LETTER 23rd September 2024

The General Manager PO Box 82 Manly NSW 1655 Australia

KOICHI TAKADA Architects Pty Ltd

RE: Design Verification Statement – 1112-1116 Barrenjoey Road, Palm Beach Section 34 Conference

Office: Suite 41 & 42 61 Marlborough Street Surry Hills, NSW 2010 AUSTRALIA

To whom it may concern,

T +61 2 9698 8510 F +61 2 8209 4995 Pursuant to Section 29 of the Environmental Planning and Assessment Regulation 2021, I hereby declare that I am a qualified designer as defined under Schedule 7, being a registered architect in accordance with the Architects Act 2003.

E info@koichitakada.com

I directed the design of the residential development at **1112-1116 Barrenjoey Road,** Palm Beach.

ABN 63 131 365 896

Nominated Architect:

Koichi Takada NSW Architects 6901 VIC Architects 6179

Australian Institute of Architects 25286 Royal Institute of British Architects 1041159 As detailed in the architectural design report and ADG compliance table, I confirm that the design achieves the quality principles set out in the State Environmental Planning Policy (Housing) 2021 – Chapter 4 Design of residential apartment development and the objectives of the Apartment Design Guide

Yours sincerely,

Koichi Takada Nominated Architect NSW Architects No. 6901

Principle 1: Context & 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.

The site is located 1112-1116 Barrenjoey Road, Palm Beach, to the North of the prominent Barrenjoey House. The site is located approximately 50km north of Sydney's CBD on Pittwater Bay. Located on the main road and entry point to this popular destination makes this a prominent and highly visible context. The site is located within the Northern Beaches Local Government Area (LGA) within a B1 Neighbourhood Centre.

Located across the road from the Palm Beach wharf, the site is ideally positioned to access all the amenities of Palm Beach. The area around the site boasts a wide variety of outdoor amenity and recreation, with a small amount of retail offerings, cafés, and restaurants.

Surrounding developments are concentrated along Barrenjoey house and built into the slope to the east. The site has very steep terrain, The level change on the site from East to West falls by approximately 13m, with 10m occurring in approximately 50% of the site depth. The slope of the site exceeds 30% (average of 23.28° = 43%) meaning the site is eligible for the 10m concessional height limit as per Clause 4.3 of the Pittwater LEP. The proposal embraces this terrain by incorporating terraced levels that follows the slope. The terraced form is designed to respond sensitively to the natural topography, concertrating the bulk of the structure away from the street frontage.

The diminishing profile and articulated, stepped facade, with a significant setback for the upper level ensure that the building appears visually unobstrsive from Barrenjoey Road and diminishes its overall scale.



Looking North towards the site aligning with and complimenting Barrenjoey House.

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.

The development seeks a primary frontage on Barrenjoey Road at ground level, where retail spaces are proposed. Levels 1 and 2 are set back from the ground level building line, with an additional setback for level 3 to minimize bulk and scale. The level 3 unit steps back with the terrain to the East, minimizing the visual impact of the top floor from the pedestrian realm and streetscape. The proposal fully complies with the concessional 10m height limit as measured from the natural ground (noting previous excavation has artificially lowered the site levels). Consideration has been given to the local context; the proposal is sympathetic to the scale and height of Barrenjoey House to the south while incorporating sensitive terraced form and landscape design that connects with the natural character of Palm Beach. At ground level and within the side setbacks, a combination of low, stepped planters and deep soil planting creates a soft interface with the public domain and neighbouring properties.

The large vertical landscaped break and horizontal architectural language align with the residential buildings in the area. This vertical landscaped break creates a strong division in the building form, separating it into two distinct structures. The gap between these forms enhances the similarity with adjacent urban character and built forms. A flat roof creates a tidy, homogeneous facade, emphasizing the terraced eastern aspect of the building. This design reduces bulk and preserves views fro neighbours to the rear.

The combination of greenery, timber-look screens, and the feature awning creates a design that is sensitive to the natural context. The terraced building form is sympathetic to the streetscape and enhances the relationship with Barrenjoey House.



Barrenjoey Road Street perspective, showing the vertical articulation and modulation.

Principle 3: Density

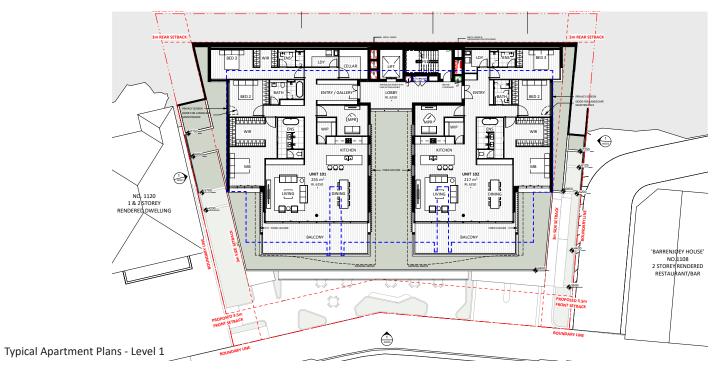
Good design achieves a high level of amenity for residents and each apartment, resulting in a density appropriate to the site and its context.

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.

The site is located in a B1 Neighbourhood Centre zone. Its location is well served by public transportation connections (a bus and ferry) as well as lifestyle, leisure and community facilities, including beaches golf clubs, retail offerings and parks. The mixed use proposal combines five apartments with two ground floor retail tenancies, delivery high quality retail to this key arrival location in Palm Beach.

The DCP requires 25% of the gross floor area to be commercial/retail. The ground floor maximizes the available frontage and area for Retail with a proposed 489m² of area (27.6% of the overall GFA). Space for services, the driveway ramp, and residential entry has been contained within the building footprint to maximize landscaped areas.

The proposal meets market demands by offering high-quality 3 bedroom units, with apartment sizes ranging from 217m² to 282m² of internal area. This mix aims to cater to the market appealing to downsizers and owner occupiers. All apartments comply with the DCP and ADG in terms of room sizes, balcony sizes, and achieve the appropriate amenity envisaged from a development of this nature.



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.

The proposed building is designed to meet energy efficiency performance standards. A BASIX assessment has been prepared to verify water conservation, thermal comfort, and energy efficiency.

The insulation value for the walls, roofs and floors combined with window dimensions, locations, glass types and shading devices has achieved compliant heating and cooling loads.

A feature awning is provided on the western elevation which provides additional shading to living areas and balconies from the afternoon summer sun.

All toilet cisterns, shower heads and taps have been specified to achieve a minimum of 4-Star WELS rating. Natural cross ventilation and solar access is achieved in 100% (5/5) of the apartments.

The proposed scheme contains the ability to provide EV charger at the basement car park for electric vehicle charging. Dedicated Bicycle spaces on ground level and general storage for each unit is provided to promote alternate transport modes. PV panels are installed on the roof and facing north to maximize the energy harvest.

All units are oriented to maximise the view and provide good access to daylight. The open common corridors and lobbies on each residential floors are designed to receive natural light and ventilation.



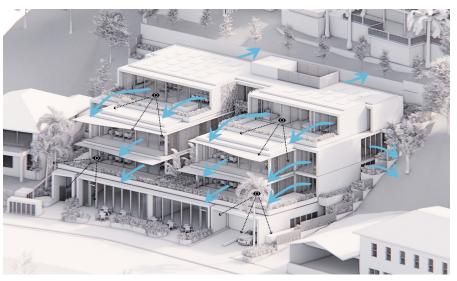












Principle 5: Landscape

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, microclimate, 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.

The proposed landscaping responds to both the existing local context and the aims of Council's controls, through the introduction of new, vibrant planting. This proposal seeks to improve upon the current site conditions (mostly hard surfaces at the ground level) by providing substantial perimeter planting to soften the boundary and street frontages.

A series of stepped planters in the side setbacks seek to retain the steep level change while providing an attractive screening from neighbouring buildings. These, coupled with the large vertical landscaped break and perimeter planters to the balconies break up the building's overall mass, while preserving the architectural language of the proposal. These planters also offer visual privacy to the residents, interrupting views from the streets below. In addition to architectural screening, landscape planters to the elevations assist in screening and providing visual privacy.

The deep soil zones (17.2% of the site area) located at the north, south and east setbacks allow for a series of significant trees. All plant species have been carefully selected to suit the location and climate and native species have been used where possible.















Planting Typologies

Principle 6: Amenities

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

The new building optimises residential amenity, providing each of the 5 units will have large external balconies. Tri-aspect and cross-through units are maximised in order to provide the opportunity for cross ventilation with 100% (5/5) compliance. Living rooms are positioned to maximise views and solar access, with 100% (5/5) meeting the requirements for solar access.

Landscape buffer zones, perimeter planting, and privacy screens are proposed to prevent overlooking onto the adjacent development to the north.

Access to the ground floor residential entry is designed to ensure accessibility for all individuals, regardless of physical ability. All levels are serviced by a lift with direct access from the basement carpark level

A garbage and recycling room is located on the ground floor for residential waste, with a separate waste room designated for retail. Bins are collected from a screened holding area at street level.

All units have balconies, with full height sliding doors. All balconies and terraces exceed the ADG minimum area requirements. All apartments have been designed to exceed ADG minimum area requirements and special care has been taken to provide useful storage areas, larger laundries and integrated joinery to address an increasing demand for the downsizer market.

For public interface, a front setback ranging from 4.3m to 6.8m on the ground floor exceeds the council's 3.5m control. Combined with planting and outdoor seating, this enhances the quality of outdoor space and fosters a strong connection to Barrenjoey Road.

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.

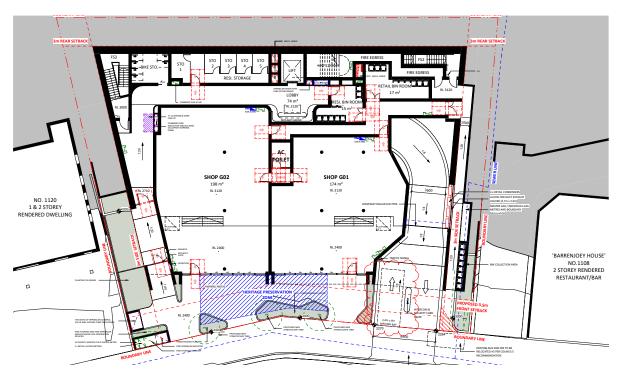
A positive relationship between public and private spaces is achieved through clearly defined secure access points and well lit and visible areas that are easily maintained and appropriate to the location and purpose.

The proposal aims to enhance safe movement for its tenants and neighbours by creating welcoming and attractive street frontages

A highly visible pedestrian entry connects the ground floor lobby to Barrenjoey road. The security gate at the building line to provide safety for residents.

This entry will be well lit, day and night, with access to natural daylight and connection to the landscape. The Basement is accessible via a remote operated roller shutter, which will be secured at all times. An intercom system will allow for identification of visitors at the pedestrian and vehicle entries. The driveway entry is positioned on the southern corner of the site, away from the pedestrian crossing and residential entry to minimise conflicts. The installation of traffic sign at each end of the driveway ramp is to enhance the safety for the vehicles' safety.

The site's northern, southern and eastern boundaries will be secured by privacy fencing. Also, windows and balconies from the apartments address all aspects of the site, providing a high level of passive surveillance to the street below.



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.

The proposed building has been designed to respond to its social context and offer a range of apartment sizes in the 3 Bedroom type. The variety of apartment sizes, coupled with the provision of landscaped balconies and terraces of varying size will attract different buyers and occupants with individual requirements.

The design encourages social interaction among residents through the inclusion of retail spaces on the ground level. The linear residential entry and lobbies on each residential level are design to receive natural light and ventilation, creating open spaces for residents to gather and socialize with their neighbours.

While no communal open space has been provided in the development the site is located within close proximity to many open spaces, parks and waterways providing easy access for communal gatherings.



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.

The visual appearance of a well designed apartment development responds to the existing or future local context, particularly desirable elements and repetitions of the streetscape.

This proposal is the result of careful consideration of the local context, blending modern geometric elements with natural forms and materials. It aims to harmonize with the seaside character while respecting the heritage significance of Barrenjoey House. The built form terraces back with the natural terrain, and a feature awning provides lightweight sunshading, contributing to a fine-grain and seaside-friendly aesthetic.

An awning is provided to the ground floor pedestrian spaces and runs the length of the site. The feature is clad in natural sandstone, grounding the scheme and providing a visual connection to the location's many beaches, enhancing the seaside character of Barrenjoey Road. The inclusion of a natural, raw material at the lower levels anchors the building to the site. The upper levels are characterized with perimeter planters, timber look screens, and a bamboo like awning. The landscape inclusions serves to compliment the modern geometry of the building, lightweight building design and accentuate its connection to the natural environment.

The horizontal form of the proposal is broken into two distinct masses that provide light and ventilation to the common corridors. This interruption to the building forms and wide gap between two building form serves to reduce the bulk and scale of the building when viewed from the street aligning to the widths of the adjacent developments.

The design, scale and treatment reflect a 'seaside-village' character through a building design that sits comfortably within the landscape, provides a coastal material palette and light weight facade features. The retail will incorporate outdoor seating encouraging public domain activation which can be enhanced with retail seating.



3D visualization of the ground floor retail and public domain.

Summary of Compliance with the NSW Apartment Design Guide

Objectives and Design Criteria			Consistent
Part 2 Developing the controls			
2E Building Depth			All apartment units are with glass to two (Front and Rear) or three frontages (Front, Rear & Side) maximising cross floor ventilation, natural light, and amenity.
			Level 1: 15.1m glass line to rear wall
			Level 2: 15.1m glass line to rear wall
			Level 3: 9.9m - 10.8m glass line to glass line
2F Building Separation			The north setback has been increased to an average 5.1m setback, with the minimum setback at 3m which complies with council's DCP controls.
	Landscaping and privacy screens to the norther and southern elevations provide visual separation to the neighbouring properties.		
Part 3 Siting the Development			
3D Communal and Public Open Space			
Objective An adequate area of communal open space is provided to enhance residential amenity and to provide opportunities for landscaping.			N/A DCP does not require communal open space fo shoptop housing. However, each apartments has generous private open space.
Design Criteria			N/A
Communal open space has a minimum area equal to 25% of the site. Developments achieve a minimum of 50% direct sunlight to the principal usable part of the communal open space			N/A
for a minimum of 2 hours between 9 am and 3 pm on 21 Ju 3E Deep Soil Zones	une (mid-winter).		
•			√
Objective Deep soil zones provide areas on the site that allow for, su residential amenity and promote management of water and	Extensive deep soil zones are provided around the perimeter of the building		
Design Criteria			✓
Deep soil zones are to meet the following minimum require		D 0 11 7 /0/ 6	234.7m ² or 17.2% of the site area is provided as deep soil.
Site Area	Minimum Dimensions	Deep Soil Zone (% of site area)	The side and rear setbacks have a minimum
Less than 650m ²	-	7%	dimension of 3m.
650m ² – 1,500m ²	3m		
Greater than 1,500m ²	6m		
Greater than 1,500m ² with significant existing tree cover	6m		
3F Visual Privacy			
Objective			✓
Adequate building separation distances are shared equitablevels of external and internal visual privacy.	A 3m rear setback allows for the protection of th existing planting and new screening plants, providing additional visual privacy. The propose generally will be treated with a green curtilage.		

All sides are screened at ground level with stepped planters while the upper levels will be screened with perimeter planters.

An average 5.1m setback is provided to the North and South setbacks. The angled site boundary has varied setbacks from MAX 6.6m to MIN 3m dimensions.

In addition to this, privacy screens and battens are provided to the North and South facades, providing increased privacy, and protecting against cross viewing into adjoining properties.

Design Criteria

Separation between windows and balconies is provided to ensure visual privacy is achieved. Minimum required separation distances from buildings to the side and rear boundaries are as follows:

Building Height	Habitable rooms and balconies	Non-habitable rooms
Up to 12m (4 storeys)	6m	3m
Up to 25m (5-8 storeys)	9m	4.5m
Over 25m (9+ storeys)	12m	6m

The development has a 2-storey dwelling house on the North and abuts a driveway and commercial property (Barrenjoey House) to the South. There is ~9 metres of separation to the single storey extension at Barrenjoey House while separation from the heritage building is ~20 metres.

The proposal contributes equitably to building separation to the north. The setbacks exceed DCP requirements and the planning, layout and position of windows have been designed to protect the visual amenity, prevent cross viewing, and provide a landscape buffer.

The windows on the North and South range in distance from the boundary from a MIN 4.6m to 7.2m from the boundary, with an average of 5.6m for the extent of the side walls.

3J Bicycle and Car Parking

Objective

Car Parking is provided based on proximity to public transport in metropolitan Sydney and centres in regional areas.

Design Criteria

For development in the following locations:

- on sites that are within 800m of a railway station or light rail stop in the Sydney Metropolitan Area; or
- on land zoned, and sites within 400m 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.

√/X

The development has numerous site constraints (including a heritage preservation zone) which restrict the number of parking spaces that can be provided. This results in a shortfall of 2 retail parking spaces vs. Council DCP requirements. That said, retail parking provisions are expected to adequately cater to actual parking demand noting the retail shops are expected to draw many of the customers from "linked trips" or "passing trade," noting that the site is located in direct walking vicinity of the popular beaches within Palm Beach. Linked trips occur when a person visits the site but also visits another premises nearby on the same trip whilst not moving their car, thereby not requiring an additional parking space.

Bicycle parking for both residential and retail is located at Ground level in a dedicated storage area.

Part 4 Designing the Buildings

4A Solar and Daylight access

Objective

All apartments receive adequate solar access.

	tments receiving sunlig	t to habitable rooms, primary windows, and private open		
space.			,	
Design Criteria			√ 4000/ (1.1.1. ii.)	
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.			A total of 5units (being 100% of total units) receive direct sunlight for a minimum of 2 hours.	
A maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid-winter.			✓ All apartments receive solar access.	
4B Natural Ventilation			All apartments receive solal access.	
Objective			√	
The number of apartments with natural cross ventilation is maximised to create a comfortable indoor environment for residents.			·	
Design Criteria			✓	
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.			100% of units are cross-ventilated. In addition to this, the common corridor is designed to provide natural ventilation and daylight to the common areas.	
Overall depth of a cross-over or cross-through apartment does not exceed 18m, measured glass line to glass line.			N/A	
4C Ceiling Height			,	
Objective		de Rold	√	
Ceiling height achieves sufficient	t natural ventilation and	daylight access.	,	
Design Criteria	ed to finished epiling lo	al minimum pailing haighta aras	✓	
Measured from finished floor leve	rei to finished ceiling le	ei, minimum ceiling neights are:	Cailing baights for regidential units on all levels	
Minimum ceiling height Habitable rooms	2.7m		Ceiling heights for residential units on all levels achieve 2.7m minimum for habitable rooms.	
Non-habitable	2.4m		-	
		iving area floor		
For 2 storey apartments		d floor, where its area does not exceed 50% of the		
Attic spaces	-	of room with a 30		
'	-	m ceiling slope		
If located in mixed use areas		d and first floor to promote future flexibility of use		
These minimums do not preclud		•		
4D Apartment Size and L	Layout			
Objective			✓	
•	partment is functional,	rell organised and provides a high standard of amenity		
Design Criteria	,		✓	
Apartments are required to have	e the following minimur	internal areas:	All units exceed the minimum requirements.	
Apartment Type	Mir	imum internal area		
Studio	35n	2		
1 bedroom	50n	2		
2 bedrooms	70n	2		
B bedrooms		2		
The minimum internal areas included by 5m² each.	lude only one bathroon	Additional bathrooms increase the minimum internal area		
A fourth bedroom and further ad-	lditional bedrooms incr	ase the minimum internal area by 12m ² each.		
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.		All habitable rooms are provided with a window opening for natural daylight and air.		
Objective			√	
Environmental performance of the	he apartment is maxim	sed.		
Design Criteria			✓	
Habitable room depths are limited to a maximum of 2.5 x the ceiling height.		The apartment areas and dimensions of the rooms are generous, providing larger proportions.		

In open plan layouts (where the from a window.	living, dining and kitchen are co	mbined) the maximum habitable room depth is 8m	Habitable room depths are not more than 8m from an openable window (measured to the edge of the back kitchen bench)
Objective			√
Apartment layouts are designed to accommodate a variety of household activities and needs.			
Design Criteria			✓
Master bedrooms have a minimum area of 10m² and other bedrooms 9m² (excluding wardrobe space).			
Bedrooms have a minimum dimension of 3m (excluding wardrobe space).			✓
Living rooms or combined living/	_	vidth of:	✓
3.6m for studio and 1 bedroom apartments			
• 4m for 2 and 3 bedroom apa	irtments.		
The width of cross-over or cross-through apartments are at least 4m internally to avoid deep narrow apartment layouts.			N/A
4E Private Open Space a	and Balconies		
Objectives			✓
Apartments provide appropriately sized private open space and balconies to enhance residential amenity.			
Design Criteria			✓
All apartments are required to ha			Balconies are designed in accordance with this
Dwelling Type	Minimum Area	Minimum depth	requirement, with all balconies a minimum of
Studio apartment	4m ²	-	2.4m deep.
1 bedroom apartment	8m ²	2m	Level 1: 2.4m
2 bedroom apartment	10m ²	2m	
3+ bedroom apartment	12m ²	2.4m	Level 2: 2.4m
The minimum balcony depth to I	pe counted as contributing to the	e balcony area is 1m.	Level 3-4: 3m+
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.			N/A
4F Common Circulation	and Spaces		,
Objective Common circulation spaces achieve good amenity and properly service the number of apartments.			The common corridors are designed with natural ventilation and solar access. One lift service the 5 units, providing a well serviced building.
Design Criteria			√
The maximum number of apartments off a circulation core on a single level is eight.			Maximum 2 Apartments off a circulation core on a single level.
For buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40.			N/A
4G Storage			
4G Storage Objective			✓
4G Storage Objective Adequate, well designed storage	e is provided in each apartment.		✓
Objective	e is provided in each apartment.		✓
Objective Adequate, well designed storage		following storage is provided:	✓ All units are generous in size and are provided
Objective Adequate, well designed storage Design Criteria		following storage is provided: Minimum Volume	All units are generous in size and are provided with adequate storage in accordance with the
Objective Adequate, well designed storage Design Criteria In addition to storage in kitchens			All units are generous in size and are provided with adequate storage in accordance with the design criteria requirements. Additional storage
Objective Adequate, well designed storage Design Criteria In addition to storage in kitchens Dwelling Type		Minimum Volume	All units are generous in size and are provided with adequate storage in accordance with the
Objective Adequate, well designed storage Design Criteria In addition to storage in kitchens Dwelling Type Studio apartment		Minimum Volume 4m ³	All units are generous in size and are provided with adequate storage in accordance with the design criteria requirements. Additional storage
Objective Adequate, well designed storage Design Criteria In addition to storage in kitchens Dwelling Type Studio apartment 1 bedroom apartment		Minimum Volume 4m ³ 6m ³	All units are generous in size and are provided with adequate storage in accordance with the design criteria requirements. Additional storage