Barangaroo R9 Project Application

Architectural Design Report Prepared by PTW Architects November 2012



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1 Design Verification Statement

Pursuant to Clause 50 (1A) of the Environmental Planning and Assessment Regulation 2000, effective from July 26 2003;

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 above and I affirm that the design achieves the design quality principles as set out in Part 2 of the State Environmental Planning Policy No 65 -Design Quality of Residential Flat. I have provided further detail on the designs' compliance with the quality principles in this Design Verification Statement, which is attached.

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Andrew Andersons Principal Director PTW Architects

2 Introduction

This report supports a Project Application (MP11_0002) submitted to the Minister for Planning pursuant to Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). The Application seeks approval for construction of two residential flat buildings (known as Buildings R8 and R9) and associated works at Barangaroo South as described in the Overview of Proposed Development section of this report. This Architectural Design Report specifically relates to Building R9.

The R8 and R9 Project Application seeks approval for the construction and use of two residential flat buildings comprising 159 apartments, ground floor retail, allocation of car parking spaces from the Bulk Excavation and Basement Car Parking Project Application, and the construction of the surrounding ancillary temporary public domain and landscaping.

Barangaroo is located on the north western edge of the Sydney Central Business District, bounded by Sydney Harbour to the west and north, the historic precinct of Millers Point (for the northern half), The Rocks and the Sydney Harbour Bridge approach to the east; and bounded to the south by a range of new development dominated by large CBD commercial tenants.

The Barangaroo site has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Central and Barangaroo South. The R8 and R9 Project Application Site area is located within Barangaroo South as shown in the site location plan. The Project Application Site extends over land generally known and identified in the approved Concept Plan as Block X.



R8 and R9 Residential Building Project Application (MP11_0002) aerial site location plan

3 Design Excellence

Architectural innovation and a sound reputation for high standards of design and planning are the principles PTW Architects has consistently delivered since inception as Peddle Thorp & Walker, in Sydney, 1889. PTW Architects has offices in Sydney, Beijing, Hanoi, Ho Chi Minh City and Shanghai, with a well-respected reputation for excellence in architecture and Concept Planning over a diversity of building types, we create buildings where commercial objectives are balanced with cultural and public uses, leading to the enhancement of the public realm and a city's facilities.

PTW Architects' values are based on design excellence, collaboration, professional integrity, creativity, pride and commitment. These qualities are integral in the way we apply ourselves to each architectural task to ensure a distinctive and specific outcome. Operating within a unique studio structure, our people are allocated to a project throughout its lifetime. This approach leads to the creation of collaborative and creative teams who possess all the skills required for a project and gives us the ability to tackle architectural challenges of considerable scale and complexity, successfully and within expeditious timeframes.

Projects by PTW Architects include: Watercube for the Beijing 2008 Games (Beijing's National Swimming Centre), the Walsh Bay Redevelopment – Sydney including residential apartments and Sydney Theatre - Sydney, Prince Henry Concept Plan - Sydney, Darling Island Apartments - Pyrmont, National Gallery of Australia – South Entrance and Indigenous Australian Galleries – Canberra ACT, The Forum Development – St Leonards, Lumiere (with Foster and Partners) Sydney, Quay Grand and Bennelong Centre at East Circular Quay, 30 The Bond - Sydney, Angel Place Development - Sydney, Civic Tower - Sydney, St Margaret's Redevelopment – Surry Hills, 8 Central Avenue ATP - Sydney, UTS Multi-purpose Sports Hall - Sydney, Kingston Foreshore Development - Canberra ACT, and Sutherland Hospital Redevelopment – Caringbah.

PTW Architects' architectural achievement has been recognized repeatedly throughout its history. In 1930, the firm won the inaugural Sulman Award (the highest honor awarded by the Royal Australian Institute of Architects) for Science House - Sydney. It won this award again in 1952 for the Royal Swedish Legation – Canberra. The Quay Grand and Bennelong Centre at East Circular Quay received a Commendation Civic Design Award from RAIA in 2001. The most recent awards include the 2012 AIA Public Architecture Award for the Sydney Grammar School Assembly Hall and the 2012 AIA John Verge Interior Architecture Award for the John Kaldor Family Gallery at the Art Gallery of New South Wales.



Art Gallery of New South Wales - Kaldor Gallery



Sydney Grammar School Assembly Hall



Walsh Bay Redevelopment



Darling Island Apartments - Pyrmont



Quay Grand and Bennelong Centre at East Circular Quay

4 Site Analysis

The R9 site is positioned in Block X of the Barangaroo Concept Plan and forms part of the residential strip along the western edge of the Barangaroo South. The site is orientated north south and marks the south-west corner of the Barangaroo development. It is positioned over the common basement to Barangaroo and will make use of the parking facilities and services allocated in the underground basement.

Towards the west the R9 site faces the Sydney Harbour waters and borders a public promenade which connects to King Street Wharf and Darling Harbour. The foreshore promenade will have a public character with covered seating, trees and landscaping. Opposite to the R9 site across from the promenade the concept plan proposes three ferry wharfs.

The site has a close proximity to all the amenities of the CBD, the Rocks and Darling Harbour. To the east the site is defined by Globe Street which is the main vehicular route through the Barangaroo South development. Globe Street forms the address point to R9. Union Walk and Margaret Street, running east west through the Concept Plan, define the northern and southern extent of the site. These pedestrian routes connect the development back to the Sydney CBD.

The three high-rise office buildings proposed on top of three storey commercial podiums just east from R9 will bring the urban density of the Sydney CBD close towards the water's edge. This creates a contrast in conditions between east with high density buildings and the west where the site is exposed to the Sydney Harbour. The towers will overlook the R9 site and appropriate measures will have to be taken to prevent cross viewing. With the office towers located to the east of R9, the solar access will be predominately from the west. The orientation of the proposal will therefore be towards the Sydney Harbour to benefit from the solar access and unobstructed water views. Factors such as wind, low afternoon sun, reflectivity from the water as a result of being on the water's edge in combination with the public character of the promenade will further influence the proposed development on the R9 site.



Site Analysis Scheme

5 Urban Design

5.1 Design Vision

R9 is positioned in a unique location at the edge of the CBD facing the Sydney harbour. The building serves as a high quality interface with the waterfront while meditating the scale of the high towers behind it creating the western façade to Barangaroo. It forms the edge of the public foreshore promenade, which links Pyrmont and Darling Harbour with Walsh Bay and Circular Quay. Globe Street provides a recognizable address to the building which accommodates spacious high quality apartments with good amenities. All units share the views to the harbour and have good solar access in the afternoon.

The R9 design has a palette of natural façade materials; integrally coloured precast concrete, pre-weathered metal and engineered stratified timber which emphasize the contrasting planes of the façades while creating harmony through colour and texture. The facades are modulated by a pattern of perforated metal screens for either shading or to mediate cross viewing and avoid any meretricious effects. The landscaping is part of the overall design concept of R9 and forms the counterpoint to the facade design. It generates an urban scale to the development in contrasts with the human scale of individual operable screens. It provides the residents with gardens and nature in one of the densest urban developments in Sydney. The top floor apartments have private gardens and the southern end of the building has a communal roof space. The roof, which integrates landscaping and photovoltaic panels, creates the fifth façade of the building which is highly visible from the office buildings behind R9.

The residential character of the building, with its operable shutters and green elements will have an important role in creating architectural richness and diversity in Barangaroo.



5.2 Design Process

R9 has gone through an intensive design process with input from multiple parties involved. The R9 design has been simultaneously developed with R8, designed by FJMT. This process has led to an effective design collaboration and design cross fertilisation in coordination with Lend Lease and their design advisors. Furthermore the R9 design has been under regular scrutiny of the Barangaroo Delivery Authority and their design advisors. The design has been presented to the Council of the City of Sydney and feedback has been incorporated into the design. Specialist consultants for services, structure, facades and environmental sustainable design have given input throughout the process to optimize the outcome of the proposed design.

Some of the key areas within the design process were the following;

The typical residential floor plate is designed around four cores, allowing all the apartments a western orientation while increasing cross ventilation. Through the design process the typical module has been refined to optimize the usable space for the apartments. This included the repositioning of the egress stair to the eastern façade which makes it spatially part of the lobby. The lobby is naturally lit and ventilated through the egress stair. The stair has become a feature which further modulates the Globe Street facade. The operable metal screens which are used on all façades have been carefully developed to provide shade and privacy while creating unity for the building as a whole. The landscape concept which forms an important part of the façade design has been refined throughout the design process.



Typical floorplan - level 1-6







Initial Module

Developed Module



Bifold facade - narrow operable louvers



Bifold facade - wide operable louvres, landscape as part of facade design



Bifold facade - perforated metal screens coloured frames



Globe St - curved staircase and balconies



Globe St - angled screens



Globe St - parallel screens - colour and movement

5.3 Buildings R8/R9 as part of the Concept Plan

The design of R8 and R9 has been informed by the Concept Plan Urban Design Controls which create a relation in scale and mass. The two buildings together create a stepping effect from the R8 northern module which addresses a public space to the lower scale of King Street Wharf.

The typical apartment module used in both building is reflected in both the east and west elevation design which creates harmony while being different. The two buildings define the western edge of Barangaroo South. The generous five meter ground floor retail to both buildings creates a continuous active edge along the promenade. The public awnings and landscaping of the public domain further interlink the two buildings.

While both R8 and R9 represent different designs, the six storey middle part and two top storeys align to create a coordinated elevation. From the harbour waters the buildings can be seen as the façade to Barangaroo which mediates to the three high-rise office towers behind it.



Height Transition Waterfront



6 Built Form

6.1 Design Principles

R9 relates in scale and massing to R8 to form the western edge of Barangaroo. Together with R8, R9 establishes a strong built form along the promenade facing the harbour. The built form mediates between the traditional scale of the Sydney waterfront and the high-rise office towers to the east. The building creates an alignment with the building along King Street Wharf to create a continuous active edge to the water. The ground plane of R9 engages with the active public character of the boulevard. The strong form of the building is given depth and modulation through its façade treatment which creates a contrast of solids and voids. Landscaping is an important part of the R9 design which breaks up the scale of the building.

6.2 Building Scale and Massing

R9 consists of 9 storeys which are broken up in three horizontal layers; the ground plane, six bands of typical apartments and a layer of two storey apartments which extend over 60% of the length of the building. These horizontal layers are contrasted in expression to create a clear reading of the building. Towards the southern end the building steps down from 9 to 7 storeys. This step creates a scale transition to the buildings along Kings Street Wharf and Lime Street. Towards the north the six storey middle zone and double storey top layer ties in with the adjacent R8 building to create continuity along the public promenade and unite the two buildings as the western façade to the Barangaroo development. From this direction R8 and R9 form a base to the much larger scale commercial buildings. Towards the east, the 9 storey R9 building and the three storey C4 and C5 podium buildings define the street profile of Globe Street.

6.3 Waterfront Interface

Building R9 is orientated towards the Sydney harbour. All the apartments have living rooms and balconies which are orientated towards the west to optimize the experience of living near the water's edge. The living rooms extend into three meter balconies which give full exposure to the views. To provide the residents with both privacy and shading, the balcony can be closed and opened by the external bi-fold screen which is manually operated. The screens allow for a good micro climate on the balcony by blocking the low afternoon sun, the reflection from the water and potential strong winds from the harbour. The screens can be pushed to the side of the balconies completely to optimize the visual relation with the harbour. The 27 meter wide promenade between R9 and the water's edge is seen as an active "peoples place" with outdoor seating, ferry wharfs, extensive tree cover and landscaping, celebrating Sydney's unique harbour side setting. The operable western façade further helps to mediate between this contrast of community and privacy.





West Elevation



East Elevation



Position within the Concept Plan indicative R9 building envelope





6.4 Solar Response

The defined building envelope for R9 orientates the building north south. Towards the east the approved commercial towers will overshadow R9 in the morning hours. Solar access to R9 is therefore predominately from the west. The living rooms and balconies of R9 are orientated west to benefit from the views to the water and maximize the exposure to the sunlight. The three metre deep balcony zone creates an extension of the living rooms of the apartments. SEPP65 requires 70% apartments to receive 3 hours of sun between 9 am till 3 pm in midwinter in the living room. As R9 is positioned in a high density urban development, this requirement can be reduced to 2 hours of solar access. Although the northern module and rooftop apartments meet the required 2 hours of solar access in the required timeframe, the orientation of the building in combination with the balcony zone restricts the building to achieve this requirement.

The following arguments should be considered in relation to solar access to the apartments:

1. Apartment orientation and solar access to balconies

All the apartments in the development share the western orientation. The continuous layer of balconies therefore restricts solar access to the recessed living rooms which will only have solar access after 2pm in midwinter. The balconies which effectively are an extension of the living rooms have solar access from 1pm in midwinter. 100% of the apartments receive 2 hours of solar access to the balconies between the hours of 9am-3pm on the 21st of June.

2. Solar access period

The rationale to assess the solar access from 9am to 3pm relates to the overshadowing impact of typical adjacent urban development around the site which would normally block out the sun at the end of the day at 3pm. Although R9 has high urban density towards the east, it has an unobstructed access to sunlight until sunset towards the west. All the apartments of R9 will have the afternoon sun stream into the living rooms up to sunset as there are no adjacent buildings blocking the sun. Therefore the solar access period can be considered to be from 9 am until 4.45pm. This gives 100% of the apartments 2 hours of solar access within the living room of the apartment.

3. Rooftop communal space

A significant part of the R9 roof is accessible to all the residents of the building to use as communal space. The body corporate rooftop provides the residents with barbeques, seating, generous landscaping and lawns which have excellent solar access throughout the year.

Sun Impact Typical Residential Floor



21 June 1:30 pm



21 June 2 pm



21 June 2:30 pm



21 June 3 pm



21 June 3:30 pm



21 June 4 pm



Unobstructed waterfront - Solar access until sunset



Sun path diagram





June 21 16:45

Solar Access Study

6.5 Setbacks

R9 is designed within the indicative R9 building envelope which is positioned within the site boundary of Block X of the Barangaroo Concept Plan.

The indicative building envelope proposes a three metre balcony zone towards the west. R9 has a continuous layer of balconies within this zone. While the two bedroom apartments strictly follow the 3 metre zone, the one bedroom apartments step out 900mm into this zone. This improves the solar access to the living rooms of these apartments. The balconies are screened by bi-folding perforated metal screens. When the screens are in open position they extent outside of the set envelope. These elements create further richness and depth to the façade.

The indicative building envelope proposes a one metre setback zone along the eastern façade. Part of the building protrudes in this zone, creating two contrasting planes of the façade. This depth to the facade creates the opportunity for diagonal views from the bedrooms to avoid the direct cross viewing from the office building across Globe Street. At the ground plane the retail glass line steps back one metre back while the base of the building sits within the setback zone. The recesses along the base provide for seating along the retail to further activate Globe Street.

The north and south façade extend to the indicative R9 envelope. The floor slabs are expressed beyond the envelope and carry perforated metal sliding screens. Glazed bay windows project beyond the envelope to allow for views to the water. These elements give the north and south façade further architectural interest and help to mark the northern and southern end of the building.



R9 Envelope and Setback Lines



Setbacks Globe Street Ground Floor



Setbacks Globe Street Typical Residential Floor



6.6 Ground Floor and Public Domain

The building has a lofty ground floor retail space which orientates itself towards the public foreshore promenade. The operable retail façade can be opened up completely to allow for a seamless connection of the public realm into the restaurants and outlets which will occupy this space. The promenade will have elements of public seating and public awnings which will allow the retail activity to extend into the public realm. Landscaping and trees define the active edge of the building and layer the 27 meter wide promenade.

R9 defines the western edge of Globe Street which is seen as an active shopping street. Globe Street provides the address to the apartments and a vehicular drop-off for the ground level restaurants, bars and cafes. The residential lobbies are expressed in contrasting rich materials to give each lobby a distinctive character. A part of the retail space at Globe Street runs through to the promenade to enhance the permeability of the ground plane and, where possible, creates transparency to the water's edge. The one metre recessed retail façade is operable and allows for seating along the footpath's edge to further activate Globe Street.



Outdoor Seating Area





6.7 Residential Floors

The building is designed around four lift cores with lobbies naturally lit and ventilated through the open egress staircases. This allows the residents to make use of the stair from the ground floor lobby rather than using the lift.

The clients' brief requires a mix of one and two bedroom apartments. The apartments are all orientated towards the western harbour views, with wide living rooms opening onto generous balconies. Where the opportunity exists we have customized the design to take advantage of the corner conditions at the north west and south west corner of the building, creating panoramic view from the living rooms towards the harbour.

The rooftop apartments have access to private roof terraces with gardens, screened from the office towers with photovoltaic cells and landscaping. The one bedroom apartments have a wider frontage which integrates planting beds and vertical landscaping. The staggered planters on the facade create a variety of experiences within the typical one bedroom apartments. There are 77 apartments (in a mix of 24 one bedroom and 53 two bedroom) with six different types.

At the southern end of the building there is a communal rooftop which has good solar access, lawns and landscaping. This will be accessible for all residents in R9. The space provides barbeques, amenities and seating areas allowing for a diversity of uses in this body corporate space.



Typical Module - Level 1-6

6.8 Facades

R9 has a palette of natural facade materials: integrally coloured precast concrete, perforated metal and engineered stratified timber which emphasize the different planes of the façade and create harmony through colour and texture. The east façade towards Globe Street is strongly modulated through the expressed egress staircases which mark the four modules of the building. At the base of the building the stairs are emphasised through planting beds hanging down over the ground floor podium. This landscaping further enriches the public domain and creates a verdant pedestrian experience along Globe Street. Above the base, the two layers of the façade are contrasted through the use of engineered stratified timber panels and the integrally coloured precast panels. Further layering of the façade through the use of the perforated metal sliding screens provides privacy screening to the R9 bedroom from the office buildings. The metal screens create a pattern which enriches the façade. Similar perforated metal panels are used as a bifolding system on the western façade creating a sense of unity for the building as a whole.

To the west the balconies are screened by perforated metal screens in metal frames. The perforated screens are folded to give the screens stiffness and depth. The screens are designed to bi-fold to the side of the balcony to allow for the full exposure to the harbour. The random positioning of the screens creates a pattern which enriches the western façade influenced by the individual preference of the residents. The screens create a sense of movement and layering to the façade which is both dynamic as kinetic. When in open position, the exposed edges display the strong primary yellow and orange colours which relate to the primary colours used on the façade design of the office building behind. The screens provide shade and comfort to ensure a good microclimate in the balcony zone.

The multi storey landscape elements contrast with the individual scale of the screens to create a counterpoint in the façade design. Stacks of planters on the one bedroom balconies articulate the west façade. The two story green walls at the top of the building mark the top floor apartments. The landscaping is an integrated part of the building design which extends to the communal rooftop area and private terraces.

The north and south façade celebrate the corner apartments of the building allowing the glass of the living rooms to wrap around the corner and opening up towards the views. The floor slabs of the balconies extend towards the north and south to create depth to the façade and help to keep the high summer sun off the northern glass. The metal perforated screens used on the western façade wrap around as sliding screens on the north and south façade to provide shade and privacy to the balconies and living rooms. The north and south façade reflect the contrast between the transparent living room zone and the precast bedroom. The concrete panels have punched openings with glazed bay windows to allow for views of the water and two zones articulated by bathroom windows, further enriching the façade.



West Facade - Bi-fold screens closed



West Facade - Bi-fold screens half open



West Facade - Bi-fold screens open



East Facade - Globe Street



West Facade - Promenade





6.9 Rooftop

The R9 roof is highly exposed to the tall office buildings proposed as part of Barangaroo South. The roof is composed as partly private residential terraces and partly body corporate rooftop space. The five top floor apartments have private roof decks which are orientated towards the Sydney harbour. The terraces are embraced by landscaping and a have a roof of photovoltaic panels which prevent cross viewing from the commercial towers C3, C4 and C5. The communal rooftop consists of a composition of lawn, landscaping and paved areas. A lightweight roof with photovoltaic panels provides shade and privacy to dedicated communal barbeque areas. The landscaping emphasizes both horizontal as vertical planes of the R9 rooftop and provides the building with an attractive fifth façade.

6.10 Basement

R9 shares the common basement which serves all the buildings of the Barangaroo South development. Two egress staircases from the basement extend up to the ground floor to provide egress to Globe Street. The four residential lift cores provide the residents with access to the car park spaces allocated in the common basement. A part of the required residential storage space is located in the basement in numbered storage cages and residents have access to the garbage rooms adjacent to each residential core. The ground floor retail is services through by two goods lifts from the basement. A designated service path on the perimeter of the basement connects the goods lifts and waste handling to the central loading dock.



Level 7 Communal Roof Top



Level 8 Private Roof Terraces



View from office buildings

6.11 Environment and Sustainability

R9 is consistent with the wider Barangaroo precinct sustainability aspirations to reduce the use of water and energy throughout the project. The Building Sustainability Index (BASIX) sets energy reduction, thermal comfort and water reduction targets which are passed and are further discussed in the Basix Report prepared by Lend Lease.

The building is designed around four lift cores with lobbies naturally lit and ventilated through the open egress staircases. The Residential Flat Design Code allows 8 apartments to be off one lift lobby, R9 has only three apartments of which two are cross ventilated apartments. The "single orientation" one bedroom apartments have a wide frontage of 7.5 metres, with floor to ceiling glass, effecting ease of air change. Overall 68% of the apartments are cross ventilated. With its reinforced concrete structure, the thermal storage capacity of the building provides a buffer against diurnal temperature change. Together with excellent solar access and operable screening, on all facades, the building will enjoy excellent comfort conditions with the need for air-conditioning only in extreme heat-wave conditions.

The selection of natural materials aims to reduce the embodied carbon and energy. The building incorporates landscape elements which further enhance the quality of living. It makes gardens and planting part of living in one of the densest urban environments of Sydney. The shading structures used for both the private roof terraces as well as the communal roof incorporate photovoltaic panels which is an essential component of the current Green Star strategy as well as one of the wider precinct sustainability aspirations. All heating and cooling in the dwellings will be serviced by individual fan coil units. These fan coil units will receive chilled water from the precinct harbour-water cooled chilled water plant, and receive heating hot water from the gas fired boiler in the building. R9 is connected to the Barangaroo precinct recycled water treatment plant. The fire sprinkler system test water will be reticulated back to the precinct Fire Tanks for re-use. R9 will be an exemplar of sustainable design to Sydney.



Roof Plan - Solar Panels





Sections - Cross-Ventilation and Solar Impact



Roof Overview - Photovoltaic Cells

7 C	OMPLIANCE WITH APPROVED CONCEPT PLAN MP06_0	162 MODI	FICATION NO.4
		Respond	Comment
7.1	Building Mass and Location	0	
	Objectives:		
	To ensure building mass is appropriate within the envelope.	<i>✓</i>	
	The predominant height of the building mass fronting the foreshore promenade shall be 6 or 7 storeys above ground level, with over 70% of the building frontages having a consistent height. Any "pop ups" shall not result in more than 9 storeys above ground level and the overall massing shall be such to create an homogenous yet interesting streetwall	J	
	Standard:		
	Above Ground floor level the westerly oriented facades to have a minimum 3m setback. Open and enclosed balconies are allowed to protrude into the setback zones. On the easterly oriented facades a minimum of 1m setback is required.	J	See Section 5.5
	Although the maximum height is RL41.5, the roof line will be undulating between maximum RL41.5 and RL20.	1	
7.2	Street Wall Establishment	_	
	Objectives:		
	Street Wall defines promenade and Globe Street.	1	
	To ensure an active Street Wall is established around each Block.	<i>✓</i>	
	The building mass at the podium is to form a continuous Street Wall around the site for a minimum of 85% of the site perimeter.		
73	Building Articulation		
7.0	Objectives:		
	To establish an articulated, well proportioned building mass.	<i>√</i>	
	Standard:		
	To reduce the impact of the building's mass, the envelope and floor plates are to be horizontally and/or vertically articulated, in particular at upper levels across Block X & 4A. Building Form is to express sustainability features such as for example access to natural light, ventilation and solar shading.	J	
7 4	Desirations for a site life a		
1.4			
	Constituent elements of the building need to be legible	./	
	The building elements and structure should be legible at the	· ·	
	base.	· · ·	
	Statiualu. The senarate primary components of the building will be		
	expressed and include additional elements such as the open and enclosed balconies.		
	Reinforce articulation of building form with modulation of open and enclosed balconies, building elements, etc. to avoid monotony.	1	
7.5	Ground Floor Permeability and Accessibility of Public Realm		
	Objectives:		

	To ensure building mass is appropriate within the envelope.	1	
	Standard:		
	Above Ground floor level the westerly oriented facades to have a minimum 3m setback. Open and enclosed balconies are allowed to protrude into the setback zones. On the easterly oriented facades a minimum of 1m setback is required.	<i>✓</i>	
	Although the maximum height is RL41.5, the roof line will be undulating between maximum RL41.5 and RL20.	<i>J</i>	
7.6	Ensuring Quality of Rooftops		See Section 5.9
	Objectives:		
	The mass at the rooftop shall be articulated and legible.	1	
	The architectural treatment of the roof and its form is to be designed, coordinated and remain sympathetic to adjacent context.	1	
	Roof Design to integrate sustainable features.	1	
	Standard:		
	Architectural treatment of roof form.		
	Architectural treatment of exposed elements such as lift shafts, overruns control rooms and any sustainability features.		
	Exposed mechanical equipment is to be avoided.	1	
	Use of good quality materials (i.e. durable, hardwearing, sustainable).	1	
	Roof to incorporate no more than 60% accessible terraces.	✓ ✓	
77	Facades		
1.1	Objectives:		
	To ensure the architectural quality of the facades		
	To articulate the building's functions and massing with		
	appropriate facade design and detailing.		
	and mass.		
	To contribute to "carbon neutral" for Barangaroo South.		
	Standard:		
	and flexibility. Materials such as steel, glass, concrete, timber and aluminium.	v	
	Environmentally sustainable design is to be incorporated on all facades.	1	
	Depth and layering of facades is to be achieved through relief and protrusions. Mirrored facades should be avoided.	<i>✓</i>	
7 8	Active Street-fronts		
7.0	Objectives:		
	Ensure an activated domain at street level with access to shops, lobbies, etc.	✓	
	Ground Floor retail uses will activate the waterfront.		
	At least 70% of the ground floor frontages to the pedestrian waterfront promenade shall comprise retail or entertainment uses, open to the public to activate the adjoining foreshore pedestrian promenade.	<i>✓</i>	
	At least 85% of the Ground Loval is to be active on the primary		
	Street Wall facades (North & West)	V	
	Building entrances to internal areas such as residential lobbies, exit ways and service areas or loading docks shall be considered as part of the 85% active requirement.		

8 Residential Amenities

8.1 SEPP 65 Principles

Principle 1: Context

The R9 site is positioned in Block X of the Barangaroo Concept Plan and forms part of the residential strip along the western edge of the Barangaroo South. The site is orientated north south and marks the south-west corner of the Barangaroo development. It is positioned over the common basement to Barangaroo and will make use of the parking facilities and services allocated in the underground basement.

Towards the west the R9 site faces the Sydney Harbour waters and borders a public promenade which connects to King Street Wharf and Darling Harbour. The foreshore promenade will have a public character with covered seating, trees and landscaping. Opposite to the R9 site across from the promenade the concept plan proposes three ferry wharfs.

The site has a close proximity to all the amenities of the CBD, the Rocks and Darling Harbour. To the east the site is defined by Globe Street which is the main vehicular route through the Barangaroo South development. Globe Street forms the address point to R9. Union Walk and Margaret Street, running east west through the Concept Plan, define the northern and southern extent of the site. These pedestrian routes connect the development back to the Sydney CBD.

The three high-rise office buildings proposed on top of three storey commercial podiums just east from R9 will bring the urban density of the Sydney CBD close towards the water's edge. This creates a contrast in conditions between east with high density buildings and the west where the site is exposed to the Sydney Harbour. The towers will overlook the R9 site and appropriate measures will have to be taken to prevent cross viewing. With the office towers located to the east of R9, the solar access will be predominately from the west. The orientation of the proposal will therefore be towards the Sydney Harbour to benefit from the solar access and unobstructed water views. Factors such as wind, low afternoon sun, reflectivity from the water as a result of being on the water's edge in combination with the public character of the promenade will further influence the proposed development on the R9 site.

Principle 2: Scale

R9 consists of 9 storeys which are broken up in three horizontal layers; the ground plane, six bands of typical apartments and a layer of two storey apartments which extend over 60% of the length of the building. These horizontal layers are contrasted in expression to create a clear reading of the building. Towards the southern end the building steps down from 9 to 7 storeys. This step creates a scale transition to the buildings along Kings Street Wharf and Lime Street. Towards the north the six storey middle zone and double storey top layer ties in with the adjacent R8 building to create continuity along the public promenade and unite the two buildings as the western façade to the Barangaroo development. From this direction R8 and R9 form a base to the much larger scale commercial buildings. Towards the east, the 9 storey R9 building and the three storey C4 and C5 podium buildings define the street profile of Globe Street.



Globe Street



Public Promenade

Principle 3: Built Form

R9 relates in scale and massing to R8 to form the western edge of Barangaroo. Together with R8, R9 establishes a strong built form along the promenade facing the harbour. The built form mediates between the traditional scale of the Sydney waterfront and the high-rise office towers to the east. The building creates an alignment with the building along King Street Wharf to create a continuous active edge to the water. The ground plane of R9 engages with the active public character of the boulevard. The strong form of the building is given depth and modulation through its façade treatment which creates a contrast of solids and voids. Landscaping is an important part of the R9 design which breaks up the scale of the building.

Principle 4: Density

RR9 is positioned at the western edge of the Barangaroo South which will represent one of the densest developments of Sydney. East of R9 large commercial podia with high-rise office buildings are placed closely together to form an ensemble of buildings. While R9 forms part of the dense building ensemble to the east it has contrasting openness of the harbour towards the west. This contrast in building density naturally orientates the residential building towards the west to optimise the views and available solar access.

Principle 5: Resource, Energy and Water Efficiency

<u>R9</u> is consistent with the wider Barangaroo precinct sustainability aspirations to reduce the use of water and energy throughout the project. The Building Sustainability Index (BASIX) sets energy reduction, thermal comfort and water reduction targets which are passed and are further discussed in the Basix Report prepared by Lend Lease.

The building is designed around four lift cores with lobbies naturally lit and ventilated through the open egress staircases. The Residential Flat Design Code allows 8 apartments to be off one lift lobby, R9 has only three apartments of which two are cross ventilated apartments. The "single orientation" one bedroom apartments have a wide frontage of 7.5 metres, with floor to ceiling glass, effecting ease of air change. Overall 68% of the apartments are cross ventilated. With its reinforced concrete structure, the thermal storage capacity of the building provides a buffer against diurnal temperature change. Together with excellent solar access and operable screening, on all facades, the building will enjoy excellent comfort conditions with the need for air-conditioning only in extreme heat-wave conditions.

The selection of natural materials aims to reduce the embodied carbon and energy. The building incorporates landscape elements which further enhance the quality of living. It makes gardens and planting part of living in one of the densest urban environments of Sydney. The shading structures used for both the private roof terraces as well as the communal roof incorporate photovoltaic panels which is an essential component of the current Green Star strategy as well as one of the wider precinct sustainability aspirations. All heating and cooling in the dwellings will be serviced by individual fan coil units. These fan coil units will receive chilled water from the precinct harbour-water cooled chilled water plant, and receive heating hot water from the gas fired boiler in the building. R9 is connected to the Barangaroo precinct recycled water treatment plant. The fire sprinkler system test water will be reticulated back to the precinct Fire Tanks for re-use. R9 will be an exemplar of sustainable design to Sydney.





Rooftop view offices

Principle 6: Landscape

Landscaping forms an integral part of the R9 building design and creates the counterpoint to the individual scale of the operable louvers. The planters on the balconies of the one bedroom apartments create multi storey stacks of green which articulate the western facade. Lush green vertical walls emphasize the two storey reading of the rooftop apartments. The green elements provide the building with a larger urban scale which is legible from a distance. The landscaping blends into the roof plane where it embraces both the private terraces and the communal rooftop. The landscaping provides soft screening and privacy to the terraces to prevents cross viewing from the adjacent commercial buildings. The rooftop is highly visible from the adjacent office towers overlooking R9. Both the private terraces as the communal roof have large areas of lawn and planters which emphasize both the vertical and horizontal planes of the building. The rooftop design is a coordinated composition of building mass, roof planes and landscaping to create a high quality fifth façade. The landscape concept is further developed by landscape architects Aspect and Oculus.

Principle 7: Amenity

R9 is located in an active people's place along Globe Street and a public promenade. This provides the residents with a wide range of options to enjoy both public space as restaurants, cafés and shopping. At the same time R9 provides comfortable apartment which provide privacy and amenity. The building is designed around four separate lift cores which provide good access to only three apartments off each lift core. The typical lift lobby is naturally lit and ventilated through the egress staircase which forms part of the spatial experience of the lobby. The four separate ground floor lobbies, designed with high quality finishes are accessed from Globe Street. Each apartment has generous proportions to allow for comfortable layouts of furniture. All apartments have a large balconies facing west towards the harbour and are seamlessly connected to living rooms. The west facing balconies enjoy good solar access in the afternoon and have bi-folding perforated metal screens to provide shading. The operable screens allow the residents to optimize the use of the balcony during all times of the year and hours of the day by adjusting them to circumstances. All residents have access to a body corporate rooftop located at the southern end of the building. The rooftop has barbeque areas and generous accessible grass lawns with full exposure to the water's edge and excellent solar access. The rooftop landscape design forms further pockets of space for the resident to enjoy.

Principle 8: Safety and Security

R9 provides the residents with a high level of security. The four residential lobbies along Globe Street provide secure access to the residents. The mailroom is accessed separately from the lobby to improve the security of the building. All the apartments are equipped with intercom and a security system to allow the residents to control the access for visitors. The small cluster of three apartments of each lift core improves the social awareness amongst the neighbours which improves the safety within the building. The communal rooftop has secure access to the R9 residents and their visitors. This provides the area with passive surveillance which improves the safety in the immediate context of the building.



Landscaping facade



Gound floor lobby



Principle 9: Social Dimensions

The ground floor residential lobbies are positioned along Globe Street which is seen as an active filled with shops, coffee bars and restaurants. This gives the residents the opportunity to become part of the Barangaroo community and meet each other. Within the building, the four separate lift cores with only three apartments of each lift core improve the social awareness amongst neighbours. Building R9 provides all the residents with a communal rooftop terrace. The rooftop has multiple barbeque areas and seating pockets setup to allow groups of people to entertain themselves, but also share space. The ability to share this space in combination with good solar access, harbour views and landscaping will enhance the social aspects amongst the people living in R9.

Principle 10: Aesthetics

R9 has a clear composition of building elements which relate to their specific orientation and relation to context. R9 has a palette of natural façade materials; integrally coloured precast concrete, perforated metal and engineered stratified timber which emphasize the different planes of the façade and create harmony through colour and texture. The facades are modulated by a pattern of bi-folding perforated metal screens for either shading or to mediate cross viewing and avoid any meretricious effects. The primary colours which will be visible on the exposed edges of the bi-folding screens give the façade further energy and relate to the colours used throughout the Barangaroo Development. The landscaping forms the counterpoint in the facade design and generates an urban scale to the project which contrasts with the human scale of the bi-folding screens. The landscaped rooftop design, which integrates photovoltaic cells, creates the fifth façade of the building which is highly visible to the office buildings behind R9. The residential character of the building, with its operable shutters and green elements, will have an important role in creating architectural richness and diversity at Barangaroo.



Globe Street Address



West Facade Design

Residential Building R9 Project Application Residential Flat Design Code 'Rules of Thumb' Assessment

The following table lists the relevant Residential Flat Design Code 'Rules of Thumb' and the projects consistency with those standards. Where variations are proposed they are addressed in Section X.X of the Environmental Assessment Report.

Re	quirement	Residential Building R9	
KE	Y ISSUES		
Bui	lding Depth		
ln g dep	eneral, an apartment building depth of 10 to 18 metres is appropriate. Freestanding buildings may have a th greater than 18 metres only if they achieve satisfactory daylight and natural ventilation.	Typical 16-17m	
Ор	en Space		
The site	area of communal open space required should generally be at least between 25 and 30 percent of the area. Larger sites and brownfield sites may have potential for more than 30 percent.	Communal Roof area 400m2 (25% of site area)	
Where developments are unable to achieve the recommended communal open space, such as those in dense urban areas, they must demonstrate that residential amenity is provided in the form of increased private open space and/or in a contribution to public open space.			
Vis	ual Privacy		
_	five to eight storeys/up to 25 metres 18 metres between habitable rooms/balconies 13 metres between habitable rooms/balconies and non-habitable rooms 9 metres between non-habitable rooms nine storeys and above/ over 25 metres 24 metres between habitable rooms/balconies 18 metres between habitable rooms/balconies and non-habitable rooms 12 metres between non-habitable rooms	There is a16-17m separation to the commercial podia at Globe Street. The eastern façade is layered in two planes which allows for diagonal views from the bedrooms. Further use of screening creates visual privacy from the commercial buildings across Globe Street.	
Peo	lestrian Access		
- - -	Identify the access requirements from the street or car parking area to the apartment entrance. Follow the accessibility standard set out in Australian Standard (AS 1418 (Parts 1 & 2) as a minimum. Provide barrier free access to at least 20% of dwellings in the development.	Clear access to lobbies of Globe Street	
Ара	artment Layout		
-	Single-aspect apartments should be limited in depth to 8 metres from a window. The back of a kitchen should be no more than 8 metres from a window. The width of cross-over or cross-through apartments over 15 metres deep should be 4 metres or greater to avoid deep narrow apartment layouts.	The1 BR depth is generally 6.5m with a single sided kitchen. The 2BR depth to the front of the kitchen is 7m, to the back of the kitchen it is 8.8m. All 2BR units have 5.5 m width and are cross ventilated.	
-			
-	Buildings not meeting the minimum standards listed above must demonstrate how satisfactory daylighting and natural ventilation can be achieve, particularly in relation to habitable rooms (see Daylight Access and Natural Ventilation).	68.8% Cross Ventilated – Solar access to sunset	

If Council chooses to standardise should be used. As a guide, the A sizes which can contribute to hou affordability)	apartment sizes, a range of sizes that do not exclude affordable housing Affordable Housing Service suggest the following minimum apartment sing affordability: (apartment assize is only on e factor influencing	
 – 1 Bedroom apartment 5 	50m ²	1br 57m2
 – 2 Bedroom apartment 7 	70m ²	2br 99m2
– 3 Bedroom apartment	95m ²	2br+R114m2
Balconies		
Minimum depth of private balconi	1br 2.2m	
		2br 2.8m
Ceiling Heights		
Minimum 2.7m for all habitable ro	oms.	2.7m
In Mixed Use buildings: 3.3m min residential or commercial.	Min 4.5	
Internal Circulation		
In general where units are arrang single core corridor should be lim	3 units per core	
Storage		
In addition to kitchen cupboards a following rates:	and bedroom wardrobes, provide associated storage facilities at the	1br 6m3 (50%in basement)
 Studio apartments 	6m³	2br 8m3 (50%in basement)
 One bedroom apartments 	6m³	
 Two bedroom apartments 	8m³	
- Three plus bedroom apartm	ients 10m ³	
Daylight Access		
Living rooms and private open sp receive a minimum of three hours areas a minimum of two hours ma	All living rooms and west balconies receive 2 hours of sunlight between 9am and sunset in midwinter	
Limit the number of single-aspect of the total units proposed. Deve demonstrate how site constraints energy efficiency is addressed (se	All apartments face west, no single aspect apartments facing south	
Natural Ventilation		· · ·
- Building depths which suppo	ort natural ventilation typically range from 8 to 15 metres.	Typical 16-17m
- Sixty percent (60%) of resid	ential units should be naturally cross-ventilated.	68.8%
- Twenty five percent (25%) of	All 2 BR are cross ventilated	
 Developments which seek to ventilation can be satisfacto 	with kitchens set in from the facade	

9 Architectural Drawings