

CASE STUDY

Bourke Street Apartments, Woolloomooloo



Driven by the location

The proximity of the freeway drives the planning as the apartments turn away from noise and pollution.
Image: Brett Boardman Photography.

High-quality market
apartments in a challenging
built-environment context

QUICK FACTS

APARTMENT BUILDING

TYPE:

Row

LOCATION:

Woolloomooloo, NSW
Urban

COUNTRY:

Gadigal

LOCAL GOVERNMENT

AREA:

City of Sydney

ZONING:

B4 Mixed Use

APPLICABLE CONTROL:

2002 Residential Flat
Design Code (RFDC)

PROCUREMENT:

Full documentation and
lump sum tender with
architectural services
throughout

PROJECT DATA:

Site area 1,079 m²
Floor space ratio 2.00:1
31 apartments
(24 x 1B, 7 x 2B)
1 commercial unit
2–5 storeys
19 car parking spaces
37 bicycle parking spaces

SITE DENSITY:

287 dwellings/ha

YEAR:

Completed 2016

PROJECT TEAM:

ARCHITECTURE

McGregor Westlake
Architecture (MWA)

LANDSCAPE ARCHITECTURE

Jane Irwin Landscape
Architecture

HERITAGE

John Oultram Heritage
& Design

TOWN PLANNER

ABC Planning

STRUCTURAL ENGINEER

iStruct Consulting
Engineers

HYDRAULIC ENGINEER

Greenarrow Hydraulics

MECHANICAL ENGINEER

Viscona

ELECTRICAL ENGINEER

Joeliane Electrical
Engineer Consultants

ACOUSTIC ENGINEER

Koikas Acoustics

ESD

Efficient Living

TRAFFIC ENGINEER

McLaren Traffic
Engineering

ACCESS

Accessible Building
Solutions

BUILDING CODE ADVICE

BCA Logic

PRIVATE CERTIFIER

Building Certificates Aust

PROJECT MANAGER

Evolve Project Consulting

BUILDER

Growthbuilt

AWARDS:

2016 AIA NSW, Architecture
Award–Multiple Housing



An outwardly tough yet internally amenable apartment building, the common urban problems of noise and pollution are successfully mitigated here through skillful choice of building typology and masterful arrangement of built form on the site.

The gritty environment is mirrored in robust material choices like off-form concrete. The soft inner face of the development provides contrast with a highly detailed and articulated response

The T-shaped site with limited street frontage is a challenge for site circulation. The residential entry sits alongside the commercial unit

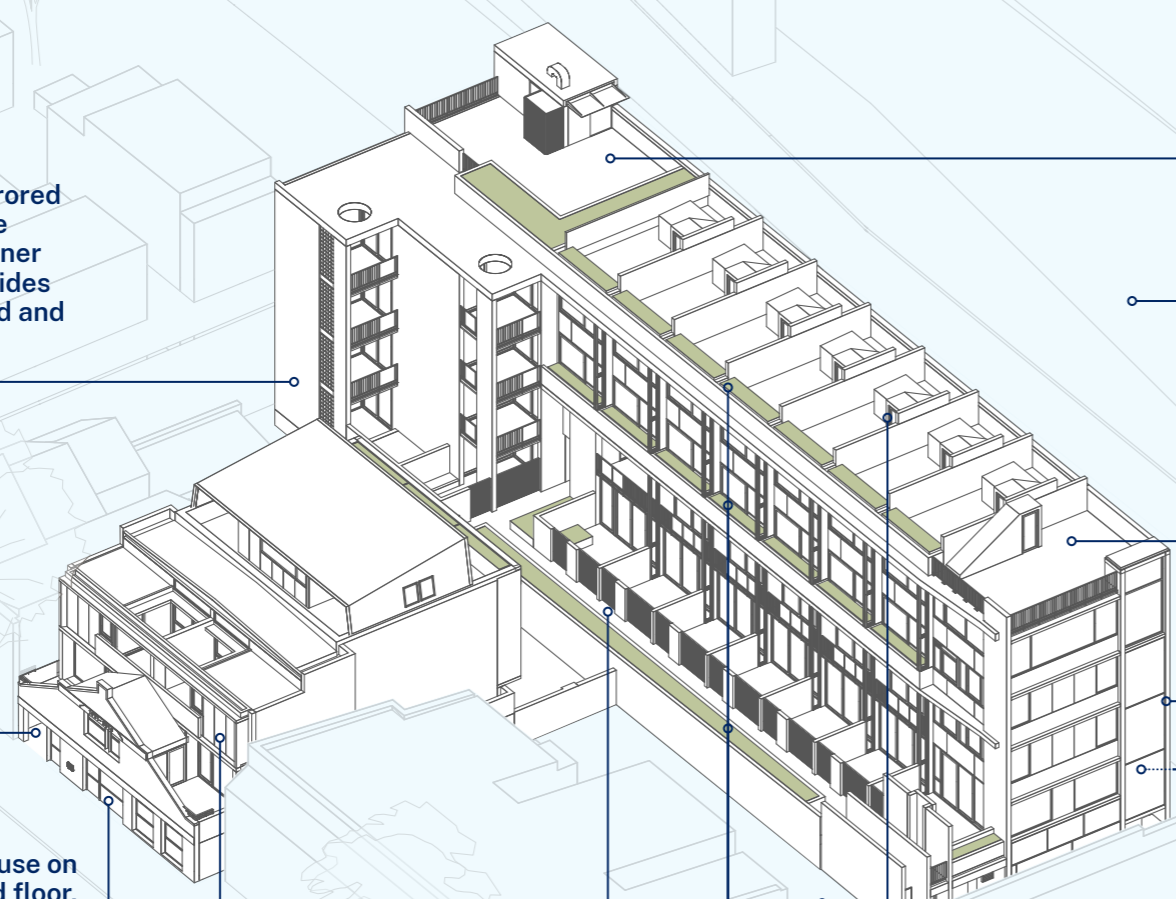
Commercial use on the ground floor, facing Bourke Street, activates the street

New built form set back from the retained heritage facade and aligned with the adjoining terrace parapet maintains the street character

An elevated walkway over the ground level parking provides entry to the courtyards of the lower maisonettes

Deep planters soften interior elevations and mitigate overlooking

Turning away from the freeway
The site viewed from the north-east, looking into the courtyard facade.
Image: MWA/MAKO Architecture.



A raised railway viaduct is an additional source of noise in this highly urban environment

A common roof terrace is a valuable suntrap and an ideal vantage point for New Year's Eve fireworks

7 lanes of freeway challenge the amenity of this site

Each upper maisonette has its own roof deck, with views back to the botanic gardens and the city beyond

The solid facade to the motorway is designed to be appreciated at high speed

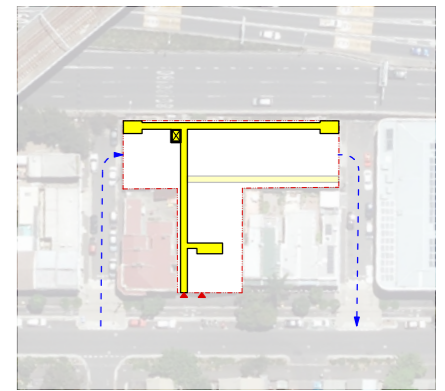
Corridors, stairs and service spaces are loaded to the western side of the plan and establish a sound and pollution shield for the living spaces overlooking the central courtyard

The individual stairwell serving 3 levels (maisonette + roof deck) creates natural convective air flow through each apartment as an alternative to mechanical ventilation

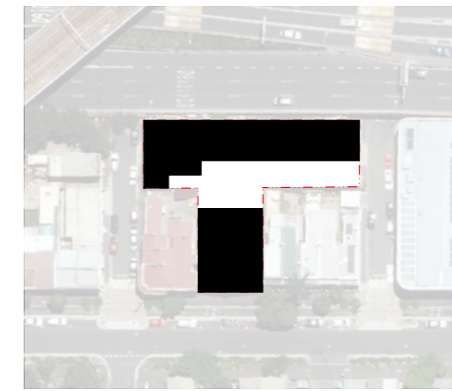
The private open spaces of the existing terraces are shielded by the new development from freeway noise



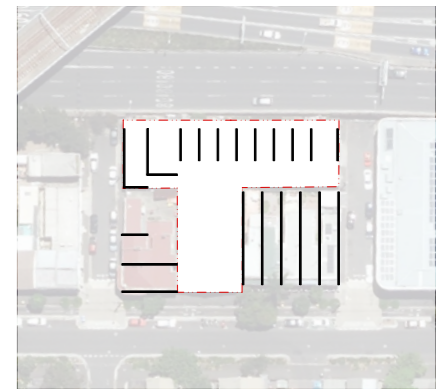
Railway and motorway



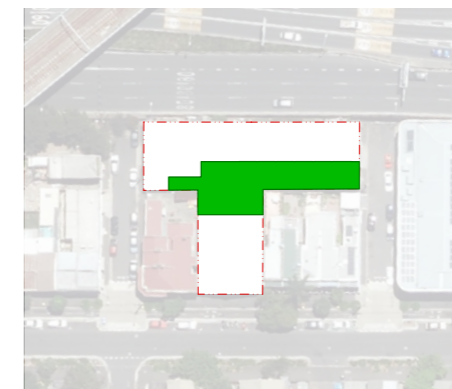
Circulation and entry



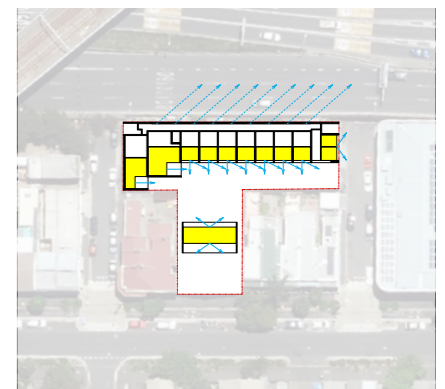
Block layout



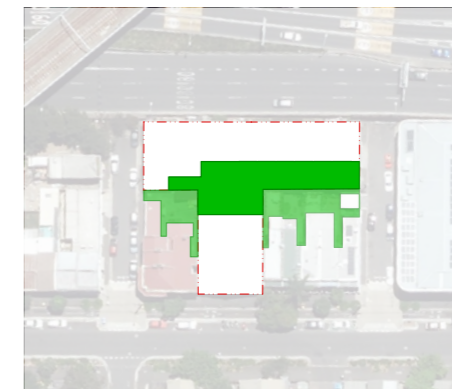
Module layout



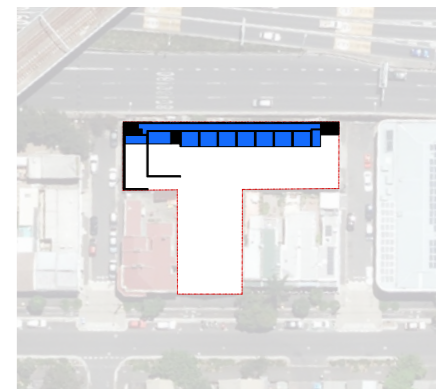
Courtyard



Living rooms and bedrooms face courtyard with peek views to city



Borrowed courtyards



Circulation and services to freeway



Design concepts
Diagrams prepared by the architect explain the main ideas of the scheme.
Images: MWA.

The Bourke Street Apartments are a valuable precedent for residential projects located next to noisy infrastructure, illustrating how integrated built form arrangements can overcome adverse environmental conditions more successfully than engineering solutions.

Located within an eclectic context immediately to the east of a raised motorway (Eastern Distributor) and a block to the north of an overhead railway viaduct, the building is a tight urban infill project on a highly constrained site. The site is T-shaped with a short eastern primary street frontage to Bourke Street, short northern and southern laneway frontages to Griffiths Street and Harmer Street respectively, and a long western boundary adjoining 7 lanes of motorway, which run past the site 3 m above ground level. Despite the complex and seemingly hostile conditions, the project delivers residential accommodation with a high degree of amenity, while also making a significant and positive contribution to the cityscape.

Creating amenity with the section

The location of the project demanded a solution to the problem of noise and pollution. Rather than seal the building and rely upon mechanical air conditioning, or installing filtered acoustic plenums to each habitable room, the building itself is designed to operate as an acoustic 'shield' protecting its residents from noise intrusion. A 'double wall' containing services, common circulation, bathrooms and kitchens creates an acoustic buffer for the bedrooms and living areas, all of which open to the courtyard in the centre of the site. A very thin building section — just 9 m including balconies — allows the apartments to be single-sided and gain sufficient sunlight, air and views. Small inoperable horizontal windows to the western motorway facade allow additional daylight to the rear of the spaces and provide glimpses back to the city. The protection to the units provided by the shielding building also benefits the communal courtyard and neighbouring properties, improving amenity for everyone.

The planning is highly efficient. Apartment layouts extract maximum utility from the available space. Each apartment type is specifically designed to respond to its particular location within the building. Single-storey units are located next to the lift core at the southern end of the plan as they can be serviced at every level. The balcony to the southernmost unit reaches beyond its neighbour in plan so both can receive northern sun. The remainder of units are 2-storey maisonettes stacked in 2 layers. The lower row of units is accessed from the courtyard through the units' outdoor terraces and into their living rooms with bedrooms on the upper floor. Above, the section of the units is reversed, with entry to a lower level of bedrooms, and living rooms on the upper floor to maximise views and access private roof terraces over.

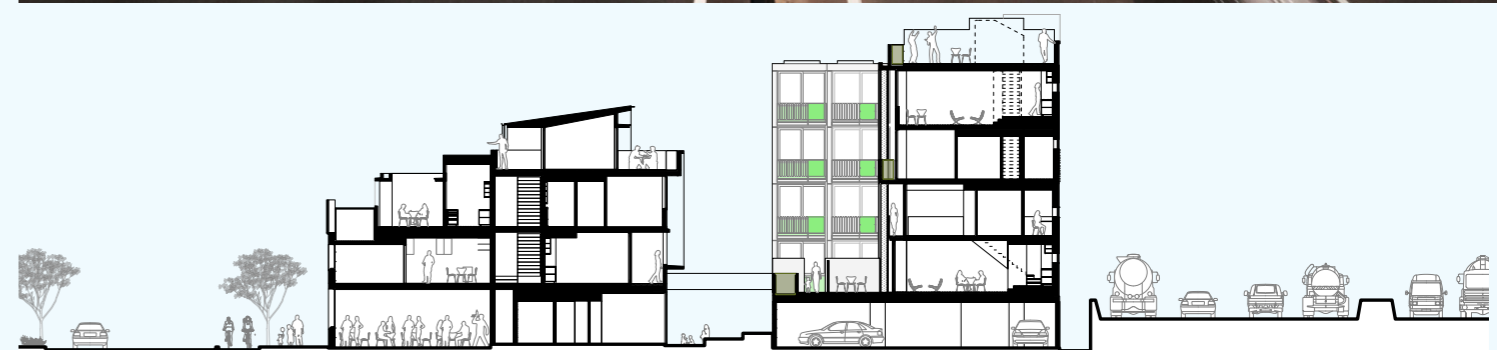
Building separation to the common central boundary allows the centre of the block to remain open and permit light and air to all dwellings. A wide planter box along the courtyard periphery provides a green, softening edge that allows outlook but prevents the overlooking of the lower neighbouring rear yards. An above-ground car parking podium resolves the level change between the site and the raised motorway. A highly efficient layout includes perpendicular parking and uses alternate laneway frontages for entry and exit. Waste, services and fire egress stairs are also integrated into these end elevations, which relieves the primary street address of these requirements.

High-speed artwork

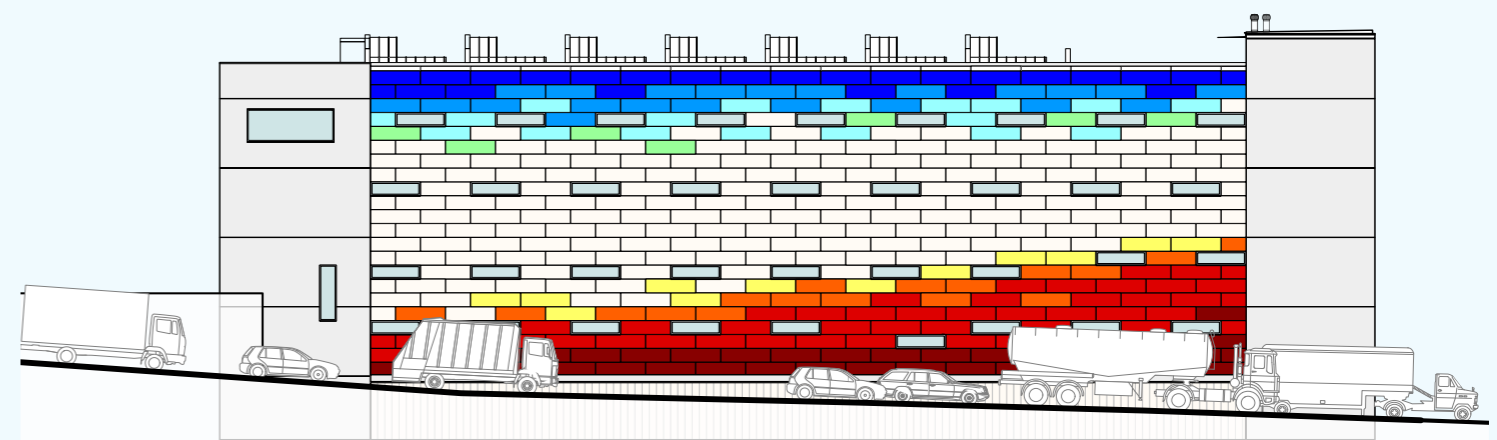
The City of Sydney supported the development of the motorway facade as a bold, memorable large-scale artwork for a captive audience of drivers. Concrete fire-stair towers frame a billboard-sized composition of glossy, polychrome panels and windows arranged in stretcher bond, with bold colours in a Lego-like super graphic referencing an automobile aesthetic at the base close to the freeway and the landscape of the adjacent harbour on the upper levels.



The challenge to quiet living
An elevated railway viaduct and 7 lanes of freeway present considerable challenges to creating homes in this tough urban location.
Image: Kyal Sheehan.



Site section



Freeway elevation

Artwork by the architect, Peter McGregor.



Creating amenity
Looking north (right) and south (left) to individual courtyard entries. Metalwork with coloured panels and the softness of timber and planting provide contrast to off-form concrete.

Servicing
Side lanes north and south provide vehicle access and one-way circulation, for a very efficient basement.

Heritage streetscape
Existing street character is maintained. A commercial unit in the former car workshop activates the street. All images: Brett Boardman Photography.

Contribution to city-making

On the main street frontage, between a row of terrace houses, the retained brick facade of a former car workshop has been stripped of paint and detailed to expose the history of adjustments to its openings. The new building inserted behind the heritage facade is set back to match the alignment of neighbouring parapet walls to the north, to maintain the existing scale at street edge. At the ground floor, a commercial space engages with the footpath and activates the street, while above, 7 walk-up units face either forward to overlook the street, or to the rear with views over the courtyard.

Moving through the site

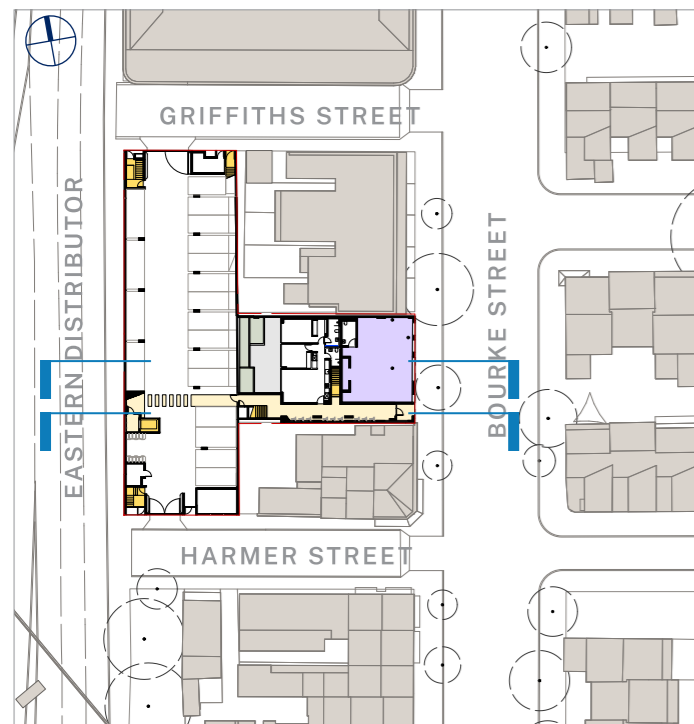
The circulation is legible and clear. A pedestrian entry from Bourke Street connects directly to a passage beside the commercial space, through the front building to the lower courtyard. Access to the eastern building apartments is halfway along this passage. From the lower courtyard there is a door to the lift core and car park beyond or stairs to the upper linear courtyard providing access to the Level 1 maisonettes via private entry courtyards. The lift serves each of the levels in the western building facing the motorway, including the common roof terrace.

Materials for the city

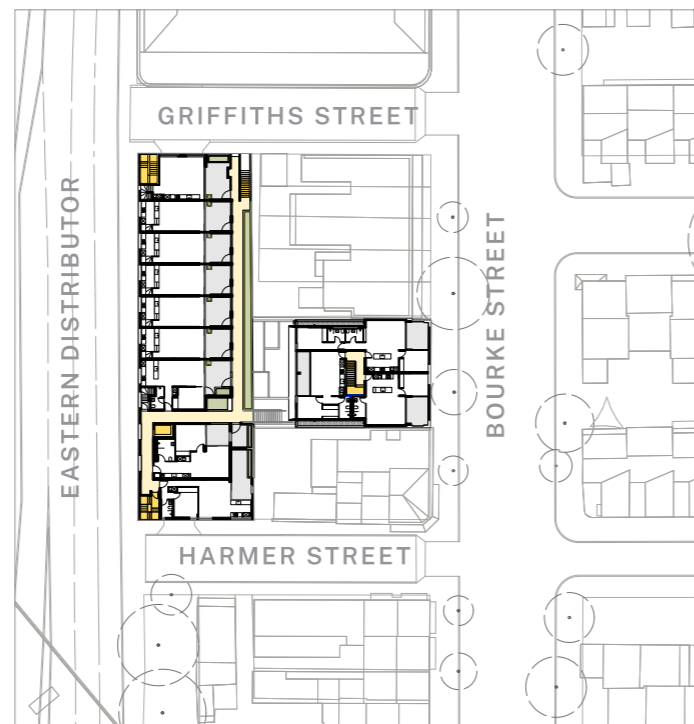
The building is materially robust and 'matter-of-fact' to respond to and cope with the gritty environment. Primarily comprised of off-form concrete and taking on an almost infrastructural quality, sophistication is provided by careful proportioning and introducing smaller-scale highly detailed elements. Anodised windows and steel balustrades create contrasting fineness to the heft of the concrete, while green-coloured panels, timber gates and window planter boxes lend a domestic touch. To the laneways, open mesh screens and gates to car parking and fire stairs enable natural ventilation of these spaces.

'The acoustic and sensory challenge influenced the development of the inward-focused courtyard plan.'

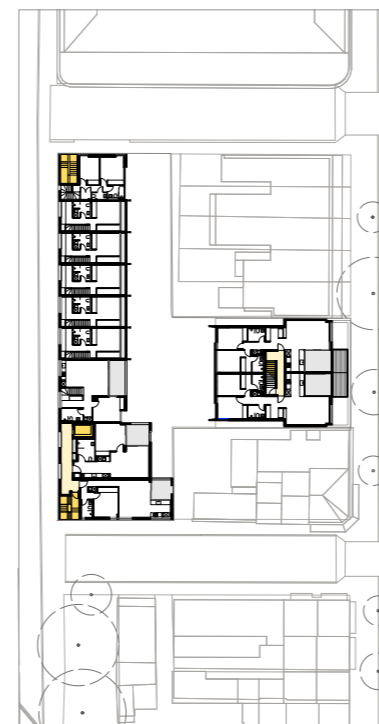
— McGregor Westlake Architecture



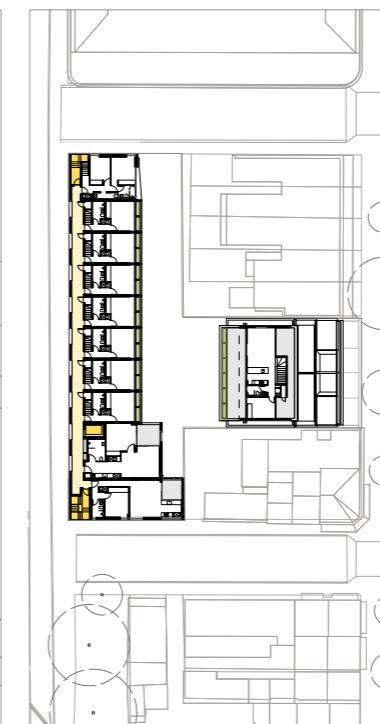
Ground floor plan 10 25 50M



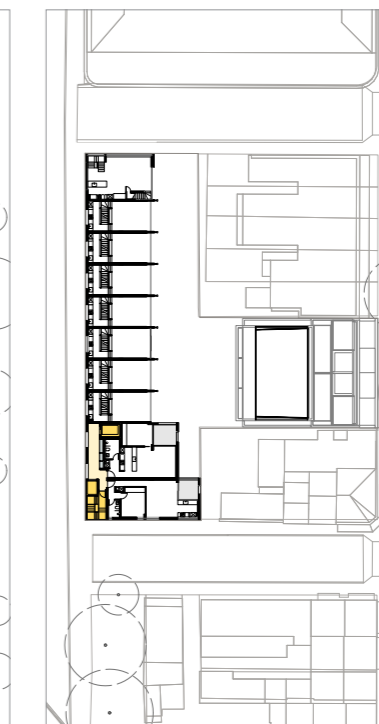
Level 1 plan



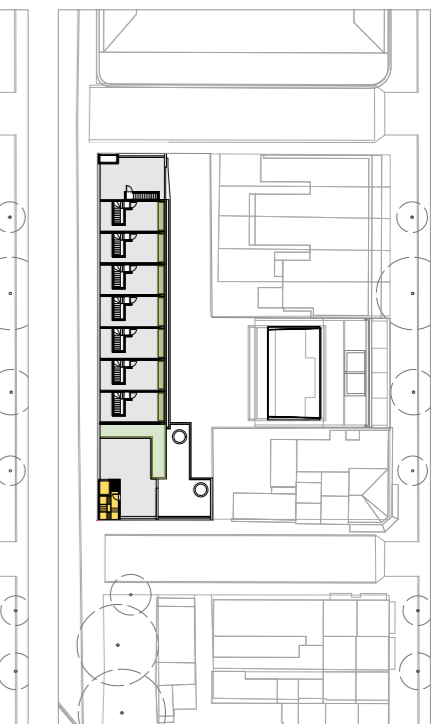
Level 2 plan



Level 3 plan



Level 4 plan



Level 5 (roof) plan

Metropolitan and domestic circulation

One of the slot windows looking over the freeway to the botanic gardens. Images: Brett Boardman Photography.



Achieving residential amenity

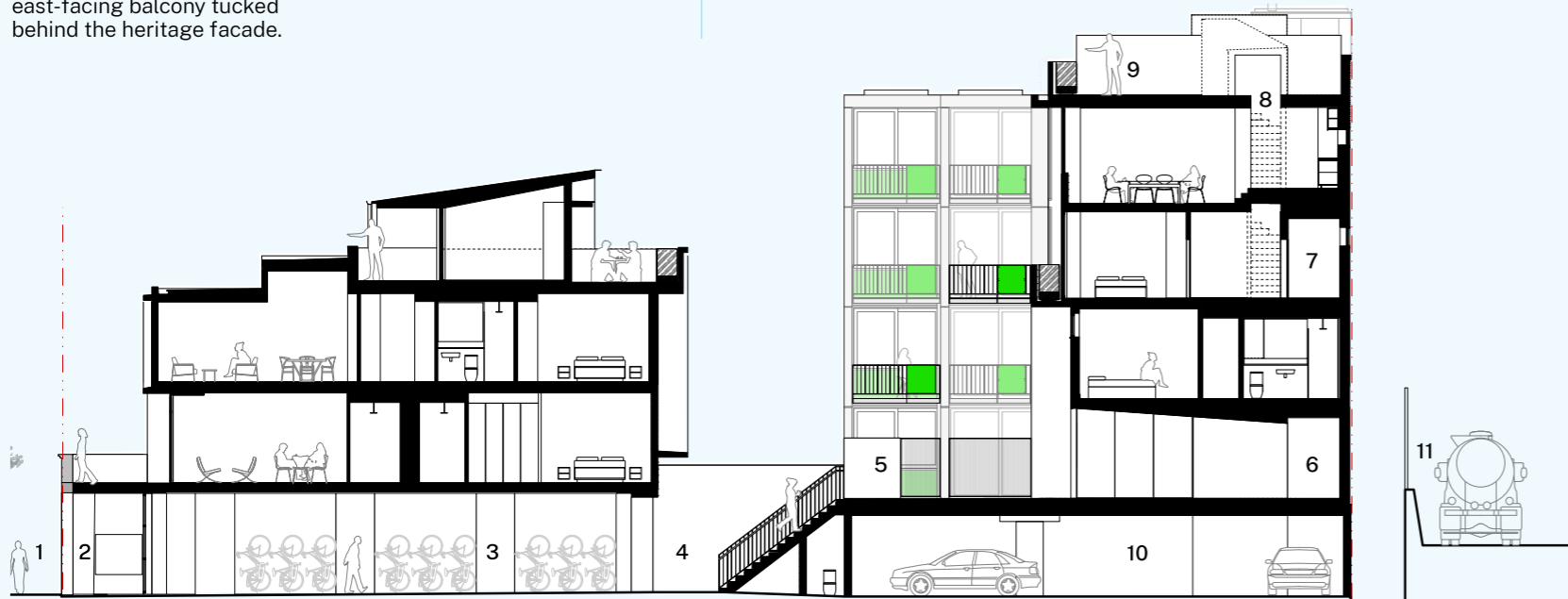
There is a generosity to the apartments in this development, due in part to the multi-level arrangement of many of the dwellings. Including study nooks in several of the apartments proved an advantage with the increased incidence of working from home. Storage, apartment size and private open space provision is generally above required minimums, and many of the apartments feature clotheslines, a provision often jettisoned in market apartments in favour of dryers, which are easier for developers to accommodate spatially. The majority of apartments are dual aspect, an impressive achievement in a dense inner city location like Woolloomooloo. Voids and the use of floor levels to create room definition is another delight derived from the multi-level format.

Over 60% of the apartments achieve natural cross-ventilation. Because of the environmental challenges for the upper western apartments facing the motorway, the pathway is convective, using the stairwell which connects the 2 habitable levels to the roof terrace, and effectively drawing air through the courtyard bedroom and living room windows to the roof. Several of the apartment plans also feature bathrooms and kitchens with external glazing, another feature which is rarely found in market apartments, yet contributes much to both the sustainability and the amenity of the dwelling.



Suntrap

A kitchen addressing an east-facing balcony tucked behind the heritage facade.



Site section

Showing the common circulation pathway through the site, and the 3-level stairwell through the upper level maisonette, which acts as a convective chimney to create cross-ventilation. Image: MWA.

LEGEND

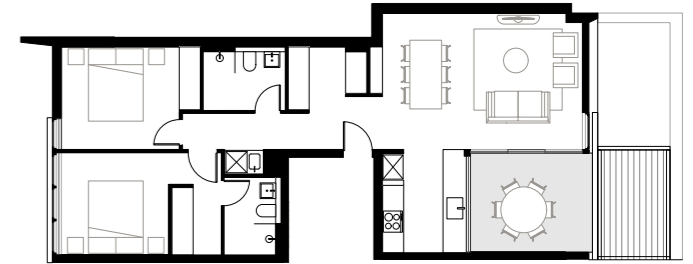
- 1. Bourke Street
- 2. Street entry
- 3. Entry passage
- 4. Lower courtyard
- 5. Upper courtyard
- 6. Lobby
- 7. Upper gallery
- 8. Stairwell
- 9. Private roof terrace
- 10. Car park
- 11. Motorway

1 2 5M

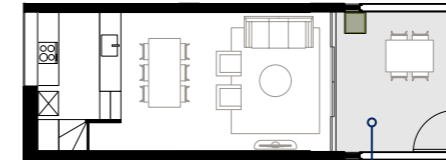
Typical apartment plans

This north point and scale bar applies to all plans. Drawings: MWA and MAKO Architecture.

1 2 5M

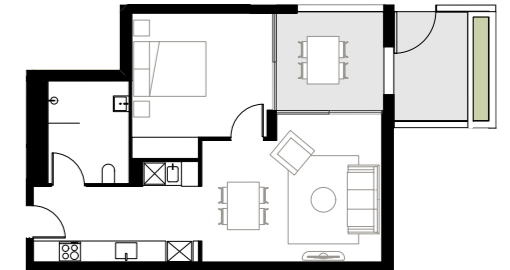


Eastern single-level 2 bedroom
75 m² + 10 m² private open space

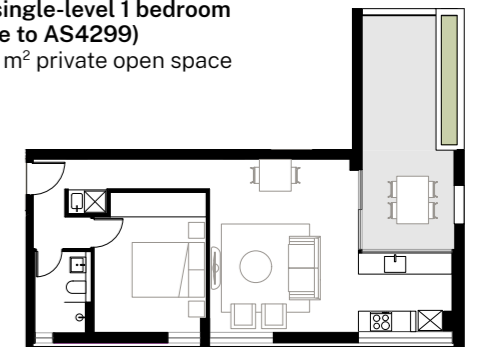


Lower 2-level maisonette
60 m² + 16 m² private open space

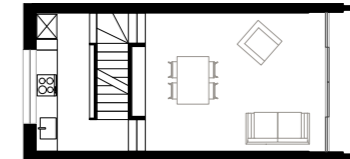
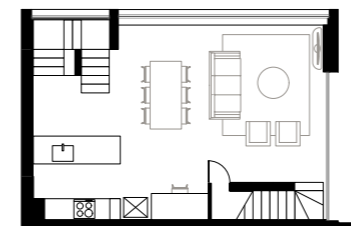
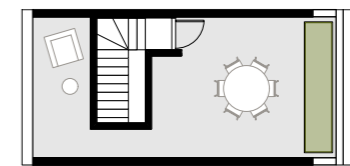
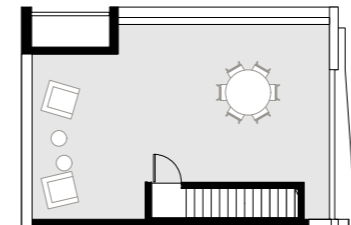
Courtyard accessed from common circulation



Western single-level 1 bedroom (adaptable to AS4299)
51 m² + 18 m² private open space



Western single-level 1 bedroom
54 m² + 15 m² private open space



Upper 3-level maisonette 2 bedroom + roof deck
86.5 m² + 46.5 m² private open space

Upper 3-level maisonette 1 bedroom + roof deck
54.5 m² + 33 m² private open space

The stair through all 3 levels creates convective airflow to the roof

Level 1 entry to Level 2 apartment above

Western 2-level 1 bedroom + study
56 m² + 10 m² private open space

LINE OF SIGHT TO THE APARTMENT DESIGN GUIDE (ADG)

ADG 4J NOISE AND POLLUTION

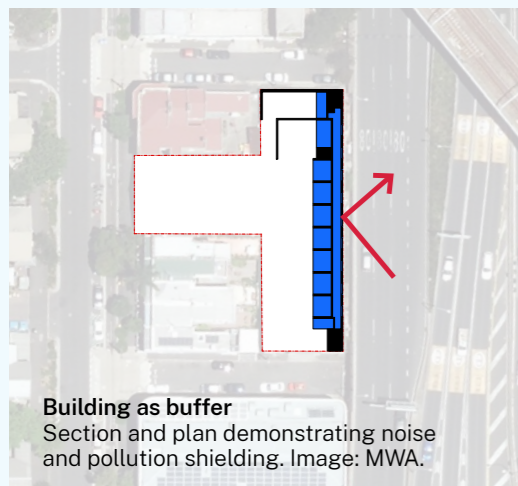
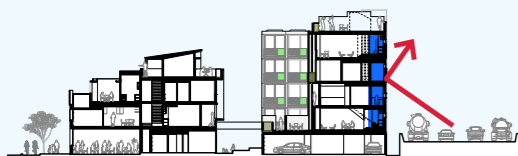
OBJECTIVE 4J-1:

In noisy or hostile environments the impacts of external noise and pollution are minimised through the careful siting and layout of buildings

OBJECTIVE 4J-2:

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

Rather than seal the building and rely upon mechanical air conditioning, or installing filtered acoustic plenums to each habitable room, the building itself is designed to operate as an acoustic 'shield' protecting its residents from noise intrusion. A 'double wall' containing services, common circulation, bathrooms and kitchens creates an acoustic buffer for the bedrooms and living areas, all of which open to the courtyard in the centre of the site. A very thin building section — just 9 m including balconies — allows the apartments to be single-sided and gain sufficient sunlight, air and views. Small inoperable horizontal windows to the western motorway facade allow additional daylight to the rear of the spaces and provide glimpses back to the city. The protection to the units provided by the shielding building also benefits the communal courtyard and neighbouring properties, improving amenity for everyone.



Building as buffer

Section and plan demonstrating noise and pollution shielding. Image: MWA.

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

Despite the east-west orientation of the longer sides of the buildable portion of the site, the project achieves required solar access to the majority of apartments' living spaces and balconies. In the case of the apartments in the image below, which sit along the southern boundary, the balconies and living rooms were stepped out to the east of the main facade, in order to capture northern exposure.



ADG 4B NATURAL VENTILATION

OBJECTIVE 4B-3:

The number of apartments with natural cross ventilation is maximised to create a comfortable indoor environment for residents

Despite the challenge of the location, which prevented operable windows on the Eastern Distributor facade, the majority of apartments achieve natural cross-ventilation, including in some cases by using a stairwell to create convective air flow. Amenity has been further enhanced by minimising the building depth (less than 9 m), so the single-sided apartments next to the freeway have adequate light and outlook from all the rooms. Many of the apartments are dual aspect, and additional sustainability is achieved by providing natural ventilation to kitchens and bathrooms, particularly in the eastern building.

ADG 4R ADAPTIVE REUSE

OBJECTIVE 4R-1:

New additions to existing buildings are contemporary and complementary and enhance an area's identity and sense of place

Additions to the heritage envelope of the former factory are clearly identifiable and contemporary. The original built form is legible, as the new work is set back and tucked behind the parapet of the existing building, aligning with neighbouring terraces. Material choice creates further contrast, with new work deliberately neutral against the highly detailed face brick. The retained brick facade was not only stripped of paint but was carefully detailed to expose the history of adjustments to its openings. Fine dark steel-framed glazing is in keeping with the period, and simultaneously modern.



ADG 4E PRIVATE OPEN SPACE AND BALCONIES

OBJECTIVE 4E-1: Apartments provide appropriately sized private open space and balconies to enhance residential amenity

Apartments generally feature oversized private open space, typically located to maximise available outlook and solar access. Small entry courtyards to the lower maisonettes on the parking podium are sized to accommodate folding clotheslines in addition to outdoor dining settings. Deep planters are included throughout the development, for privacy screening and to soften the minimalist architecture.

City glimpses

Fixed slot windows provide daylight and views over the motorway to the city and the botanic gardens. All images: Brett Boardman Photography.

