FORBES RESIDENCES

DESIGN REPORT_REV B

13 December 2018

The following Design Report is in support of the application for

10-14 FORBES ROAD &
40A,B,C KISHORN ROAD
APPLECROSS

submitted on Monday 19 November, and incorporating feedback from the Design Review Panel.

KEY CHANGES INVOLVE:

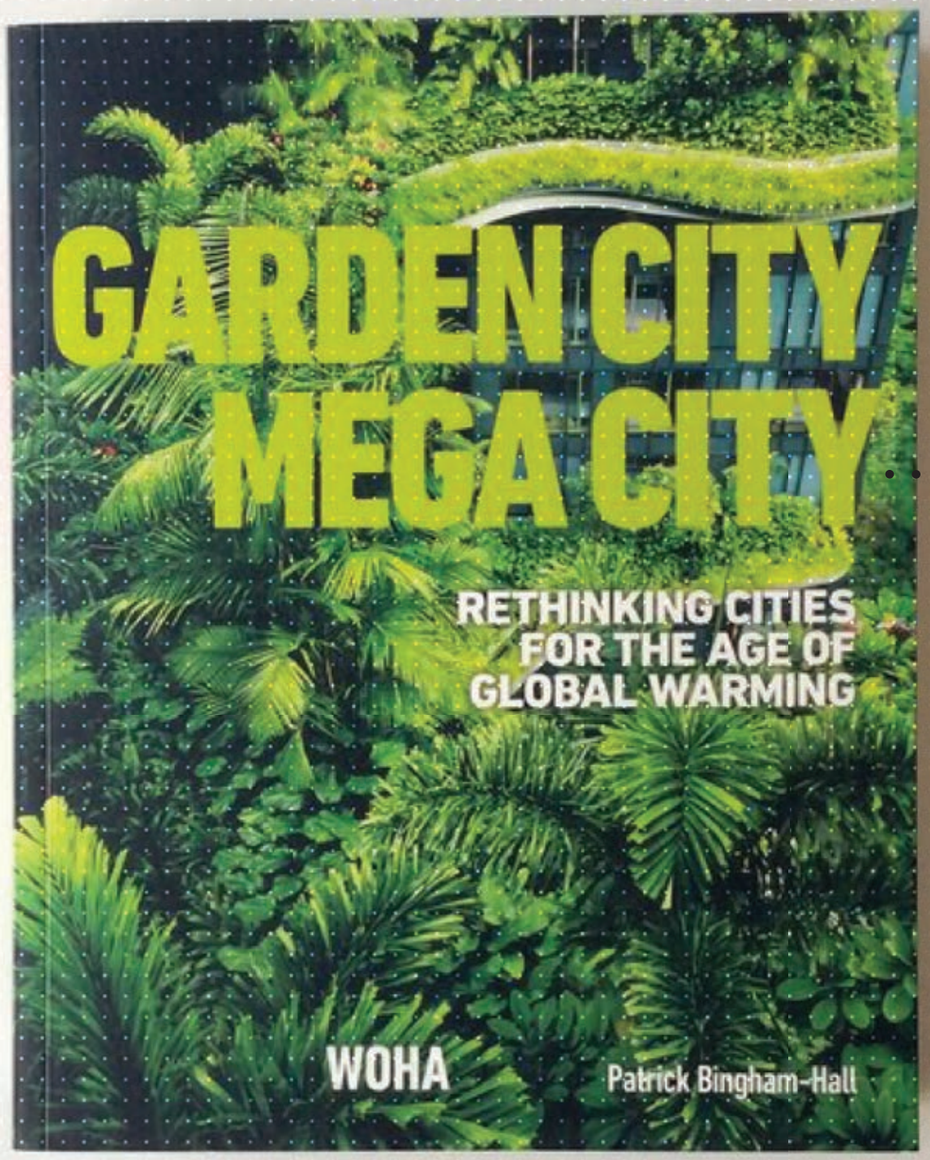
- Increased setbacks to the north, east and south boundaries (now over 4m)
- Short Stay Apartments removed from Level 1
- Reduced floorplate size
- Three crossovers reduced to one
- New public stair added for direct access to Community Garden
- Additional street level analysis now provided
- Shadow diagrams now provided
- Deep Soil Zone (Landscape Areas) analysis

NOW PROVIDED IN APPENDIX:

- Wind Analysis
- Waste Management Report
- Transport Impact Statement
- Landscape Design Report, with detailed water, wind and landscaping strategy

W O H A x MJA

CONTENTS



FROM THE GROUND UP, THIS PROJECT HAS BEEN CAREFULLY CONSIDERED IN REGARDS TO WOHA'S FIVE RATINGS, OUTLINED IN THEIR BOOK:

GARDEN CITY MEGA CITY:
RETHINKING CITIES FOR THE AGE OF GLOBAL WARMING
WOHA & Patrick Bingham-Hall, Pesaro Publishing

The Five Ratings were conceived by WOHA to address antiquated & ineffective planning metrics, where measures of success were based purely on economic productivity and capital cost efficiency, rather than their overall contribution to the city as components within a self-sufficient system.

Cities must now be made of, by and for people. Sociable architecture and sustainable cities have now become the 21st Century priorities, and building developments need to be assessed in terms of their contribution to social and environmental sustainability, as well as their economic viability.

In order to redirect the priorities of 20th century rationalist (de-personalised) planning, and to emphatically reinstall the notion of the 'greater good', WOHA have created 5 new social and ecological ratings for all city developments.

WOHA'S FIVE RATINGS:

1 Green Plot Ratio

The amount of landscaped surfaces compared to a development's site area.

The measurement includes all new and preserved vegetation, vertical and horizontal landscaping, water features, lawns and trees, raised planters, and urban farms.

All buildings need to encourage bio-diversity, reduce the urban heat island effect, provide shade and cooling, improve air quality, soften the harshness of the cityscape, restore wildlife habitats, and re-connect people with nature.

2 Community Plot Ratio

The amount of community space allocated within a development's site area.

The measurement includes fully public areas, semi-private communal spaces, care centres, libraries, restaurants, cafés, and community centres.

The amenity of an urban precinct is largely determined by the quantity and quality of its community spaces. The buildings should encourage human interaction and facilitate social gatherings. Human scale, accessibility, and inclusivity, are crucial to the success of community integration.

3 Civic Generosity Index

The extent to which a development encourages and facilitates the public life of a city.

The index rates the value of a development's public attributes, such as urban connections, shared relaxation areas, sheltered walkways, gardens, and artworks.

In a sociable city, buildings should be judged by their 'human' characteristics…are they friendly, generous, and accommodating?

4 Ecosystem Contribution Index

The degree to which a development supplements a city's ecosystem.

The index rates a building's capacity to maintain connections between natural habitats; its intention to provide food, water and shelter for local wildlife, and settings for native plants; and its implementation of an environmentally sensitive method for water management.

As land in cities can be more successfully adapted for wildlife preservation than that of agricultural zones, building developments now play a key role in regenerating a city's (and a region's) ecological processes. In order to reverse the unprecedented environmental degradation caused by rapid urbanisation, a city's architects, planners, and developers must view buildings as homes for flora and fauna, as well as people.

5 Self-Sufficiency Index

A development's capacity to provide its own energy, food and water.

The index rates the success of a development's energy, food and water production; the amount of its surfaces allocated to solar collection and urban farming; and the extent of its systems for recycling and harvesting natural resources.

In a sustainable city, buildings must aim to be completely self-sufficient… they must produce as much energy as they consume, and preferably more, in order to compensate for existing high-maintenance buildings.

We have evaluated Forbes Residences against these ratings and summarise the results on page 67

10_Principles

CONTEXT+ CHARACTER

Perth needs to densify, but there's a resistance to highrise housing...

The quarter-acre block with a back lawn, a shed and a hills hoist is a cultural icon and many are resistant to other, denser forms of housing...

...a threat to Perth's laidback suburban lifestyle?

To them, the future **seems worse...**

less green and more **crowded, noisy, & congested.** certainly very different to the present

The question we're asking is...

HOW CAN WE MAKE DENSER HOUSING THAT ACTUALLY GIVES MORE OF WHAT WE LOVE?

Can Applecross be more pleasant, leafier, quieter, and yet with more facilities, more support for long term and older residents?

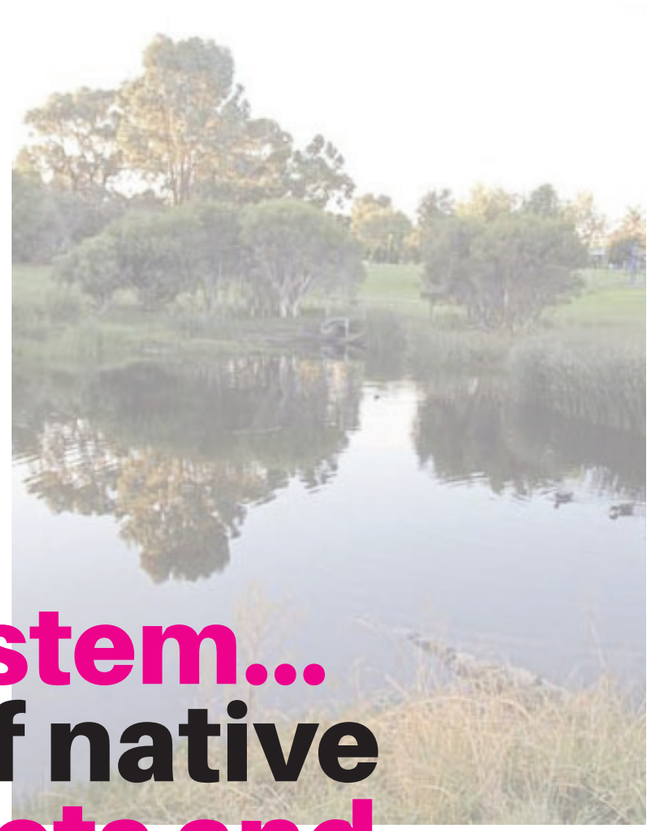
Can Applecross share more of itself with friends, relatives and new arrivals?

Multi-level housing is usually perceived as something which takes away from the district and doesn't give back...

This project will challenge that notion...

Forbes Residences will use the space we create in the sky for more than just homes...

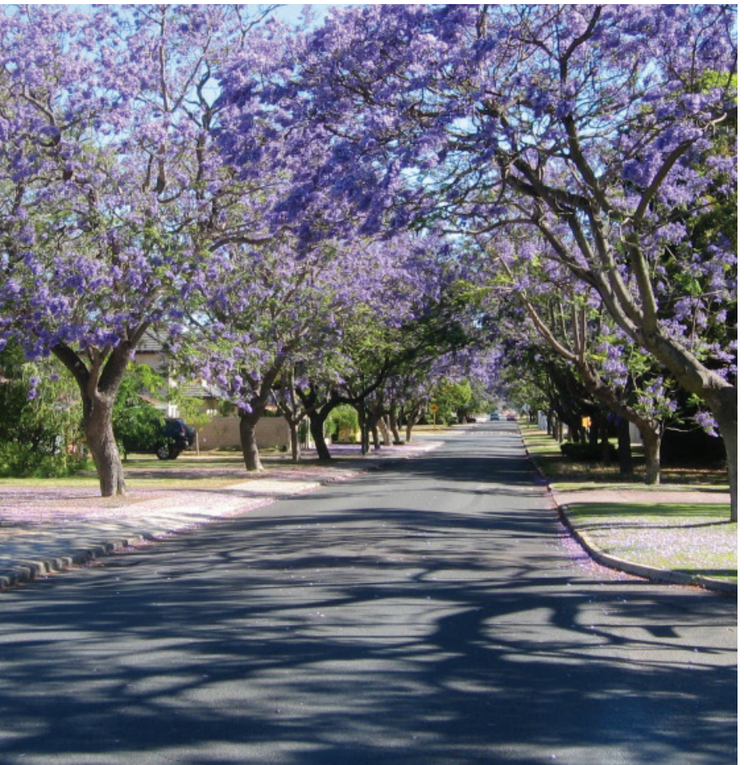
Gardens and playgrounds will create even more spaces for birds and animals, whilst solving water and energy needs



It will create its own Eco-system... with a beautiful landscape of native plants, attracting birds, insects and animals as it treats waste water for use in the gardens

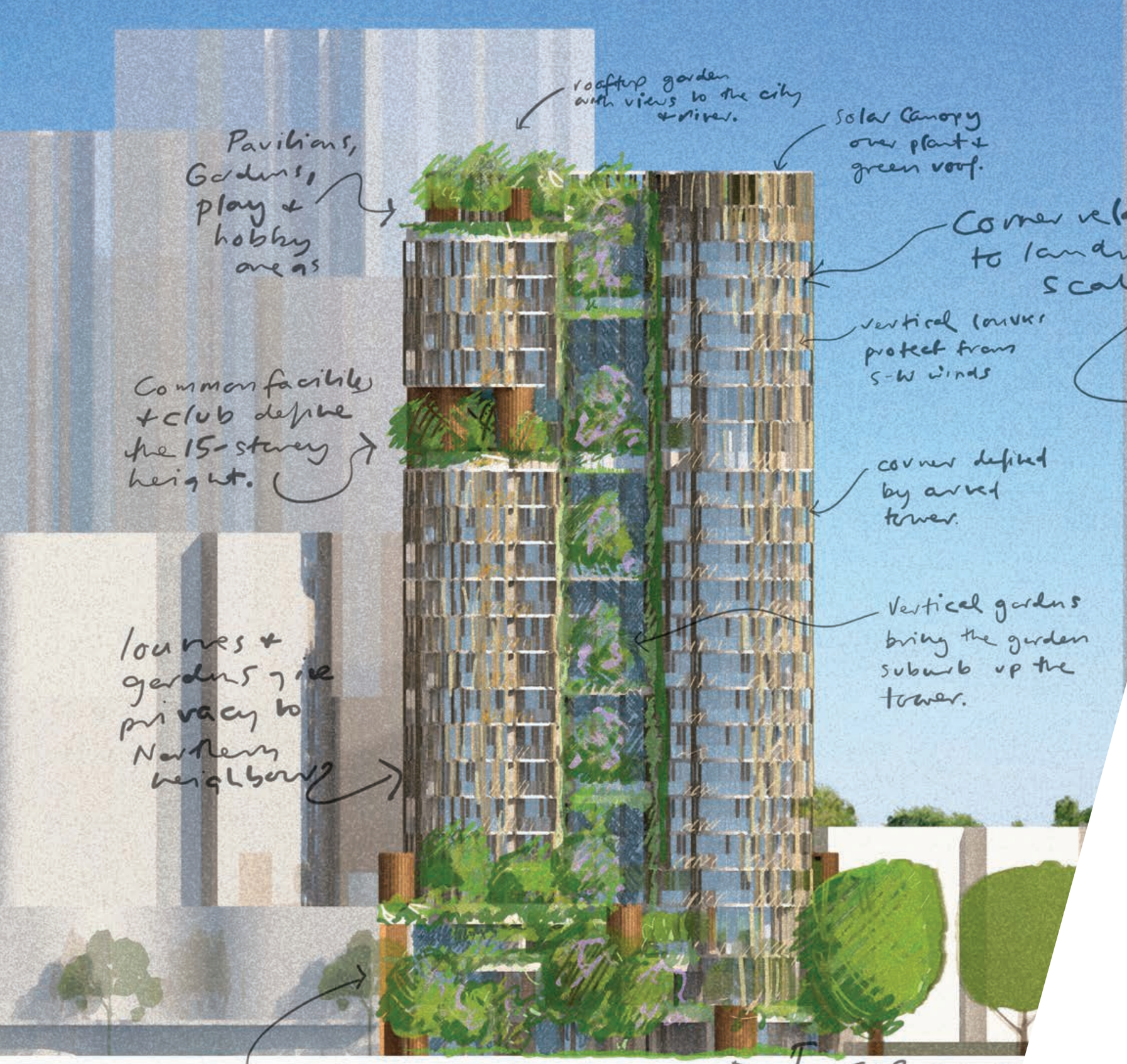
Every three floors will have a vibrant Skygarden

The segmentation of the building into separate **three storey neighbourhoods** facilitates a sense of community. Interactions are kept intimate, with neighbours able to build **quality relationships** with each other.



The design and layout references and extends Applecross vertically

The Skygardens will be shared by **21 apartments.** There are **21 dwellings on the average Applecross street block**. The vertical spacing of the trees in each Skygarden also references the **distance between trees at street level.**

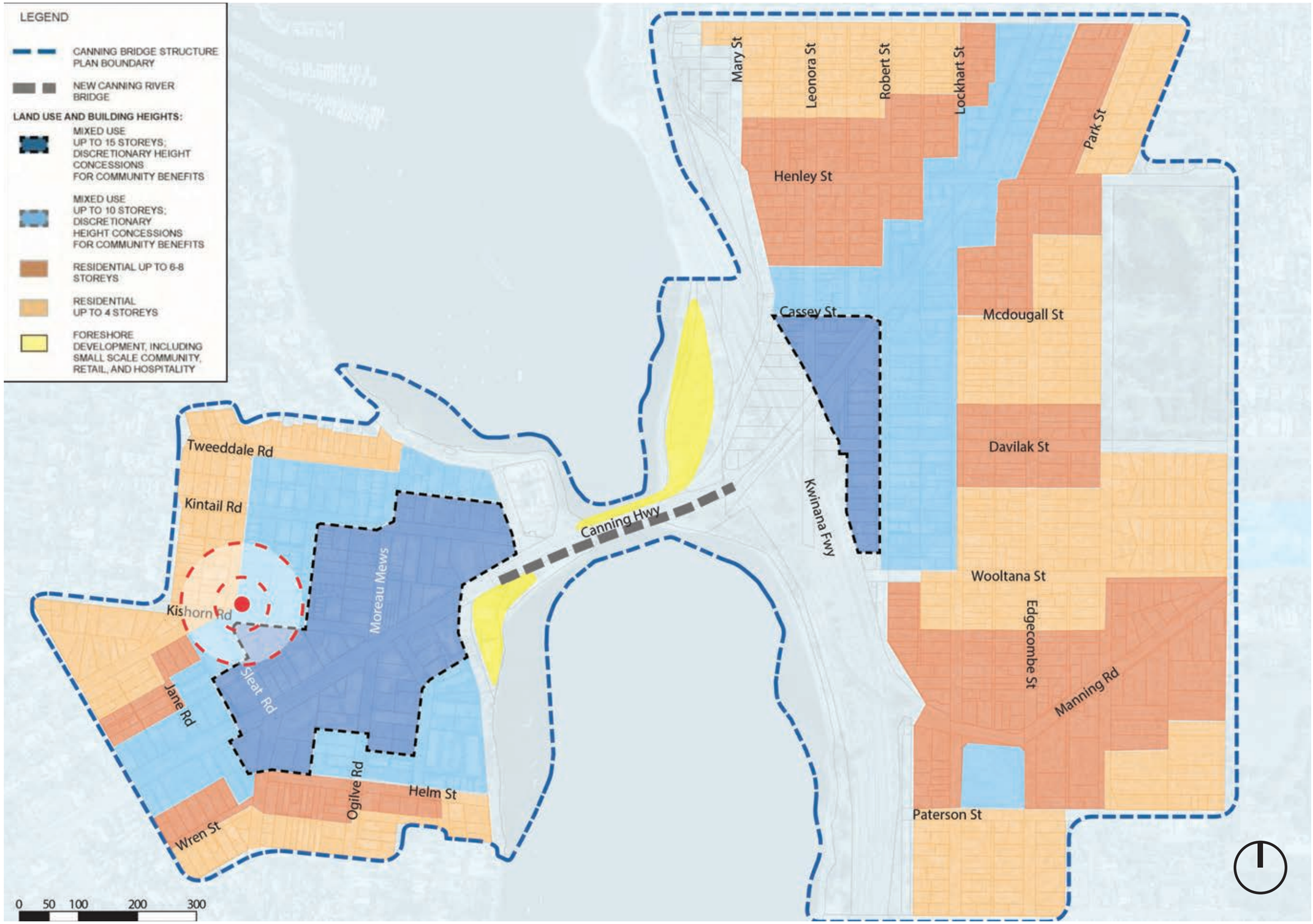


It's a vertical Applecross in the sky, speaking to the past by giving us what we need for the future

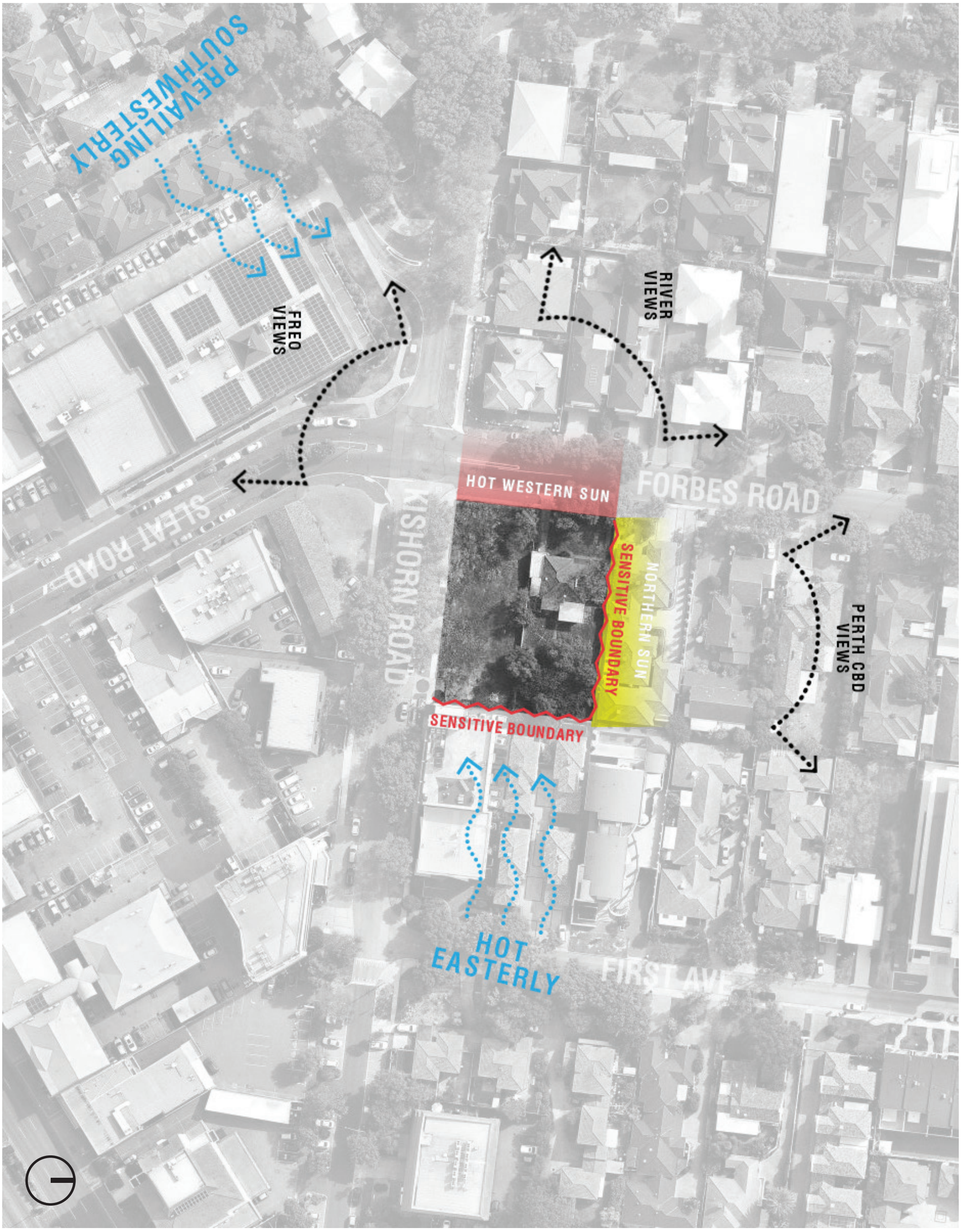
SITE_

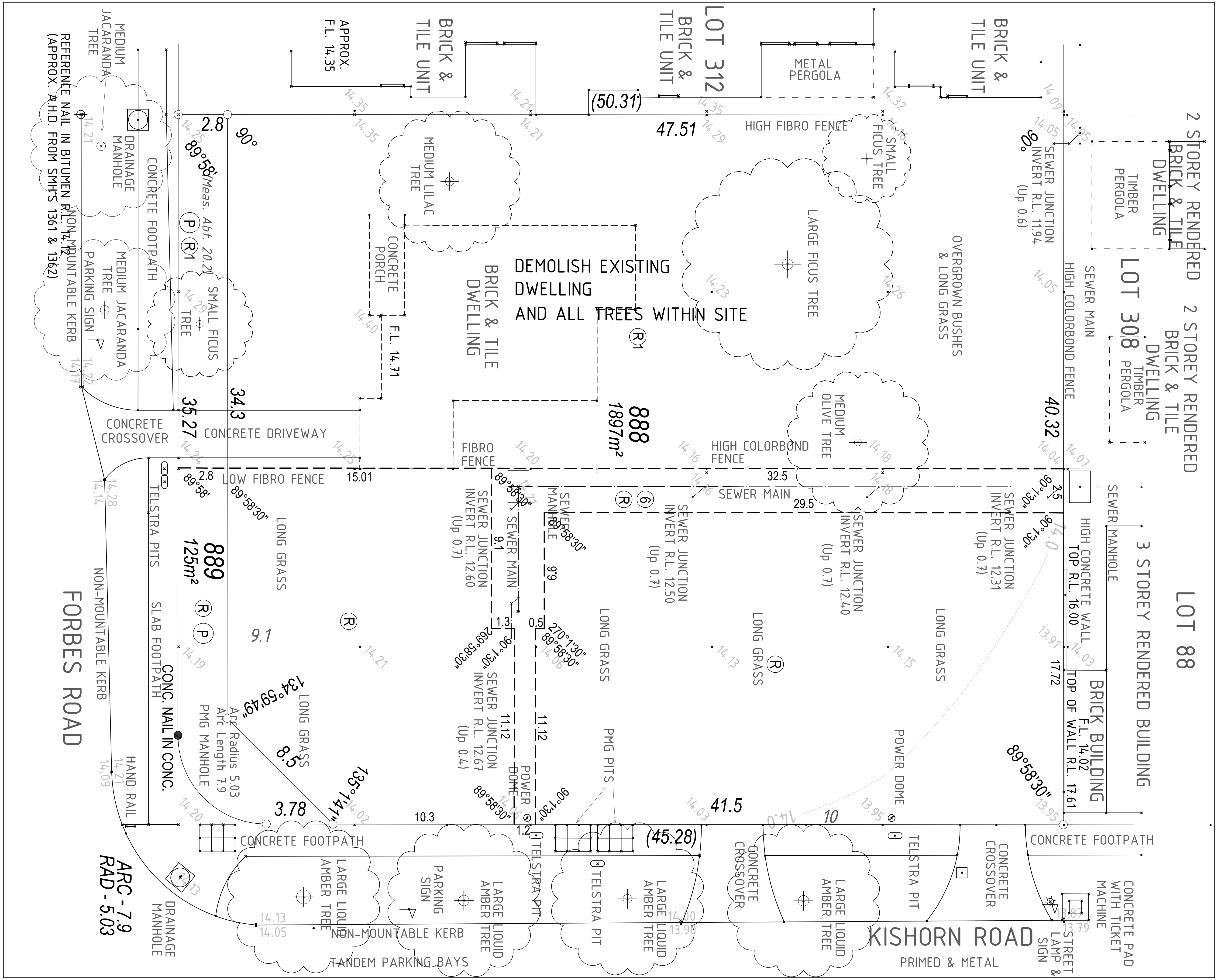
10-14 Forbes Road & 40A,B,C Kishorn Road Applecross

SITE_ Canning bridge Activity Centre Plan



SITE_ Analysis





WOHA x MJA studio

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REV.	DATE	AMENDMENT	INIT.
1	18.11.18	DA ISSUE	MEC

CARLTON SURVEYS
Licensed Surveyors
SUITE 4, 160 BURSWOOD ROAD,
BURSWOOD, W.A., 6100.
TEL 9361 5358 FAX 9361 3457
E-mail : carlton@carlton-surveys.com.au

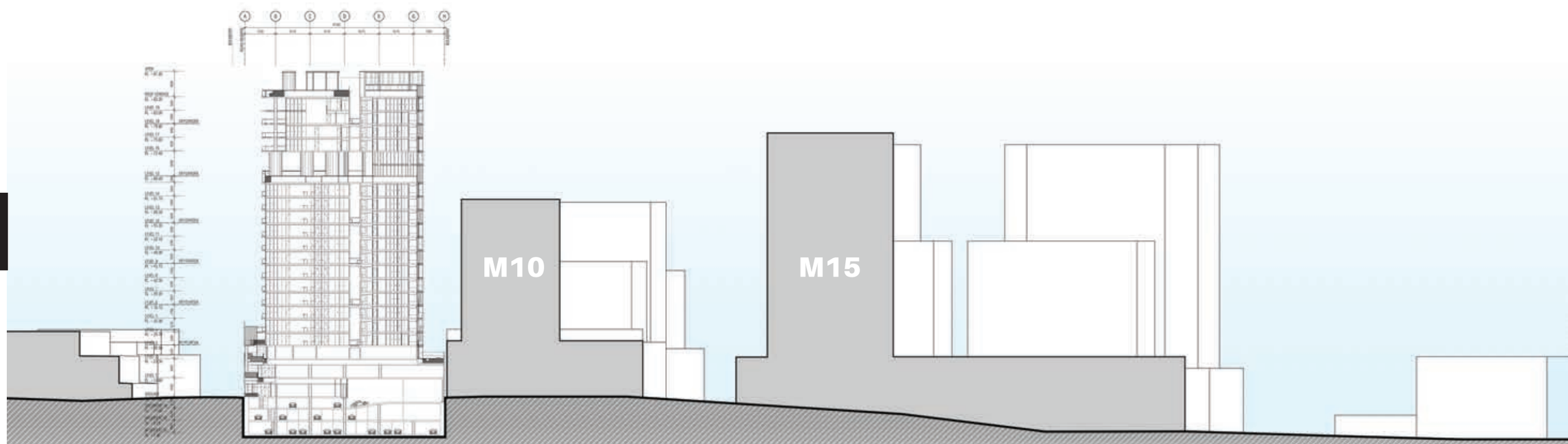
CONTOUR AND FEATURE SURVEY OF LOTS 311 & 800 - 804 INCLUSIVE
#10-14 FORBES ROAD &
#40A-40C KISHORN RD,
APPLECROSS

CLIENT
APEX VIEW PTY LTD
PROJECT
FORBES RESIDENCES
PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS
MJA PROJECT NUMBER
18003
TRUE NORTH PROJECT NORTH
SCALE
1:200 @ A3
STATUS
ISSUED FOR DA
DRAWING
EXISTING SITE SURVEY

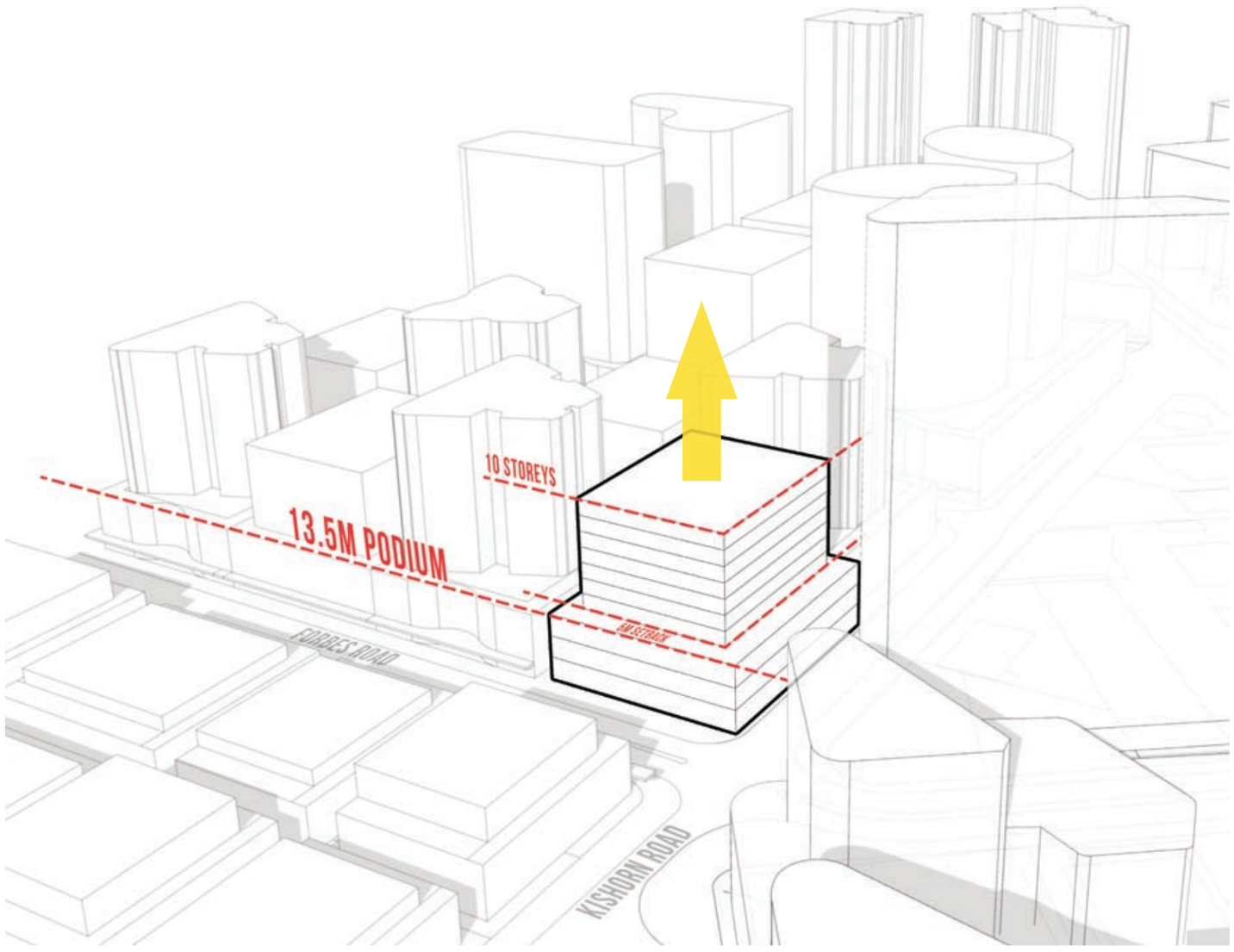
DRAWING NO.	DRAFTER	CHECKED	REV.
DA.01	MEC	MEC	1

SITE_ Plan / Section

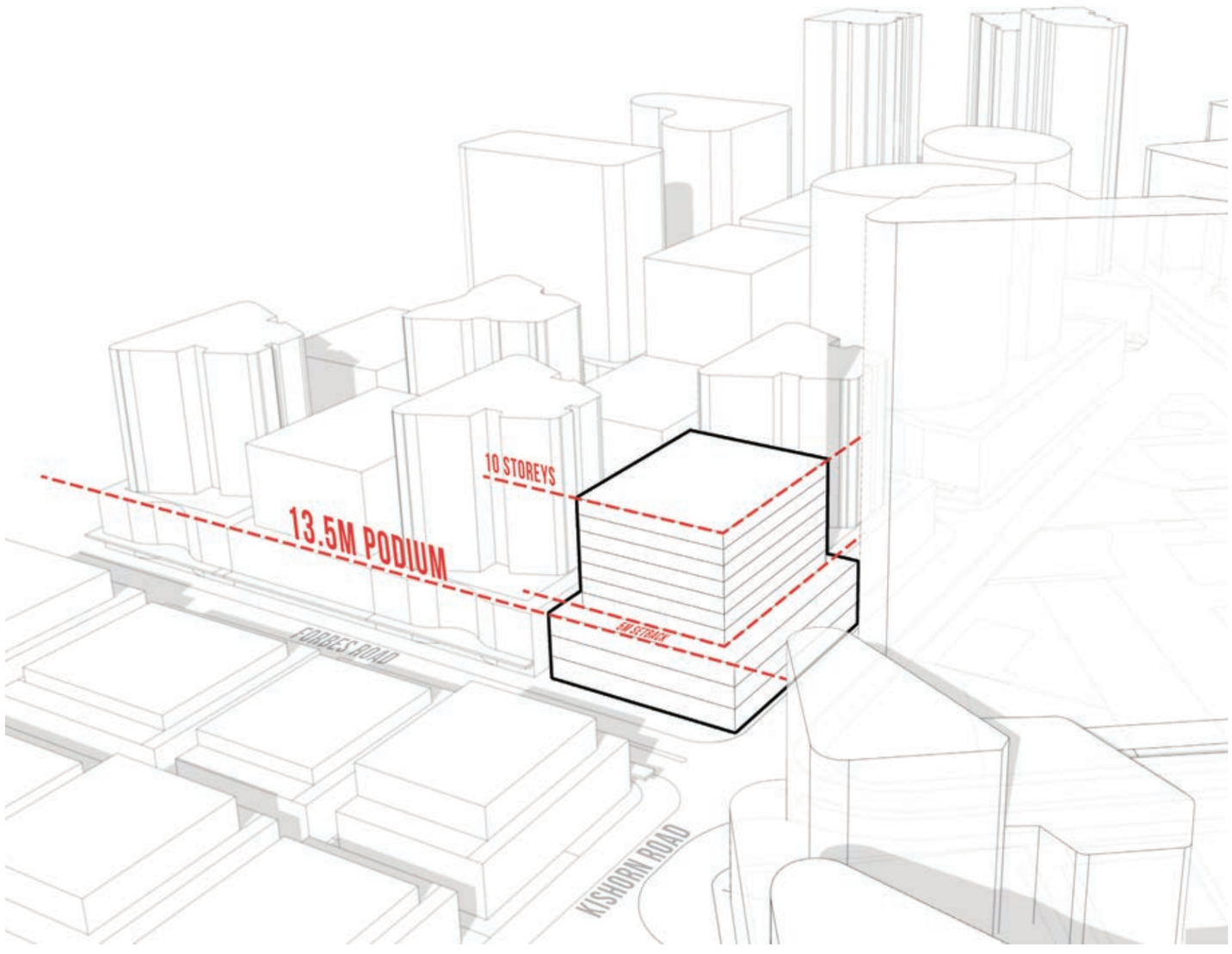
Site Plan 1:1000



Site Section 1:1000 (shown with neighbouring 15 storeys with discretion)

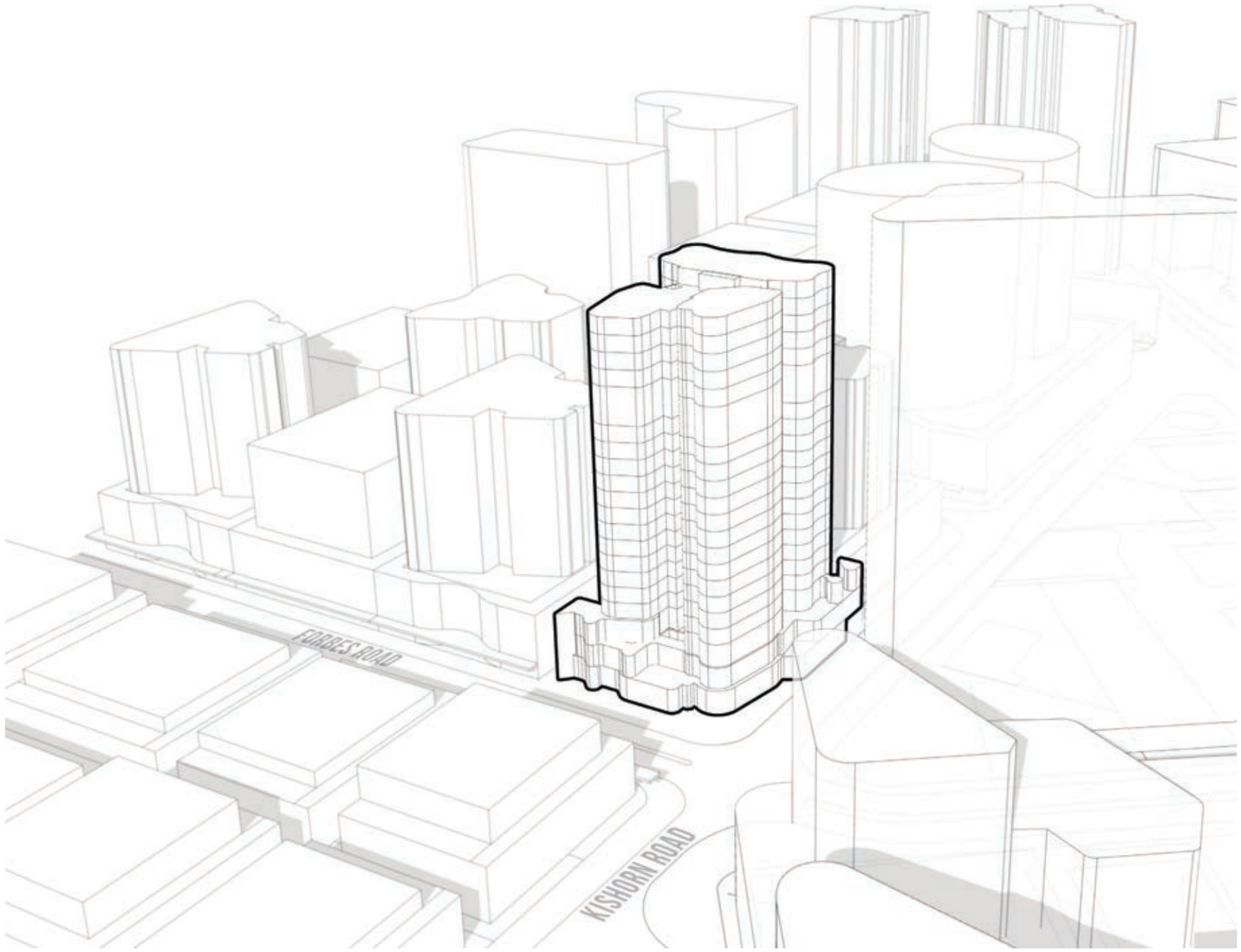


We understand that to go above 10 stories we need discretion and must comply with all clauses of element 21, plus at least four clauses of element 22 of the Canning Bridge Activity Centre Plan (CBACP)



A 10 storey compliant building in the M10 zone (built out to its maximum setbacks) has 15,988m² of total floor plate area*

*see TOTAL FLOOR PLATE COMPARISON table, page 40



Forbes Residences has a total floor plate area of 23,352m²

23352m² - 15988m² = 7,364m²

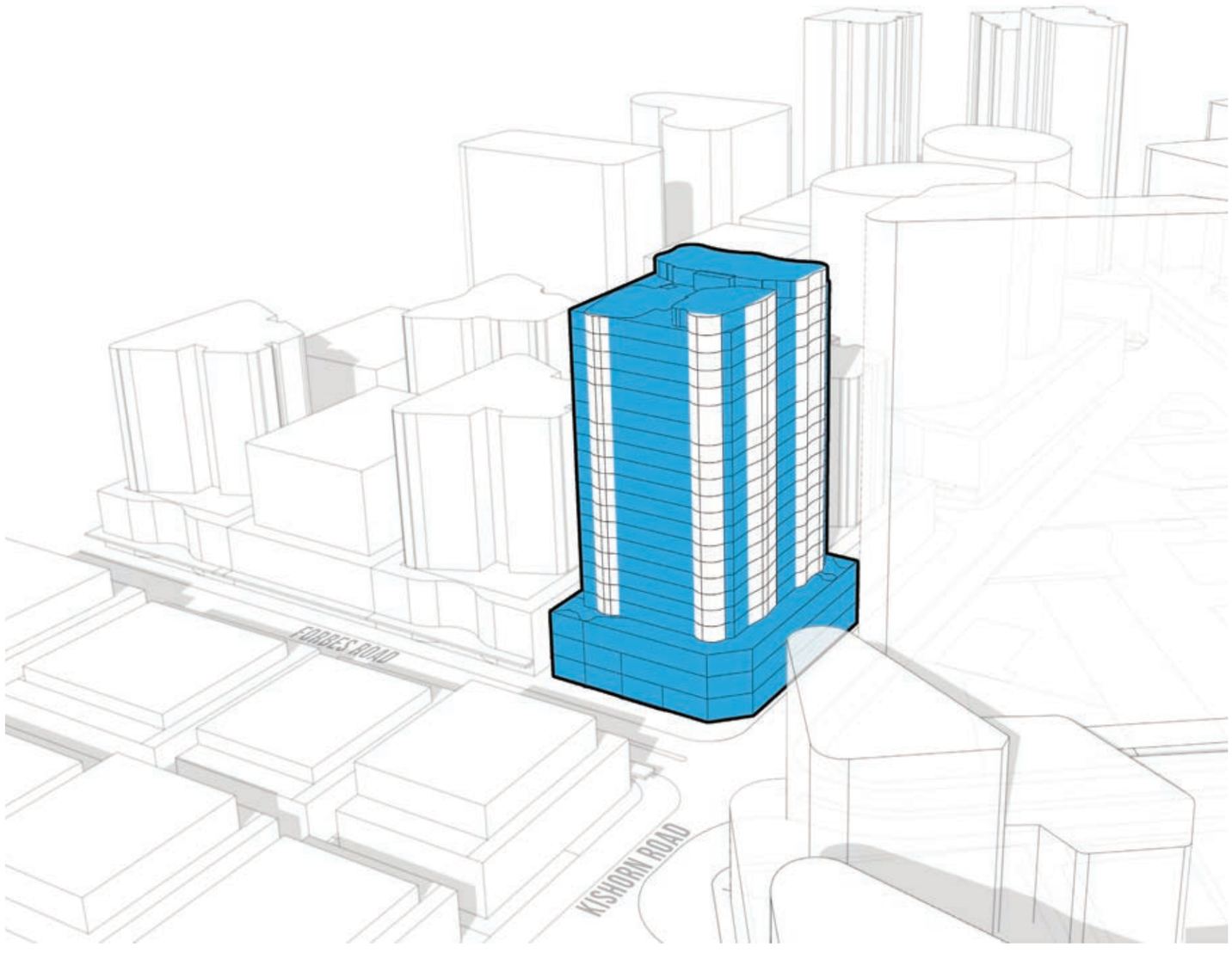
Forbes Residences — 10 Storey Complaint

We therefore recognise that we have an increase in floor plate area of

7,364m²

over a compliant 10 storey building

*see TOTAL FLOOR PLATE COMPARISON table, page 40



In response to this, Forbes Residences is over & above setback requirements, significantly reducing excess bulk and overshadowing.

The sculpted form results in an averaged setback increase of 4,643m²

This can be subtracted from our initial increase of floor plate area:

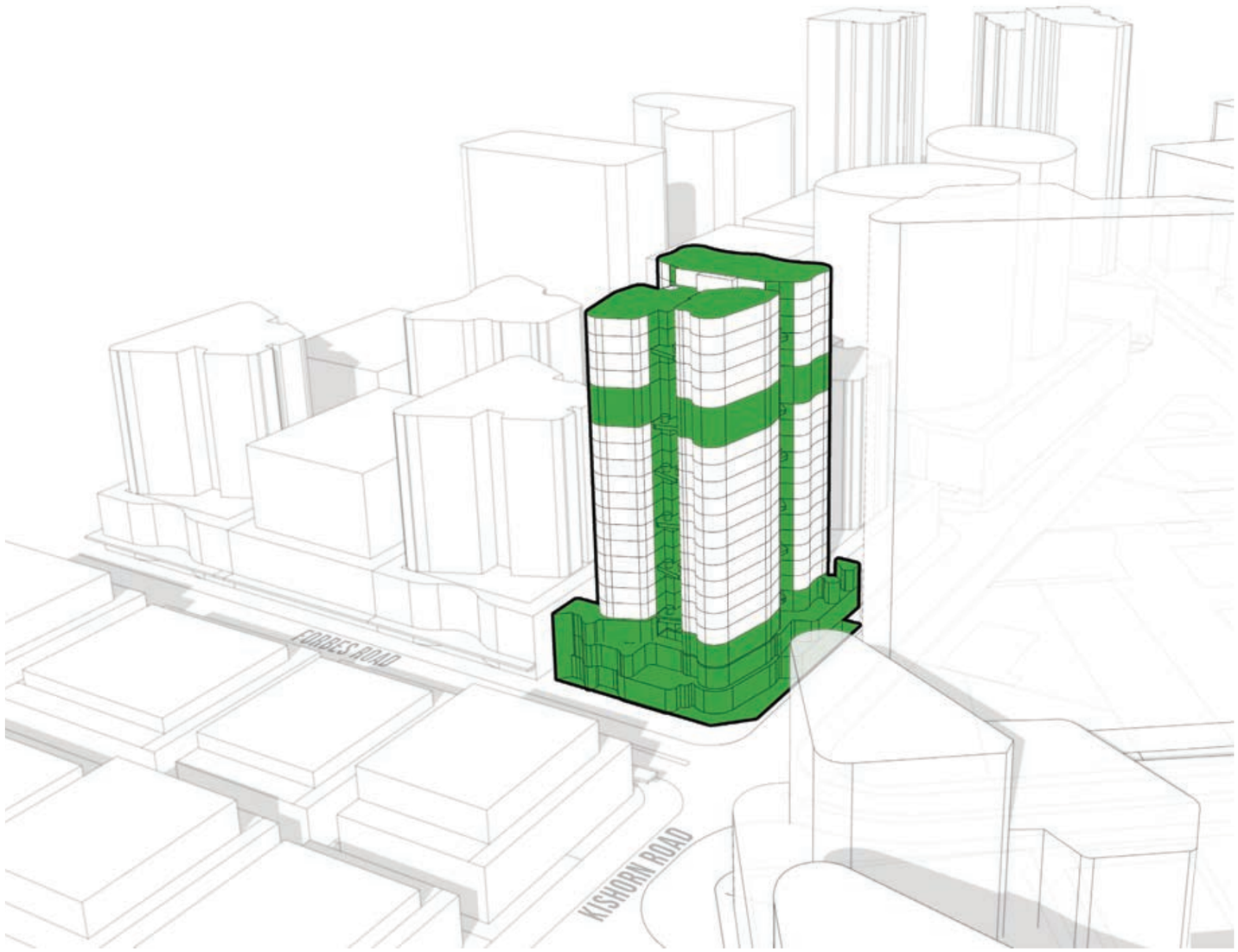
7364m² - 4643m²

Increase of floor plate area (m²)

Averaged Setback Increase (m²)

= 2,721m²

New increase of floor plate area



We are also over & above open space & landscaping, with a total landscaping area of 5478m²

… or 3455m² more than the minimum required in the CBACP

2721m² - 3455m²

Current increase of floor plate area (m2)

landscaping area increase (m²)

= -734m²

New *surplus* of floor plate area

*see LANDSCAPE AREAS table, page 53

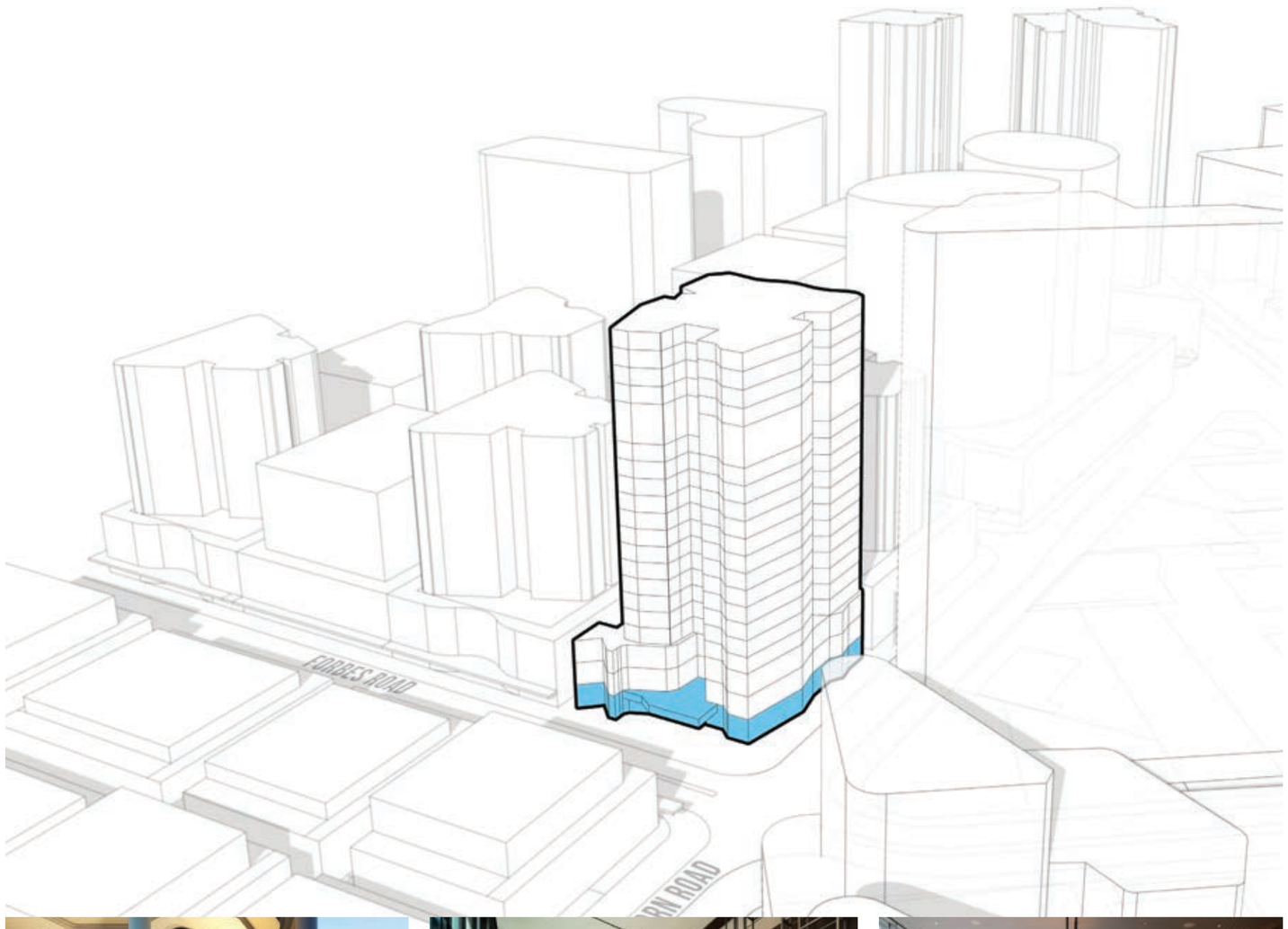
This means that from a starting increase in floor plate area of 7,364m²...

...through considered design strategies we have not only reduced this number to ZERO but have in fact gone past it into the negative, which means we're actually now providing an additional surplus of +734m²

We meet all six requirements of Element 21, with:

21.1 Exemplary design is proposed in the opinion of the Design Advisory Group; and	✓ + Exemplary design (pending)
21.2 For development in the M15 Zone, the site shall have a minimum area of 2,600 m2; or	(not applicable)
21.3 For development in the M10 Zone, the site shall have a minimum area of 2,000 m2.	✓ + Complies (site area, 2023m²)
21.4 In addition to Clause 21.1 and Clause 21.2 or 21.3, the applicant proposes the following:	
21.4.1 The proposed development has been designed with regard for solar access for adjacent properties taking into account outdoor living areas, major openings to habitable rooms, solar collectors and balconies.	✓ + See Overshadowing Analysis - page 41
21.4.2 The proposed development meets or exceeds a 5 Star rating under the national rating scheme of the Green Building Council of Australia.	✓ + See Sustainability - page 58
21.4.3 A traffic statement is submitted showing that the additional floorspace allowed will not unduly impact on the surrounding centre.	✓ + See Traffic Management Report - Appendix
21.4.4 The proposed development includes the provision of infrastructure which supports area wide resource efficiency, such as plant and equipment required to reduce the demand for either building or area wide service infrastructure	✓ + Naturally ventilated basement via wind scoops + Naturally ventilated corridors & lobbies + Greywater dripline reticulation system + Three points of daylight to floor plate, reducing need for artificial lighting + Photo Voltaics See more: Sustainability - page 58

...and we meet seven requirements of Element 22:



Element 22.1.1 *(1 of 7)*

High quality active street frontages, furniture and landscaping

Compliant frontage:

76 metres
(82m - 6m crossover)

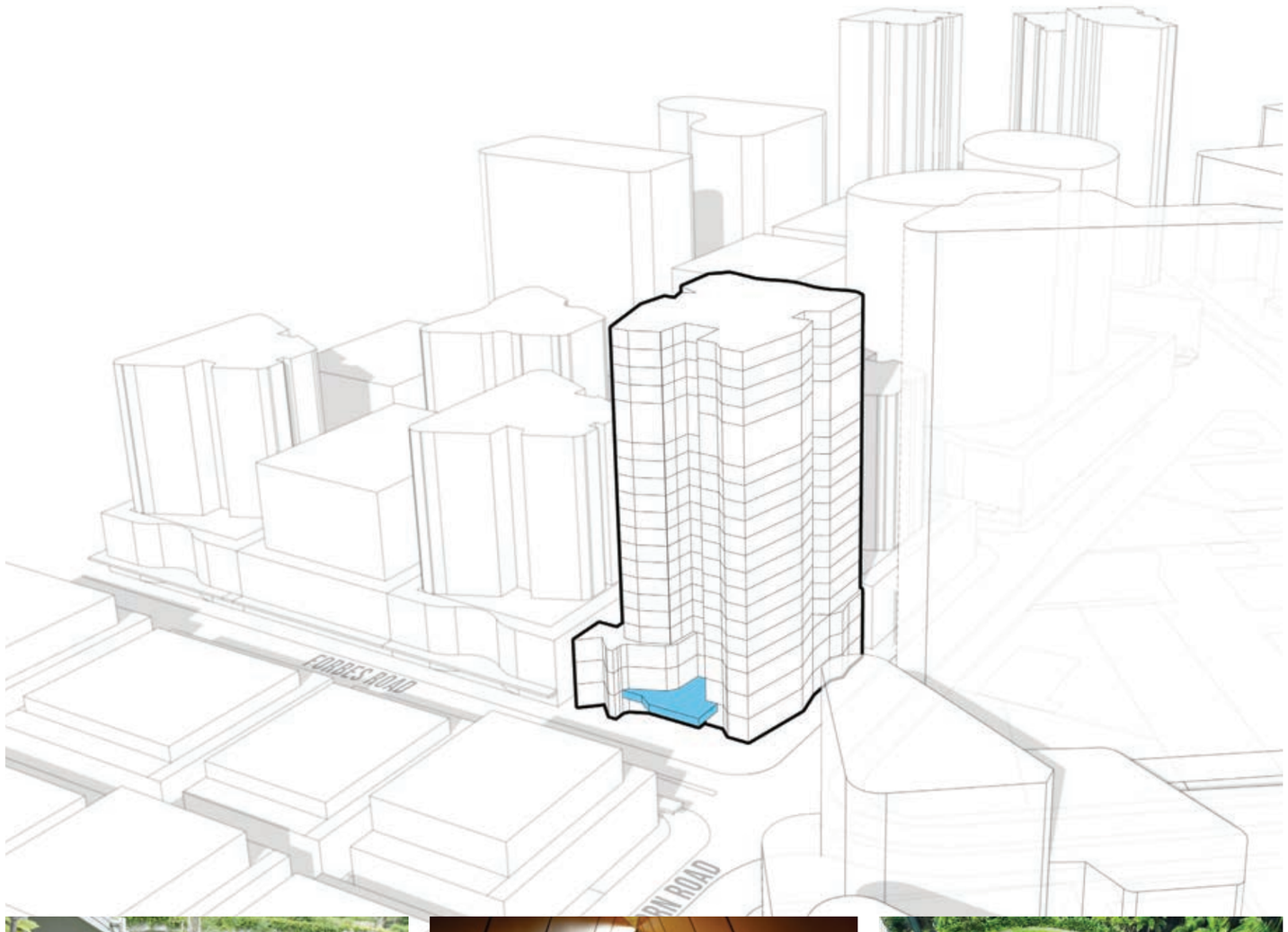
Our frontage:

134 lineal metres

By manipulating the contour of ground floor glazing and creating an island hospitality tenancy we can significantly extend the active frontage.

734m²
Current surplus of floor plate area

Provision of landscaped spaces and/or other facilities accessible to the public such as rooftop and/or podium level gardens



+ Community Garden on Level 1
+ Multiple landscaped areas on ground and first

If neighbours are coming to our corner cafe/bar why can't they take their coffee up to the podium and enjoy it up there too?

We believe a publicly accessible community garden that wraps around the free venting podium can provide an active use to the space and a break out point for members of the co-share.

Its location within the podium makes it more intuitively accessible via a prominently placed public stair; ideal for a general public who are not accustomed to having access to a private residential high-rise.

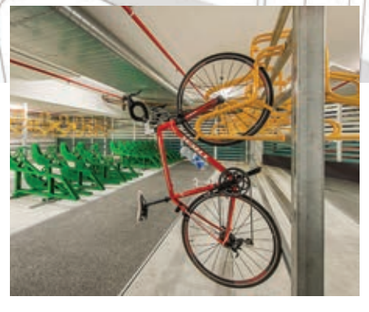
= 734m² Current surplus of floor plate area

+ 154m² Community Garden

+ 300m² 300m² alfresco & new public space on this prominent corner

= 1,188m²
New surplus of floor plate area (incorporating community benefit areas)

Provision of public facilities such as toilets, showers and sheltered bike storage.



+ Bike storage
+ End of Trip (EoT) facilities

As the CBACP develops it's critical that there is increased infrastructure that can facilitate a walking / riding / public transport approach to life by residents and the public.

Forbes Residences accommodates this need by incorporating extensive EoT facilities on the ground floor, for both the general public and tenants of the building.

= 1188m² + **87m²**

Current surplus of floor plate area

EoT facilities

= 1,275m²

New surplus of floor plate area (incorporating community benefit areas)

Improvement to pedestrian networks

+ New pedestrian throughfares on ground
+ New Planning Controal Area land boundary adherence

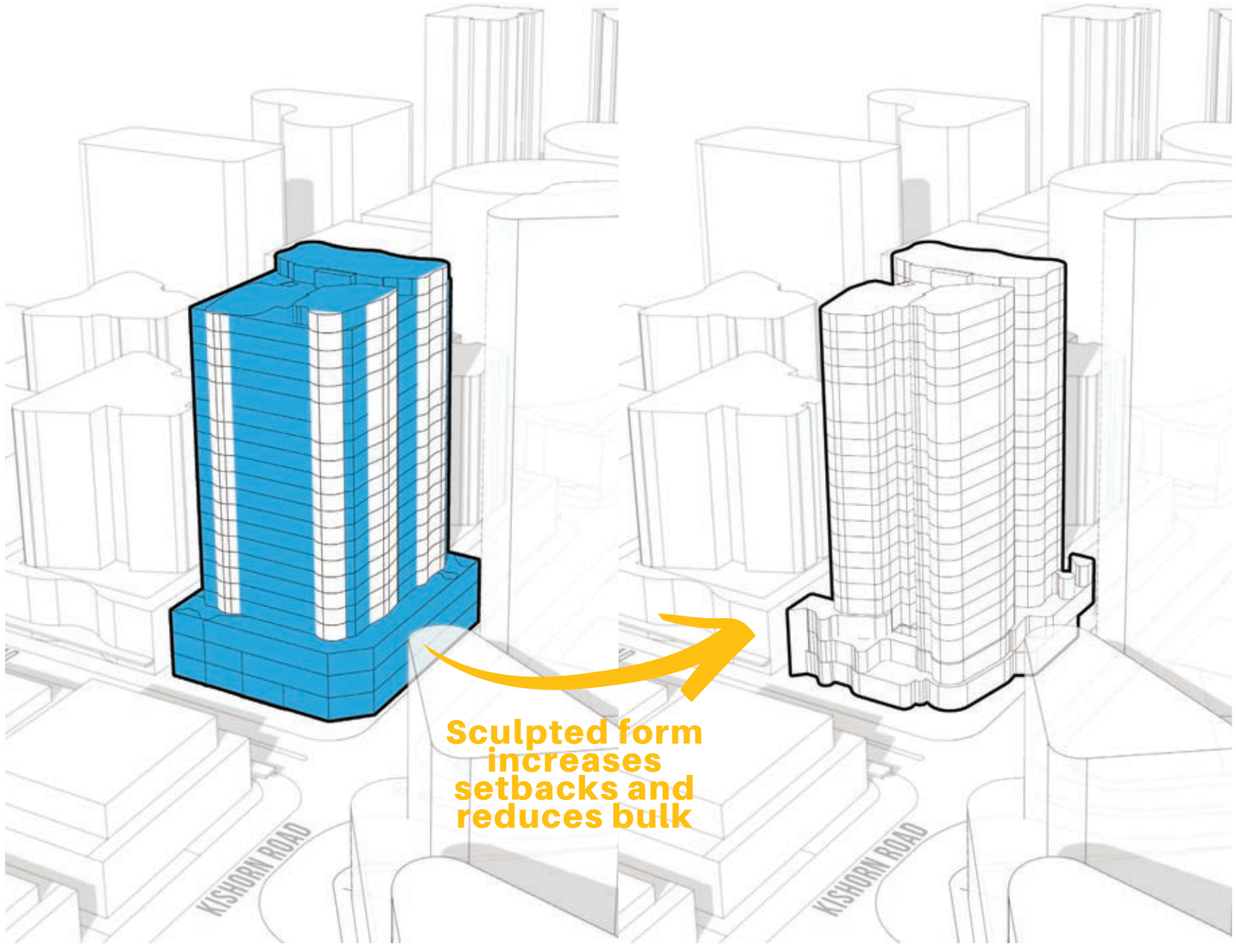
The dynamic ground floor is catered to pedestrian movement, allowing an organic flow of foot traffic through the site via new pedestrian throughfares.

In addition to this, we are accommodating for any potential future planning by adhering to the new Planning Control Area land boundary.

= 1275m² Current surplus of floor plate area **+ 235m²** Pedestrian Throughfare

= 1,510m²
New surplus of floor plate area (incorporating community benefit areas)

Provision of view corridors and/or mid-winter sunlight into adjacent properties

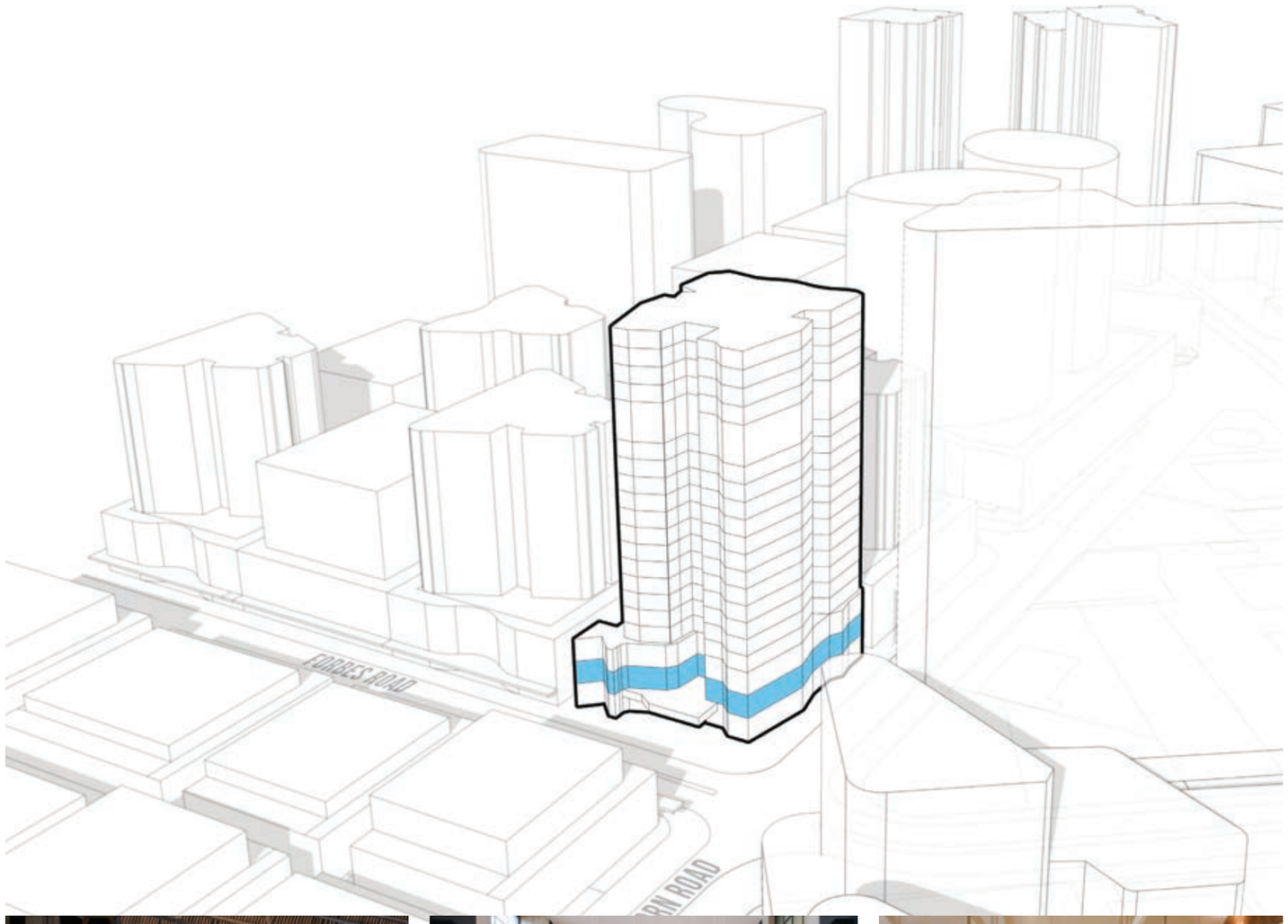


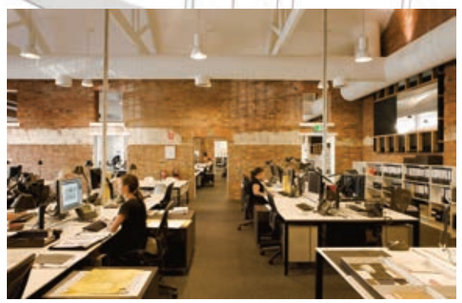
\+ Sculptured built form reduces bulk

The contoured and sculpted built form of the building allows for a significant volume of the building to be removed. This reduced bulk optimises view corridors and sunlight access to neighbouring properties.

= 1,510m²
Current surplus of floor plate area
(incorporating community benefit areas)

Provision of community, communal and/or commercial meeting facilities.





+ Co-Share
+ Public Forum & Meeting Spaces

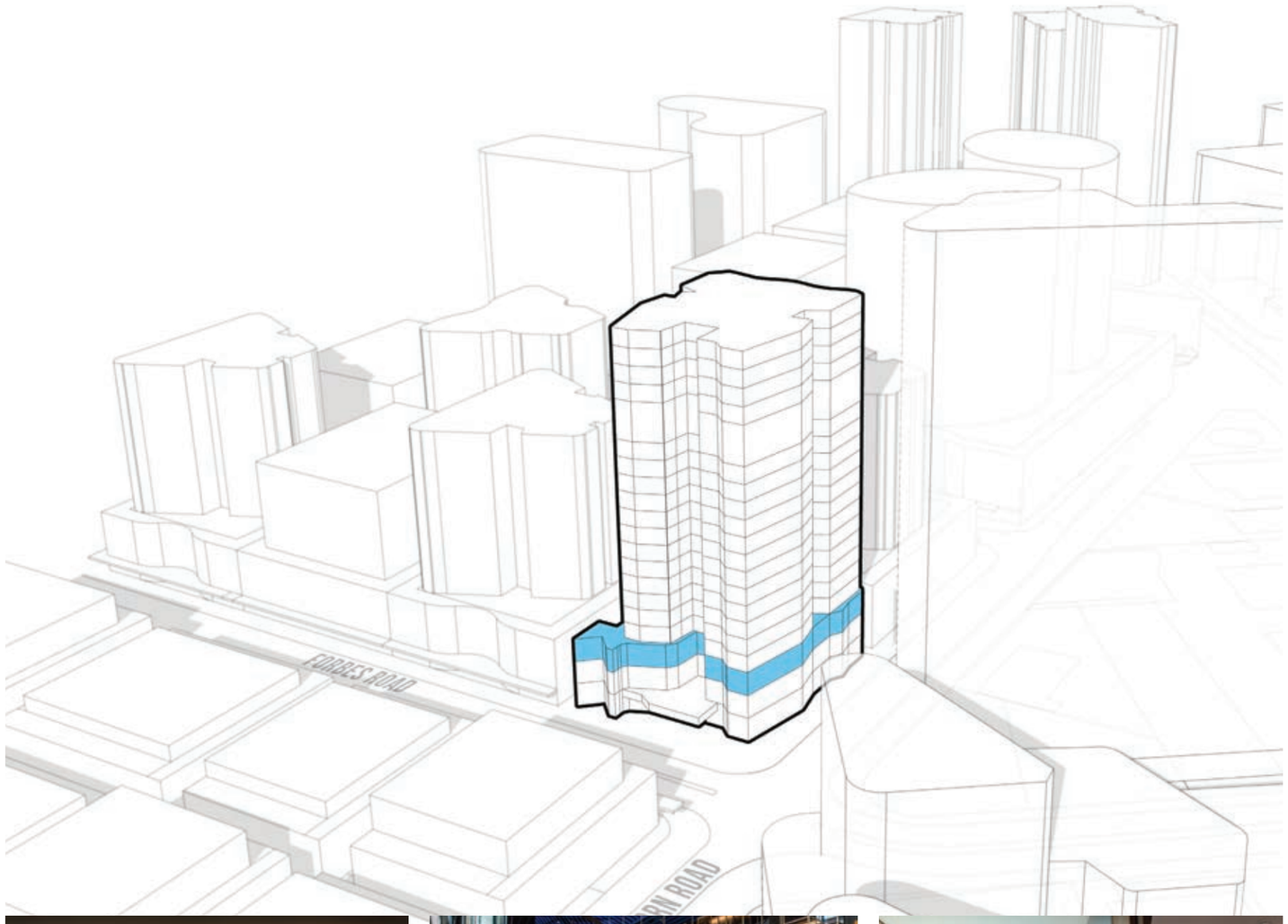
If our neighbours could have their own workspace in close proximity they would have more time to concentrate on their work and would be able to convert commute time to free time.

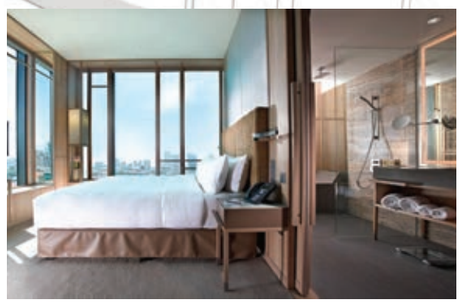
They will be in an amongst their peers in a curated space that encourages public meetings, lectures and forums...we see this as becoming a local culture hub and new business incubator.

= 1510m² Current surplus of floor plate area **+ 412m²** Community Co-Share

= 1,922m²
New surplus of floor plate area (incorporating community benefit areas)

The development comprises a hotel.





- Short Stay Hotel

There is a critical shortage of short stay options in the city of Melville.

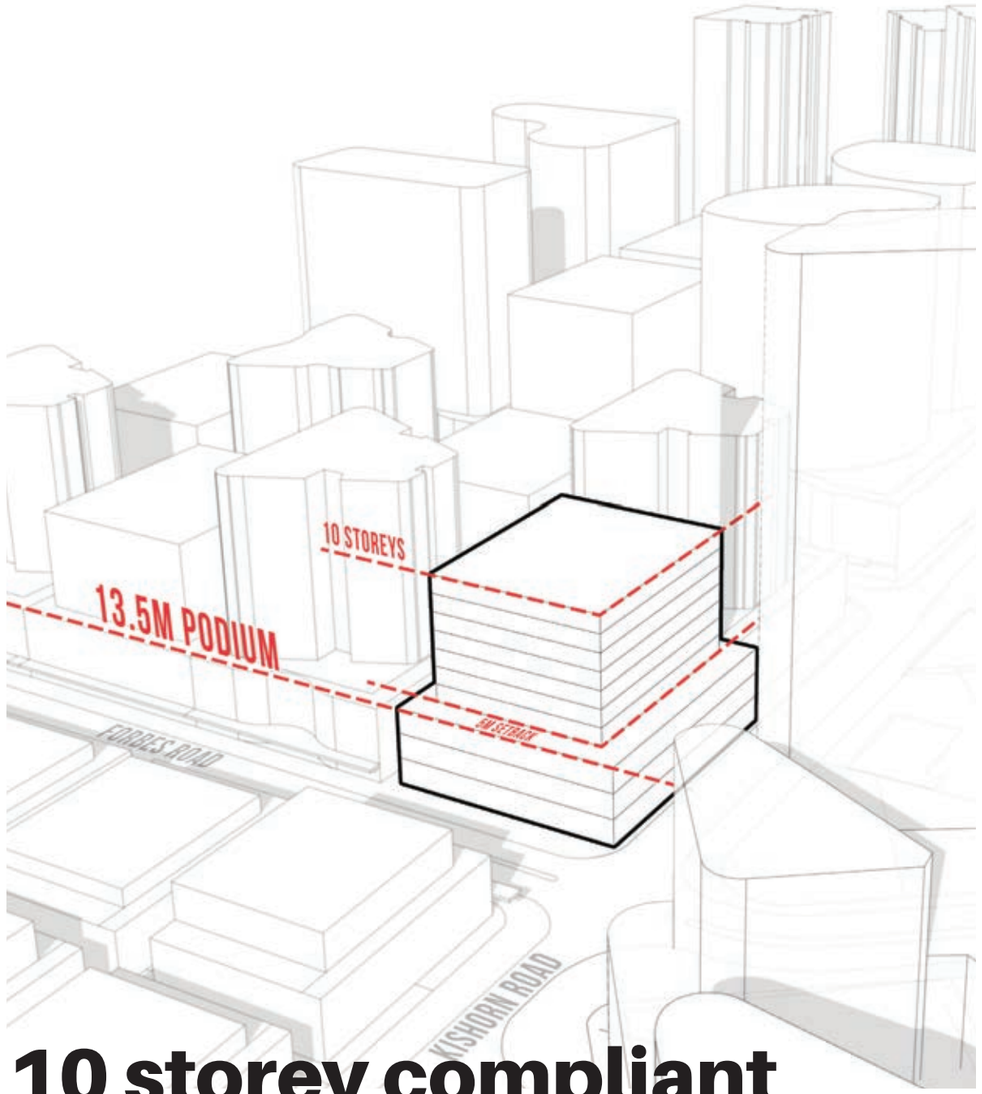
Increasingly around the world, tourists are interested in more local/neighborhood stays rather than in anonymous CBD hotels. Forbes Residences will localise these short stay tenants onto their own discrete floor on level 2, separate from permanent residents.

This boutique offer will increase the amount of rooms in the local area by **33%**.

= 1922m² Current surplus of floor plate area **+ 1619m²** Short Stay Floor Plate

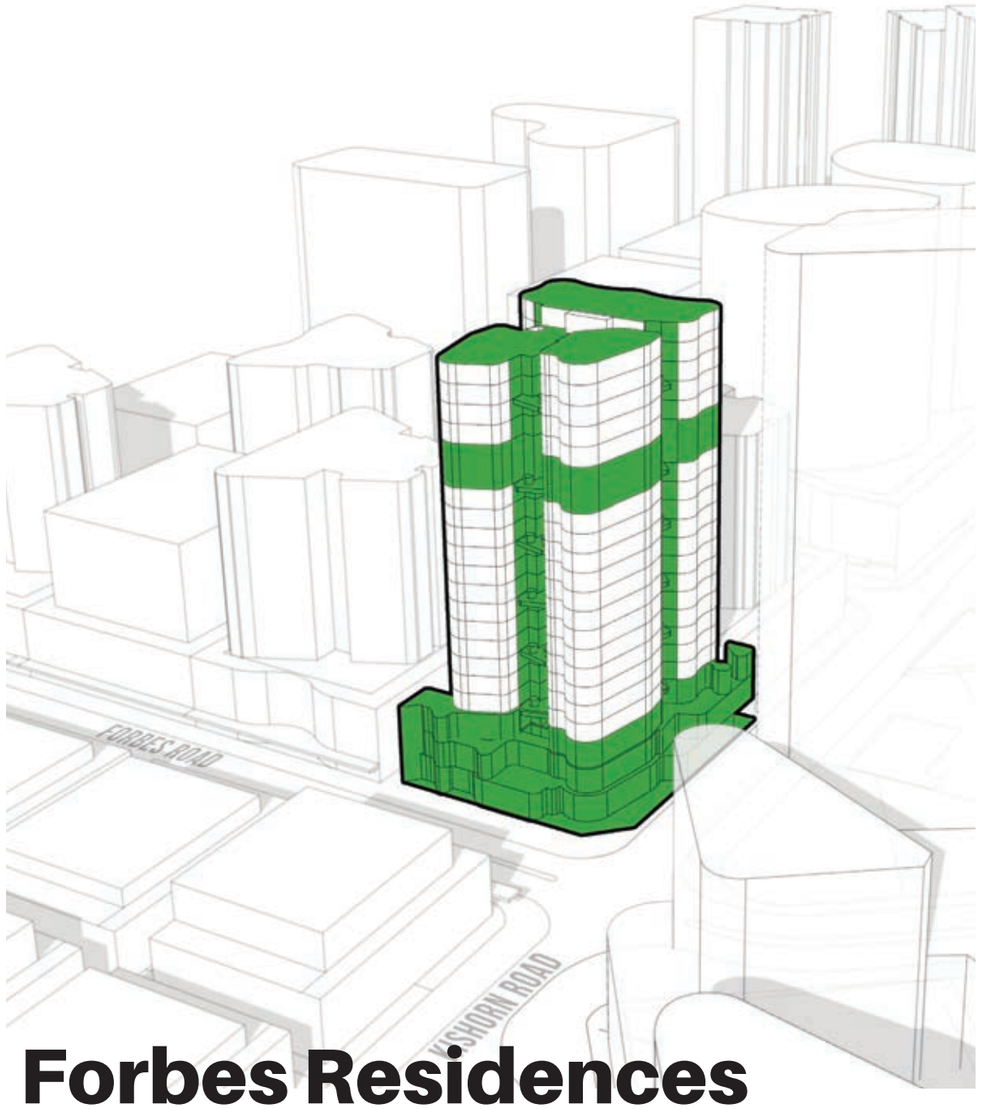
= 3,541m²
New surplus of floor plate area (incorporating community benefit areas)

So let's take another look at the comparison between the 10 storey compliant building and Forbes Residences...



10 storey compliant

15,988m² of total floor plate area



Forbes Residences

23,352m² of total floor plate area

1.

Forbes Residences — 10 storey compliant

23,352 - 15,988

= +7,364m² increase of floor plate area

2.

From **+7,364m²** we can subtract the following three figures:

4643 - 3455 - 2807 = **-3541m²**

- averaged setback increase (m^2) (see pg.22)
- landscape increase (m^2) (see pg.23)
- element 22 surplus (m^2)
  - community garden
  - public alfresco
  - public facilities (EoT) area
  - pedestrian throughfare
  - community co-share area
  - short stay area

(see Appendix, pg.69)

3.

This not only reduces the 7,364m² deficit to ZERO, but in fact gives an additional 3,541m² back to the City of Melville and the community

Surplus of floor plate area (m^2) / Typical Floor Area (m^2)

3541 / 988

= 3.58

This is the equivalent to over 3.5 floors of community benefit

In conclusion, we see community benefit as:

+ providing a significant **setback increase** through a considered built form, that reduces bulk and overshadowing

+ exemplary **greenery & landscaping,** that provides a landmark building that directly responds and contributes positively to the natural environment of Applecross

+ meeting seven requirements of element 22 by providing numerous **community oriented facilities**, such as an extended and vibrant street frontage, a community garden, co-share spaces, a short stay hotel and public end of trip facilities, and more

Imagine a building where...

Laura is a mum...

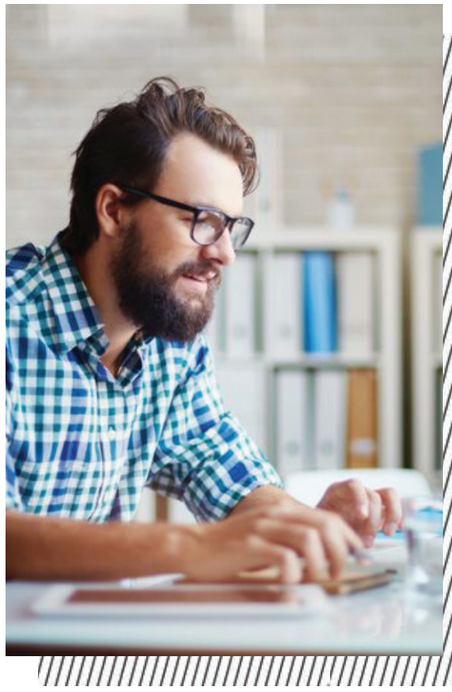
...who lives down the road from Forbes Residences. Every Thursday she takes her six-month-old for a playdate with her best friend and her ten-month-old, after grabbing a coffee at the Forbes Residences Café on the ground floor.

This Thursday they're attending a parenting seminar in the community meeting room on level 1. Before the seminar they order a takeaway coffee and climb the public stairs to the Community Garden, where they let the little ones have a play while they wait for it to start.

Justin runs a small start-up...

...developing mobile apps. He is just getting off the ground and is taking advantage of the co-working facilities at Forbes Residences. Each morning he hops on his bike and rides to the co-working space, using the public End-of-Trip facilities to freshen up.

Sometimes he uses Forbes Residences as a base, parking his bike there and catching a bus to the city for a meeting. Being at the very early stages of his start-up, Justin loves being able to use a vibrant, co-shared space at a minimal cost.



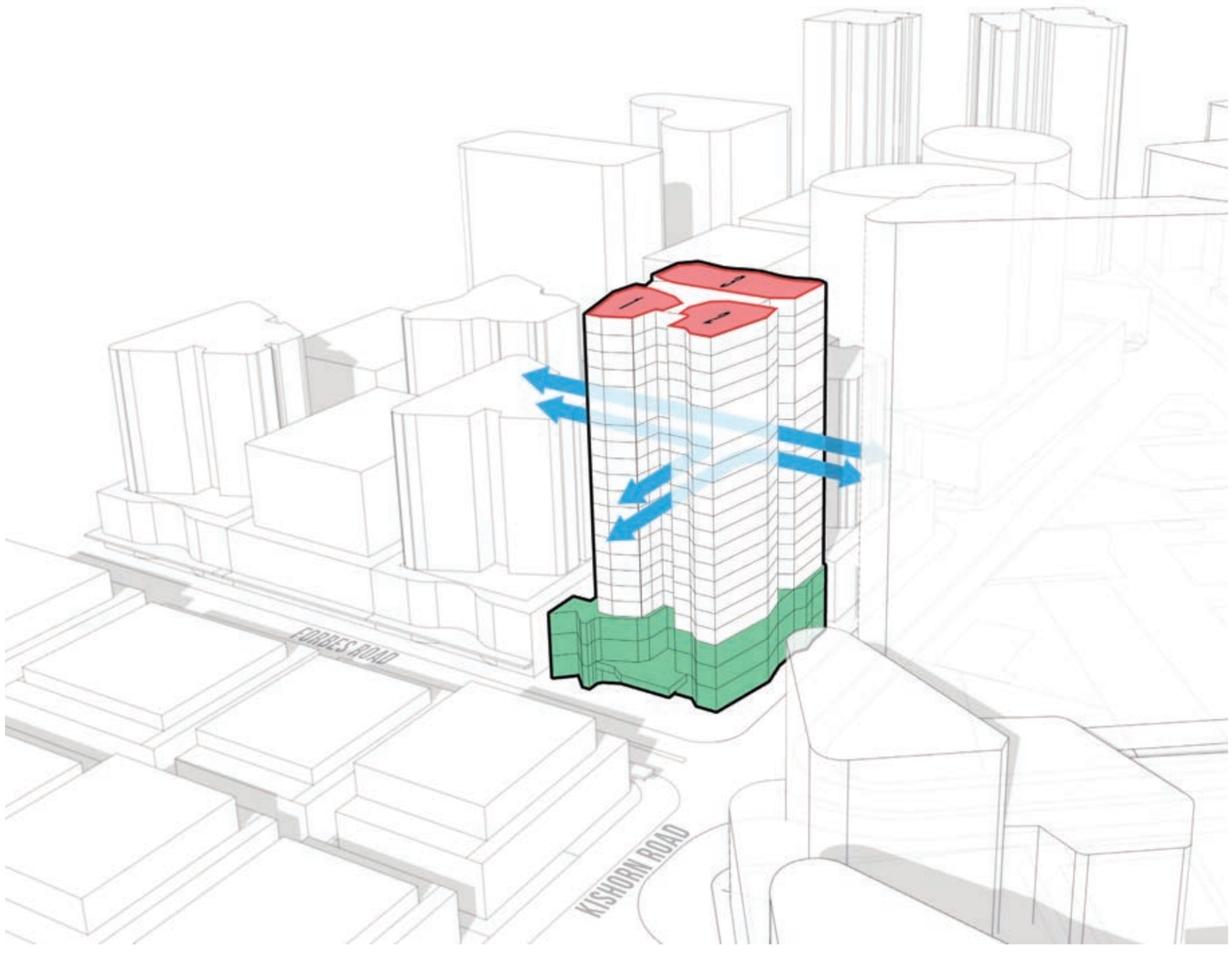
Elizabeth and Frank are visiting...

...from overseas, here to see their newly born grandson, Jack, whose parents live on Level 5. The convenience of being so close to their daughter and grandson, while also being able to give them (and have) their own space is extremely beneficial to them.

They love the convenience of taking the lift up to visit them each day and giving the tired parents a break by taking their older granddaughter, Julie, to the podium Community Garden on level 1.

This building will offer unique, inclusive opportunities that will benefit the **entire Applecross community.**

BUILT FORM+ SCALE



Tower

The tower is divided into a cluster of three "Jacaranda Petals", which allow the homes to be majority corner homes, with circulation spaces located at the perimeter. As shown in the setback analysis, this façade articulation also significantly reduces bulk.

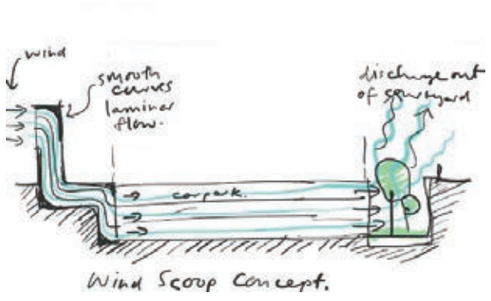
Natural Ventilation

The separation of the built form into three petals allows for the building to be naturally ventilated. Naturally vented corridors/lobbies can have a large effect on energy use - in a study by the City of Sydney, the common areas used up to 60% of the total energy use in highrise residential towers.

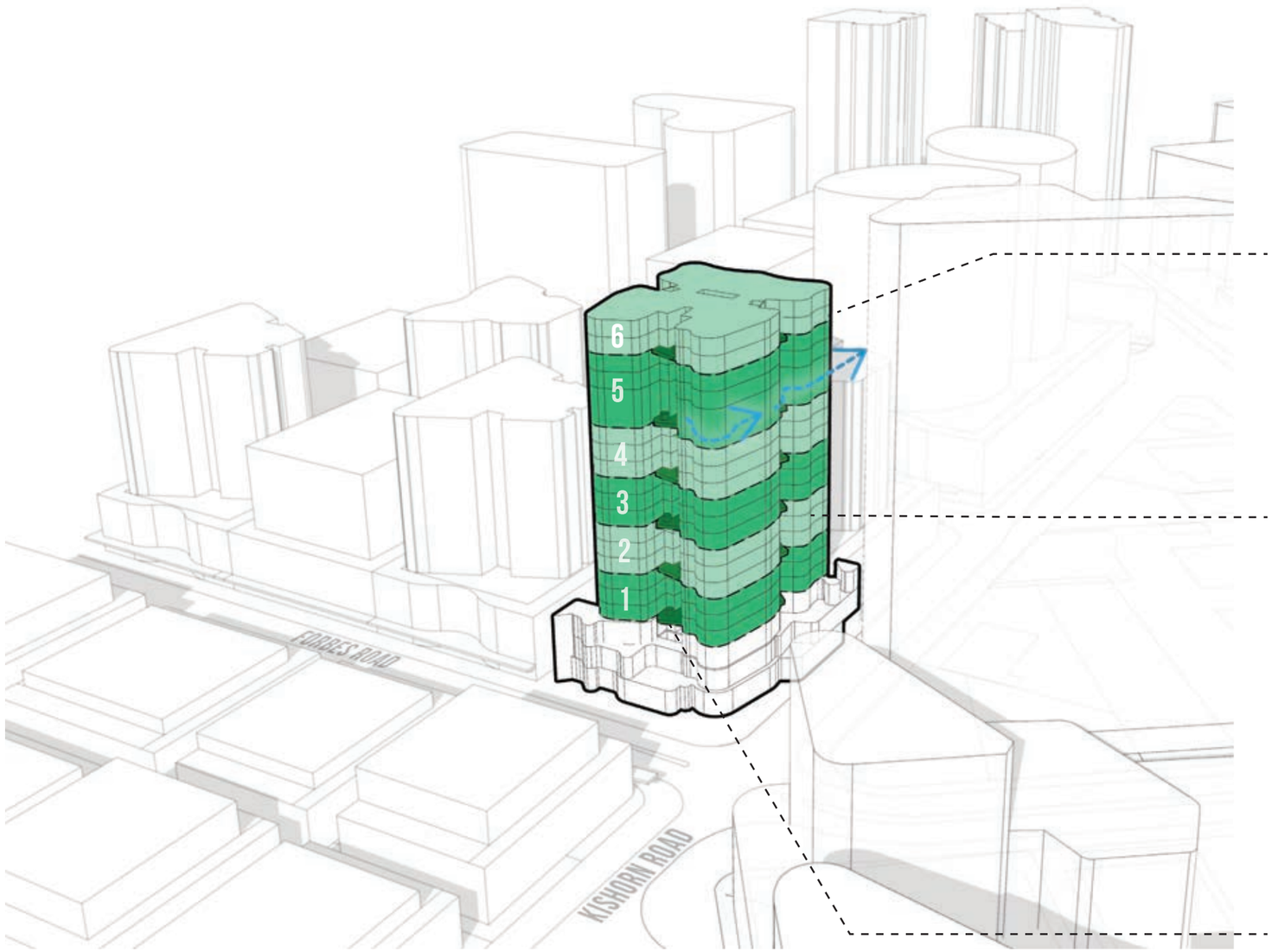
Podium

The first three levels are expressed as a planted facade that connects the street trees to the vertical gardens, with contoured & stepped planters that both enhance the corner and allow more space to plant trees.

Below ground windscoops are used to drive fresh air into the basement parking. This will reduce the long-term energy consumption.



BUILT FORM+ SCALE



Rounded Aesthetic

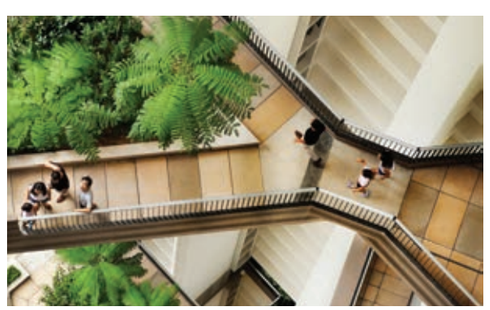
The rounded shape creates less turbulence and downdrafts as the wind flows more smoothly around the building.

Six Vertical Neighbourhoods

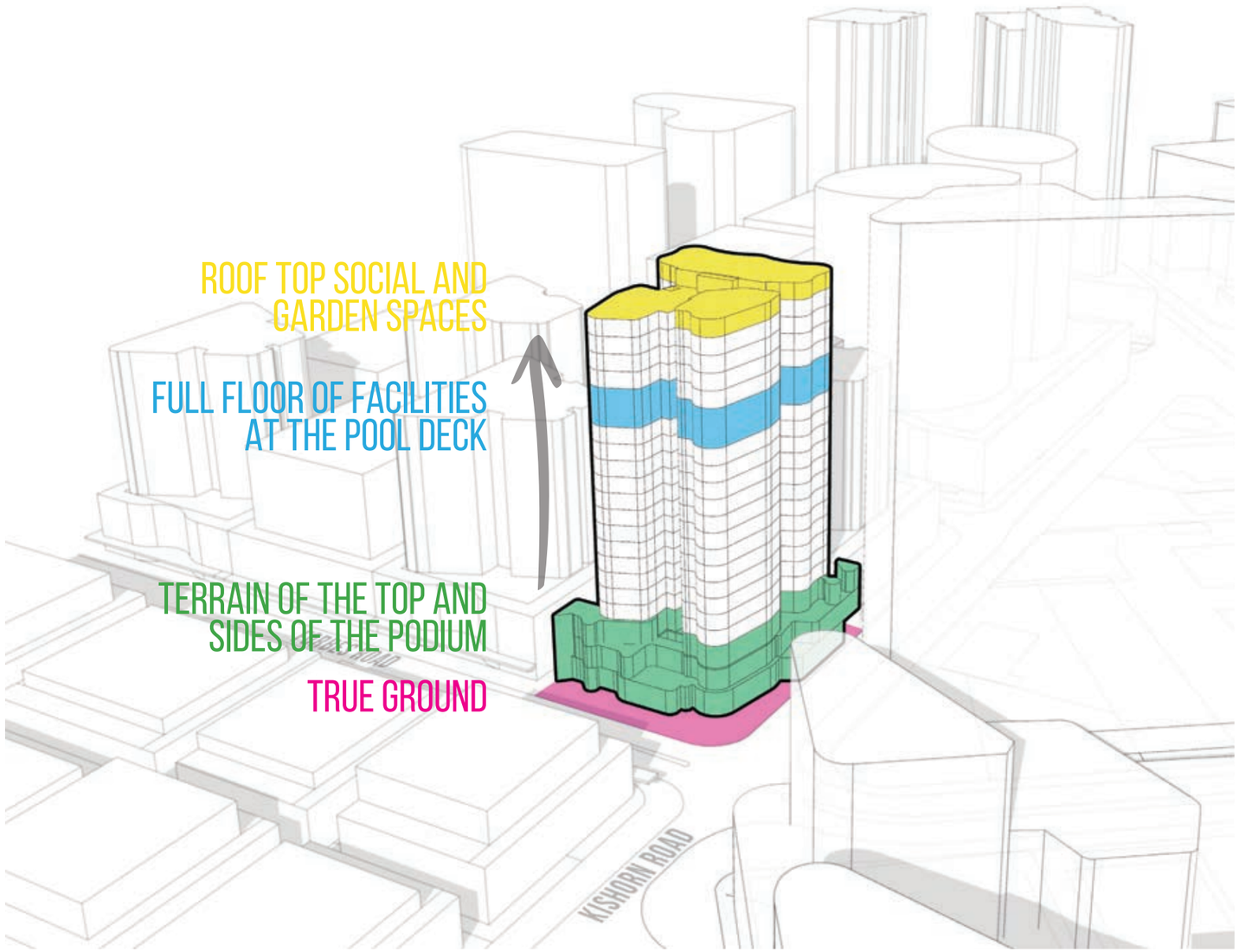
Naturally ventilated and lit lobbies which are divided primarily into 3-storey neighbourhoods, each with their own Skygardens and character. In this development, rather than a tower of over 91 homes, it is a cluster of 6 vertical neighbourhoods, each with approximately 15-20 homes.

Six Skygardens

The skygardens are located in recessed, protected pockets which create a more protected microclimate.



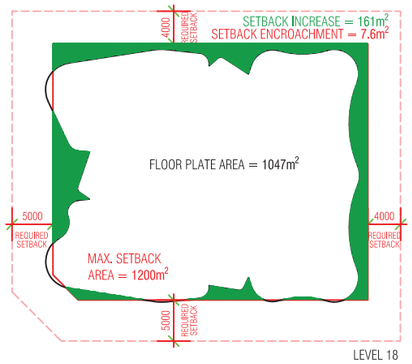
BUILT FORM+ SCALE



Multiple Ground Levels

The high amenity spaces are created through a series of “ground planes” where social activities take place.

TOWER



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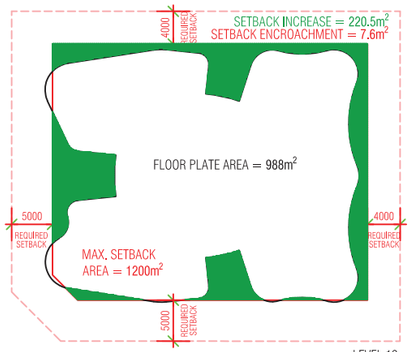

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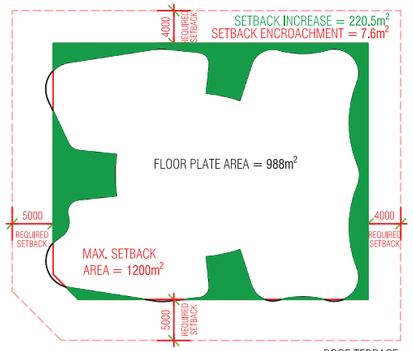
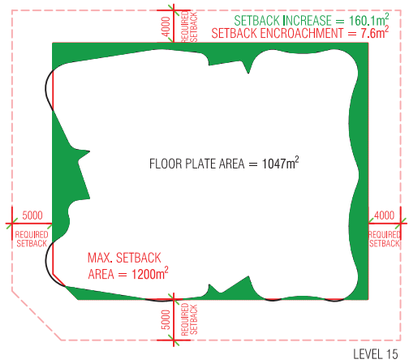


ROOF TERRACE



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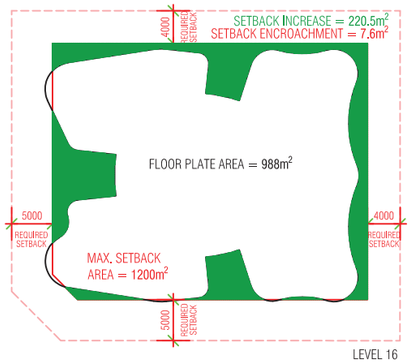

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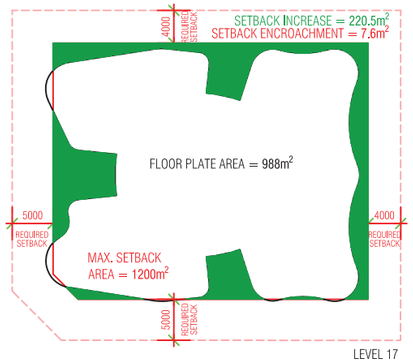

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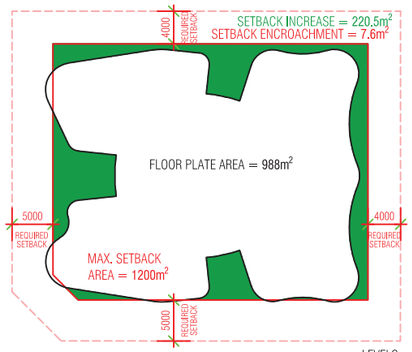
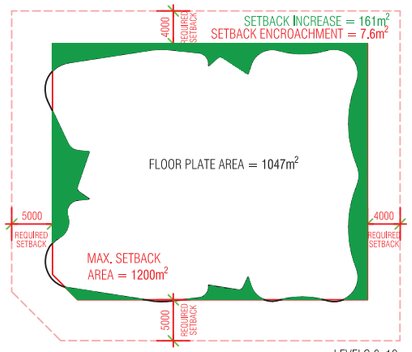
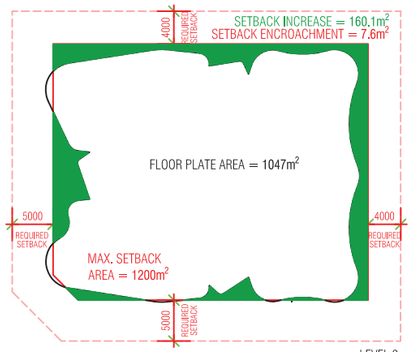


LEVELS
4,5,7,8,10,11,13,14

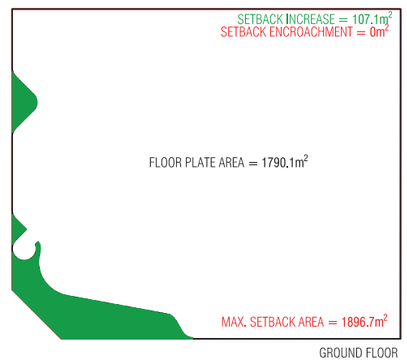


LEVELS 6, 12

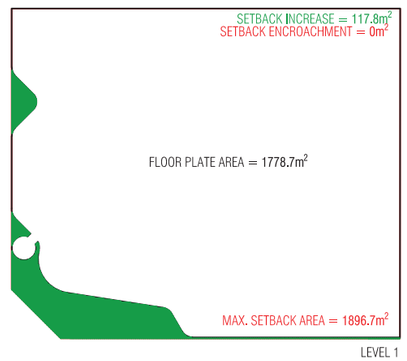


LEVEL 9

PODIUM



GROUND FLOOR



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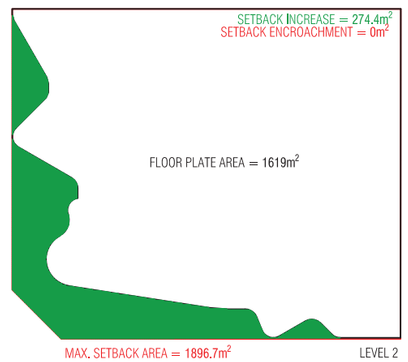
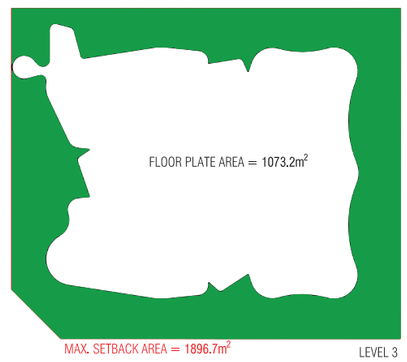


MAX. SETBACK AREA = 1896.7m²
LEVEL 2



MAX. SETBACK AREA = 1896.7m²
LEVEL 3

SETBACK ANALYSIS - FORBES RESIDENCES

	LVL	ENCROACHMENT	INCREASE	AVERAGED
TOWER	ROOF	7.6	220.5	212.9
	19	7.6	220.5	212.9
	18	7.6	161.2	153.6
	17	7.6	220.5	212.9
	16	7.6	220.5	212.9
	15	7.6	160.1	152.5
	14	7.6	220.5	212.9
	13	7.6	220.5	212.9
	12	7.6	161.2	153.6
	11	7.6	220.5	212.9
	10	7.6	220.5	212.9
	9	7.6	160.1	152.5
	8	7.6	220.5	212.9
	7	7.6	220.5	212.9
	6	7.6	161.2	153.6
	5	7.6	220.5	212.9
	4	7.6	220.5	212.9
PODIUM	3	0	823.5	823.5
	2	0	274.4	274.4
	1	0	117.8	117.8
GROUND FLOOR		0	107.1	107.1
TOTAL		**129**	**4,773**	**4,643**

TOTAL FLOOR PLATE COMPARISON

10 storey - 15 storey - Forbes Residences

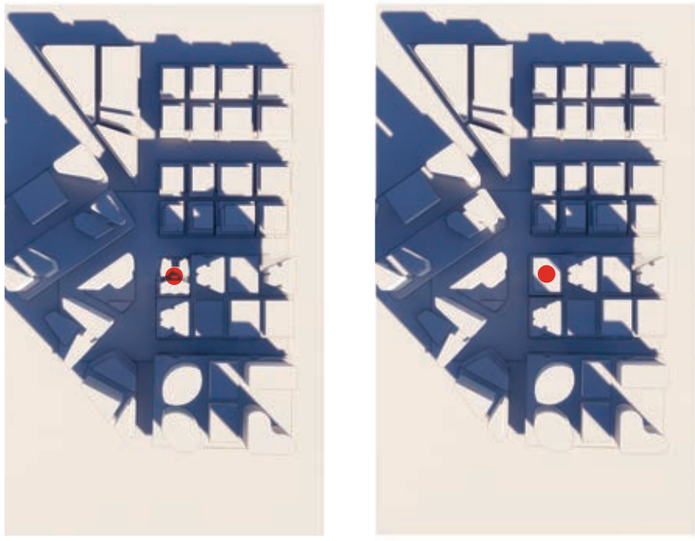
	LVL	10 STOREY	15 STOREY	FORBES RESI
TOWER	ROOF			988
	19			988
	18			1047
	17			988
	16			988
	15		ROOF 1200	1047
	14		1200	988
	13		1200	988
	12		1200	1047
	11		1200	988
	10	ROOF 1200	1200	988
	9	1200	1200	1047
	8	1200	1200	988
	7	1200	1200	988
	6	1200	1200	1047
	5	1200	1200	988
	4	1200	1200	988
PODIUM	3	1897	1897	1073
	2	1897	1897	1619
	1	1897	1897	1779
GROUND FLOOR		1897	1897	1790
TOTAL		**15,988**	**21,988**	**23,352**

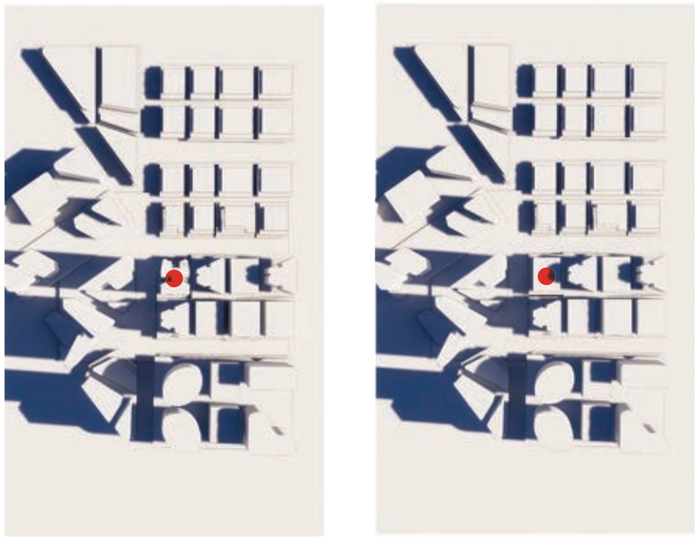
winter

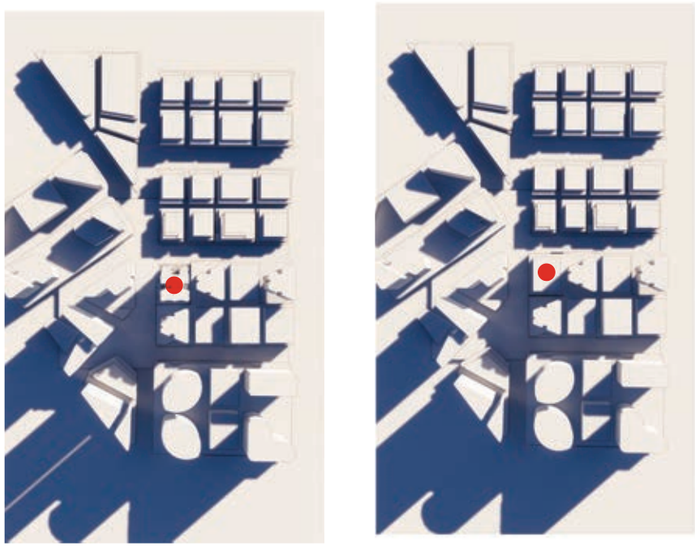
Overshadowing
Analysis

Forbes Residences

10 Storey Compliant





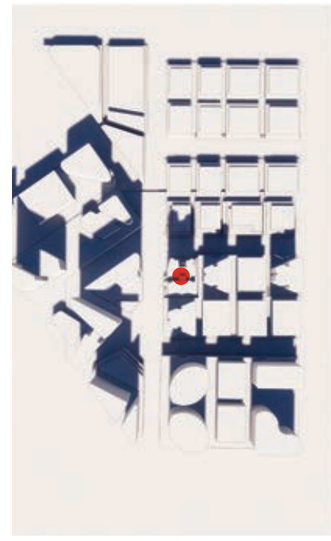


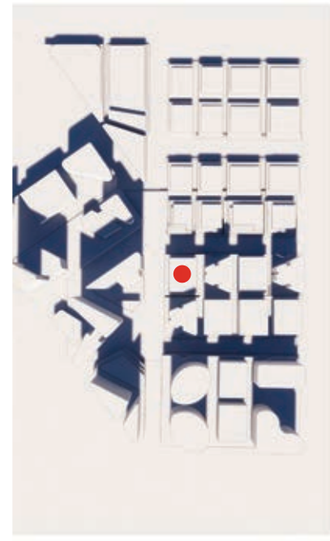
summer

Overshadowing
Analysis

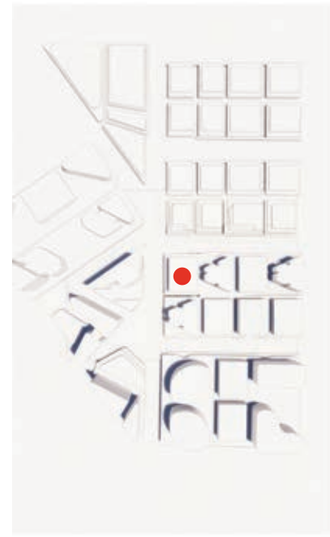
Forbes Residences

10 Storey Compliant

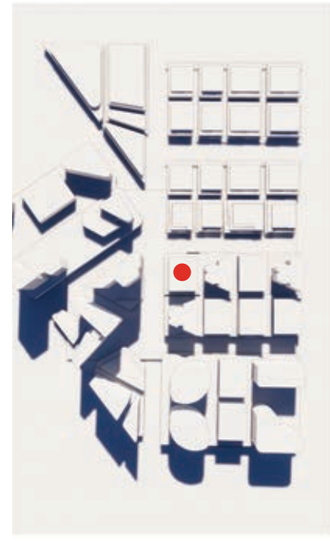




9am



12pm

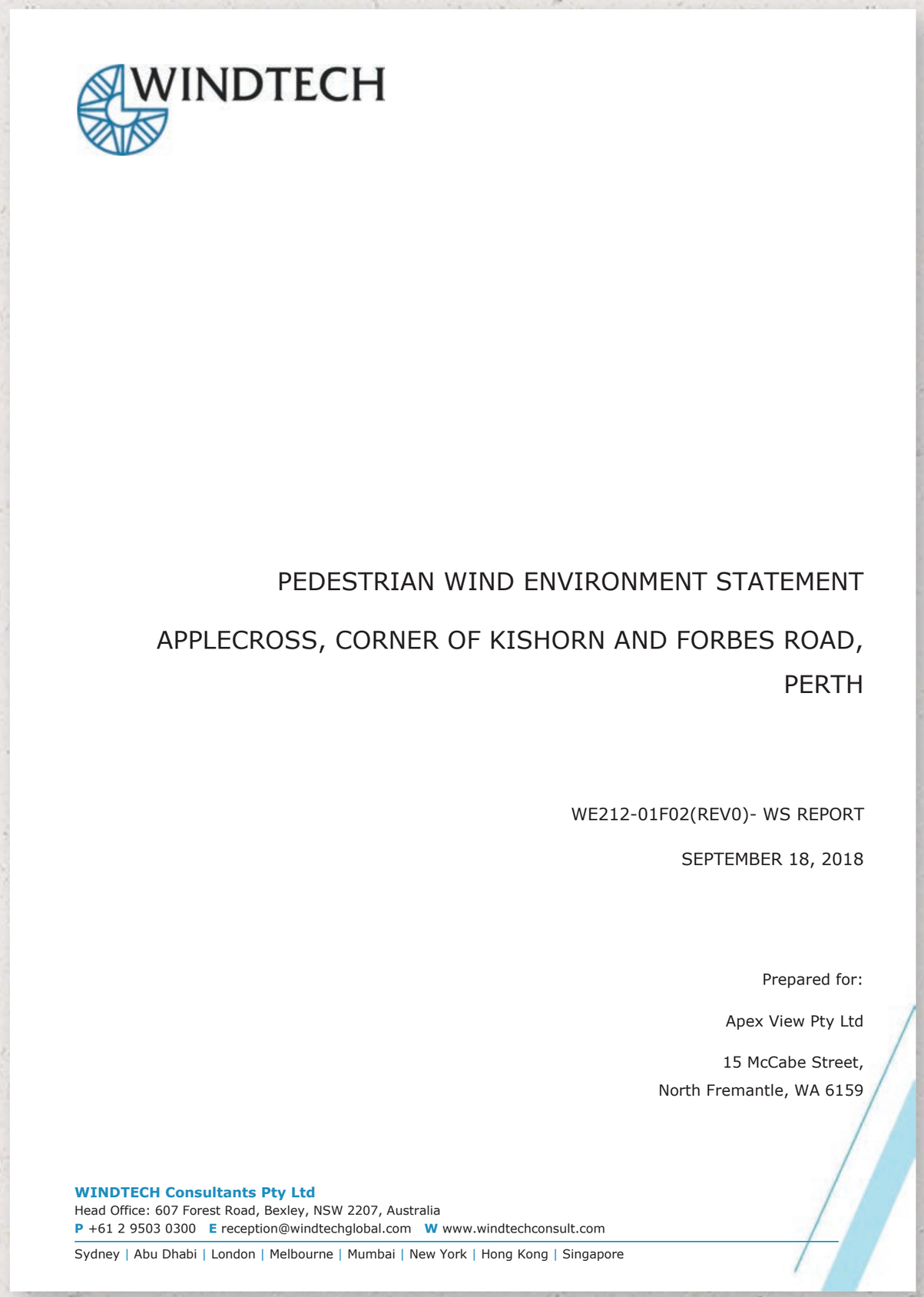


3pm

BUILT FORM+ SCALE

Wind Analysis

** Please see Appendix for full Wind Report **



PEDESTRIAN WIND ENVIRONMENT STATEMENT

APPLECROSS, CORNER OF KISHORN AND FORBES ROAD, PERTH

WE212-01F02(REV0)- WS REPORT

SEPTEMBER 18, 2018

Prepared for:

Apex View Pty Ltd

15 McCabe Street,
North Fremantle, WA 6159

WINDTECH Consultants Pty Ltd
Head Office: 607 Forest Road, Bexley, NSW 2207, Australia
P +61 2 9503 0300 **E** reception@windtechglobal.com **W** www.windtechconsult.com
Sydney | Abu Dhabi | London | Melbourne | Mumbai | New York | Hong Kong | Singapore

+ The WindTech reports states that the scheme is ‘relatively exposed’ to the three predominant wind directions for the Perth region - the easterly, south-west, and westerly winds
+ However **suitable wind conditions can be met** with the **implementation of wind treatments** at trafficable areas within the scheme
+ These solutions will be **developed and implemented** through design development to achieve optimal outcomes

Street analysis_
Entrance from Kishorn Road

Street analysis_
View down Forbes Road

Street analysis_
Entrance from Forbes Road

Street analysis_
Kishorn/Forbes intersection

FORBES RESIDENCES

10_Principles

LANDSCAPE QUALITY

Landscape Design Report

Please see Appendix for full Landscape Report

Landscape architects CAPA have provided a detailed landscape strategy, with the following three key issues of concern being addressing in the following pages:

1. **Overall Landscape Strategy**
2. **Water Efficient Landscapes**
3. **Wind Initiatives**

These three issues will demonstrate how the landscaping in this scheme will be achieved **in the Perth climate.**

1. Overall Landscape Strategy

Considered Plant Selection:

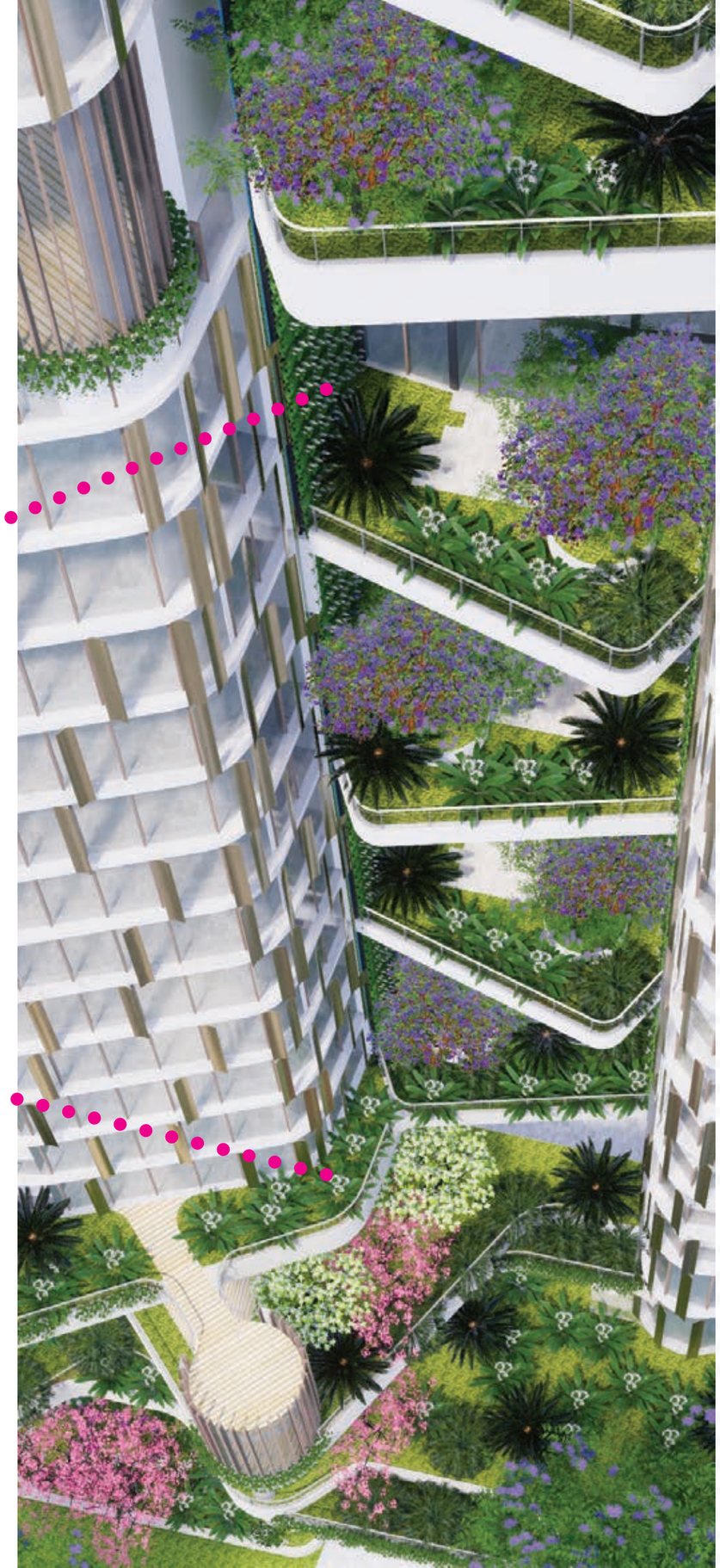
Vertical Planting

Plant selections will be resilient clinging type affixed to the trellis structure

Linear planters placed every 1.5m in height, behind a fixed trellis system set off from the building to allow ease of maintenance access behind

Ground & Podium Levels

resilient & low maintenance native plants selected



Other Considerations:

Continuing input and expertise

...during design development and input by a specialised vertical softscape engineer

Final analysis

...and accompanying certification be submitted as part of the Building License Issue as a commitment to provide a system that will provide a sustained outcome

The project's team approach is to include the right expertise, appropriate system, evaluate proven examples of installed examples that have thrived over a reasonable period of time in Perth.

2. Water Efficient Landscapes

A four tiered strategy:

1. Plant selections (low water requirement)

+ In principle, the majority of the softscape ground planting selections are endemic and **have a low water requirement**
+ The scheme will also include some feature exotics; offering **flowering, deciduous trees** and shade qualities

2. Reduced evaporation losses

+ The majority of plantings are located in **raised planters** reducing water evaporation loss
+ Gravel mulching selected for wind will also provide a **blanket layer** for reducing water evaporation
+ Irrigation is provided **below the mulch layer** which offers greatly improved efficiency

3. Efficient water supply

+ All plantings will be irrigated via efficient **inline drip irrigation system** which will cater for water mains and recycled water supply
+ Where achievable, the plantings will be **hydro-zoned** according to water requirements, allowing the reticulation to the endemic plantings to be **separately controlled and greatly reduced** following their establishment period

4. Water recycling

+ The project will also include infrastructure and provision for a significant capacity for **re-using water for irrigation**, consistent with WA Health Department guidelines for multi-residential developments and use
+ **A grey water recycling system** has been appropriately sized for a maximum of 5000L per day, that will collect water from Short Stay Accommodations shower and handbasins and EoT shower facilities. The ozone treated water will be dispelled via the dripline.

3. Wind Initiatives

Skygardens

Landscaping elements benefit from the recessed design of the Skygardens

Skygarden trees will be permanently guyed with vertically tensioned wiring supports and collars

Smaller trees to the podium areas will be guyed with stainless tripod arrangement

Vertical Trellis'

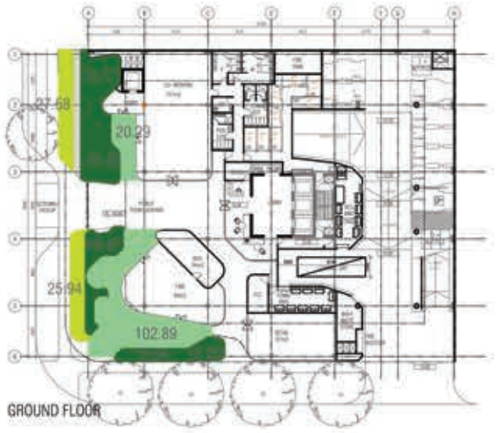
Vertical trellis elements will require considered planting selection to optimise solar access and wind protection

Each of these trellis arrangements will be tested during design development

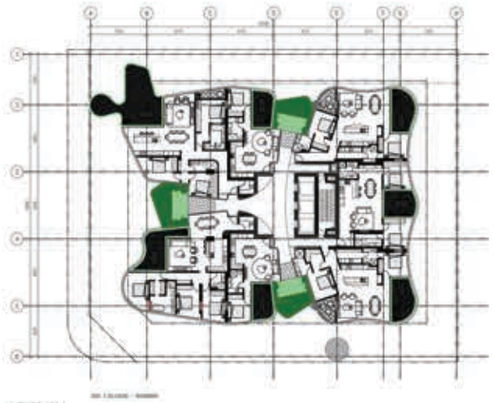
View from across Kishorn Road looking east at Forbes Residences

LANDSCAPE AREAS_

LANDSCAPE AREA
PLANTING ON STRUCTURE (as deep soil alternative)
DEEP SOIL
BALCONIES > 12M2



GROUND FLOOR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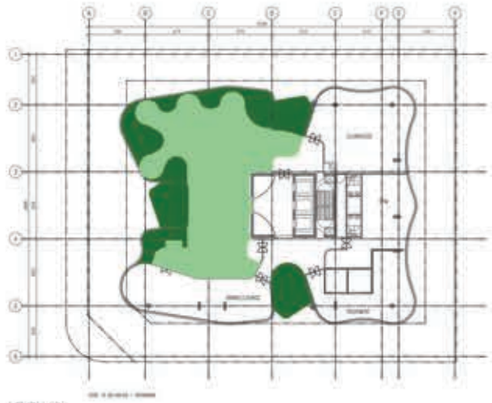
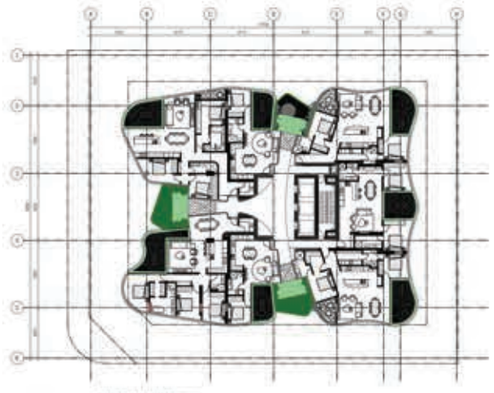
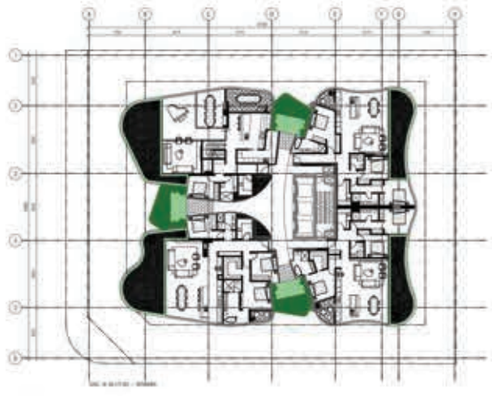

LEVEL 15

LEVEL 1


LEVELS 6 & 12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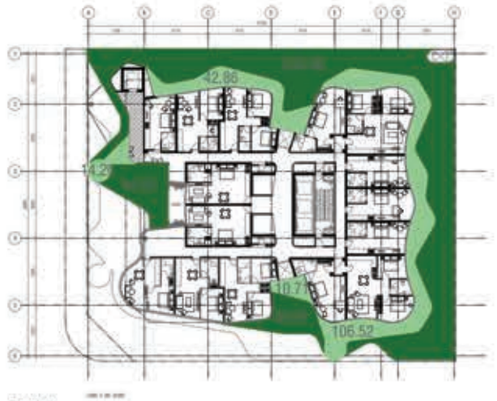

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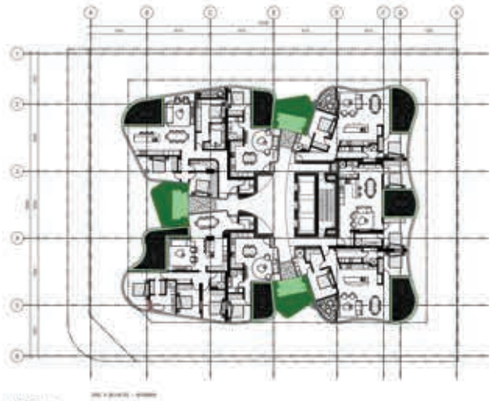
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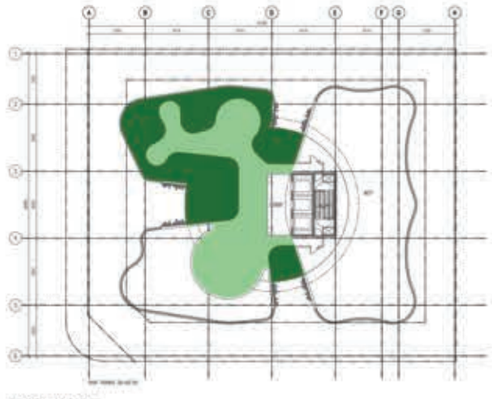

ROOF TERRACE

BALCONIES > 12M2

LEVEL	BALCONIES
GROUND	-
1	-
2	-
3	132.7
4	104.2
5	104.2
6	104.2
7	104.2
8	104.2
9	104.8
10	104.2
11	104.2
12	104.2
13	104.2
14	104.2
15	-
16	130.1
17	130.1
18	143.1
19	132.8
ROOF	-
TOTAL	1815.6

TOTAL BALCONY OVER 12M2 AREA
= 1815.6m²

VERTICAL LANDSCAPE AREAS

LEVEL	VERTICAL LANDSCAPE AREAS
GROUND	-
1	21.12
2	15.36
3	72.50
4	72.50
5	55.51
6	72.50
7	72.50
8	55.51
9	72.50
10	72.50
11	55.51
12	72.50
13	72.50
14	72.50
15	141.24
16	72.50
17	55.51
18	72.50
19	72.50
ROOF	49.85
TOTAL	1336.4

TOTAL VERTICAL LANDSCAPE AREA
= 1336.40m²

HORIZONTAL LANDSCAPE AREAS

LEVEL	LANDSCAPED ZONES (m²)	PLANTING ON STRUCTURE (m²) as deep soil alternative	DEEP SOIL (m²)	TOTAL LANDSCAPE AREA PER LEVEL (m²)
GROUND	123.18	126.57	53.52	303.27
1	70.01	260.10		330.11
2	174.29	413.69		587.98
3	42.44	42.57		85.01
6	16.74	42.43		59.17
9	16.74	42.57		59.31
12	16.74	42.43		59.17
15	262.74	146.37		409.11
18	16.74	42.43		59.17
ROOF	193.48	179.76		373.24
TOTAL	933.10	1338.92	53.52	2325.54

PLANTING ON STRUCTURE/TOTAL SITE AREA

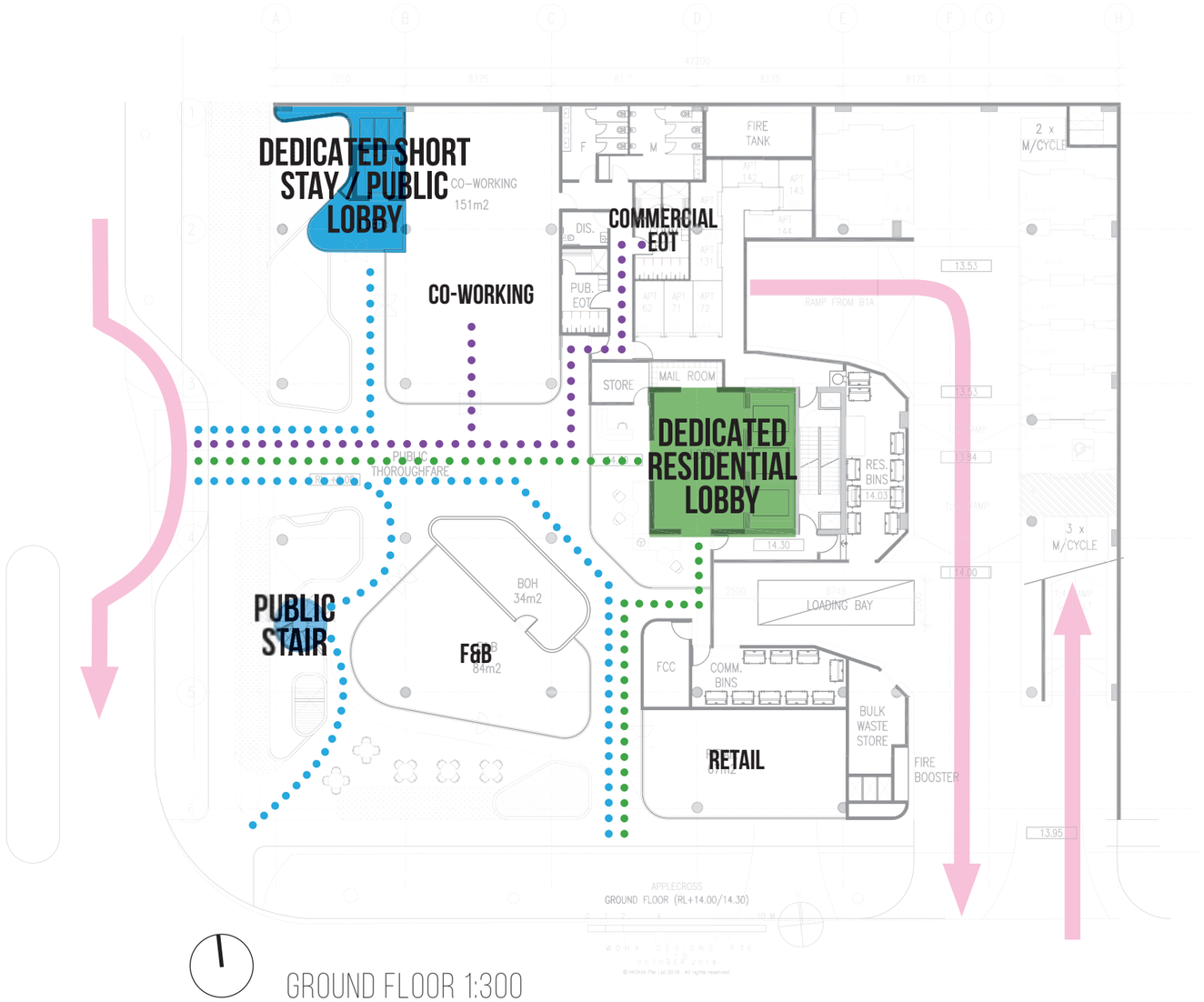
= 1815.6m2 + 1336.4 + 2325.54
= 5477.54
= 5477.54 / 2023 (site area)
= 2.7 (270% of the minimum required in Clause 10.3 of the CBACP)

PLANTING ON STRUCTURE/TOTAL SITE AREA

= 1392.44m2 / 2023 m2
= 69% (44% more than the minimum required 25% area in clause 3.4.1, WAPC Apartment Design Policy)

10_Principles

FUNCTIONALITY+ BUILD QUALITY



GROUND FLOOR 1:300

A Highly Functional Ground Floor...

+ The streetscape interface balances, SHORT STAY, COMMERCIAL, RESIDENTIAL and PUBLIC access requirements
+ Well considered plan facilitates pedestrian flow across site
+ Vehicle access is separated, reducing potential conflict (drop-offs via Forbes Road and residential and short stay parking entrance via Kishorn Road)
+ Separate, dedicated entry lobbies separates private residential from short stay / public access
+ Universally accessible ground floor, no ramps required

Commercial

Residential

Public & Short Stay

Vehicle

FUNCTIONALITY+ BUILD QUALITY

LEVEL 1, 1:300

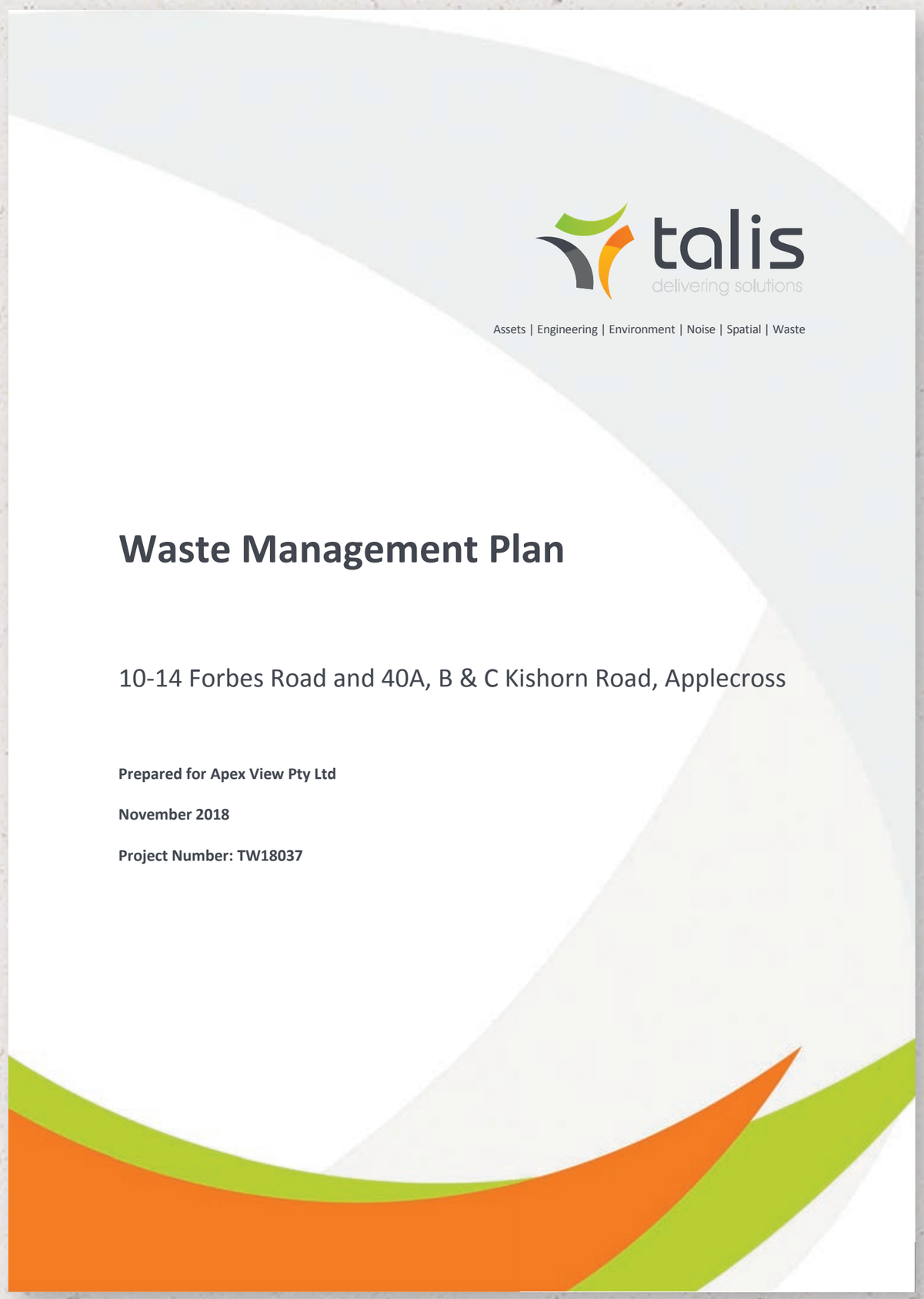
...Leading to a Highly Communal Level 1

+ Pedestrian friendly access to Level 1 amenities
+ Attractive public garden space and terrace
+ Productive co-working environment
+ Multiple passive surveillance points for heightened security

Commercial

Residential

Public



10_Principles

FUNCTIONALITY+ BUILD QUALITY

Waste Management Plan

Please see Appendix for full Waste Report

Conclusions:

According to the Talis report the proposal provides **a sufficiently large Bin Storage Area**

...for collection and storage of refuse and recyclables based on the anticipated waste generation rates and a suitable configuration of receptacles

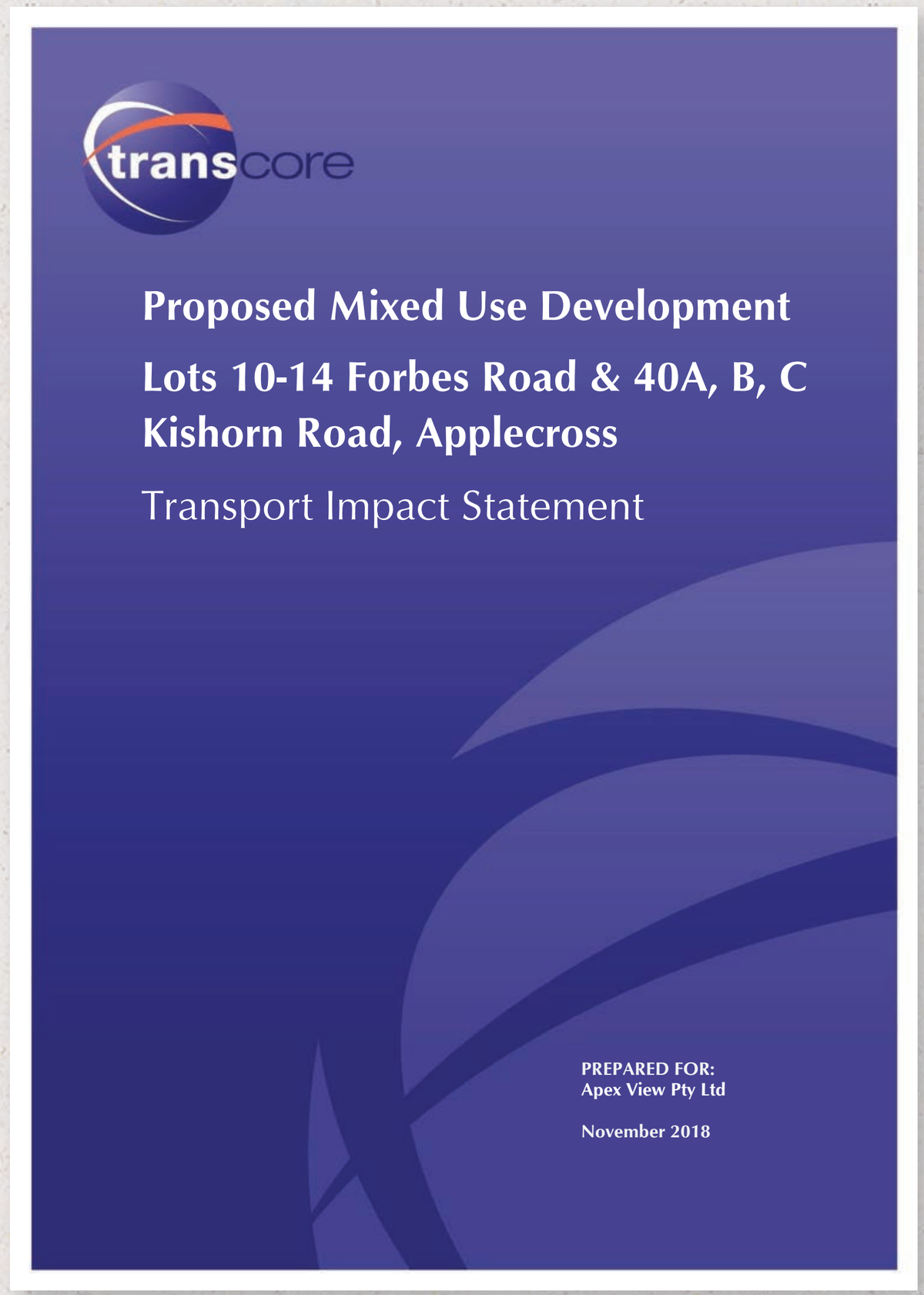
The above is achieved using:

Residential Waste

+ Five 660L refuse receptacles, collected by the City three times each week; and
+ Three 660L recyclables receptacles, collected by the City three times each week

Commercial Waste

+ Four 660L refuse receptacles, collected by the City three times each week; and
+ Two 660L recyclables receptacles, collected by the City three times each week



FUNCTIONALITY+ BUILD QUALITY

Transport Impact Statement

Please see Appendix for full Transport Report

Conclusions:

"The traffic analysis undertaken in this report shows that the traffic generation of the proposed development is conservatively estimated to be in order of about 664 daily and 68/50 peak hour trips during AM/PM peak (both inbound and outbound). **Accordingly, the traffic impact of the proposal on the surrounding road network will be insignificant.**

No particular transport or safety issues have been identified for the proposed development.

Finally, it is concluded that the traffic-related issues should **not form an impediment to the approval** of the proposed development."

10_Principles

SUSTAINABILITY

Beyond Five Star Greenstar

UNIQUE TO PERTH,PASSIVE HIGHRISE

We are committed to a minimum 5 star greenstar rating but what we want to do is take on some of the some critical aspects of energy use which fall through the cracks of rating tools.

Communal lobby areas in towers often don't have access to light and are rarely naturally vented so significant energy is wasted heating them in summer in the early morning and cooling in winter in the late afternoon to maintain 23.5° climate control. City of Sydney research has found that 60% of energy use is in common areas.

This proposal allows three points of daylight to the floorplate as well as three points of venting via mechanically operated louvres which will remain open unless in fire mode.

The floorplate's unique shape also maximises external wall surface and potential for daylighting to apartments, thus reducing the need for artificial lighting during the day for the residents.

10_Principles

SUSTAINABILITY

An Integrated Landscape

As mentioned previously, we are **OVER+ABOVE** green plot ratio with **135%** of site area allocated to planting.

If you relate this to the requirements of the CBACP we are:

270%

of the minimum landscaping required in **CLAUSE 10.3**

(total planting) *(site area)*
5477.54 / 2023
= 2.7
OR 270% of the minimum 100% of site area required in Clause 10.3 of the CBACP

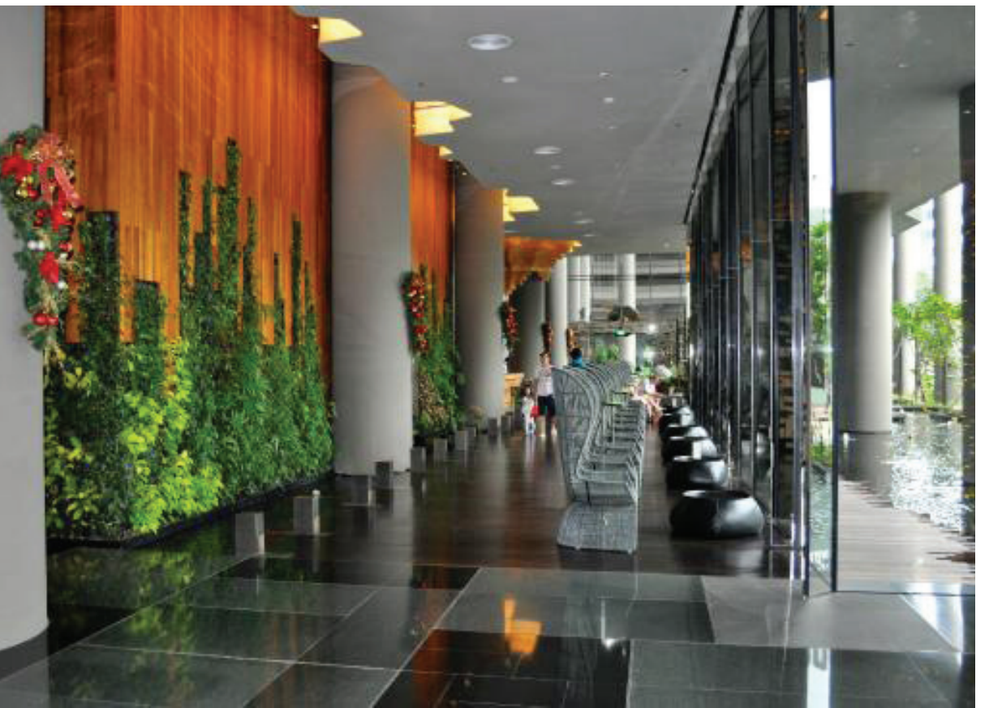
We want to change the public perception that buildings destroy nature. We want people to see buildings that integrate, restore and expand the natural environment.

10_Principles

AMENITY

Comfortable, Engaging spaces

+ Unique floorplate shape allows for three points of venting via mechanically operated louvres
+ Unique floorplate shape maximises external wall surface and daylight to apartments
+ Six Skygardens shared over multiple levels each provide community gardens and greenery
+ Dual aspect apartments
+ Large terraces open directly from indoor living areas
+ Visual privacy enforced throughout, with no cross-views between apartments
+ High quality fixtures and fitting to reduce ongoing costs
+ Communal facilities provide areas for larger gatherings
+ Full height glazing



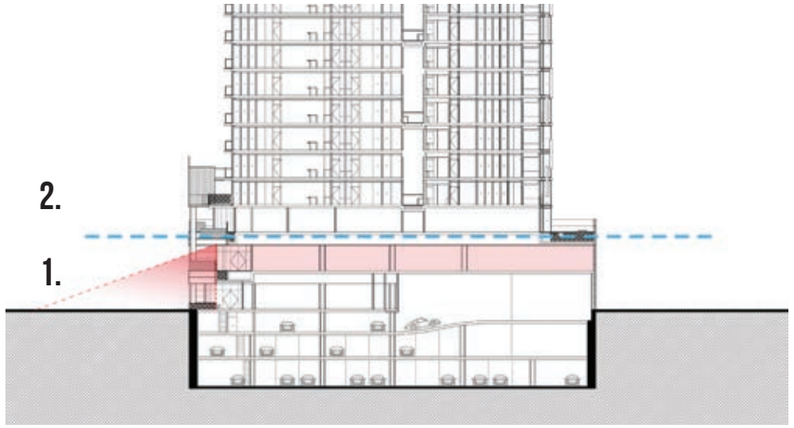
10_Principles

LEGIBILITY

Effective Communication

+ Clear separation of residential, short stay, and commercial entries
+ Opportunities for integrated signage within built form
+ Sight lines considered at pedestrian & vehicle entries
+ Open core facilitates wayfinding on apartment levels

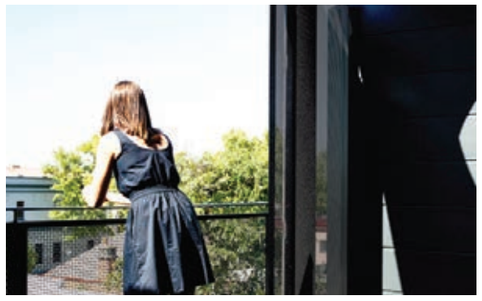
SAFETY



SECTION A-A - PASSIVE SURVEILLANCE

GROUND FLOOR

LEVEL 1



Safe & Secure

1. Strong passive surveillance from Level 1 Community Garden
2. Residences and Short Stay apartments buffered from ground floor by two storeys
3. Commercial frontages maximise glazing to street
4. Well lit and active ground floor
5. Secured entrances with no entrapment spaces

PUBLIC COMMUNITY

GROUND FLOOR

Commercial Co-Working

Commercial EOT

Public EOT

Food & Beverage

Retail

Verandah Garden improves pedestrian environment

Ground Floor & Level 1

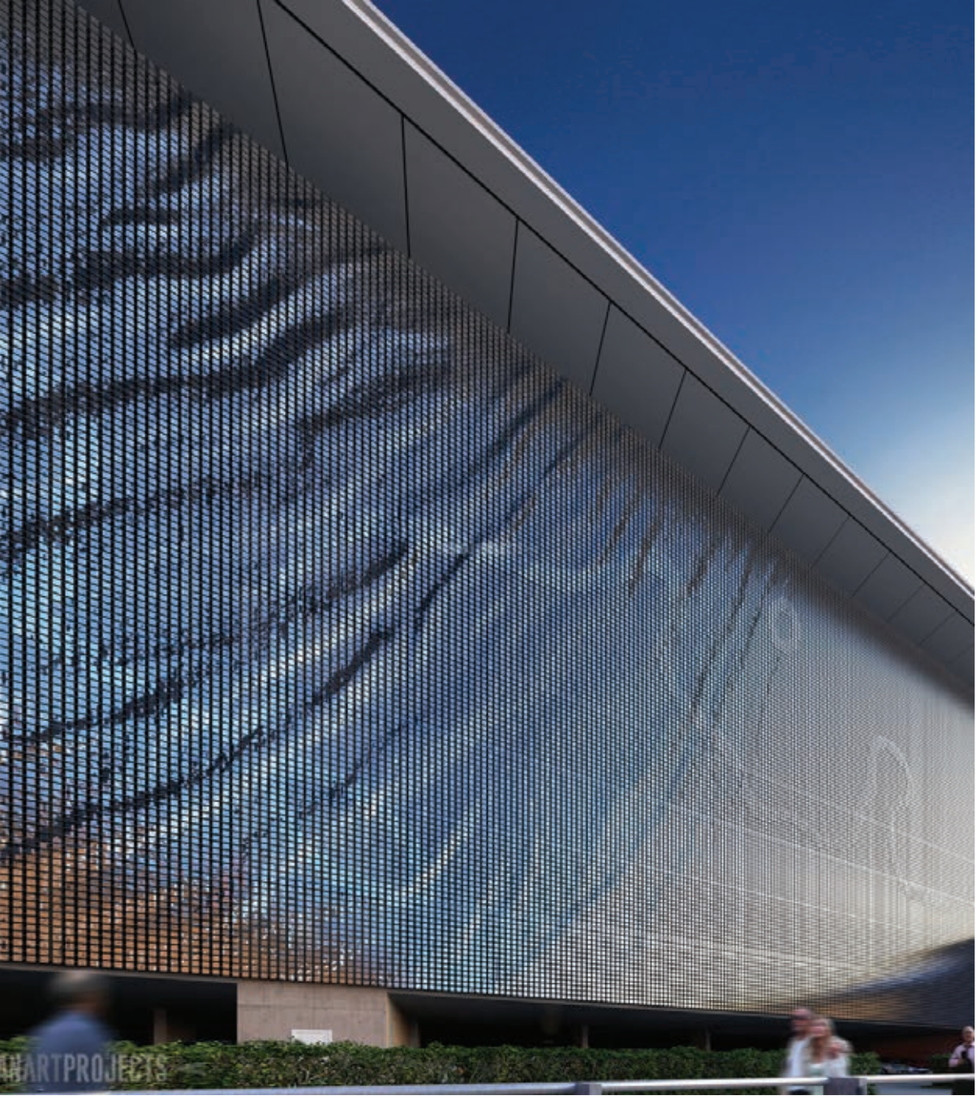
+ Ground floor Verandah Garden creates better pedestrian environment
+ Active commercial tenancies create a safer environment
+ Co-working space enables flexible working arrangements
+ Public gardens encourage community engagement

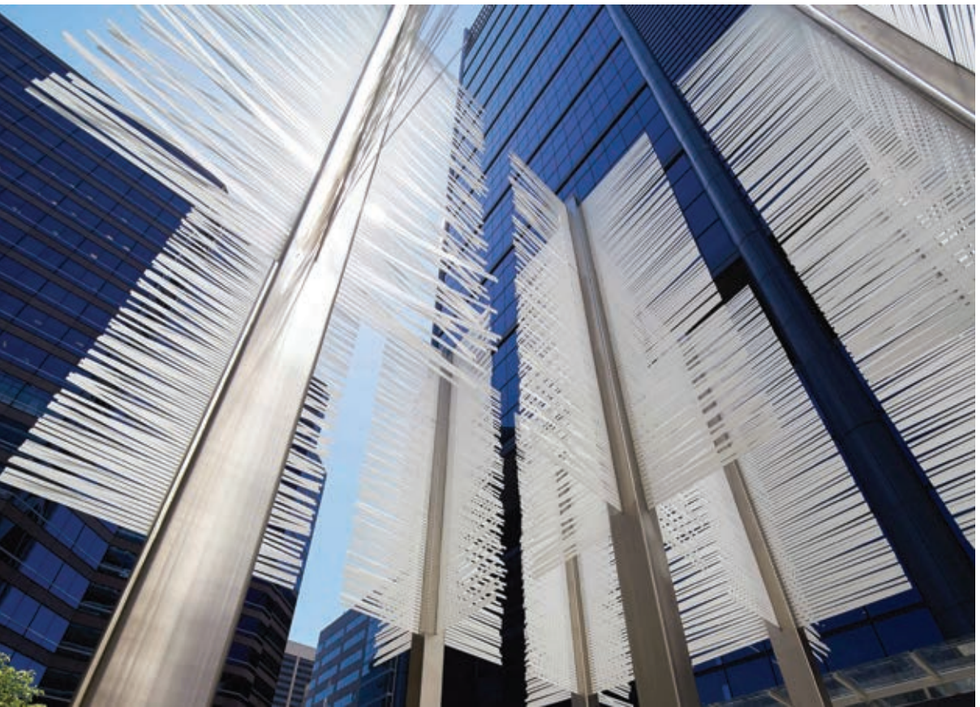
LEVEL 1

Commercial Co-Working

Public Community Garden

Public Community Terrace





10_Principles

PUBLIC COMMUNITY

Inspiring Public Artwork

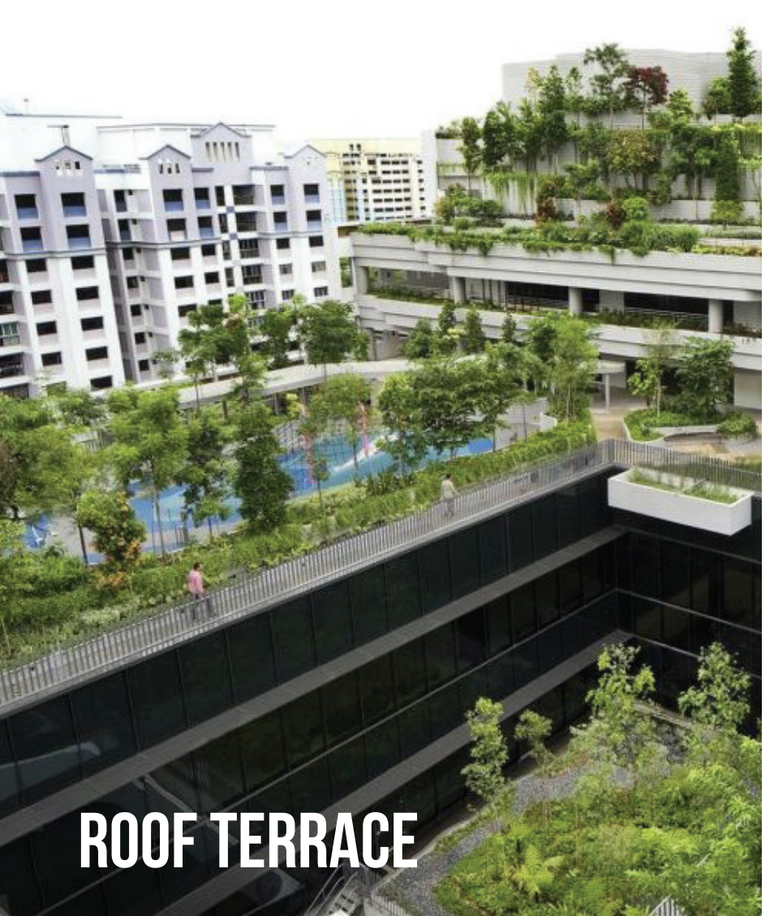
With the emphasis on natural systems and sustainability, an artwork that makes visible the processes in the building is desired.

Some options include kinetic sculptures as part of the wind scoops that show the wind.

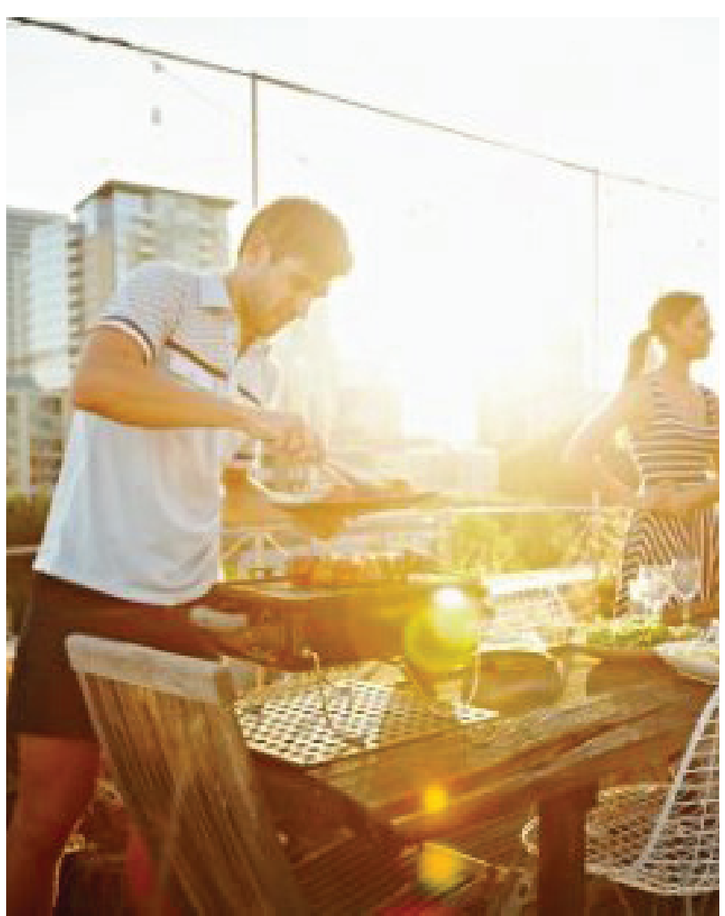
We believe the best location for public art is for it to clad the SW corner of the podium above the F&B. The rippling surface would be animated by the prevailing wind and create endless interest for the alfresco diners.

As per the guidelines of the CBACP, this concept will be developed and fine tuned with a recognised artist.

SKYGARDENS



ROOF TERRACE

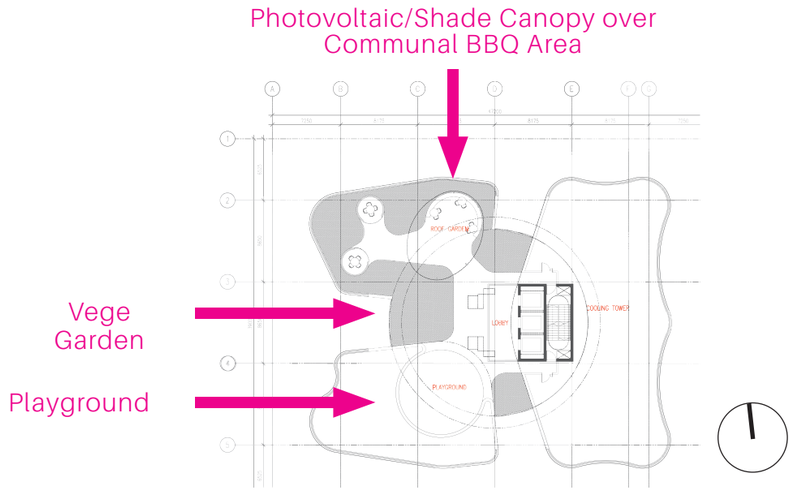


10_Principles

RESIDENTIAL COMMUNITY

Live / Work / Play

+ Diverse mix of apartments sizes and types
+ Six Skygardens localise community interactions within the building
+ Neighbourhoods of 21 homes over three floors share a lobby & Skygarden. 21 homes is the average number of houses on a typical Applecross suburban street block
+ Roof Terrace provides opportunity for residents to meet and socialise with their neighbours



Communal Roof Terrace

10_Principles

AESTHETICS

Landmark Design

+ The curved floor plate is comprised of three petals, evoking the organic form of a Jacaranda blossom
+ The greenery of the building's vegetation is a significant part of its aesthetic, starting with the lush greenery of the podium base and running up the recesses of the facade between the petals, accentuated by Skygardens at approximately every third floor
+ The contoured levels of the podium create a distinctive interface and transition between the ground and tower and facilitates public engagement by opening up views and allowing public access to above ground levels

SO WHATS THE SCORE?

1 Green Plot Ratio

The amount of landscaped surfaces compared to a development's site area.

The measurement includes all new and preserved vegetation, vertical and horizontal landscaping, water features, lawns and trees, raised planters, and urban farms.

All buildings need to encourage bio-diversity, reduce the urban heat island effect, provide shade and cooling, improve air quality, soften the harshness of the cityscape, restore wildlife habitats, and re-connect people with nature.

✓ 135%

2 Community Plot Ratio

The amount of community space allocated within a development's site area.

The measurement includes fully public areas, semi-private communal spaces, care centres, libraries, restaurants, cafés, and community centres.

The amenity of an urban precinct is largely determined by the quantity and quality of its community spaces. The buildings should encourage human interaction and facilitate social gatherings. Human scale, accessibility, and inclusivity, are crucial to the success of community integration.

✓ 131%

3 Civic Generosity Index

The extent to which a development encourages and facilitates the public life of a city.

The index rates the value of a development's public attributes, such as urban connections, shared relaxation areas, sheltered walkways, gardens, and artworks.

In a sociable city, buildings should be judged by their 'human' characteristics…are they friendly, generous, and accommodating?

✓ 5/5

4 Ecosystem Contribution Index

The degree to which a development supplements a city's ecosystem.

The index rates a building's capacity to maintain connections between natural habitats; its intention to provide food, water and shelter for local wildlife, and settings for native plants; and its implementation of an environmentally sensitive method for water management.

As land in cities can be more successfully adapted for wildlife preservation than that of agricultural zones, building developments now play a key role in regenerating a city's (and a region's) ecological processes. In order to reverse the unprecedented environmental degradation caused by rapid urbanisation, a city's architects, planners, and developers must view buildings as homes for flora and fauna, as well as people.

✓ 60-80%

5 Self-Sufficiency Index

A development's capacity to provide its own energy, food and water.

The index rates the success of a development's energy, food and water production; the amount of its surfaces allocated to solar collection and urban farming; and the extent of its systems for recycling and harvesting natural resources.

In a sustainable city, buildings must aim to be completely self-sufficient… they must produce as much energy as they consume, and preferably more, in order to compensate for existing high-maintenance buildings.

TBC...

APPENDIX

+ Element 22 surplus area calculation
+ Wind Analysis
+ Waste Management
+ Transport Impact Statement
+ Landscape Design Report
+ Architectural Drawings

Total element 22 floor area surplus:

154m² + 300m² + 87m² + 235m² + 412m² + 1619m²

Community Garden	300m² alfresco & new public space on this prominent corner	EoT facilities	Pedestrian Throughfare	Community Co-Share	Short Stay Floor Plate

= 2807m²
of element 22 surplus

Appendix

WIND ANALYSIS

WINDTECH

PEDESTRIAN WIND ENVIRONMENT STATEMENT

APPLECROSS, CORNER OF KISHORN AND FORBES ROAD, PERTH

WE212-01F02(REV0)- WS REPORT

SEPTEMBER 18, 2018

Prepared for:

Apex View Pty Ltd

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DOCUMENT CONTROL

Date	Revision History	Issued Revision	Prepared By (initials)	Instructed By (initials)	Reviewed & Authorised by (initials)
September 18, 2018	Initial.	0	BH	SWR	JG

EXECUTIVE SUMMARY

This report is in relation to the proposed development located on the corner of Kishorn and Forbes Road, Applecross and presents an opinion on the likely impact of the proposed design on the local wind environment on the critical outdoor areas within and around the subject development. The effect of wind activity is examined for the three predominant wind directions for the Perth region; namely the easterly, south-west, and westerly winds. The analysis of the wind effects relating to the proposed development was carried out in the context of the local wind climate, building morphology and land topography.

The conclusions of this report are drawn from our extensive experience in this field and are based on an examination of the latest architectural drawings. No wind tunnel testing has been undertaken for the subject development, and hence this report addresses only the general wind effects and any localised effects that are identifiable by visual inspection. Any recommendations in this report are made only in-principle and are based on our extensive experience in the study of wind environment effects.

The results of this assessment indicate that the development is relatively exposed due to the minimal shielding from the three prevailing wind directions affecting the site; east, south-west, and west. As a result, there are expected adverse wind effects within certain areas of the development. It is expected that suitable wind conditions can be achieved through all trafficable areas within and around the site with the treatments recommended in this report, which are summarised below:

- Inclusion of densely foliating evergreen trees along the pedestrian footpath areas and shrubs within the planter areas along the southern and western aspects.
- An impermeable awning above the south-west ground floor seating area.
- A baffle screen design within the through site link on the ground floor.
- An awning over the exposed balcony areas on Level 1.
- An awning over the eastern and northern aspects of the podium on Level 2.
- Inclusion of screening (2.0m to full-height) along two aspects of the balcony areas on Level 16-19, with an impermeable balustrade along the perimeters.
- Inclusion of perimeter screening (1.5-2.0m high) along the communal area balcony on Level 15.
- Inclusion of perimeter screening (minimum 2.0m high) of the Roof terrace area, as well as densely foliating evergreen shrubs within the planter regions (capable of growing 1.5-2.0m).

It should be noted that for any tree planting and landscaping to be effective as a wind ameliorative device, the species selected should be of an evergreen variety and densely foliating. Trees should by planted in clusters with interlocking canopies to help absorb the wind as a tree in isolation can be impacted by stronger wind conditions.

Wind tunnel testing is recommended to be undertaken to assess the wind conditions within and around the subject development. This will provide a quantitative analysis of the wind conditions and determine the extent of the abovementioned wind mitigation treatments to ensure suitable wind conditions are achieved.

CONTENTS

1 INTRODUCTION

An opinion on the likely impact of the proposed design on the local wind environment affecting pedestrians within the critical outdoor areas within and around the subject development is presented in this report. The analysis of wind effects relating to the proposed development has been carried out in the context of the predominant wind directions for the region, building morphology of the development and nearby buildings, and local land topography. The conclusions of this report are drawn from our extensive experience in the field of wind engineering and studies of wind environment effects.

No wind tunnel testing has been undertaken for this assessment. Hence this report addresses only the general wind effects and any localised effects that are identifiable by visual inspection, and any recommendations in this report are made only in-principle.

2 DESCRIPTION OF THE DEVELOPMENT AND SURROUNDINGS

The development site is bounded by Forbes Road to the west, Kishorn Road to the south, and low-rise residential and retail to the north and east. The site is predominantly surrounded by low-rise residential/retail buildings, with the Swan River lying further to the east, north, and west. A survey of the land topography indicates there are no major elevation changes in the region surrounding the site, only a gentle slope down towards Swan River to the east. An aerial image of the subject site and the local surroundings is shown in Figure 1.

The proposed development is a mixed-use building comprising of retail on the Ground floor, residential apartments above, and communal floors on Level 15 and the Roof. The overall height of the development is twenty-one floors inclusive of Ground.

The critical trafficable areas associated with the proposed development, which are the focus of this assessment with regards to wind effects, are detailed as follows:

- Pedestrian footpaths and site entrances along Forbes Road and Kishorn Road,
- Ground floor seating area along the south-west corner of the development,
- Main entrance lobby area,
- Balcony and podium areas on Level 1-2,
- Private balcony areas on Level 3-14 and Level 16-19,
- Skygarden areas on Level 3, 6, 9, 12, 15, 16, and 19, and
- Outdoor communal areas on Level 15 and the Roof.

Figure 1: Aerial Image of the Site Location

3 REGIONAL WIND

The Perth region is governed by three principal wind directions, and these can potentially affect the subject development. These winds prevail from the east, south-west and west. A summary of the principal time of occurrence of these winds throughout the year is presented in Table 1 below. This summary is based on an analysis of wind rose data obtained by the Bureau of Meteorology from Perth Airport, from 1944 to 2006.

Table 1 Principal Time of Occurrence of Winds for Perth

Month	Wind Direction		
	Easterly	South-Westerly	Westerly
January	X	X	
February	X	X	
March	X	X	X
April	X	X	X
May	X		X
June			X
July			X
August		X	X
September	X	X	X
October	X	X	X
November	X	X	X
December	X	X	

A directional plot of the annual and 5% exceedance winds for the Perth region, and the frequency of the winds are shown in Figure 2. Again, this plot has been produced based on an analysis of recorded wind speed data obtained from Perth Airport, from 1944 to 2006.

As shown in Figure 2, the easterly winds are the most frequent for the Perth region, and are also the strongest. The south-westerly winds occur most frequently during the warmer months of the year for the Perth region, and hence are usually welcomed within outdoor areas. South-westerly winds are also similar strength to the westerly winds, but not as strong as the easterly events. The south-westerly and westerly winds typically occur during the afternoon periods.

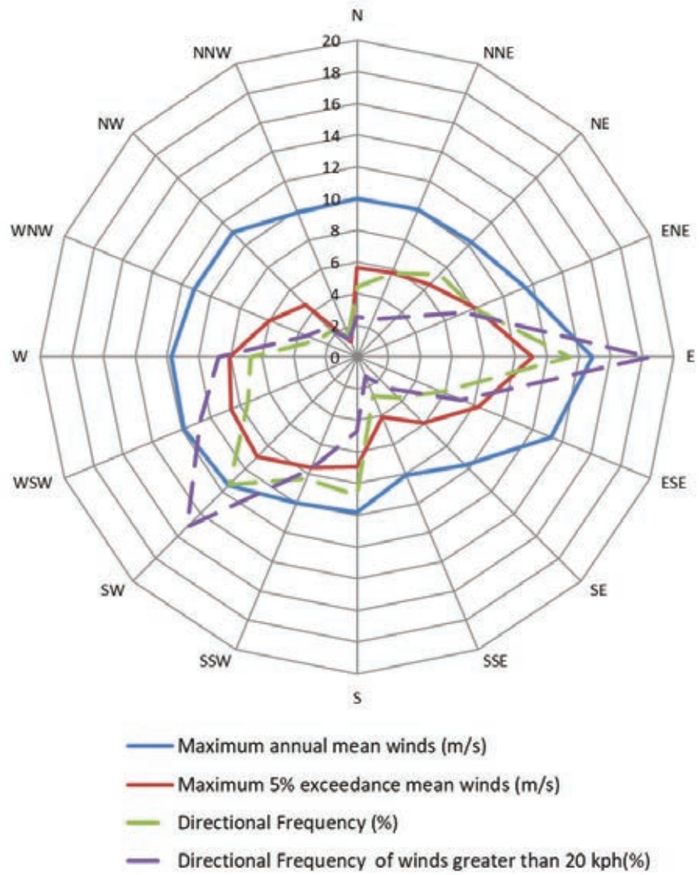

Figure 2: Annual and 5% Exceedance Hourly Mean Wind Speeds, and Frequencies of Occurrence, for the Perth Region (referenced to 10m above ground in standard open terrain)

4 WIND EFFECTS ON PEOPLE

The acceptability of wind in any area is dependent upon its use. For example, people walking or window-shopping will tolerate higher wind speeds than those seated at an outdoor restaurant. Various other researchers, such as A.G. Davenport, T.V. Lawson, W.H. Melbourne, and A.D. Penwarden, have published criteria for pedestrian comfort for pedestrians in outdoor spaces for various types of activities. Some Councils and Local Government Authorities have adopted elements of some of these into their planning control requirements.

For example, A.D. Penwarden (1973) developed a modified version of the Beaufort scale which describes the effects of various wind intensities on people. Table 2 presents the modified Beaufort scale. Note that the effects listed in this table refers to wind conditions occurring frequently over the averaging time (a probability of occurrence exceeding 5%). Higher ranges of wind speeds can be tolerated for rarer events.

Table 2: Summary of Wind Effects on People (A.D. Penwarden, 1973)

Type of Winds	Beaufort Number	Mean Wind Speed (m/s)	Effects
Calm	0	Less than 0.3	Negligible.
Calm, light air	1	0.3 – 1.6	No noticeable wind.
Light breeze	2	1.6 – 3.4	Wind felt on face.
Gentle breeze	3	3.4 – 5.5	Hair is disturbed, clothing flaps, newspapers difficult to read.
Moderate breeze	4	5.5 – 8.0	Raises dust, dry soil and loose paper, hair disarranged.
Fresh breeze	5	8.0 – 10.8	Force of wind felt on body, danger of stumbling
Strong breeze	6	10.8 – 13.9	Umbrellas used with difficulty, hair blown straight, difficult to walk steadily, wind noise on ears unpleasant.
Near gale	7	13.9 – 17.2	Inconvenience felt when walking.
Gale	8	17.2 – 20.8	Generally impedes progress, difficulty balancing in gusts.
Strong gale	9	Greater than 20.8	People blown over.

It should be noted that wind speeds can only be accurately quantified with a wind tunnel study. This assessment addresses only the general wind effects and any localised effects that are identifiable by visual inspection and the acceptability of the conditions for outdoor areas are determined based on their intended use (rather than referencing specific wind speeds). Any recommendations in this report are made only in-principle and are based on our extensive experience in the study of wind environment effects.

5 RESULTS AND DISCUSSION

The expected wind conditions are discussed in the following sub-sections of this report for the various outdoor areas within and around the subject development. The interaction between the wind and the building morphology in the area is considered and important features taken into account including the distances between the surrounding buildings and the proposed building form, as well as the surrounding landform. Note that only the potentially critical wind effects are discussed in this report.

Located in Applecross, the development site is surrounded by low-rise residential and retail buildings with some medium-rise buildings located a further distance away. As a result, the site receives minimal shielding and the prevailing winds will be relatively unobstructed upstream of the development, with the potential to cause adverse wind conditions.

5.1 Ground Level Areas

The wind conditions for the various pedestrian footpaths in close proximity to the tower are expected to be stronger than the existing conditions due to the increased height of the development in relation to the surrounding buildings. The existing building around the site to the north and the east have the potential to provide some shielding effects for the low level direct winds, however, due to their shorter height, their benefit will be minimal. The tower is expected to capture the prevailing winds and direct them downwards around the south-west corners along Kishorn and Forbes Road.

The tower setback along the northern and eastern aspects is expected to reduce the impact of the downwash winds from the tower onto the neighbouring areas by breaking up the flow pattern. The lack of a setback in the other areas is expected to allow the tower to capture the prevailing westerly and south-westerly winds and cause a potentially adverse downwash effect. It is recommended to include an impermeable awning above the seating area to prevent adverse downwash effects affecting the comfort of pedestrian and residents using the outdoor space.

The east-west alignment of Kishorn Road combined with minimal shielding will allow the predominant easterly, westerly and south-westerly winds to directly impact the pedestrian footpath areas along Kishorn and Forbes Road. There is the potential for these winds to interact with the building morphology and accelerate around the corner at the south-western aspect. It is recommended to include densely foliating evergreen trees along the pedestrian footpath areas and shrubs within the planter areas along the southern and western aspects, as shown in the drawings, to provide shielding against the prevailing winds.

The main lobby entrance receives shielding from direct winds and downwash, as the entrance is located centrally under Level 1. However, the adjacent through site link located south of the main lobby entrance has the potential to propagate the predominant westerly winds and funnel

through the space, resulting in adverse wind conditions. It is recommended to consider a baffle screen design within the through site link to mitigate any funnelling effects.

5.2 Podium and Balcony Areas

The majority of the balcony floor area on Level 1 is shielded from downwash effects, however the southern and western balconies do consist of areas exposed to potential downwash winds from the tower. It is recommended to consider an awning over these spaces to mitigate any adverse downwash wind effects. It is recommended to retain the impermeable balustrades around the balcony perimeters.

The Level 2 podium areas along the northern and eastern aspects are potentially exposed to downwash wind effects captured by the building tower above. It is recommended to consider an awning over these areas to mitigate any downwash wind effects.

The centrally located private balcony areas on Levels 3-14 are expected to be suitable for their intended use as the areas incorporate a recessed design with balustrades in place, as well as exposure limited to only a single aspect. This design will ensure the winds are not able to accelerate across the balcony areas. The corner balconies are also recessed within the floor plan, however they have the potential to be exposed to wrap around winds due to minimal shielding and the impact of the predominant winds interacting with the building form.

The large corner private balconies located on Level 16-19 will be exposed to the prevailing winds due to their elevation, and the lack of upstream shielding. They will be particular prone to direct winds streaming across the open space of the balcony areas, interacting with the building form and accelerating around the corners. To ensure comfortable wind conditions is it recommended to include screening (2.0m to full-height) along two aspects of these balcony areas, with an impermeable balustrade along the perimeters.

The Sky Garden areas located on Levels 3, 6, 9, 12, 15, 16, and 19 are expected to be suitable for their intended use as the areas incorporate a recessed design with balustrades in place. The inclusion of densely foliating evergreen vegetation within these spaces is expected to provide further mitigation.

5.3 Outdoor Communal Areas

The outdoor communal area on Level 15 is partially shielded from the predominant easterly and south-westerly winds due to the floorplan design. The proposed seating features on the north-western aspect are expected to be suitable for their intended use due to their enclosed design. However, the communal are is exposed to the direct westerly winds with the potential for the south-westerly and easterly winds to wrap around into the area. To mitigate these effects it is recommended to consider perimeter balustrades of 1.5-2.0m high. This can be glazed to preserve the view of the surroundings.

The outdoor areas on the Roof include a Playground, Garden, and seating features. The area is exposed to the three prevailing wind directions due to limited shielding, which will result in

adverse wind conditions. The Playground is expected to be suitable for its intended use as it is enclosed with a canopy above. This design will stagnate flow in the area. The Roof Garden also consist of a canopy constructed on pillars in an elliptical shape. It is recommended that perimeter screening with a minimum height of 2.0m be considered around the perimeter of the Roof Level. It is also recommended to include densely foliating evergreen shrubs within the planter regions capable of growing to a height of 1.5-2.0m high above the floor slab.

Wind tunnel testing is recommended to be undertaken to assess the wind conditions within and around the subject development. This will provide a quantitative analysis of the wind conditions and determine the extent of the abovementioned wind mitigation treatments to ensure suitable wind conditions are achieved.

6 REFERENCES

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Appendix

WASTE MANAGEMENT

talis
delivering solutions

Assets | Engineering | Environment | Noise | Spatial | Waste

Waste Management Plan

10-14 Forbes Road and 40A, B & C Kishorn Road, Applecross

Prepared for Apex View Pty Ltd

November 2018

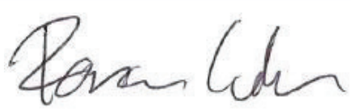
Project Number: TW18037

DOCUMENT CONTROL

Version	Description	Date	Author	Reviewer
0a	Internal Review	28/08/18	JW	RH
1a	DRAFT Released to Client	31/08/18	JW	Client
1b	Released to Client	07/11/18	JW	Client
1c	Released to Client	16/11/18	RH	Client

Approval for Release

Name	Position	File Reference
Ronan Cullen	Director	TW18037- Waste Management Plan.1c
Signature		



Waste Management Plan
10-14 Forbes Road and 40A, B & C Kishorn Road, Applecross
Apex View Pty Ltd

Executive Summary

Apex View Pty Ltd is seeking development approval for the proposed mixed use development located at 10-14 Forbes Road and 40A, B & C Kishorn Road, Applecross (the Proposal) within the Kintail Quarter of the Canning Bridge Activity Centre.

To satisfy the conditions of the development application the City of Melville (the City) requires the submission of a Waste Management Plan (WMP) that will identify how waste is to be stored and collected from the Proposal. Mustera Property Group on behalf of Apex View Pty Ltd has engaged Talis Consultants Pty Ltd (Talis) to prepare this WMP to satisfy those conditions.

The anticipated quantities of refuse and recyclables for the Proposal were based upon the City's *Waste and Recyclable's Collection for Multiple Dwellings, Mixed Use Developments and Non Residential Developments* (2016). In addition, discussions with the City were also undertaken to ensure that the selected generation rates were suitable for the Proposal.

A summary of the receptacle size, numbers, collection frequency and collection method for the Proposal is provided in the below table.

Proposed Waste Collection Summary

Waste Type	Generation (L/week)	Bin Size (L)	Number of Bins	Collection Frequency/Week	Collection
Residential Apartments					
Refuse	8,273	660	5	3	City of Melville
Recyclables	4,353	660	3	3	City of Melville
Commercial Spaces					
Refuse	7,093	660	4	3	City of Melville
Recyclables	1,997	660	2	3	City of Melville

The City will utilise its rear lift waste collection vehicle to service the Proposal from Loading Bay within the development. The City's waste collection staff will ferry the receptacles to and from the City's rear lift waste collection vehicle for servicing. The City will provide a 'spotter' who will accompany the driver to assist when the waste collection vehicle is reversing on-site.

Building management will oversee the relevant aspects of waste management at the Proposal.

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Apex View Pty Ltd

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Figures

Introduction

Apex View Pty Ltd is seeking development approval for the proposed mixed use development located at 10-14 Forbes Road and 40A, B & C Kishorn Road, Applecross (the Proposal), within the Kintail Quarter of the Canning Bridge Activity Centre.

To satisfy the conditions of the development application the City of Melville (the City) requires the submission of a Waste Management Plan (WMP) that will identify how waste is to be stored and collected from the Proposal. Apex View Pty Ltd has engaged Talis Consultants Pty Ltd (Talis) to prepare this WMP to satisfy those conditions.

The Proposal is bordered by residential premises to the north, Forbes Road to the west, Kishorn Road to the south and a mix of commercial premises to the east, as shown in Figure 1.

1.1 Objectives and Scope

The objective of this WMP is to outline the equipment and procedures that will be adopted to manage all waste (refuse and recyclables) at the Proposal. Specifically, the WMP demonstrates that the Proposal should be designed to:

- Adequately cater for the anticipated quantities of waste and recyclables to be generated;
- Provide suitable Bin Storage Areas including appropriate receptacles; and
- Allow for efficient collection of receptacles by appropriate waste collection vehicles.

To achieve the objective, the scope of the WMP comprises:

- Section 2: Waste Generation;
- Section 3: Waste Storage;
- Section 4: Waste Systems;
- Section 5: Waste Collection;
- Section 6: Waste Management Activities; and
- Section 7: Conclusion.

2 Waste Generation

This section outlines the waste generation rates used and the estimated waste volumes to be generated at the Proposal.

2.1 Proposed Tenancies

The anticipated quantities of refuse and recyclables to be generated were based on the number of residential and commercial tenancies at the Proposal. The Proposal consists of the following residential and commercial spaces:

- Residential:
  - Apartments – 98; and
  - Amenities including, pool deck, gym, treatment, bbq, dining/lounge and clubhouse – 619m^2;
- Commercial Tenancies:
  - Short Stay Apartments – 15;
  - Restaurant/Cafe – 118m^2;
  - Co-working space– 412m^2; and
  - Retail (non-food) – 67m^2.

2.2 Waste Generation Rates

The anticipated quantities of refuse and recyclables for the Proposal were based upon the City's *Waste and Recyclable's Collection for Multiple Dwellings, Mixed Use Developments and Non Residential Developments* (2016). In addition the discussions with the City were also undertaken to ensure that the selected generation rates were suitable for the Proposal.

Consideration was also given to Western Australian Local Government Association's *Multiple Dwelling Waste Management Guidelines* (2014) and *Commercial and Industrial Waste Management Plan Guidelines* (2014).

2.3 Waste Generation Volumes

Waste generation is estimated by volume in litres (L) as this is generally the influencing factor when considering receptacle size, numbers and storage space required.

2.3.1 Residential Waste

Residential waste volumes in litres per week (L/week) of refuse and recyclables adopted for this waste assessment are shown Table 2-1. It is anticipated that the residential apartments and associated amenities will generate 8,273L of refuse and 4,353L of recyclables each week.

Table 2-1: Estimated Waste Generation - Residential

Residential Tenancies	Number of Apartments / floor area (m^2)	Waste Generation Rate (L/week)	Waste Generation (L/Week)
Refuse			
Apartments	98	80	7,840
Amenities: pool deck, gym, treatment, bbq, dining/lounge and clubhouse	619	10	433
		Total	**8,273**
Recyclables			
Apartments	98	40	3,920
Amenities: pool deck, gym, treatment, bbq, dining/lounge and clubhouse	619	10	433
		Total	**4,353**

2.3.2 Commercial Waste

Commercial waste generation volumes in litres per week (L/week) of refuse and recyclables adopted for this waste assessment are shown in Table 2-2. It is anticipated that the commercial tenancies at the Proposal will generate 7,093L of refuse and 1,997L of recyclables each week.

Table 2-2: Estimated Waste Generation - Commercial

Commercial Tenancies	Number of serviced apartments / floor area (m^2)	Waste Generation Rate (L/week)	Waste Generation (L/Week)
Refuse			
Short Stay Apartments	15	80	1,200
Restaurant/Café	118	660	5,452
Co-working spaces	412	10	206
Retail (non-food)	67	50	235
		Total	**7,093**
Recyclables			
Short Stay Apartments	15	40	600
Restaurant/Café	118	130	1,074
Co-working spaces	412	10	206
Retail (non-food)	67	25	117
		Total	**1,997**

2.4 Potential Waste Streams

Identification of the following waste materials is relevant to the potential opportunities to avoid and reduce their impact on the waste stream at the Proposal. Waste materials relevant to all apartments and commercial tenancies at the Proposal are predominantly:

- General Waste (refuse);
- Organics;
- Corrugated Cardboard and Paper;

- White office Paper;
- Mixed Plastics (PET and HDPE);
- Beverage containers included in the proposed Container Deposit Scheme;
- Glass;
- E-waste; and
- Hazardous wastes including batteries and fluorescent/LED light globes.

3 Waste Storage

To ensure that waste is managed appropriately at the Proposal, it is important to allow for sufficient space to accommodate the required number of receptacles within the Bin Storage Area. The procedure and receptacles to be used in this area is described in the following sections.

3.1 Residential Internal Receptacles

To promote positive recycling behaviour and maximise diversion from landfill, the Proposal will have a minimum two receptacles within each apartment for the separate disposal of refuse and recyclables. These receptacles will be transferred by the resident, or their authorised representative, to the waste chute system for disposal to the Residential Bin Store. Large cardboard items or bulky materials will be taken by the resident to the Bin Storage Area to reduce the likely hood of blockage in chutes.

A minimum of two receptacles will be located in common use areas across the Proposal's residential amenities for the separate disposal of refuse and recyclables. These receptacles will be taken by the building manager, or their authorised representative, to the Residential Bin Store for disposal into the appropriate receptacles.

3.2 Commercial Internal Receptacles

Each serviced apartment and commercial tenancy will have a minimum of two receptacles for the separate disposal of refuse and recyclables. Refuse and recyclable materials generated by the serviced apartments and commercial tenancies will be taken by staff/cleaners, or their authorised representative, and placed in the appropriate receptacles in the Commercial Bin Store. Refuse and recyclable receptacles will be clearly labelled at all times.

In the future the Proposal may provide additional receptacles for the source separation of waste streams identified in Section 2.4 to further assist with diversion of wastes from landfill.

3.3 Bin Storage Area

Refuse and recyclable materials generated within the Proposal will be collected in receptacles located in the Bin Storage Area shown in Figure 2.

3.3.1 Receptacle Sizes

The information in Table 3-1 below presents the typical dimensions of receptacle sizes 660L and 1,100L. It should be noted that these receptacle dimensions are approximate and can vary slightly between suppliers.

Table 3-1: Typical Receptacle Dimensions

Bin Size (L)	Depth (mm)	Width (mm)	Height (mm)	Area (mm^2)
660	770	1,306	1,200	1,500
1,100	1,100	1,400	1,400	2,000

Reference: City of Melville guidelines

3.3.2 Residential Bin Store Size

To ensure sufficient area is available for storage of the residential waste receptacles, the quantity of receptacles required for Residential Bin Store was using the dimensions in Table 3-1 and assuming three collections each week of residential refuse and recyclables from the Proposal. Based on modelling results in Table 3-2 the Residential Bin Store is designed to accommodate the following receptacles:

- Five 660L refuse receptacles; and
- Three 660L recyclable receptacles.

Table 3-2: Receptacle Requirements – Residential Bin Store

Waste Stream	Waste Generation (L/week)	Number of Receptacles Required	
		660L	1,100L
Refuse	8,273	5	3
Recyclables	4,353	3	2

The configuration of the receptacles within the Residential Bin Store is shown in Figure 2. It is worth noting that the number of receptacles and corresponding placement of receptacles shown in Figure 2 represents the maximum requirements, assuming three collections each week of refuse and recyclables. Increased collection frequencies or use of a compactor would reduce the required number of receptacles.

3.3.3 Commercial Bin Store Size

To ensure sufficient area is available for storage of the residential waste receptacles, the quantity of receptacles required for Residential Bin Store was using the dimensions in Table 3-1 and assuming three collections each week of residential refuse and recyclables from the Proposal. Based on modelling results in Table 3-3 the Commercial Bin Store is designed to accommodate the following receptacles:

- Four 660L refuse receptacles; and
- Two 660L recyclable receptacles.

Table 3-3: Receptacle Requirements – Commercial Bin Store

Waste Stream	Waste Generation (L/week)	Number of Receptacles Required	
		660L	1,100L
Refuse	7,092	4	3
Recyclables	1,997	2	1

The configuration of these receptacles within the Bin Storage Area is shown in Figure 2. It is worth noting that the number of receptacles and corresponding placement of receptacles shown in Figure 2 represents the maximum requirements assuming three collections each week of refuse and recyclables. Increased collection frequencies would reduce the required number of receptacles.

3.3.4 Design

The design of the Bin Storage Area will consider the following:

- Impervious floors draining to the sewer, not less than 75mm in thickness, and provided with an adequate liquid refuse disposal system;
- A tap for washing of receptacles and Bin Storage Area as required;
- Adequate aisle width for easy manoeuvring of receptacles;
- No double stacking of receptacles;
- Self-closing doors and are proposed to be vermin proof;
- Doors wide enough to fit bins through;

- Ventilated to a suitable standard, in accordance with the Australian Standard 1668.2: The Use of Ventilation and Air Conditioning in Buildings;
- Signs installed at drop-off points and within the Bin Storage Area to encourage correct recycling and reduce contamination;
- Clear signage instructing how to correctly use the waste management system;
- Located behind the building setback line;
- Receptacles are not visible from the property boundary or areas trafficable by the public; and
- Receptacles are reasonably secured from theft and vandalism.

Receptacle numbers and storage space within the Bin Storage Area will be monitored by the building manager during operation of the Proposal to ensure that the number of receptacles and collection frequency is sufficient.

4 Waste Systems

4.1.1 Waste Chute

In order to ensure the efficient disposal of waste to the Residential Bin Store a waste chute will be utilised at the Proposal. The Proposal may utilise a single waste chute with diverter system, which uses a common chute with a diverter mechanism at the terminus of the chute for separation of the refuse and recyclables.

The waste chute system will be located in close proximity to the elevators and be accessible on each residential unit level. Chute doors would be self-closing with a bottom hinge and two hour fire rated to AS1530.4-2005. Chutes are required to be vented to reduce odour and insulated for noise reduction. The chute system should be routinely cleaned via chute flushing operations.

The building manager will be required to swap full receptacles with empty receptacles at the terminus of the waste chute system.

4.1.2 Automated Bin Tracks

The Proposal may utilise automated track system within the Residential Bin Store at the terminus of the waste chute. This system is designed to automate the rotation of a number of receptacles through the use of sensors under the waste chute which is activated when the receptacle is full.

The automated track system can be designed to send the building manager a digital alert of the receptacles capacity to ensure the swapping of empty and full bins is done in a timely manner. The automated track system will reduce the amount of work for building management swapping full and empty waste receptacles.

The building manager will be required to manually swap full receptacles with empty receptacles at the terminus of the waste chute.

4.1.3 Compactors

Compactors may be introduced to the Proposal and may be combined with the automated track system under the terminus of the chute system or as standalone equipment. Compactors will typically only be used on the general waste stream, and have a compaction ratio set at around 2:1 to reduce OHS problems and mechanical damage caused by heavier receptacles resultant from higher compaction rates.

5 Waste Collection

5.1 Residential Waste

The City will service the Proposal by providing five 660L receptacles for refuse and three 660L receptacles for recyclables, which will be collected by City's rear lift waste collection vehicle, three times each week for refuse and three times each week for recyclables.

The City's rear lift waste collection vehicle will enter the Proposal in forward motion far enough to then be able reverse into the Loading Bay adjacent to the Residential Bin Store. The City's waste collection staff will ferry the receptacles to and from the City's rear lift waste collection vehicle for servicing. The path for wheeling bins between the loading bay and the Residential Bin Store is of flat surface, with no steps and will be kept free of obstacles. The Loading Bay allows for a 2.5m loading area behind the rear lift waste collection vehicle. Once servicing is complete the City's rear lift waste collection vehicle will exit the Proposal in forward motion.

The City will provide a 'spotter' who will accompany the driver to assist when the waste collection vehicle is reversing on-site. The City will be provided with key/PIN code access to the security access gate and the Bin Storage Area.

The ability for the waste collection vehicle to access the Proposal has been assessed by Transcore and will be included within their Traffic Impact Assessment.

5.2 Commercial Waste

The City will service the Proposal by providing four 660L receptacles for refuse and two 660L receptacles for recyclables, which will be collected by City's rear lift waste collection vehicle, three times each week for refuse and three times each week for recyclables.

The City's rear lift waste collection vehicle will enter the Proposal in forward motion far enough to then be able reverse into the Loading Bay adjacent to the Commercial Bin Store. The City's waste collection staff will ferry the receptacles to and from the City's rear lift waste collection vehicle for servicing. The path for wheeling bins between the loading bay and the Commercial Bin Store is of flat surface, with no steps and will be kept free of obstacles. The Loading Bay allows for a 2.5m loading area behind the rear lift waste collection vehicle. Once servicing is complete the City's rear lift waste collection vehicle will exit the Proposal in forward motion.

The City will provide a 'spotter' who will accompany the driver to assist when the waste collection vehicle is reversing on-site. The City will be provided with key/PIN code access to the security access gate and the Bin Storage Area.

The ability for the waste collection vehicle to access the Proposal has been assessed by Transcore and will be included within their Traffic Impact Assessment.

5.3 Bulk Wastes and Other Waste Services

Residential tenants are entitled to one kerbside bulky goods collection and three kerbside green waste collections each year. Due to the surrounding streetscape placement of bulky or green wastes on the verge would not be appropriate for this development.

Waste Management Plan
10-14 Forbes Road and 40A, B & C Kishorn Road, Applecross
Apex View Pty Ltd

The City encourages bulky waste to accumulate within a storage area and for the building manager to arrange for onsite collection with the City, as it is required. Removal of bulky wastes will be the responsibility of the resident and is to be removed as it is generated so that large amounts of bulk wastes are not accumulated. The building manager will monitor bulky waste and assist residents with its removal, as required.

Each residential apartment has a dedicated store where bulky wastes can be stored for disposal. In addition, a Bulk Waste Store has been allocated for the temporary holding of bulky goods, as shown in Figure 2. This space may also be used for the temporary storage of specialty wastes and bulky commercial wastes and will assist with the reduction of illegal dumping of bulky waste at the Proposal.

It is expected green waste collection will not often be required. Generation of green waste is to be removed as it is generated and will be managed by the building manager.

The City offers a number of additional recycling programs throughout the year and a range of educational opportunities to residents in sustainability and waste minimisation. Information regarding these services can are available on the City's website.

5.4 Specialty/Hazardous Waste

Adequate space will be allocated throughout the Proposal for suitable cabinets/containers for the collection and storage of specialty/hazardous wastes that cannot be disposed within the refuse or recyclable receptacles. Specialty/hazardous waste may include items such as:

- Clothing;
- Batteries;
- E-wastes;
- Used cooking oil;
- White goods;
- Cleaning chemicals; and
- Fluorescent/LED light bulbs.

Bulky specialty/hazardous wastes can be accumulated within the Bulky Waste Store, while smaller waste items can be collected in cabinets/containers in centralised locations across the Proposal.

Specialty/hazardous wastes will be removed from the Proposal once sufficient volumes have been accumulated to warrant disposal. Specialty/hazardous waste collection will be managed by the building manager, who will organise for its disposal at the appropriate facility.

5.5 Future Waste Recovery

In the future the Proposal may look to reduce waste volumes in order to minimise waste collection costs. The Bin Storage Area has allowed space for future resource recovery from the waste streams. This may include the addition of receptacles for source separation of waste streams identified in Section 2.4.

In addition the Proposal could look to reduce the number of waste receptacles or collections by utilising technology such as balers, compactors, or a containerised composting unit to reduce the volume of food waste through treatment.

The incorporation of source separation or treatment technologies into the waste management system will be dependent on the nature of the tenants, available technologies, market conditions and building management

considerations in the future. The building manager should engage with residents, staff and cleaners on what opportunities exist for additional resource recovery.

6 Waste Management Activities

Building management will be engaged to complete the following tasks:

- Monitoring and maintenance of receptacles and the Bin Storage Area;
- Cleaning of receptacles and Bin Storage Area when required;
- Monitoring and maintenance of waste systems and equipment;
- Swapping of full bins with empty bins at the terminus of the waste chute;
- Management of bulk, green and specialty wastes, as required;
- Display and maintain consistent signage on all receptacles and in Bin Storage Area;
- Regularly engage with residents, staff and cleaners to develop opportunities to reduce waste volumes and increase resource recovery;
- Monitor resident and cleaner behaviour and identify requirements for further education and/or signage;
- Ensure all residents, staff and cleaners are aware of the Waste Management Plan and their responsibilities thereunder; and
- Regularly engage with the City to ensure an efficient and effective waste service is maintained.

7 Conclusion

As demonstrated within this WMP, the Proposal provides a sufficiently large Bin Storage Area for collection and storage of refuse and recyclables based on the anticipated waste generation rates and a suitable configuration of receptacles. This indicates that a satisfactorily designed Bin Storage Area has been provided and collection of refuse and recyclable receptacles can be completed from the Proposal.

The above is achieved using:

- Residential Waste:
  - Five 660L refuse receptacles, collected by the City three times each week; and
  - Three 660L recyclables receptacles, collected by the City three times each week.

- Commercial Waste
  - Four 660L refuse receptacles, collected by the City three times each week; and
  - Two 660L recyclables receptacles, collected by the City three times each week.

The City will utilise its rear lift waste collection vehicle to service the Proposal from Loading Bay within the development. The City's waste collection staff will ferry the receptacles to and from the City's rear lift waste collection vehicle for servicing. The City will provide a 'spotter' who will accompany the driver to assist when the waste collection vehicle is reversing on-site.

Building management will oversee the relevant aspects of waste management at the Proposal.

Figures

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LEGEND

- Site Boundary
- Cadastre

LOCALITY

0 2 4 8 12 16 km

LOCALITY

10-14 Forbes Road and
40A, B and C Kishorn Road
Applecross
WA 6153

0 2.5 5 10 15 20 metres
Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994
Scale @ A3: 1:500

Prepared:	F Walker	Date:	28/06/2018
Checked:	N King	Project No:	TW18037
Reviewed:	J Wroe	Revision:	A

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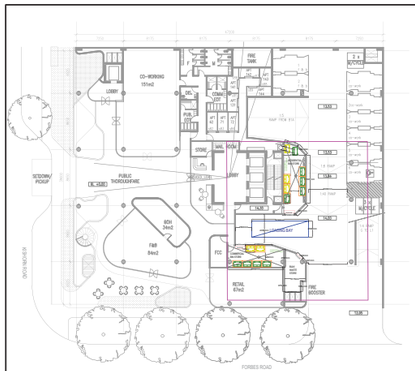
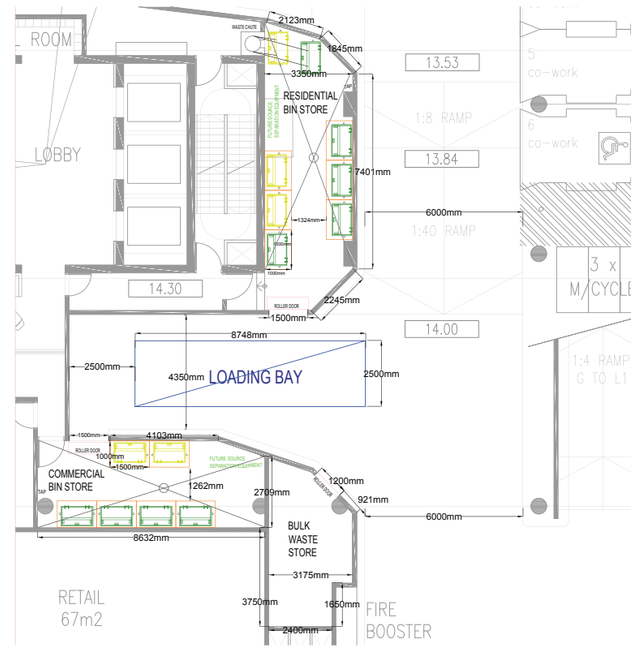
Figure 01





Legend:

Residential Bin Storage Area
- 5 x 660L refuse (780mm x 1260mm)
- 3 x 660L recycling (780mm x 1260mm)

Commercial Bin Storage Area
- 4 x 660L refuse (780mm x 1260mm)
- 2 x 660L recycling (780mm x 1260mm)

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Client: Apex View Pty Ltd

NOTES
1. This drawing is the property of Talis Consultants Pty Ltd. It is a confidential document and must not be copied, used, or its contents divulged without prior written consent.
2. All levels refer to Australian Height Datum.
3. DO NOT SCALE, use figured dimensions only, if in doubt please contact Talis Consultants.

No.	Date		Amendment / Issue	App.
C	16/11/18		THIRD ISSUE	JW
B	09/11/18		SECOND ISSUE	JW
A	31/08/18		FIRST ISSUE	JW

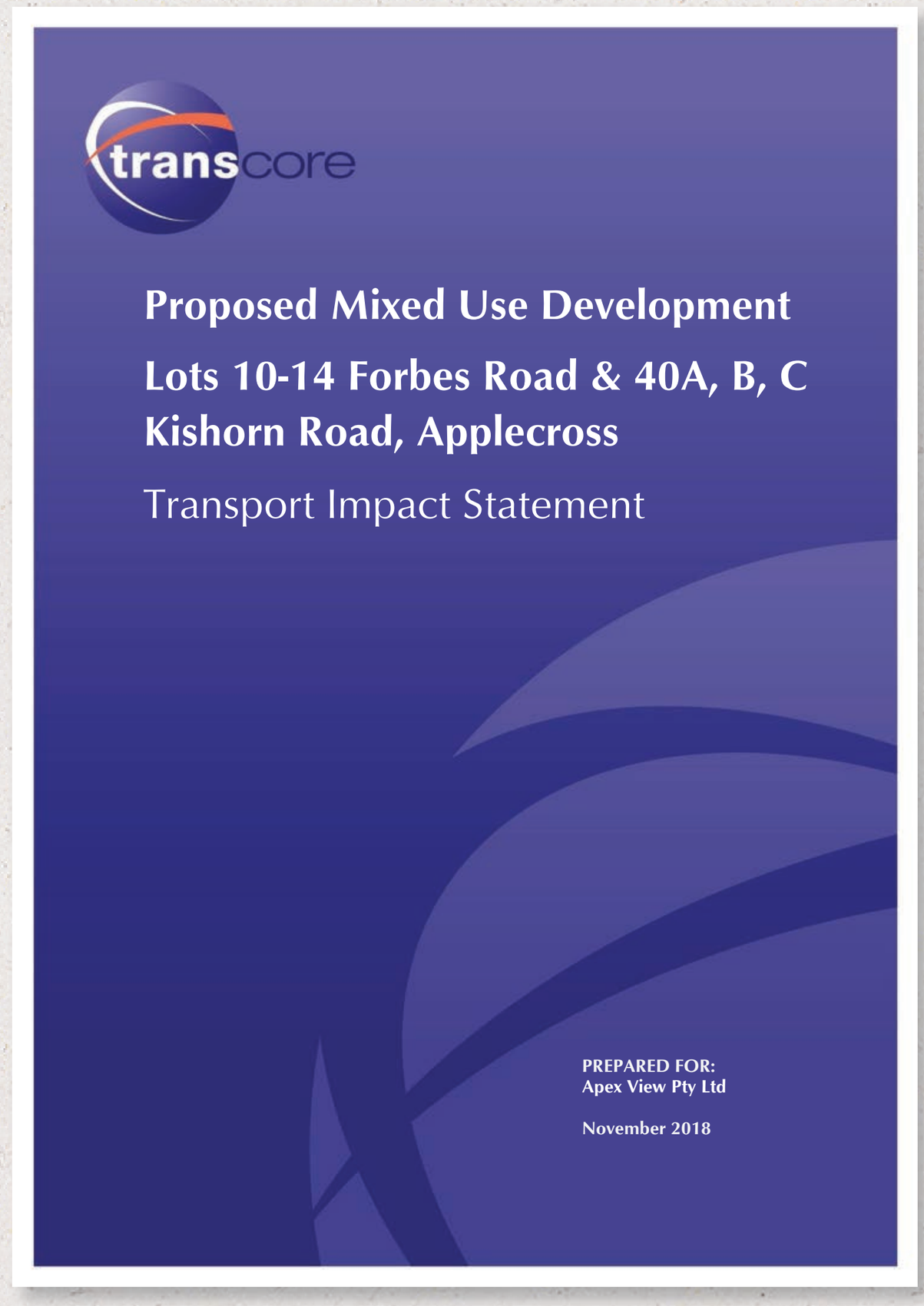
Project: 10 -14 Forbes Road & 40A, B & C Kishorn Road, Applecross

Title: Bin Storage Area

Drawn by:	JW	Job No:	TW18037
Checked by:	RH	File No:	TW18037DWG002
Approved by:	JW	Dg. No:	002
Scale:	NTS	Rev:	C
Date:	16/11/18		

Appendix

TRANSPORT IMPACT STATEMENT



Document history and status

Author	Revision	Approved by	Date approved	Revision type
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Author: Vladimir Baltic

Project manager: Behnam Bordbar

Client: Apex View Pty Ltd

Project: Lots 10-14 Forbes Road & 40A, B, C Kishorn Road, Applecross

Document revision: r01c

Project number: t18.124

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REPORT TABLES

1.0 Introduction

This Transport Impact Statement has been prepared by Transcore on behalf of Apex View Pty Ltd with regard to the proposed mixed-use development to be located at Lots 10-14 Forbes Road & 40A, B, C Kishorn Road in Applecross, City of Melville.

The Transport Impact Assessment Guidelines for Developments (WAPC, Vol 4 – Individual Developments, August 2016) states: *"A Transport Statement is required for those developments that would be likely to generate moderate volumes of traffic[1] and therefore would have a moderate overall impact on the surrounding land uses and transport networks"*. Section 5.0 of Transcore's report provides details of the estimated trip generation for the proposed development. Accordingly, as the total peak hour vehicular trips are estimated to be less than 100 trips, a Transport Impact Statement is deemed appropriate for this development.

The site (amalgamation of six smaller lots) is located at the northeast corner of Forbes Road/Kishorn Road/Sleat Road intersection approximately 165m north of the Sleat Road/Canning Highway intersection as shown in **Figure 1**.

Figure 1: Location of the subject site

The site is bounded by Forbes Road to the west, Kishorn Road to the south, existing residential developments to the north and the existing commercial and residential

[1] *Between 10 and 100 vehicular trips*

developments to the immediate east. Vehicle access to the site is presently available off both frontage roads via the existing Forbes Road and Kishorn Road crossovers.

Pedestrians are currently accessing the site directly via existing paths along Forbes Road and Kishorn Road.

The northern half of the subject site (Lot 10) is presently occupied by a single storey residential dwelling with the balance of the site being vacant. The site is located within an established residential area with a mix of office, commercial and retail land uses located to the east and south.

2.0 Proposed Development

The subject site occupies an area of approximately 2,040m^2 at the northwest corner of Forbes Road and Kishorn Road intersection.

As part of the development proposal the existing structures at the subject site will be replaced with a 19-storey development comprising short–stay accommodation, residential apartments, small-scale retail and restaurant/cafe tenancies and an office component with associated multi-level car parking facility.

The development proposal entails the following elements:

- Total of 15 short-stay units comprising single-bed and two-bed units;
- Total of 98 residential apartments comprising a mix of single-bedroom, two-bedroom and three-bedroom apartments over 16 levels;
- Lap pool, gym, spa and other associated amenities for the residents;
- Small-scale food & beverage store of about 120m^2 GFA at ground floor;
- Small-scale retail tenancy of about 70m^2 GFA at ground floor; and,
- Commercial tenancies (office space) totalling 420m^2 GFA at ground and first floors.

Parking will be fully provided on-site across five levels of car park (three basement levels, ground level and one level above ground) totalling 158 parking bays served by a single, full-movement crossover on Kishorn Road located at the eastern end of the site. The proposed car park crossover will be set back approximately 45m from the Forbes Road intersection. The basement car park facility and the first floor car park facility will have separate ramps which will connect to ground level access driveway. Car bays will also be provided at ground floor accessed directly from the ground level access driveway. An internal two-way ramp system provides connectivity between the basement car park levels and ground floor while a single-lane, two-way operation ramp serves the first floor car park.

In addition to car bays a total of five motorcycle bays area also provided for the development, located at the Basement 1 level.

The waste and recycle bin storage area is located at the ground floor and is accessed via internal driveway connecting the two car park ramps with the Kishorn Road crossover. A turn path assessment using a 9.5m long truck (typical private contractor waste collection vehicle) was undertaken to confirm the suitability of the proposed service bay design. The turn path assessment indicates that the service vehicle can comfortably access and egress the site in forward gear. A number of turn path plans are shown in **Appendix B**.

The secured bicycle storage area with end-of-trip facilities (showers and lockers) is provided at the ground floor adjacent to the stair case and lift lobby. Total bike parking provision is 13 parking spaces.

Pedestrians will access the development from the external footpath network along the Forbes Road and Kishorn Road frontages. Separate lobbies with lifts are provided for residents/visitors and employees/visitors for the commercial component and short-stay apartments. Both lift lobbies are accessible from both road frontages.

Refer to **Appendix A** for plans of the proposed development.

3.0 Vehicle Access and Parking

According to the plans prepared by WOHA the proposed car park facility would be accessed via a single full-movement crossover on Kishorn Road. The proposed crossover is located at the easternmost end of the property some 45m away from the Forbes Road/Kishorn/Sleat Road intersection. Refer **Appendix A** for detailed development plans.

The total proposed on-site parking provision for the development is 158 car and five motorcycle parking bays all of which are in the single-bay format (no tandem bays).

The total car parking supply for the development is proposed to be distributed as follows:

- A total of 139 residential bays;
- A total of 10 short stay apartment bays;
- A total of 6 retail and commercial bays;
- A total of 2 food & beverage tenancy bays;
- One EV charging bay; and.
- Five motorcycle bays.

In addition to the separate basement and first level car park facilities a total of eight parking bays are located at ground level accessed off the internal driveway.

Separate access ramps to the basement (two-lane, two-way ramp) and upper level car park (single-lane, two-way ramp) are connecting to the internal site driveway at ground level which is accessed via Kishorn Road crossover.

4.0 Provision for Service Vehicles

The waste collection is proposed to take place off internal site driveway, with waste collection vehicle accessing and egressing the site in forward gear. A dedicated loading bay is provided at ground level and accessed directly off the internal driveway. All truck manoeuvring takes place within the site. The rubbish bin storage areas are located immediately next to the loading area.

Turn path assessment using 9.6m long service vehicle template was undertaken to ensure the design is conducive for the use of such vehicle. A number of turn path plans demonstrating truck's ingress, manoeuvring within the site and egress are shown in **Appendix B**.

5.0 Daily Traffic Volumes and Vehicle Types

The traffic volumes likely to be generated by the proposed mixed-use development have been estimated based on the proposed land uses and in accordance with the *RTA NSW "Guide to Traffic Generating Developments (2002)", Transport Roads & maritime Services Technical Direction TDT 2013/04a and WAPC TIA 2016 Vol 2 Guidelines* documents, which provide peak hour trip rates for the constituent land uses.

In this particular case peak hour trip generation rates of 4.58, 0.53 and 0.32 trips/dwelling for total daily, AM and PM peak periods has been applied corresponding to "high density residential flat dwellings (regional)" type of residential units and short-stay apartments (TDT 04a). The adopted trip rates are conservative resulting in a robust assessment considering the site location, surrounding land uses, good public transport accessibility and higher level of bicycle and pedestrian trips participation.

The daily, AM and PM peak hour trip rate for office space of 11, 1.6 and 1.2 trips/100m^2 GFA was adopted for the office component of the development (TDT 04a).

The daily, AM and PM peak hour trip rate for restaurant/café of 60, 0.5 and 5 trips/100m^2 GFA was adopted for the food & beverage component of the development (RTA NSW).

The daily, AM and PM peak hour trip rate for retail (non-food) of 40, 1.25 and 4 trips/100m^2 GFA was adopted for the retail tenancy component of the development (WAPC TIA 2016).

Accordingly, it is estimated that the proposed mixed-use development would generate a total of approximately **664** daily vehicle trips with about **68** and **50** trips during the AM and PM peak hour periods. These trips include both inbound and outbound vehicle movements. It is anticipated that most of the vehicle types would be passenger cars and to the lesser extent 4WDs.

As advise by the project architects it is highly likely that the commercial space would be leased by the very residents of the development due to relatively limited size and convenience. Similarly, due to the size of the retail and restaurant/café tenancies, it is expected that these two components will attract mainly local (foot) traffic rather that trade arriving from afar. As such, it is highly likely that the proposed development will attract even less vehicle-based traffic than previously estimated. Accordingly, the estimated vehicular traffic generation represents a robust scenario.

The traffic distribution detailed in **Table 1** was based on the following directional split assumptions for peak hour periods:

- Morning (AM) peak split estimated at 25%/75% and 80%/20% for inbound/outbound trips associated with residential/short-stay and retail/commercial components, respectively; and,
- Afternoon (PM) peak split estimated at 66%/34% and 50%/50% for inbound/outbound trips associated with residential/short-stay and retail/commercial components, respectively.

Table 1: Peak hour trips for the proposed development

Time period	Directional traffic split	Residential/Short-stay Component	Retail Components	Commercial Component	Peak Hour Trips
Morning Peak	Inbound	15	2	5	**68**
	Outbound	46	0	2	
Afternoon Peak	Inbound	23	4	2	**50**
	Outbound	13	5	3	

With respect to the location of the development, permeability and layout of the surrounding road network and the actual traffic operation conditions at local intersections, the assumed directional split for traffic arriving to the site is assumed as follows:

- 40% of all trips to/from the areas east of the site (along Canning Highway);
- 30% of all trips to/from the areas west of the site (along Canning Highway); and,
- 30% of all trips to/from the areas west of the site (along Kishorn Road).

The directional morning and afternoon trip distribution of the development-generated traffic is illustrated in **Figure 2.**

Figure 2. Estimated traffic movements for the subject development – morning, and afternoon peak hour trips

The WAPC *Transport Impact Assessment Guidelines for Developments (2016)* provides guidance on the assessment of traffic impacts:

"As a general guide, an increase in traffic of less than 10 percent of capacity would not normally be likely to have a material impact on any particular section of road but increases over 10 percent may. All sections of road with an increase greater than 10 percent of capacity should therefore be included in the analysis. For ease of assessment, an increase of 100 vehicles per hour for any lane can be considered as equating to around 10 percent of capacity. Therefore, any section of road where the development traffic would increase flows by more than 100 vehicles per hour for any lane should be included in the analysis."

From **Figure 2** it can be seen that the estimated traffic impact from the proposed development would be nowhere near the critical thresholds with the most pronounced traffic increases of 41vph for a short distance of Kishorn Road during PM peak hour (west of development's crossover), hence the impact on the surrounding road network is considered to be insignificant.

6.0 Traffic Management on the Frontage Streets

Kishorn Road, is approximately 8m wide single-carriageway, two-way road with pay (8AM-6PM, Monday to Saturday) on-street parking along one or both sides of the road. The pedestrian footpaths are in place along both sides of the road in this vicinity. Refer **Figure 3** and **Figure 4** for more details.

Figure 3. Westbound view along Kishorn Road in the vicinity of subject site

Figure 4. Eastbound view along Kishorn Road in the vicinity of subject site

Kishorn Road operates under a default 50km/h built-up area speed limit regime. It is classified as an *Access Road* in the Main Roads WA *Metropolitan Functional Road Hierarchy* document.

Based on the latest available traffic counts sourced from the City of Melville, Kishorn Road (east of Forbes Road) carried approximately 1,170vpd on a regular weekday in November 2015.

Forbes Road, is approximately 9m wide single-carriageway, two-way road with pedestrian path on eastern side along most of its length except for the stretch between Kishorn Road and Canning Highway where it entails paths along both sides and a painted 2m wide median. Pay parking (8AM-6PM, Monday to Saturday) is also available along one or both sides of the road. Refer **Figure 5** for more details.

Forbes Road operates under a default 50km/h built-up area speed limit regime. It is classified as an *Access Road* in the Main Roads WA *Metropolitan Functional Road Hierarchy* document. There are no available up-to-date traffic counts for Forbes Road at present.

Figure 5. Northbound view along Forbes Road in the vicinity of subject site

Sleat Road, between Forbes Road and Canning Highway is presented as a single-carriageway, boulevard-style road with a 2m wide painted/raised median and pay parking (9AM-6PM, Monday to Saturday) along both side of the road serving local commercial/retail developments. Refer **Figure 6** for more details.

Sleat Road operates under a default 50km/h built-up area speed limit regime. It is classified as an *Access Road* in the Main Roads WA *Metropolitan Functional Road Hierarchy* document.

Figure 6. Southbound view along Sleat Road in the vicinity of subject site

Based on the latest available traffic counts sourced from the City of Melville, Sleat Road (north of Canning Highway) carried approximately 3,860vpd on a regular weekday in June 2017.

Immediately adjacent to the subject site, Kishorn Road, Forbes Road and Sleat Road form a stop-controlled four-way intersection with priority on Forbes Road and Sleat Road.

Main Roads WA Intersection *Crash Ranking Report* provides detailed crash data for the Labouchere Road/Lyall Street intersection over the 5-year period ending 31 December 2017. There has been only one crash (one medical intervention) recorded at this intersection during the previous five-year period. Crash report information for this intersection is presented in **Table 2**.

The crash history data for the Kishorn Road/Forbes Road/Sleat Road intersection suggests there are no safety concerns relating to the operation of this intersection.

Table 2. Crash history for the Kishorn Road/Forbes Road/Sleat Road intersection

Intersection				Total Crashes	Casualty
Kishorn Road/Forbes Road/Sleat Road				1	1
Side Swipe	**Rear End**	**Pedestrian**	**Cycle**	**Wet**	**Night**
1	0	0	0	0	0

7.0 Public Transport Access

The site is very well served by a number of high frequency bus services (111, 114, 115, 150, 160 and 910) operating along Canning Highway and (148 and 158) operating along Kintail Road with bus stops located within the walking distance from the subject site.

In addition, the subject site is located about 950m walking distance from the Canning Bridge Train Station to the east of the subject site securing access to the greater Perth metro area.

Bus stops and train station are accessible via existing footpath network which is in place within the locality. Refer **Figure 7** for more details.

Figure 7. Local public transport service map (source: Transperth Maps)

8.0 Pedestrian Access

Pedestrian access to the proposed development is available directly from the existing extensive footpath network within the locality and on Forbes and Kishorn Roads. The existing path network provides direct and convenient access to and from local food and beverage, retail, educational attractors reducing reliance on private vehicles.

Pedestrian crossing opportunities are available immediately next to the subject site at Forbes Road/Kishorn Road intersection, on Kishorn Road mid-block some 65m east of the site, at adjacent signal-controlled pedestrian crossing at Canning Highway/Forbes Road traffic signals and at the footbridge over Canning Highway located some 170m east of the site, facilitating access to/from the site to/from the nearby bus stops and Canning Bridge Train Station.

9.0 Cycle Access

According to the current Department of Transport *Perth Bicycle Network Plan*, the subject site is served exceptionally well by the existing bike network within the locality.

The Perth bicycle network route SW5 is in place along Kishorn Road providing direct and convenient access to the local recreational high quality shared path along western bank of Canning River as well as the Principal Shared Path along Kwinana Freeway.

In addition, there are a number of local roads classified as "good road riding environment" providing access to the local Applecross Primary School located some 500m west of the subject site.

With these routes and facilities, it is evident that the subject site enjoys excellent access to existing cycling network and facilities connection to public transport services thus supporting the use of non-motorised means of transport. Refer **Figure 8** for more details.

Figure 8: Extract from Perth Bicycle Network (Department of Transport)

10.0 Site Specific Issues

No particular site-specific issues have been identified for this proposed mixed-use development.

11.0 Safety Issues

No particular transport safety issues have been identified for this proposed development.

12.0 Conclusions

This Transport Impact Statement provides information on the proposed multi-storey, mixed-use development located at 10-14 Forbes Road & 40A, B, C Kishorn Road in Applecross, City of Melville. The development comprises 15 short-stay units, 98 residential apartments, small-scale retail and restaurant/café tenancies (70m^2 and 120m^2 GFA), and one office space (420m^2 GFA). The proposed development is served by a multi-level (three basement levels, ground and one upper floor) car park facility.

A total of 158 car and five motorcycle parking bays are provided on site for the use of residents, employees and visitors. The car park access/egress to and from the site will be provided from Kishorn Road via a single, full-movement crossover.

The subject site has very good accessibility by the existing road, pedestrian and cyclist network and enjoys very good public transport coverage through existing bus and train services located in close proximity of the site.

The traffic analysis undertaken in this report shows that the traffic generation of the proposed development is conservatively estimated to be in order of about 664 daily and 68/50 peak hour trips during AM/PM peak (both inbound and outbound). Accordingly, the traffic impact of the proposal on the surrounding road network will be insignificant.

No particular transport or safety issues have been identified for the proposed development.

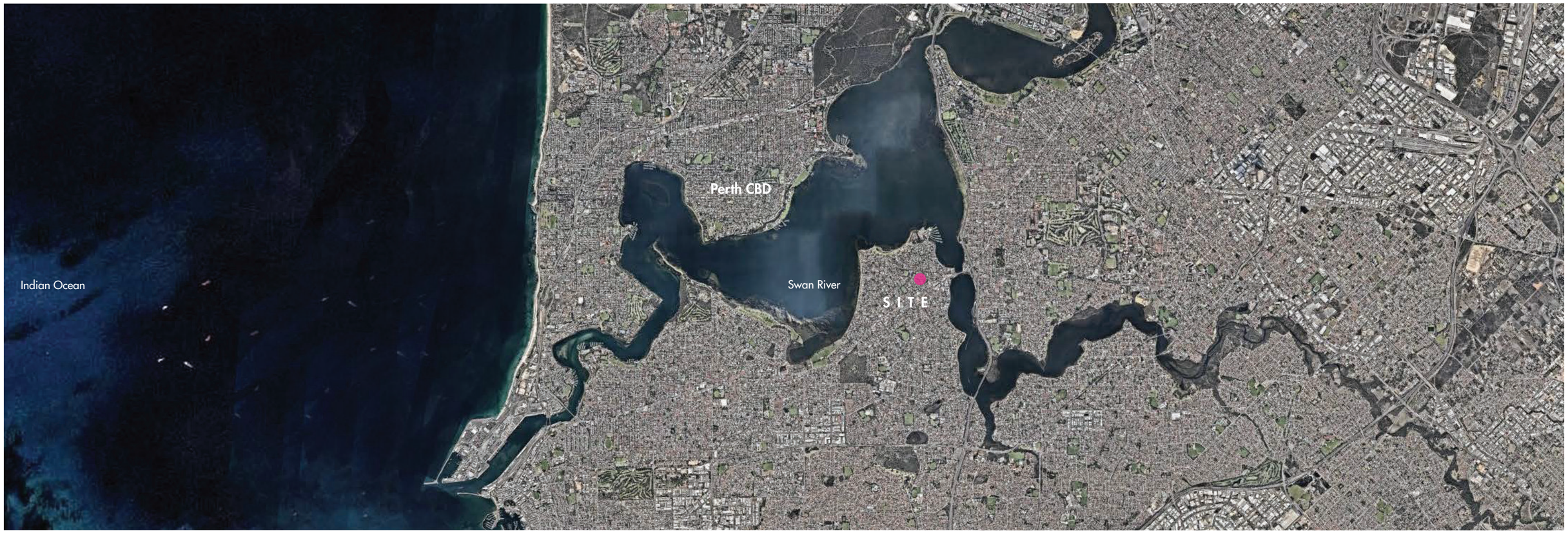
Finally, it is concluded that the traffic-related issues should not form an impediment to the approval of the proposed development.

Appendix

CAPA LANDSCAPE REPORT

FORBES Residences
Applecross, Western Australia

Landscape Schematic
DA Submission Issue - 181116



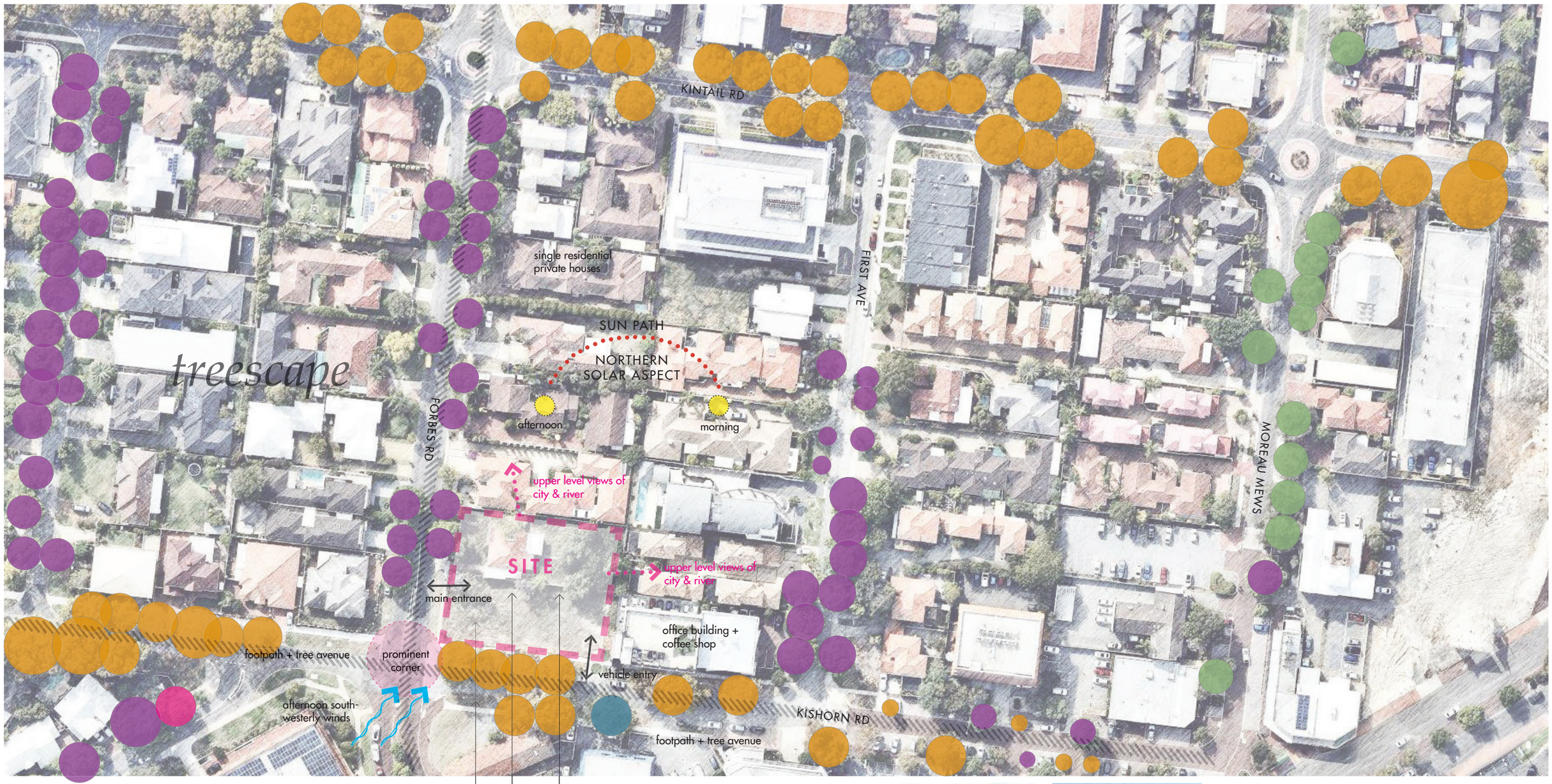
FORBES RESIDENCES
APPLECROSS

SCALE: NTS@A3

LOCATION PLAN

WOHA x MJA
architecture

CAPA
landscape design



Existing Neighbourhood Street + Site Condition

STREETSCAPE
Existing street trees provide a large scaled tree address to the site. The views from the site across the street are largely of commercial premises.

EXISTING SITE VEGETATION
The existing site does not have any vegetation of note.

PANORAMA
The project site will be both highly visible and allow panoramic views from the upper levels.


Jacaranda Mimosifolia
(Jacaranda)

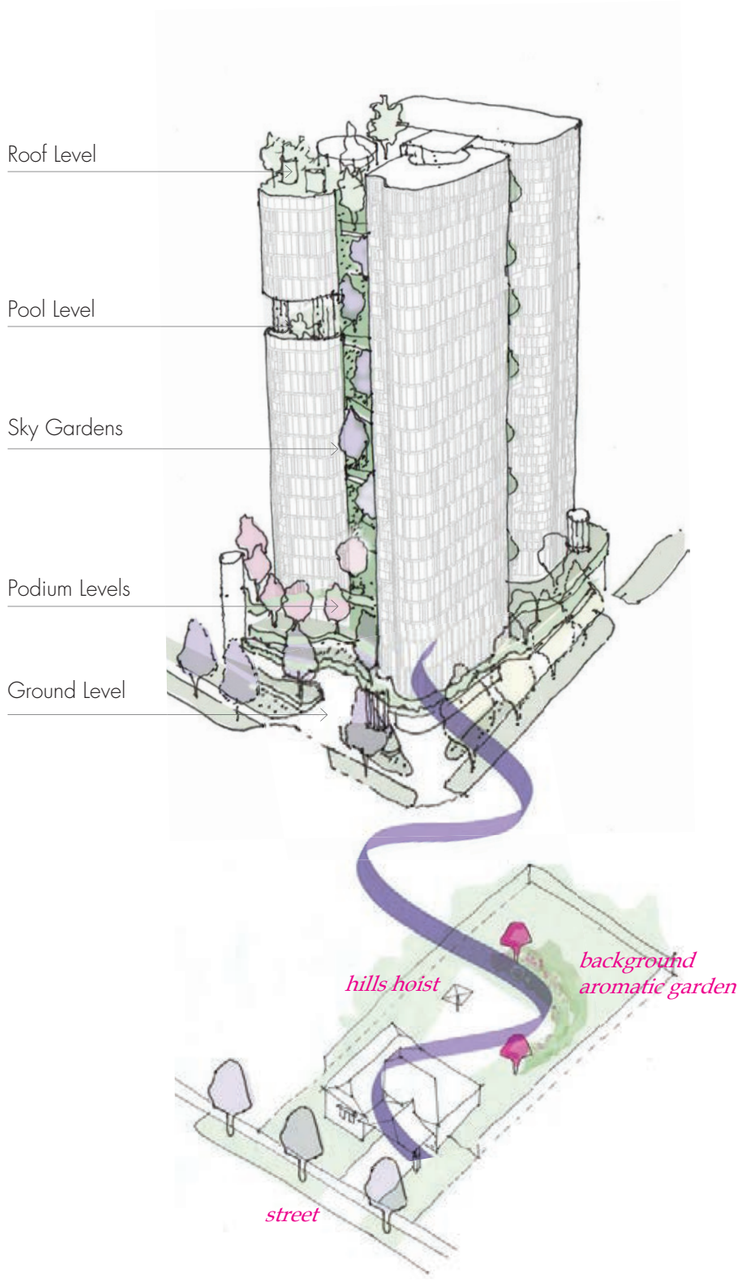

Platanus Acerifolia
(London Plane)


Agonis Flexuosa
(Willow Myrtle)


Bauhinia Sp.
(Purple Hong Kong Orchid)


Melia Azedarach
(Chinaberry)

EXISTING LANDSCAPE KEY



CONCEPT IDEA
interpreting an Applecross residential landscape

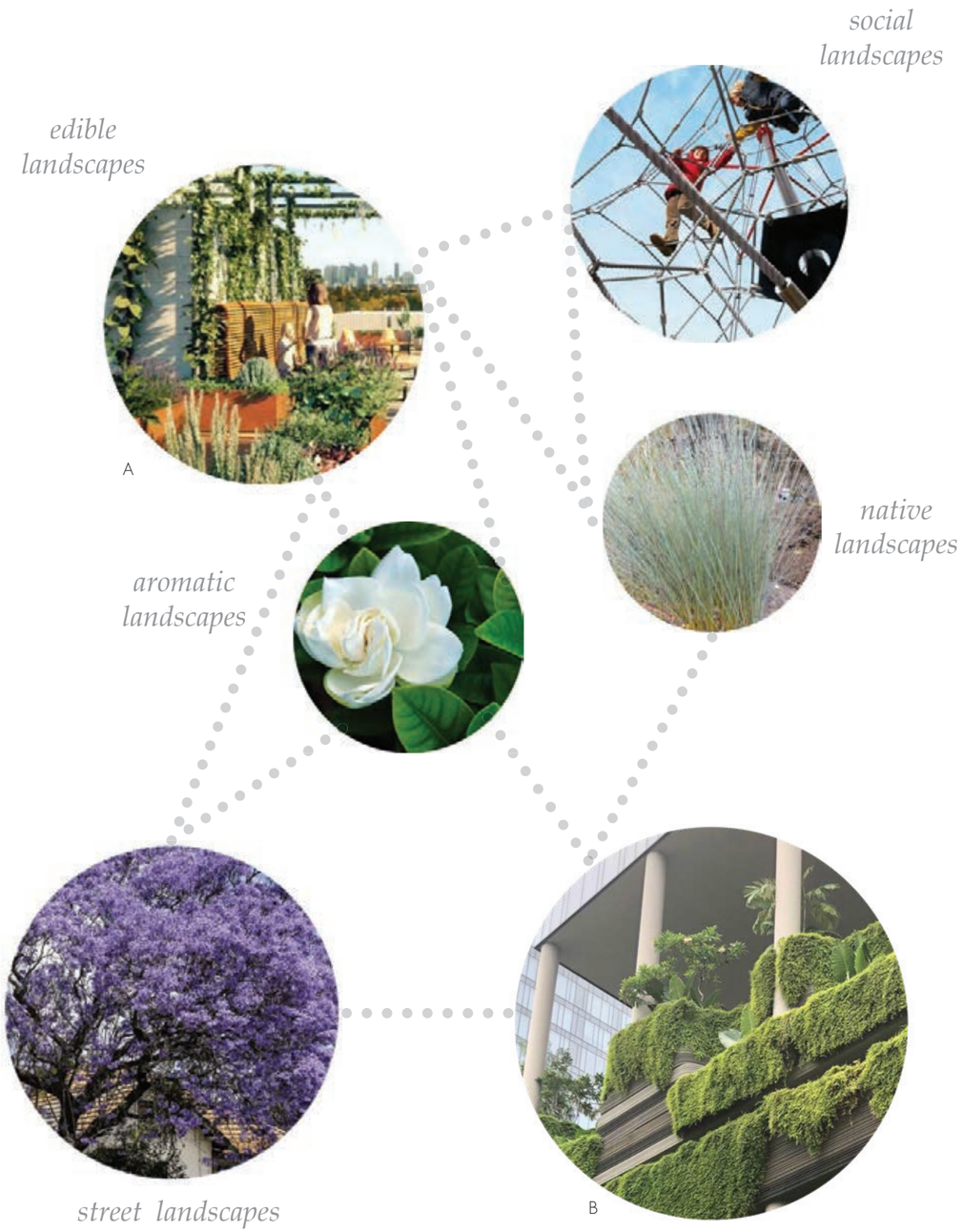
Immersed in a Landscape

The Forbes Residences landscape has been considered as primary element by the team and has been purposefully integrated into the planning and articulation of the residences from the project's inception.

One the unique qualities of the locale would have to be the large trees lining both sides of the streets to Applecross. Their filtered canopies provide a welcoming presence for all driving and walking at street whilst providing a front address for each residence. The trees frame, guide and provide an enduring single marker for all in the landscape. Generous sized suburban backyards offer refuge for life. The locale's eclectic and exotic suburban landscapes offer familiar memories in flower, texture and aroma. Tree houses, hills hoist and cultivated gardens present.

The project's landscape design echoes these features, interpreting them for a multi-levelled environment. The landscapes provides a soft layered link to all the floors, providing continuing landscapes trellises and sky gardens, echoing the street, providing a welcome for arrivals and residents.

A number of the landscape elements proposed have been demonstrated in a number of completed projects by the team, reflecting a continuing commitment and employment of strategies that have been effectively realised in practice.



A

B

LANDSCAPE CONNECTIONS + DIVERSITY

Image Key
A. One Central Park, Sydney
B. WOHA - Park Royal on Pickering

Landscape Connections

Suburban gardens are disappearing with Perth's densification, reducing external social amenities and diverse garden spaces. We are hoping to establish in the proposal, real connections with people and landscapes. At street level, at the front door and in the social gathering areas. Throughout the upper levels, aromatic gardens, the fruit patch, the hills hoist and the outdoor barbeque can be experienced both intimately and by all.

Cascading + Vertical Landscapes

Reflecting the project's strategy of continuing landscape to all the levels, cascade and vertical landscape elements have been provided in a variety of ways.

To the ground and podium levels, continuous native plantings of cascade plants have been provided to all the edges, providing a soft ribbon layer to the lower levels. Selections have been based on plants that are resilient, low maintenance plants and have a naturally occurring pendulous habit.

Extensive vertical plantings to three sides, extend to all the building's levels, flanking the sky garden tree. They will be a significant landscape element that will be unique to the building's elevation and experience from the internal circulation areas (often neglected in recent residential developments).

It is proposed that the vertical garden elements be provided by linear planters placed every 1.5m in height, behind a fixed trellis system. They will be set off from the building to allow ease of maintenance access behind. A green wall cassette system has not been envisaged as a viable solution due to its high water, maintenance requirement and often high plant failure. Instead, plant selections will be resilient clinging type affixing to the trellis structure. Plantings will be paired with a mix of plantings of lower and extended height plant types to provide green coverage.

Given the significance, complexity and the challenge of providing such an extensive vertical green infrastructure, these vertical planting elements will require continuing input during design development and analysis of documentation and input by a specialised vertical softscape engineer. This analysis will include solar study & glass reflection study, wind study, review of landscape soil, trellis + plant selections and review of irrigation documentation. It is proposed that this analysis and accompanying certification be submitted as part of the Building License Issue as a commitment to provide a system that will provide a sustained outcome. This process will allow for good process and accurate rigor of the documented proposals.

Vertical green elements require lifecycle care and consideration to include design and maintenance. Some vertical green elements can be costly to maintain, fail and are simply not practical to maintain. We do believe that trellis systems have value for multi-residential projects. The project's team approach is to include the right expertise, appropriate system, evaluate proven examples of installed examples that have thrived over a reasonable period of time in Perth.
From a development point of view, viable and sustainable outcomes are imperative given the impact that they have on strata responsibilities and costs.

MATURE TREE PLANTINGS

PODIUM PLANTING
efficient water output: contained & blanketed

A

MAINTENANCE
Access to vertical plantings and podium levels considered

Image Key
A. WOHA - The Met

Diversity in our Landscapes

Along with the vertical trellis planting selections, the landscape proposal purposely sets out to have the best of both worlds: pairing exotic (aromas) with endemic selections (resilient) Aromatic, floral and productive garden selections will also be represented throughout the project.

Thriving Landscapes

Mature tree and feature plant selections will be specified,along with dense plantings as to provide a significant landscape environment at opening.

However the completion of a project is only just the beginning for new landscapes. Key considerations are needed to achieve thriving outcomes: Appropriate plant selections for site, orientation and solar/shade access and the installation of good size plantings. The ongoing maintenance that is critical for long term outcomes and the design and its installation needs to envisage its future care by others.

i) *Responsibility of Maintenance*
The key for long term success is to ensure that the majority of visible landscape elements from the street and public amenities will be taken care of by the body corporate/strata rather than the individual. This reduces the potential risk of negligence and failure. As such, access provisions will be embedded into the strata guidelines and these areas will be cared for and reticulated as a whole. As the visible areas are part of the strata responsibility, there is a shared interest in ensuring that these landscapes are looked after and maintained.

ii) *Maintenance Access*
All landscaped areas will require ease of access for checking of reticulation, nutrient replenishment and general plant tidying. Plant selections will be made period seasonal maintenance required, rather than intensive care. Plant selections will be make will be made based upon their requirement for seasonal maintenance only, rather than constant intensive care. Consideration for fixed ladder access to vertical trellis garden elements have been included.

Sustainable Landscapes

WATER EFFICENT LANDSCAPES

With the majority of the soft landscape being situated in planters as contained situations, there is an opportunity to provide a co-ordinated strategy for a water efficient landscape. Collectively, this would feature

i) plant selections (low water requirement)
ii) reduction in evaporation losses
iii) efficient water supply
iv) water recycling

Plant selections

In principle, the majority of the softscape ground planting selections are endemic and have a low water requirement. The scheme will also include some feature exotics; offering flowering, deciduous tree and shade qualities. Whilst these exotics echo the locale's existing suburban gardens and seasonal variety, there are also appropriate for shaded situations and offer deciduous habits for winter solar access.

Reductions in evaporation loss

The majority of plantings are located in raised planters. The insulated merits of the constructed planter materials and thicknesses will assist in reducing water evaporation loss. Gravel mulching selected for wind will also provide a blanket layer for reducing water evaporation. As noted in irrigation below, the irrigation is provided below the mulch layer which offers greatly improved efficiency.

Efficient water supply

All plantings will be irrigated via efficient inline drip irrigation system which will cater for water mains and recycled water supply. Where achievable, the plantings will be hydro- zoned according to water requirements. This allows the reticulation to the endemic plantings to be separately controlled and greatly reduced following their establishment period.

Water recycling

The project will also include infrastructure and provision for a significant capacity for re-using water for irrigation, consistent with WA Health Department guidelines for multi-residential developments and use.

As the recycled water is gathered from multiple sources (multi-residential) a grey water recycling system has been appropriately sized for a maximum of 5000L per day. This system will collect water from Short Stay Accomodations shower and handbasins and EoT shower facilities, and be stored for a maximum of a 24hr period. The ozone treated water will be dispelled via the dripline.

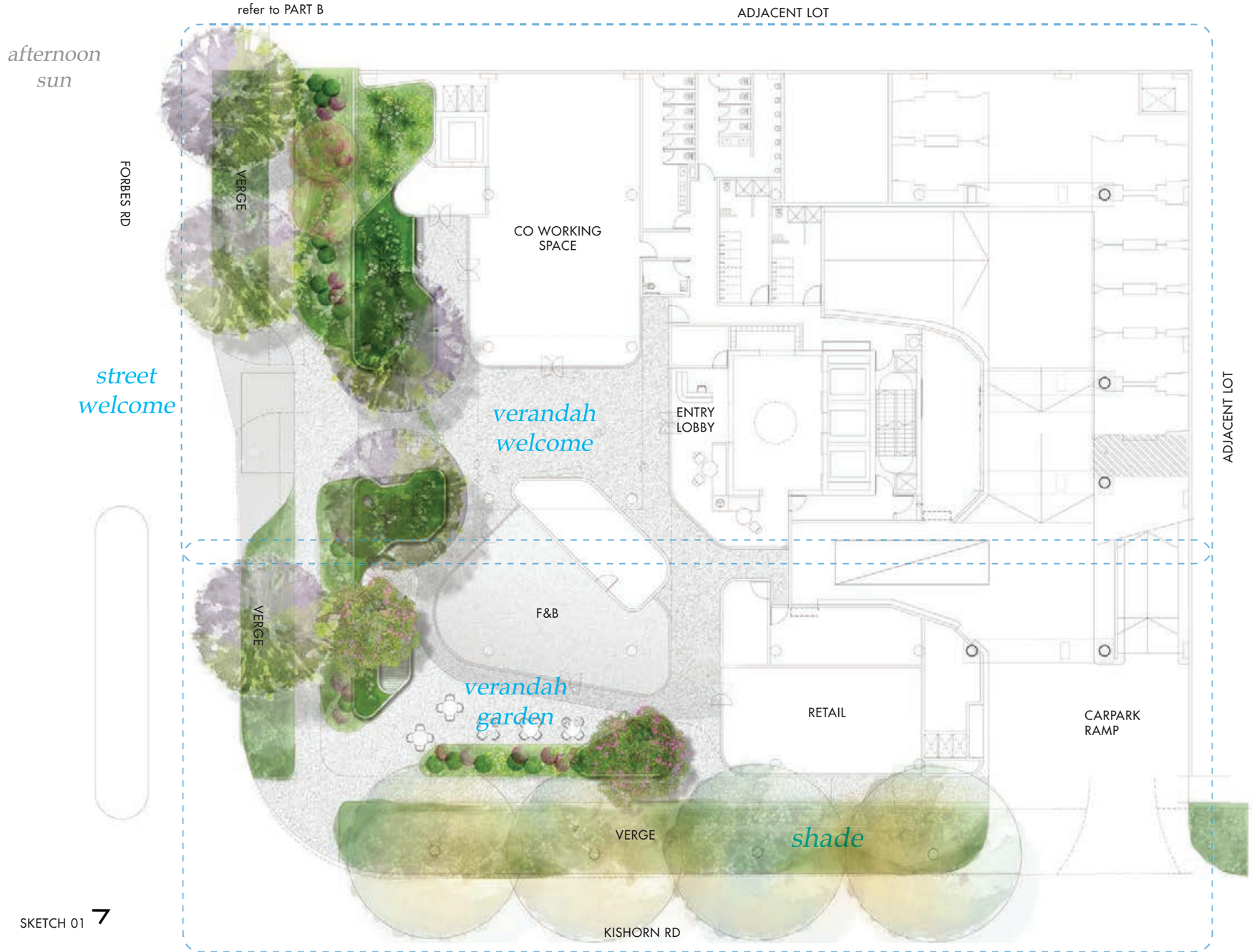
This will be sufficient to water the ground, first and second level plantings. Any top-up requirements during summer and irrigation to the upper levels will be provided via the same dripline system from mains water supply.

WIND INITIATIVES

Given the buildings exposure to south-westerly winds and potential building downdrafts, any Sky Park trees will be permanently guyed with vertically tensioned wiring supports and collars to all trees. Smaller trees to the podium areas will be guyed with stainless tripod arrangement.

Vertical trellis elements will require suitable and appropriate planting types to each micro-climate area for solar access and wind protection to be sustainable. Each of these trellis arrangements will be tested during design development with wind and solar analysis, taking into account building envelope, glazing reflection and wind modelling. This will provide the trellis green sub- consultant confirmed information, allowing rigorous testing to be undertaken on the proposed architectural modelling.

LANDSCAPE PLAN
Ground Floor Overall



PROJECT REFERENCE
Porte Cochere Foyer Landscape
TIERRA - Metropolitan Hotel

JACARANDA AVENUE

CORNER SKETCH - VIEW 01

SKETCH 01 7

REFER TO PART B

LANDSCAPE PLAN
Ground Floor - part A

FORBES RD

BOUNDARY

verandah welcome

ENTRY LOBBY

ENTRANCE

TALL PLANTER

TALL PLANTER - FEATURE -
Crinum pedunculatum
Cycads sp.

TALL PLANTER CASCADE EDGE -
Casuarina glauca 'Cousin It'
Myoporum yareena
Acacia 'Limelight'

NEW VERGE TREE
Jacaranda Mimosaefolia
(1 off)

OUTDOOR SPIRAL STAIR -
Aromatic climbing plants to surround. *Stephanotis sp.*

FLORAL EVERGREEN TREES -
Bauhinia sp. purple To provide colours of seasonal variation

WIND SCOOP RELIEF

FOOD & BEVERAGES

Loose furniture to verandah garden terrace (by tenant)

verandah garden

RETAIL

TALL PLANTER - MASS BED-
Deep greens & shade
Arthropodium cirratum
Philodendron Xanadu

FLORAL EVERGREEN TREES -
Bauhinia sp. purple To provide colours of seasonal variation

PROPOSED FOOTPATH -
Quality paving to extend to footpath from adjacent terracing, for council approval

VERGE PLANTING -
Paired plantings of aromatic exotic prostrate and native planting - *Trachelospermum Jasminoides* Star Jasmine' and *Myoporum Insulare* to edges

VERGE

PROPOSED CROSS OVER

GROUND PLANTER - TALL FEATURE SHRUBS -
Colourful and vibrant selections of grouped feature plantings
Rhododendron pink sp.
Pittosporum 'Miss Muffet'

VERGE

BOUNDARY

PROPOSED VEHICLE ENTRANCE

KISHORN RD

VERGE PLANTING -
Paired plantings of aromatic exotic prostrate and native planting - *Trachelospermum Jasminoides* Star Jasmine' and *Myoporum Insulare* to edges

LARGE EXISTING STREET TREES -
Platanus Acerifolia sp.

FLORAL TREES -
Lagerstromia indica x fauriei
'Tuscarora'to provide colours of seasonal variation

PROPOSED FOOTPATH -
Quality paving to extend to footpath from adjacent terracing, for council approval

GROUND PLANTER - FEATURE

Rhododendron sp.
Evergreen shub with masses of purple, pink flowers
Height:1.8m high x 1.8m wide

GROUND PLANTER - FEATURE

Pittosporum tobira 'miss muffet'
Small shrub with compct foliage, white flowers
Height: 1m high x 1.5m wide
Flower: Perfumed white flowers

LANDSCAPE PLAN
Ground Floor - part B

FORBES RD

BOUNDARY

FLORAL TREES -
Lagerstromia indica x fauriei
'Tuscarora'to provide colours of seasonal variation

EXISTING STREET TREES -
Jacaranda Mimosaefolia

VERGE PLANTING -
Paired plantings of aromatic exotic prostrate and native planting - *Trachelospermum Jasminoides* Star Jasmine' and *Myoporum Insulare* to edges

EXISTING STREET TREES -
Jacaranda Mimosaefolia

GROUND PLANTER - MASS-BED
Consolidated swathe planting of resilient and aromatic ground cover
Trachelospermum Jasminoides
Liriope sp.
Gardenia radicans
Agapanthus sp.

GROUND PLANTER - TALL FEATURE -
Colourful and vibrant selections of grouped feature plantings
Rhododendron pink sp.
Pittosporum 'Miss Muffet'

NEW ENTRANCE TREES
Continue street tree plantings type.
Jacaranda Mimosaefolia
(2 off)

NEW VERGE TREE
Jacaranda Mimosaefolia
(1 off)

CO-WORKING SPACE

LOBBY

MID PLANTER - SHADE -
Deep greens
Clivia miniata 'yellow'

WAITING SEAT

TALL PLANTER - FEATURE -
Crinum pedunculatum
Cycads sp.

TALL PLANTER - MASS BED-
Deep greens
Agapanthus sp.
Philodendron Xanadu

TALL PLANTER CASCADE EDGE -
Casuarina glauca 'Cousin It'
Myoporum yareena
Acacia 'Limelight'

verandah
welcome

ENTRY LOBBY

FORBES RD

VEHICLE SET DOWN

CANOPY ABOVE
Shown dashed

WAITING SEAT
Seat to provide ground floor waiting area seating

TALL PLANTER - FEATURE -
Crinum pedunculatum
Cycads sp.

TALL PLANTER - MASS BED-
Deep greens
Agapanthus sp.
Philodendron Xanadu

REFER TO PART A

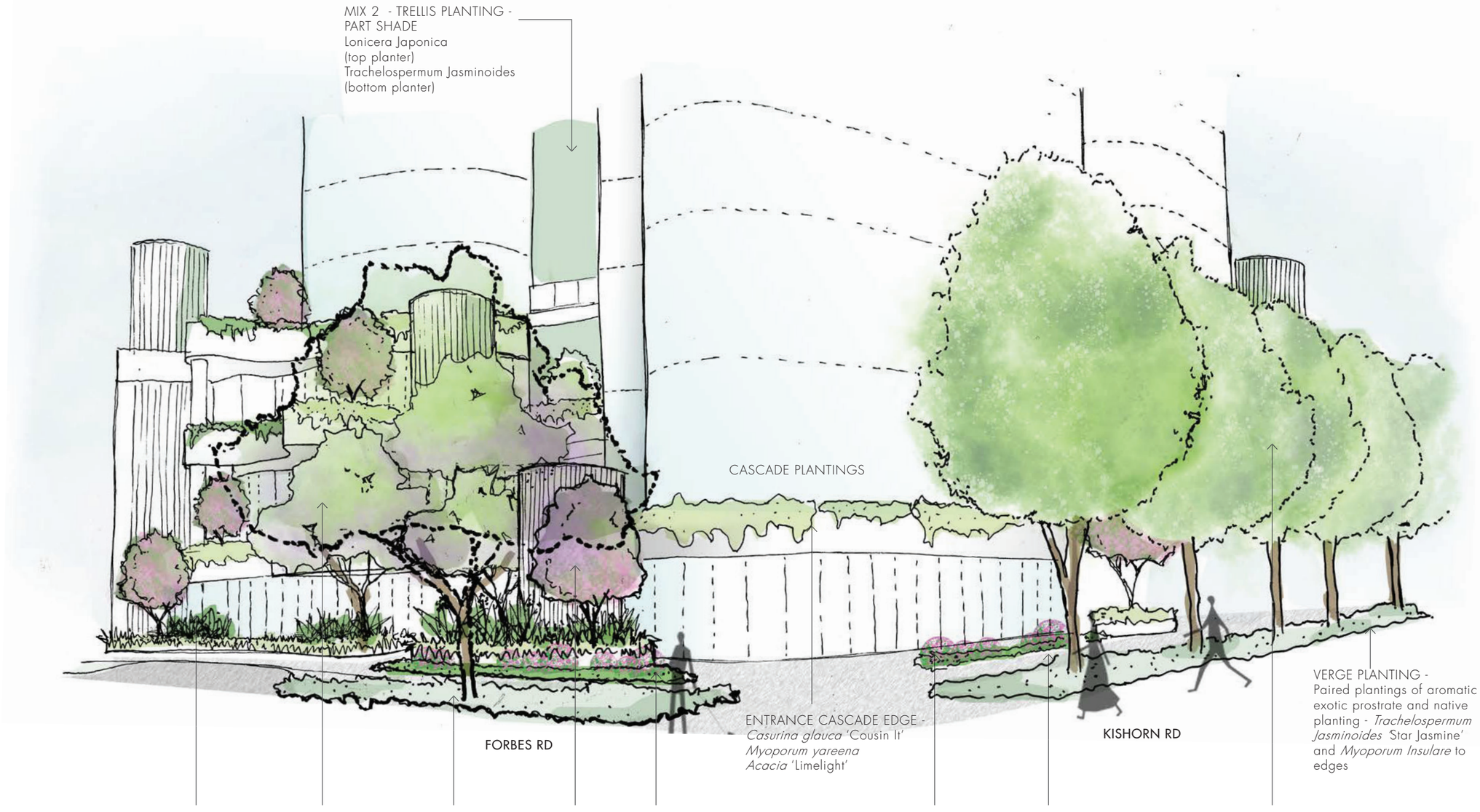
STREET TREE + SKYPARK TREE

Jacaranda mimosaefolia 'Purple Jacaranda'
Deciduous tree with green soft foliage yellowing prior to shedding.
Height: 10m high x 8m wide.
Flower: purple bell shaped flowers.

FEATURE SMALL TREE

Lagerstroemia indica (Crepe Myrtle)
Specimen tree with a broad spreading crown. and masses of flowers. Red-bronze autumn foliage colour and exfoliating bark
Height: 5-6m x 5m wide.
Flower:White/deep pink flowers in summer.

LANDSCAPE SKETCH 01
Ground Floor



TALL PLANTER - BED PLANTING

Philodendron 'Xanadu'
Evergreen, low height shrub with deep foliage
Height: 1-1.5m high x 1m wide

TALL PLANTER - BED PLANTING

Agapanthus orientalis 'Queen Mum'
Glossy strap leaves with flower spikes
Height: 1.5m high x 1.2m wide
Flower: Large white/blue flowers in Summer.

TALL PLANTER - FEATURE PLANTING

Crinum Pedunculatum (Spider Lily)
Broad strappy leaves.
Height: up to 2m high.
Flower: Perfumed white flowers in late Spring to Summer.

TALL PLANTER - FEATURE PLANTING

Cycas Revoluta (Japanese Sago Palm)
Decorative Cycad with symmetrical form.
Height: 1m wide x 1-3m high

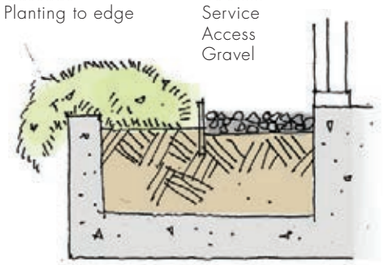
LANDSCAPE PLAN
Level 1 - Overall

PROJECT REFERENCE
Entrance cascade landscape
WOHA - Parkroyal on Pickering

CASCADE EDGE PLANTING

Acacia 'Limelight'
Australian native with lush weeping habit.
Height: 50cm high x 1m wide

Casuarina 'Cousin It'
Prostrate dark green with dense foliage
Height: .15 high x 3m wide



SECTION DIAGRAM A - SOFT EDGE CASCADE

FORBES RESIDENCES
APPLECROSS

SCALE 1:250@A3

LANDSCAPE PLAN - LEVEL 1 OVERALL

WOHA x MJA
architecture

CAPA
landscape design

LANDSCAPE PLAN
Level 1 - part A

ENTRANCE CASCADE EDGE -
Planting Mix:
Casuarina glauca 'Cousin It'
Myoporum yareena
Acacia 'Limelight'

FLORAL EVERGREEN TREES -
Bauhinia sp. purple To provide colours of seasonal variation

FEATURE PURPLE PLANTS -
Breynia 'Ironstone'
Phormium Tenax purpureum

FEATURE TALL PLANTING -
Zamia + Phormium
'Green Dwarf'

FEATURE SMALL EVERGREEN TREES
Plumeria Obtusa
'Dwarf Singapore Pink'

FLORAL EVERGREEN TREES -
Bauhinia sp. purple To provide colours of seasonal variation

URBAN ORCHARD
Citrus tree and raised vegetable/herb gardens

SKY PARK TREE
Jacaranda Mimosaefolia
(Medium sized, deciduous type)

GROUND PLANTING-
Liriope sp.
Dianella sp.
Trachelospermum Jasminoides

OUTDOOR SPIRAL STAIR -
Aromatic climbing plants to surround. *Stephanotis sp.*

LOBBY

soft edge cascade

TRELLIS PLANTING -
PART SHADE
Various climbing fruits (Kiwi, berries etc)

urban orchard

VOID ABOVE

B

CARPARK

soft edge cascade

GROUND SHADE PLANTING-
Philodendron 'xanadu'
Arthropodium sp

FEATURE SHADE PLANTS-
Clivia miniata 'yellow' sp.
Cycad sp

PLANTER - (SERVICE ACCESS) - Gravel mulch

SMALL SHADE TREE-
Bauhinia sp. white

PLANTER (SERVICE ACCESS) - Access restraint system with anchorage points

URBAN ORCHARD
(WOHA Office Singapore)

CONSIDERED ACCESS

SMALL FEATURE EVERGREEN TREES

Plumeria Obtusa 'Dwarf Singapore Pink'
Shapely sculptural tree with lush green foliage
Height at Maturity: 2.5m x 1.5m wide.
Flower: Pink flowers with yellow centres.

FEATURE SHADE PLANTS

Clivia miniata 'yellow'
Lush strappy leaves, ideal for shade
Height at Maturity: 0.6m x 0.6m wide.
Flower: Yellow flowers

FORBES RESIDENCES
APPLECROSS

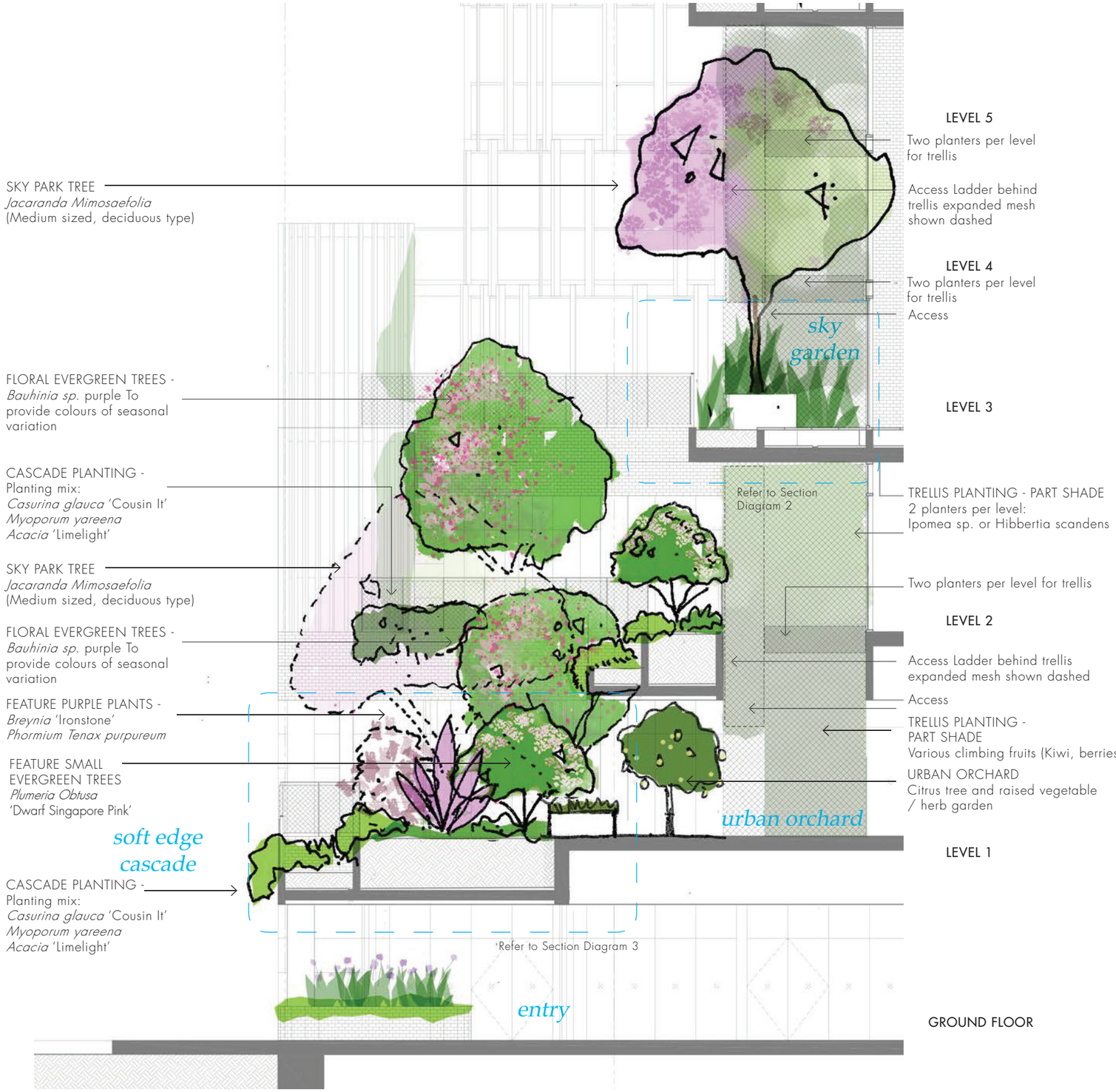
SCALE 1:150@A3

LANDSCAPE PLAN - LEVEL 1 - PART A

WOHA x MJA
architecture

CAPA
landscape design

LANDSCAPE DETAIL
SECTION DIAGRAM B



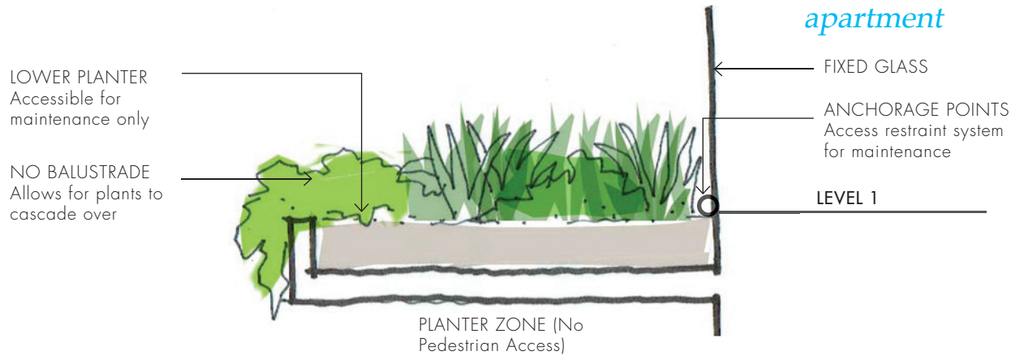
SECTION DIAGRAM B - URBAN ORCHARD + SKY GARDEN

FEATURE PURPLE PLANTS
Phormium tenax Purpureum -
Evergreen perennial, ornamental and robust
Height: 1.8m high x 1.2m wide

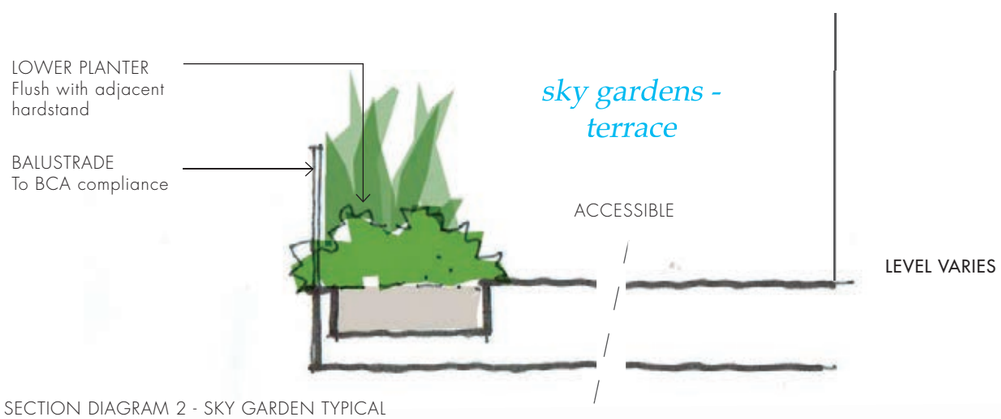
NATIVE FEATURE PIURPLE PLANTING
Breynia 'Ironstone'
Evergreen, red-brown foliage plant with a graceful weeping habit. Small green flowers
Height: 1.5-2m high x 1m wide

FLORAL EVERGREEN TREES
Bauhinia Purpurea 'Purple Butterfly Tree'
Medium sized orchid tree. Butterfly shaped leaf.
Height: 6-10m x 6m wide.
Flower: large purple/pink flowers in Autumn

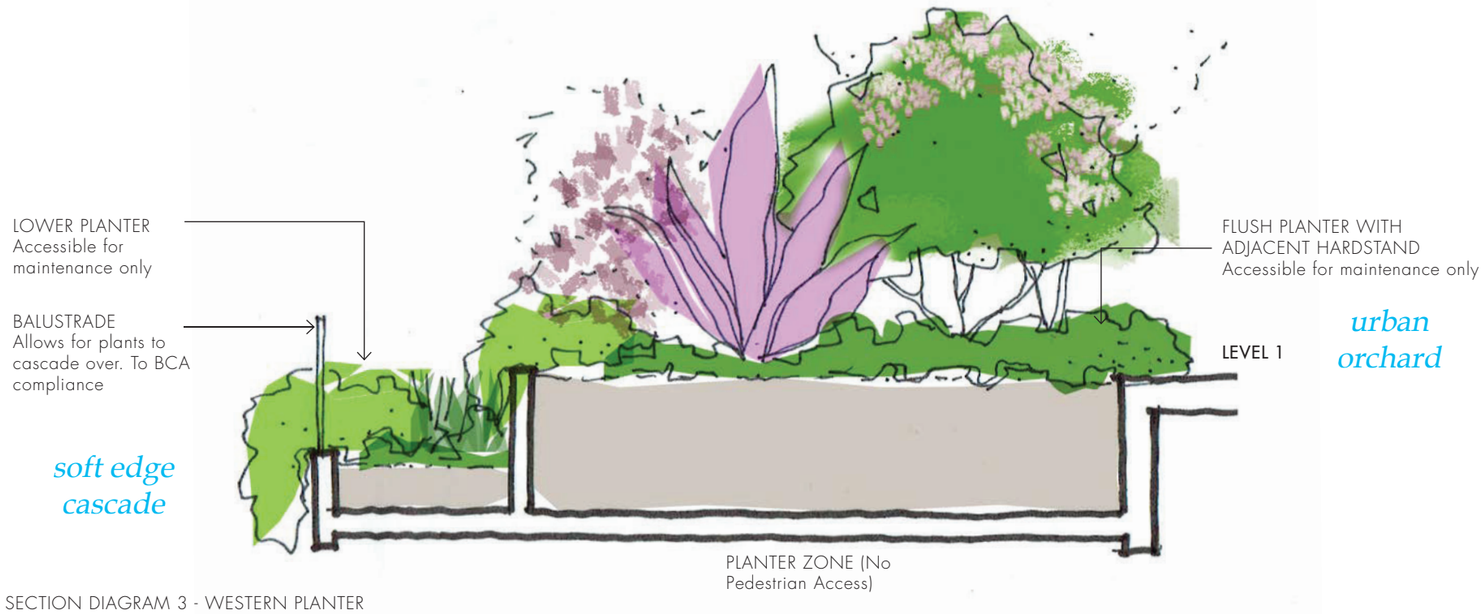
REFERENCE IMAGE - URBAN ORCHARD



SECTION DIAGRAM 1 - SOUTHERN PLANTER



SECTION DIAGRAM 2 - SKY GARDEN TYPICAL



SECTION DIAGRAM 3 - WESTERN PLANTER

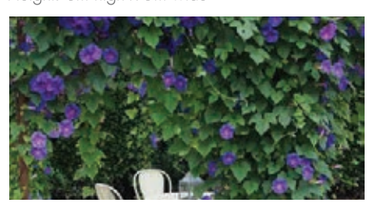
LANDSCAPE PLAN
Level 2 - Sky Park - Overall

Raphiolepis. - Reference Image
ornamental with splendid display of flowers

Rhododendron sp.- Reference Image
Shade and beautiful colours

Hydrangea sp. - Reference Image
An Applecross favourite

TRELLIS PLANTING
Kennedia Nigricans 'Black Coral Pea'
Vigorous clinber, drought resistant
Height: 6m high x 5m wide



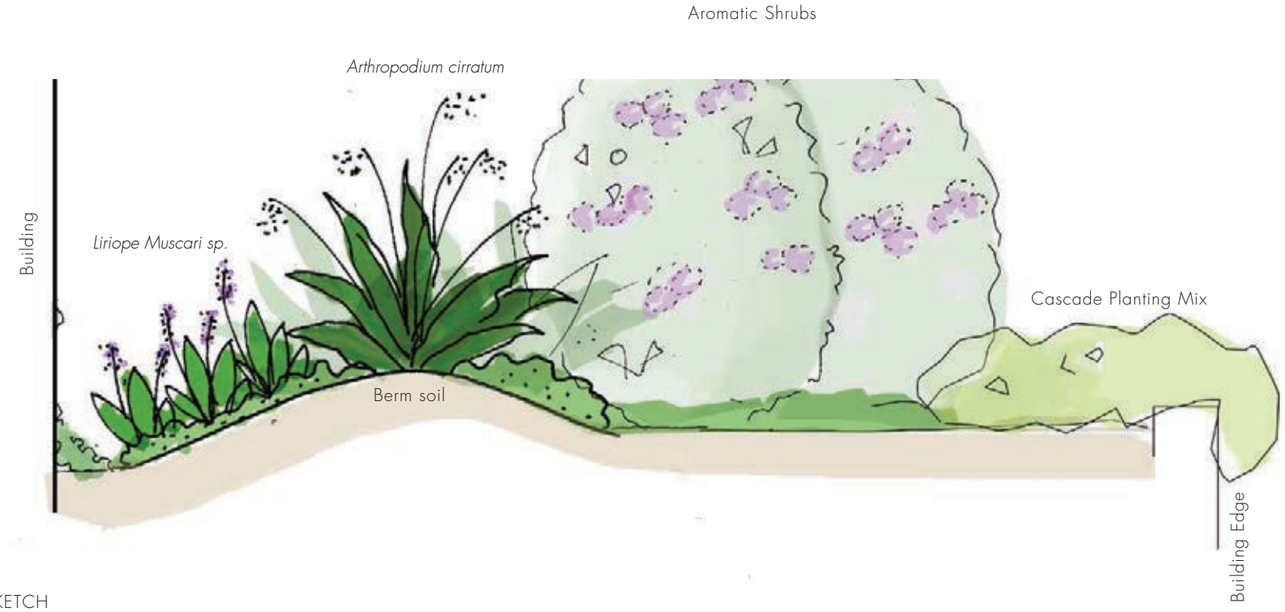
PART SHADE TRELLIS PLANTING
Ipomea sp.
Evergreen climber , purple flowers
Height: 3-5m high x 2m wide

FORBES RESIDENCES
APPLECROSS

SCALE 1:250@A3

LANDSCAPE PLAN - LEVEL 2

WOHA x MJA architecture | CAPA landscape design



SECTION C SKETCH

LEVEL 2 - Sky Park
Flower Garden diagram

FLOWER GARDEN

Arthropodium cirratum (NZ Rock Lily)
Perennial, lush foliage with white flowers
Height: 1m high x 75cm wide

FLOWER GARDEN

Liriope Muscari sp.
Broad strappy leaves with purple flowers
Height: 50cm high x 50cm wide

FLOWER GARDEN

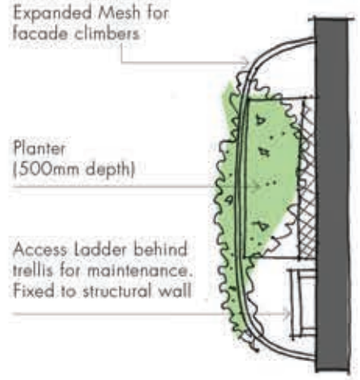
Trachelospermum jasminoides 'Star Jasmine'
Evergreen vine, hardy, aromatic

B

LANDSCAPE PLAN
Level 3 Overall

PROJECT REFERENCE
Entrance trellis landscape
WOHA - The Met Bangkok

PROJECT REFERENCE
Climbing planting to web mesh trellis system



FACADE CLIMBER TRELLIS CONCEPT
(PLAN DIAGRAM)

FORBES RESIDENCES
APPLECROSS

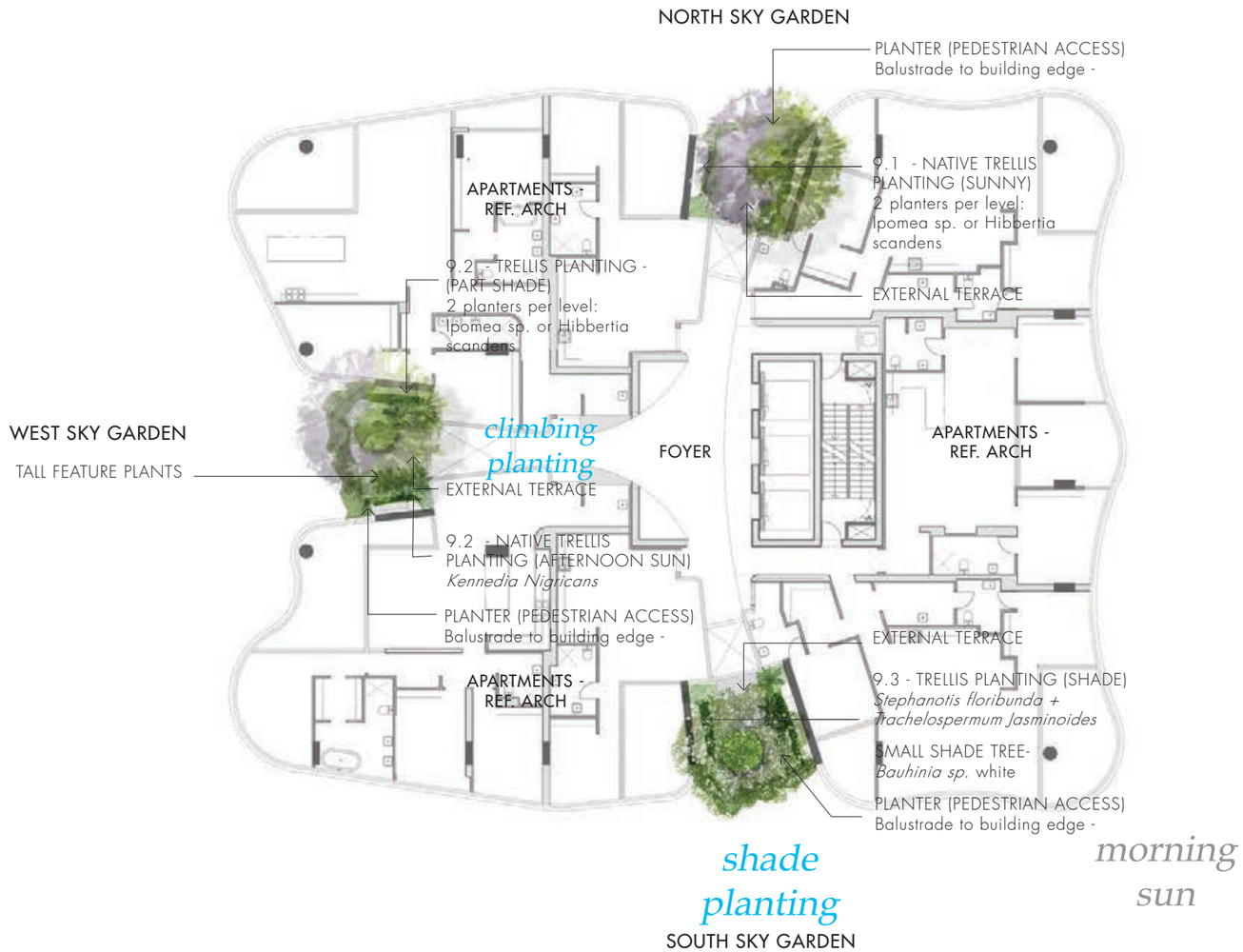
SCALE 1:250@A3

LANDSCAPE PLAN - LEVEL 3 OVerall

W O H A x MJA
architecture

CAPA
landscape
design

LANDSCAPE PLAN
Levels 9 (Levels 19 sim)



SKY GADREN SHADE TREE

Bauhinia alba 'White Hong Kong Orchid'
Medium sized orchid tree. Butterfly shaped leaf
Height: 5-6m x 4m wide.
Flower: large white flowers in Spring

SHADE TRELLIS PLANTING

Trachelospermum jasminoides 'Star Jasmine'
Evergreen vine, hardy, aromatic
Height: 6m high

SHADE TRELLIS PLANTING

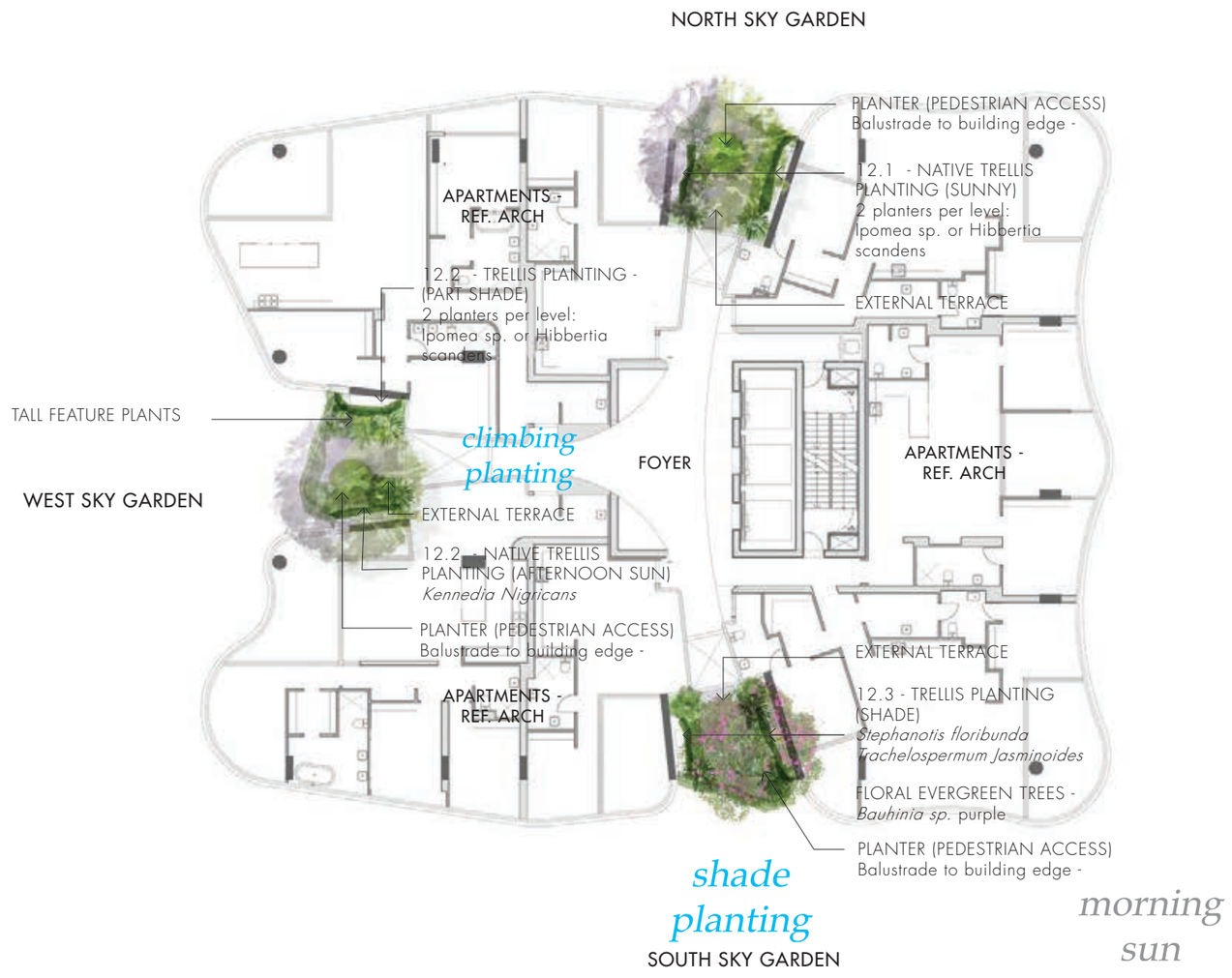
Stephanotis floribunda
Evergreen with large glossy leaves
Height:2m high x 2m wide

MASS BED PLANTING - SHADE

Arthropodium cirratum (NZ Rock Lily)
Broad leaf lily, Mass white flowers

LANDSCAPE PLAN
Level 12 (levels 6 and 16 sim)

afternoon sun



SKYGADREN SHADE TREE

Bauhinia Purpurea 'Purple Butterfly Tree'
Medium sized orchid tree. Butterfly shaped leaf.
Height: 6-10m x 6m wide.
Flower: large purple/pink flowers in Autumn

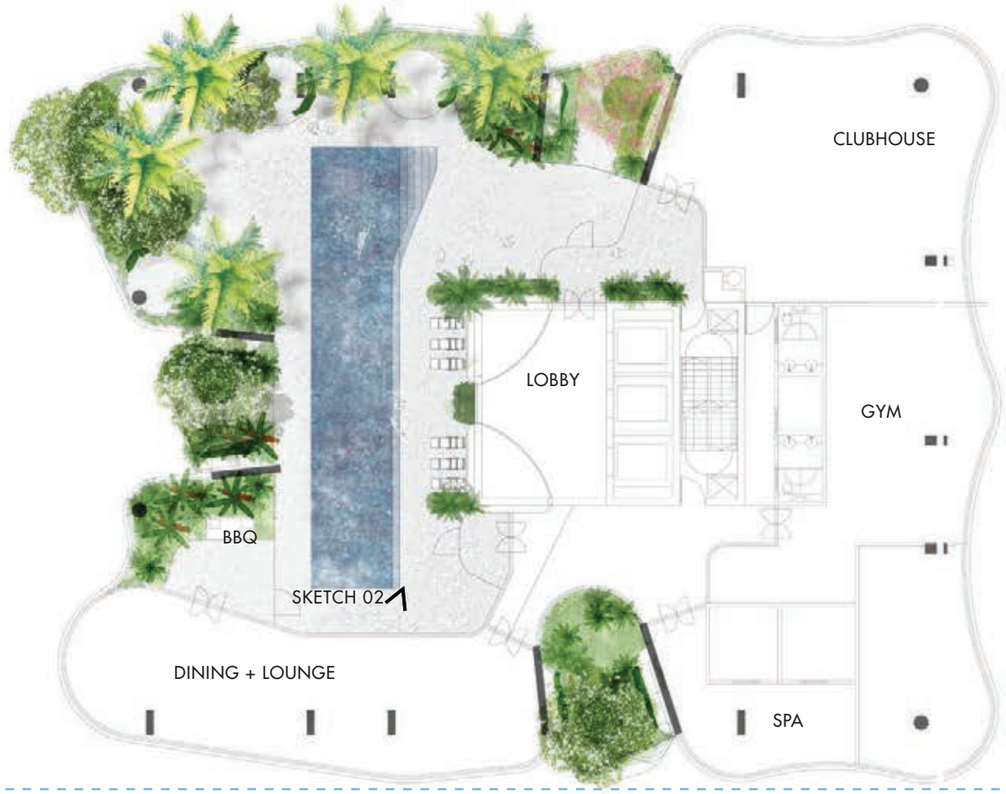
PROJECT REFERENCE
Sky terrace
WOHA - Newton Suites

Blechnum Lady Luck - Silver Lady Fern
Fast growing fern palm like foliage.
Height: 1.2m high x 1m width
Flowers: No flowers

LANDSCAPE PLAN
Level 15 Overall

afternoon sun

lush surround

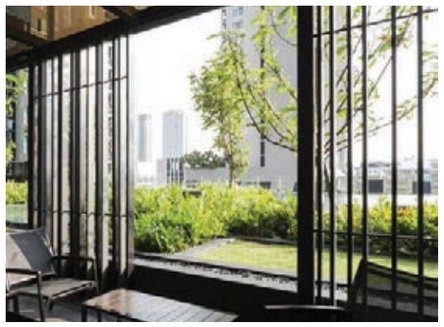


refer to PART A

shade planting

morning sun

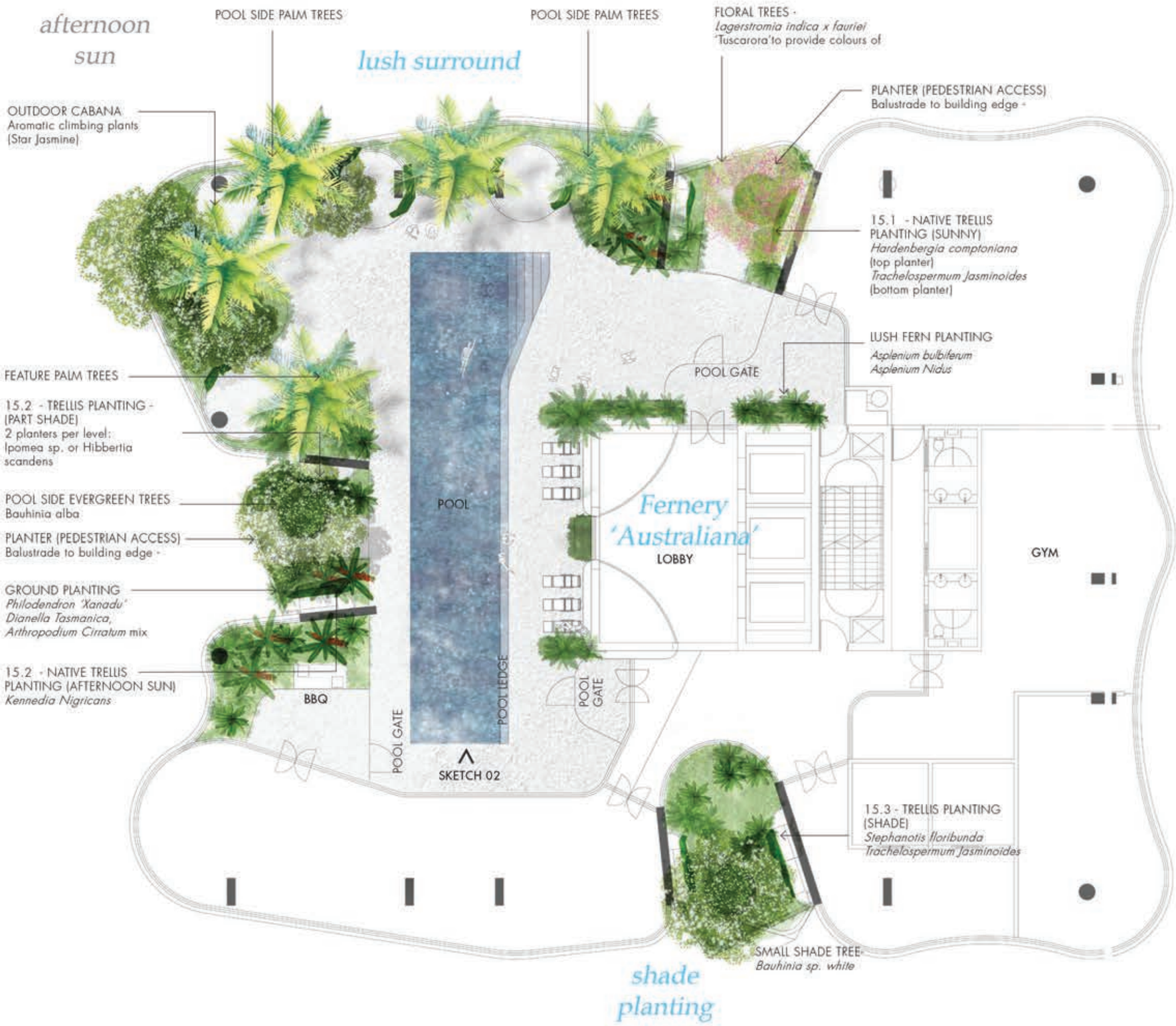
PROJECT REFERENCE
Shaded pool environment
SHMA - Hyde condominium Sukhumvit 13, Bangkok



PROJECT REFERENCE
Varied activities to pool
SHMA - Baan san ngam

PROJECT REFERENCE
Outdoor Cabana
WOHA - Alila villas Ulawatu

LANDSCAPE PLAN
Level 15 - Part A



POOL SIDE PALMS
Grouped plantings of medium size palms to provide a distinct landscape environment. Australian selections will be made where available. i.e Australian Fan Palm (wind resistant and sun tolerant)

Cyathea cooperi 'Australian Tree Fern'
Height: 2-5m high x 1-3m wide

FERN PLANTING
Asplenium bulbiferum 'Hen and Chicken Fern'
Hardy, native fern, weeping habit
Height at maturity: 30cm high x 50cm wide
Flower: yellow flowers

FEATURE FERN PLANTING
Asplenium Nidus 'Bird's Nest Fern'
Fern that is naturally epiphytic
Height: 1m x 1.5m width

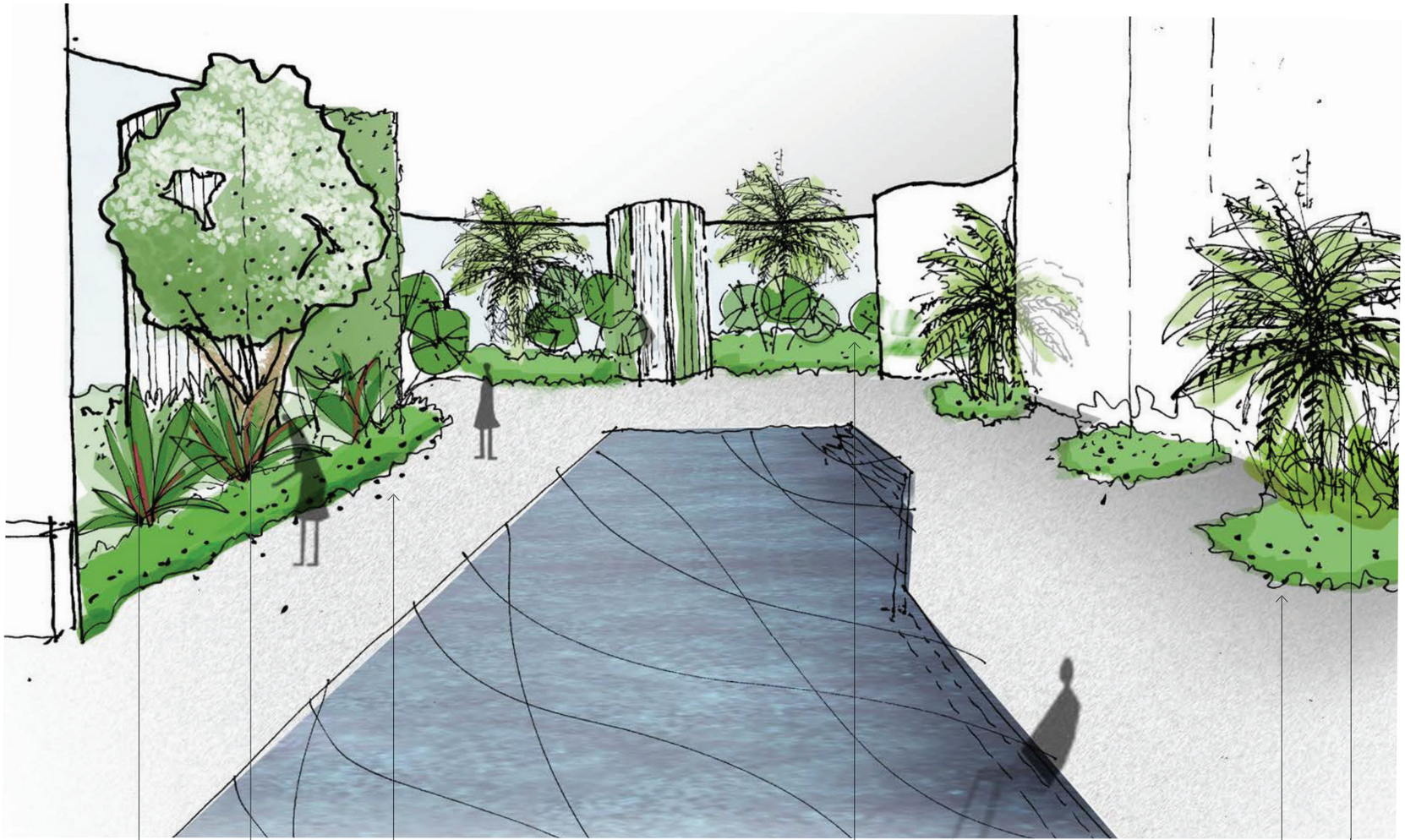
FORBES RESIDENCES
APPLECROSS

SCALE 1:150@A3

LANDSCAPE PLAN - LEVEL 15 PART A

W O H A x MJA
architecture

CAPA
landscape design



FEATURE SHRUB
Alcantarea sp.
(Giant Bromeliad)

POOL SIDE TREES
Bauhinia alba

GROUND PLANTING
Philodendron 'Xanadu'
Dianella Tasmanica,
Arthropodium Cirratum mix

POOL SIDE PALMS
Alexander Palms
+ Licuala Palm understorey

LUSH FERN PLANTING
Asplenium bulbiferum
Asplenium Nidus

FEATURE FERN
Cyathea cooperi 'Australian Tree Fern'

POOL SKETCH 02

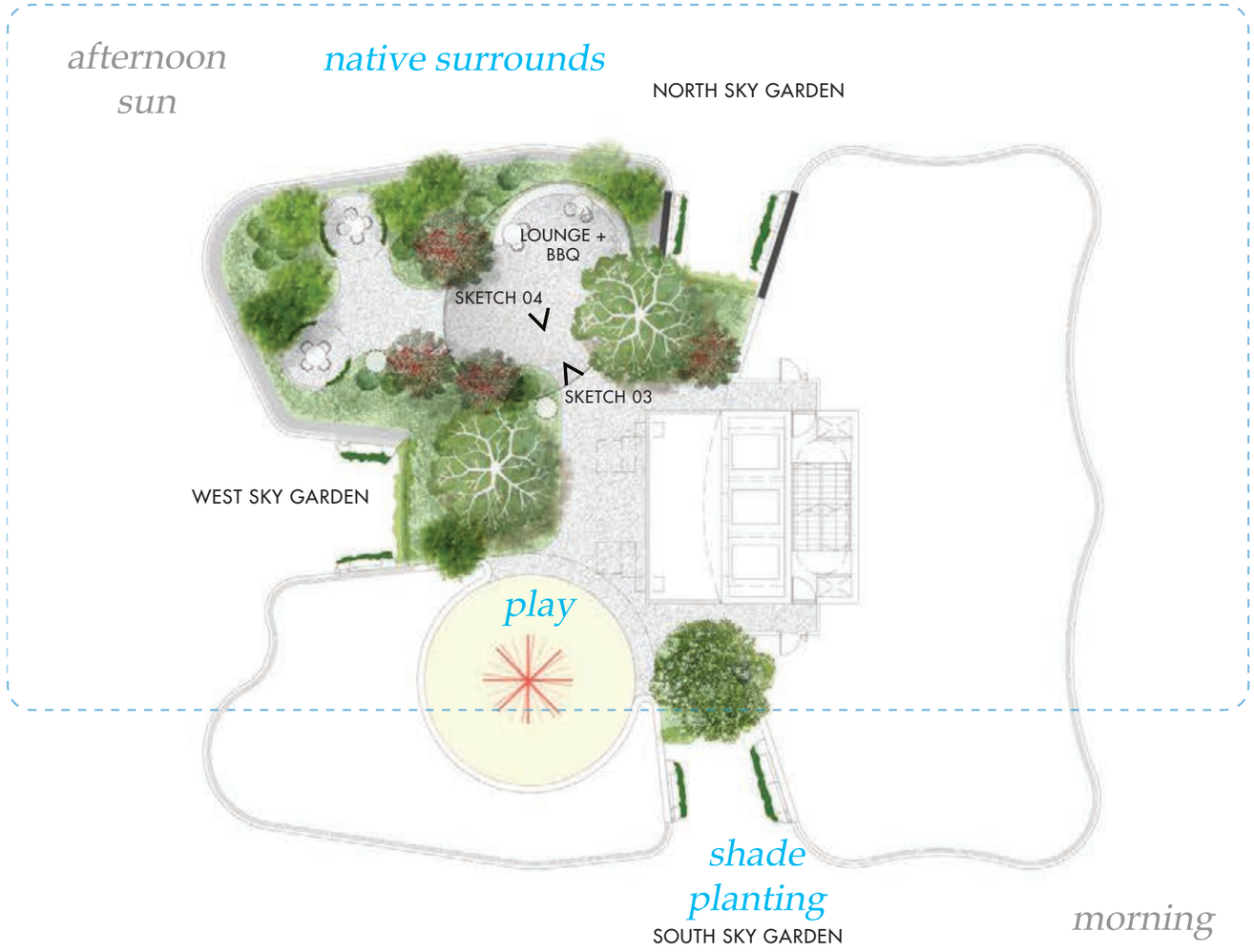
FEATURE PALMS (HIGH CANOPY)
Archontophoenix alexandrae (Alexander Palm)
Height: 8- 10 high x -5m wide.
Habit: Solitary trunk with spreading canopy

FEATURE SHADE
Cyathea cooperi 'Australian Tree Fern'
Height: 2-5m high x 1-3m wide

FEATURE PLANTING
Alcantarea sp. (Giant Bromeliad)
Evergreen, feature plant
Flower: N/A

LANDSCAPE PLAN
Level 20 Rooftop

refer to PART A



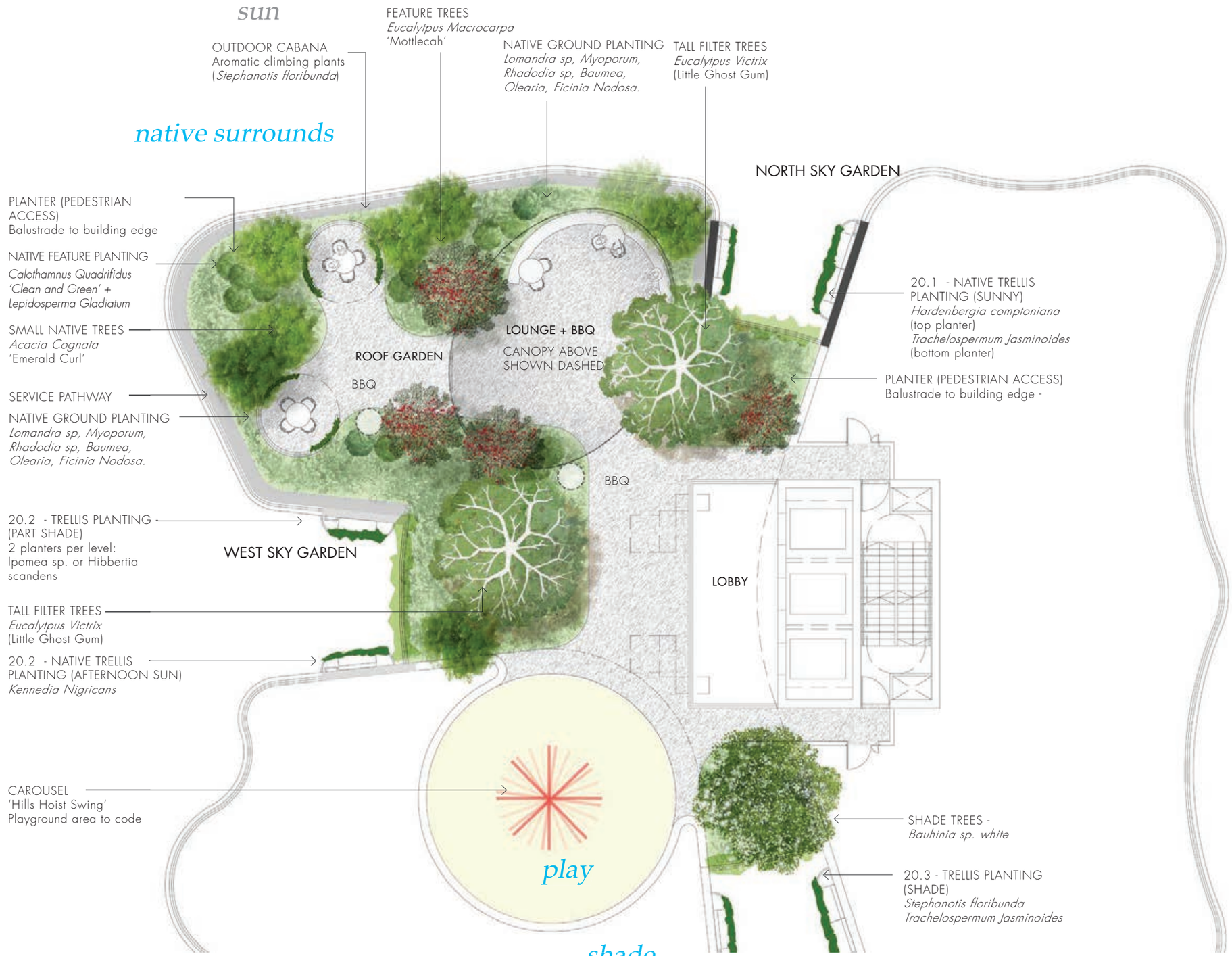
PROJECT REFERENCE
BBQ and Dining Amenities
ARIA - HIllam Architects w/ landscaoe by CAPA)

PROJECT REFERENCE
Play opportunities (Berliner playground + festival)

PROJECT REFERENCE
Native surrounds, city views
William Dangar - Cleveland rooftop

TALL FILTER TREES
Eucalyptus Victrix "Little Ghost Gum'
Height at maturity: 8m high x 4m wide
Flower: small cream

LANDSCAPE PLAN
Level 20 Rooftop - Part A



SMALL NATIVE + RESILIENT TREE
Acacia Cognata 'Emerald Curl'
Height at maturity: 3-5m high x 3-3.5m wide
Flower: Yellow

FEATURE NATIVE TREES
Eucalyptus Macrocarpa 'Mottlecah'
Height at maturity: 3m high x 2m wide
Flower: Red

NATIVE GROUND PLANTING
Olearia 'Ghost Town' (Daisy Bush)
Australian Native shrub with silver foliage.
Height: 50cm-1m high x 1m wide

Atriplex Cinerea - "Coastal Saltbush"
Low spreading ground cover with grey leaves
Height: 20cm high x 2m w.

FORBES RESIDENCES
APPLECROSS

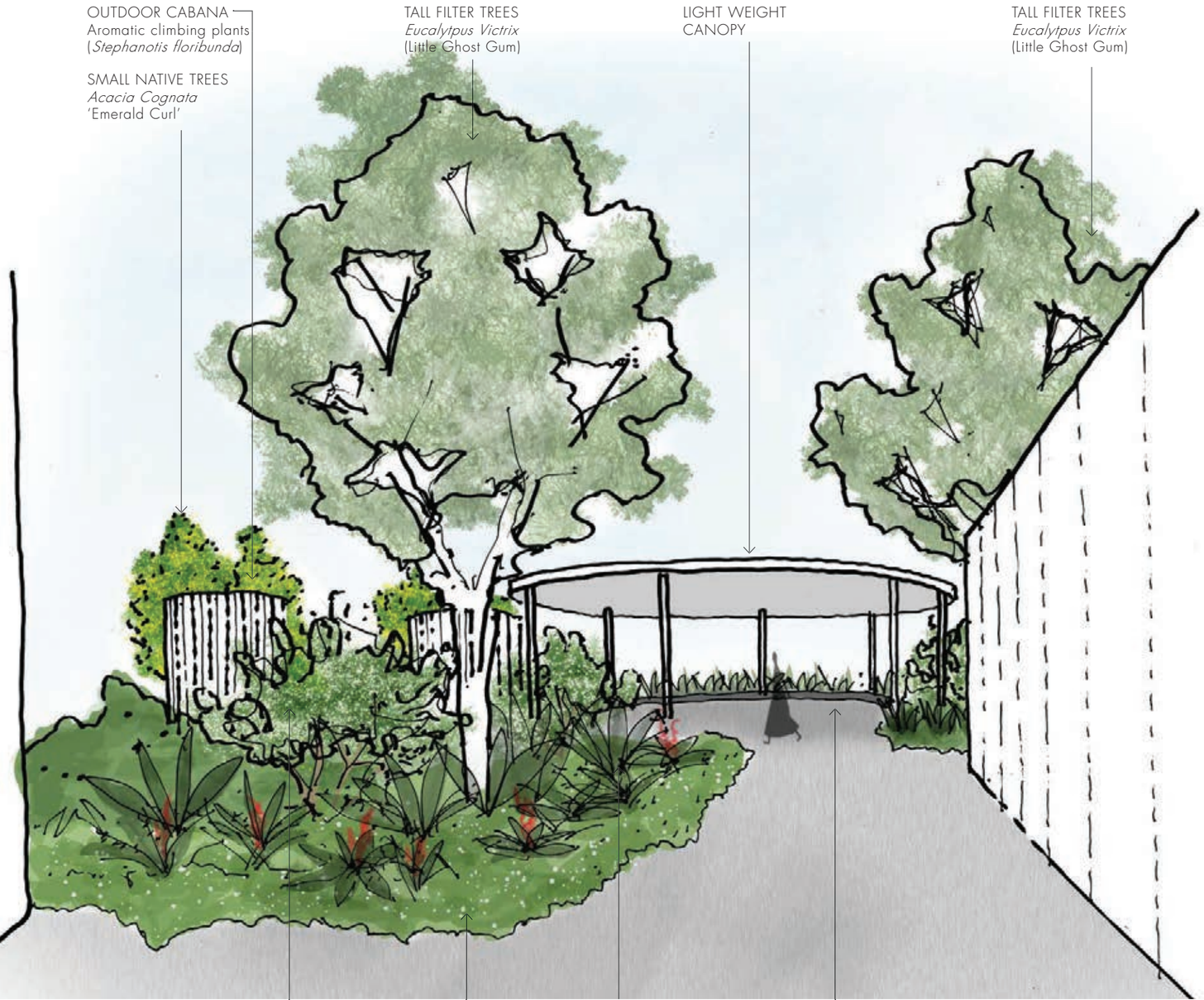
SCALE 1:150@A3

LANDSCAPE PLAN - LEVEL 20 - PART A

WOHA x MJA
architecture

CAPA
landscape design

LANDSCAPE SKETCH 03
Level 20

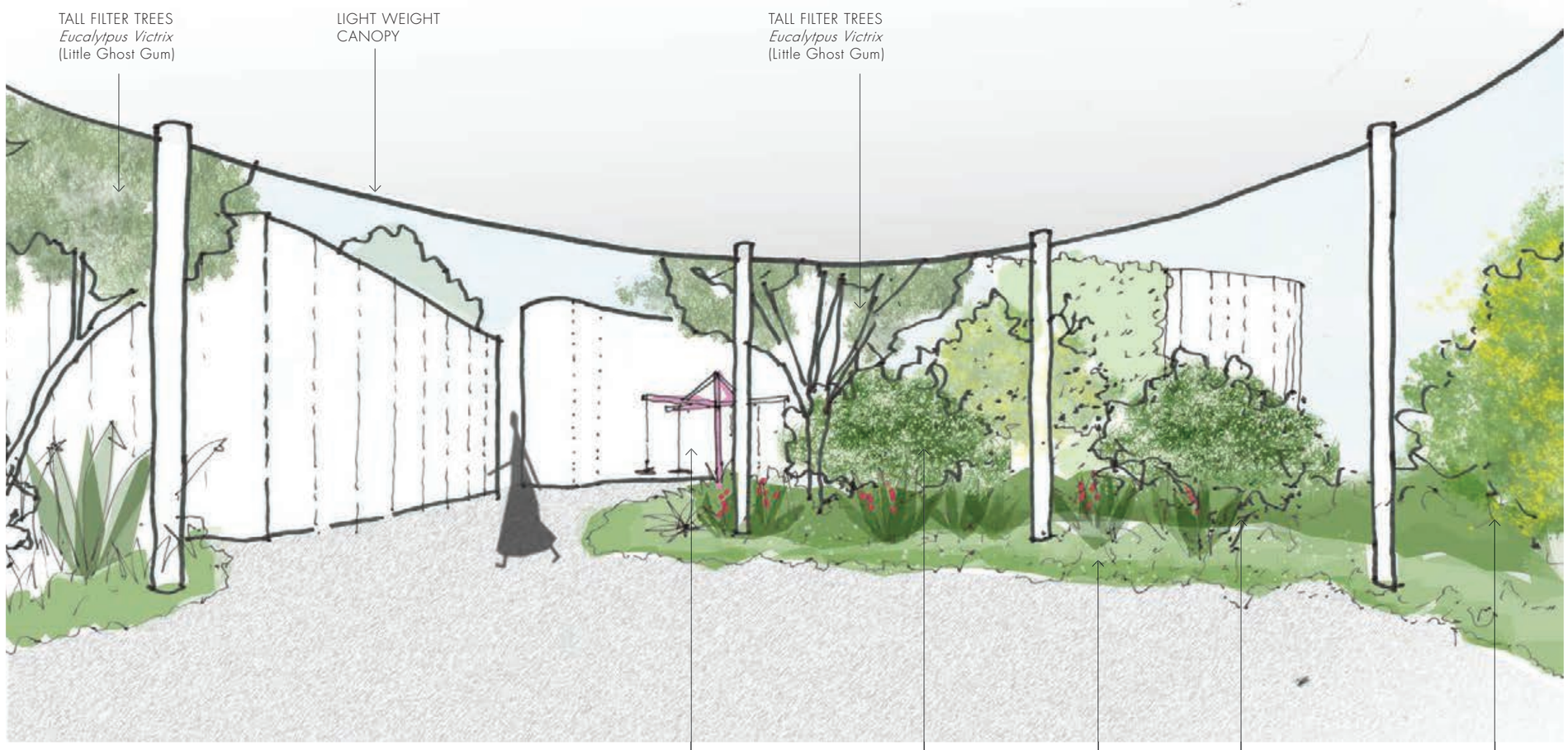


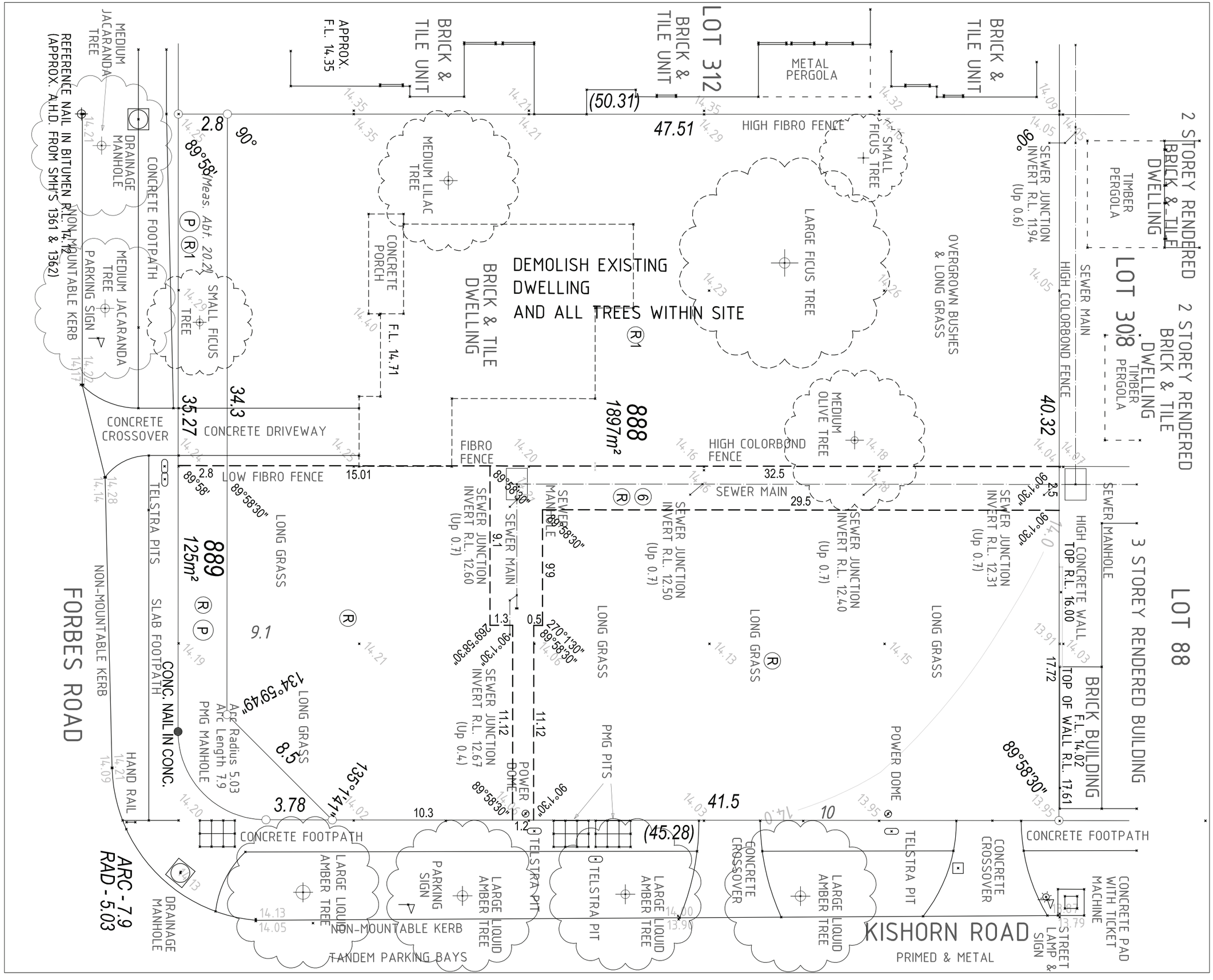
NATIVE FEATURE PLANTING
Calothamnus Quadrifidus 'Clean and Green'
Australian native, bright green foliage
Height: 1m high x 1m wide
Flowers: red

Lepidosperma Gladiatum 'Coastal Edge'
Australian native, clumping strap leaves
Height: 1.5m high x 1.5m wide
Flowers: bronze

Myoporum parvifolium 'Yareena'
A prostrate cascade planting with clean foliage.
Height: 10cm high x 1m wide

IMAGE REFERENCE
Circular Lounge Seating


TALL FILTER TREES
Eucalytpus Victrix
(Little Ghost Gum)
LIGHT WEIGHT
CANOPY
TALL FILTER TREES
Eucalytpus Victrix
(Little Ghost Gum)
CAROUSEL
'Hills Hoist Swing'
FEATURE TREES
Eucalytpus Macrocarpa
'Mottlecah'
NATIVE GROUND PLANTING
Iomandra sp, Myoporum, Rhagodia sp, Baumea, Olearia, Ficinia Nodosa.
NATIVE FEATURE PLANTING
Calothamnus Quadrifidus 'Clean and Green' + Lepidosperma Gladiatum
SMALL NATIVE TREES
Acacia Cognata
'Emerald Curl' Shrubbery



WOHA
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1	18.11.18	DA ISSUE	MEC

CARLTON SURVEYS
Licensed Surveyors
SUITE 4, 160 BURSWOOD ROAD,
BURSWOOD, W.A., 6100.
TEL 9361 5358 FAX 9361 3457
E-mail : carlton@carlton-surveys.com.au

CONTOUR AND FEATURE SURVEY OF LOTS 311 & 800 - 804 INCLUSIVE #10-14 FORBES ROAD & #40A-40C KISHORN RD, APPLECROSS

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

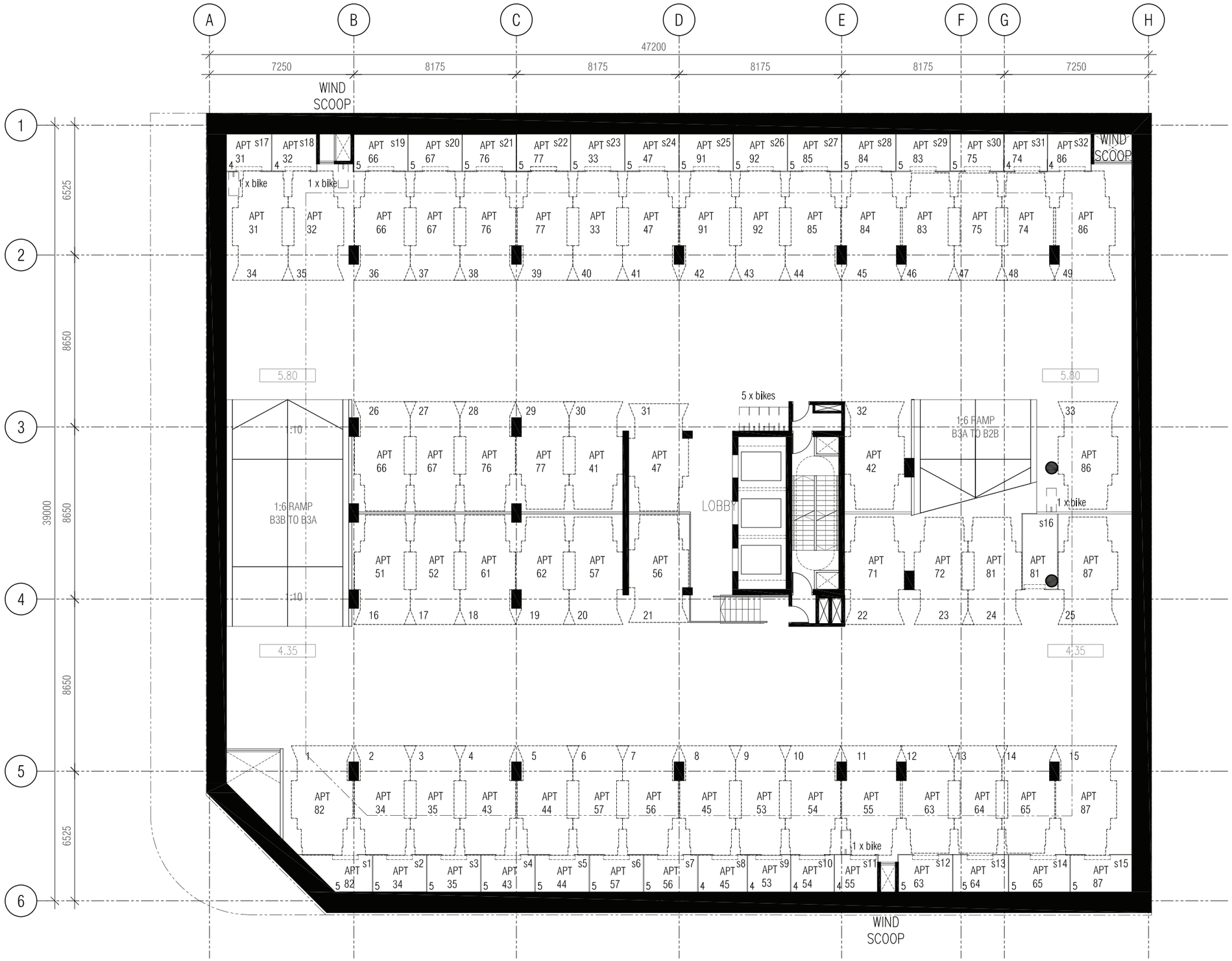
TRUE NORTH | PROJECT NORTH

SCALE
1:200 @ A3 (0 2 4 10)

STATUS
ISSUED FOR DA

DRAWING
EXISTING SITE SURVEY

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.01	MEC	MEC	1



BASEMENT 3 (RL 5.80/4.35)

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PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

TRUE NORTH | PROJECT NORTH

SCALE
1:200 @ A3
0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
BASEMENT 3

DRAWING NO.	DRAFTER	CHECKED	REV.
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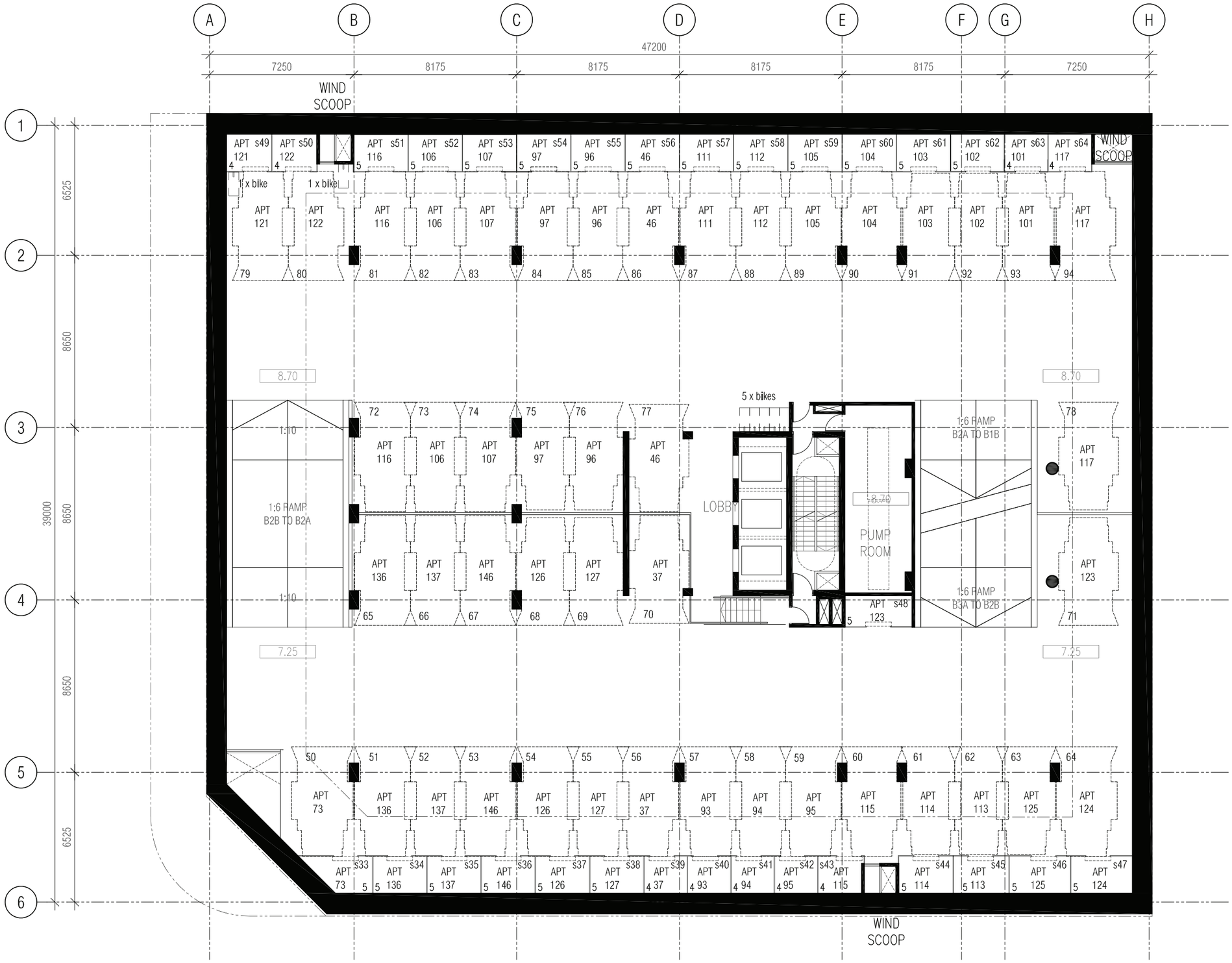

BASEMENT 2 (RL 8.70/7.25)

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1	18.11.18	DA ISSUE	MEC

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PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

TRUE NORTH / PROJECT NORTH

SCALE
1:200 @ A3
0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
BASEMENT 2

DRAWING NO.	DRAFTER	CHECKED	REV.
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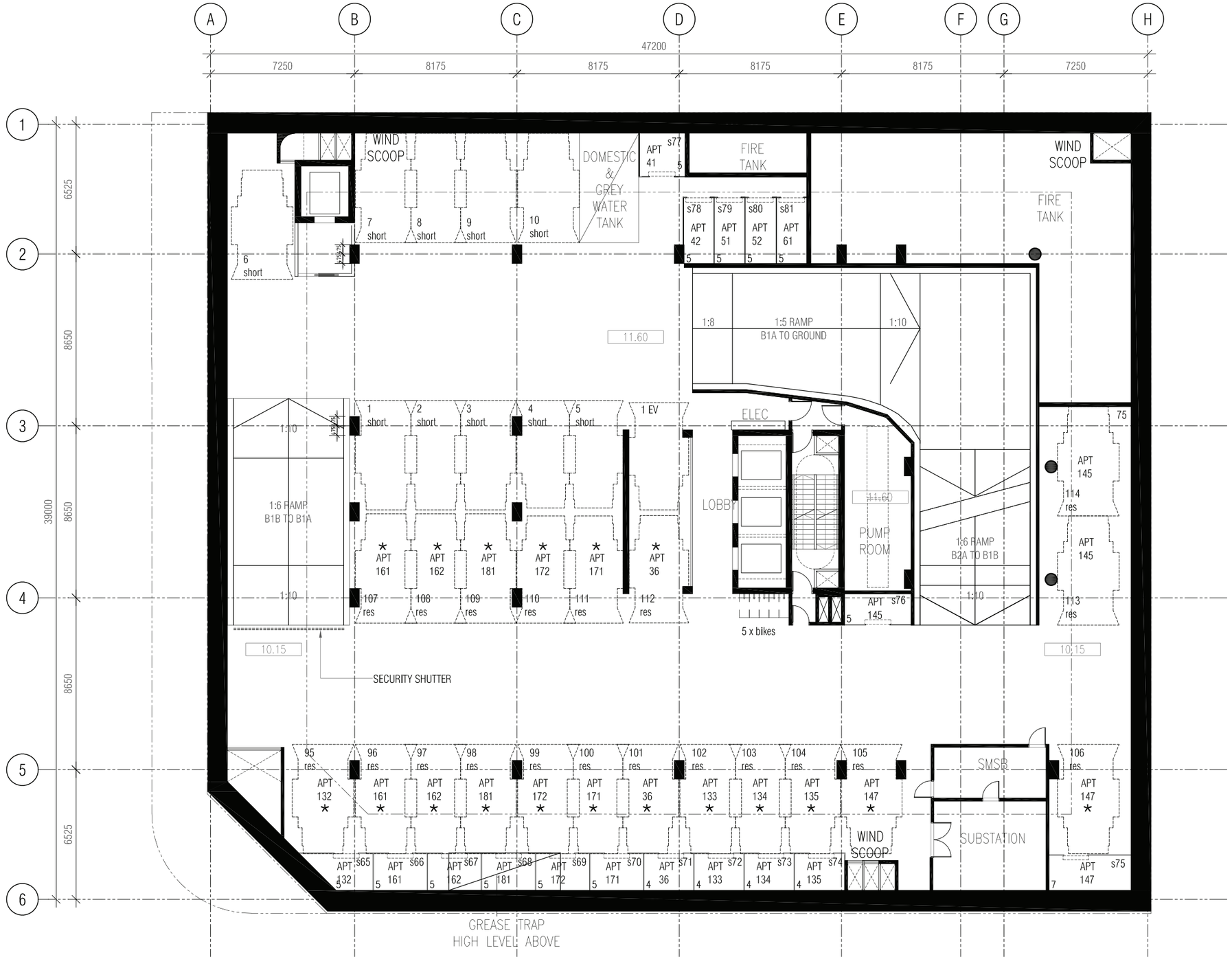

BASEMENT 1 (RL 11.60/10.15)

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1	18.11.18	DA ISSUE	MEC

NOTE:

TOTAL RESI. CAR BAYS	139
TOTAL SHORT STAY CAR BAYS	10
TOTAL CO-WORK CAR BAYS	06
TOTAL F & B BAYS	02
EV CHARGING BAY	01
TOTAL CAR BAYS	158

* CAR BAYS TO BE CAPABLE OF UTILISING INDIVIDUAL STACKER SYSTEM

CLIENT
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PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

TRUE NORTH | PROJECT NORTH

SCALE
1:200 @ A3
0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
BASEMENT 1

DRAWING NO.	DRAFTER	CHECKED	REV.
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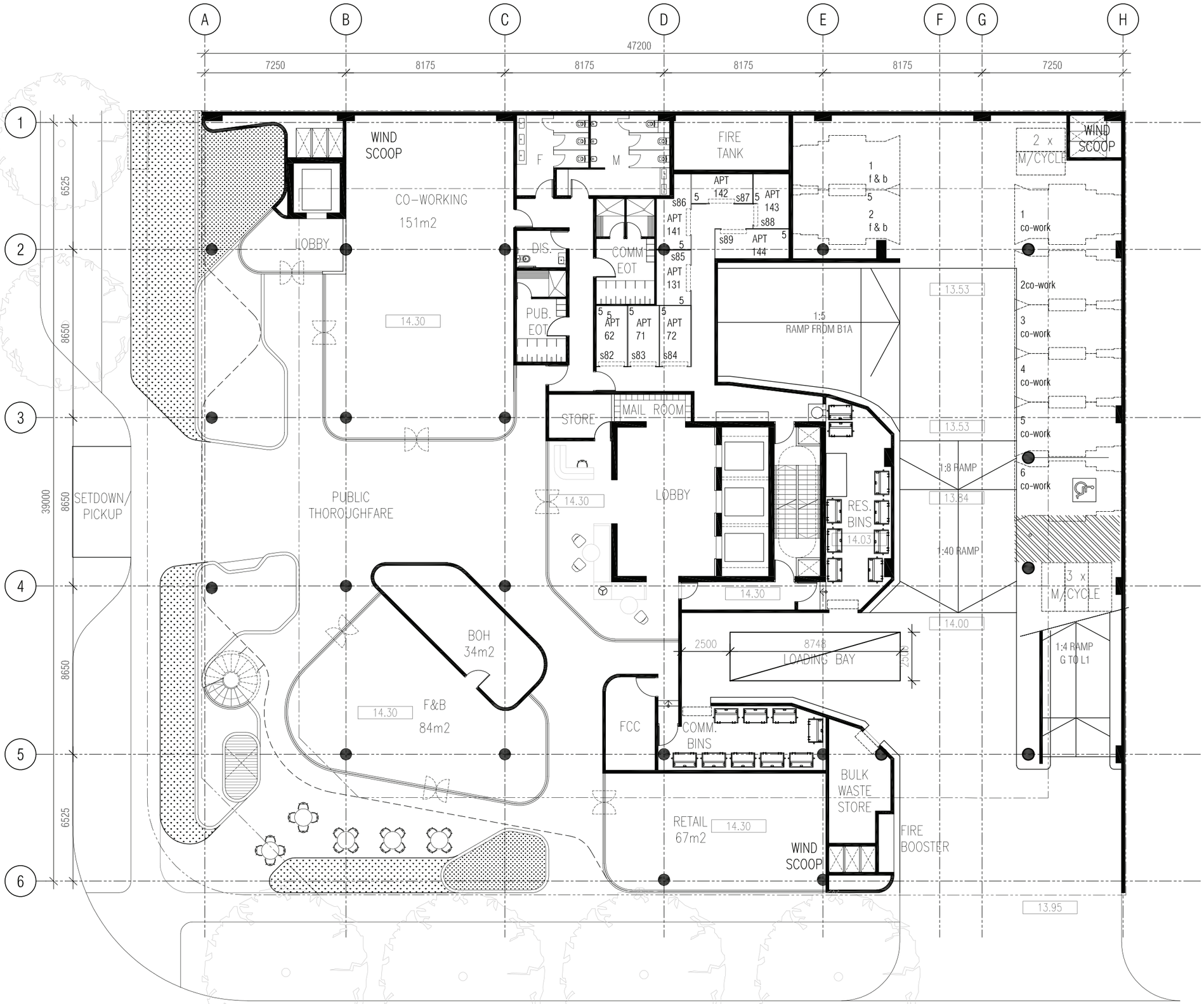

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TRUE NORTH | PROJECT NORTH

SCALE
1:200 @ A3
0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
GROUND/SITE PLAN

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.05	MEC	MEC	1

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1	18.11.18	DA ISSUE	MEC

CLIENT
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PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

TRUE NORTH PROJECT NORTH

SCALE
1:200 @ A3
0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
LEVEL 1

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.06	MEC	MEC	1

LEVEL 2 (RL 23.80)

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1	18.11.18	DA ISSUE	MEC

CLIENT
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PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

TRUE NORTH | PROJECT NORTH

SCALE
1:200 @ A3
0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
LEVEL 2

DRAWING NO.	DRAFTER	CHECKED	REV.
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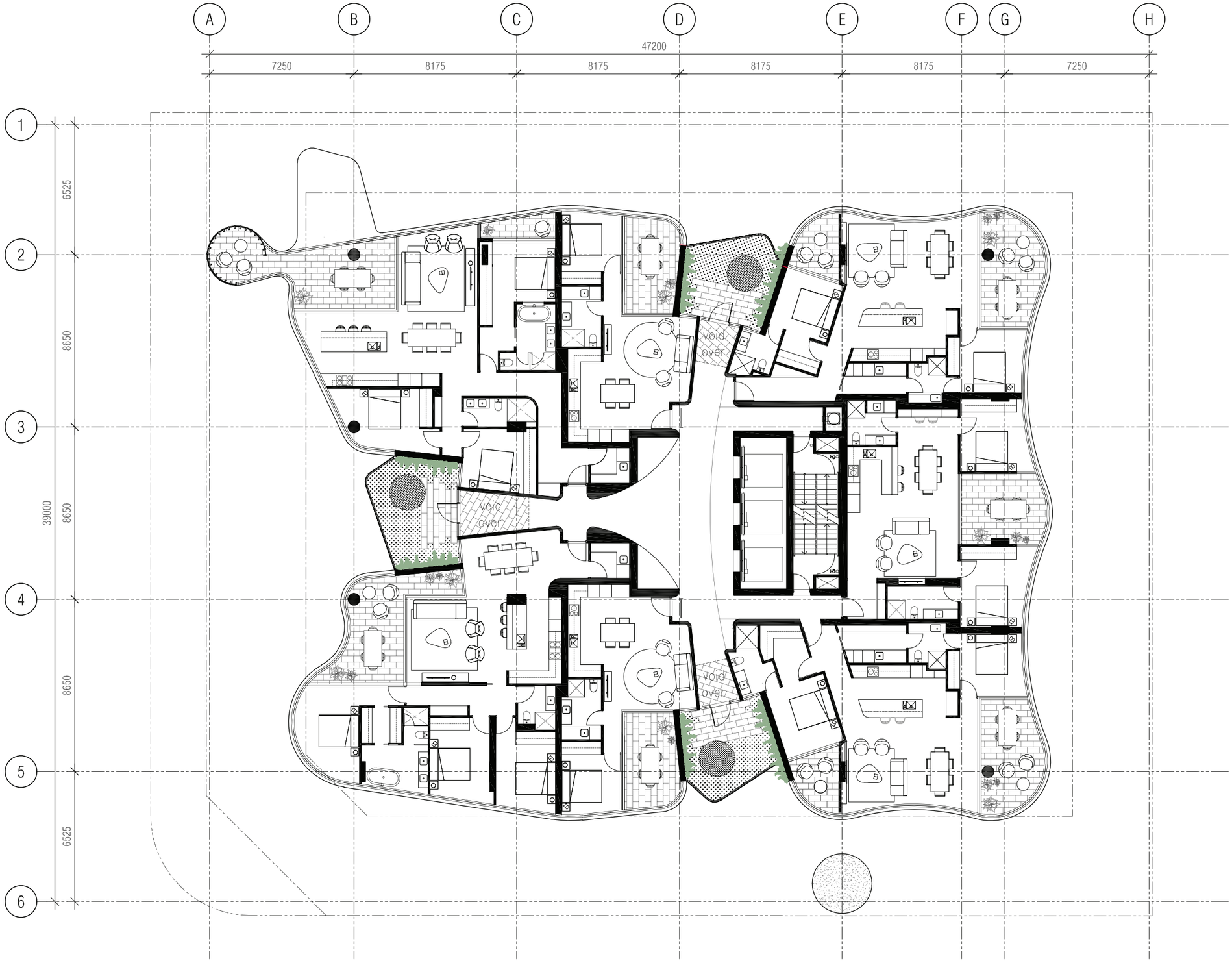

LEVEL 3 (RL+26.50) – SKYGARDENS

WOHA
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REV.	DATE	AMENDMENT	INIT.
1	18.11.18	DA ISSUE	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

TRUE NORTH PROJECT NORTH

SCALE
1:200 @ A3 0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
LEVEL 3

DRAWING NO.	DRAFTER	CHECKED	REV.
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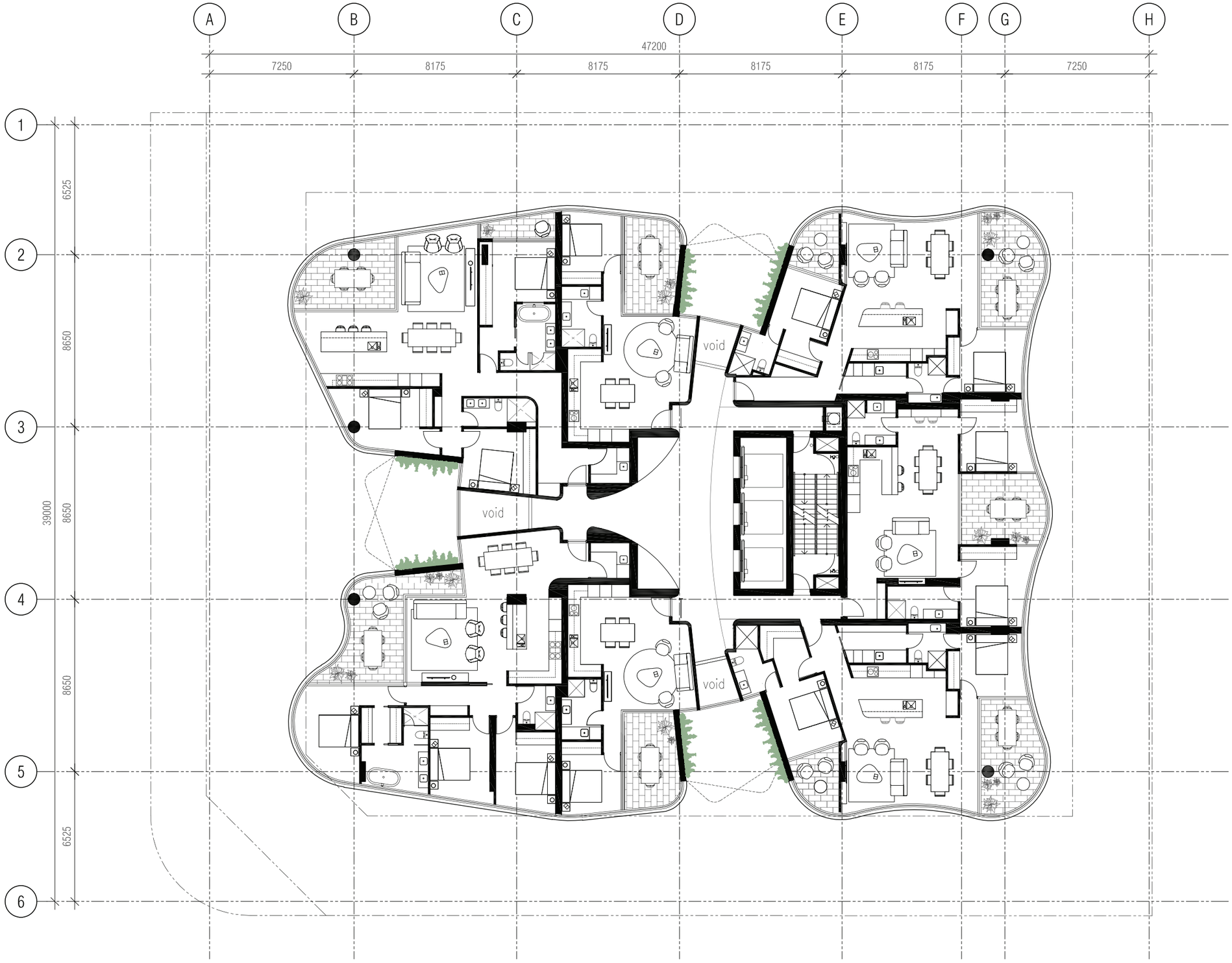

TYPICAL – LEVEL 4, 5, 7, 8, 10, 11, 13, 14

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REV.	DATE	AMENDMENT	INIT.
1	18.11.18	DA ISSUE	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

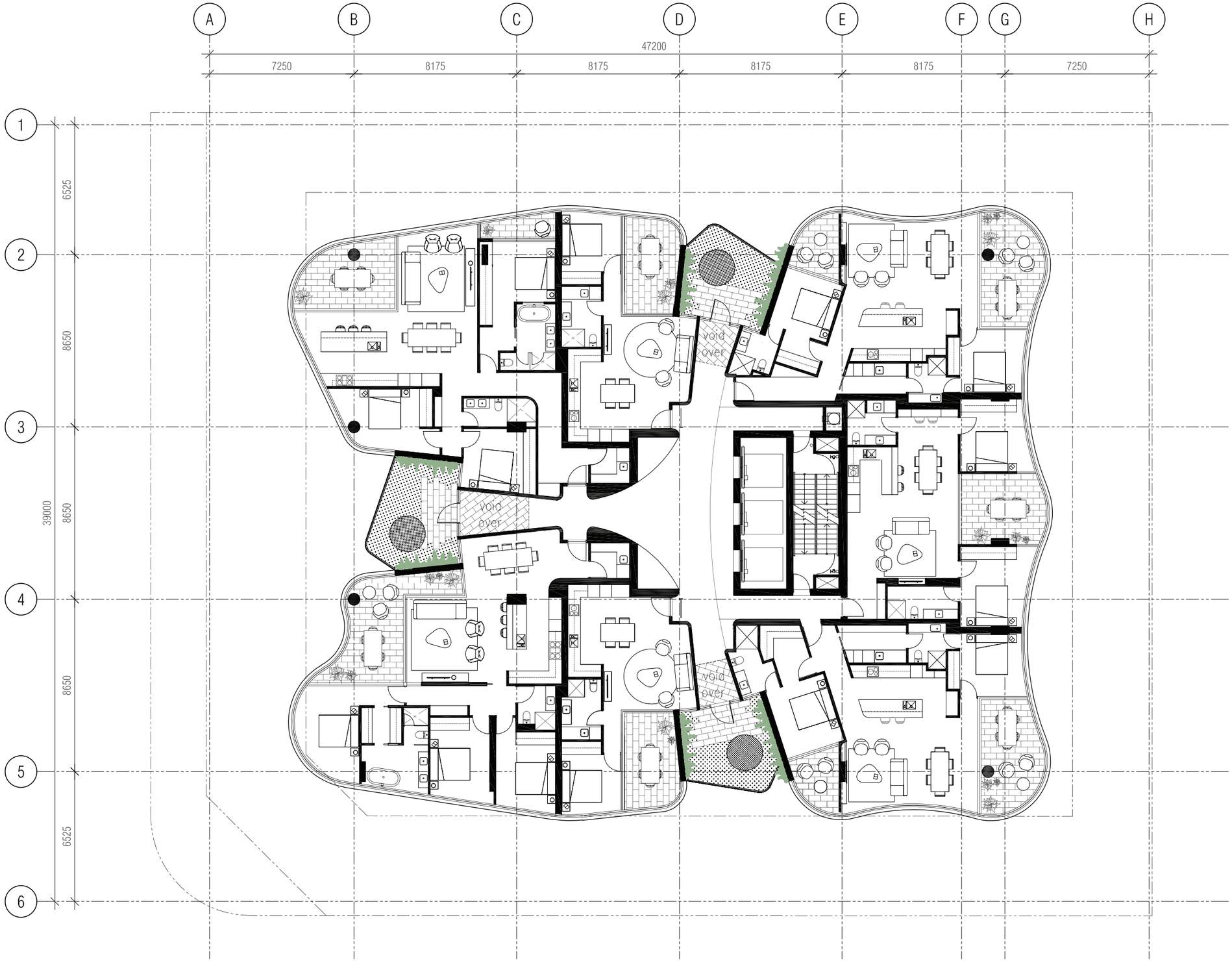
TRUE NORTH PROJECT NORTH

SCALE
1:200 @ A3 0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
LEVELS 4,5,7,8,10,11,13,14

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.09	MEC	MEC	1



LEVEL 6 (RL+36.10) & 12 (RL+55.30) – SKYGARDENS

WOHA
X
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REV.	DATE	AMENDMENT	INIT.
1	18.11.18	DA ISSUE	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

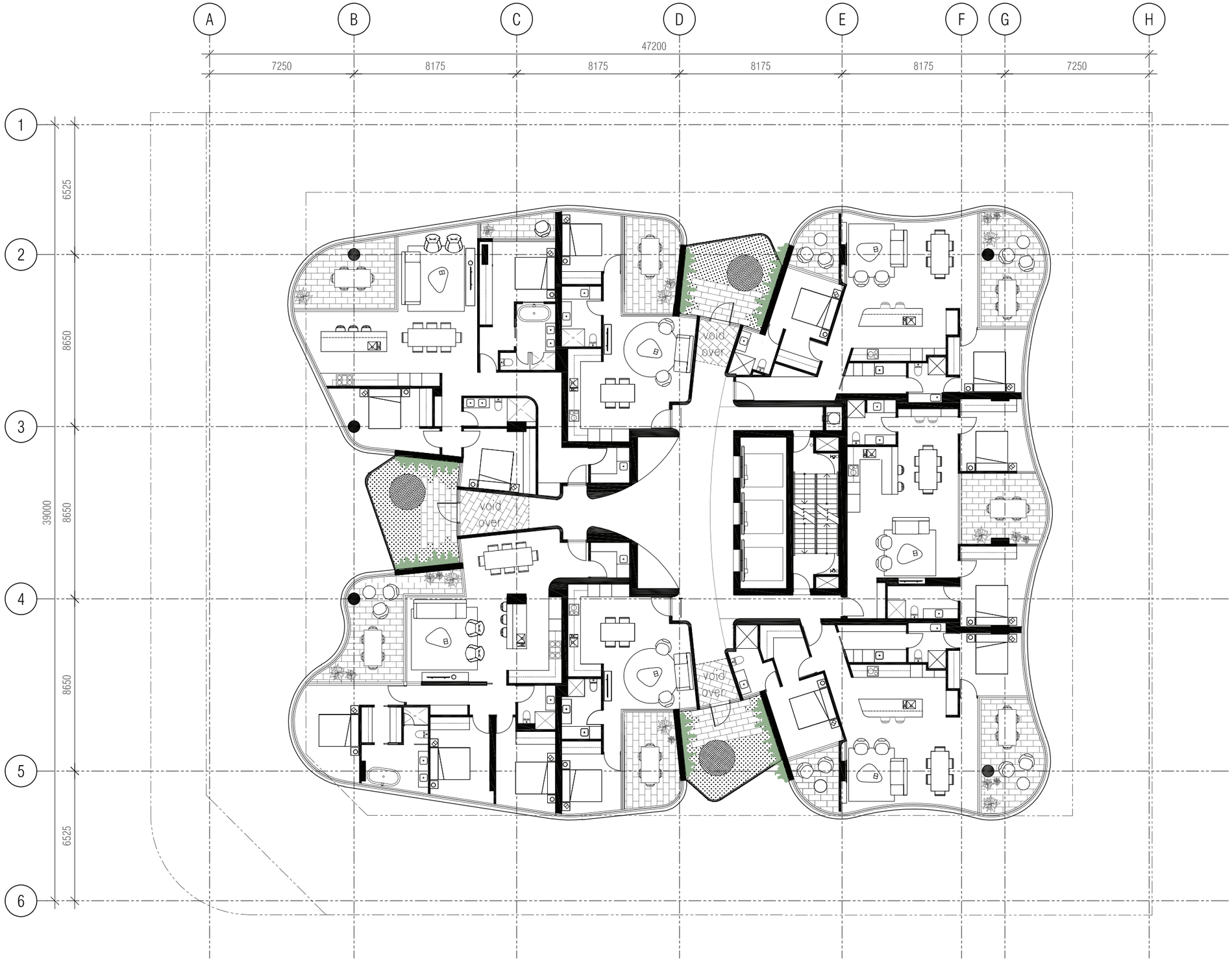
TRUE NORTH | PROJECT NORTH

SCALE
1:200 @ A3
0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
LEVELS 6 & 12

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.10	MEC	MEC	1



LEVEL 9 (RL+45.70) – SKYGARDEN

WOHA
X
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REV.	DATE	AMENDMENT	INIT.
1	18.11.18	DA ISSUE	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

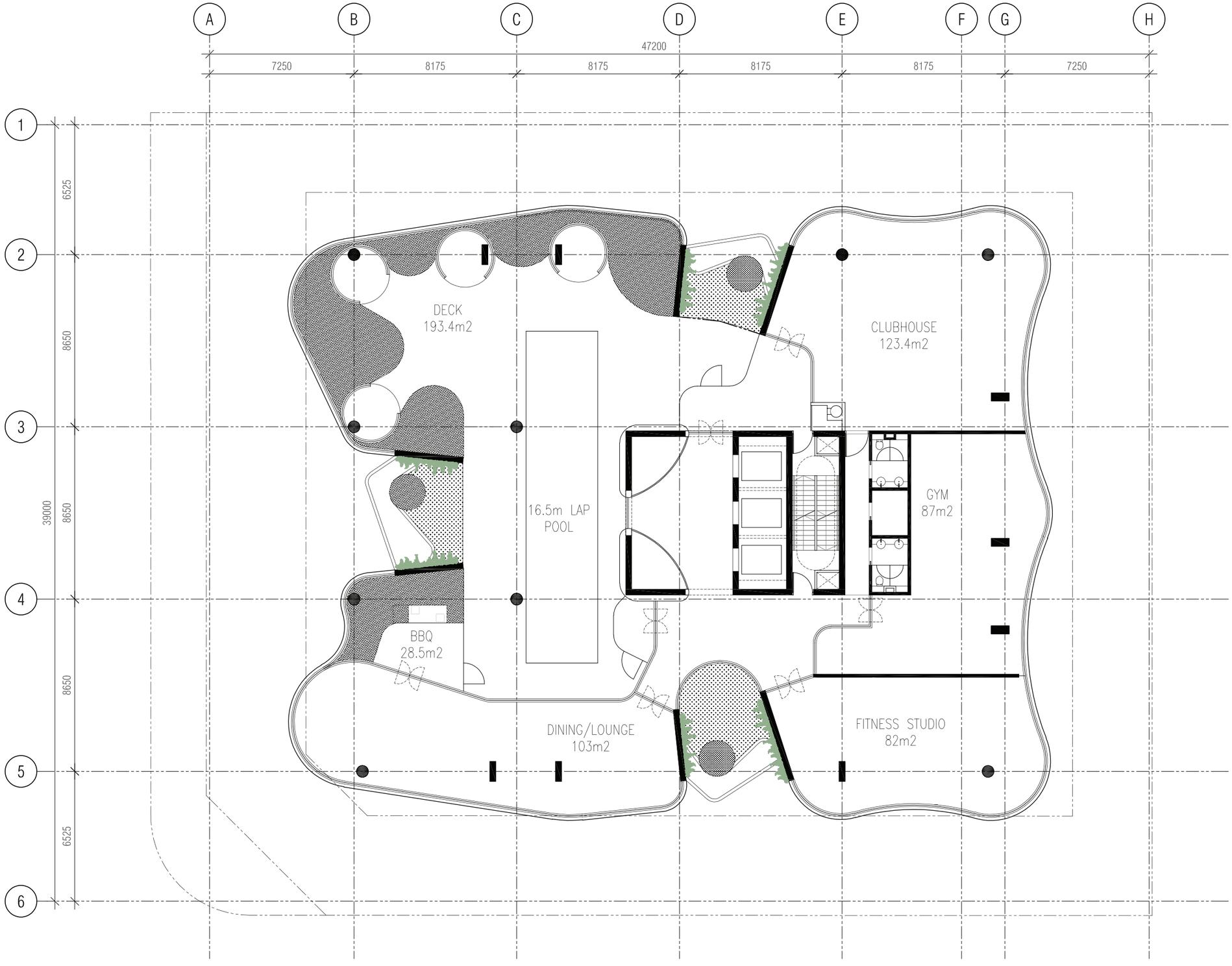
TRUE NORTH | PROJECT NORTH

SCALE
1:200 @ A3
0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
LEVEL 9

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.11	MEC	MEC	1



LEVEL 15 (RL+66.40) – SKYGARDEN

WOHA
X
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REV.	DATE	AMENDMENT	INIT.
1	18.11.18	DA ISSUE	MEC

CLIENT
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PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

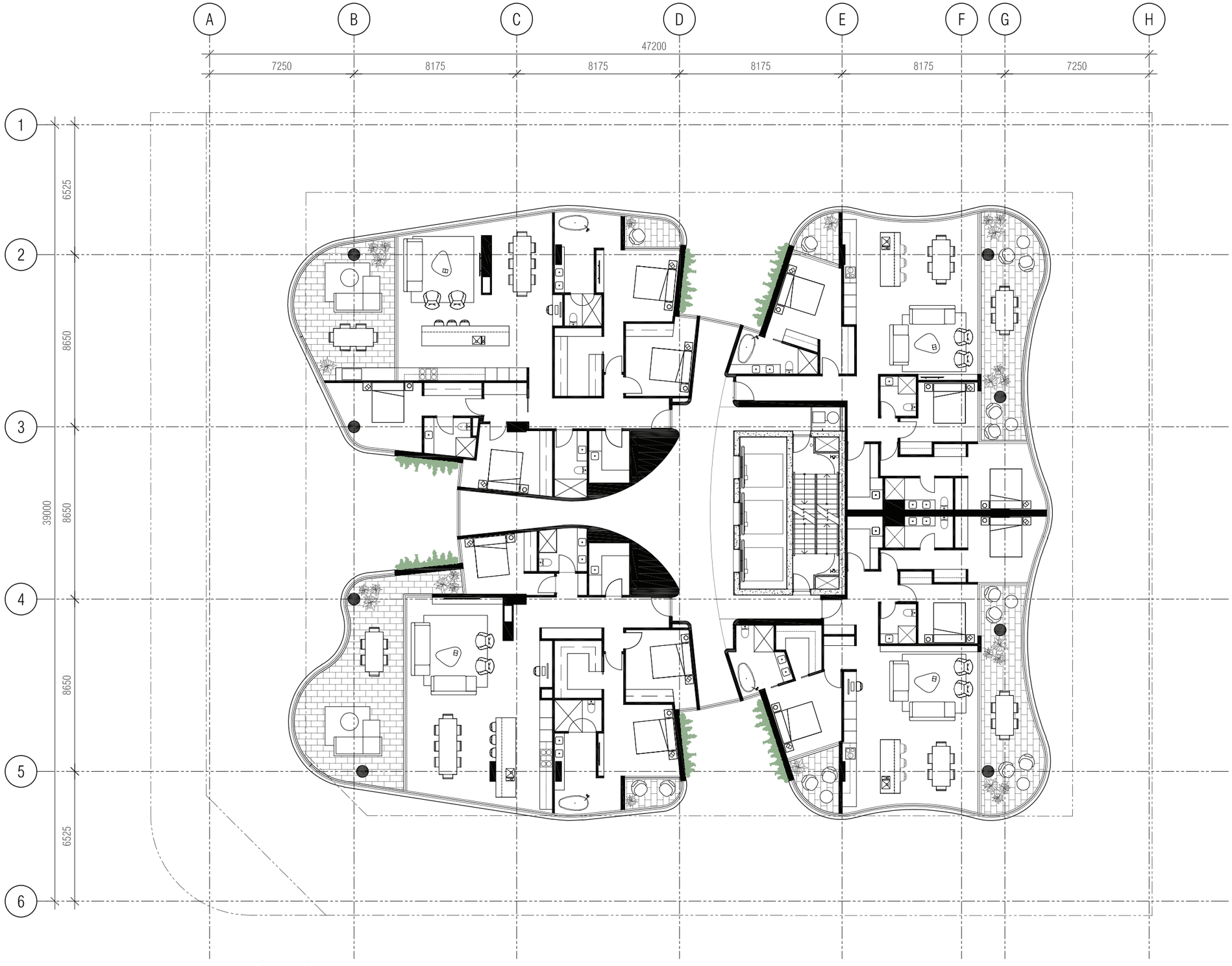
TRUE NORTH | PROJECT NORTH

SCALE
1:200 @ A3
0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
LEVEL 15

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.12	MEC	MEC	1



LEVEL 16 (RL+72.40)

WOHA
X
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REV.	DATE	AMENDMENT	INIT.
1	16.11.18	DA ISSUE	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

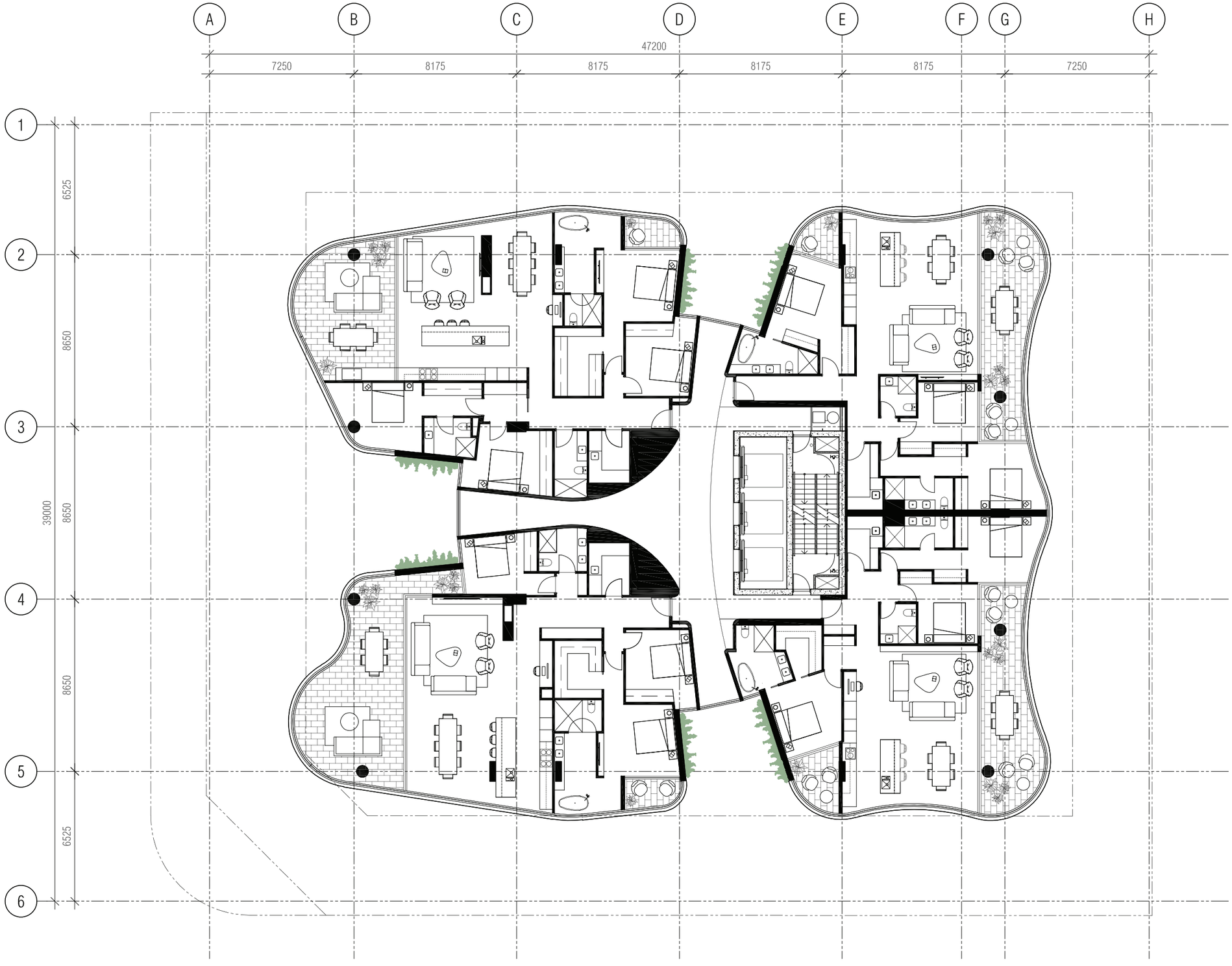
TRUE NORTH PROJECT NORTH

SCALE
1:200 @ A3 0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
LEVEL 16

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.13	MEC	MEC	1



LEVEL 17 (RL+75.60)

WOHA
X
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REV.	DATE	AMENDMENT	INIT.
1	18.11.18	DA ISSUE	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

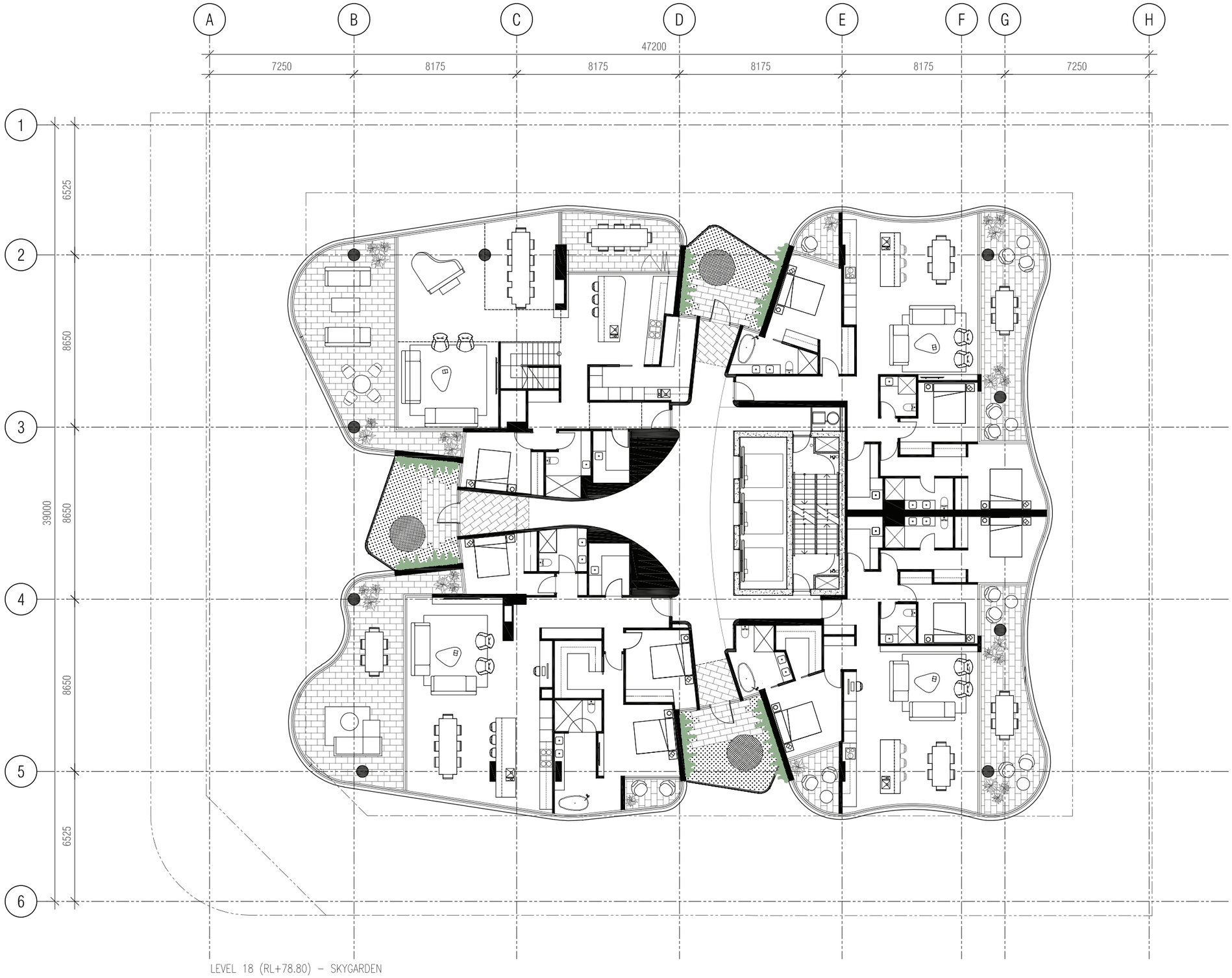
TRUE NORTH PROJECT NORTH

SCALE
1:200 @ A3 0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
LEVEL 17

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.14	MEC	MEC	1



LEVEL 18 (RL+78.80) – SKYGARDEN

WOHA

X

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REV.	DATE	AMENDMENT	INIT.
1	18.11.18	DA ISSUE	MEC

CLIENT

APEX VIEW PTY LTD

PROJECT

FORBES RESIDENCES

PROJECT ADDRESS

10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER

18003

TRUE NORTH PROJECT NORTH

SCALE

1:200 @ A3 0 2 4 10

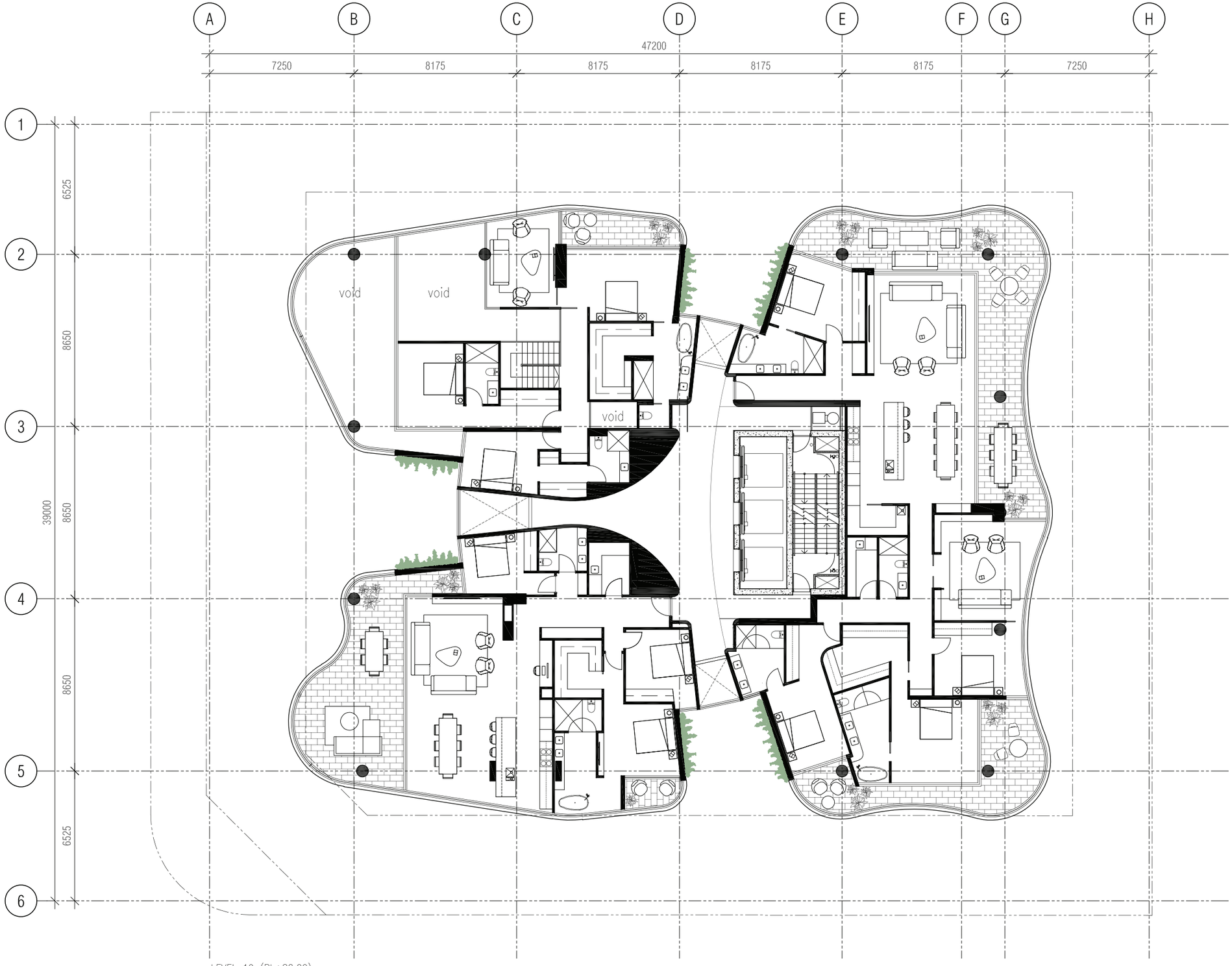
STATUS

ISSUED FOR DA

DRAWING

LEVEL 18

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.15	MEC	MEC	1



LEVEL 19 (RL+82.00)

WOHA
X
MJA studio

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REV.	DATE	AMENDMENT	INIT.
1	18.11.18	DA ISSUE	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

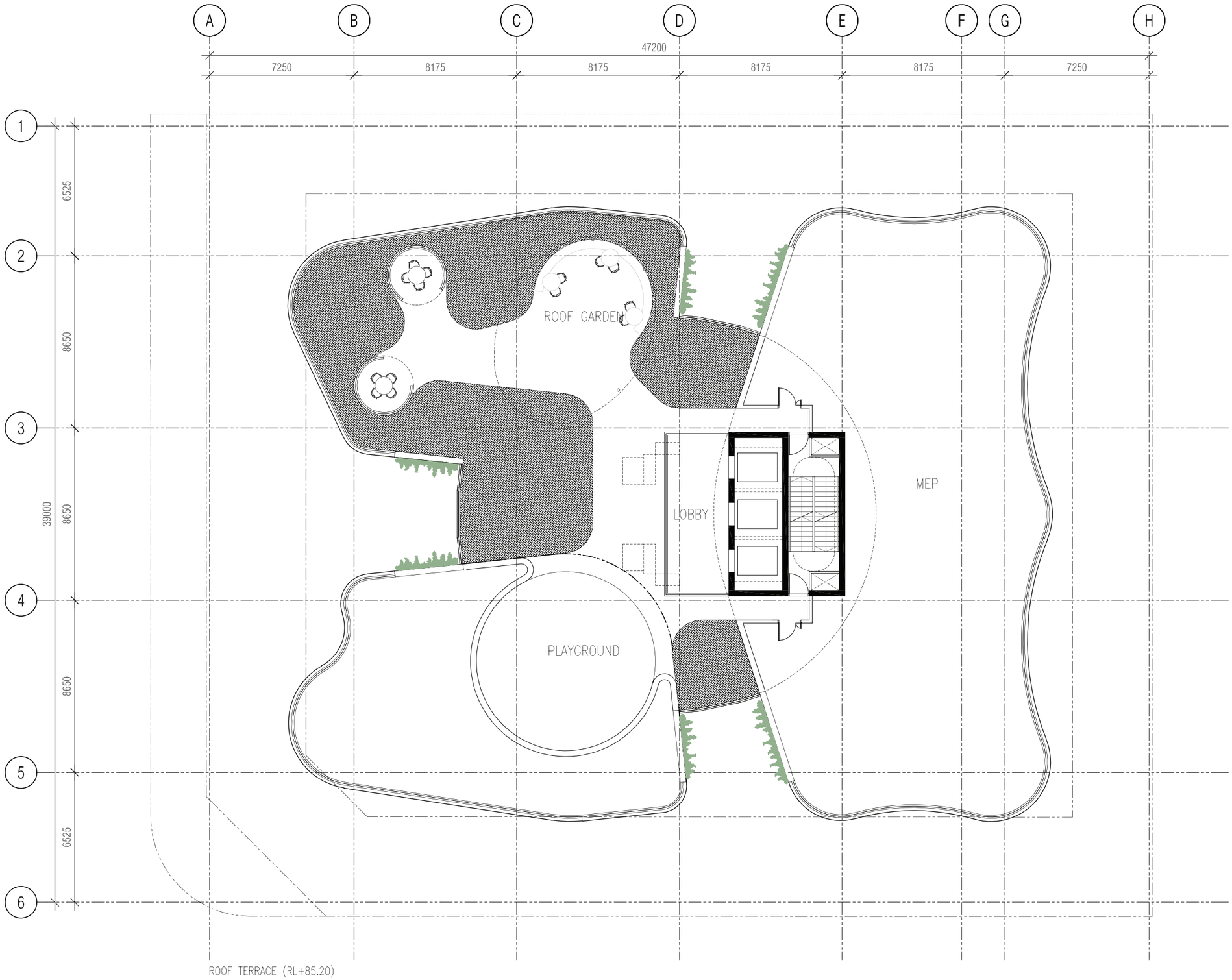
TRUE NORTH
PROJECT NORTH

SCALE
1:200 @ A3
0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
LEVEL 19

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.16	MEC	MEC	1



WOHA
X
MJA studio

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REV.	DATE	AMENDMENT	INIT.
1	18.11.18	DA ISSUE	MEC

CLIENT
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PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

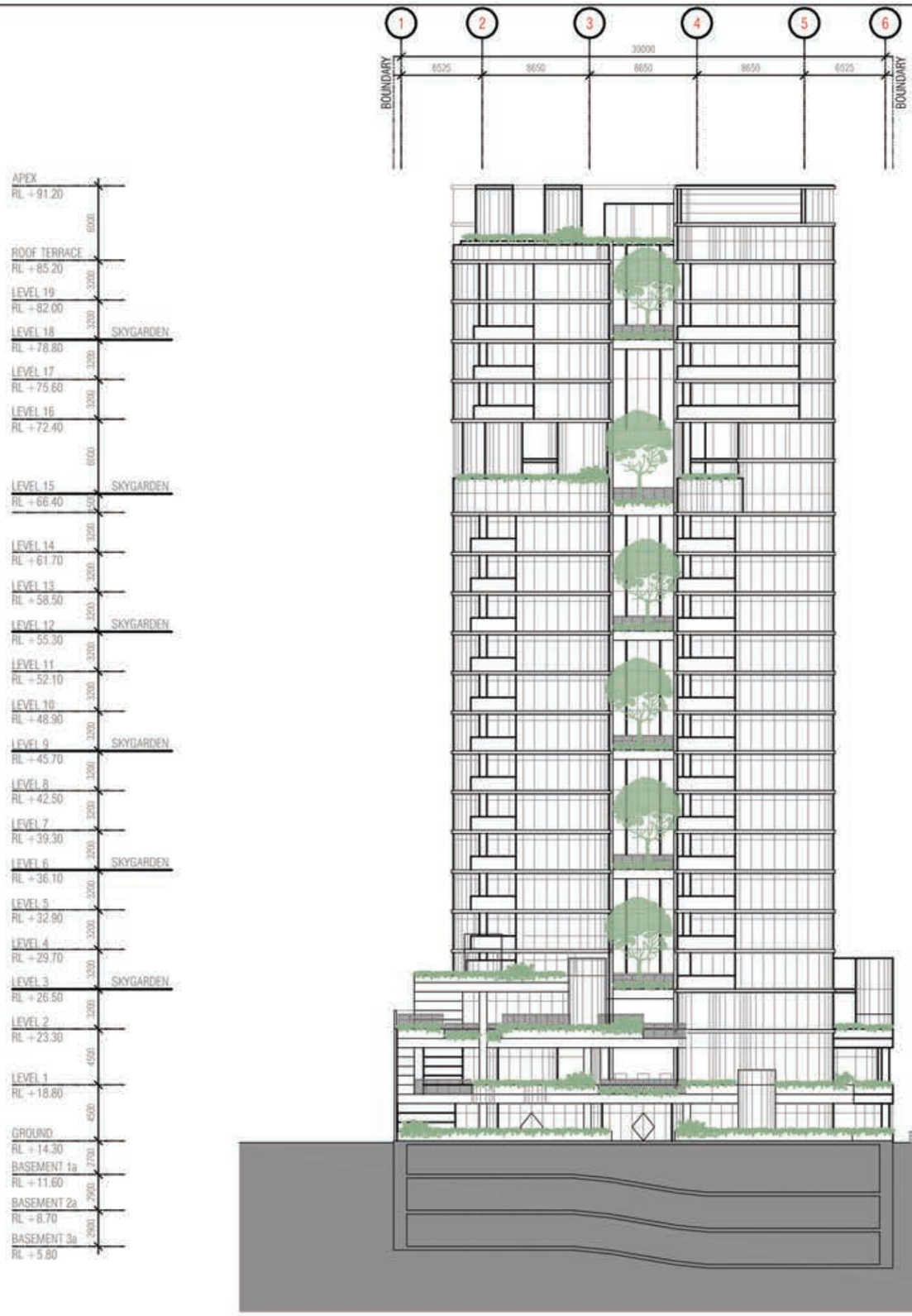
TRUE NORTH PROJECT NORTH

SCALE
1:200 @ A3 0 2 4 10

STATUS
ISSUED FOR DA

DRAWING
LEVEL ROOF TERRACE

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.17	MEC	MEC	1



NOTE: Vertical Louvers not shown for clarity

EXTERNAL FINISHES

G-L3	FACE BRICKWORK P/COATED ALUM. COMMERCIAL FRAMED GLAZING
L4-ROOF TERRACE	EXPRESSED SLAB EDGE DETAILNG, PAINTED FINISH P/COATED ALUM. COMMERCIAL FRAMED GLAZING P/COATED ALUM. VERTICAL FINS, RANDOMLY ARRANGED

WOHA
X
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REV.	DATE	AMENDMENT	INIT.
1.	18.11.18	DA ISSUE	MEC
2.	05.12.18	TREES ADDED	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

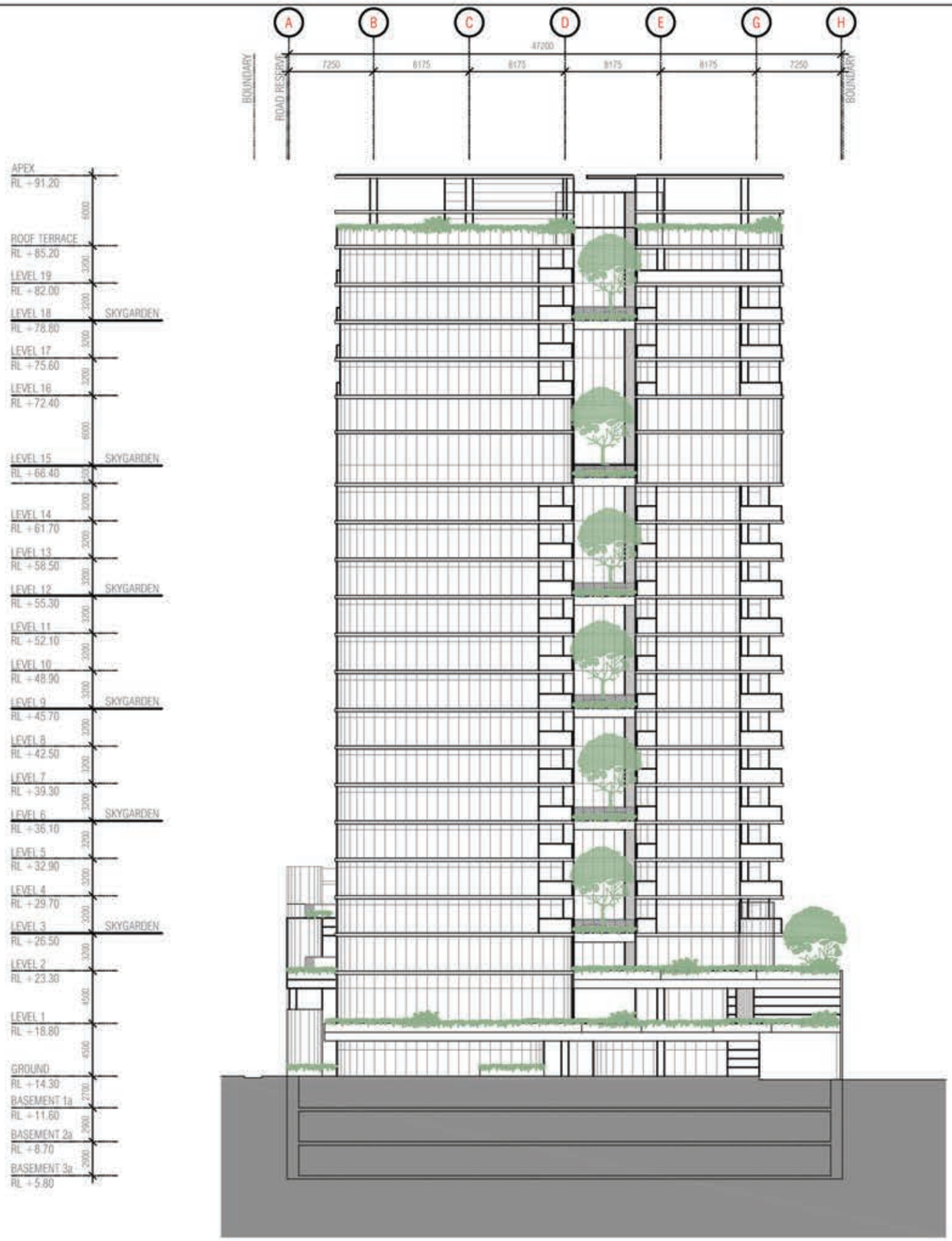
TRUE NORTH | PROJECT NORTH

SCALE
1:400 @ A3
0 4 8 20

STATUS
ISSUED FOR DA

DRAWING
WEST ELEVATION

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.18	MEC	MEC	2



NOTE: Vertical Louvers not shown for clarity

WOHA
X
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REV.	DATE	AMENDMENT	INIT.
1	18.11.18	DA ISSUE	MEC
2	05.12.18	TREES ADDED	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

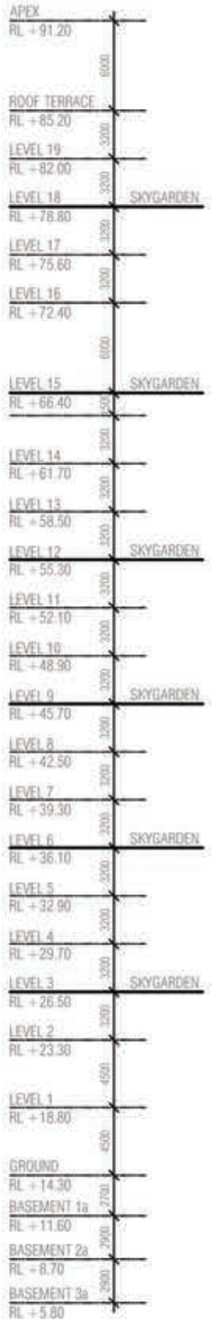
TRUE NORTH | PROJECT NORTH

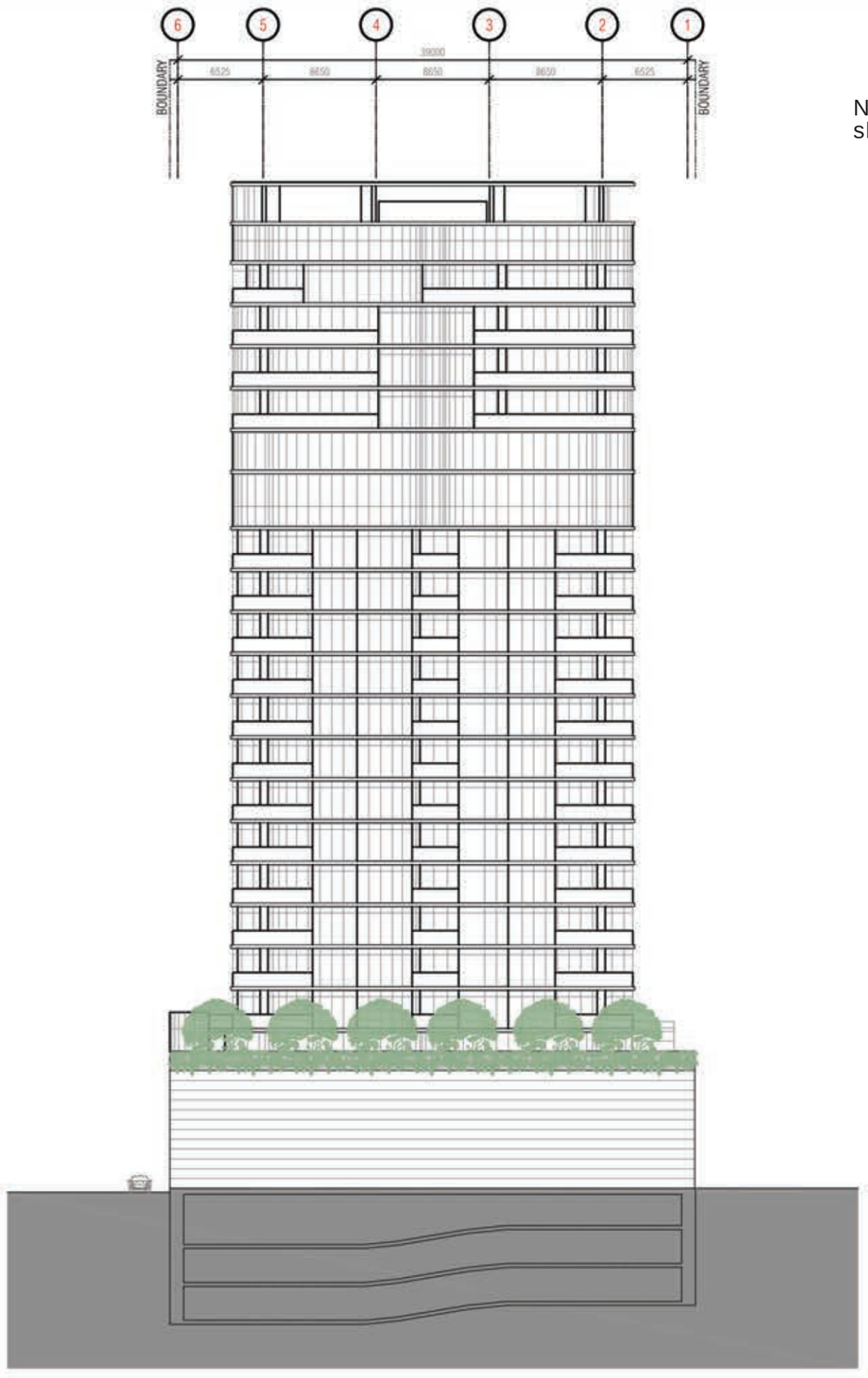
SCALE
1:400 @ A3
0 4 8 20

STATUS
ISSUED FOR DA

DRAWING
SOUTH ELEVATION

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.19	MEC	MEC	2





NOTE: Vertical Louvers not shown for clarity

WOHA
X
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REV.	DATE	AMENDMENT	INIT.
1.	18.11.18	DA ISSUE	MEC
2.	05.12.18	TREES ADDED	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

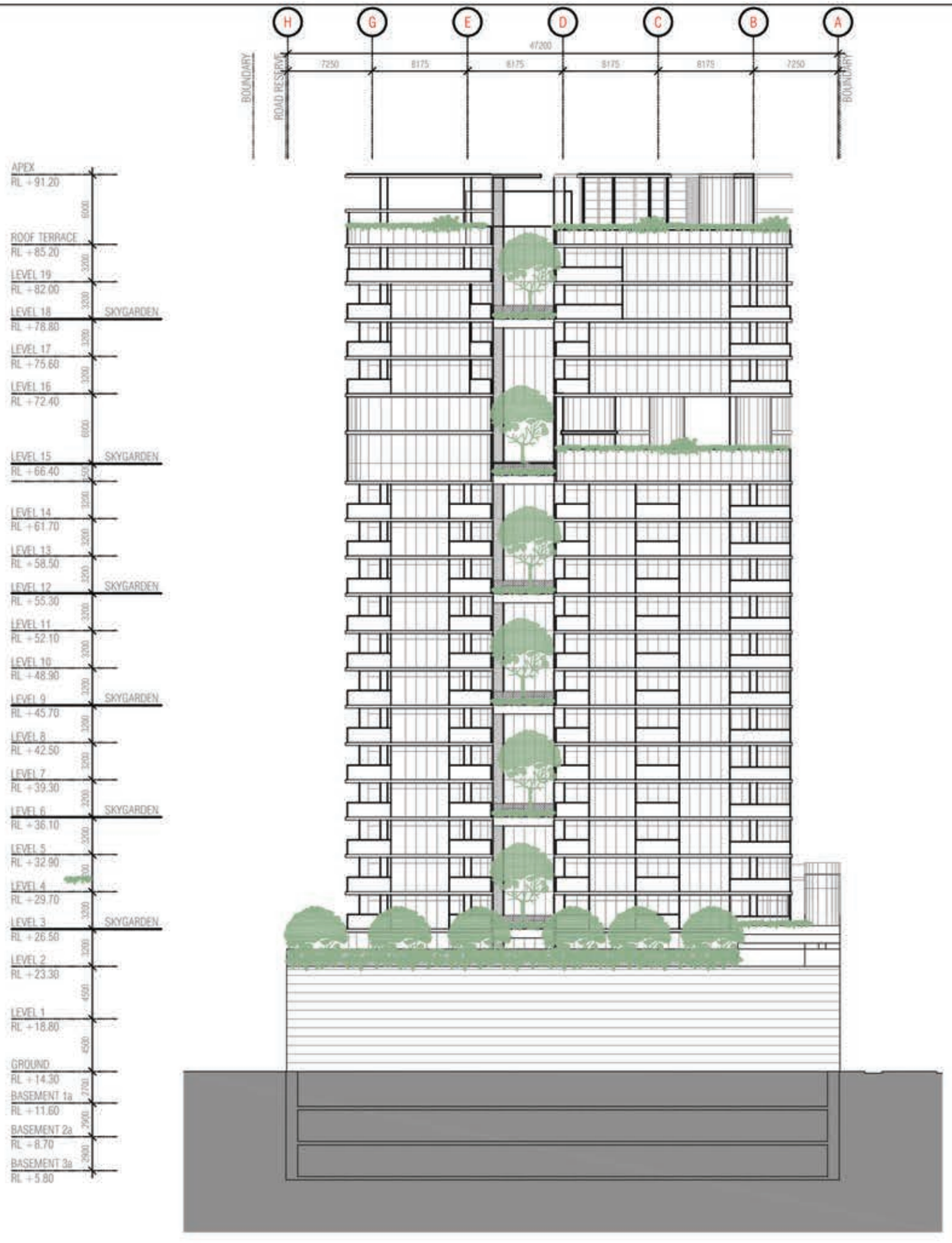
TRUE NORTH | PROJECT NORTH

SCALE
1:400 @ A3
0 4 8 20

STATUS
ISSUED FOR DA

DRAWING
EAST ELEVATION

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.20	MEC	MEC	2



NOTE: Vertical Louvers not shown for clarity

WOHA
X
MJA studio

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REV.	DATE	AMENDMENT	INIT.
1.	18.11.18	DA ISSUE	MEC
2.	05.12.18	TREES ADDED	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

TRUE NORTH | PROJECT NORTH

SCALE
1:400 @ A3
0 4 8 20

STATUS
ISSUED FOR DA

DRAWING
NORTH ELEVATION

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.21	MEC	MEC	2

NOTE: Vertical Louvers not shown for clarity

WOHA
X
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REV.	DATE	AMENDMENT	INIT.
1.	18.11.18	DA ISSUE	MEC
2.	05.12.18	TREES ADDED	MEC

CLIENT
APEX VIEW PTY LTD

PROJECT
FORBES RESIDENCES

PROJECT ADDRESS
10-14 FORBES RD
APPLECROSS

MJA PROJECT NUMBER
18003

TRUE NORTH | PROJECT NORTH

SCALE
1:400 @ A3
0 4 8 20

STATUS
ISSUED FOR DA

DRAWING
SECTION

DRAWING NO.	DRAFTER	CHECKED	REV.
DA.22	MEC	MEC	2

FORBES RESIDENCES