CASE STUDY

Boomerang Tower, Sydney Olympic Park

Towering statement
An attractive, shallow-floorplate tower form that capitalises on a highly prominent location to create amenity for residents. Image: Mike Chorley.

An exemplar of high-density residential tower design that cleverly evolves the typology to increase amenity and create a sophisticated and striking sculptural form

QUICK FACTS

APARTMENT BUILDING TYPE:
Tower

LOCATION:
Sydney Olympic Park, NSW
Urban

COUNTRY:
Wangal

LOCAL GOVERNMENT AREA:
City of Parramatta

ZONING:
B4 Mixed Use

APPLICABLE CONTROL:
2015 Apartment Design Guide (ADG)

CLIENT:
Ecove Group

PROCUREMENT:
Design and construct

PROJECT DATA:
Site area 4,071 m^2
Non-residential NLA 3,490 m^2
Floor space ratio 6.17:1
229 apartments
(58 x 1B, 130 x 2B, 30 x 3B, 11 x 4B)
7–39 storeys
353 car parking spaces
282 bicycle parking spaces

SITE DENSITY:
563 dwellings/ha

YEAR:
Completed 2019

PROJECT TEAM:

ARCHITECTURE & INTERIORS
Bates Smart

LANDSCAPE ARCHITECT
Turf Design Studio

TOWN PLANNER
Ethos Urban

STRUCTURAL & CIVIL ENGINEER
Van der Meer Consulting

FACADE ENGINEER
AMA Facade

HYDRAULIC ENGINEER
Bluewater Group

FIRE ENGINEER
Warrington Fire

FIRE SERVICES ENGINEER
Force Fire

MECHANICAL ENGINEER
ACES

ELECTRICAL ENGINEER
DDP Electrical

LIGHTING
Cundall

SUSTAINABILITY
Renyi

TRAFFIC ENGINEER
PDC Consultants

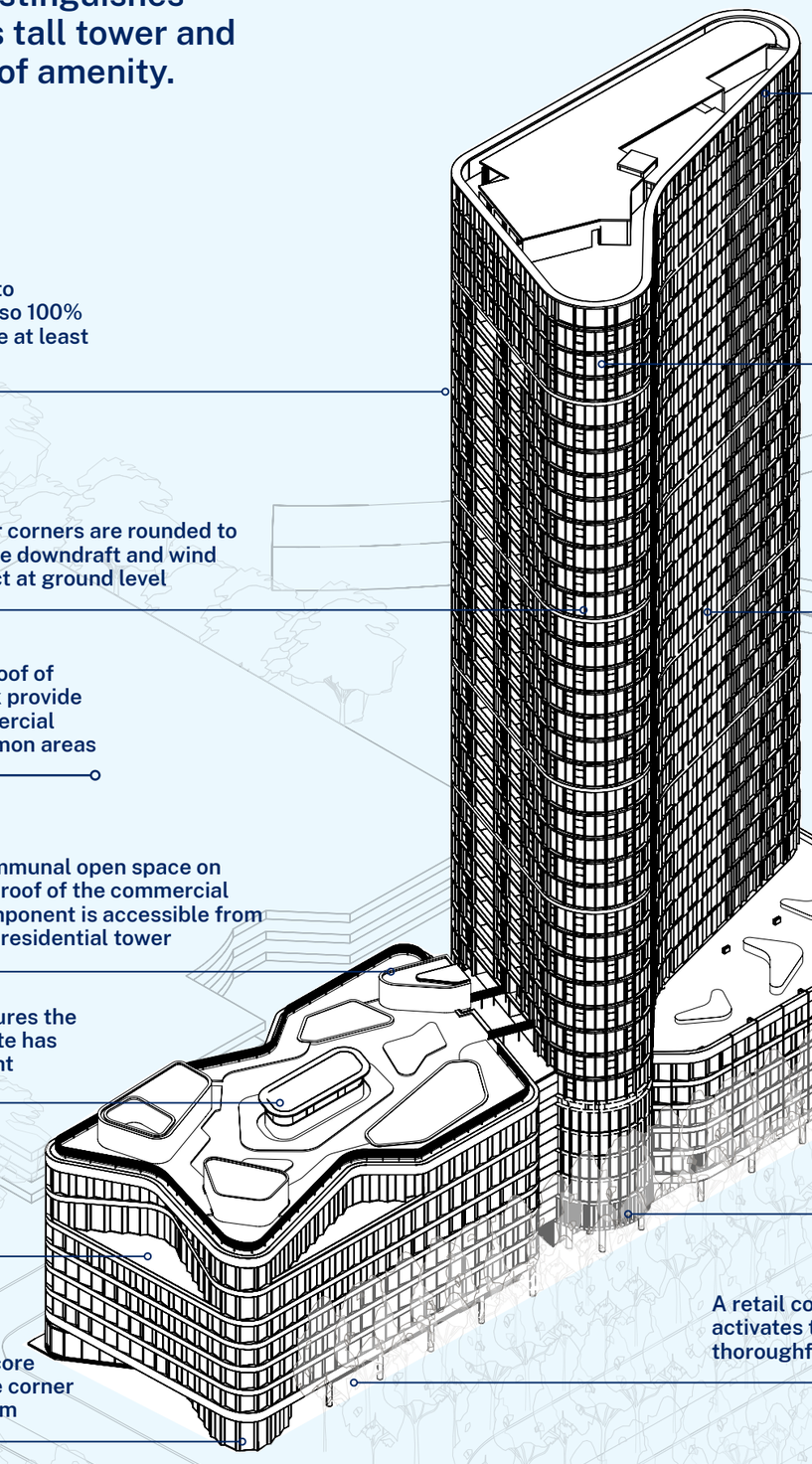
BUILDING CODE / CERTIFIER
McKenzie Group

BUILDER
Taylor Construction

AWARDS:
2020 AIA NSW, Residential Architecture – Multiple Housing, Award

NSW GOVERNMENT

Skillful facade design and a unique tower shape responding to site-specific conditions distinguishes the expression of this tall tower and results in high levels of amenity.



Vertical facade fins are carried through to screen the plant rooms and create a unified appearance

Exposed balconies on the curved corners are glazed to form winter gardens, whereas sheltered balconies are open

The tower lift lobby and fire stair, not requiring solar access, are located on the southern facade with district outlook

The tower is shaped to maximise views, and so 100% of apartments receive at least 2 hours of winter sun

Tower corners are rounded to reduce downdraft and wind impact at ground level

Solar panels on the roof of the adjacent car park provide energy for the commercial component and common areas

The podium roof is landscaped for an attractive outlook

Communal open space on the roof of the commercial component is accessible from the residential tower

Car parking is above ground in a 'parking podium' because excavation to create a basement was prohibited due to ground contamination

A central atrium ensures the entire office floorplate has access to natural light

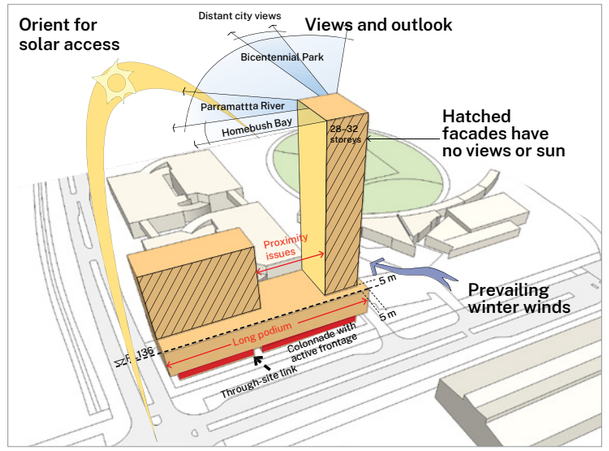
The residential tower form extends down to the ground level to create an identifiable entry

Office floors have been shaped to maximise amenity, with outdoor terraces overlooking the park

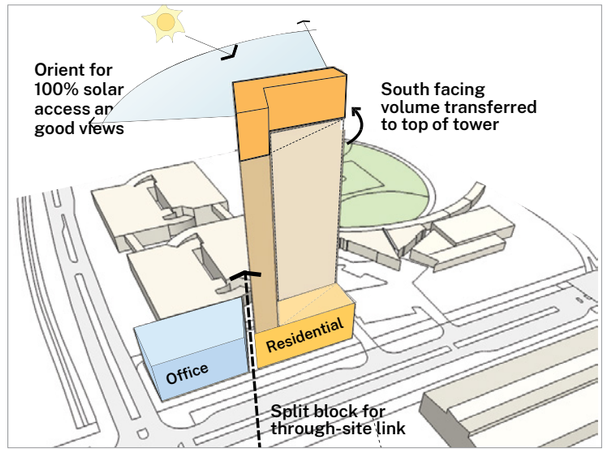
A retail colonnade activates the main thoroughfares

The commercial lift core provides a distinctive corner element to the podium

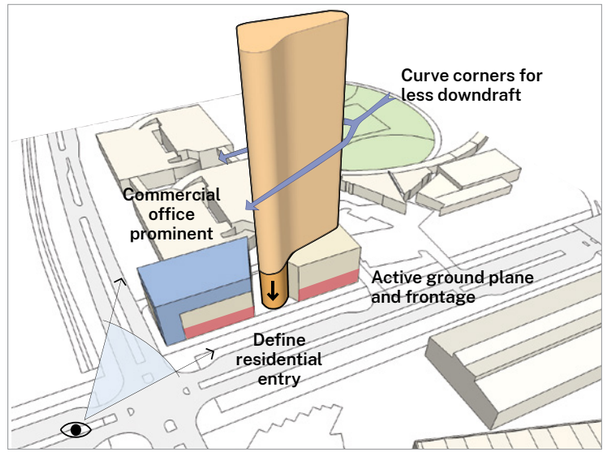
Collection of forms
Three interlocking objects represent the three primary uses: office, parking and residential. Image: Bates Smart, MAKO Architecture.



Original master plan envelope



Lift and shift master plan volumes



Detailed resolution of envelopes

Architectural design response
The architect challenged the Sydney Olympic Park master plan envelopes and proposed a single tower in place of the double tower scheme, yielding 100% of apartments with solar access, and ensuring every apartment has views. The ground plane was activated with retail and the through-site link reoriented to define movement and entry. Images: Bates Smart urban design report.

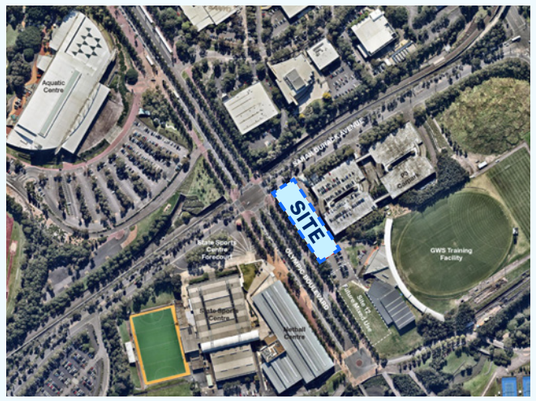
Image: Mike Chorley.

Boomerang fulfills the Sydney Olympic Park master plan strategy for an integrated mixed-use development, with ground floor retail, sustainable commercial space and a landmark residential tower which responds to the bold scale demanded by the Olympic Boulevard address.

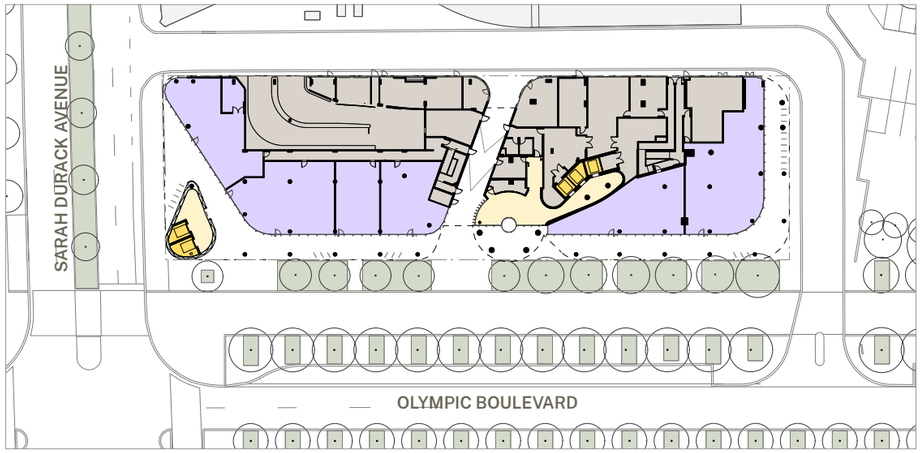
The project strongly defines its block by building to all 4 street edges, and creating the consistent 6–8 storey street wall called for in the master plan. A colonnade with retail tenancy frontages lines the streets on 3 sides; services and loading are appropriately relegated to the narrower rear lane. A through-site link shortens the length of the block and anticipates future pedestrian connections.

Above the retail, four-and-a-half levels of car parking are subsumed within the overall podium form, eschewing basement car parking which is not permitted due to ground contamination at Sydney Olympic Park. Commercial office space, connected internally within a skylit atrium, is located on the top 2 floors of the northern podium. The commercial lift core is located on the western street corner to provide commercial presence at street level. Above the podium, 32 storeys of residential apartments rise in an elegant tower form.

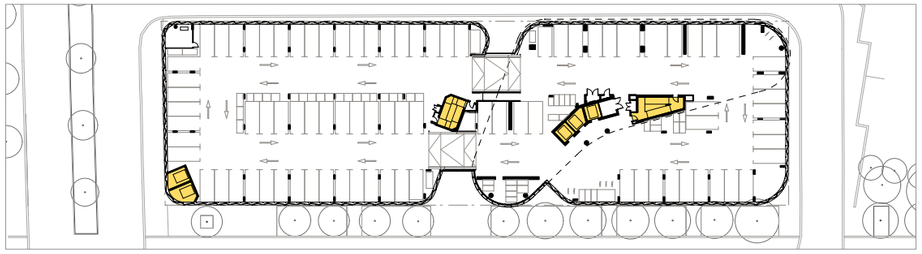
As shown in the diagrams on the previous page, the architects questioned the original master plan in order to reconcile the building envelopes with an updated brief for a different balance of commercial and residential uses. The through-site link is extended through the podium and aligned with sightlines from the sports centre, and the 2 tower forms originally planned were consolidated into one. The shape of the tower footprint was remoulded from square to triangular to increase the amount of frontage angled to the north and north–east towards the sun and views. The inferior floorspace on the south side of the triangle was then removed (creating the distinctive 'boomerang' plan shape) and transferred to the top of the building adding an additional 5 floors. The narrowed rounded ends of the building make for a remarkably slender appearance from different viewpoints. The design review panel supported these changes as an improved design outcome and appropriate given the location of the tower on Olympic Boulevard.



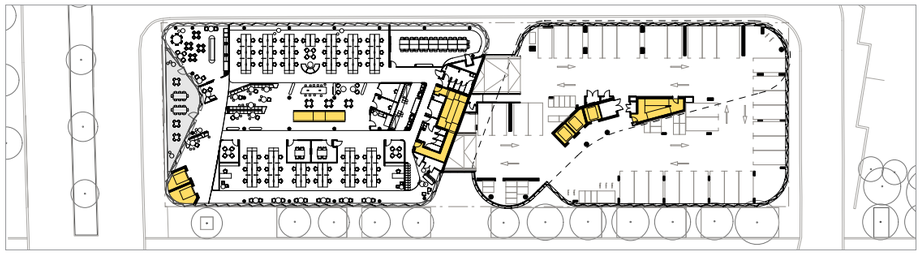
Site plan
The site is on a prominent corner in the master plan, at the junction of 2 major boulevards, next to the Greater Western Sydney training ground, and diagonally opposite the aquatic centre. Image: Bates Smart urban design report.



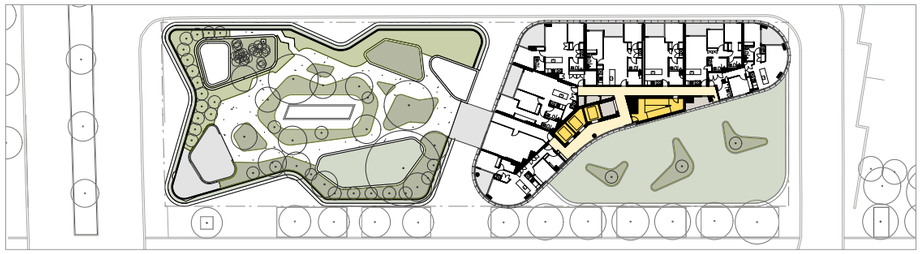
Ground floor plan (retail)



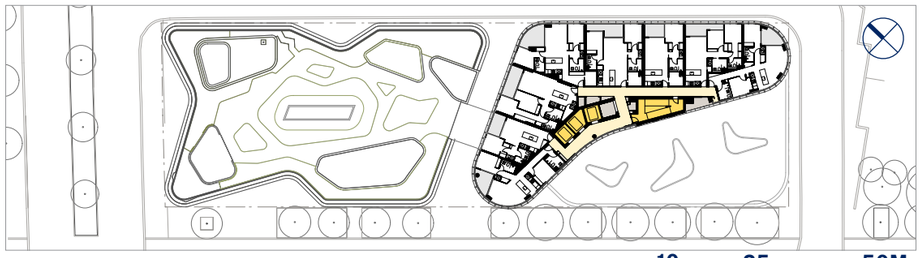
Level 4 plan (car park)



Level 7 plan (commercial + car park)



Level 9 plan (communal open space)



Level 10 plan (typical tower plan)

10 25 50M

The materials palette is inspired by the former history of the site as the NSW State Brickworks.

Tactile earthen terracotta ‘baguettes’ clad the lower podium floors close to street level where they can be appreciated by passers-by. At higher floors, where a lightness of construction is required, thin projecting aluminium shade fins in a spectrum of oranges and reds capture the tonal qualities of the podium. The staggered distribution of variegated colour arrayed across the tower facade unites variations in the elevation into a cohesive visual whole. The overall tower form becomes a singular sculptural object to be seen in the round and recognisable from a distance in the broader landscape. The use of colour here is sophisticated. Floor-to-floor heights vary between 3.1 m and 3.4 m, allowing uncomplicated coordination of building services where unit mix changes occur over the height of the building. Floor plans are grouped vertically into 6 different groups, expressed on the facade by varying the thickness of the slab edge, contributing to the building’s overall proportions.

A unified whole

Each of the uses – residential, commercial and parking – has very different practical requirements, yet the architects have used colour and material to create a unified family of facade treatments. Parking contained within the podium appears indistinguishable from other parts of the podium; the geometric (‘zig-zag’) facade line combines alternating panels of terracotta with bays of aluminium mesh to provide natural ventilation. For the commercial levels the mesh is substituted with glazing that is oriented southwards to reduce heat load on the workspaces.

Environmental credentials

Sustainability features exceed standard practice. Rainwater is harvested, and efficient water fixtures connect to the Sydney Olympic Park Water Reclamation and Management Scheme (WRAMS). A modular photovoltaic array located on the adjacent car park roof offsets the energy requirements of the 6 Star Green Star commercial fitout. Planted communal roof gardens reduce heat gain. Over 200 bicycle spaces and end-of-trip facilities encourage cycling as an alternative mode of transport, and the car park is 100% naturally ventilated. Ensuring all apartments have midwinter solar access not only increases amenity, but reduces winter heating energy requirements. Brightly coloured full-height shade fins contained by the slab edges provide solar protection to a combination of fixed glazing and stacked awning windows in the residential tower.

A family of facade treatments
The faceted facade of the parking levels (bottom left) is repeated for the commercial space (right) and the colours are mirrored in the fins over the residential glazing (top left). Image: Tom Roe.

‘The residential tower has been designed to maximise amenity and contribute to Sydney Olympic Park Authority’s vision for Olympic Boulevard of widely spaced slender towers above a consistent street wall and activated ground plane.’

— Matthew Allen, Bates Smart

A prominent corner
The commercial lift core fronts the parking podium on the western corner, providing high visibility and identity for the office use. Image: Mike Chorley.

Shared amenity
A communal roof deck has shared facilities like barbecues and covered dining areas. A skylight in the centre lights an atrium to the offices. Images: Tom Roe, Mike Chorley.

Prospect
Tower lift lobbies are naturally lit and capture district outlook.
Images: Mike Chorley.

Vantage point
Protected balconies are open and enjoy distant views of the CBD.
Image: Mike Chorley.

Green roof

Generous communal open space is provided on the rooftop of the northern building and connected to the residential tower via a bridge over the through-site link. Pavilions and planting increase comfort by acting as a wind break, and provide different spatial qualities from open lawn to small seating nooks. This allows the rooftop to be enjoyed simultaneously by multiple groups and caters for both social interaction and private contemplation. Planting on structure compensates for the lack of deep soil planting available due to capping ground contamination and enhances the amenity of the open space.

Small floorplate for good amenity

The typical tower floorplate has a gross floor area of 700 m^2, with each floorplate accommodating 8 units. As a result of reshaping the tower form, all apartments in the building receive a minimum of 2 hours of direct sunlight to living rooms and private open spaces at midwinter, and benefit from panoramic views of Bicentennial Park, Parramatta River and the Sydney CBD. Due to the north-east to north-west aspect of the apartments, the majority of living rooms have been set back behind a recessed balcony to provide summer shading but admit winter sun. The lift core is located asymmetrically to the south side of the building with a glazed common corridor providing daylight and generous views over Olympic Park.

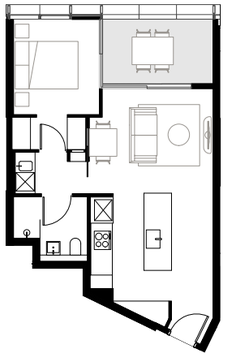
Rounding the corners

The edges of the tower form are curved in plan to reduce lateral wind obstruction and lessen downdraft impacts to the public realm. All corner apartment balconies are enclosed with operable glazing as ‘wintergardens’ to protect these private open spaces from high wind speeds, while sheltered balconies in the centre of each facade are open.

‘A very clear demonstration of the design rationale, and constructive discussions with the design review panel, allowed authorities to vary the original building envelope to achieve a superior built form … delivering significant additional amenity benefits’

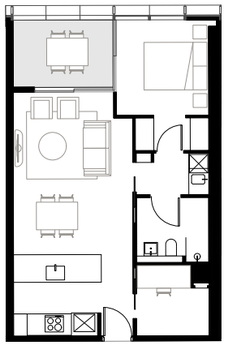
— Matthew Allen, Bates Smart

Typical apartment plans
Drawings are to scale, indicated below.
The north point for each plan is true for the individual apartment shown, but may vary where plans have been repeated.

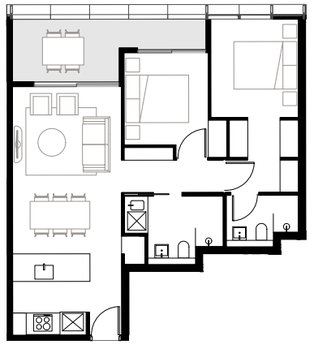


1 2 5M

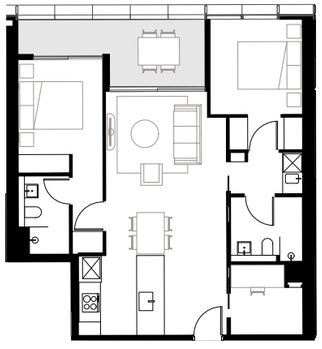
1 bedroom
50 m^2 + 8 m^2 private open space



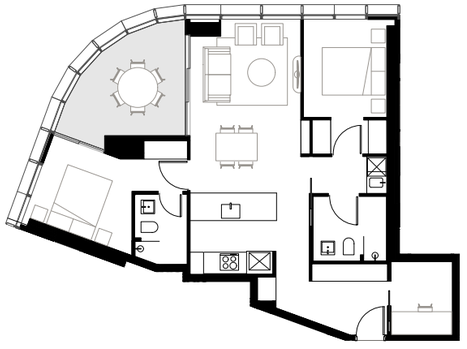
1 bedroom + study, adaptable
57 m^2 + 8 m^2 private open space



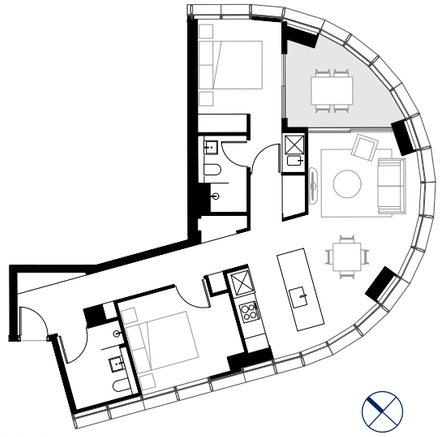
2 bedroom
70 m^2 + 10 m^2 private open space



2 bedroom + study, adaptable
78 m^2 + 11 m^2 private open space



2 bedroom + study
82 m^2 + 13 m^2 private open space



2 bedroom
78 m^2 + 10 m^2 private open space

LINE OF SIGHT TO THE APARTMENT DESIGN GUIDE (ADG)

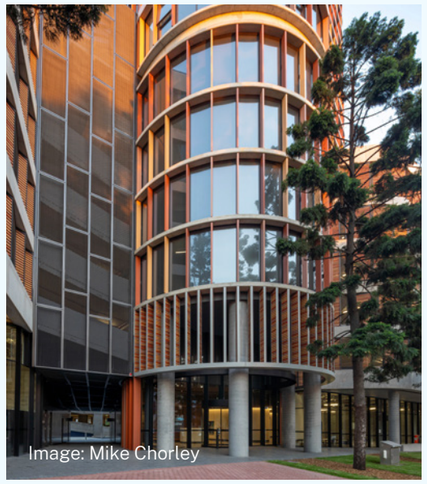


Image: Mike Chorley

ADG 3G PEDESTRIAN ACCESS AND ENTRIES OBJECTIVE 3G-2:
Access, entries and pathways are accessible and easy to identify

ADG 4S MIXED USE OBJECTIVE 4S-1:
Mixed use developments are provided in appropriate locations and provide active street frontages that encourage pedestrian movement

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

The residential and commercial entries are visually prominent and very distinct, as suggested by the ADG. The residential tower form is extended to the ground to define the residential entry, as shown in the image above. Access to parking in the podium is from the secondary street frontage and integrated into the overall building design, also recommended by the ADG. The ground floor interface balances the need for flexible use of space with the potential for varied tenancy sizes that encourage activation and vibrant street life, important as this area transitions from sporting infrastructure to a mixed-use precinct.


Image: Mike Chorley

ADG 4A SOLAR AND DAYLIGHT ACCESS OBJECTIVE 4A-1:
To optimise the number of apartments receiving sunlight to habitable rooms, primary windows and private open space

The tower form has been driven by a desire to achieve 100% of apartments with 2 hours of solar access to living rooms and balconies between 9 am and 3 pm on the winter solstice. Due to the north-east–north-west aspect of the apartments the majority of living rooms are set back behind a recessed balcony to provide shading during the summer months but admit low-angle sun during winter.

ADG 4E PRIVATE OPEN SPACE AND BALCONIES OBJECTIVE 4E-1:
Apartments provide appropriately sized private open space and balconies to enhance residential amenity

The architects have followed the approach suggested by the ADG: partially enclosing balconies at higher levels using operable louvres or wintergardens to screen wind. Sheltered balconies (lower in the tower and in the centre of the straight portions of the facade) are open, whereas the upper levels and the exposed curved corners throughout have balconies treated as wintergardens, with awning windows for natural ventilation. Rooms that open onto the wintergardens also have an alternative operable window in the facade, that is, they don't rely solely on the wintergarden for natural ventilation.

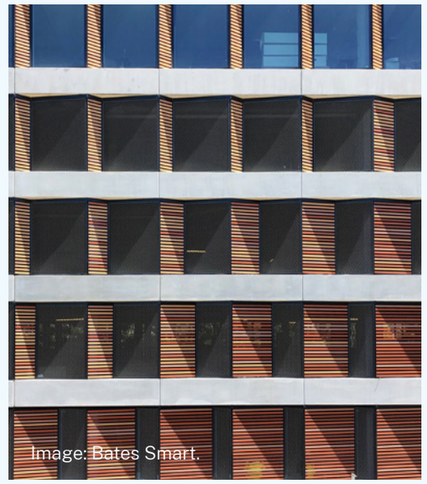


Image: Bates Smart.

ADG 4M FAÇADES OBJECTIVE 4M-1:
Building facades provide visual interest along the street while respecting the character of the local area

ADG 4N ROOF DESIGN OBJECTIVE 4N-1:
Roof treatments are integrated into the building design and positively respond to the street

Colours used in the facade reference the original brickworks on the Sydney Olympic Park site, and the podium features terracotta cladding in various tones, an abstraction of the geological layering on the site. In the podium, the scale of the car park enhances the presence of the commercial element. The presence of the above-ground car parking is hidden by using clever facade detailing which substitutes the mesh panels of the car parking levels for glass in the office levels. Sitting behind a consistent slab edge, the spacing and angles of the zigzag facade elements subtly change from level to level and around the podium, transitioning between the more open facade of the office to the near-closed facade of the car park at Level 1, and creating a wave of texture across the facade (refer image above).

The vertical fins on the facade are carried through to create a perimeter 'crown' for the tower, concealing services plant and lift overruns on the roof.

Tower in the landscape
The shaping of the tower to avoid sharp corners creates a visual softening from most angles with a gradient of daylight falling across the sinuous facade. Image: Tom Roe.