

CASE STUDY

# Lumina Apartments, Penrith



**City-making**  
Close to transport and services, Lumina represents an inventive interpretation of the master plan vision. Image: The Guthrie Project.

A bold and playful residential apartment development in a master-planned area, achieving fine-grained built form within a large envelope

## QUICK FACTS

**APARTMENT BUILDING TYPE:**  
Perimeter block

**LOCATION:**  
Penrith, NSW, Urban

**COUNTRY:**  
Dharug

**LOCAL GOVERNMENT AREA:**  
Penrith City Council

**ZONING:**  
B2 Local Centre

**APPLICABLE CONTROL:**  
2015 Apartment Design Guide (ADG)

**DESIGN EXCELLENCE:**  
Council design review panel

**CLIENT:**  
Urban Property Group

**PROCUREMENT:**  
Builder/developer, architectural services throughout

**PROJECT DATA:**  
Site area 3,084 m<sup>2</sup>  
Floor space ratio 4.40:1  
141 apartments (49 x 1B, 77 x 2B, 14 x 3B, 1 x 4B)  
1 retail unit  
7-10 storeys  
161 car parking spaces  
48 bicycle parking spaces (plus extra in storage cages)

**SITE DENSITY:**  
457 dwellings/ha

**YEAR:**  
Completed 2020

**PROJECT TEAM:**  
**ARCHITECT (DESIGN + DA)**  
DKO Architecture  
**ARCHITECT (DOCUMENTATION)**  
Urban Link Architects  
**LANDSCAPE ARCHITECT**  
Turf Design Studio  
**TOWN PLANNER**  
Think Planners  
**ACCESS**  
Access Link Consulting  
**CERTIFIER**  
CBS Building Surveyors  
**STRUCTURAL ENGINEER**  
Australian Consulting Engineers  
**HYDRAULIC ENGINEER**  
Scott Collis Consulting  
**ELECTRICAL ENGINEER**  
Tricom Engineering Group  
**MECHANICAL ENGINEER**  
Two MS Consulting Engineers  
**FIRE ENGINEER**  
Innova Services  
**SUSTAINABILITY**  
Greenworld Architectural  
**TRAFFIC ENGINEER**  
TTM Consulting

**AWARDS:**  
2021 UDIA NSW, Excellence in High-Density Development, Finalist  
2021 Sydney Design Awards, Architecture - Multi Residential - Constructed, Gold  
2021 The Urban Developer Awards, Development of the Year - High-Density Residential, Finalist



Lumina is articulated in height, plan and facade to break down a single large building envelope into a collection of smaller buildings. It also serves the master plan requirement to mediate between the lower-density residential townhouses to the north of the site and the higher apartment developments to the south.

Axonometric view from the south-east  
Image: DKO Architecture, MAKO Architecture.

The building is serviced from the north-west corner (at ground level)

Set-down areas create protected communal roof spaces and allow solar penetration to the development on the south

Residents' food growing area

Generous built-in seating and facilities within ample planting on structure encourage social interaction in a comfortable setting to promote a sense of community

Windows are selectively grouped to appear double storey, altering the proportion and scale of the building

2-3 storey townhouses between Lumina and the canal

Strongly legible double-height entry porticos to common lobbies

Facade inclined in response to the building height opposite, creating an interesting riff on a French mansard roof

Apartments are generously sized and there is a wide variety of layouts

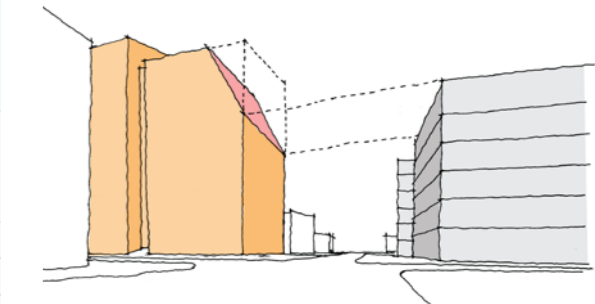
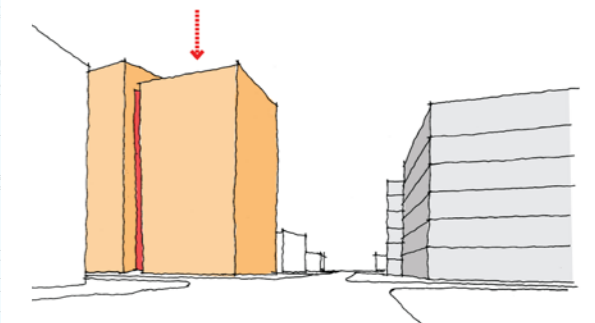
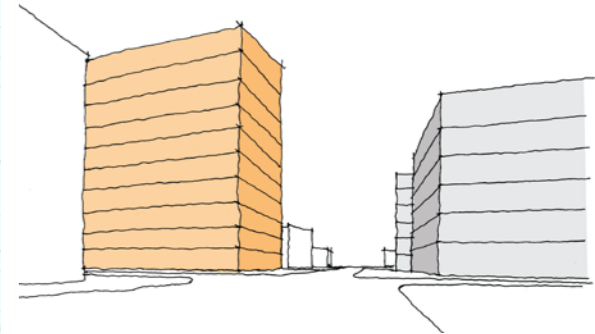
Lower levels of communal rooftops benefit from shade and weather protection and include facilities like table tennis and children's play areas

Gardens are irrigated using rainwater collected in tanks on site

A residents' bicycle hub / communal room is provided on the ground floor

Ground floor retail space activates the street

The architects responded to the key corner approach by shaping the building termination to relate to the building opposite.



Key street corner  
The street wall was manipulated to relate to the existing building opposite. Images: DKO Architecture.



South elevation  
(not to scale)

plan (LEP) allowed for a maximum building height equivalent to 10 storeys. As the result of a negotiation between the applicant and council, a design review panel was appointed to provide guidance and input into the process to vary the planning provisions. This informed the applicant's approach to addressing the planning objectives while pursuing an alternative approval pathway.

In varying the controls to take advantage of the opportunity for additional height, the design distributes different heights to each part of the building, rather than adding storeys evenly across the entire building footprint. This creates visual interest and a highly varied skyline. The high and low portions also work to permit solar access through the site to the south and create protected upper-level roof terraces for communal open spaces.

A second stage of the project provides build-to-rent apartments within a similar built form on the block to the immediate west.

### Response to context

The project responds to each of its 4 ground-level street edge conditions. The short, eastern end of the building fronts the main street leading to the train station and presents retail uses with large, glazed openings and a projecting awning. The long, southern frontage is the primary residential address for the building, and 3 pronounced double-height entry portals extend forward to the meet the footpath with interstitial deep soil landscaping and solid brick fencing mediating privacy to ground floor apartments. The short, western end permits drive-through access for the garbage truck, while the north elevation to the lane provides car park access and ventilation that is well-screened by planting.

## With Lumina, the architects have proposed an alternative model for city-making, one comprised of many smaller buildings.

Lumina is a 7-to 10-storey mixed-use residential flat building within a master-planned precinct, the Thornton Estate, immediately to the north of Penrith train station. The project occupies a whole urban block within the master plan and has been designed to provide a built-form transition between the scale of larger apartment buildings to the south and the fine grain of the smaller terrace houses to the north. Front setbacks are varied along the length of the building to modulate the built form, volumetrically breaking it down into a number of visually discrete components with each piece assigned a different architectural character. The result is a colourful and lively streetscape seemingly comprised of a multitude of separate smaller buildings rather than one large monotonous form.

### Approval pathway

The site was subject to a site-specific development control plan (DCP) limiting the height to 6 storeys, even though the local environmental



Thornton Estate aerial view  
Lumina indicated.  
Image: Nearmap.

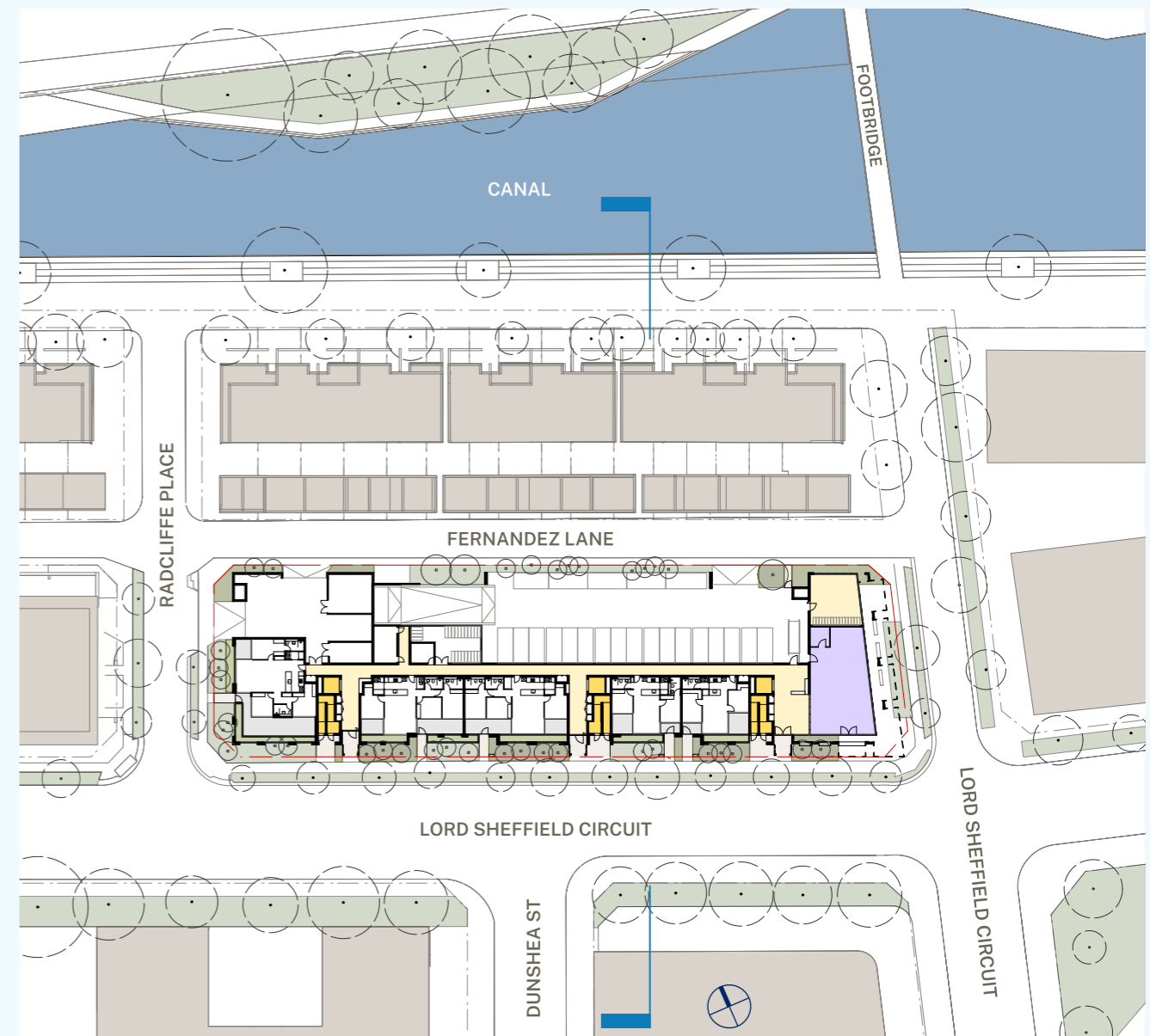


Thornton Estate from the south  
Further development is scheduled for the lot in the foreground.  
Image: The Guthrie Project.



Level 9 plan (top), Level 8 plan (bottom)

Level 7 plan (top), Level 6 plan (bottom)



Site plan with ground floor plan

10 25 50M



## Material animation

The building appearance is animated by playing with its form, materials and facade composition. The topmost floors at the end and centre of the building are inclined to subtly relate to the height of neighbouring buildings as well as to reduce the apparent mass. An exuberant material palette has been intentionally chosen to achieve contrasting qualities that accentuate the expression of the building and lend a different 'personality' to each part, including use of fibre cement sheet for a matt finish, metal cladding for gloss, and face brickwork for texture. Dark-framed windows are selectively grouped to appear double storey, altering the proportion and perceived scale of the building. The range of materials and the detailed facades create a joyful and figured street edge, with clearly defined entries and communities established around the building cores with their elevated gardens.

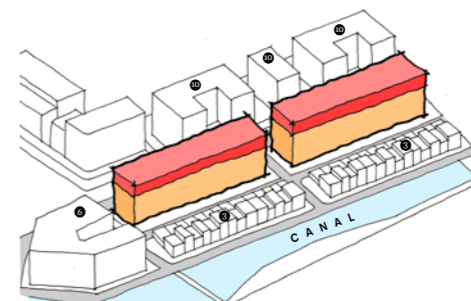
## Entry statement

Two-storey elements signify common entry points. All ground floor dwellings have direct street access. Image: The Guthrie Project.

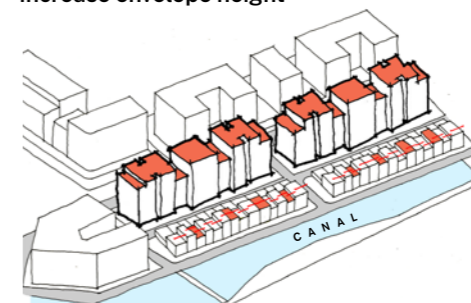


## Articulated to match

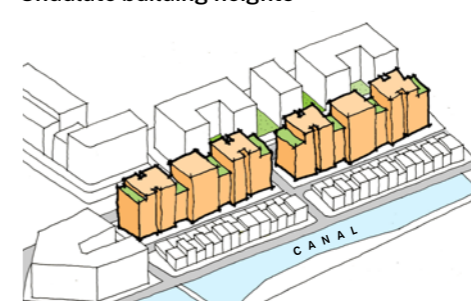
The massing references the terraces that face the canal. Image: The Guthrie Project.



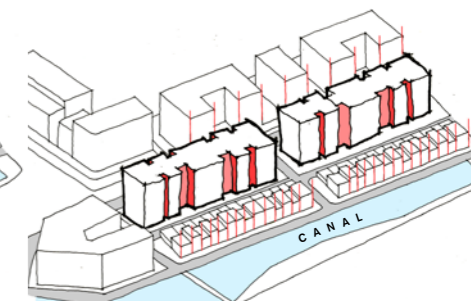
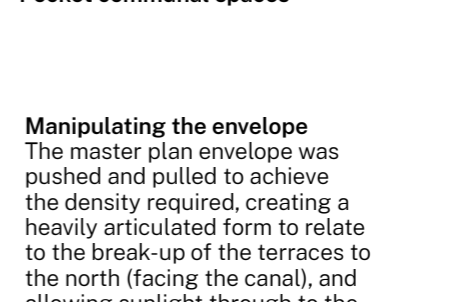
## Increase envelope height



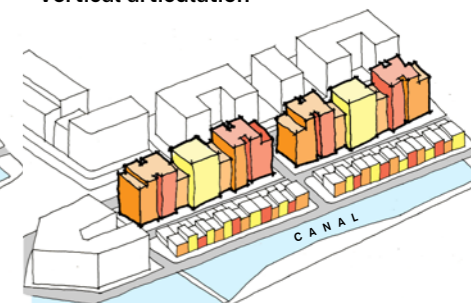
## Undulate building heights



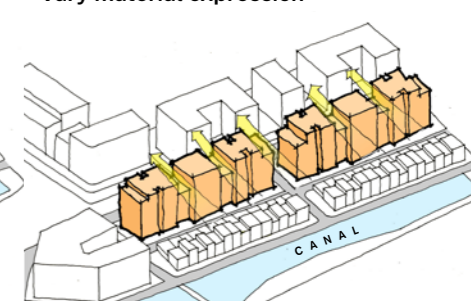
## Pocket communal spaces



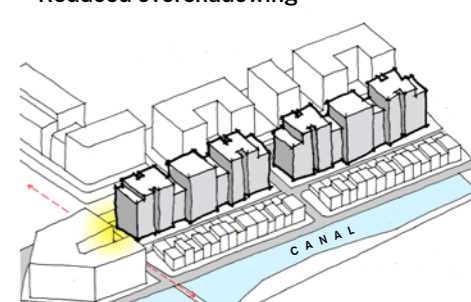
## Vertical articulation



## Vary material expression



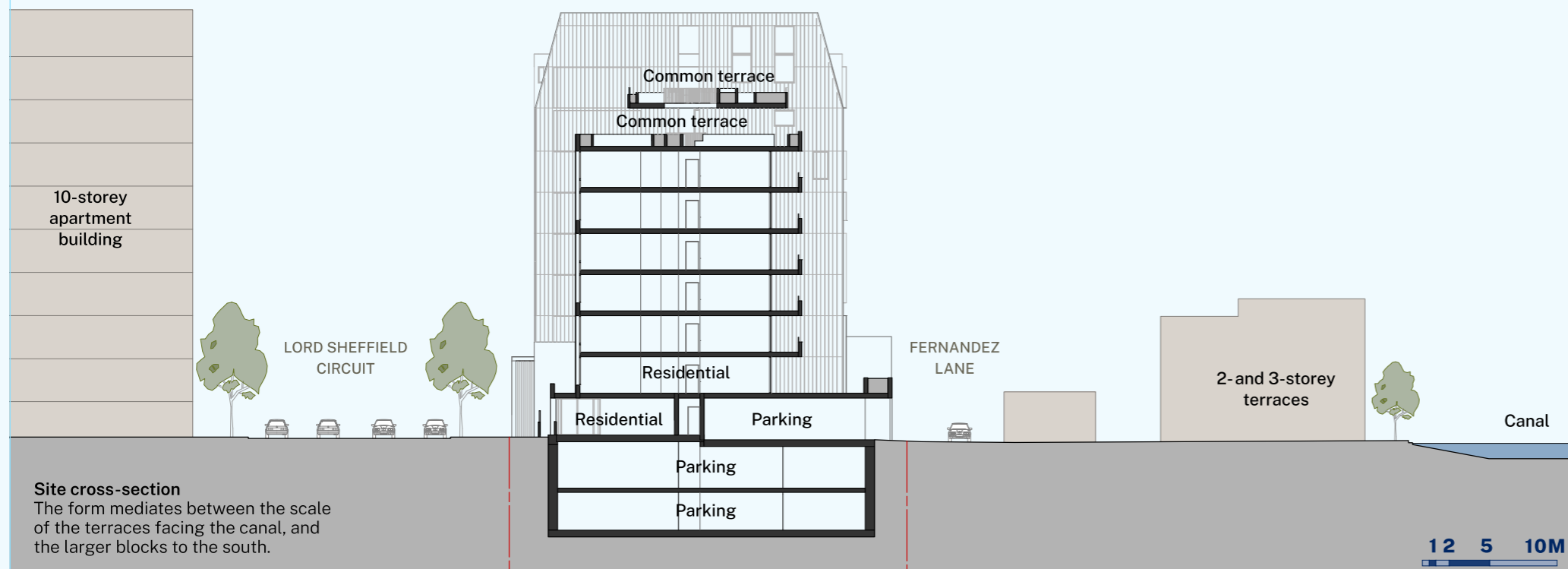
## Reduced overshadowing



## Manipulating the envelope

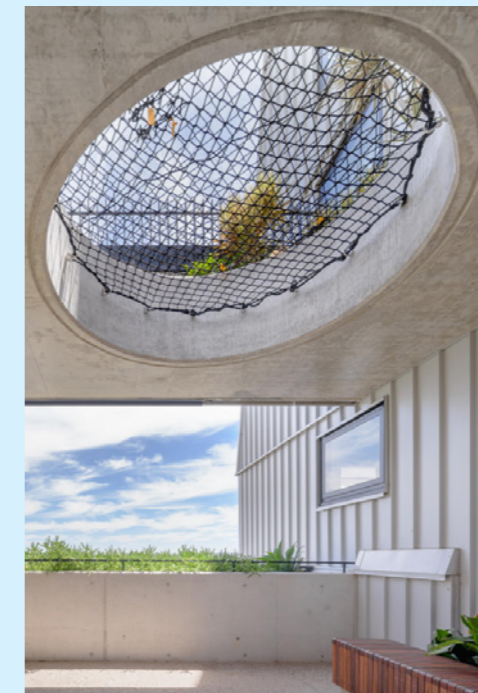
The master plan envelope was pushed and pulled to achieve the density required, creating a heavily articulated form to relate to the break-up of the terraces to the north (facing the canal), and allowing sunlight through to the development to the south. Images: DKO Architecture.

## Address the key corner



## Site cross-section

The form mediates between the scale of the terraces facing the canal, and the larger blocks to the south.



**A series of communal outdoor rooms**  
The communal roof terraces offer all residents a range of activities and experiences, and access to the best outlook and solar access available in the development. All images: The Guthrie Project.

### Developing community

The building has been conceived of as a series of 'vertical villages' arranged around multiple lift cores with groups of 5 or 6 units per floor. This is intended to foster smaller 'communities' within the building, where it becomes possible for neighbours to know one another. This arrangement also cleverly allows for more cross-through apartments, where units have aspects on both sides of the building, thereby achieving natural cross-ventilation and solar access from the prime northern aspect.

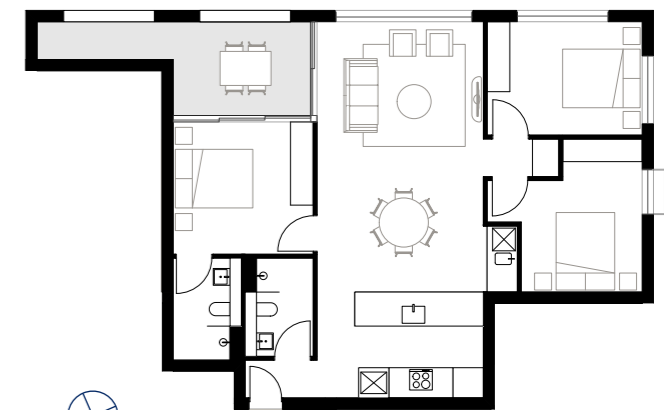
The lift cores are connected at ground level and levels 7 and 8 to allow all residents to conveniently

access all shared parts of the building such as letterboxes and rooftop communal open spaces.

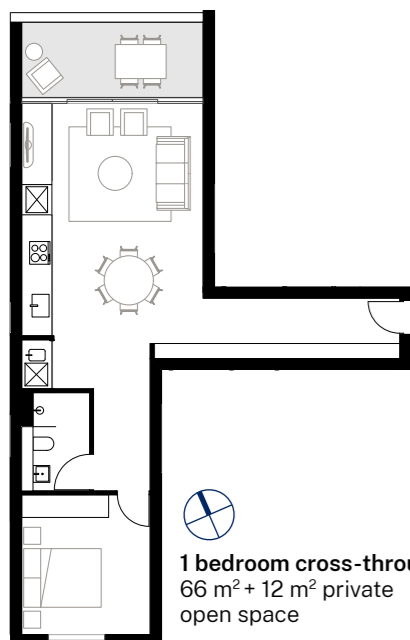
The long east-west orientation of the block demanded the overall building depth be constrained in order to achieve adequate residential amenity. Dual-aspect apartments occupy the outermost corners and the thinner sections of the building body; single-aspect apartments are located centrally, next to lift cores. Most apartments are well above minimum size to suit the suburban location, and the majority of units have north-facing living rooms and balconies with unobstructed views over Penrith. A variety of apartment layouts and sizes are offered to cater to the diversity of potential households.

**'Generous open green zones supporting various resident activities – from relaxation and play, to food production and gatherings ... will foster social interactions between residents and promote a real sense of community.'**

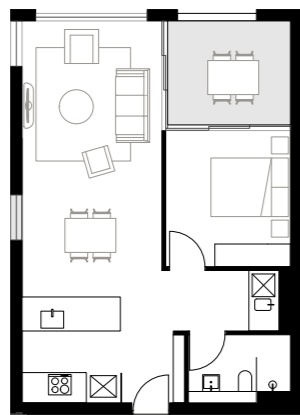
—DKO Architecture



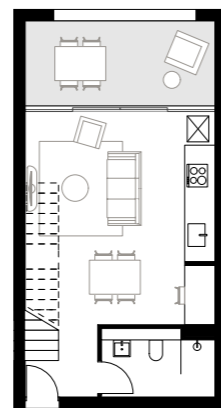
**3 bedroom**  
100 m<sup>2</sup> + 13 m<sup>2</sup> private open space



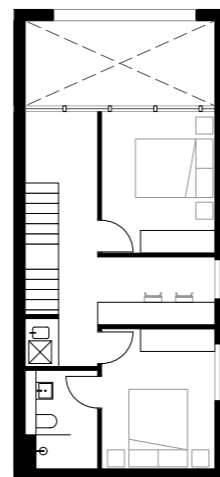
**1 bedroom cross-through**  
66 m<sup>2</sup> + 12 m<sup>2</sup> private open space



**1 bedroom**  
62 m<sup>2</sup> + 9 m<sup>2</sup> private open space



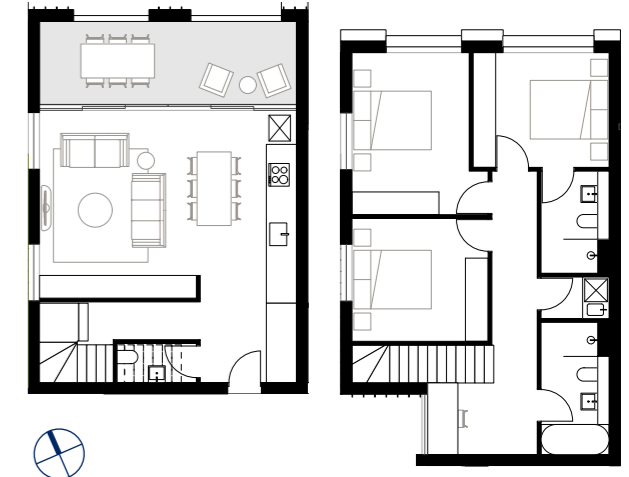
**2 bedroom + study – 2 storey**  
82 m<sup>2</sup> + 11 m<sup>2</sup> private open space  
(117 m<sup>2</sup> roof terrace not shown)



**2 bedroom cross-through adaptable**  
85 m<sup>2</sup> + 12 m<sup>2</sup> private open space



**2 bedroom**  
90 m<sup>2</sup> + 12 m<sup>2</sup> private open space



**3 bedroom + study – 2 storey**  
114 m<sup>2</sup> + 15 m<sup>2</sup> private open space

## LINE OF SIGHT TO THE APARTMENT DESIGN GUIDE (ADG)



### ADG PART 2 DEVELOPING THE CONTROLS

Lumina represents a sophisticated response to the site's envelope controls, with pop-ups on some of the forms to the maximum LEP height limit at 10 storeys, well above the 6-storey limit in the site-specific DCP. In combination with varying setbacks, this creates a rhythmic and interesting streetscape, both on the main street and in the laneway on the north. By not applying the additional storeys uniformly across the building, the sense of each element being a separate element is emphasised. The 'blockouts' in the top 3 storeys create a haven that is used to great effect for communal open space, but also allows solar penetration to the apartment block to the south.

Working within the existing master plan, the shallow 29.5-m block depth results in shallow building depths between 15 and 22 m including balconies. This, combined with 3 cores serving only 5–6 units each, results in high levels of amenity. The south facade is characterised by punched windows, whereas the northern side features more expansive openings, to capture winter sun. For a site with such a long axis facing north, and thereby an equally long facade to the south, the project manages well to achieve over 70% of apartments with 2 hours of solar access to living areas and private open space between 9 am and 3 pm in midwinter.

The project also meets the design criteria for deep soil, and supplements this with extensive green cover, with trellised wall treatments and extensive planting.



### ADG 3D COMMUNAL AND PUBLIC OPEN SPACE OBJECTIVE 3D-1:

An adequate area of communal open space is provided to enhance residential amenity and to provide opportunities for landscaping

#### OBJECTIVE 3D-2:

Communal open space is designed to allow for a range of activities, respond to site conditions and be attractive and inviting

Communal open spaces were not envisaged at ground level; roof tops provide the required 25% of site area. Rather than being located on the exposed topmost roof level, the variations in building height allow protected communal open spaces to be integrated at lower levels and accessed horizontally from the building corridors. An upper platform provides options for different social groupings as well as welcome shade below. The provision of communal open space on rooftops was surprisingly successful and became a key selling point for the development. Much attention was given to the design of these spaces to ensure their success as the social focus of the building. Specific 'programming' through design elements meant that a wide variety of communal activities were anticipated and supported. A play area for children includes a swing, table tennis area and a suspended net. Vegetable patches encourage gardening. Barbecue facilities and tables enable entertaining for larger groups. A dedicated dog area reinforces the pet-friendliness of the building. Locating the communal spaces at the top of the building allows all residents to share and benefit from the best views and amenity.



### ADG 3G PEDESTRIAN ACCESS AND ENTRIES OBJECTIVE 3G-1:

Building entries and pedestrian access connects to and addresses the public domain

#### OBJECTIVE 3G-2:

Access, entries and pathways are accessible and easy to identify

Three clearly legible double-height entries for the lift cores face the main street, and street activation is complemented by a retail use on the eastern end of the ground floor, a bike hub on the north-east corner, and multiple direct street entries for ground floor apartments. The street interface is treated with deep soil landscaping to provide some privacy to ground floor private open space, in addition to solid balustrades.

### ADG 4D APARTMENT SIZE AND LAYOUT OBJECTIVE 4D-1:

The layout of rooms within an apartment is functional, well organised and provides a high standard of amenity

Apartments in Lumina are typically oversized and have generous balconies. The larger size was seen as advantageous in a suburb where single dwelling houses are the norm. There is a huge variety of apartment layouts available, from one-bedroom cross-through apartments to 2- and 3-bedroom 2-storey apartments on the upper levels. Larger 3-bedroom units are distributed through the building, with more at ground and upper levels where private or communal space is available. The architects believed the varied layouts would in turn appeal to a wide cross-section of residents, creating a diverse community.



A bold street address  
All images: The Guthrie Project.