communal spaces, other uses or dwellings.

1.15 Use building setbacks to provide outlook and a visual connection from a dwelling to its context and allowing for visual relief.

Guidance to Communal Open Space

2.1 Use the urban context report to identify locations for the communal open space which can achieve adequate amenity and is responsive to existing uses of adjacent sites.

2.2 Provide communal open space that is usable throughout the year and in a range of weather conditions.

2.3 Provide lighting in communal open space to support safe movement and evening use.

2.4 Provide clear delineation of public, communal and private open spaces to encourage access and use by all residents.

2.5 Layout the communal open spaces to be usable with easy access for cleaning and maintenance.

2.6 Integrate communal open space with internal common areas, where provided, to promote better use of both spaces.

2.7 Integrate landscaping into communal open space to improve the outlook into and from the communal open space.

2.8 Layout the communal open space to minimise the visual and noise impacts of building services.

2.9 Layout communal open space to create informal surveillance opportunities within the development and from adjoining buildings.

Guidance to Solar Access to Communal Outdoor Open Space

3.1 Locate communal open space in areas that will have minimal overshadowing from surrounding buildings.

3.2 When locating communal open space to achieve winter sun, also select the location to provide usability and amenity.

Guidance to Landscaping

4.1 Retain significant vegetation where appropriate.

4.2 Select and locate evergreen and deciduous trees to optimise winter sunlight and summer shading of surrounding dwellings to encourage passive cooling opportunities.

4.3 Locate and size appropriate canopy trees and other vegetation away from basements or other obstructions to allow for future growth to protect built structures.

4.4 Consolidate deep soil areas where possible, to support healthier trees and provide adequate growing room for larger trees between buildings.

4.5 Optimise urban heat reduction through integrating planting, stormwater management, water sensitive urban design and selection of surface materials.

4.6 Where the deep soil standard cannot be met due to the urban context, alternative forms of landscaping should demonstrate equivalent canopy cover.

Guidance to Building Entry and Circulation

5.1 Locate the main pedestrian entry to provide a sense of address by being clearly visible and accessible from the street.

5.2 Provide clear sight lines from the foyer to the street so people can see both in and out when entering or leaving the building.

5.3 Where ground floor dwellings face the street, individual entrances can assist in promoting a sense of personal address and activate the street.

5.4 Separate the pedestrian and vehicle entries to the buildings.

5.5 Provide shelter and waiting space on the street at pedestrian entries to buildings.

5.6 Provide mail boxes and parcel post facilities close to the building entries in a well-lit and weather protected area, with potential for informal surveillance.

5.7 Locate and arrange utility service installations to minimise their impact on the building's active street frontage.

5.8 Provide appropriate access between street ground level and the entry lobby floor level for safe, functional and efficient movement.

5.9 Design windows and openings in corridors to respond to the site context.

Section 2 - Building Performance

6.1 If the development is not within a Noise Influence Area

6.2 If the development is within a Noise Influence Area

6.3 Ventilation

6.4 Meet the noise requirements through an acoustic report or a standard design treatment.

Guidance to Energy Efficiency

7.1 Plan for energy efficiency of buildings and involve a specialist ESD consultant early in the design process to make energy efficient design integral to the building form and layout.

7.2 Apply the cooling load caps for all apartments.

7.3 Reduce building cooling loads through design and construction responses.

Guidance to Waste and Recycling

8.1 Prepare a Waste Management Plan (WMP) that details how different waste streams (including hard waste) will be stored and collected in the development.

8.2 Provide bins suitably sized to accommodate all categories of waste. Provide a waste room that is sufficiently sized to accommodate all bins.

8.3 Nominate waste collection vehicle size, access points and movement paths.

8.4 Provide dual waste and recycling chutes (or equivalent system) in taller buildings with openings on each floor to provide convenient access for residents.

8.5 Design waste facilities to provide adequate drainage, noise and odour controls including 1450mm provisions for a bin wash down area.

Guidance to Integrated Water & Stormwater Management

9.1 Reduce stormwater runoff from the lot to the minimum volume possible.

9.2 Apply principles of water sensitive urban design (WSUD) to reduce the volume of stormwater runoff and to improve the quality of stormwater.

9.3 The storm water drainage system should be designed so that any overflow during heavy rain periods is safely conveyed to the legal point of discharge (LPD) to protect public safety and property.

9.4 Connect the apartment building to a reticulated recycled water supply (purple pipe) where available.

Section 3 - Dwelling Amenity

Guidance to Functional Layout

10.1 Demonstrate usability and functionality of room configurations by including furniture layouts with realistically scaled furniture and adequate circulation space.

10.2 Apartment layouts which propose irregularly shaped or atypical spaces, need to demonstrate functionality and usability of the design with realistically scaled furniture and circulation.

Guidance to Room Depth

11.1 Increase the size and head height of windows to improve the daylight penetration into the depth of the room.

11.2 Allow for sufficient structural floor to floor heights to achieve required ceiling heights for the room depth.

11.3 Configure balconies to suit the orientation of the apartment and increase daylight while controlling sunlight.

Guidance to Windows

12.1 Design the window type, size, glazing selection, orientation and placement to respond to the site context and to optimise daylight.

12.2 Design windows and other openings to balance privacy with daylight and outlook.

12.3 Skylights may be used to contribute to daylight but should not provide the only source of daylight into a habitable room.

Guidance to Storage

13.1 Provide practical arrangement of storage appropriate to each space within the dwelling.

13.2 Long term storage provided externally to an apartment can be provided in basements and car parking areas, or in a common area convenient to the apartment.

Guidance to Natural Ventilation

14.1 Configure floor plates with corner or through apartments to achieve effective cross ventilation.

14.2 Wherever possible, provide operable windows or doors into habitable rooms to achieve natural air flow.

14.3 Locate and design windows that are on different orientations of a dwelling to provide cross ventilation with optimal breeze paths.

14.4 An adequately sized operable roof light in a single aspect apartment may achieve cross ventilation where adequate air flow can be demonstrated by engineering analysis.

14.5 Demonstrate alternative effective ventilation solutions where cross ventilation is constrained, for example, by consistently high wind conditions or heritage or adaptive reuse of existing buildings.

Guidance to Private Open Space

15.1 Configure balconies to support other internal apartment amenity objectives.

15.2 Where the urban context and site layout constrain provision of private open space, compensate with increased areas of communal open space.

Guidance to Accessibility

16.1 Locate the main bedroom with convenient access to the adaptable bathroom.

16.2 Configure spaces to achieve clear access paths while allowing for functional furniture arrangements.

16.3 When providing an adaptable bathroom to meet either Option A or Option B make use of the typical configurations illustrated or demonstrate that the standard is met with an alternative layout.

16.4 When applying bathroom design option A, if the toilet cannot be located in the corner of the room, include a nib wall adjacent to the toilet.

NSW State Environmental Planning Policy No. 65 Design of Quality Residential Apartment Buildings and Apartment Design Guide

Design Quality Principles

Principle 1: Context and neighbourhood character

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

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

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

Principle 2: Built form and scale

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

Good design also achieves an appropriate built form for a site and the building's purpose in terms of building alignments, proportions, building type, articulation and the manipulation of building elements.

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

Principle 3: Density

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

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

Principle 4: Sustainability

Good design combines positive environmental, social and economic outcomes.

Good sustainable design includes use of natural cross ventilation and sunlight for the amenity and liveability of residents and passive thermal design for ventilation, heating and cooling reducing reliance on technology and operation costs. Other elements include recycling and reuse of materials and waste, use of sustainable materials and deep soil zones for groundwater recharge and vegetation.

Principle 5: Landscape

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

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

Good landscape design optimises useability, privacy and opportunities for social interaction, equitable access, respect for neighbours' amenity and provides for practical establishment and long term management.

Principle 6: Amenity

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

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

Principle 7: Safety

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

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

Principle 8: Housing diversity and social interaction

Good design achieves a mix of apartment sizes, providing housing choice for different demographics, living needs and household budgets.

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

Good design involves practical and flexible features, including different types of communal spaces for a broad range of people and providing opportunities for social interaction among residents.

Principle 9: Aesthetics

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

Part 1 Identifying the Context

1A Apartment Building Types

1B Local Character and Context

1C Precincts and Individual Sites

Part 2 Developing the Controls

2A Primary Controls

2B Building Envelopes

2C Building Height

2D Floor Space Ratio

2E Building Depth

2F Building Separation

2G Street Setbacks

2H Side and Rear Setbacks

Part 3 Siting the Development

3A Site Analysis

Objective 3A-1 Site analysis illustrates that design decisions have been based on opportunities and constraints of the site conditions and their relationship to the surrounding context

3B Orientation

Objective 3B-1 Building types and layouts respond to the streetscape and site while optimising solar access within the development

Objective 3B-2 Overshadowing of neighbouring properties is minimised during mid winter

3C Public Domain Interface

Objective 3C-1 Transition between private and public domain is achieved without compromising safety and security

Objective 3C-2 Amenity of the public domain is retained and enhanced

3D Communal and Public Open Space

Objective 3D-1 An adequate area of communal open space is provided to enhance residential amenity and to provide opportunities for landscaping

Criteria1. Communal open space has a minimum area equal to 25% of the site (see figure 3D.3)

Criteria 2. Developments achieve a minimum of 50% direct sunlight to the principal usable part of the communal open space for a minimum of 2 hours between 9 am and 3 pm on 21 June (mid winter)

Objective 3D-2 Communal open space is designed to allow for a range of activities, respond to site conditions and be attractive and inviting

Objective 3D-3 Communal open space is designed to maximise safety

Objective 3D-4 Public open space, where provided, is responsive to the existing pattern and uses of the neighbourhood

3E Deep Soil Zones

Objective 3E-1 Deep soil zones provide areas on the site that allow for and support healthy plant and tree growth.

Criteria 1. Deep soil zones are to meet the following minimum requirements: 7% of Site Area / Variable Minimum Dimensions on Site Area

3F Visual Privacy

Objective 3F-1 Adequate building separation distances are shared equitably between neighbouring sites, to achieve reasonable levels of external and internal visual privacy

Criteria 1. Separation between windows and balconies is provided to ensure visual privacy is achieved. Minimum 3m (Non-Habitable / Lower Floors) to 12 m (Habitable / Upper Floors)

Objective 3F-2 Site and building design elements increase privacy without compromising access to light and air and balance outlook and views from habitable rooms and private open space

3G Pedestrian Access and Entries

Objective 3G-1 Building entries and pedestrian access connects to and addresses the public domain

Objective 3G-2 Access, entries and pathways are accessible and easy to identify

Objective 3G-3 Large sites provide pedestrian links for access to streets and connection to destinations

3H Vehicle Access

Objective 3H-1 Vehicle access points are designed and located to achieve safety, minimise conflicts between pedestrians and vehicles and create high quality streetscapes

3J Bicycle and Car Parking

Objective 3J-1 Car parking is provided based on proximity to public transport in metropolitan Sydney and centres in regional areas

Criteria 1. For development in the following locations:

- on sites that are within 800 metres of a railway station or light rail stop in the Sydney Metropolitan Area; or
- on land zoned, and sites within 400 metres of land zoned, B3 Commercial Core, B4 Mixed Use or equivalent in a nominated regional centre

the minimum car parking requirement for residents and visitors is set out in the Guide to Traffic Generating Developments, or the car parking requirement prescribed by the relevant council, whichever is less

The car parking needs for a development must be provided off street

Objective 3J-2 Parking and facilities are provided for other modes of transport

Objective 3J-3 Car park design and access is safe and secure

Objective 3J-4 Visual and environmental impacts of underground car parking are minimised

Objective 3J-5 Visual and environmental impacts of on-grade car parking are minimised

Objective 3J-6 Visual and environmental impacts of above ground enclosed car parking are minimised

Part 4 Designing the Building

4A Solar Access

Objective 4A-1 To optimise the number of apartments receiving sunlight to habitable rooms, primary windows and private open space

Criteria 1. Living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at mid winter in the Sydney Metropolitan Area and in the Newcastle and Wollongong local government areas

Criteria 2. In all other areas, living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 3 hours direct sunlight between 9 am and 3 pm at mid winter

Criteria 3. A maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid winter

Objective 4A-2 Daylight access is maximised where sunlight is limited

Objective 4A-3 Design incorporates shading and glare control, particularly for warmer months

4B Natural Ventilation

Objective 4B-1 All habitable rooms are naturally ventilated

Objective 4B-2 The layout and design of single aspect apartments maximises natural ventilation

Objective 4B-3 The number of apartments with natural cross ventilation is maximised to create a comfortable indoor environment for residents

Criteria 1. At least 60% of apartments are naturally cross ventilated in the first nine storeys of the building. Apartments at ten storeys or greater are deemed to be cross ventilated only if any enclosure of the balconies at these levels allows adequate natural ventilation and cannot be fully enclosed

Criteria 2. Overall depth of a cross-over or cross-through apartment does not exceed 18m, measured glass line to glass line

4C Ceiling Heights

Objective 4C-1 Ceiling height achieves sufficient natural ventilation and daylight access

Criteria 1. Measured from finished floor level to finished ceiling level, minimum ceiling heights are: (Habitable Room: 2.7m / Non-Habitable Room: 2.4m / Attic: 1.8m)

Objective 4C-2 Ceiling height increases the sense of space in apartments and provides for well proportioned rooms

Objective 4C-3 Ceiling heights contribute to the flexibility of building use over the life of the building

4D Apartment Size and Layout

Objective 4D-1 The layout of rooms within an apartment is functional, well organised and provides a high standard of amenity

Criteria 1. Apartments are required to have the following minimum internal areas: (Studio = 35sqm / 1 Bedroom = 50sqm / 2 Bedroom = 70 sqm / 3 Bedroom = 90sqm) *+5sqm / extra bathroom **+12sqm / extra bedroom

Criteria 2. Every habitable room must have a window in an external wall with a total minimum glass area of not less than 10% of the floor area of the room. Daylight and air may not be borrowed from other rooms.

Objective 4D-2 Environmental performance of the apartment is maximised

Criteria 1. Habitable room depths are limited to a maximum of 2.5 x the ceiling height.

Criteria 2. In open plan layouts (where the living, dining and kitchen are combined) the maximum habitable room depth is 8m from a window.

Objective 4D-3 Apartment layouts are designed to accommodate a variety of household activities and needs

Criteria 1. Master bedrooms have a minimum area of 10m2 and other bedrooms 9m2 (excluding wardrobe space)

Criteria 2. Bedrooms have a minimum dimension of 3m (excluding wardrobe space)

Criteria 3. Living rooms or combined living/dining rooms have a minimum width of:

- 3.6m for studio and 1 bedroom apartments
- 4m for 2 and 3 bedroom apartments

Criteria 4. The width of cross-over or cross-through apartments are at least 4m internally to avoid deep narrow apartment layouts.

4E Private Open Space & Balconies

Objective 4E-1

Apartments provide appropriately sized private open space and balconies to enhance residential amenity

Criteria 1. All apartments are required to have primary balconies as follows: (Studio: 4sqm / 1 Bedroom: 8sqm / 2 Bedroom: 10sqm / 3 Bedroom: 12sqm) *2.0 - 2.4 minimum width **only widths greater than 1m counted as balcony area

Criteria 2. For apartments at ground level or on a podium or similar structure, a private open space is provided instead of a balcony. It must have a minimum area of 15m2 and a minimum depth of 3m

Objective 4E-2 Primary private open space and balconies are appropriately located to enhance liveability for residents

Objective 4E-3 Private open space and balcony design is integrated into and contributes to the overall architectural form and detail of the building

Objective 4E-4 Private open space and balcony design maximises safety

4F Common Circulation and Spaces

Objective 4F-1 Common circulation spaces achieve good amenity and properly service the number of apartments

Criteria 1. The maximum number of apartments off a circulation core on a single level is eight

Criteria 2. For buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40

Objective 4F-2 Common circulation spaces promote safety and provide for social interaction between residents

4G Storage

Objective 4G-1 Adequate, well designed storage is provided in each apartment

Criteria 1. In addition to storage in kitchens, bathrooms and bedrooms, the following storage is provided: (Studio: 4cum / 1 Bedroom: 6cum / 2 Bedroom: 8cum / 3 Bedroom 10cum) *50% of storage volume to be internal to the unit

Objective 4G-2 Additional storage is conveniently located, accessible and nominated for individual apartments

4H Acoustic Privacy

Objective 4H-1 Noise transfer is minimised through the siting of buildings and building layout

Objective 4H-2 Noise impacts are mitigated within apartments through layout and acoustic treatments

4J Noise and Pollution

Objective 4J-1 In noisy or hostile environments the impacts of external noise and pollution are minimised through the careful siting and layout of buildings

Objective 4J-2 Appropriate noise shielding or attenuation techniques for the building design, construction and choice of materials are used to mitigate noise transmission

4K Apartment Mix

Objective 4K-1 A range of apartment types and sizes is provided to cater for different household types now and into the future

Objective 4K-2 The apartment mix is distributed to suitable locations within the building

4L Ground floor apartments

Objective 4L-1 Street frontage activity is maximised where ground floor apartments are located

Objective 4L-2 Design of ground floor apartments delivers amenity and safety for residents

4M Facades

Objective 4M-1 Building facades provide visual interest along the street while respecting the character of the local area

Objective 4M-2 Building functions are expressed by the façade

4N Roof design

Objective 4N-1 Roof treatments are integrated into the building design and positively respond to the street

Objective 4N-2 Opportunities to use roof space for residential accommodation and open space are maximised

Objective 4N-3 Roof design incorporates sustainability features

4O Landscape design

Objective 4O-1 Landscape design is viable and sustainable

Objective 4O-2 Landscape design contributes to the streetscape and amenity

4P Planting on structures

Objective 4P-1 Appropriate soil profiles are provided

Objective 4P-2 Plant growth is optimised with appropriate selection and maintenance

Objective 4P-3 Planting on structures contributes to the quality and amenity of communal and public open spaces

4Q Universal design

Objective 4Q-1 Universal design features are included in apartment design to promote flexible housing for all community members

Objective 4Q-2 A variety of apartments with adaptable designs are provided

Objective 4Q-3 Apartment layouts are flexible and accommodate a range of lifestyle needs

4R Adaptive reuse

Objective 4R-1 New additions to existing buildings are contemporary and complementary and enhance an area's identity and sense of place

Objective 4R-2 Adapted buildings provide residential amenity while not precluding future adaptive reuse

4S Mixed use

Objective 4S-1 Mixed use developments are provided in appropriate locations and provide active street frontages that encourage pedestrian movement

Objective 4S-2 Residential levels of the building are integrated within the development, and safety and amenity is maximised for residents

4T Awnings and signage

Objective 4T-1 Awnings are well located and complement and integrate with the building design

Objective 4T-2 Signage responds to the context and desired streetscape character

4U Energy efficiency

Objective 4U-1 Development incorporates passive environmental design

Objective 4U-2 Development incorporates passive solar design to optimise heat storage in winter and reduce heat transfer in summer

Objective 4U-3 Adequate natural ventilation minimises the need for mechanical ventilation

4V Water management and conservation

Objective 4V-1 Potable water use is minimised

Objective 4V-2 Urban stormwater is treated on site before being discharged to receiving waters

Objective 4V-3 Flood management systems are integrated into site design

4W Waste management

Objective 4W-1 Waste storage facilities are designed to minimise impacts on the streetscape, building entry and amenity of residents

Objective 4W-2

Domestic waste is minimised by providing safe and convenient source separation and recycling

4X Building maintenance

Objective 4X-1 Building design detail provides protection from weathering

Objective 4X-2 Systems and access enable ease of maintenance

Objective 4X-3 Material selection reduces ongoing maintenance costs

London Housing Design Guide

1.0 Shaping Good Places

1.1 Defining Places

How the design responds to its physical context, including the character and legibility of the area and the local pattern of building, public space, landscape and topography;

How the scheme relates to the identified character of the place and to the local vision and strategy or how bolder change is justified in relation to a coherent set of ideas for the place expressed in the local vision and strategy or agreed locally.

How the scheme complements the local network of public spaces, including how it integrates with existing streets and paths;

Public spaces and pedestrian routes are designed to be overlooked and safe, and extensive blank elevations onto the public realm at ground floor have been avoided;

For larger developments, how any new public spaces including streets and paths are designed on the basis of an understanding of the planned role and character of these spaces within the local movement network, and how new spaces relate to the local vision and strategy for the area.

1.2 Outdoor Spaces

Development proposals should demonstrate that they comply with the borough's open space strategies, ensuring that a review of surrounding open space is undertaken and that opportunities to address a deficiency in provision by providing new public open spaces are taken forward in the design process.

For developments with a potential occupancy of ten children or more, development proposals should make appropriate play provision in accordance with the London Plan SPG, Providing for Children and Young People's Play and Informal Recreation.

Where communal open space is provided, development proposals should demonstrate that the space:

- is overlooked by surrounding development;
- is accessible to wheelchair users and other disabled people;
- is designed to take advantage of direct sunlight;
- has suitable management arrangements in place.

2.0 Housing for a Diverse City

2.1 Appropriate Density

Development proposals should demonstrate how the density of residential accommodation satisfies London Plan policy relating to public transport accessibility level (PTAL) and the accessibility of local amenities and services, and is appropriate to the location in London

2.2 Residential Mix

Development proposals should demonstrate how the mix of dwelling sizes and the mix of tenures meet strategic and local borough targets and are appropriate to the location in London.

3.0 From Street to Front Door

3.1 Entrance & Approach

All main entrances to houses, ground floor flats and communal entrance lobbies should be visible from the public realm and clearly identified.

The distance from the accessible car parking space of requirement 3.3.4 to the home or to the relevant block entrance or lift core should be kept to a minimum and should be level or gently sloping [Lifetime Homes Criterion 2].

The approach to all entrances should preferably be level or gently sloping [Lifetime Homes Criterion 3].

All entrances should be illuminated and have level access over the threshold. Entrance doors should have 300mm of clear space to the pull side, and clear minimum opening widths of 800mm or 825mm depending on the direction and width of approach. Main entrances should have weather protection and a level external landing [Lifetime Homes Criterion 4].

3.2 Shared Circulation within Buildings

The number of dwellings accessed from a single core should not exceed eight per floor.

An access core serving 4 or more dwellings should provide an access control system with entry phones in all dwellings linked to a main front door with electronic lock release. Unless a 24 hour concierge is provided, additional security measures including audio-visual verification to the access control system should be provided where any of the following apply:

- more than 25 dwellings are served by one core
- the potential occupancy of the dwellings served by one core exceeds 100 bed spaces
- more than 8 dwellings are provided per floor.

Where dwellings are accessed via an internal corridor, the corridor should receive natural light and adequate ventilation.

The minimum width for all paths, corridors and decks for communal circulation is 1200mm. The preferred minimum width is 1500mm, and is considered particularly important where corridors are double loaded (they serve dwellings on each side) and where wheelchair accessible dwellings are provided.

For buildings with dwellings entered from communal circulation at the first, second or third floor where lifts are not provided, space should be identified within or adjacent to the circulation cores for the future installation of a wheelchair accessible lift.

All dwellings entered at the fourth floor (fifth storey) and above should be served by at least one wheelchair accessible lift, and it is desirable that dwellings entered at the third floor (fourth storey) are served by at least one such lift. All dwellings entered at the seventh floor (eighth storey) and above should be served by at least two lifts.

Every designated wheelchair accessible dwelling above the ground floor should be served by at least one wheelchair accessible lift. It is desirable that every wheelchair accessible dwelling is served by at least two such lifts.

Principal access stairs should provide easy access* regardless of whether a lift is provided. Where homes are reached by a lift, it should be fully wheelchair accessible [Lifetime Homes Criterion 5].

3.3 Car Parking

All developments should conform to London Plan policy on car parking provision. In areas of good public transport accessibility and/or town centres the aim should be to provide less than one space per dwelling. Elsewhere parking provision should be as follows:

- 4+ bedroom dwellings: 1.5 - 2 spaces per dwelling;
- 3 bedroom dwellings: 1 - 1.5 spaces per dwelling;
- 1 - 2 bedroom dwellings: less than 1 per dwelling.

Each designated wheelchair accessible dwelling should have a car parking space 2400mm wide with a clear access way to one side of 1200mm. Refer to appendix 3 for design standards for wheelchair accessible housing.

Careful consideration should be given to the siting and organisation of car parking within an overall design for open space so that car parking does not negatively affect the use and appearance of open spaces.

Where car parking is within the dwelling plot, at least one car parking space should be capable of enlargement to a width of 3300mm. Where parking is provided in communal bays, at least one space with a width of 3300mm should be provided per block entrance or access core in addition to spaces designated for wheelchair user dwellings [Lifetime Homes Criterion 1].

3.4 Cycling Storage

All developments should provide dedicated storage space for cycles at the following levels:

- 1 per 1 or 2 bedroom dwelling; or
- 2 per 3 or more bedroom dwelling

Individual or communal cycle storage outside the home should be secure, sheltered and adequately lit, with convenient access to the street. Where cycle storage is provided within the home, it should be in addition to the minimum GIA and minimum storage and circulation space requirements. Cycle storage identified in habitable rooms or on balconies will not be considered acceptable.

3.5 Refuse, Post and Deliveries

Communal refuse and recycling containers, communal bin enclosures and refuse stores should be accessible to all residents including children and wheelchair users, and located on a hard, level surface. The location should satisfy local requirements for waste collection and should achieve full credits under the Code for Sustainable Homes Technical Guide. Refuse stores within buildings should be located to limit the nuisance caused by noise and smells and provided with means for cleaning.

Storage facilities for waste and recycling containers should be provided in accordance with the Code for Sustainable Homes Technical Guide and local authority requirements.

4.0 Dwelling Space Standards

4.1 Internal Floor Areas

Internal Floor Areas (1 Bedroom = 50 sqm / 2 Bedroom = 61sqm-70sqm / 3 Bedroom = 74sqm-95sqm / 4 Bedroom = 90sqm-99sqm) *Variations also exist for multi-storey dwelling. **For dwellings designed for more than 6 people, at least 10 sq m gross internal area should be added for each additional person.

Dwelling plans should demonstrate that dwellings will accommodate the furniture, access and activity space requirements relating to the declared level of occupancy. Refer to A appendix 3 for design standards for wheelchair accessible housing.

4.2 Flexibility & Adaptability

Dwelling plans should demonstrate that dwelling types provide flexibility by allowing for alternative seating arrangements in living rooms and by accommodating double or twin A beds in at least one double bedroom.

4.3 Circulation in the Home

The minimum width of hallways and other circulation spaces inside the home should be 900mm. This may reduce to 750mm at 'pinch points'. Where a hallway is at least 900mm wide and the approach to the door is head-on, a minimum clear opening door width of 750mm should be provided [Lifetime Homes Criterion 6].

The design of dwellings of more than one storey should incorporate potential for a stair lift to be installed and a suitable identified space for a through-the-floor lift from the entrance level† to a storey containing a main bedroom and an accessible bathroom [Lifetime Homes Criterion 12].

4.4 Living, Dining and Kitchen Areas

Minimum combined living/kitchen/dining areas should be: (2 person = 23sqm / 3 person = 25 sqm / 4 person = 27 sqm / 5 person = 29sqm / 6 person = 31sqm)

The minimum width of the main sitting area should be 2.8m in 2-3 person dwellings and 3.2m in dwellings designed for four or more people.

Dwellings with three or more bedrooms should have two living spaces, for example a living room and a kitchen-dining room. Both rooms should have external windows. If a kitchen is adjacent to the living room, the internal partition between the rooms should not be load- bearing, to allow for reconfiguration as an open plan arrangement. Studies will not be considered as second living spaces.

There should be space for turning a wheelchair in dining areas and living rooms and basic circulation space for wheelchairs elsewhere [Lifetime Homes Criterion 7].

A living room, living space or kitchen-dining room should be at entrance level [Lifetime Homes Standard 8].

Windows in the principal living space should start 800mm above finished floor level (+/- 50mm) to allow people to see out while seated. At least one opening window should be easy to approach A and operate by people with restricted movement and reach. [Lifetime Homes Criterion 15].

4.5 Bedrooms

The minimum area of a single bedroom should be 8 sq m. The minimum area of a double or twin bedroom should be 12 sq m.

The minimum width of double and twin bedrooms should be 2.75m in most of the length of the room.

In homes of two or more storeys with no permanent bedroom at entrance level, there should be space on the entrance level that could be used as a convenient temporary bed A space [Lifetime Homes Criterion 9].

Structure above a main bedroom and an accessible bathroom should be capable of supporting a ceiling hoist and the design should allow for a reasonable route between this A bedroom and bathroom [Lifetime Homes Criterion 13].

4.6 Bathrooms & WCs

Dwellings designed for an occupancy of five or more people should provide a minimum of one bathroom with WC and one additional WC.

Where there is no accessible bathroom at entrance level, a wheelchair accessible WC with potential for a shower to be installed should be provided at entrance level* [Lifetime Homes A Criterion 10].

An accessible bathroom should be provided in every dwelling on the same storey as a main bedroom [Lifetime Homes Criterion 14].

Walls in bathrooms and WCs should be capable of taking adaptations such as handrails [Lifetime Homes Criterion 11].

4.7 Storage & Utility

Built-in general internal storage space free of hot water cylinders and other obstructions, with a minimum internal height of 2m and a minimum area of 1.5 sq m should be provided for 2 person dwellings, in addition to storage provided by furniture in habitable rooms. For each additional occupant an additional 0.5 sq m of storage is required.

4.8 Study and Work

Dwelling plans should demonstrate that all homes are provided with adequate space and services to be able to work from home. The Code for Sustainable Homes guidance on working from home is recommended as a reference.

Service controls should be within a height band of 450mm to 1200mm from the floor and at least 300mm away from any internal room corner [Lifetime Homes Criterion 16].

4.9 Wheelchair User Dwellings

Ten percent of new housing should be designed to be wheelchair accessible or easily adaptable for residents who are wheelchair users in accordance with the GLA Best Practice Guide, Wheelchair Accessible Housing. Refer to appendix 3 for design standards for wheelchair accessible housing.

4.10 Private Open Space

A minimum of 5 sq m of private outdoor space should be provided for 1-2 person dwellings and an extra 1 sq m should be provided for each additional occupant.

Private outdoor spaces should have level access from the home [Lifetime Homes Criterion 4]

The minimum depth and width of all balconies and other private external spaces is 1500mm.

5.0 Home as a Place of Retreat

5.1 Privacy

Design proposals should demonstrate how habitable rooms within each dwelling are provided with an adequate level of privacy in relation to neighbouring property and the street and other public spaces.

5.2 Dual Aspect

Developments should avoid single aspect dwellings that are north facing, exposed to noise exposure categories C or D, or contain three or more bedrooms.

Where single aspect dwellings are proposed, the designer should demonstrate how good levels of ventilation, daylight and privacy will be provided to each habitable room and the kitchen.

5.3 Noise

The layout of adjacent dwellings and the location of lifts and circulation spaces should seek to limit the transmission of noise to sound sensitive rooms within dwellings.

5.4 Floor to Ceiling Heights

The minimum floor to ceiling height in habitable rooms is 2.5m between finished floor level and finished ceiling level. A minimum floor to ceiling height of 2.6m in habitable rooms is considered desirable and taller ceiling heights are encouraged in ground floor dwellings.

5.5 Daylight and Sunlight

Glazing to all habitable rooms should be not less than 20% of the internal floor area of the room.

All homes should provide for direct sunlight to enter at least one habitable room for part of the day. Living areas and kitchen dining spaces should preferably receive direct sunlight.

6.0 Climate Change Mitigation and Adaptation

6.1 Environmental Performance

Designers should seek to achieve a minimum of Level 4 of the Code for Sustainable Homes in all new developments.

All homes should satisfy London Plan policy on sustainable design and construction and make the fullest contribution to the mitigation of and adaptation to climate change.

6.2 Energy and CO2

Development proposals should be designed in accordance with the London Plan energy hierarchy, and should meet the following minimum targets for carbon dioxide emissions reduction. (2016-2031 - Zero Carbon)

6.3 Overheating

Development proposals should demonstrate how the design of dwellings will avoid overheating during summer months without reliance on energy intensive mechanical cooling systems.

6.4 Water

New dwellings should be designed to ensure that a maximum of 105 litres of water is consumed per person per day.

Where development is permitted in an area at risk of flooding, it should incorporate flood resilient design in accordance with PPS25.

New development should adhere to standards for surface water run-off as set out in the Code for Sustainable Homes.

New development should incorporate Sustainable Urban Drainage Systems and green roofs where appropriate.

6.5 Materials

All new residential development should meet the requirements of the Code Level 4 with regard to using materials with lower environmental impacts over their lifecycle.

All new residential development should accord with Code for Sustainable Homes Level 4 and the London Sustainable Design and Construction SPG with regard to the sourcing of materials.

6.6 Ecology

The design and layout of new residential development should avoid areas of ecological value and seek to enhance the ecological capital of the area in accordance with GLA best A practice guidance on biodiversity and nature conservation.

Singapore Housing Development Board (Urban Redevelopment Authority Guidelines)

Gross Plot Ratio

Varies from 1.4, 1.6, 2.1, 2.8 or more than 2.8 as stipulated in the prevailing Master Plan

Bonus GFA

Applicable Bonus Scheme (with a cumulative maximum of 10%):

- Balcony Incentive Scheme
- Conserved Bungalows Scheme
- Indoor Recreation Spaces Scheme

Balconies, Private Roof Terraces (PRT), Private Enclosed Spaces (PES)

All balconies, PRTs, and PESs proposed on or after 12 January 2013 shall be counted as GFA under the 10% maximum bonus GFA allowed beyond the Master Plan (MP) stipulated GPR, and is subject to payment of development charge or differential premium, where applicable.

To qualify for the bonus GFA scheme, balconies, PRTs, and PESs shall retain a semi-outdoor character.

Maximum No. of Dwelling Units (DU)

The DU size control shall not apply to developments within the Central Area.

For flats outside the Central Area, excluding the estates in Maps 2-10: Maximum no. Of DUs = MP allowable GPR x Site Area / 85sqm.

For flats within the estates in Maps 2-10: Maximum no. of DUs = MP allowable GPR x Site Area / 100sqm.

As a guide, all self-contained dwelling units island-wide shall be more than 35sqm nett in internal area.

There shall be provision of a good mix of unit sizes including larger DUs that can cater to the needs of larger families. An example is a development where about 20% of the DUs have a nett internal area of at least 100sqm, excluding voids, balconies, air-conditioner ledges and other external areas, and units of nett internal area less than 50sqm shall not exceed about 20% of the proposed DUs

For computation purposes, the formula shall exclude bonus GFA schemes and the GFA of any strata landed units.

The maximum number of dwelling units derived from the formula may not be attainable depending on the site context, site conditions and the traffic impact that the proposed development may have in the area.

Site Area

Flats: Minimum 1,000sqm Condominiums: Minimum 4,000sqm

Site Coverage

Maximum 50%. It has been simplified to include all building structures that protrude more than 1m from the ground as seen from the top-down 'Site Plan' view.

Building Setback from Boundary

Varies from 3.0m to 15.5m depending on proposed storey height

Building Height

Based on GPR and Max. No of Stories: (1.4/5 storeys / 1.6/12 storeys / 2.1/24 stories / 2.8/36 stories / More than 2.8 / More than 36 storeys)

Floor to Floor Height

1st Storey (G/F) = 5.0 metres / Top Storey = 3.6m or 5.0m (GPR > 1.6) / Typical/Other Stories = 3.6m / PSTS* = 5.0m) *Predominant Sky Terrace Storeys (PSTS) are floors where the sky terrace occupies equal to or more than 60% of the floor plate. Floors with less than 40% of sky terrace are considered 'other storeys'

Building Length

Refer to the 'Acceptable Zone' as shown in the section on Building Length

Landscape Deck

1. Envelope

No deck structures within the planting strips/green buffers.

Deck structures shall be contained within a 1:2.5 gradient envelope.

2. Max. Height

If the landscape deck exceeds 5m in height as measured from the platform level, it shall be counted as an additional storey and subject to site coverage control.

3. Storey Control

At least 50% of each façade of the basement wall area may be covered either by:

Earth-berms/earth fills. The gradient of the earth-berms/earth fills shall be less than or equal to 1:2.5 and lushly landscaped (not just turfed only).

OR

Vertical greening on the exposed blank wall. The greenery shall be well distributed, and the 50% shall be computed based on the elevation plan. If the intention is for the landscape deck to be naturally ventilated, measures shall be taken (e.g. physical brackets, fins) to confine the vertical greenery within the spaces set aside for the greenery.

Earth fill may be allowed within the planting strip/green buffers to raise the landscape deck height, up to a height of 5m from the platform level.

Openings (basement access points/ventilation openings) and/or hard surfaces of the basement wall (either treated or untreated with vertical green) shall not exceed 50% (maximum) of the basement wall area.

4. Greenery Provision

At least 30% (minimum) of the deck surfaces shall be provided with greenery.

The soil depth shall be at least 500mm for planting purposes.

Artificial turf, water features, including water bodies with water plants shall be excluded from the 30% greenery provision.

5. Boundary Walls

The boundary abutting the Landscape Deck shall have porous fencing, as opposed to full height solid boundary walls. Where it is necessary to comply with PUB surface water drainage purposes, the boundary wall may consist of a solid 0.6m high wall followed by a porous 1.2m high fencing. This is to ensure that the landscaping is visible on all facades from the street level.

Basements

Basements with protrusions of up to 1.0m:

- shall comply with the road buffer and building setback.
- Any basement protrusions of more than 1.0m above the ground level

are treated as a storey.

Sunken basements may be built up to the street reserve line and lot boundary provided:

- the portion underneath the green buffer is submerged at least 2m or

more below the ground level.

- There are no technical requirements.
- It does not cause any adverse impact to the adjoining property.

Street Block Plans

Street block plans guide the detailed setback, storey height and building height, for various locations across the city. Specific Controls and how they address the street.

Developments involving Waterbodies

Criteria 1. Retaining Walls

Retaining walls along the waterbodies may be allowed subject to the following criteria:

Retaining walls are less than 1.5m in height;

Retaining walls are set back at least 300mm from the boundary;

Retaining walls are covered with creepers.

Criteria 2. Boundary Walls/Fences

For non-industrial developments, proposed boundary fences shall be porous (eg chained-link, metal-grille, or timber fence).

For industrial developments, the following may be allowed:

Solid boundary walls not exceeding 1.8m in height. The walls shall be aesthetically treated.

Chain-linked fences not exceeding 1.8m in height with close planting of shrubs/vegetation as screenings. A planting strip of 0.5m width (minimum) shall be provided within the development.

Criteria 3. Slope

There shall be no abrupt change in slope gradient at the boundary between the development and the waterbody. The slope gradient shall not exceed 1:2.

Criteria 4. Conservation of Vegetation

Mature vegetation along the waterbodies are to be saved and conserved, wherever possible.

Attic

Maximum height: 5m

Maximum pitch: 45 degrees from the springing line

Attic and the unit below cannot be strata subdivided

Primary access to the attic is from the internal staircase to the unit below

Shops

Up to 0.3% of the proposed GFA (excluding bonus balcony GFA, if any) may be proposed for shops providing personal services, subject to the following criteria:

- scale of the development in terms of gross floor area;
- location of the site in relation to the main road;
- character of the surrounding developments; and
- planning intention of the surrounding area.

Only personal service trades are allowed (eg mini-marts/laundromats). Independent offices are not allowed

Ancillary Structures

Refer to section on Ancillary Structures for detailed setback requirements depending on the type of ancillary structure.

Other ancillary structures located within the physical buffer and building setback that exceed the guidelines but are less than 6m in height will be evaluated depending on its merits.

Parking

Parking standards and requirements are prescribed by the Land Transport Authority (LTA).

Residential strata titled units may have a maximum of 2 private car parking lots, which have to be physically integrated to the respective residential strata lots and capable of being formed into single strata lots.

RC Flat Roofs

C flat roofs shall remain inaccessible except for maintenance purposes only. Activating the rooftop for uses such as roof terraces may be allowed depending on the merits of the proposal. No structures shall be allowed unless otherwise approved by URA. Where allowed, structures shall comply with the following guidelines.

Communal Pavilions

Maximum 50sqm or 50% of roof coverage, whichever is lower;

For developments with storey height control, pavilions shall be open-sided;

For developments without storey height control, maximum 50% perimeter enclosure of the pavilions may be allowed;

Communal pavilions shall be integrated with lush greenery. The greenery on the rooftop shall be both enjoyable by the building users and visible from the surroundings;

Plants shall be incorporated on permanent and preferably sunken planting, planned with sufficient soil depth based on the types of plants proposed. Some space shall be set aside for the provision of communal facilities and furniture to enhance the rooftop.

Solar Panels

Site is subject to urban design guidelines or located within Conservation Areas;

Elevated solar panels; *A solar panel is deemed to be elevated if it is raised more than 1m from the roof level for landed housing developments or 1.8m from the roof level for other developments.

Spaces under solar panels are enclosed or put to commercial use.

Greenery

Developments in identified Strategic Areas shall provide LRA that is minimally equivalent to the development's gross site area, as shown in the table and diagram below. At least 40% of the LRA requirement shall be reserved for softscape (permanent planting) areas. The remaining LRA requirement may be provided as hardscape.

To qualify as LRA, all horizontal areas shall be:

unenclosed and open-to-sky, or

If covered, open sided, naturally ventilated, and qualify for GFA exemption under a LUSH incentive scheme (eg Communal Planter Boxes, Covered Communal Ground Gardens and/or, Sky Terraces). Rooftop urban farms counted as GFA may be counted as LRA subject to the guidelines under the Hardscape Area section below.

All LRA shall be designed taking into account safety and maintenance considerations.

Softscape Areas

These are permanent, sunken planting areas which shall be designed with sufficient soil depth to accommodate a variety of plant types.

A minimum soil depth of 1000mm shall be provided for trees and palms, 500mm for shrubs and climbers, and 300mm for ground covers.*

Potted plants do not count as softscape.

*As an alternative to providing sunken planting beds, building owners can provide well-landscaped, raised planting beds at maximum 300mm high, planted with trees or shrubs (ie no turfing allowed). This facilitates compliance with FSSD's fire safety requirements on habitable space.

Hardscape Areas

These are communal facilities (eg event plazas, playgrounds and water features), surrounded by lush landscaping.

Covered Rooftop Urban Farms may count towards hardscape under the LRA requirement, up to 10% of site area and subject to the merits of the proposal.

For crop protection, covers over rooftop urban farms may be allowed.

Such covered urban farm area may be allowed on Temporary Permission and counted as Gross Floor Area, subject to a Temporary Development Levy. URA may consider allowing additional GFA for farms over and above the maximum permissible GFA under the Master Plan.

Prevailing building height controls shall continue to apply to any structures and equipment proposed at the roofs. Proposals within areas subject to Urban Design guidelines or Conservation requirements shall be evaluated according to prevailing controls.

Vertical Greenery & Extensive Green Roofs

May count towards either softscape or hardscape under the LRA requirement, up to 10% of site area.

The following guidelines shall apply:

Vertical greenery shall be publicly visible, eg placed at external building facade fronting key pedestrian thoroughfares, major public spaces, and main entrance areas, etc. Vertical greenery for sites in Urban Design areas eg Central Area and Key Growth areas (see the Urban Design Guidelines on URA SPACE) may be subject to additional urban design requirements.**

Extensive green roofs shall be of a substantial size to contribute to green cover and support biodiversity. Apart from maintenance purposes, extensive green roofs shall not be accessible for other users. Horizontal trellis-based greenery shall not qualify as extensive green roofs.

**For vertical green proposing support systems, planter boxes of minimum 500mm depth are encouraged to be provided at every storey for dense plant growth.

Areas which do not Qualify as Landscaping

Service facilities, eg vehicular drop-offs, drive ways, etc and its ancillary greenery.

Circulation areas, eg stairs, ramps, walkways, etc and its ancillary greenery.

Ownership

In strata subdivided developments, the LRAs shall be part of common property.

Building owners shall retain the required LRAs.

LUSH (Landscaping for Urban Space and High-Rise) Incentives

Sky Terraces

Communal Planter Boxes

Covered Communal Ground Gardens

Communal pavilions

Walking & Cycling Plan

Flats and condominiums with more than 700 DUs shall provide a Walking and Cycling Plan (WCP) as part of their Development Application. Refer to section on Walking and Cycling Plan

Strata Subdivision

Only residential units and shop units, if any, may be strata sub-divided. Common areas shall not be strata subdivided into a separate strata unit.

Earthworks

Earthworks are not allowed within the building setback area.

Earthworks within the build-able area are subject to evaluation. If earth fill of more than 1m is allowed, the overall aggregate building height measured from the allowable platform level shall comply with the maximum allowable building height control.

Earth fill involving the entire development site may only be considered if the proposed earthworks are required to meet the Minimum Platform Level (MPL) stipulated by PUB.

Boundary and Retaining Walls

Maximum allowable height for boundary walls is 1.8m.

Erection of retaining walls are subject to evaluation. If retaining walls are allowed:

- the height shall be less than 1.5m;
- retaining walls higher than 1.5m may be considered depending on site constraints and the need for extensive excavation;
- the total visible height of the solid boundary-cum-retaining wall shall not exceed 2.8m, of which the solid boundary wall shall not exceed 1.8m.

DISCLAIMER

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