ONE SYDNEY HARBOUR

DESIGN VERIFICATION STATEMENT - BUILDING R5

(State Significant Development 6966)

Pursuant to Clause 50 (1A) and (1B) of the Environmental Planning and Assessment Regulation 2000

I hereby declare that I am a qualified designer, which means a person registered as an architect in accordance with the Architects Act 1921 as defined by Clause 3 of the Environmental Planning and Assessment Regulation 2000.

I designed, or directed the design, of the mixed use development stated and I affirm that the design achieves the design quality and principles as set out in Part 2 of the *State Environmental Planning Policy No 65 - Design Quality of Residential Flat Development* and the associated Objectives of Parts 3 and 4 of the *Apartment Design Guide..* I have provided further detail on the design's compliance with the quality principles in this Design Verification Statement, which is attached.

Principal Architect:

Emanuela Baglietto
Partner
Renzo Piano Building Workshop
NSW Architects Registration Board
Registration Number 9512

In collaboration with Executive Architect:

Stephanie Smith
Principal Architect
Lendlease
NSW Architects Registration Board
Registration Number 6480

ONE SYDNEY HARBOUR - RESIDENTIAL BUILDING R5

SEPP 65 DESIGN QUALITY PRINCIPLES STATEMENT

PREPARED BY RENZO PIANO BUILDING WORKSHOP AND LEND LEASE DESIGN

This Statement against the Design Quality Principles of *State Environmental Planning Policy No 65 - Design Quality of Residential Flat Development* (SEPP 65) and the associated Objectives of Parts 3 and 4 of the *Apartment Design Guide* supports a State Significant Development Application (SSD6966) submitted to the Minister for Planning pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EPA Act). The Development Application (DA) seeks approval for construction of a residential flat building (known as R5) and associated works at Barangaroo South as described in the Environmental Impact Statement attached to this report.

The R5 DA seeks approval for the construction and use of a 29 storey residential flat building comprising 151 apartments, ground floor retail, the allocation of car parking, services, plant and storage within the common Basement (subject of a separate concurrent DA), and the construction of ancillary landscaping and temporary public domain.

Approval for the construction of R5's core and associated plant and services within the basement is being sought as part of the concurrent One Sydney Harbour Basement DA and does not form part of this DA.

This statement is prepared in accordance with the provisions of Clause 50 (1A) and (1B) of the *Environmental Planning and Assessment Regulation 2000* (EPA Regulation), which are set out below:

> *(1B) If a development application that relates to residential apartment development is made on or after the commencement of the Environmental Planning and Assessment Amendment (Residential Apartment Development) Regulation 2015, the application must be accompanied by a statement by a qualified designer.*
>
> *(1AB) The statement by the qualified designer must:*
>
> *(a) verify that he or she designed, or directed the design, of the development, and*
>
> *(b) provide an explanation that verifies how the development:*
>
> *(i) addresses how the design quality principles are achieved, and*
>
> *(ii) demonstrates, in terms of the Apartment Design Guide, how the objectives in Parts 3 and 4 of that guide have been achieved.*

DESIGN QUALITY PRINCIPLES of SEPP 65 – BUILDING R5

Design Quality Principle	Objective / Control	Evaluation	Verification
01 CONTEXT	*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.*	▪ Barangaroo is situated on the harbour foreshore and marks the western edge of the Sydney CBD. ▪ The site is part of the greater Barangaroo urban regeneration project that is transforming the Sydney Harbour waterfront. ▪ The site sits to the north of the commercial precinct of the Rogers Stirk Harbour + Partners (RSHP) masterplan and is framed by key thoroughfares of Watermans Quay, Barangaroo Avenue, Barton Street and Hickson Road. ▪ Hickson Road incorporates a range of buildings of varied use and age. ▪ Watermans Quay will be defined on the south side by the RSHP commercial building - 'International Tower One' (Commercial Building C3). ▪ To the west of Barangaroo Avenue will be the future development of the proposed Crown Hotel and Resort. ▪ Barton Street will have future development to be defined in the next phase of the development known as Central Barangaroo. ▪ The public domain will be defined by the creation of a generous north facing open space, Hickson Park. ▪ This development proposal has been designed concurrently with the public domain and seeks to draw upon the following characteristics of the context to create a high quality outcome: – Landscape: builds upon the principles of the greater masterplan vision and is marked by the creation of a north facing public open space. R5 will sit at the south east edge of Hickson Park and define the Hickson Road, Barangaroo Avenue corner. – Architecture: R5 has been designed as part of an elegant composition of three buildings by the same architect, each founded on the concept of a "crystalline" form. These define the northern edge of Watermans Quay and frame Hickson Park. The building is envisaged as being a pure, transparent and refined form that will read cohesively with the other associated proposed adjacent residential towers and	✓

Design Quality Principle	Objective / Control	Evaluation	Verification
		achieve an appropriate transition in architectural style between the natural landscape of the harbour and the commercial vernacular of buildings to the east and south in the Sydney CBD. In this sense they will make a significant positive contribution to the Sydney city skyline. – Circulation: A series of links around the site define the public realm. – Views: The site has views to some of Sydney's prestigious landmarks including the Harbour Bridge, Opera House and Blue Mountains. Informed by analysis of the existing view corridors, R5 seeks to access these views equitably with consideration to the neighbouring developments. Furthermore, the project will enhance views to the CBD from surrounding key vantage points through its architectural contribution. – Vehicular circulation: vehicular access to the basement has been consolidated into one entry and exit point off Watermans Quay.	
02 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 proposed building height and scale is within the defined developable envelopes as approved in the MOD 8 concept plan. ▪ The podium of R5 is three storeys in height and responds to the scale of the RSHP International Tower One podium on the other side of Watermans Quay. ▪ The R5 podium defines the site extent and allows the residential tower to meet the ground plane at a human scale appropriate to the precinct. ▪ R5 is the shortest of the family of three residential towers and responds to the scale of nearby buildings fronting Hickson Road, while buildings to the west are taller, responding to the scale of the proposed Crown Landmark Hotel building to the west. ▪ The building footprint has been carefully designed so that it reads as a crystal like form on the city skyline.	✓

Design Quality Principle	Objective / Control	Evaluation	Verification
		▪ The building location and alignment has been carefully considered in relation to the family of three residential towers and is positioned to allow for optimum vistas and views from the site. ▪ R5 is defined by a narrow module which sets a discrete and regular rhythm on the façade. This is punctuated by balconies and wintergardens which provide a dynamic building skin that will play with light to enhance the crystalline, lightweight presence of the building. ▪ R5 addresses Hickson Road, Waterman's Quay and Hickson Park to the north with the residential lobby and retail providing activation and appropriate scale to the ground plane. ▪ The orientation and siting of the building relative to adjacent existing and proposed buildings, together with the internal floor layout and features of the façade design, will create a high level of internal and external amenity in terms of visual privacy, outlook/views, solar access, natural ventilation and space functionality.	
03 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 proposed density of the R5 residential tower is appropriate to the site and its urban context. ▪ The R5 residential tower will contribute to the vision of the Barangaroo masterplan as a thriving mixed use community in the Sydney CBD. ▪ The density provides for the efficient use of the land in close proximity to jobs, shops, services and transport. The development can be supported by the surrounding environment, with infrastructure and services readily available, retail, business and recreational hubs immediately nearby and high quality public transport within a short distance. ▪ The design of the three residential towers includes an array of communal residential facilities that provide both indoor and outdoor amenity to residents in the precinct. ▪ The composition of the three residential towers has been carefully considered in relation to the northerly aspect and Sydney Harbour icons and optimises views, solar access and	✓

Design Quality Principle	Objective / Control	Evaluation	Verification
		the public open space of the site. ▪ Each apartment within R5 has been designed so that the aspect and outlook contribute to the ultimate amenity and well-being of the residents.	
04 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 Barangaroo Precinct's sustainability initiatives are extensive and are underpinned by aspirations of carbon neutral, zero waste and water positive. ▪ R5 will be a sustainable residential building, with low operational energy consumption, reduced potable water use, minimisation of waste to landfill and appropriate materials selection while at the same time maintaining a high level of indoor environmental quality through appropriate mechanical design, façade configuration and materials selection. ▪ It will appropriately contribute towards the achievement of the sustainability requirements included in the Statement of Commitments of the approved Concept Plan, is committed to a 5 Star Green Star rating and will meet the requirements of the Building Sustainability Index (BASIX). ▪ The proposed residential development will benefit from Barangaroo South's precinct sustainability initiatives such as the district cooling plant, on-site renewables and generation strategy and the precinct recycled water plant. These initiatives are essential to ensure the Barangaroo South achieves sustainability targets such as: – Minimal operational energy consumption off-set by offsite renewable energy to ensure a carbon neutral precinct. – The capability to export more recycled water than potable water is imported to ensure a positive water impact. – An 80% operational waste diverted from landfill, targeting zero net waste to landfill by 2020. – 20% reduction in embodied carbon (cradle to gate) not including tenant fit outs. – On site renewables of an amount to offset public realm	✓

Design Quality Principle	Objective / Control	Evaluation	Verification
		and recycled water treatment plant energy use. ▪ Further, individual apartments are located and oriented to maximise opportunities for controlled solar access and natural ventilation, minimising energy use and maximise the efficient use of resources.	
05 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.*	▪ The public domain and architecture have been developed through a collaborative design process. The public domain is seen as an extension of the building architecture and is an integral component of the proposal in the context of its urban setting and connectivity with the wider precinct. ▪ Hickson Park will be a significant new addition to the framework of the public realm for the city. In addition the park will provide an extension of the residential amenity of the towers and access to green open space. ▪ The design approach to the landscape for the podium includes careful consideration of the need to provide a variety of spaces and experiences that provide necessary respite and refuge from the busy CBD and also capitalises on the impressive outward distant views across the harbour towards Balmain and Pyrmont. The design will also provide excellent views down to Watermans Cove. ▪ The podium will feel like a private garden. A garden which strives to engender ownership by residents of the tower, provide a place in which they can relax and feel comfortable in - away from the busy city streets - and engage in the magnificent harbourside setting. ▪ The landscaped podium roofs will also provide an attractive outlook for the proposed adjacent developments.	✓
06 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*	▪ The amenity of the proposed R5 apartments is of a high quality. Internal spaces include: – Open planned interiors which maximise the useability of each space with generous internal dimensions and functionality.	✓

Design Quality Principle	Objective / Control	Evaluation	Verification
	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.	– Balconies and wintergardens that are a continuation of the internal living space in size and materiality. The proportions are deep enough to be comfortably furnished whilst allowing penetration of winter sun into living spaces. – Wintergardens are provided at higher levels to ameliorate wind conditions to support the useability of outdoor spaces throughout the year. – The design of the building façade promotes connectivity with the natural environment and natural ventilation, in conjunction with a high thermal performance providing ultimate comfort for residents. – Ceiling heights exceed minimum requirements and are designed to complement the proportions of the internal apartment spaces. – Access to views and vistas, including the Harbour Bridge, Opera House and the Blue Mountains, have been maximised. – Access design allows for all users to circulate throughout the development. – Split cores serve specific levels of the building creating a sense of community through vertical villages. – Privacy is established for apartments through careful building siting, façade design and floor plan orientation to surrounding landscape and view lines rather than directly into adjacent residences.	
07 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*	▪ The proposal is designed in keeping with the 4 CPTED principles: – Surveillance – Access control – Territorial reinforcement – Space management. ▪ Public spaces around the buildings have clear sight lines. ▪ The lobbies to R5 provides a direct and legible means of	✓

Design Quality Principle	Objective / Control	Evaluation	Verification
	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.	access from Watermans Quay and Hickson road and the public realm. ▪ The R5 proposal provides retail activation along the southern edge of Hickson Park, Hickson Road and Watermans Quay. ▪ External spaces within the site are designed to be lit in a controlled fashion, providing sufficient illumination for security without impacting residents. ▪ Secure entries are provided at both ground floor lobbies and basement carpark to control access to the building interiors.	
08 HOUSING DIVERSITY & 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 R5 proposal contributes to the overall vision of the Barangaroo masterplan as a mixed use community. ▪ A range of 1, 2 and 3 bedroom apartments are provided in a range of sizes and types to cater for the likely future demographic makeup of the precinct. ▪ The apartment mix has been considered across the family of three buildings with affordable housing provided. ▪ The apartments accessed off Hickson Road are designated for Key Worker Housing which contributes to the housing diversity within the precinct. ▪ The apartments are designed with regard for furnishability, circulation and flow. Rooms are well oriented with views to the surrounding parkland and water.	✓
08 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 well-designed apartment development responds to the existing or future local context, particularly desirable elements and repetitions of the streetscape.*	▪ The massing of the R5 Building has been carefully composed as part of a composition of buildings fringing Hickson Park, featuring: – A series of dynamic, breatheable glass facades each focusing on specific views towards the prime vistas and landmarks of the harbour; – Facades that express the facet of a crystal and together play with the light reflections from the sky and glittering harbour water, reflecting their setting; ▪ The R5 podium form and façade detailing responds to the surrounding contextual cues and brings the tower to the ground at a human scale.	✓

Design Quality Principle	Objective / Control	Evaluation	Verification
		▪ The proposal utilises a set of quality material textures and fittings which create visual interest in an appropriate and harmonious way within the sites wider context.	

DESIGN OBJECTIVES & GUIDANCE COMPLIANCE

The following table lists the Objectives and associated Design Criteria of the Apartment Design Guide (ADG), and assesses the project's achieves the intent of those Objectives, as required by Clause 50(1B) of the EPA Regulation.

The assessment demonstrates that the proposed development is consistent with the relevant objectives and the majority of the numeric Design Criteria, and that all apartments within the proposed development will achieve a very high standard of residential amenity. Where an alternative solution is proposed to the Design Criteria to meet the Objectives, the proposal's consistency with the Objectives and associated Design Guidance are discussed in further detail below the table.

Design Criteria	Proposal	Achievement of Objective
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	✓	
Design Criteria 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 for a minimum of 2 hours between 9 am and 3 pm on 21 June (mid winter)	Achieves intent →	A total of 64% of the Building R5 site area has been provided as communal and publicly accessible open space, exceeding the Design Criteria minimum by 39%. Of this communal and public open space 48% of achieves direct sunlight during the winter solstice. This is close to the 50% nominated by the Design Criteria and represents 31% of the Building R5 site area. Achieving direct sunlight to 50% of the total communal and publicly accessible open space would require direct sunlight to 32% of the Building R5 site area, which is equivalent to more than double the 12.5% of the site area recommended by the ADG if the minimum area of communal and public open space was provided (i.e. 50% of 25% of the site area). More broadly, the communal and publicly accessible open spaces within Buildings R4A, R4B and R5 will be accessible to the occupants of all three towers. Additionally, the residents of Buildings R4A, R4B and R5 gain amenity from their position adjoining the future Hickson Park, a large open space to the north, which will receive plenty of solar access throughout the year. In light of the above, the proposed communal open space achieves the intent of Objective 3D-1 as adequate area of communal open space will be provided in a way that enhances the residential amenity of the development.

<table>
<tr><th>Design Criteria</th><th>Proposal</th><th>Achievement of Objective</th></tr>
<tr><td colspan="3">3E Deep Soil Zones</td></tr>
<tr><td><u>Objective</u>
Deep soil zones provide areas on the site that allow for and support healthy plant and tree growth. They improve residential amenity and promote management of water and air quality.</td><td>Achieves intent
→</td><td>Refer to discussion below, the site includes a site-wide basement, which precludes the provision of deep soil areas, although provides sufficient soil depth for plating of mature trees.</td></tr>
<tr><td>Design Criteria
Deep soil zones are to meet the following minimum requirements:

<table><tr><th>Site Area</th><th>Minimum Dimensions</th><th>Deep Soil Zone (% of site area)</th></tr><tr><td>Greater than 1,500m^2</td><td>6m</td><td>7%</td></tr></table></td><td>Achieves intent
→</td><td>Deep Soil Zones are defined as ‘areas of soil within a development that are unimpeded by buildings or structures above and below ground and have a minimum dimension of 6m. Deep soil zones exclude basement car parks, services, swimming pools, tennis courts and impervious surfaces including car parks, driveways and roof areas.’

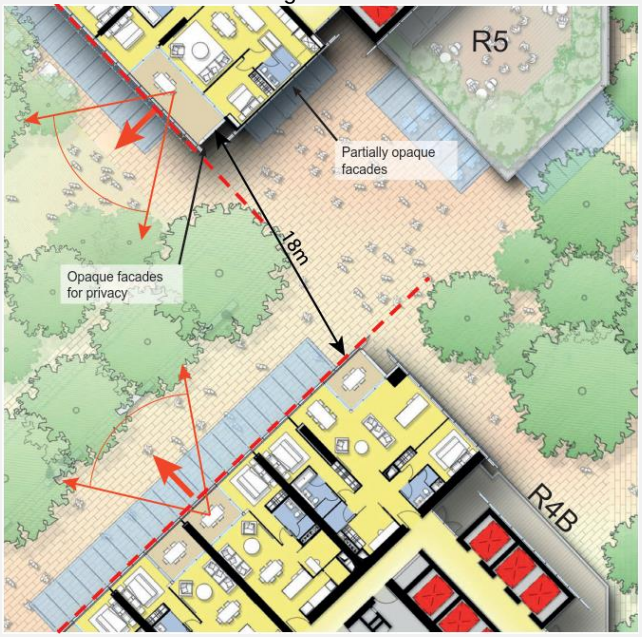
Residential Buildings R4A, R4B and R5 are positioned above a site-wide basement, which precludes the provision of deep soil zones. The Design Guidance acknowledges this may not be possible on sites where:
– the location and building typology have limited or no space for deep soil at ground level (e.g. central business district, constrained sites, high density areas, or in centres); and / or
– there is 100% site coverage or non-residential uses at ground floor level.

Consistent with the Design Guidance, the site is located in a high density precinct, within the Central Business District. There are also non-residential uses at ground floor which limit the provision of deep soil zones.

Notwithstanding this, the proposal meets Objective 3E-1 with the landscape design developed by Grants Associates featuring a combination of hardscape, bed planting and new planting in specially designed pits to ensure healthy growth and long term viability. A range of sustainable stormwater management solutions are also proposed in the precinct, as set out in the ESD Report, Services Report and the Construction Framework Environmental Management Plan. These include the use of filter media in tree pits to treat stormwater, gross pollutant traps to remove littler, vegetative matter and free oils, and the use of a proprietary stormwater filtration system which will achieve the required pollutant reduction targets.</td></tr>
<tr><td colspan="3">3F Visual Privacy</td></tr>
<tr><td><u>Objective</u>
Adequate building separation distances are shared equitably between neighbouring sites, to achieve reasonable levels of external and internal visual privacy.</td><td>✓</td><td></td></tr>
</table>

Design Criteria	Proposal	Achievement of Objective
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:	Achieves intent →	The minimum separation distance between the habitable rooms of adjacent buildings R4B and R5 is approximately 18m (see figure below), which is less than the 24m between habitable rooms recommended in the Design Criteria.

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



Separation between R4B and R5 demonstrating the orientation of apartments towards key views, mitigating cross-viewing.

However, consistent with the Design Guidance, the architectural composition and alignment of the buildings in relation to each other has been carefully considered to maximise views and outlook, whilst providing privacy between the buildings to achieve the intent of Objective 3F-1 as follows:

- sightlines into a living area or wintergarden / balcony from an adjacent living area or wintergarden / balcony are avoided by the arrangement of the floor layout of each building and apartment;
- sightlines from living areas / wintergardens / balconies into bedrooms, and vice versa, are obstructed by architectural elements including opaque facades and overlapping façade wings; and
- the relevant apartments are offset, or oriented towards available views to the north east

Design Criteria	Proposal	Achievement of Objective
		rather than towards the bedrooms of the apartments of the adjacent building (which are east and north-west from R4B and west from R5). At the nearest interface between the two buildings (at the balcony of Apartment 05 in Building R5 and Apartment 03 in Building R4B) an opaque facade has been provided to limit overlooking. Further, Apartment R5 L05 has been designed to look towards Hickson Park and the harbour, away from Building R4B. Furthermore, the potential for development on adjacent land has been thoroughly considered. The proposed building forms part of a unified architectural composition together with the proposed Crown Sydney Hotel and Resort. The siting of the buildings is intended to achieve a better amenity outcome and more efficient use of the land than a scheme that strictly meets the Design Criteria separations. The Concept Plan design responds to the height and separation from Barangaroo Central and the substantial amenity provided by the outlook and views across the park and to the more significant distant views. By grouping the towers at the southern end of the site the maximum number of apartments are given the opportunity to benefit from the amenity of having uninterrupted views, rather than spacing them to achieve a 'compliant' view 24m across to another tower. The proposed design therefore cleverly deals with the immediate privacy interface through apartment layouts, the inclusion of appropriate architectural responses, and the orientation of the buildings to minimise sightlines between buildings and maximise exposure to the north facing views. With this in mind any additional separation distance would not materially benefit the occupants of the proposed buildings. Considering the architectural responses, view line orientation and the site's context in the dense urban environment that is the Sydney CBD, the proposed building separation distances will achieve a reasonable of external and internal visual privacy, consistent with Objective 3F-1.
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	Proposal	Achievement of Objective
Design Criteria 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.	N/A	Parking is provided as per the limits specified in the approved Concept Plan (MP06_0162).
Part 4 Designing the Buildings		
4A Solar and Daylight access		
Objective To optimise the number of apartments receiving sunlight to habitable rooms, primary windows and private open space	✓	
Design Criteria 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.	Achieves intent →	Consistent with the Design Guidance the proposed apartment layout and design optimises the number of apartments that receives sunlight. A total of 69% of apartment living areas and private open spaces in Building R5 will achieve 2 hours of direct sunlight between 9am and 3pm in mid-winter, just short of the 70% target of the Design Criteria. Solar access to Building R5 is constrained by the existing CBD development to the east and development proposed to the west. However, as One Sydney Harbour is positioned near the harbour edge, further development to the west is highly unlikely to occur in the future, and therefore the precinct will receive direct sunlight even at low solar altitudes. For this reason, daylight access has also been studied for the 9am-5pm period. During this extended 9am to 5pm period, 69.5% of apartments will achieve 2 hours of direct sunlight to apartment living areas and private open space. The proposed variation to the Design Criteria is very minor (equating to 2 apartments of the 151 apartments) in the context of the scale of the development and the other amenity benefits afforded on the site through access to open space, views and recreational opportunities at the Barangaroo site and broader CBD. Additionally, the proposed façade typology will allow a high light transmission glass to be used with automated cavity blinds providing solar control when needed.

<table>
<tr><th>Design Criteria</th><th>Proposal</th><th>Achievement of Objective</th></tr>
<tr><td></td><td></td><td>In light of the above, despite the very minor variation to the solar access Design Criteria, the development achieves Objective 4A-1 by optimising the number of apartments receiving good daylight access to functional areas of the dwelling.</td></tr>
<tr><td>A maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid winter.</td><td>✓</td><td></td></tr>
<tr><td colspan="3">4B Natural Ventilation</td></tr>
<tr><td><u>Objective</u>
The number of apartments with natural cross ventilation is maximised to create a comfortable indoor environment for residents</td><td>✓</td><td></td></tr>
<tr><td>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.</td><td>✓</td><td></td></tr>
<tr><td>Overall depth of a cross-over or cross-through apartment does not exceed 18m, measured glass line to glass line.</td><td>✓</td><td></td></tr>
<tr><td colspan="3">4C Ceiling Height</td></tr>
<tr><td><u>Objective</u>
Ceiling height achieves sufficient natural ventilation and daylight access</td><td>✓</td><td></td></tr>
<tr><td>Design Criteria
Measured from finished floor level to finished ceiling level, minimum ceiling heights are:
<table>
<tr><td colspan="2">Minimum ceiling height</td></tr>
<tr><td>Habitable rooms</td><td>2.7m</td></tr>
<tr><td>Non-habitable</td><td>2.4m</td></tr>
<tr><td>For 2 storey apartments</td><td>2.7m for main living area floor
2.4m for second floor, where its area does not exceed 50% of the apartment area</td></tr>
<tr><td>Attic spaces</td><td>1.8m at edge of room with a 30 degree minimum ceiling slope</td></tr>
<tr><td>If located in mixed use areas</td><td>3.3m for ground and first floor to promote future flexibility of use</td></tr>
</table>
These minimums do not preclude higher ceilings if desired.</td><td>✓</td><td></td></tr>
</table>

Design Criteria	Proposal	Achievement of Objective
4D Apartment Size and Layout		
Objective The layout of rooms within an apartment is functional, well organised and provides a high standard of amenity	✓	
Design Criteria Apartments are required to have the following minimum internal areas: Apartment Type / Minimum internal area Studio / $35m^2$ 1 bedroom / $50m^2$ 2 bedroom / $70m^2$ 3 bedroom / $90m^2$ The minimum internal areas include only one bathroom. Additional bathrooms increase the minimum internal area by $5m^2$ each. A fourth bedroom and further additional bedrooms increase 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.	Achieves intent →	All apartments in Building R5 exceed the minimum internal areas nominated by the Design Criteria, and have been designed to achieve a high level of amenity with a predominantly glazed façade and abundance of natural light. In some apartments studies do not have direct access to windows. In instances where this occurs, the proposed design is consistent with the Design Guidance under Objective 4D-1 and the Design Criteria under Objective 4D-2 by providing a direct line of sight to a window / natural light that is generally 8m from the glass line to allow for the sharing of natural light and ventilation. On this basis, the Objectives to provide rooms with a high standard of amenity will be achieved.
Objective Environmental performance of the apartment is maximised	✓	
Design Criteria Habitable room depths are limited to a maximum of 2.5 x the ceiling height.	✓	

Design Criteria	Proposal	Achievement of Objective
In open plan layouts (where the living, dining and kitchen are combined) the maximum habitable room depth is 8m from a window.	Achieves intent →	For open plan living, dining and kitchen areas, the ADG recommends a maximum habitable room depth of 8m. Whilst some apartments in Building R5 have a habitable room depth of up to 9.35m, a proposed variation to the Design Criteria, the apartment design will achieve Objective 4D-2, and will maximise the environmental performance of the apartments as follows: – the majority of the kitchen area, including the main work surfaces, is within approximately 8m of the window; – the windows are full height windows which will allow large amounts of light to reach the back of the habitable space; and – the spaces are open plan, and there are no walls or obstructions between the windows and the kitchen area and therefore the layout does not impede internal access to light and ventilation.
Objective Apartment layouts are designed to accommodate a variety of household activities and needs	✓	
Design Criteria Master bedrooms have a minimum area of $10m^2$ and other bedrooms $9m^2$ (excluding wardrobe space).	✓	
Bedrooms have a minimum dimension of 3m (excluding wardrobe space).	✓	
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	✓	
▪ The width of cross-over or cross-through apartments are at least 4m internally to avoid deep narrow apartment layouts.	✓	
4E Private Open Space and Balconies		
Objective Apartments provide appropriately sized private open space and balconies to enhance residential amenity	✓	

<table>
<tr><th>Design Criteria</th><th>Proposal</th><th>Achievement of Objective</th></tr>
<tr><td>Design Criteria
All apartments are required to have primary balconies as follows:
<table><tr><th>Dwelling Type</th><th>Minimum Area</th><th>Minimum internal area</th></tr><tr><td>Studio apartment</td><td>4m^2</td><td>-</td></tr><tr><td>1 bedroom apartment</td><td>8m^2</td><td>2m</td></tr><tr><td>2 bedroom apartment</td><td>10m^2</td><td>2m</td></tr><tr><td>3+ bedroom apartment</td><td>12m^2</td><td>2.4m</td></tr></table>The minimum balcony depth to be counted as contributing to the balcony area is 1m.</td><td>Achieves intent
→</td><td>All balconies for the 1 and 3 bedroom apartments are consistent with the minimum area required in the ADG, however a small number of 2 bedroom apartments (25) are approximately 1m^2 smaller than the 10m^2 recommended by the ADG. These balconies are however 2.7m deep, well in excess of the minimum 2m required thus achieving functional proportions.

The three bedroom apartment typology in Building R5 (representing 17% of apartments in total) has a balcony which is 2.1m deep or 0.3m shallower than the ADG's recommended balcony depth for 3 bedroom apartments. However, the area of the balcony is 35% larger than required by the ADG, and so will continue to be highly functional and usable space.

All balconies are of a size and shape which is practical, usable and able to be furnished. Finally, residents of one Sydney Harbour will have access to Hickson Park, which will provide extensive open space for passive and active recreation.

In light of the above the proposed balconies achieve the intent of Objective 4E-1 as they will provide appropriately sized private open space that enhances residential amenity.</td></tr>
<tr><td>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 15m^2 and a minimum depth of 3m.</td><td>N/A</td><td></td></tr>
<tr><td colspan="3">4F Common Circulation and Spaces</td></tr>
<tr><td>Objective
Common circulation spaces achieve good amenity and properly service the number of apartments</td><td>✓</td><td></td></tr>
<tr><td>Design Criteria
The maximum number of apartments off a circulation core on a single level is eight.</td><td>✓</td><td></td></tr>
<tr><td>For buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40.</td><td>Achieves intent
→</td><td>The ADG recommends that for buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is limited to 40.

In Building R5, the ratio of lifts to apartments is 1:56 for the on-market apartments, and 1:20 for the Key Worker Housing.

Whilst the proposal seeks to vary the recommended ratio for the on-market apartments, as the lift service has been designed to be commensurate with global standards for luxury residential apartments, using high speed lifts and low interval waiting times (see table below). As detailed in the Services Report, the following indicative performance guidelines have been adopted as part of the performance criteria for the lifts in each tower.</td></tr>
</table>

<table>
<tr><th>Design Criteria</th><th>Proposal</th><th>Achievement of Objective</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th colspan="2">Indicative Performance Guidelines</th></tr>
<tr><td>Occupancy</td><td>1.5 persons/ bedroom</td></tr>
<tr><td>Lift Dispatcher</td><td>Conventional Collective</td></tr>
<tr><td>Lift Traffic Type</td><td>Two way – no interfloor.</td></tr>
<tr><td>Interval</td><td><60s seconds at lobby</td></tr>
<tr><td>Handling Capacity</td><td>10% of population in 5 minutes</td></tr>
</table>

With the above in mind, the proposal will achieve the intent of the Objective 4F-1.
</td></tr>
<tr><td colspan="3">4G Storage</td></tr>
<tr><td>Objective
Adequate, well designed storage is provided in each apartment</td><td>✓</td><td></td></tr>
<tr><td>Design Criteria
In addition to storage in kitchens, bathrooms and bedrooms, the following storage is provided:
<table>
<tr><th>Dwelling Type</th><th>Minimum Area</th></tr>
<tr><td>Studio apartment</td><td>4m^2</td></tr>
<tr><td>1 bedroom apartment</td><td>6m^2</td></tr>
<tr><td>2 bedroom apartment</td><td>8m^2</td></tr>
<tr><td>3+ bedroom apartment</td><td>10m^2</td></tr>
</table>

At least 50% of the required storage is to be located within the apartment.</td><td>✓</td><td></td></tr>
</table>

ADAPTABLE AND SILVER LEVEL HOUSING OBJECTIVES

Design Criteria	Achievement of Objective
Part 4 Designing the Building	
4Q Universal Design	
Objective 4Q-1 Universal design features are included in apartment design to promote flexible housing for all community members	All apartments include universal design characteristics to allow for flexible use.
Objective 4Q-2 A variety of apartments with adaptable designs are provided	All apartments are of a size and proportion that allow for flexible use and accommodate range of lifestyle needs.
Objective 4Q-3 Apartment layouts are flexible and accommodate a range of lifestyle needs	As above.