

# THE HEXA-CELL

FLEETWOOD AUSTRALIA  
CONCEPT DESIGN VALIDATION REPORT



## PROLOGUE

### THE HEXA-CELL: HEXAGON & HONEYCOMB

The Hexa-Cell is an innovative prefabricated housing solution that uses a honeycomb structure. The unique hexagonal module design permits ease of assembly and disassembly both on and off-site.

The architectural world continues to expand its understanding and adoption of the natural world, with bio-mimicry emerging as a significant influence in contemporary design. One such source of inspiration has been the honeycomb structure created by bees. The architectural genius of the beehive influences this design; the interlocking of the hexagonal shapes results in strength, low density, and reduced materials for manufacturing.

The proposed structure evolves from the traditional two-dimensional honeycomb design into a complex three-dimensional pattern, capable of adjusting to varying light exposure and managing thermal comfort levels within the home. Each module, when assembled, forms part of the larger structure, serving both functional and structural purposes.

The successful integration of nature's geometric, layered, and systematized solutions into our housing design marks a step forward in agile, sustainable and resilient architecture.



## CONTENTS

SITE CONTEXT	1
DESIGN CONSIDERATION	2
SUSTAINABILITY PRINCIPLES	3
INNOVATION OF PREFABRICATION	4
FLOOR LAYOUT	5
STRUCTURAL ENGINEERING ANALYSIS	6
BUILDING SERVICES	7 - 8
CONSTRUCTION PROGRAMME; BUDGET & REGULATORY EVALUATIONS	9 - 10
REFERENCES	11
APPENDIX	12 - 23

PRECEDENT



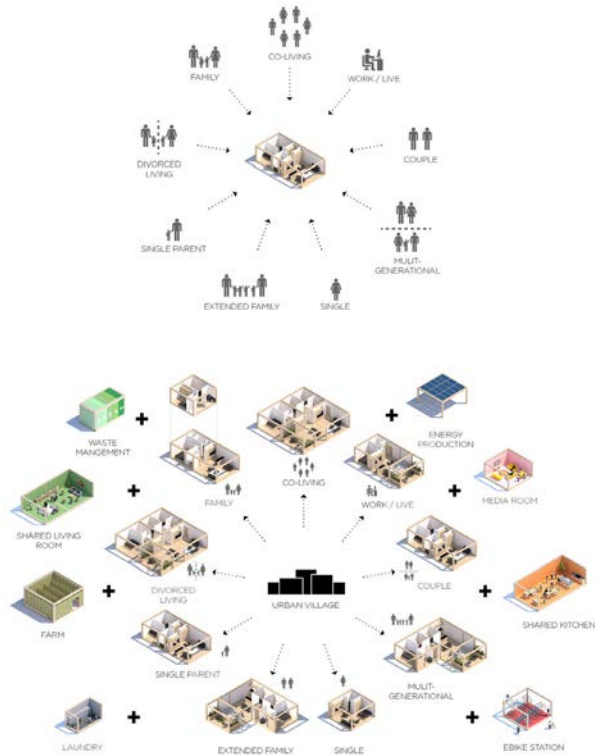
URBAN VILLAGE PROJECT - Effekt Architects

Location - Worldwide

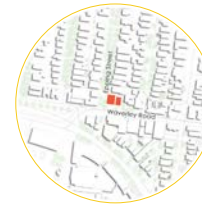
Year - 2018

Status - Ongoing Development Project

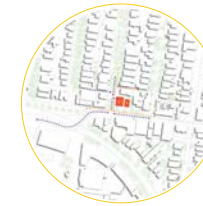
This research project by Effekt Architects and Space10 Design & Research Lab heavily influenced our project as it embodied ideas of pre-fabrication and forming better living conditions for people worldwide. The Urban Village Project is based on a grid system with multiple apartment types dedicated towards different family structures. The grid expands out to the additional facilities and services to create a community within the area.



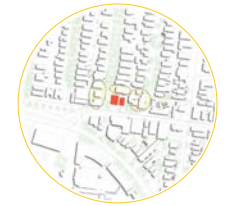
SITE ANALYSIS



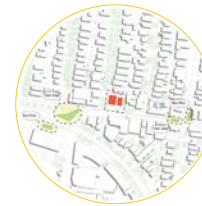
Site Location



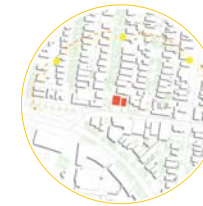
Accessibility



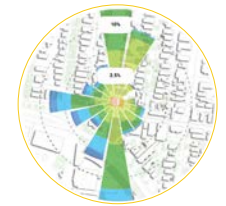
Key Neighbouring



Transportation



Sun Direction



Wind Direction

DESIGN RESPONSE



Site Location



Access to building



Large openings for natural light



Units Formation

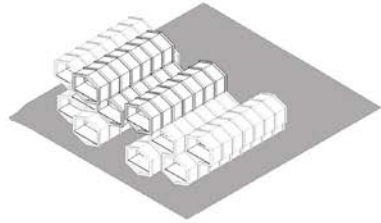


Vertical Extension

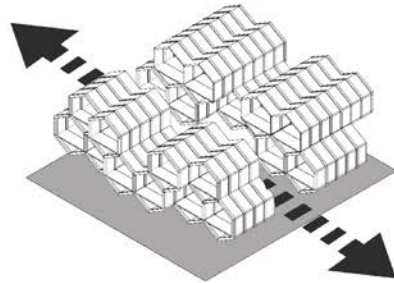


Modularised

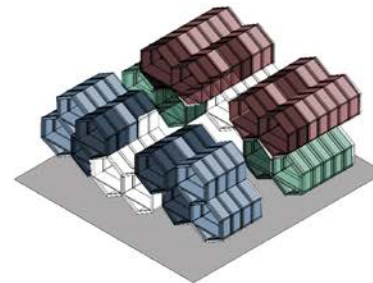
MODULE DEVELOPMENT



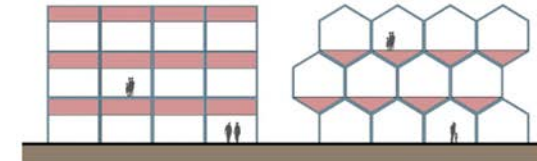
Hexagonal capsule design



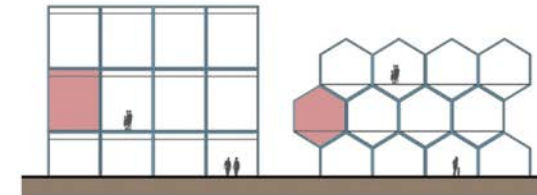
Split to shorten corridor length and allow further ventilation throughout the building



Combined hexagons to form units



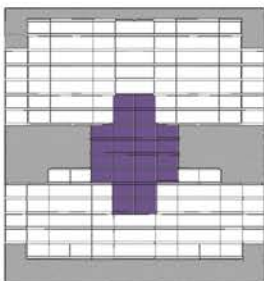
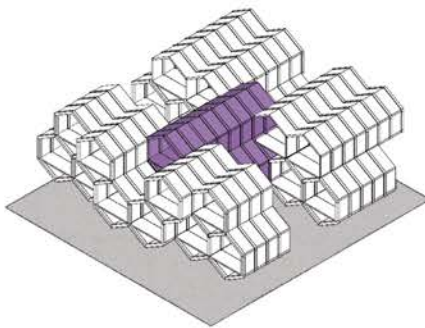
Compared using same ceiling height and floor-to-floor height; the hexagon module can minimise space that reserved for services



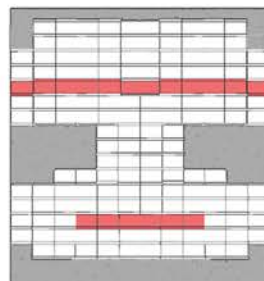
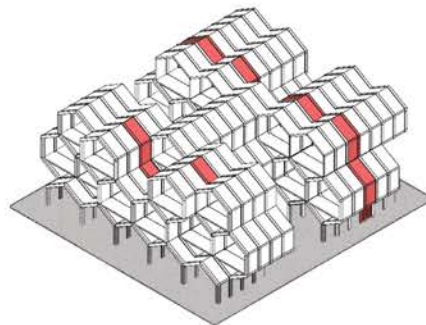
Compared using same module height; the hexagon module can achieve the same space required but with lower height.

DESIGN CONSIDERATIONS & FEATURES

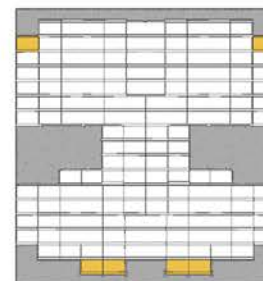
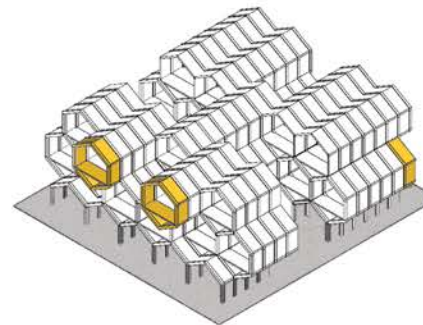
CENTRE CORE



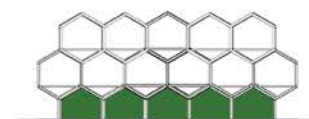
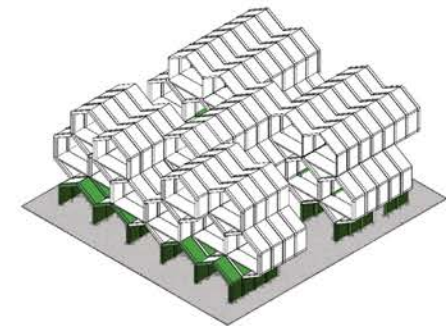
ALIGNING THE SERVICE AREA



FUTURE EXTENTIONS



COMMUNAL SPACE



**MATERIALITY**

**BIOPHILIC: Adopting Nature's Geometric**

The honeycomb structure is space efficient and strong "A hexagonal honeycomb is the way to fit the most area with the least perimeter." From a bee's perspective, that means storing more honey in a larger volume while spending less energy in building a structure to contain it.

Space-efficiency isn't the only benefit of building with hexagons. Stacked together, hexagons fill spans in an offset arrangement with six short walls around each "tube", giving structures a high compression strength. This has inspired us the potential to come up with a new prefabrication solution which could fully utilized the space and save material.

**TOTAL EMBODIED CARBON REPORT**

The embodied carbon report suggests how our material choices has allowed us to lower the embodied carbon. The material choices for the building is made according to whether its sustainable, durable and was also helpful that all the all our suppliers are less than 50 km away from the site, therefore that plays a role in the lowered embodied carbon of the building.



**LOAD BEARING STRUCTURE**  
CLT // Glulam Timber



**INTERNAL FLOOR MATERIAL**  
CLT Panel & Maxiply Maxipanel



**EXTERNAL CLADDING**  
CLT Panel & Maxiply Maxipanel



**INSULATION**  
Rockwool Insulation



**ROOF MATERIAL**  
Maxiply Maxipanel



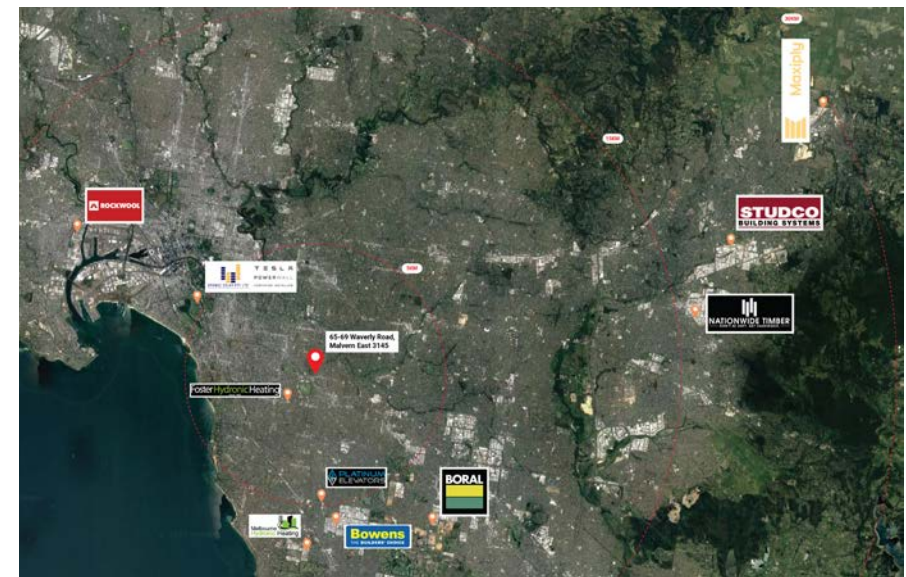
**INTERNAL CLADDING**  
FireCrunch K-Clad



**CONNECTIONS**  
Customized Steel Brackets



**GROUND FLOOR**  
Concrete Slab



Material location to the Site

MODULARITY

BASE GEOMETRY



BASIC HEXAGON STRUCTURE

ADAPTIVE ENVELOPE

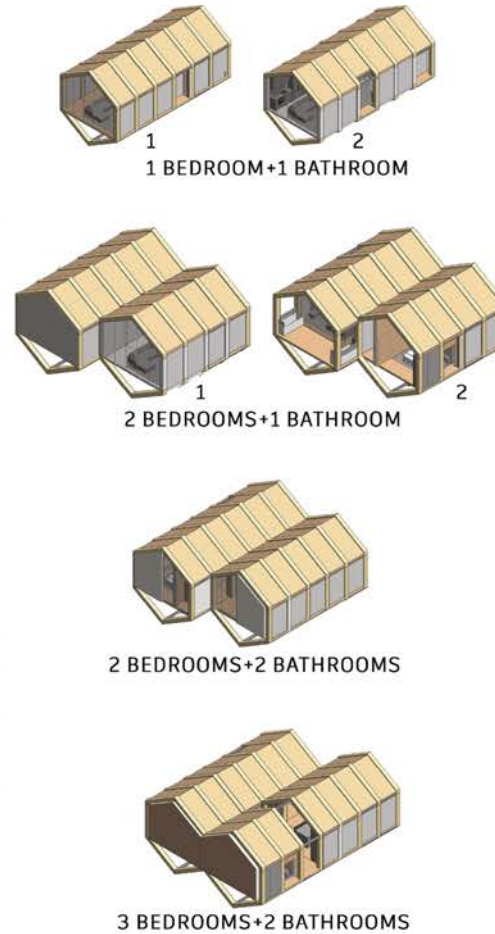


Using the CLT method of construction, we have created a hexagonal shape (Honeycomb) module which is 6m x 2m.

The module is then extended using a horizontal bracing system to join the modules together to create various spaces, such as: bathrooms; bedrooms; living/kitchen; master bedroom; study and balcony modules.

This idea about modularity allows to showcase the agile architecture, as the modules can be assembled and disassembled as per the needs of the residents, whether the modules are expanded or removed. It showcases how the building is flexible and is willing to change depending on the needs of the residents.

HABITABLE MODELLING SYSTEM



The hexagonal modules will be extended depending on the apartment type.

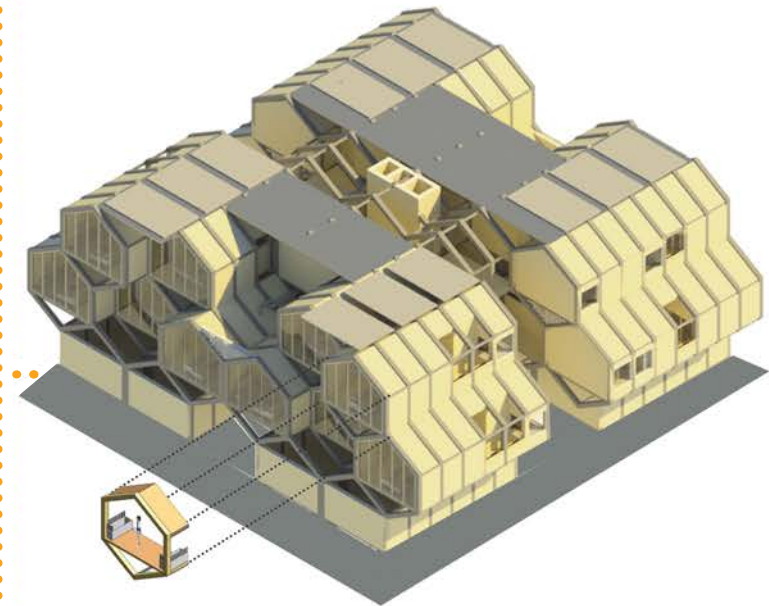
**1 Bedroom & 1 Bathroom**

The apartment will be extended out to create 5-6 modules which can fit living/kitchen modules as well as a bedroom and bathroom module.

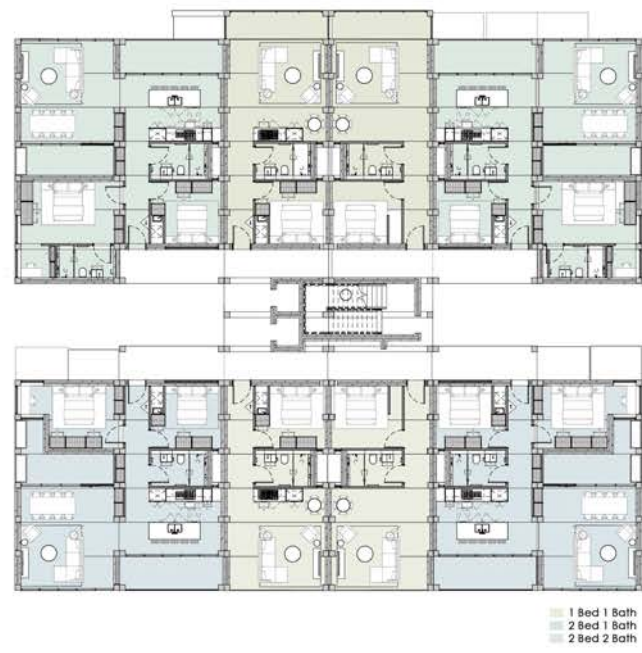
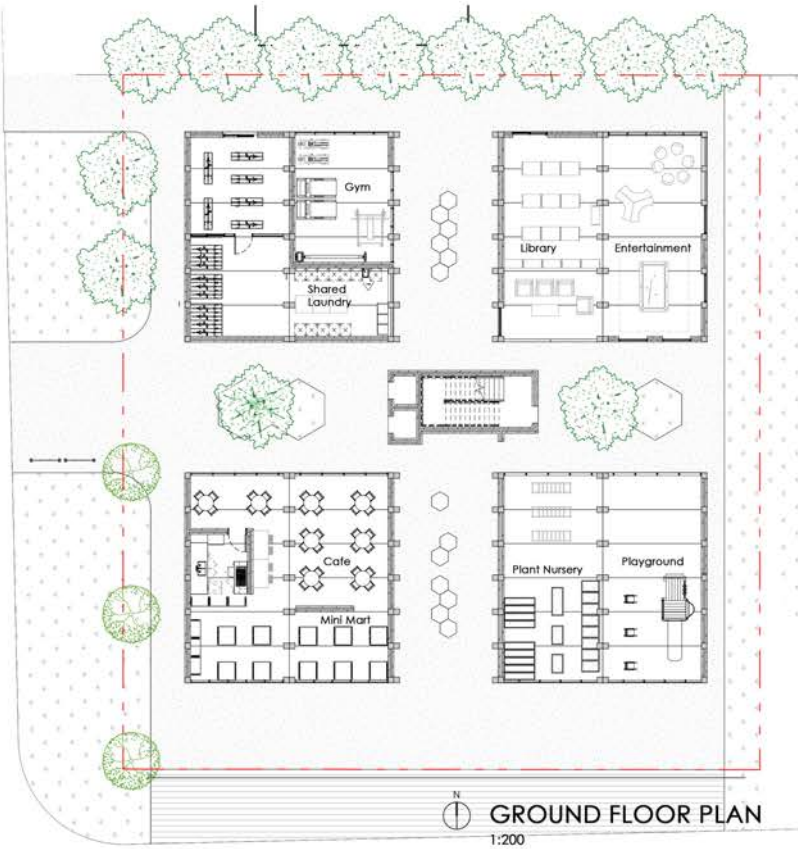
**2 Bedroom & 1 Bathroom**

The apartment will be extended out as well, however they are co-joined by another set of modules to create a much bigger space.

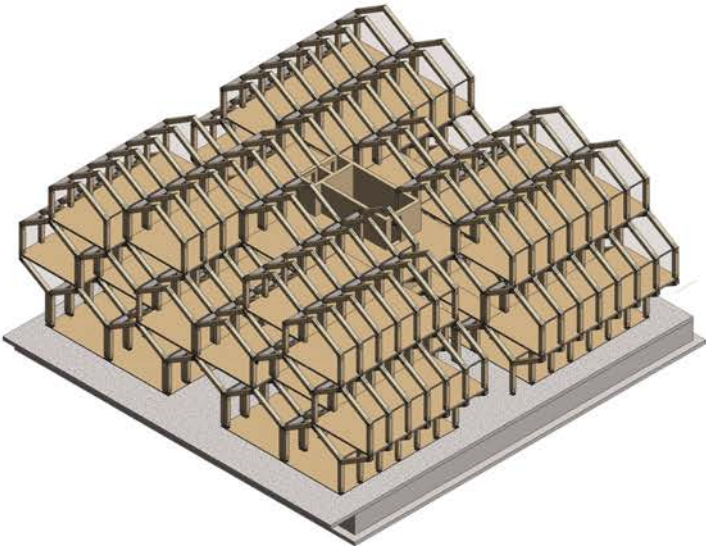
MAXIMUM EFFICIENCY SYSTEMIZED SOLUTION



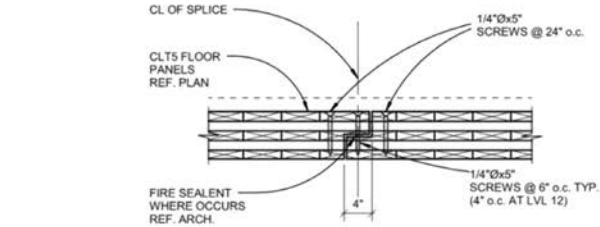
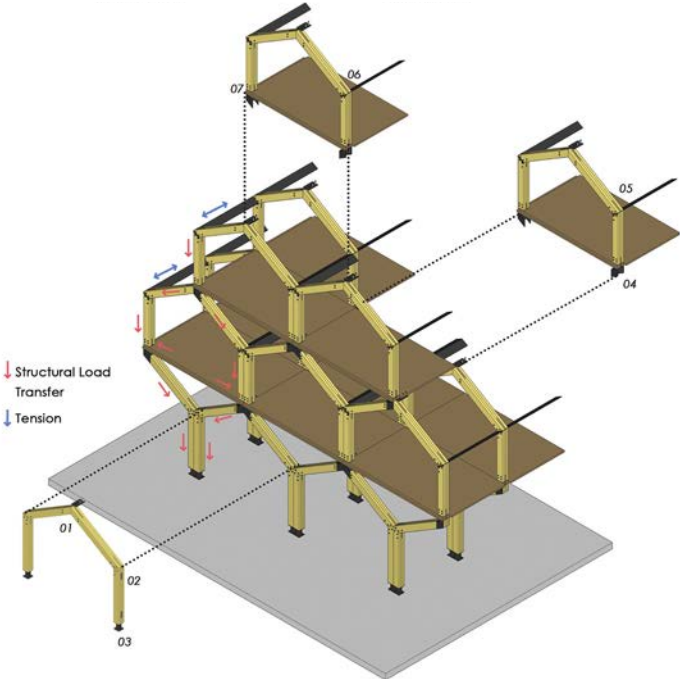
As more modules (programs) are added into the space, the modules will continuously need to adapt/change to suit the needs of the residents. This way the design/construction is flexible and is able to change accordingly to the needs and requirements.



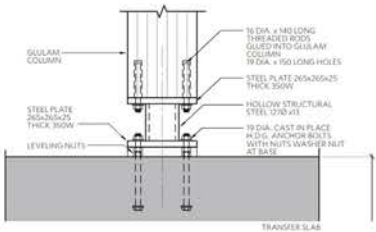
STRUCTURE & MEP SYSTEM



Mass Timber Structure



Half Lap Joint Connection



Column Bear with adjustable standoff base

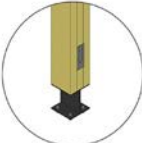
CONNECTION DETAILS



01. Knife Plate Bracket & Steel Plate



02. Knife Plate Bracket & Side Connection Hinge



03. Standoff Based Column & Connection Hinge



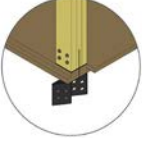
04. Floor Connection: Half Lap Joint Connection



05. Horizontal Bracing Connect to Fin Plate



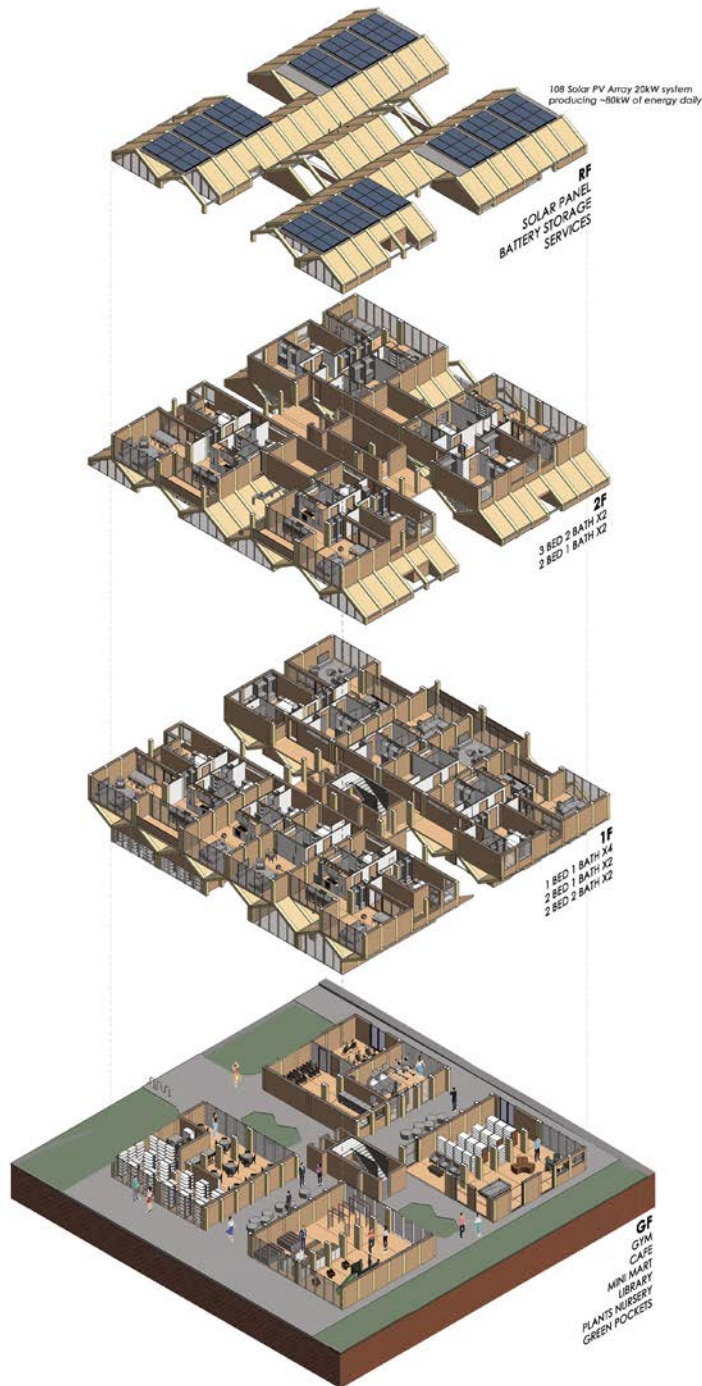
06. Knife Plate Bracket & Steel Bracing



07. Knife Plate & Stirrup Bracket

The hexagonal timber structure is 6 x 2m, so to connect the other modules, a steel bracing is used to expand the timber structure. The structural load is transferred down the vertical timber column. A concrete slab is used on the ground level.





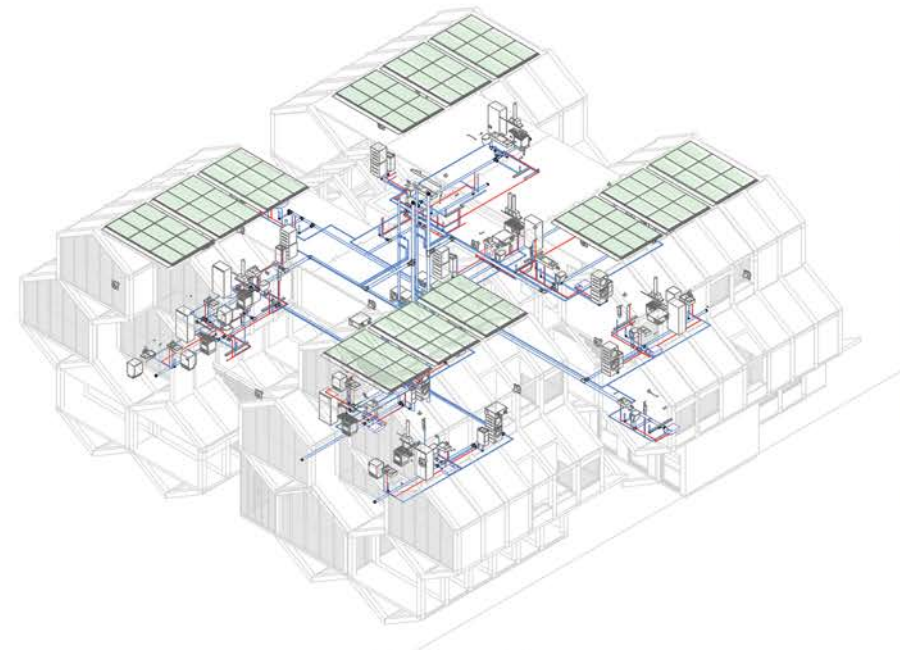
Exploded Axonometric

Australia's natural conditions, its rich timber resources, and the advanced state of its timber industry facilitate the manufacturing of mass timber products such as CLT and Glulam. These materials present several sustainable advantages including carbon sequestration, promoting a renewable cycle of material usage and reducing greenhouse gas emissions associated with construction. Additionally, the integration of efficient building envelopes, minimal glazing, and solar shading enhance the energy efficiency of the constructed building, reducing the demand for heating, cooling, and lighting.

The second steps relates to renewable energy supply. Photovoltaics (PV) are a technology that Australians are well acquainted with. The residential apartments maximizes all opportunities to integrate PV into the facade and rooftop, to lower the building from the sun.

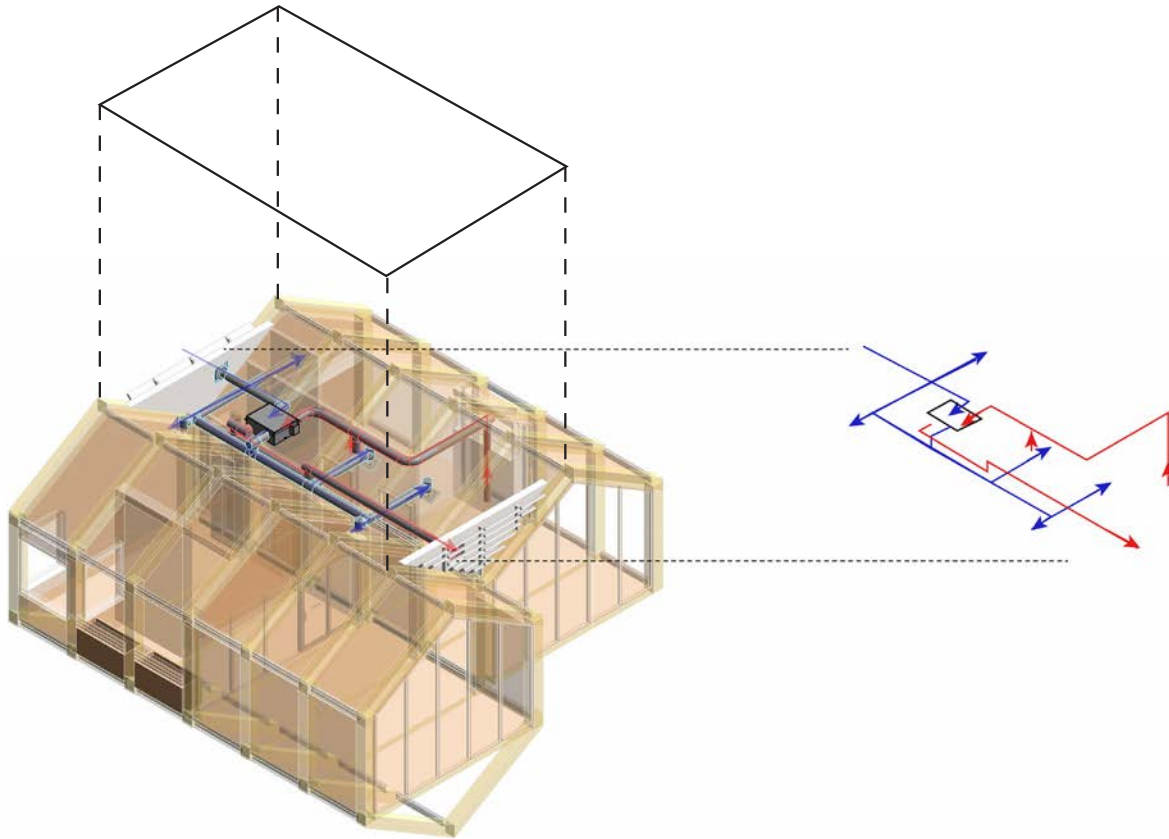
The environmental impact and carbon footprint of the construction site itself also require attention. Globally, various technologies have been developed to power machinery and equipment off-grid, transitioning from diesel to electric power sources. This shift, coupled with the waste reduction benefits of timber prefabrication, can result in a quieter, healthier, and more expedient construction process.

The deployment of 108 solar panels in Hexa-Cell, forming approximately a 20 kW system, can produce around 80 kW per day under ideal conditions. This energy production may not wholly power the building but can substantially offset operational costs. An installed battery storage system on level 2 effectively retains any surplus power generated.

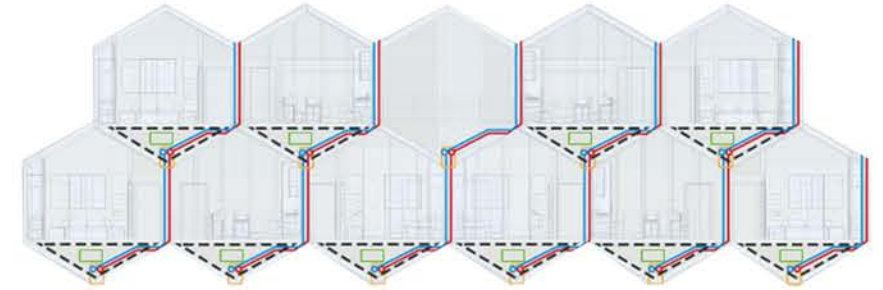


MEP System Model

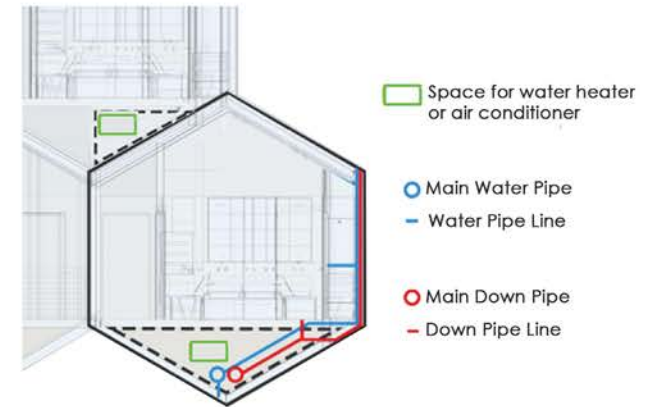
HEATING, COOLING & VENTILATION



Heating, Cooling & Ventilation Pipe Line



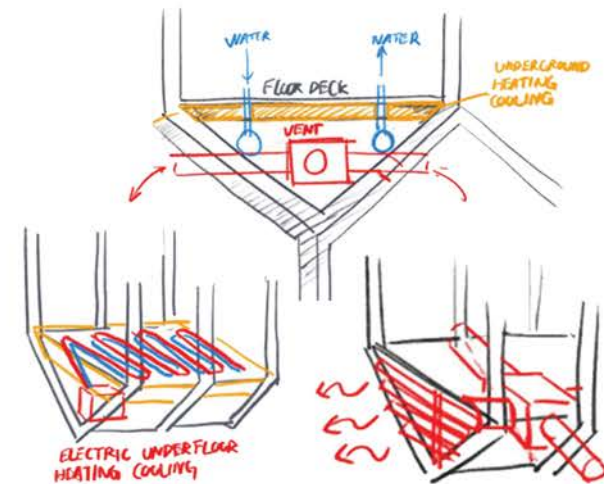
Pipe Line & Services Schematic



The plumbing and other building services are stored in between the spaces reserved for services

Through the use of hydronic heating and cooling, our aim is to reduce the carbon footprint as much as possible. As the hydronics heating is completely silent, flexible and comfortable, it is also estimated to be up to 35% more cost effective than central duct heating. Water is pumped through the insulated pipes to emit heat throughout the rooms.

Stored underneath the floorboards, the hydronic heating can provide for that specific room as well as the rooms beside, underneath or even above.



REGULATORY COMPLIANCE

THE HEXA-CELL COSTING CHART

STONNINGTON PLANNING SCHEME				
General Residential Zone				
Requirement for clause 54 & 55				
Standard: A10 and B17	Side and rear setbacks	a. For a distance of at least 5 metres behind the front facade of the building fronting the street, setback new buildings (including basements) a minimum of 2 metres from at least one side boundary and at least 1 metre from the other side boundary up to 3.6 metres in height. b. Where no setback is specified, standard A10 or B17 applies.	complies	refer to ground floor plan and building section or elevation
Standard: A11 and B18	Walls on boundaries	a. Walls should not be located on side boundaries for a distance of 5 metres behind the front facade of the building fronting the street.	complies	Refer to ground floor plan
APARTMENT DESIGN GUIDELINE FOR VICTORIA				
Section 3: Dwelling Amenities				
Clause 58.07-1 or Clause 55.07-12 (Functional layout)	Table D7: min internal room dimension	min main bedroom : 3m (w) x 3.4m (d) 10.2sqm min all other bedroom : 3m (w) x 3m(d) 9sqm	complies	Refer to unit layout at first floor plan and second floor plan
Standard (D24)	Table D8: min living area dimension	studio & 1 bedroom dwelling: 3.3m(w) . 10sqm 2 or more bedroom dwelling: 3.6m (w) . 12sqm	complies	Refer to unit layout at first floor plan and second floor plan
Clause 58.07-2 or Clause 55.07-13 (Room depth objective)	Guidance to room depth	Single aspect habitable rooms should not exceed a room depth of 2.5 times the ceiling height. The depth of a single aspect, open plan, habitable room may be increased to 3 metres if all the following requirements are met: • The room combines the living area, dining area and kitchen. • The kitchen is located furthest from the window. • The ceiling height is at least 2.7 metres measured from finished floor level to finished ceiling level. This excludes where services are provided above the kitchen. The room depth should be measured from the external surface of the habitable room window to the rear wall of the room.	complies	Refer to unit layout at first floor plan and second floor plan, elevation or section
Standard (D25 or B47)				
(Clause 58.07-3 or Clause 55.07-14)	Guidance to windows	Habitable rooms should have a window in an external wall of the building. A window may provide daylight to a bedroom from a smaller secondary area within the bedroom where the window is clear to the sky. The secondary area should be: • A minimum width of 1.2 metres. • A maximum depth of 1.5 times the width, measured from the external surface of the window	complies	Refer to unit layout at first floor plan and second floor plan, elevation or section
Standard (D26 or B48)				

Clause 58.05-4 or Clause 55.07-10 (Storage objective)	Table D6: Guidance to storage	Dwelling type, total min storage volume, min storage volume within the dwelling Studio: 8m3; 5 m3 1 bed: 10m3; 6m3 2 bed: 14m3; 9m3 3 bed or more: 18m3; 12m3	complies	Refer to unit layout at first floor plan and second floor plan
Standard (D20 or B44)				
Clause 58.07-4 or Clause 55.07-15 (Natural ventilation objectives)	Guidance to natural ventilation	The design and layout of dwellings should maximise openable windows, doors or other ventilation devices in external walls of the building, where appropriate. At least 40 % of dwellings should provide effective cross ventilation that has: • A maximum breeze path through the dwelling of 18 metres. • A minimum breeze path through the dwelling of 5 metres. • Ventilation openings with approximately the same area. The breeze path is measured between the ventilation openings on different orientations of the dwelling.	complies	Refer to floor plans
Standard (D27 or B49)				
Clause 58.05-3 (Private open space objective)	Guidance to private open space	A dwelling should have private open space consisting of at least one of the following: • An area at ground level of at least 25 square metres, with a minimum dimension of 3 metres and convenient access from a living room. • A balcony with at least the area and dimension specified in Table D5 and convenient access from a living room. • An area on a podium or other similar base of at least 15 square metres, with a minimum dimension of 3 metres and convenient access from a living room. • An area on a roof of 10 square metres, with a minimum dimension of 2 metres and convenient access from a living room.	complies	Refer to floor plans and section
Standard (D19)				
Clause 58.05-1 or Clause 55.05-6 (Accessibility objective)	Guidance to accessibility	At least 50 per cent of dwellings should have: • A clear opening width of at least 850mm at the entrance to the dwelling and main bedroom. • A clear path with a minimum width of 1.2 metres that connects the dwelling entrance to the main bedroom, an adaptable bathroom and the living area. • A main bedroom with access to an adaptable bathroom. • At least one adaptable bathroom that meets all of the requirements of either Design A or Design B specified in Table D4.	complies	Refer to floor plans
Standard (D17 or B41)				

Description	Cost (\$ AUD)
Building Works (Mockup 1:1)	\$29784.94
Elevators	\$130250.00
General Items (Deliveries, Rentals)	\$37624.00
In Situ Concrete	\$63467.25
Labour Costs	\$140107.60
Timber (Exterior)	\$84175.00
Room Materiality	\$904943.14
Solar Panels	\$1771092.00
Site Clearance	\$36700.00
<b>Total Costs</b>	<b>\$3198143.93</b>
Contingency (10%)	\$319814.39
GST (10%)	\$319814.39
Overhead & Profit Markup (7.5%)	\$239860.79
<b>Total Construction Costs</b>	<b>\$4077633.51</b>

THE HEXA-CELL CONSTRUCTION SCHEDULE

Project Start:	Mon, 3/6/2023				
Display Week:	40				
	Mar, 2023   Apr, 2023   May, 2023   Jun, 2023   Jul, 2023   Aug, 2023   Sep, 2023   Oct, 2023   Nov, 2023 6 13 ## 3 10 17 ## 1 8 15 ## 5 12 19 ## 3 10 17 ## 31 7 14 21 ## 4 11 ## 2 9 16 ## 4 11 18 ##				
TASK	NOTES	DURATION	START	END	

<b>Concept Design</b>				
Site Visits / Site Analysis		14 days	6/3/23	20/3/23
Architectural Design		22 days	13/3/23	3/4/23
<b>Design Development</b>				
Engineering Design (Structure)		14 days	3/4/23	17/4/23
Engineering Feedback		1 day	17/4/23	17/4/23
Finalized Architectural Design		14 days	17/4/23	1/5/23
<b>Documentation and Planning</b>				
Mechanical Design/Documentation		7 days	1/5/23	8/5/23
Electrical Design/Documentation		7 days	1/5/23	8/5/23
Plumbing Design/Documentation		7 days	1/5/23	8/5/23
Water Design/Documentation		7 days	1/5/23	8/5/23
<b>Procurement</b>				
<b>Materials</b>				
Rockwool Insulation		2 days	8/5/23	10/5/23
Maxi Panel		2 days	8/5/23	10/5/23
Concrete		2 days	10/5/23	12/5/23
Steel Framing		2 days	10/5/23	12/5/23
Steel Connection		2 days	12/5/23	14/5/23
Firecrunch		2 days	12/5/23	14/5/23
Double Glazing windows/doors		2 days	14/5/23	16/5/23
Waterproofing for roof		2 days	14/5/23	16/5/23
<b>Equipment</b>				
Storage units		2 days	22/5/23	24/5/23
Skeletal Trailers for hire		2 days	22/5/23	24/5/23
Transportation - Trucks etc.		2 days	24/5/23	26/5/23
Excavator		2 days	24/5/23	26/5/23
<b>Prefabrication</b>				
Manufacturing of Modules		15 days	26/5/23	9/6/23
Polishing - Adding final touches		10 days	9/6/23	19/6/23
Transferring Modules onto Trucks		7 days	19/6/23	26/6/23
Transporting Modules onto site		3 days	26/6/23	29/6/23

It takes 35 days to manufacture off-site and transport the modules onto the site, and it takes 30 days to assemble the modules on site.

Project Start:	Mon, 3/6/2023				
Display Week:	40				
	Mar, 2023   Apr, 2023   May, 2023   Jun, 2023   Jul, 2023   Aug, 2023   Sep, 2023   Oct, 2023   Nov, 2023 6 13 ## 3 10 17 ## 1 8 15 ## 5 12 19 ## 3 10 17 ## 31 7 14 21 ## 4 11 ## 2 9 16 ## 4 11 18 ##				
TASK	NOTES	DURATION	START	END	

<b>Site Preparation</b>				
Labour		5 days	29/6/23	3/7/23
Demolition Permits		5 days	29/6/23	3/7/23
Permits		5 days	29/6/23	3/7/23
Demolition		3 days	3/7/23	10/7/23
Site clearing		7 days	10/7/23	17/7/23
<b>Pre-Construction</b>				
<b>Groundwork</b>				
Site Grading		7 days	17/7/23	24/7/23
Excavation Layout		8 days	24/7/23	31/7/23
Elevator pit Excavation		8 days	31/7/23	7/8/23
Footing Excavation		7 days	7/8/23	14/8/23
Services Excavation		7 days	14/8/23	21/8/23
<b>Footings</b>				
Install Formwork		7 days	21/8/23	28/8/23
Install Reinforcement		8 days	28/8/23	4/9/23
Cast Concrete		3 days	4/9/23	7/9/23
Cure		7 days	7/9/23	14/9/23
Remove Formwork		4 days	14/9/23	18/9/23
Cure		7 days	18/9/23	25/9/23
Elevator shaft		8 days	25/9/23	2/10/23
<b>Services</b>				
Water		7 days	3/10/23	10/10/23
Gas		7 days	3/10/23	10/10/23
Electrical		7 days	3/10/23	10/10/23
<b>Construction</b>				
Ground floor Installation		7 days	11/10/23	18/10/23
1st Floor Installation		7 days	18/10/23	25/10/23
2nd Floor Installation		7 days	25/10/23	30/10/23
3rd Floor Installation		7 days	30/10/23	5/11/23
<b>Project Completion</b>				
Final check		7 days	5/11/23	12/11/23
Site clean up		7 days	12/11/23	19/11/23
Hand-over		7 days	19/11/23	25/11/23

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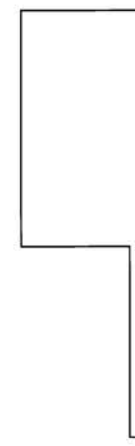
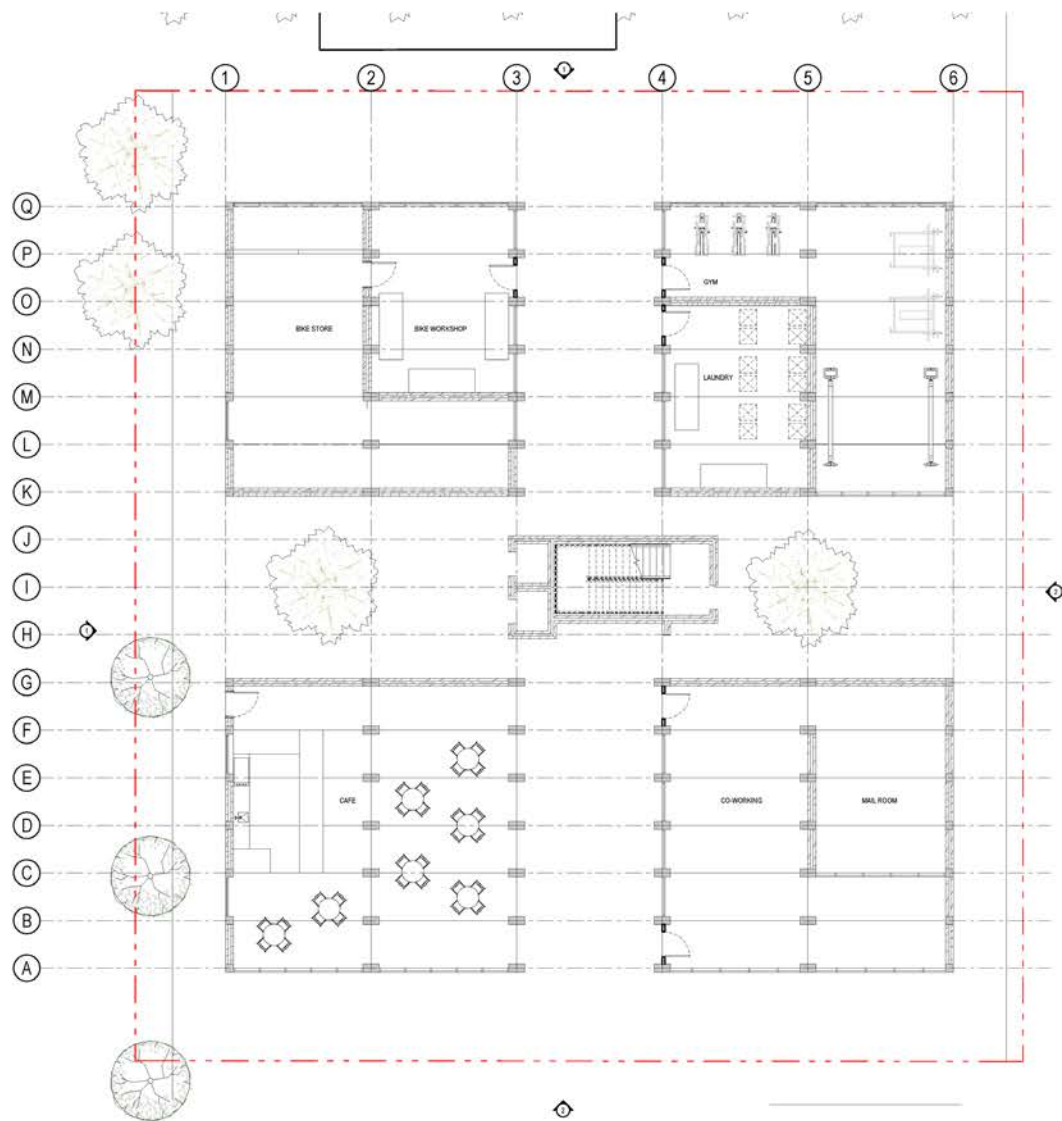
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Revisions

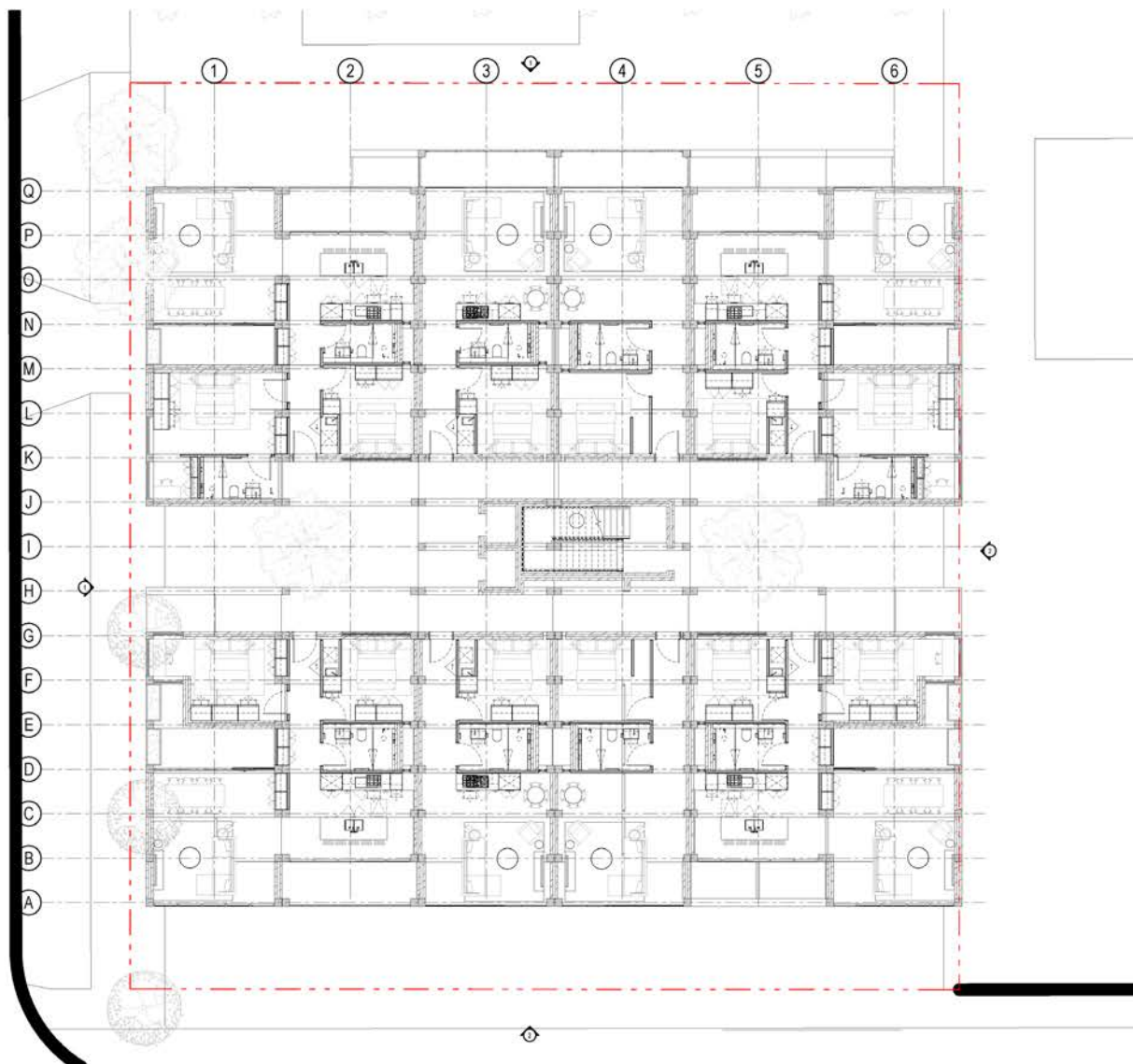
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**PRELIMINARY**  
 NOT FOR CONSTRUCTION  
 Client  
 Fleetwood and Prefab Aus

Project  
 65-69 Waverley Road, Malvern East

Drawing  
**Ground Floor Plan**

Project No. Scale: 6/11 Author  
 Drawing No. **1 : 100** Author  
 Revision

**SK01.01**



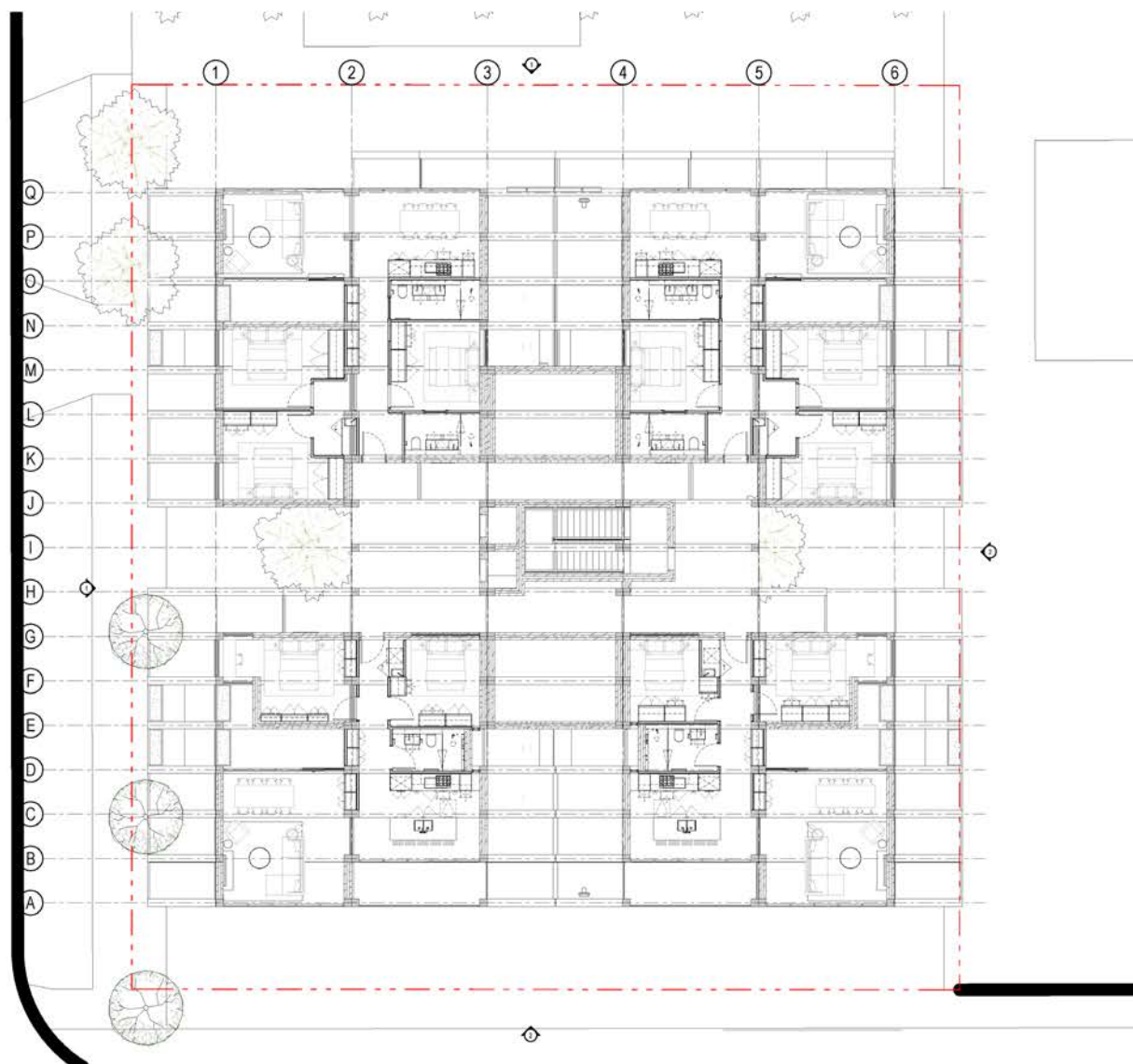
Revisions

Status  
**PRELIMINARY**  
NOT FOR CONSTRUCTION  
Client  
**Fleetwood and Prefab Aus**

Project  
65-69 Waverley Road, Malvern East

Drawing  
**Level 1 Plan**

Project No	Scale: <b>6/11</b>	Author
Drawing No	<b>1 : 100</b>	<b>Author</b>
		Revision
<b>SK01.02</b>		



Revisions

Status  
**PRELIMINARY**  
NOT FOR CONSTRUCTION  
Client  
**Fleetwood and Prefab Aus**

Project  
65-69 Waverley Road, Malvern East

Drawing  
**Level 2 Plan**

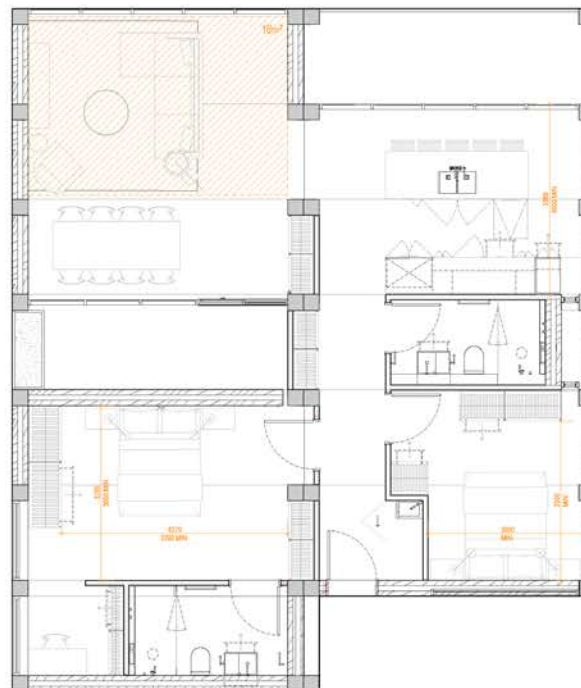
Project No	Scale: <b>6/11</b>	Author
Drawing No	<b>1 : 100</b>	<b>Author</b>
Revision		

**SK01.03**





LEVEL 1 - 1 BED BADs



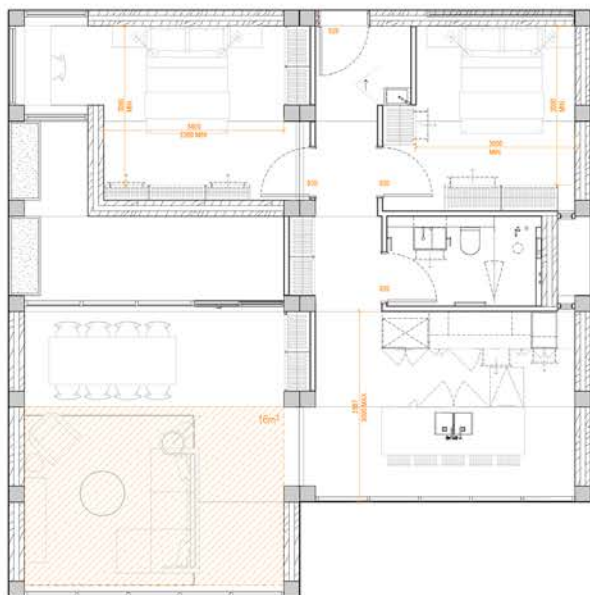
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Revisions

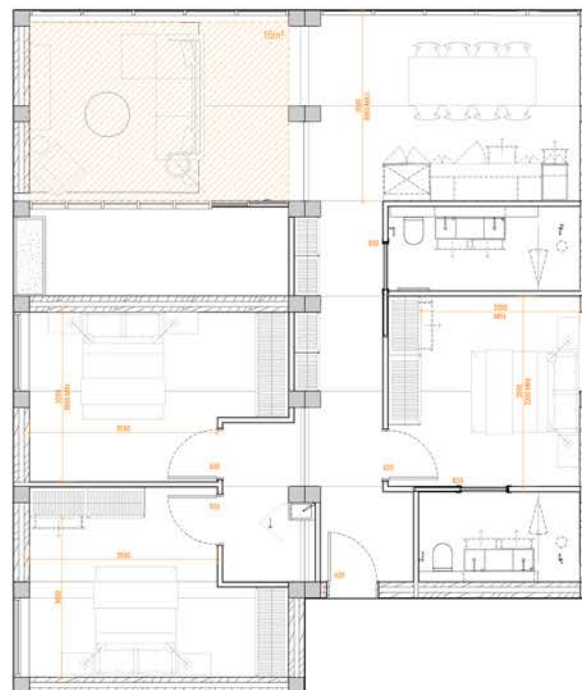
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Client  
**Fleetwood and Prefab Aus**

Project  
65-69 Waverley Road, Malvern East  
Drawing  
**BADs Compliance Plans**

Project No. Scale: **G: A1** Author  
**1 : 50** Author  
Drawing No. Revision  
**SK01.10** Revision



Level 2 - 2 BED BADs



Level 2 - 3 BED BADs

Revisions

Status  
**PRELIMINARY**  
NOT FOR CONSTRUCTION  
Client  
**Fleetwood and Prefab Aus**

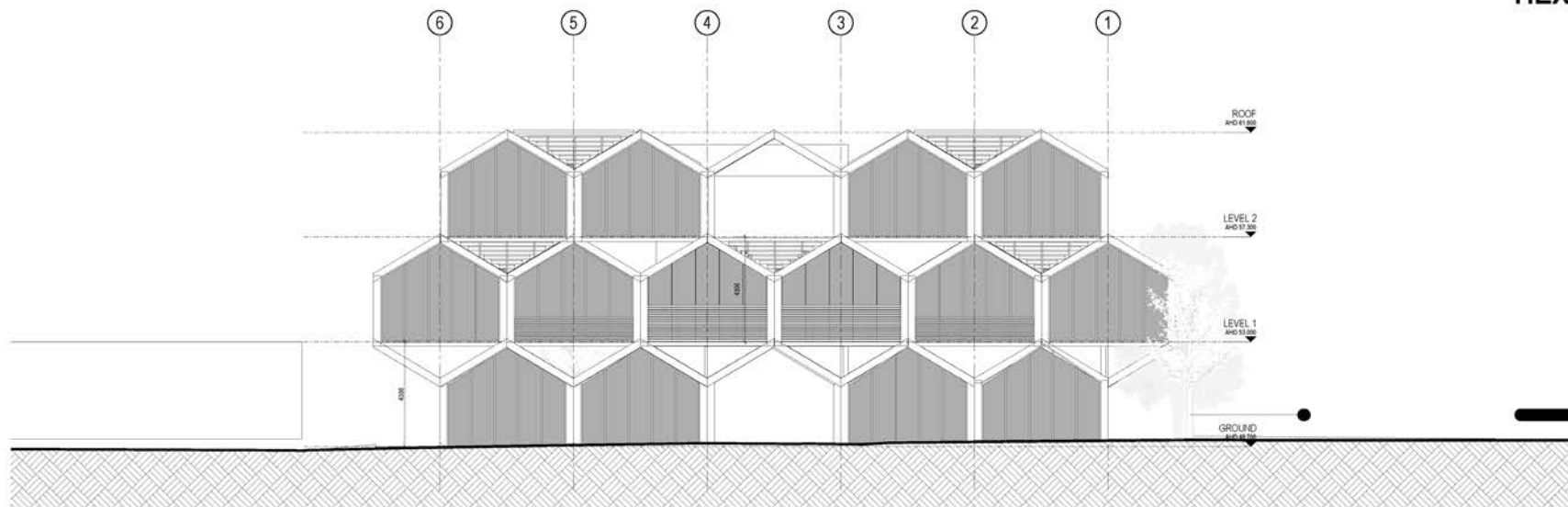
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65-69 Waverley Road, Malvern East

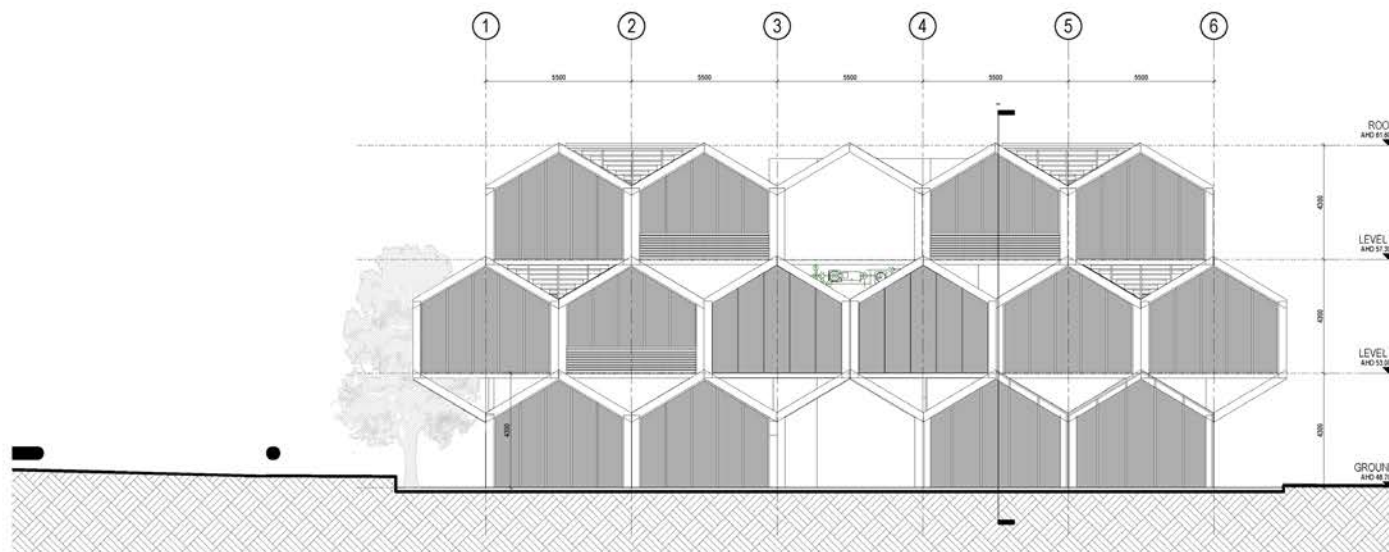
Drawing  
**BADs Compliance Plans**

Project No. Scale: G: A1 Author  
**1 : 50** **Author**

Drawing No. Revision  
**SK01.11**



1 North Elevation  
SCALE 1 : 100



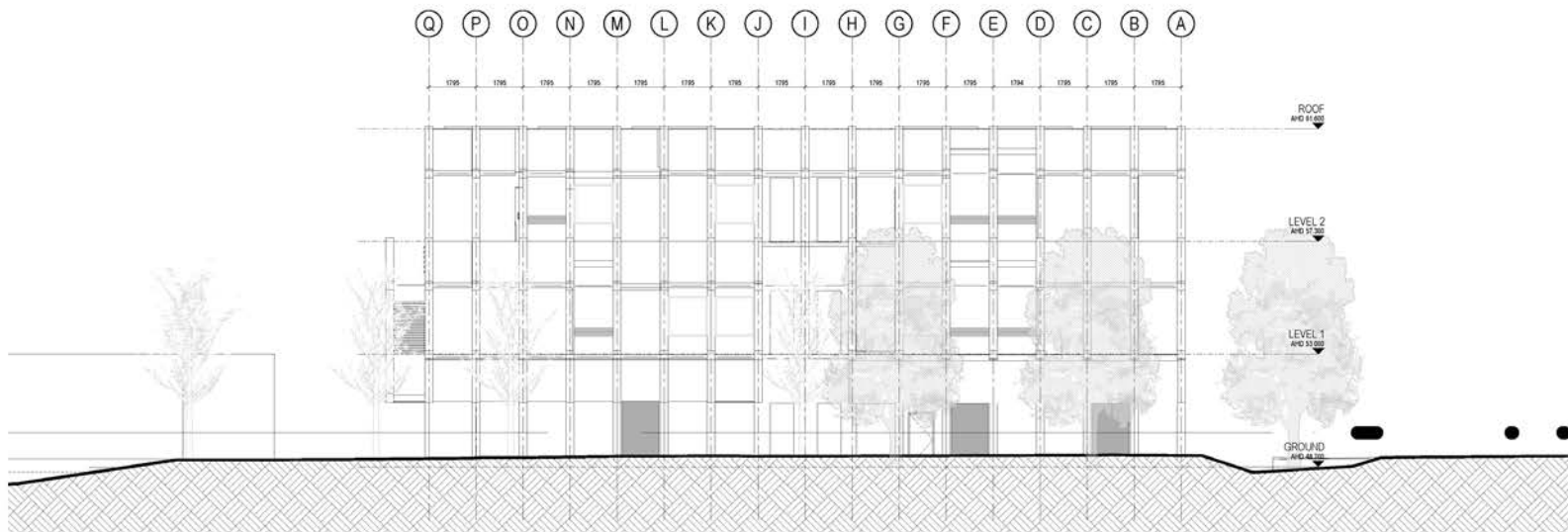
2 South Elevation  
SCALE 1 : 100

Revisions

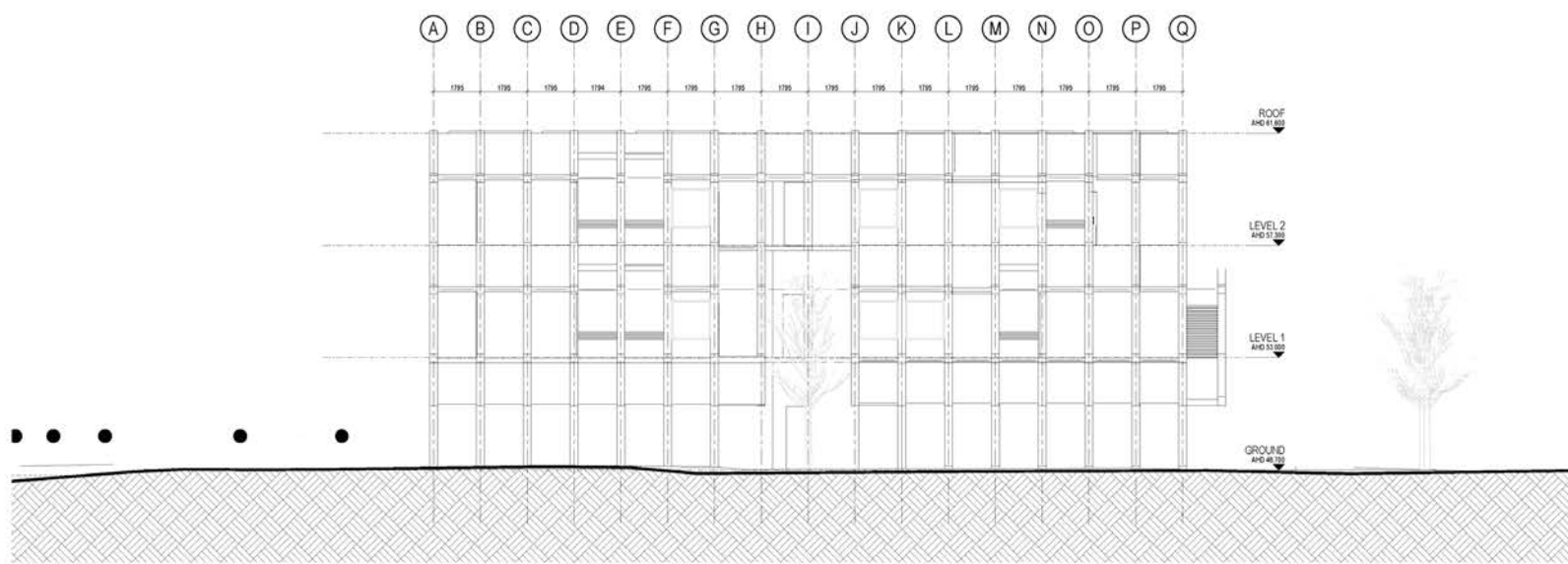
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Client  
**Fleetwood and Prefab Aus**

Project  
65-69 Waverley Road, Malvern East  
Drawing  
**North & South Elevations**

Project No. Scale: 6: A1 Author  
**1 : 100** Author  
Drawing No. Revision  
**SK02.01**



1 East Elevation  
SCALE 1 : 100



2 West Elevation  
SCALE 1 : 100

Revisions

Status  
**PRELIMINARY**  
NOT FOR CONSTRUCTION  
Client  
**Fleetwood and Prefab Aus**

Project  
65-69 Waverley Road, Malvern East  
Drawing  
**East & West Elevations**

Project No. Scale: G A1 Author  
Drawing No. 1 : 100 Author  
Revision

**SK02.02**

## MATERIALS &amp; DELIVERY

HEXAGON PANEL								
MATERIALS	COST/pcs (\$)	COST/m <sup>2</sup> (\$)	QUANTITY	AREA PER UNIT (m <sup>2</sup> )	TOTAL AREA (m <sup>2</sup> )	DELIVERY (\$)	TOTAL (\$)	LOCATION
MaxiPanel	483.40	-	374.00	-	-	3500	184291.60	22 Industry Court, Lilydale VIC
Steel Framing	14.00	-	212	-	-	1250	4218.00	130/140 Merrindale Drive,
Steel Connection	36.95	-	270	-	-	500	10476.50	717 Warrigal Road, Bentleigh East VIC 3165
Insulation	-	142.01	205	-	-	750	29862.05	116 Whitehall St, Footscray,
Glazing	400.00	-	-	-	172.70	1500	70580.00	5/163 Chesterville Road, Moorabbin, VIC 3189
Fibre Cement Sheeting	93.84	-	78	-	-	500	7819.52	717 Warrigal Road, Bentleigh East VIC 3165
Concrete Slab	-	385.00	-	-	164.85	0	63467.25	600 Clayton Rd, Clayton South VIC
Aluminum louvers	-	750.00	26	3	78	2500	58500.00	369-377 Lower Dandenong Rd, Dingley Village VIC 3172
Timber Framing	80.00	-	1050	-	-	4250	88250.00	130/140 Merrindale Dr, Croydon South VIC 3136
Timber Decking	17.00	-	30	-	-	3000	3510.00	Factory 4/43 Power Road, Bayswater VIC 3153
Solar Panels	16399.00	-	108	-	-	3750	1774842.00	470 St Kilda Rd, Melbourne VIC
Lift / Elevator	65000.00	-	2	-	-	3000	133000.00	Suite 19/2 Kirkham Rd W, Keysborough VIC 3173
Hydronic Heating & Cooling	1300.00	-	21	-	-	1500	28800.00	922-926 Glen Huntly Rd, Caulfield South VIC 3162
Waterproofing	-	50.00	-	5.5	-	1500	275.00	717 Warrigal Road, Bentleigh East VIC 3165
						<b>DELIVERY COSTS</b>	<b>27500.00</b>	

**NECESSITY COST**

	COST (\$)	QUANTITY // TIME	TOTAL (\$)
Demolition (per units)	18000.00	2	36000.00
Demolition Permit	350.00	2	700.00
Storage Unit (per month)	642.00	12	7704.00
Traylor Rental	1210.00	2.00	2420.00

NOTES

Weekly rental costs

**LABOUR COST**

JOBS	COST/hr (\$)	TIME (hr)	TOTAL (\$)
Demolition	75	112	8400.00
Draftsperson	150	400	60000.00
Construction	56.38	520	29317.60
Concreter	55	80	4400.00
Electrician	100	192	19200.00
Glazier	80	192	15360.00
Solar Power Installation	205	14	2870.00
Waterproofing Specialists	35	16	560.00
<b>TOTAL</b>			<b>140107.60</b>

NOTES Full Time: ASSUMING 8 Hours Daily  
 14 Days: Demolition / Site Clearing  
 50 Days: Drafting & Consultation  
 65 Days: Construction & Installation  
 10 Days: Slab fill and Curing  
 28 Days: 7 days for each floor  
 28 Days: 7 days for each floor  
 8 Weeks Maximum for completion (40 Days)  
 2 Days

**1 BEDROOM 1 BATHROOM**

MATERIALS	COSTS (\$)	AREA (m <sup>2</sup> )	QUANTITY	TOTAL
MaxiPanel	483.40	-	38	18369.20
Steel Framing	14.00	-	28	392.00
Steel Connection	36.95	-	42	1551.90
Insulation	142.01	-	30	4260.30
Glazing	400.00	17.7	-	7080.00
Fibre Cement Sheeting	93.84	-	12	1126.08
Waterproofing	50.00	5.5	-	275.00
Hydronic Heating & Cooling	1300.00	-	3	3900.00
Construction	56.38	-	56	3157.28
TOTAL				36954.48
TOTAL INC LABOUR				40111.76

## Glazing

LOCATION	AREA (m <sup>2</sup> )	QUANTITY	TOTAL
Front	16.5	1	16.5
Side	0.6	2	1.2
TOTAL			17.7

**2 BEDROOM 1 BATHROOM**

MATERIALS	COSTS (\$)	AREA(m <sup>2</sup> )	QUANTITY	TOTAL
MaxiPanel	483.40	-	96	46406.40
Steel Framing	14.00	-	56	784.00
Steel Connection	36.95	-	66	2438.70
Insulation	142.01	-	52	7384.52
Glazing	400.00	52.35	-	20940.00
Fibre Cement Sheeting	93.84	-	20	1876.80
Timber Balcony Flooring	17.00	-	12	204.00
Waterproofing	50.00	5.5	-	275.00
Hydronic Heating & Cooling	1300.00	-	5	6500.00
Construction	56.38	-	112	6314.56
TOTAL				86809.42
TOTAL INC LABOUR				93123.98

## Glazing

LOCATION	AREA (m <sup>2</sup> )	QUANTITY	TOTAL
Front	16.5	2	33
Side	2.25	3	6.75
Small Side	0.6	2	1.2
Internal Sliding	10	1	10
Bedroom Window	1.4	1	1.4
TOTAL			52.35

**2 BEDROOM 2 BATHROOM**

MATERIALS	COSTS (\$)	AREA(m <sup>2</sup> )	QUANTITY	TOTAL
MaxiPanel	483.40	-	112	54140.80
Steel Framing	14.00	-	64	896.00
Steel Connection	36.95	-	78	2882.10
Insulation	142.01	-	55	7810.55
Glazing	400.00	50.1	-	20040.00
Fibre Cement Sheeting	93.84	-	22	2064.48
Timber Balcony Flooring	17.00	-	12	204.00
Waterproofing	50.00	11	-	550.00
Hydronic Heating & Cooling	1300.00	-	6	7800.00
Construction	56.38	-	112	6314.56
TOTAL				96387.93
TOTAL INC LABOUR				102702.49

Glazing

LOCATION	AREA (m <sup>2</sup> )	QUANTITY	TOTAL
Front	16.5	2	33
Side	2.25	2	4.5
Small Side	0.6	2	1.2
Internal Sliding	10	1	10
Bedroom Window	1.4	1	1.4
TOTAL			50.1

**3 BEDROOM 2 BATHROOM**

MATERIALS	COSTS (\$)	AREA(m <sup>2</sup> )	QUANTITY	TOTAL
MaxiPanel	483.40	-	128	61875.20
Steel Framing	14.00	-	64	896.00
Steel Connection	36.95	-	84	3103.80
Insulation	142.01	-	68	9656.68
Glazing	400.00	52.55	-	21020.00
Fibre Cement Sheeting	93.84	-	24	2252.16
Timber Balcony Flooring	17.00	-	6	102.00
Waterproofing	50.00	11.00	-	550.00
Hydronic Heating & Cooling	1300.00	-	7	9100.00
Construction	56.38	-	112	6314.56
TOTAL				108555.84
TOTAL INC LABOUR				114870.40

Glazing

LOCATION	AREA (m <sup>2</sup> )	QUANTITY	TOTAL
Front	16.5	2	33
Side	2.25	3	6.75
Small Side	0.6	0	0
Internal Sliding	10	1	10
Bedroom Window	1.4	2	2.8
TOTAL			52.55



