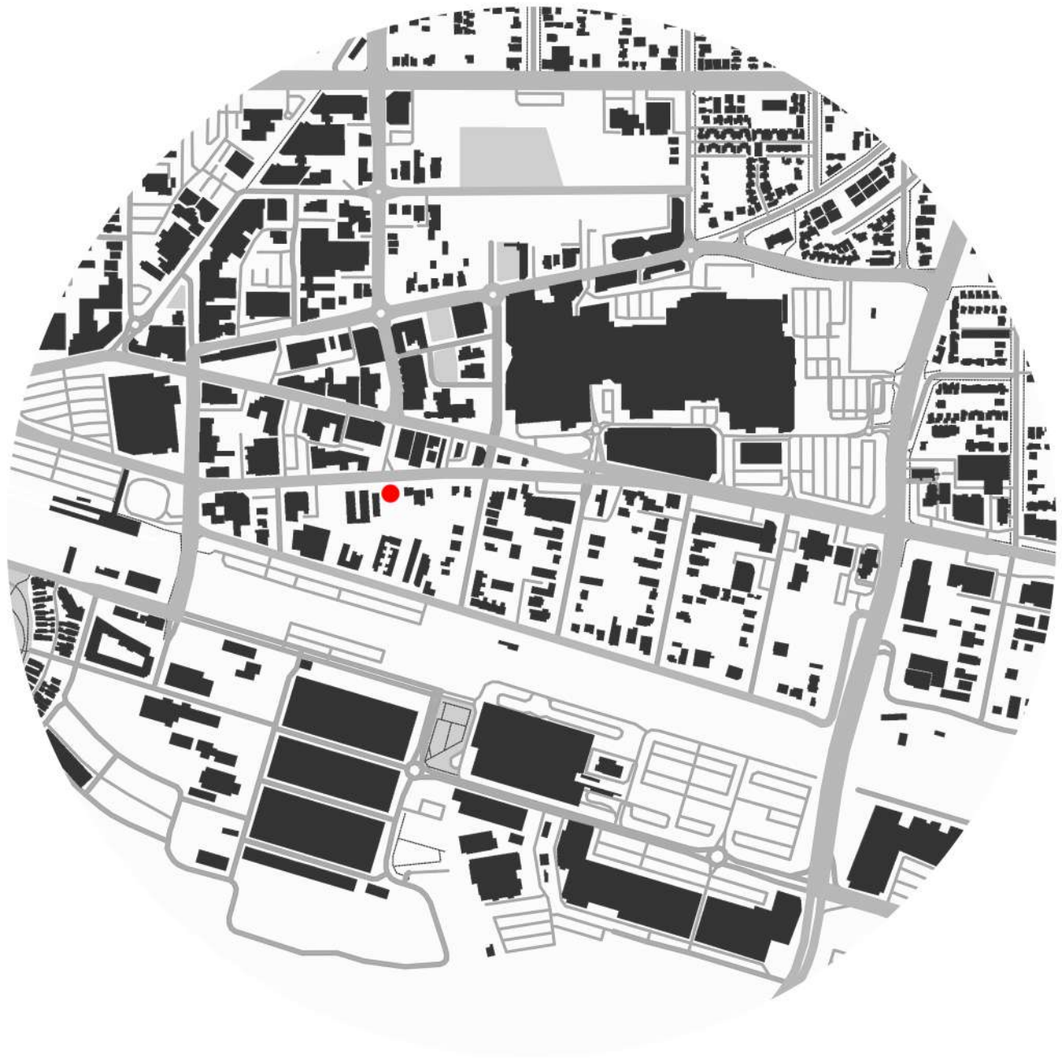


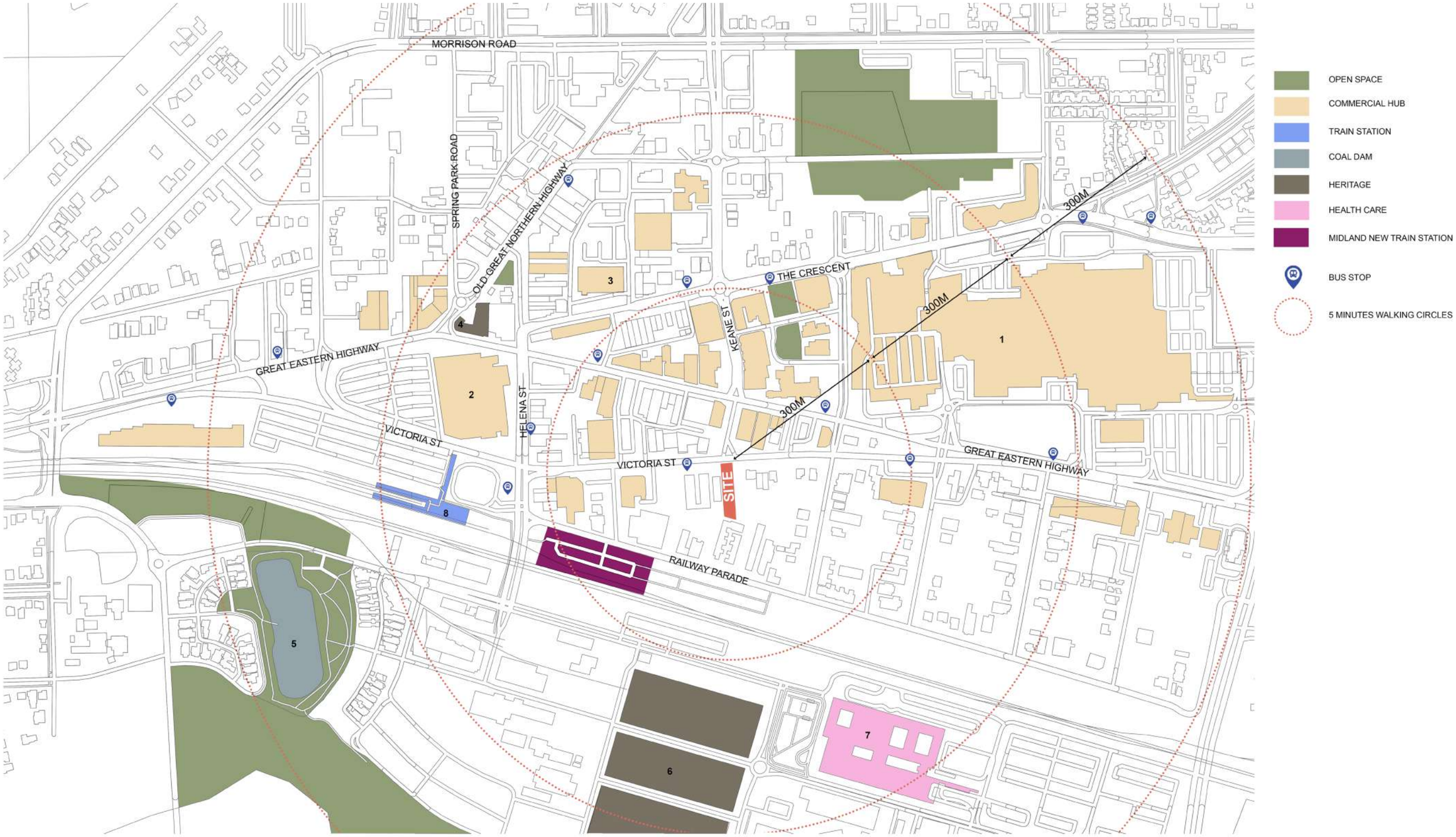
49 VICTORIA

PROJECT REPORT

CONTENT

- *SITE - MIDLAND* 3
- *PLANNING COMPLIANCE* 5
- *BUILDING COMPLIANCE* 5
- *DESIGN RESPONSE - HOMELESS HOUSING* 6
- *NET ZERO CONSIDERATION* 7
- *DESIGN INNOVATION* 9
- *SERVICES* 11
- *APPENDIX*
  - *1. CONSTRUCTIONN WORKS PROGRAM* 12
  - *2. PREMILINARY COST CALCULATIONS* 14
  - *3. COST AND TIME RELATIONSHIP* 15
  - *4. LIFE CYCLE COST ASSESSMENT* 16
  - *5. RISK AND SAFETY ANALYSIS* 17
  - *6. LOADING CRITERIA* 21
  - *7. DETAILED CALCULATIONS* 22
  - *8. PROJECT BUILDING STATUTORY AND COMPLIANCES* 26
  - *9. NCC REPORT* 27
  - *10. VISUALIZATION* 30
  - *11. CONSTRUCTION DRAWING* *37*

SITE - MIDLAND



1. MIDLAND GATE

2. CENTREPOINT SHOPPING CENTRE

3. QUEST HOTEL

4. MIDLAND TOWN HALL

5. COAL DAM PARK

6. RAILWAY WORKSHOP

7. ST JOHN OF GOD HOSPITAL

8. MIDLAND STATION

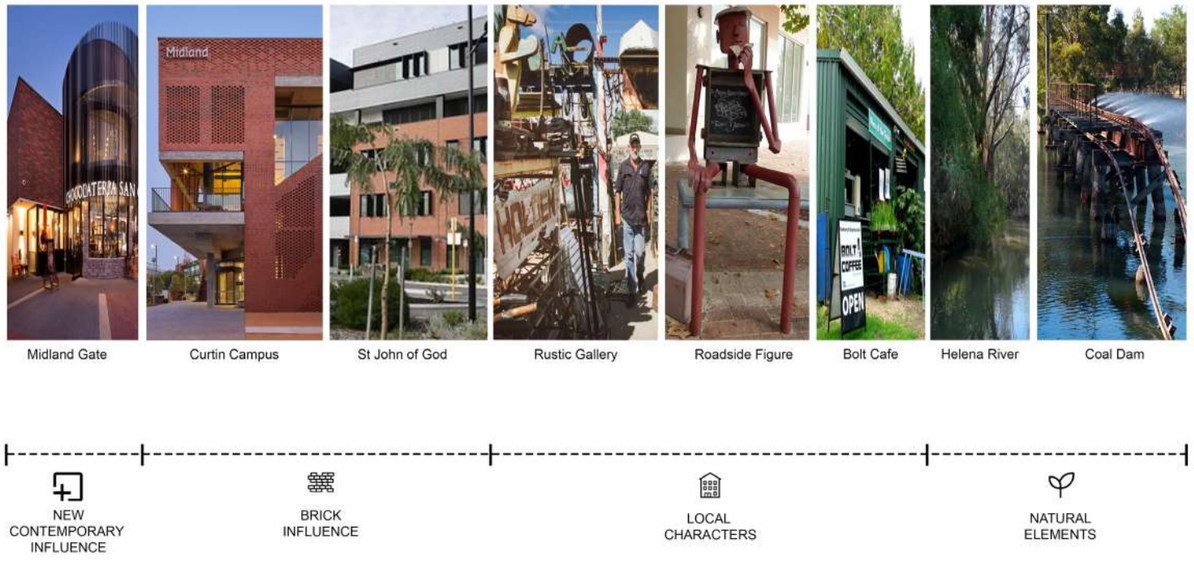
SITE - MIDLAND

Since 1832, Midland has been inhabited by settlers. However, there was little growth until 1886, when the Midland Railway Company began operations. The relocation of the Western Australian Government Railway Workshops to Midland between 1902 and 1904 had a dramatic and enduring impact on the community. During World War I, a substantial number of Workshops' men joined the military, and the Peace Statue on the site honours them. In 1923, the inhabitants of Midland put a massive four-sided clock on the dome of the Town Hall as a war memorial. This clock has become one of the most recognizable monuments in Midland. The new train station project in Midland, in particular, promises to contribute to the future development of Midland.

Through research and site visits, it can be seen that the architecture of Midland is an interweaving of heritage architecture and modern architecture. However, the common feature is the influence of traditional materials such as brick on modern buildings. This can be seen on recent buildings such as the Midland Gate, Curtin Campus and St John of God's hospital. This is a distinct feature of Midland architecture and should be preserved in future works.

The selected site in this project is Lot 49 in Victoria street. Victoria street and Great Eastern Highway are the two busiest streets in Midland, as Midland's commercial areas are developed on these two roads. This site shows a lot of potential for the development of a housing project which provides affordable homes to the homeless because of the easy access to surrounding areas such as train stations, shopping centres, healthcare. In addition, a new proposed road on the western side of the site which will help to create an activation ground floor plan for this project.

MIDLAND IDENTITY



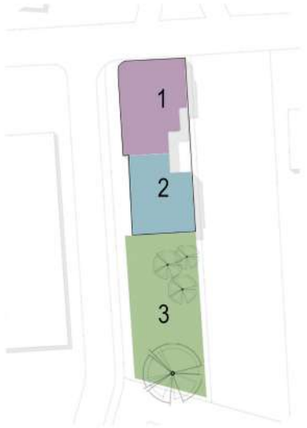
SITE COMPLIANCE - BUILDING COMPLIANCE

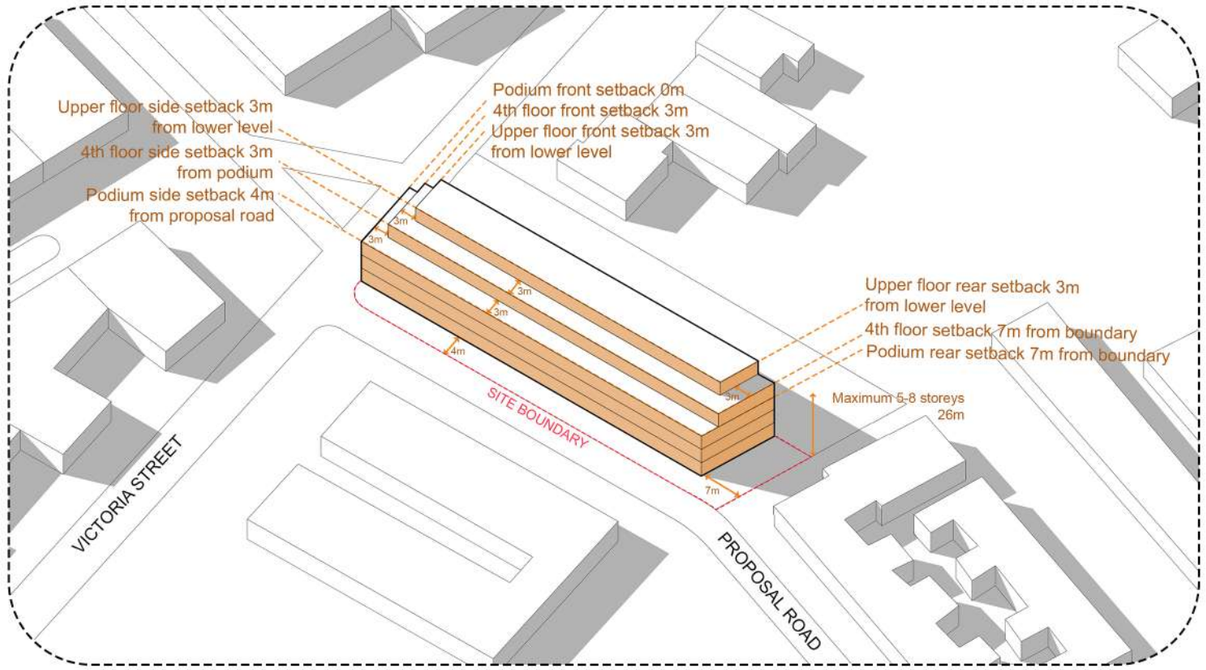
Refer to Apendix 8, 9 for building compliances.

The design of 49 Victoria will ensure that the requirements for the set-back, the height, and other aspects of the Midland Design Guildeline are met. To avoid cutting down any of the trees that are already on the site, the design of 49 Victoria that has been proposed will only use up roughly sixty percent of the overall area of the land. This will also allow for the creatio n of outdoor recreational areas.
Moreover, the design of this projecvt will also preserve the heritage architecture of Midland by consider implement the design characters of Midland Rail Way workshop.

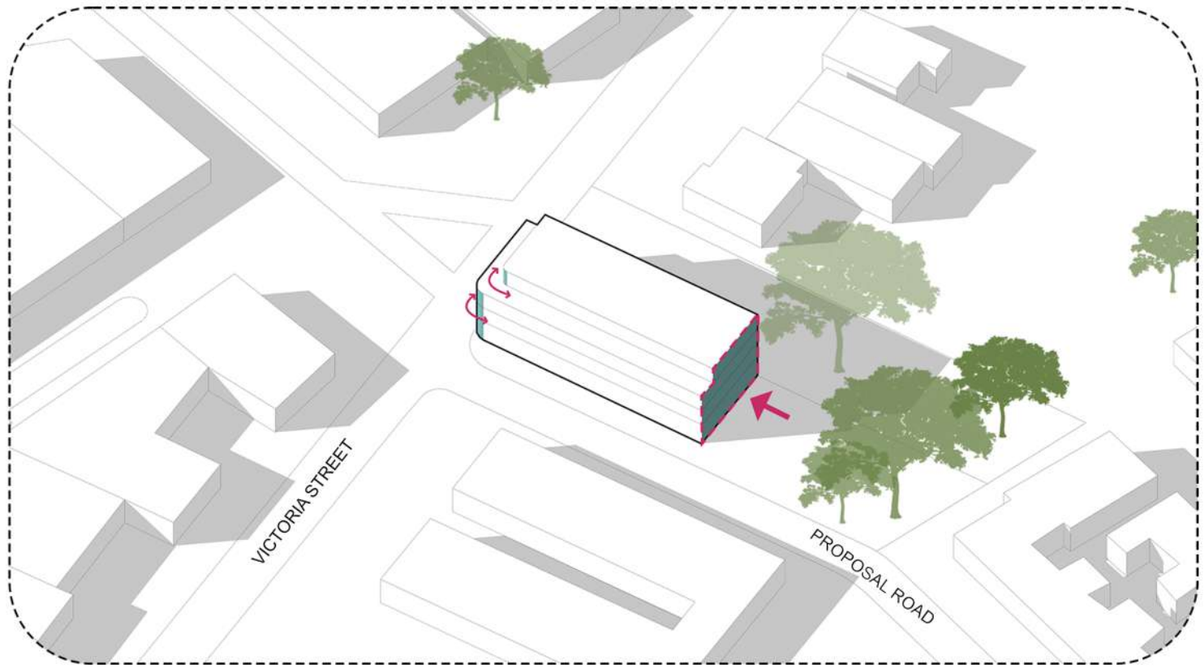
GROUND FLOOR ACTIVATION

1. Heritage design feature - Brick Podium
2. Communal indoor areas - Restaurant, Cafe.
3. Communal outdoor areas - Landscape, Garden, Pavilion





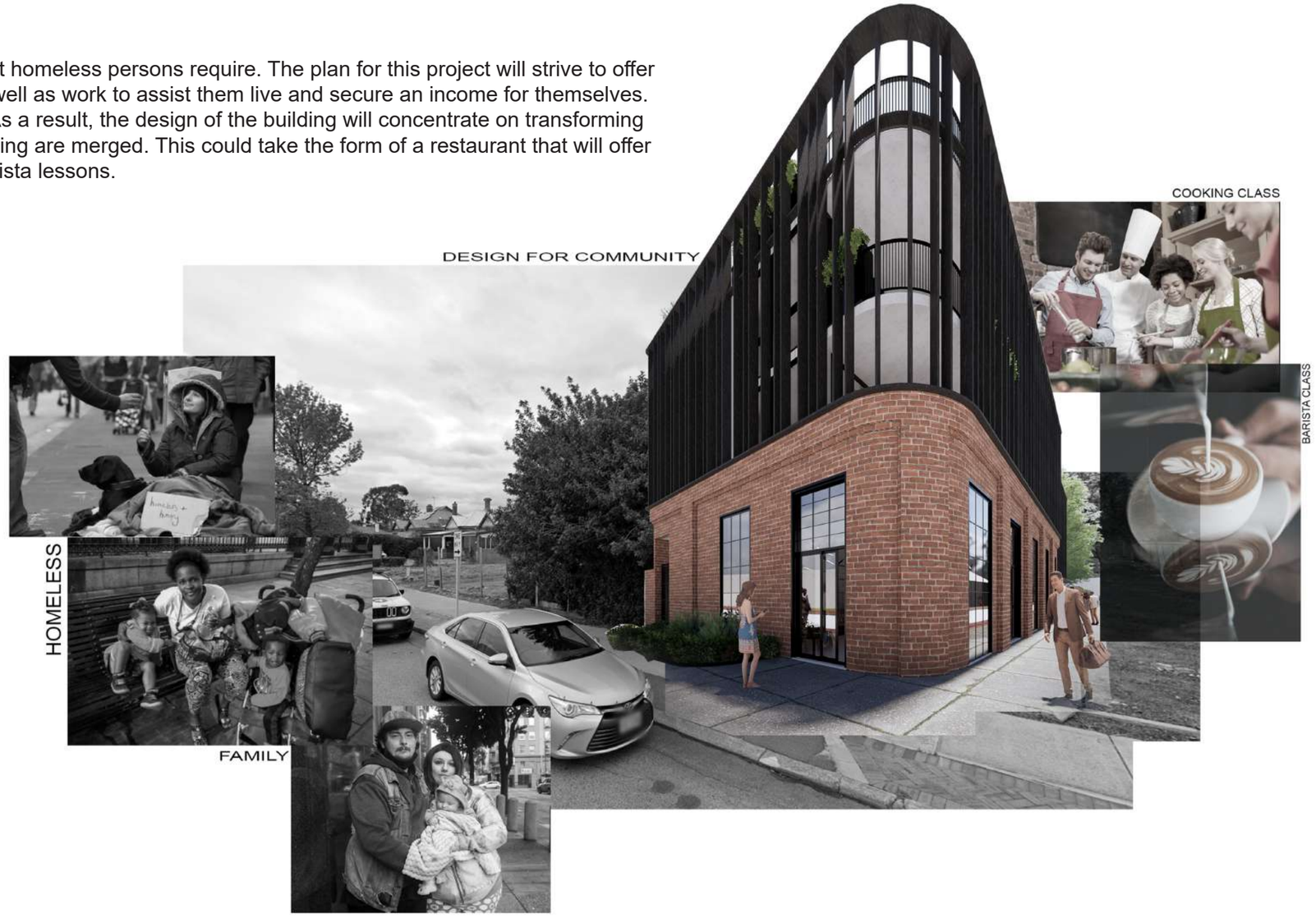
MIDLAND DESIGN GUIDLINE SCHEME



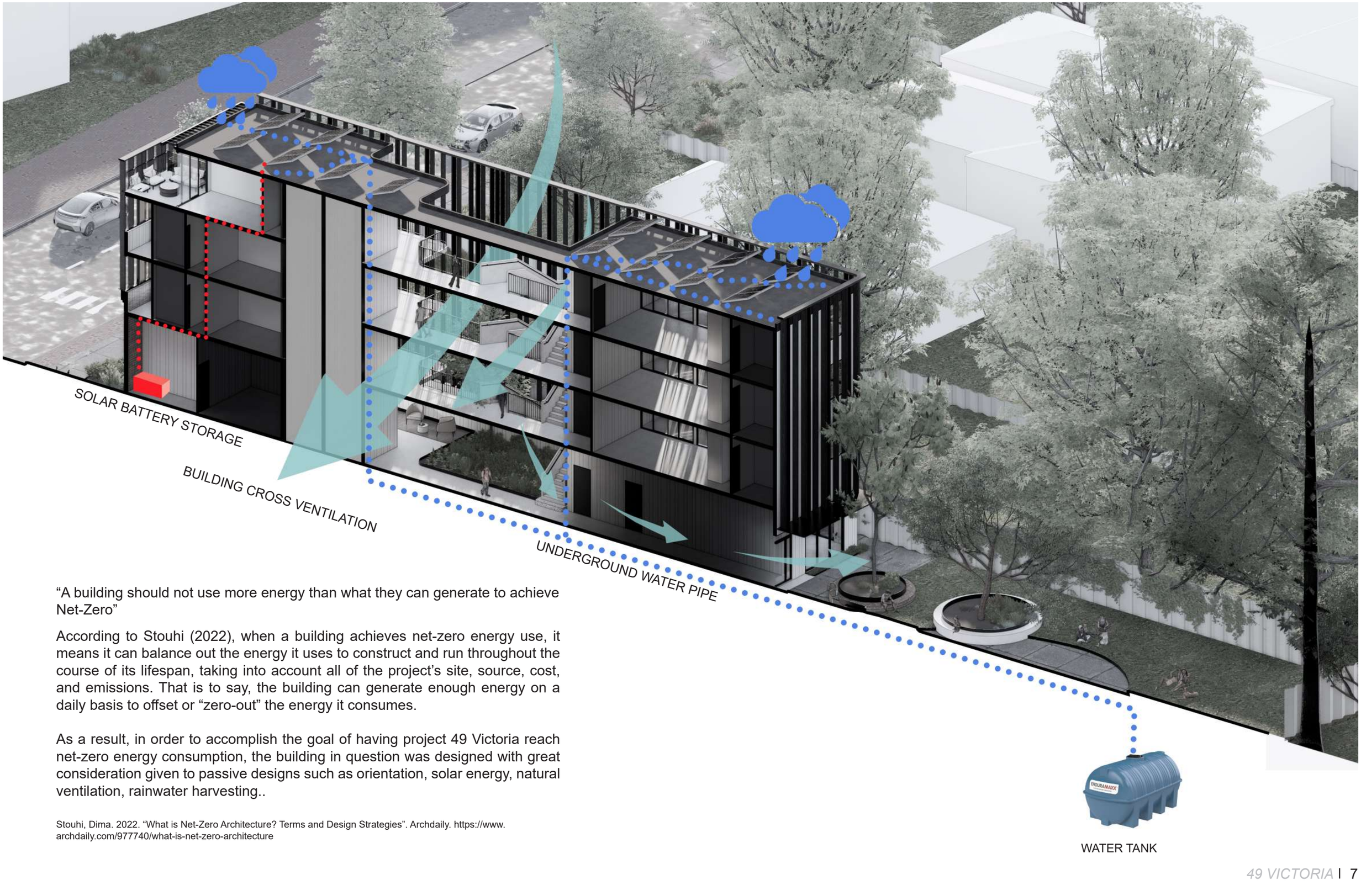
DESIGN PROPOSAL SCHEME

DESIGN RESPONSE - HOMELESS HOUSING

With an awareness of the primary necessities that homeless persons require. The plan for this project will strive to offer homeless people with a location they can call home as well as work to assist them live and secure an income for themselves. This will be accomplished through the creation of jobs. As a result, the design of the building will concentrate on transforming the bottom floor into a site where business and skill training are merged. This could take the form of a restaurant that will offer basic culinary classes or a cafe that will include mini-barista lessons.



NET-ZERO ENERGY DESIGN



“A building should not use more energy than what they can generate to achieve Net-Zero”

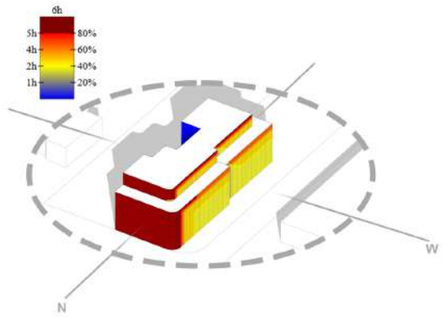
According to Stouhi (2022), when a building achieves net-zero energy use, it means it can balance out the energy it uses to construct and run throughout the course of its lifespan, taking into account all of the project’s site, source, cost, and emissions. That is to say, the building can generate enough energy on a daily basis to offset or “zero-out” the energy it consumes.

As a result, in order to accomplish the goal of having project 49 Victoria reach net-zero energy consumption, the building in question was designed with great consideration given to passive designs such as orientation, solar energy, natural ventilation, rainwater harvesting..

Stouhi, Dima. 2022. “What is Net-Zero Architecture? Terms and Design Strategies”. Archdaily. https://www.archdaily.com/977740/what-is-net-zero-architecture

NET-ZERO ENERGY DESIGN

ORIENTATION

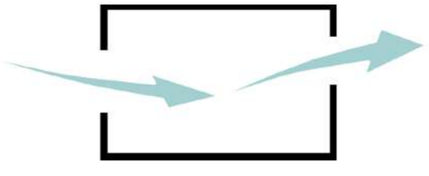


With the land extending to the west and the facade facing north and north-west, the apartments will receive sufficient sunlight throughout the entire year. In addition, understanding the building's orientation will aid in the design of a shading system that reduces the building's heating and cooling energy use.

SOLAR PANEL AND ENERGY STORE

Solar panels will be installed on the building's roof and their energy will be stored so that the building can be powered in part by solar energy.

NATURAL CROSS VENTILATION

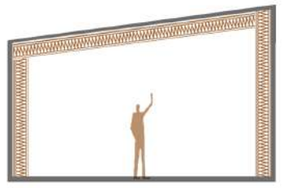


By extending the building's structure throughout the site and including a huge courtyard space within the building's interior, natural ventilation can be improved. The majority of the flats in the building will be designed to ensure that they have access to natural ventilation throughout the whole year.

RAINWATER HARVEST AND STORE

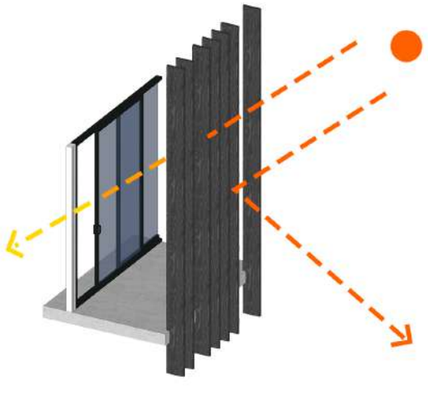
The design of the roof so that it slopes towards the atrium will make it easy to collect rainwater and store it so that it may be used for watering plants and for other purposes in the building.

ROOF AND WALLS INSULATION



Walls and roofs are going to have a lot of insulation added to them, which will assist cut down on the amount of heat that is lost during the winter and keep the heat out during the summer.

DOUBLE SKINS FACADE



The formation of a double skin facade is helped along by the vertical shading system that is installed all around the structure. With this design, the building will be open to the surrounding environment, while at the same time each apartment unit will have its own sense of seclusion.

DESIGN INNOVATION - MATERIALS

The selection of materials for this project plays a significant part since it not only helps to contribute to the creation of a structure that is favourable to the environment and the community, but it also helps to contribute to the preservation of the historic values that Midland possesses. Brick, cross-laminated lumber, and zincalume were some of the primary materials that were chosen for this project.

BRICK - PODIUM

The style of the podium was inspired by the design of the Midland Railway Workshop, which consists primarily of bricks and a huge window frame. This proposal intends to maintain midland's historic architecture. In addition, it will aid in establishing continuity between historic building and contemporary architecture.

CROSS LAMINATED TIMBER - FACADE AND SHADING

The building will be surrounded by vertical slats made by Cross Laminated Timber, which aims to create a layer of shading around the building, contributing to reducing the temperature inside the apartments. In addition, the façade design with many planter boxes helps to create a vertical garden system, which can reduce the dust load from Victoria street, a busy road.

BRICK - PODIUM

Zinc is one of the most sustainable house design materials for a host of reasons including its impressive 100% recyclability. As one of the best performing materials, zinc makes for a very eco-efficient cladding choice that can radically reduce a building's energy consumption.

DESIGN INNOVATION - GRENNERY

The design of this building has taken into consideration the inclusion of lots of green spaces in the building. This not only reduces the influence of the urban outside, but also aims to create a friendly environment for residents inside the building. The creation of green spaces will bring many benefits such as:

- The cost effective:

Modern building techniques may increase the cost of constructing a green building in comparison to a conventional structure. Green architecture is regarded to be the most cost-effective solution for users in the long run.

- Temperature regulation:

Considering the yearly increase in temperature, it is prudent to invest in green buildings, since they help regulate the temperature significantly. Additionally, the flora induces wetness around the building, creating a nice atmosphere within and around the structure. According to studies, green buildings release 62% less glasshouse gases (responsible for global warming).

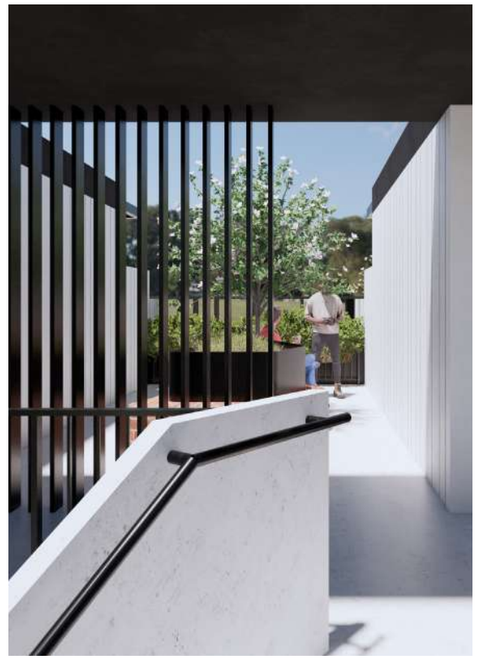
- Improvement of overall health:

It is abundantly clear that green constructions are eco-friendly and support sustainability. In addition, they provide an abundance of health benefits. Green buildings minimise pollutants, which has an undeniable effect on human health. Additionally, this type of architecture is supposed to boost mental wellness. The management of “sick building syndrome” (SBS), a disorder produced by an uncomfortable living environment, has proved highly beneficial.

-Improvement of the standard of living

Green design will improves the overall quality of life. It keeps a balance between nature and building which conventional architecture fails to provide.

ATRIUM

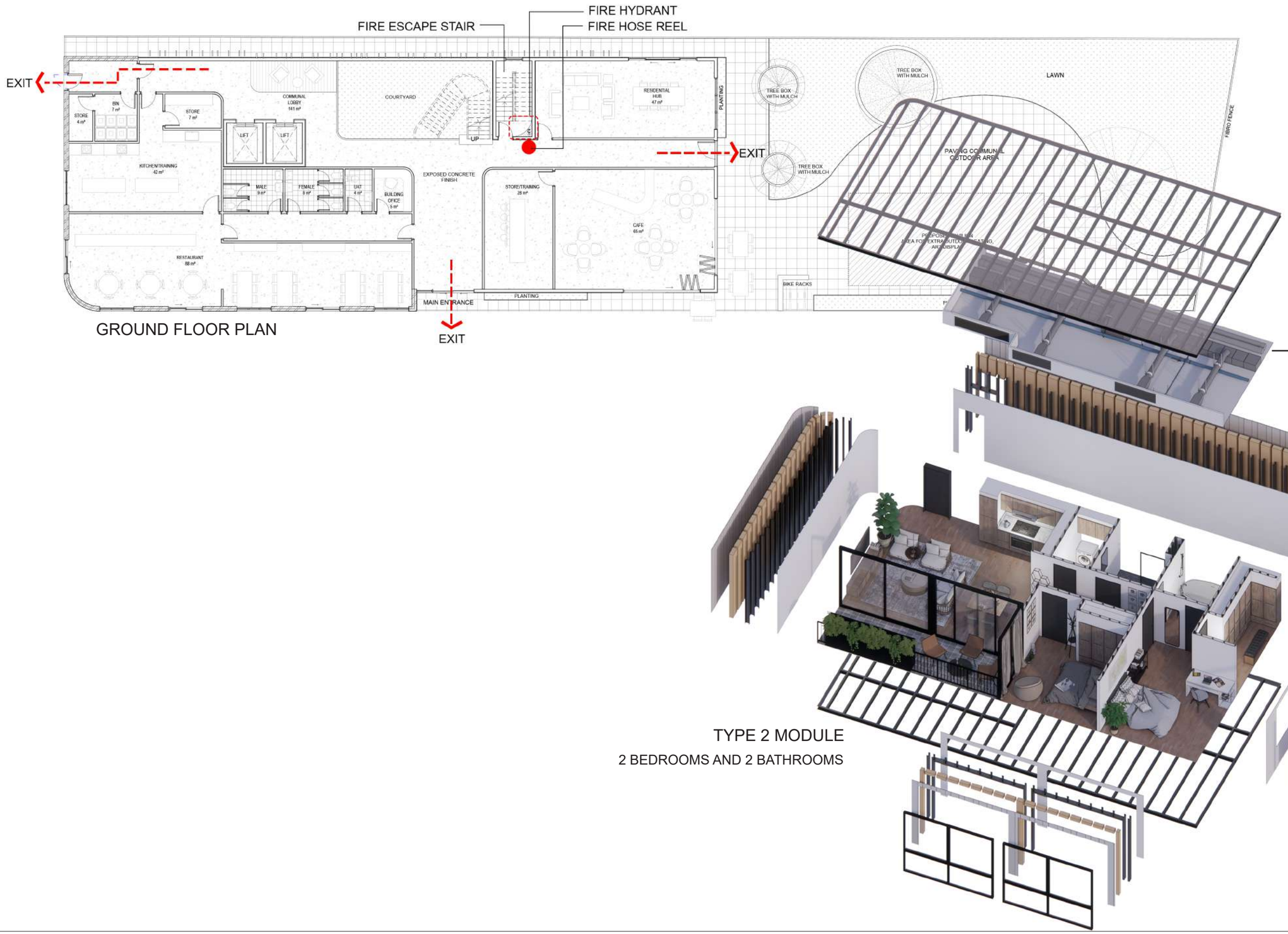


LEVEL 3 COURTYARD

FACADE GRENERY

COMMUNAL OUTDOOR AREA

SERVICES



GROUND FLOOR PLAN

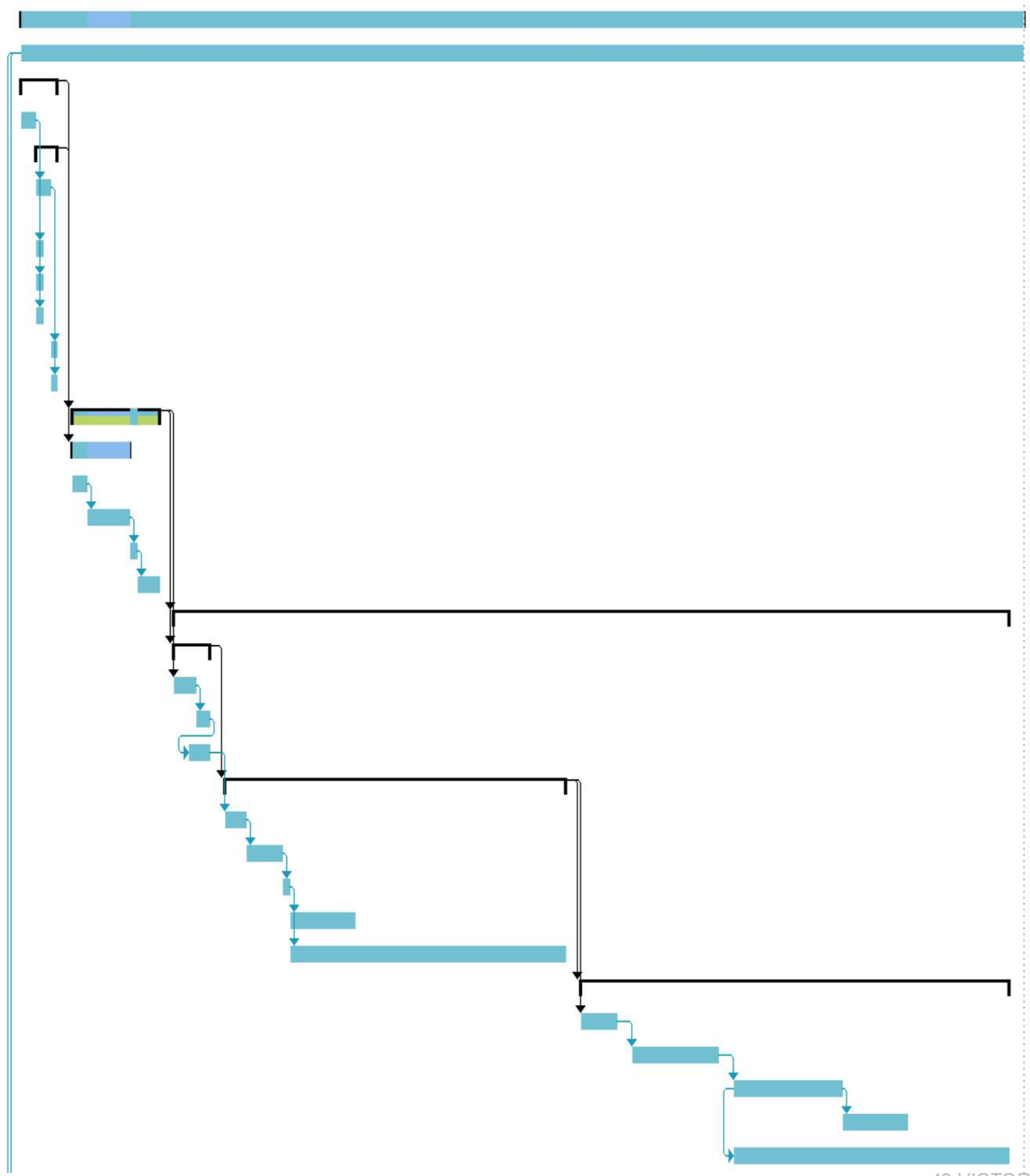
TYPE 2 MODULE

2 BEDROOMS AND 2 BATHROOMS

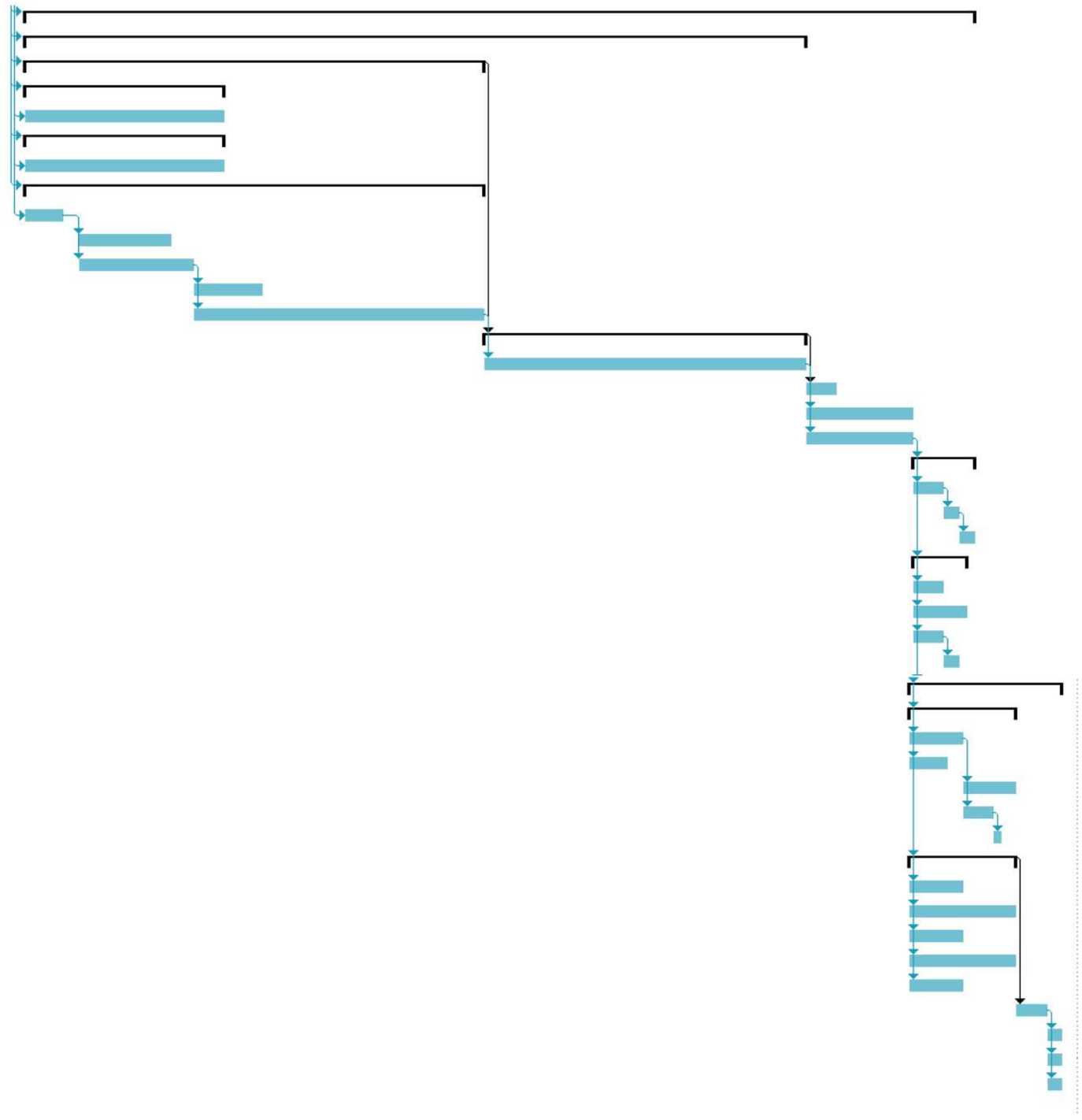
APPENDIX

1. CONSTRUCTIONN WORKS PROGRAM

47 Victoria Street Residential Building Project	**100 days**	**Mon 3/10/22**	**Fri 17/02/23**	
Staff for entirity of project	100 days	Mon 3/10/22	Fri 17/02/23	
Preliminaries	**5 days**	**Mon 3/10/22**	**Fri 7/10/22**	
Mobilisation	2 days	Mon 3/10/22	Tue 4/10/22	
Site Establishment	**3 days**	**Wed 5/10/22**	**Fri 7/10/22**	
Receive and Install Temperary Fencing	2 days	Wed 5/10/22	Thu 6/10/22	4
Install Site offices	1 day	Wed 5/10/22	Wed 5/10/22	4
Install Ammenities	1 day	Wed 5/10/22	Wed 5/10/22	4
Install services to site office and	1 day	Wed 5/10/22	Wed 5/10/22	4
Install Site Security	1 day	Fri 7/10/22	Fri 7/10/22	6
Install Signages	1 day	Fri 7/10/22	Fri 7/10/22	6
Earthworks	**10 days**	**Mon 10/10/22**	**Fri 21/10/22**	**3**
Clearing	**6 days**	**Mon 10/10/22**	**Mon 17/10/22**	**5**
Vegetation	2 days	Mon 10/10/22	Tue 11/10/22	
General	4 days	Wed 12/10/22	Mon 17/10/22	14
Laydown Area Preparation	1 day	Tue 18/10/22	Tue 18/10/22	15
Survey Set out	3 days	Wed 19/10/22	Fri 21/10/22	16
Substructure	**83 days**	**Mon 24/10/22**	**Wed 15/02/23**	**12**
Geotechnical Works	**5 days**	**Mon 24/10/22**	**Fri 28/10/22**	**12**
Removal of Soil	3 days	Mon 24/10/22	Wed 26/10/22	12
Soil Improvent	2 days	Thu 27/10/22	Fri 28/10/22	20
Levelling and Compacting	3 days	Wed 26/10/22	Fri 28/10/22	21
Foundation	**35 days**	**Mon 31/10/22**	**Fri 16/12/22**	**19**
Formwork - Pad Footing	3 days	Mon 31/10/22	Wed 2/11/22	22
Installation - Reinforcement	3 days	Thu 3/11/22	Mon 7/11/22	24
Concrete pouring	1 day	Tue 8/11/22	Tue 8/11/22	25
Concrete Curing	7 days	Wed 9/11/22	Thu 17/11/22	26
Concrete - Strength test (28days)	28 days	Wed 9/11/22	Fri 16/12/22	26
Slab	**43 days**	**Mon 19/12/22**	**Wed 15/02/23**	**23**
Formwork - Ground Slab	5 days	Mon 19/12/22	Fri 23/12/22	23
Installation - Reinforcement	10 days	Mon 26/12/22	Fri 6/01/23	30
Concrete pouring	11 days	Mon 9/01/23	Mon 23/01/23	31
Concrete Curing	7 days	Tue 24/01/23	Wed 1/02/23	32
Concrete - Strength test (28days)	28 days	Mon 9/01/23	Wed 15/02/23	32



Superstructure	**90 days**	**Mon 3/10/22**	**Fri 3/02/23**	2S
Module Constrution - Off-site	**74 days**	**Mon 3/10/22**	**Thu 12/01/23**	2S
Prefabrication of module off-site	**44 days**	**Mon 3/10/22**	**Thu 1/12/22**	2S
Columns	**20 days**	**Mon 3/10/22**	**Fri 28/10/22**	2S
Prefabricate Columns to length	20 days	Mon 3/10/22	Fri 28/10/22	2S
Beams	**20 days**	**Mon 3/10/22**	**Fri 28/10/22**	2S
Prefabricate Beams to length	20 days	Mon 3/10/22	Fri 28/10/22	2S
Slab	**44 days**	**Mon 3/10/22**	**Thu 1/12/22**	2S
Formwork - Ground Slab	5 days	Mon 3/10/22	Fri 7/10/22	2S
Installation - Reinforcement	10 days	Mon 10/10/22	Fri 21/10/22	43
Concrete pouring	11 days	Mon 10/10/22	Mon 24/10/22	43
Concrete Curing	7 days	Tue 25/10/22	Wed 2/11/22	45
Concrete - Strength test (28days)	28 days	Tue 25/10/22	Thu 1/12/22	45
Assembly of Module - Off-site	**30 days**	**Fri 2/12/22**	**Thu 12/01/23**	**37**
Internal wall panels, Columns, Bear	30 days	Fri 2/12/22	Thu 12/01/23	47
Crane Setup	2 days	Fri 13/01/23	Mon 16/01/23	48
Delivery of Complete Modules	10 days	Fri 13/01/23	Thu 26/01/23	49
On Site Construction/ Assemby of modu	10 days	Fri 13/01/23	Thu 26/01/23	49
Roofing	**6 days**	**Fri 27/01/23**	**Fri 3/02/23**	**52**
Assembling and connecting rafters	2 days	Fri 27/01/23	Mon 30/01/23	52
Assembling and connecting Purlins	2 days	Tue 31/01/23	Wed 1/02/23	54
Roof panel lift and installation	2 days	Thu 2/02/23	Fri 3/02/23	55
Fixings	**5 days**	**Fri 27/01/23**	**Thu 2/02/23**	**52**
Doors and Windows	2 days	Fri 27/01/23	Mon 30/01/23	52
Services	5 days	Fri 27/01/23	Thu 2/02/23	52
Installation of elevator	2 days	Fri 27/01/23	Mon 30/01/23	52
Contingency time allowance	2 days	Tue 31/01/23	Wed 1/02/23	60
Finishing works	**14 days**	**Fri 27/01/23**	**Wed 15/02/23**	**52**
External walls/ Façade/ Brickwork	**10 days**	**Fri 27/01/23**	**Thu 9/02/23**	**52**
External wall panels lift and installatic	5 days	Fri 27/01/23	Thu 2/02/23	52
Façade lift and installation	3 days	Fri 27/01/23	Tue 31/01/23	52
Brickwork and masonry	5 days	Fri 3/02/23	Thu 9/02/23	64
Remove scaffolding	2 days	Fri 3/02/23	Mon 6/02/23	64
Demobilise crane	1 day	Tue 7/02/23	Tue 7/02/23	67
Landscaping	**10 days**	**Fri 27/01/23**	**Thu 9/02/23**	**52**
Garden	5 days	Fri 27/01/23	Thu 2/02/23	52
Paving	10 days	Fri 27/01/23	Thu 9/02/23	52
Reticulation	5 days	Fri 27/01/23	Thu 2/02/23	52
Cosmetic features	10 days	Fri 27/01/23	Thu 9/02/23	52
Painting	5 days	Fri 27/01/23	Thu 2/02/23	52
Contingency time allowance	2 days	Fri 10/02/23	Mon 13/02/23	69
Removal of site establishments	2 days	Tue 14/02/23	Wed 15/02/23	75
Removal of temperary fencing	2 days	Tue 14/02/23	Wed 15/02/23	75
Demobilisation and site cleanup	2 days	Tue 14/02/23	Wed 15/02/23	75

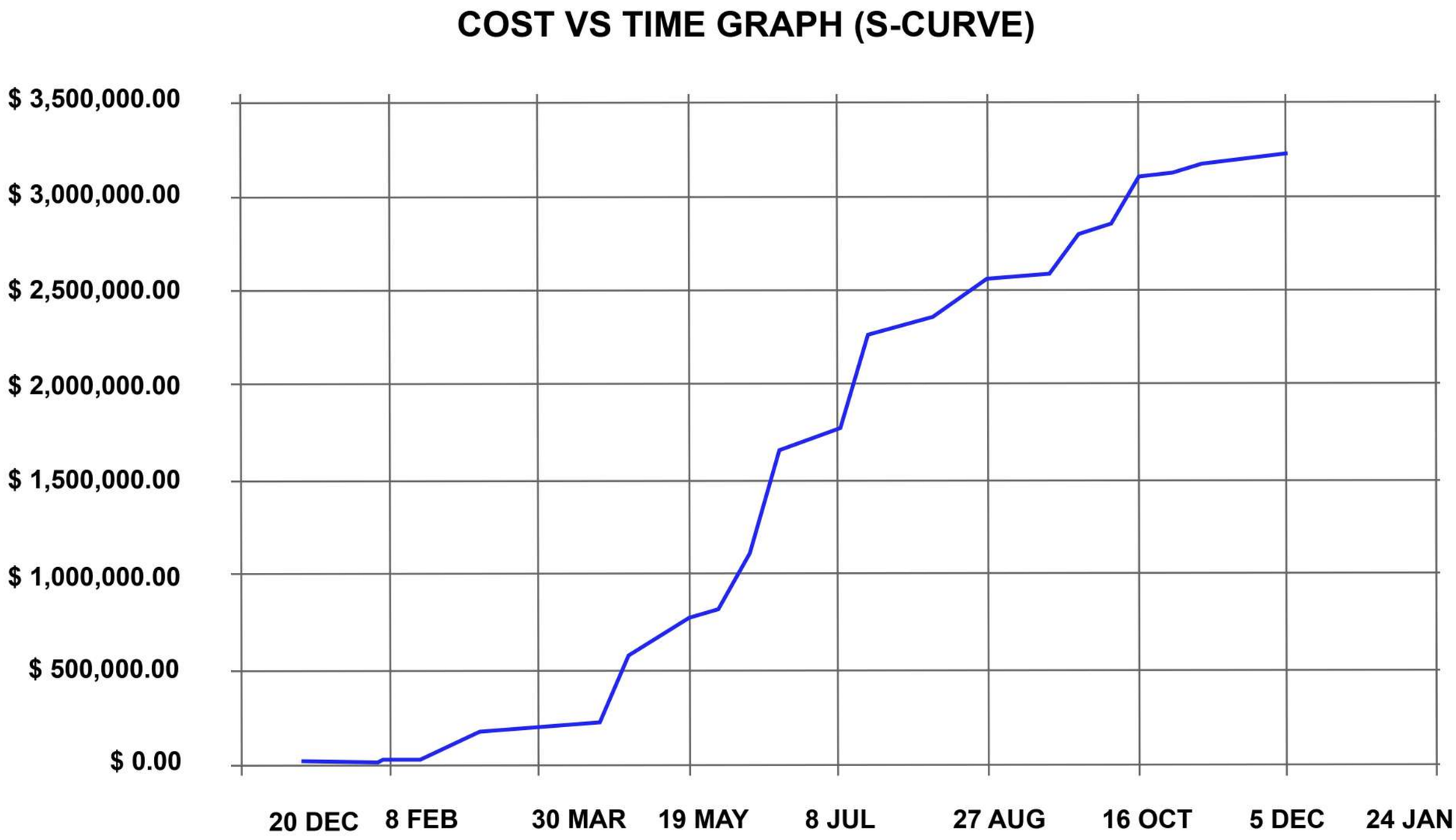


2. PREMILINARY COST CALCULATIONS

For the purpose of further deriving the feasibility of the project, a preliminary cost estimate is to be conducted. The elements of the project were divided into generalcomponents of the substructure and superstructure with pricing for all elements gathered from the cost guides, Rawlinsons 2022 and Cordell 2019. From this, the final total preliminary cost is estimated at $5.64M. Assumptions in the length of construction period was made as 20 weeks for the purpose of the analysis.

Description	Unit	Qty	Rate	Total	Source
Preliminaries / Site Preparations					
Temporary Fencing Temporary - protective fencing hire hire over 30 metres;cost per metre - any time	m	200	$ 10.45	$ 2,090.00	(Cordell 2019)
Site Clearing / Cleaning - Initial site clean ($2m^3$ bin)	item	90	$ 960.53	$ 86,447.70	(Cordell 2019)
Machine - remove tree and dispose					
2.0m canopy girth - 160mm diameter trunk;5 off	no	1	$ 266.33	$ 1,740.78	(Cordell 2019)
3.6m canopy girth - 320mm diameter trunk;5 off		1	$ 446.17		
8.0m canopy girth - 950mm diameter trunk;5 off		1	$ 1,028.28		
Site Office - 3.6 x 2.4m	weeks	20	$ 70.00	$ 1,400.00	(Rawlinson 2022)
Amenities (Ablution Shed)	weeks	20	$ 104.55	$ 2,927.40	(Cordell 2019)
Substructure					
Geotechnical Report	item	3	$ 1,750.00	$ 5,250.00	(Cordell 2019)
Level and Compaction (assuming 75% of site area required)	m^2	750	$ 3.35	$ 2,512.50	(Rawlinson 2022)
Ground Slab - Assuming 32MPa Concrete 200mm thick - 5% wastage	m^2	588	$ 107.95	$ 63,474.60	(Cordell 2019)
Superstructure					
Build Superstructure including services (refer to cost to build prelim estimate in Appendix A)	sum			$ 4,370,634.97	(Cordell 2019) & (Rawlinson 2022)
Finishing Works					
Landscaping - external site development - Residential - quality	m^2	440	$ 112.49	$ 49,495.60	(Cordell 2019)
Total				$ 4,585,973.55	
10% Contingency Allowance				$ 458,597.35	
10% GST				$ 458,597.35	
Final Total Cost				**$ 5,503,168.26**	

3. COST AND TIME RELATIONSHIP



4. LIFE CYCLE COST ASSESSMENT

To further examine feasibility a life cycle cost assessment is done after the detailed cost estimate is attained to reassess the feasibility of the project. Rental revenue based on average rental prices for Midland as stated in (Realestate 2022) is as follows:

- Single unit - $280/week
- Double unit - $330/week
- Triple unit – $360
- Retails – $500/week

This allows for yearly revenue of approximately $225,000, from which $50,000 will be utilised for maintenance. With an inflation rate of 2.5% assumed, refer to figure 1 below for the cash flows and figure 2 below for the breakeven point for the project. As depicted, the expected breakeven point for the project is around 20 years post construction. With its initial 50-year construction life-span, this is thus a feasible project.

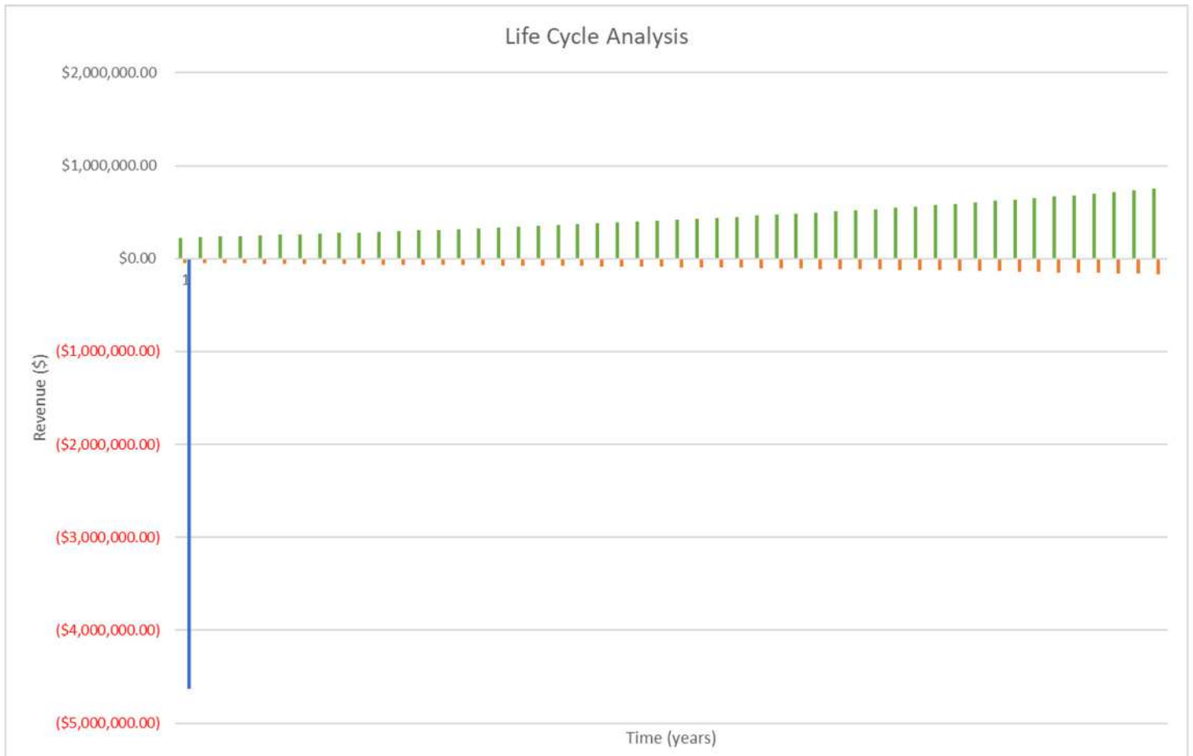


FIGURE 1

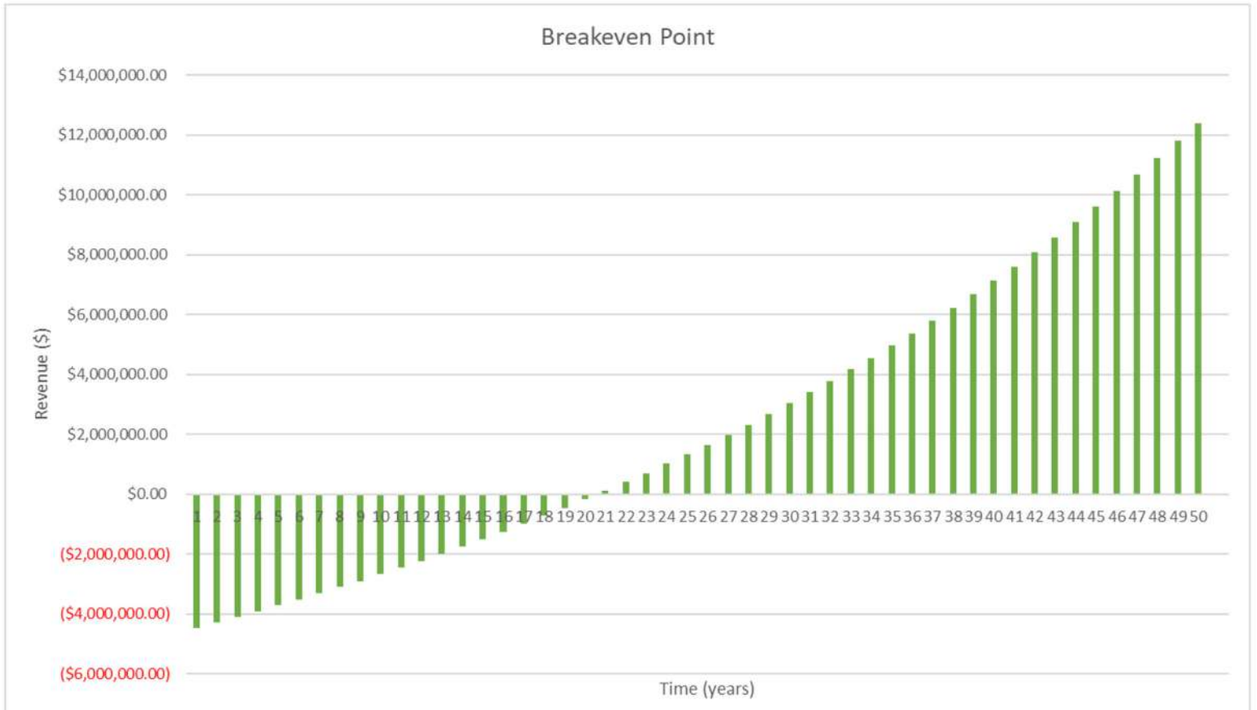


FIGURE 2

5. RISK AND SAFETY ANALYSIS

RISK ASSESSMENT

One of the key necessities to be met with during major construction projects is mitigation of any potential risks. There will be numerous risks associated during these projects, varying from small-scale to large-scale. It is vital for both the client and the contractors involved with the project tomitigate all potential risks and haVVCzards to ensure a safe working environment for all employees involved. All major projects undertake a risk assessment in order to ensure the site has been investigated and that all safety requirements are met for the safety of all employees involved. The risk assessment involves a set of steps which explore key impacts on the project such as the impact of a risk, the likelihood of the risk occurring and the necessary steps required in order to mitigate these risks. The following four tables below have been attained via Safe Work Australia 2020 to illustrate the procedure for a risk assessment.

LIKELIHOOD TABLE

Level	Likelihood	Description	Indicative Frequency	Time Based
5	Almost Certain	The event or consequence is expected to occur in most circumstances	>90%	More than once per month
4	Likely	The event or consequence will probably occur in most circumstances	51 – 90%	More than once per year
3	Possible	The event or consequence might occur at some time	11 – 50%	Once every 1 – 10 years
2	Unlikely	The event or consequence could occur at some time	0.1 – 10%	Once every 10 – 50 years
1	Rare	The event or consequence may occur only in exceptional circumstances	<0.1%	Less than once every 50 years

CONSEQUENCE REFERENCE TABLE

Level	Title	Health & Safety	Transport Services	Financial	Reputation & Trust	Business/ Project Operations	Environmental	Legal & Compliance
5	CATASTROPHIC	Multiple fatalities	• Critical service infrastructure and/or systems are not operational and cannot be rectified • Severe impact to customers	• Causing variation from initial estimated budget by +30%	• Severe adverse community impacts and condemnation • Extreme negative media attention • Consistent ongoing community loss of confidence and trust in Agency capabilities and intentions • Government intervention.	• Activities ceased • More than 50% variation in KPI or objective • Multiple critical programs or projects cannot be delivered	• Severe uncontained hazardous impact • Requiring long-term treatment and monitoring • Severe residual effect on local ecological communities, animal and plant populations it contains, and environmental and heritage values of the area	• Severe non- compliance with legislation and/or regulation • Severe contract or other legal breach • Criminal charges, penalties and/or loss of accreditation • Class action or other litigation against the Agency
4	MAJOR	Single fatality or substantial injuries or severe permanent disablement	• Several critical services and/or systems are cancelled/unavailable with extensive rectification required before resumption of services • Non- critical service infrastructure is not operational and cannot be rectified • Substantial impact to customers e.g. substantial drop in patronage or substantial level of congestion	• Causing variation from initial estimated budget by 20-30%	• Substantial and prolonged community impact and dissatisfaction publicly expressed • Consistent negative media attention • Criticism and loss of confidence/ trust by community and Stakeholders in Agency processes and capability • Ministerial intervention	• Substantial delays to activities • 25% to 50% variation in KPI or objective • One or more critical programs or projects cannot be delivered	• Substantial hazardous impact • Rectified in the long-term. • Substantial residual effect on local ecological communities, animal and plant populations it contains, and environmental and heritage values of the area	• Substantial non-compliance with legislation and/or regulation • Substantial contract or other legal breach • Termination of process or imposed penalties • Substantial litigation against the Agency
3	MODERATE	Medical treatment required or Lost time injury or Restricted work injury	• One or several services and/or systems, including critical services, are unavailable for an extended length of time • Medium impact to customers e.g. complaints and medium drop in patronage or medium level of congestion	• Causing variation from initial estimated budget by 10-20%	• Sectional community impacts and concerns publicly expressed • Increased negative media attention • Loss of confidence and trust by community and Stakeholders in Agency processes and capability. • Ministerial concern	• Medium delays to business activities • 10% - 25% variation in KPI or objective • One or more projects is significantly impaired	• Uncontained impact. • Rectified in short-medium term • Medium term residual effect on local ecological communities, animal and plant populations it contains, and environmental and heritage values of the area	• Non- compliance/s with regulation and/ or probity infringements which may result in some processes repeated • Contract or other legal breach which may result in costs/delays to the Agency • Legal action probable
2	MINOR	First aid treatment required	• One or several services and/or systems are unavailable or operating with restrictions but can be resumed within acceptable timeframes • Short term impact to customers e.g. short-term drop-in patronage or isolated congestion	• Causing variation from initial estimated budget by 5-10%	• Local community impacts and concerns • Occasional once off negative media attention • Trust issues raised	• Short- term delays to business activities • 5% to 10% variation in KPI or objective	• Contained low impact • Rectified with standard treatment • Short-term residual effect on local ecological communities, animal, and plant populations it contains, and environmental and heritage values of the area	• Complex legal/ non-compliance issue to be addressed • Legal action and /or public liability claim possible • Disciplinary action
1	INSIGNIFICANT	No treatment required	• Service infrastructure receives minimal damage, minimal rectification required. Service/s and/or systems only temporarily unavailable or remain operational • Minimal impact to customers e.g. minimal drop in patronage or minimal level of congestion	• Causing variation from initial estimated budget by 1-5%	• Isolated local community or individual's issue-based concerns. • Low profile media attention.	• Minimal delays to business activities. • Up to 5% variation in KPI or objective.	• Minimal impact to isolated area • Simple or no treatment required • No lasting effect on local ecological communities, animal and plant populations it contains, and environmental and heritage values of the area	• Guidance required for legal/ compliance issues managed through routine procedures • Legal action unlikely

RISK ASESSMENT MATRIX

Consequences, Likelihood		Insignificant	Minor	Moderate	Major	Catastrophic
		1	2	3	4	5
Almost Certain	5	Low 5	High 10	High 15	Very High 20	Very High 25
Likely	4	Low 4	Medium 8	High 12	Very High 16	Very High 20
Possible	3	Low 3	Low 6	Medium 9	High 12	High 15
Unlikely	2	Low 2	Low 4	Low 6	Medium 8	High 10
Rare	1	Low 1	Low 2	Low 3	Low 4	Medium 7

Through abiding the risk assessment tables provided above, a significant number of risks can be mitigated and treated if necessary. A coherent risk assessment will not only enable the site to mitigate hazards and risks but to identify any shortcomings that could have been overlooked during the construction phase. It is almost inevitable to avoid all hazards and risks from construction projects; therefore, a suitable risk assessment plan is highly recommended to prepare for and mitigate these risks.

RISK ACCEPTANCE TABLE

Level of Risk	Rating	Residual Risk Assessment – with current controls	Target Risk Assessment – with Treatment Action Plans
16 and over	**Very High**	Treatment Action Plan Required.	Decision on acceptance of risk to be made by Executive Committee.
10 - 15	**High**	Treatment Action Plan Required.	Decision on acceptance of risk to be made by General Manager/Executive Director, except where the risk is rated 15. Decision on acceptance of a risk rated 15 is to be made by the Executive Committee.
7 - 9	**Medium**	Risk may be accepted by Branch/Division/Directorate Manager EXCEPT where the Consequence is Catastrophic, or the risk has not been reduced to ALARP. A Treatment Action Plan is required.	Decision on acceptance of risk to be made by Branch/Division/Directorate Manager EXCEPT where the Consequence is Catastrophic. The decision on acceptance of a Catastrophic risk must be made by General Manager/Executive Director.
1 - 6	**Low**	Risk is acceptable – manage by routine procedures EXCEPT where the risk has not been reduced to ALARP. A Treatment Action Plan is required.	Decision on acceptance of risk to be made by Branch/Division/Directorate Manager

RISK MITIGATION: WORKING AT HEIGHTS

One of the major risks involved with working on construction projects is the risks involved withworking at heights. If the correct safety requirements are not met and standard procedures are not followed, there is a high likelihood of calamities occurring. There are numerous ways of a calamity occurring, including falling from heights or dropping equipment or materials from heights onto workers standing below. It is an absolute necessity to attend to any of these potential risks andcreate a treatment action plan at early as possible to avoid any injuries or fatalities.
According to Safe Work 2021, there are a standard set of procedures provided in order to elimnate the chances of any calamities occurring, these include:

• Providing a safe and well-designed entry and exit pathways with updated
• Constructing a fall prevention device such as a safety barrier, suitable scaffolding or an elevated work platform.
• An alternative to a fall prevention device such as a work positioning system. (Industrial rope access system)
• To reinforce safety and as a backup, install a fall arrest system such as a safety net or a catchplatform if the other alternatives fail.

The most ideal situation for any project is to complete the entire project with no risks or accidents. However, this is a near to impossible task no matter how carefully and responsibly the sitework is conducted. Therefore, the site's next best option is to make an attempt at mitigating as many risks as possible. A considerable number of risks and accidents occur during jobs which require workers to work at heights. Addressing and preparing cautiously for working at heights is essential for the safety of the workers as a large amount of construction jobs will most-likely require some sort of work to be conducted at heights. If the correct preventative methods and procedures are followed a relatively safer and efficient workplace environment can be produced. As mentioned earlier, following straightforward procedures such as wearing harnesses and including safety bariers, safety nets and catch platforms, a significant number of potential risks can be mitigated and allow workers to operate safely.
The respective risk assessments for working with and without the safety procedures have been constructed below:

Consequences, Likelihood		Insignificant	Minor	Moderate	Major	Catastrophic
		1	2	3	4	5
Almost Certain	5	Low 5	High 10	High 15	Very High 20	Very High 25
Likely	4	Low 4	Medium 8	High 12	Very High 16	Very High 20
Possible	3	Low 3	Low 6	Medium 9	High 12	High 15
Unlikely	2	Low 2	Low 4	Low 6	Medium 8	High 10
Rare	1	Low 1	Low 2	Low 3	Low 4	Medium 7

RISK ASSESSMENT MATRIX

Through implementing and adhering to the safety measures highlighted above, the risk assessment rating can be reduced from a potential (Very high – 16) to a (Medium – 8).

Consequences, Likelihood		Insignificant	Minor	Moderate	Major	Catastrophic
		1	2	3	4	5
Almost Certain	5	Low 5	High 10	High 15	Very High 20	Very High 25
Likely	4	Low 4	Medium 8	High 12	Very High 16	Very High 20
Possible	3	Low 3	Low 6	Medium 9	High 12	High 15
Unlikely	2	Low 2	Low 4	Low 6	Medium 8	High 10
Rare	1	Low 1	Low 2	Low 3	Low 4	Medium 7

RISK ACCEPTANCE TABLE

6. LOADING CRITERIA

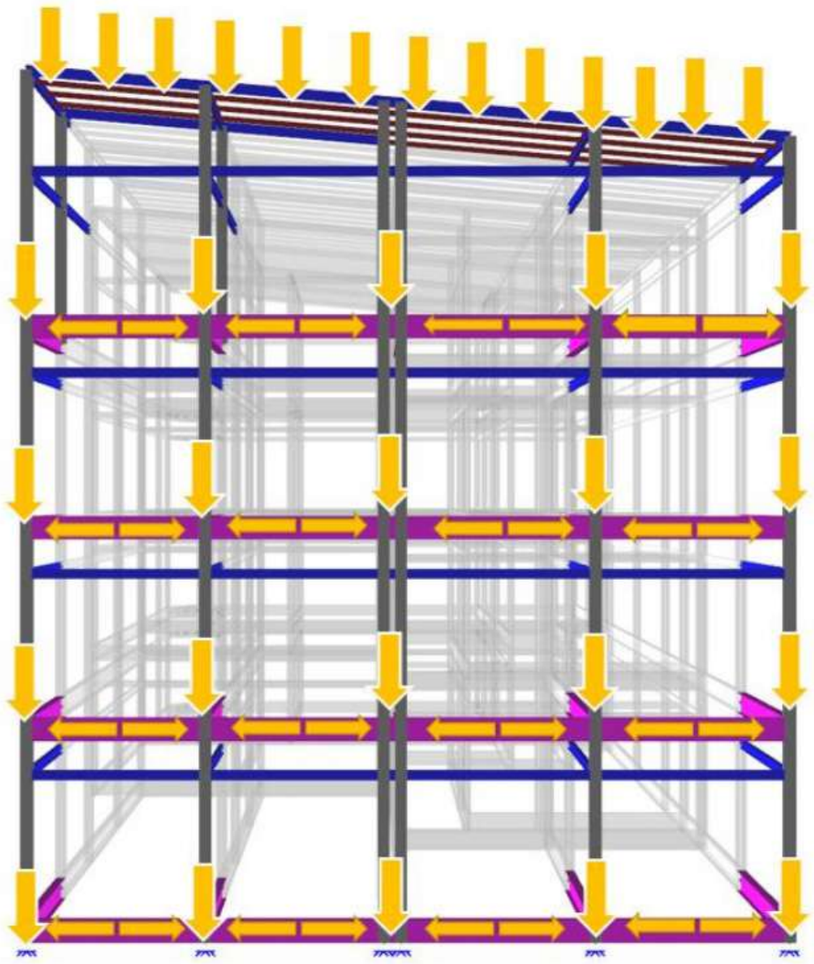
Referring the Australian Standards AS 1770.1, Table 3.1 imposed loads was determined to the building.

- General Areas around the apartment, bedrooms, kitchen were determined to be 2 kPa
- Non-accessible roof was determined to be 0.5 kPa
- Common areas, Corridors, Café and Office were determined to be 4 kPa

Critical loading was identified at a tributary area of 20.30 m2. Calculations were performed for uniformly Distributed load acting on each column for critical loading combinations.

LOAD PATH

The Structures Loads were calculated for critical sections via hand and modelling was completed through SpaceGASS. The Load path was determined to travelling from roof to Columns and beams to columns through to the footing.



IMPOSED LOAD

Referring to Australian standards AS1170.1 Table 3.1, imposed loads were determined to be assigned to the structure. The apartment areas such as living rooms, bedrooms, kitchen and bathrooms imposed load action were taken as 2kPa. Whereas common areas such as corridors, common areas, office and café has and imposed load action of 4kPa. When referring to the structure the critical load acts on Module 2 where there is a tributary area of 20.3m2. When Calculations were performed the imposed load was taken as 4kPa for all areas to be conservative.

PERMANENT ACTIONS

The permanent action loads on the structure are determined by the unit weight of the materials used. Furthermore, to include fixtures and other assembling materials an extra 2kPa is used on each floor to be conservative as well as to consider roof fixtures another 0.5kPa was determined permeant action on the roof. Unit weight of Steel materials were identified by referring to DCT and the unit weight of reinforced concrete was taken as 25kN/m3.

WIND ACTIONS

The importance level of the building was estimated as Level 2. The minimum working life of the structure was provided to be designed to 50 years. The structure was constructed where the wind region was considered to be A1 with site wind category 3. The wind load is transferred from the walls to the respective column and the heighted wind load was on the west side of the structure with a wind load of 3kPa. The structure designed has a massive opening on the east side of the building; therefore,the internal and external wind pressure are being drastically reduced throughout the structure. The wind calculations performed based on the AS1170.2 and AS1170.0.

LOAD COMBINATIONS

The load combination provided on AS1170.0 were used in calculating loads and to determine thecritical load. The following load combinations were used.

- 1.35G
- 1.2G + 1.5Q
- 1.2G + YQ +Wu
- 0.9G + Wu
- 1.2G + Wu

7. DETAILED CALCULATIONS

WIND CALCULATIONS

The standards AS1170.0 and AS1170.2 is used to calculate wind loads for this design.

- Site wind category: 3 <AS1170.2>
- Design life: 50 years
- Importance Level: 2 <AS1170.0>
- Annual probability of exceedance for Ultimate state: 1/500 <AS1170.0 Table 3.3>
- Annual probability of exceedance for Serviceability state: 1/25 <AS1170.0 Table 3.3>
- Wind Region (Victoria Street, Midland): A1
- V500 (Ultimate wind speed) = 45 m/s
- V25 (Serviceability wind speed) = 37 m/s

Internal Pressure	
Ultimate	-0.231
Serviceability	-0.156

External pressure – Windward Wall	
Ultimate	0.539
Serviceability	0.365

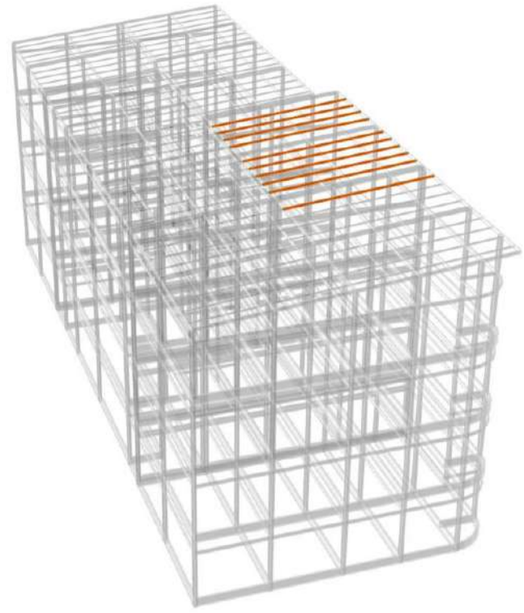
External pressure – Leeward Wall	
Ultimate	-0.385
Serviceability	-0.260

External pressure – Side Wall	
Ultimate	-0.500
Serviceability	-0.339

External pressure – Roof	
Ultimate	-0.789
Serviceability	-0.534

WIND PRESSURE

ROOF DESIGN



PURLIN (100 PFC)

The Purlin with the worst load case and highest span is determined to with a span of 3.75 m and tributary width of 1 m. Therefore, purlins will be designed to these specifications.

Roof Weight = 4.35 kg/m2
= 4.35 * 9.81
= 43 N/m2
= 0.05 kN/m2

Critical Tributary width 1 m
G = 0.05 kN/m
Q = 0.5 kN/m
Wu = -0.789 kN/m

1.2G + 1.5Q = 0.81 kN/m (Critical Loading)

Ultimate limit state checks (AS4100)			
	Requirement	**Member Capacity**	**Design Action**
Bending (kNm)	$M^* < \phi M_s$	$\phi M_s = 13$	$M^* = 1.12$ ✓
	$M^*/\alpha_m < \phi M_b$	$\phi M_b = 3.5$	$M^*/\alpha_m = 0.36$ ✓
Shear (kN)	$V^* < \phi V_v$	$\phi V_v = 81.6$	$V^* = 1.73$ ✓
Shear bending interaction (kN)	$V^* < 0.6\ \phi V_v$	$0.6\ \phi V_v = 48.96$	$V^* = 1.73$ ✓
Combined actions	-	–	-

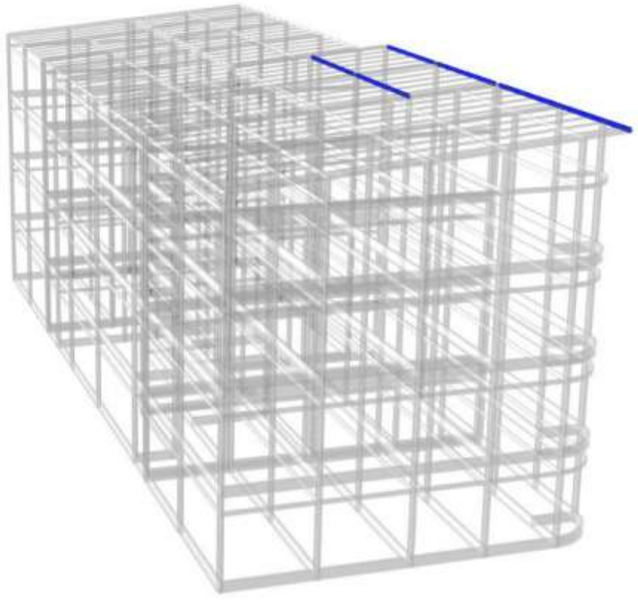
RAFTER

The Rafter with the worst load case and highest span is determined to with a span of 5.45 m and tributary width of 3.75 m. Therefore, Rafter will be designed to these specifications.
Purlin Weight = 8.33 kg/m

Purlin Weight on 1m of Rafter = 8.33 * 9.81 * 3.75
= 306.44 N/m
= 0.31 kN/m
Roof Weight on 1m of Rafter = 0.05 kN/m2 * 3.75 m
= 0.19 kN/m

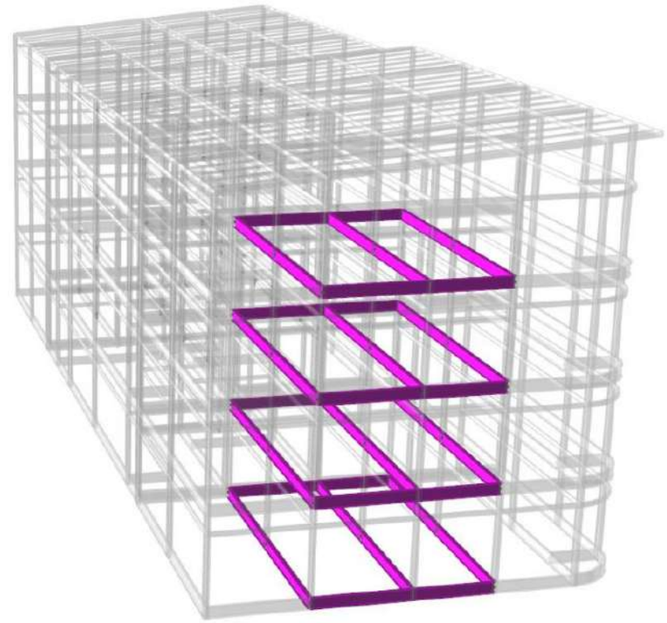
G = 0.5 kN/m
Q = 0.5 kN/mV

1.2G + 1.5Q = 1.35 kN/m (Critical Loading)



Ultimate limit state checks (AS4100)			
	Requirement	**Member Capacity**	**Design Action**
Bending (kNm)	$M^* < \phi M_s$	$\phi M_s = 13$	$M^* = 1.12$ ✓
	$M^*/\alpha_m < \phi M_b$	$\phi M_b = 3.5$	$M^*/\alpha_m = 0.36$ ✓
Shear (kN)	$V^* < \phi V_v$	$\phi V_v = 81.6$	$V^* = 1.73$ ✓
Shear bending interaction (kN)	$V^* < 0.6\ \phi V_v$	$0.6\ \phi V_v = 48.96$	$V^* = 1.73$ ✓
Combined actions	-	–	-

BOTTOM BEAM (410 UB 53.7)

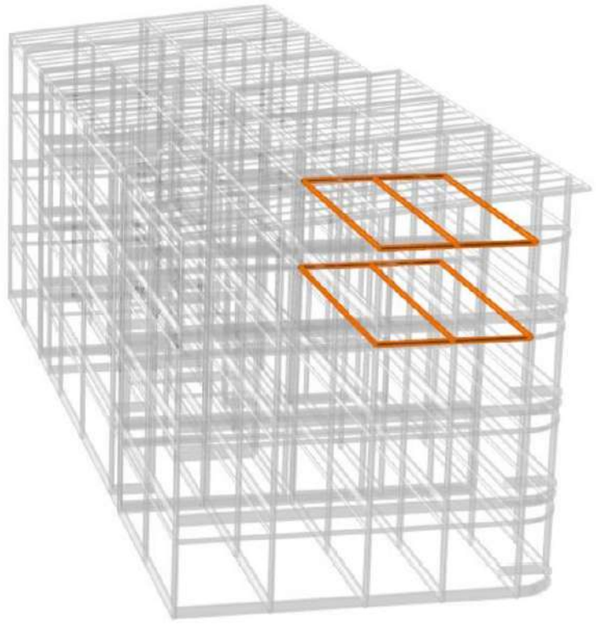


The beam with the worst load case and highest span is determined to be on Module 2 with a span of 5.45 m and tributary width of 3.725 m. Therefore, beam will be designed for Module 2 and the same beam will be used in all other Modules according to its specific measurements.

G = 5.875 * 3.725 = 21.9 kN/m
Q = 4 * 3.725 = 14.9 kN/m
1.2G + 1.5Q = 48.63 kN/m (Critical Load)

Ultimate limit state checks (AS4100)			
	Requirement	**Member Capacity**	**Design Action**
Bending (kNm)	$M^* < \phi M_s$	$\phi M_s = 340$	$M^* = 139.93$ ✓
	$M^*/\alpha_m < \phi M_b$	$\phi M_b = 81.62$	$M^*/\alpha_m = 55.97$ ✓
Shear (kN)	$V^* < \phi V_v$	$\phi V_v = 595$	$V^* = 144.25$ ✓
Shear bending interaction (kN)	$V^* < 0.6\ \phi V_v$	$0.6\ \phi V_v = 357$	$V^* = 144.25$ ✓
Combined actions	-	–	-

TOP BEAM (180 UB 22.2)

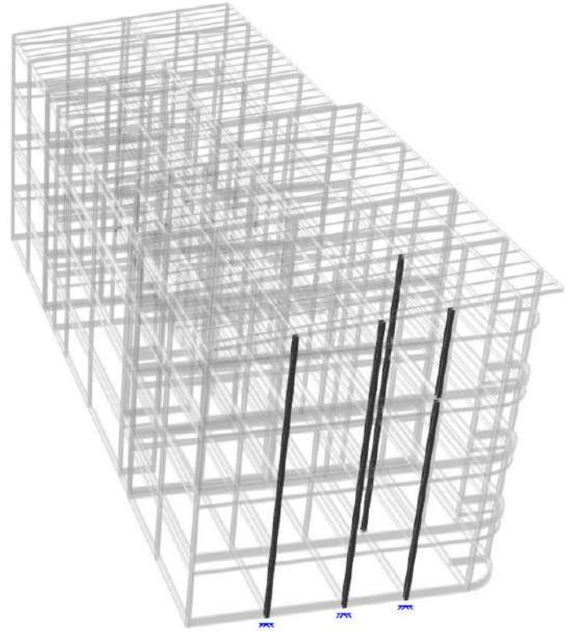


The beam with the worst load case and highest span is determined to be on Module 2 with a span of 5.45 m and tributary width of 3.725 m. Therefore, beam will be designed for Module 2 and the same beam will be used in all other Modules according to its specific measurements.

G = (0.3 * 3.725) = 1.12 kN/m
Q = (0.5 * 3.725) = 1.9 kN/m
1.2G + 1.5Q = 4.13 kN/m (Critical Load)

Ultimate limit state checks (AS4100)			
	Requirement	**Member Capacity**	**Design Action**
Bending (kNm)	$M^* < \phi M_s$	$\phi M_s = 63.6$	$M^* = 10.99$ ✓
	$M^*/\alpha_m < \phi M_b$	$\phi M_b = 13.11$	$M^*/\alpha_m = 4.4$ ✓
Shear (kN)	$V^* < \phi V_v$	$\phi V_v = 209$	$V^* = 12.06$ ✓
Shear bending interaction (kN)	$V^* < 0.6\ \phi V_v$	$0.6\ \phi V_v = 12.4$	$V^* = 12.06$ ✓
Combined actions	-	–	-

COLUMN



The Column with the worst load case and highest span is determined to be on Module 2 with a tributary area of 3.725 m * 5.45 m. Therefore, beam will be designed for Module 2 and the same beam will be used in all other Modules according to its specific measurements.

Weight on 1m of Rafter + Self-weight
= 0.19kN/m + 0.22kN/m
= 0.41 kN/m

Tributary length of rafter = 5.45m

Rafter weight of column = 2.2345kN

Weight of top beam + Self-weight
= 4.19kN/m + 0.22kN/m
= 4.41kN/m

Tributary length of top beam = 5.45m

Weight of top beam and no column

= 24.0345kN x 3
= 72.1035 kN

Weight on bottom beam + Self-weight
= 48.63kN/m + 0.53kN/m
= 49.16kN/m

Tributary length of bottom beam = 5.45m

Weight on column for bottom beam
= 49.16 x 5.45 x 3
= 803.766 kN

Total weight of bottom most column
= 2.2345 + 72.1035 + 803.766
= 878.104kN + Self-weight of column
= 878.104kN + 4.758
= 882.862kN

Ultimate limit state checks (AS4100)			
	Requirement	**Member Capacity**	**Design Action**
Bending (kNm)	$M^* < \phi M_s$	$\phi M_s = 133$	$M^* = 9.69$ ✓
	$M^*/\alpha_m < \phi M_b$	$\phi M_b = 113$	$M^*/\alpha_m = 3.876$ ✓
Shear (kN)	$V^* < \phi V_v$	$\phi V_v = 257$	$V^* = 5.5$ ✓
Shear bending interaction (kN)	$V^* < 0.6\ \phi V_v$	$0.6\ \phi V_v = 154.2$	$V^* = 5.5$ ✓
Combined actions	-	–	-

Combined actions (AS4100)			
	Requirement	**Member Capacity**	**Design Action**
Compression (kN)	$N_c^* < \phi N_{cx}$	$\phi N_{cx} = 1681$	$N_c^* = 1250$ ✓
	$N_c^* < \phi N_{cy}$	$\phi N_{cy} = 1493.7$	
Tension (kN)	$N_t^* < \phi N_t$	$\phi N_t = 1494$	$N_t^* = 306$ ✓
Section capacity (kNm)	(c) $M^* < \phi M_{rx}$	$\phi M_{rx\text{-}comp} = 38.22$	M* (comp) = 9.69 ✓
	(t) $M^* < \phi M_{rx}$	$\phi M_{rx\text{-}tens} = 38.22$	M* (tens) = 9.69 ✓
Member capacity	In plane: $\frac{M^*}{\phi M_{sx}} + \frac{N^*}{\phi N_{cx}} \leq 1.0$	$\frac{M^*}{\emptyset M_{sx}} + \frac{N^*}{\emptyset N_{cx}} = 0.81$ ✓	
	Out of plane: $\frac{M^*}{\phi M_{bx}} + \frac{N^*}{\phi N_{cy}} \leq 1.0$	$\frac{M^*}{\emptyset M_{bx}} + \frac{N^*}{\emptyset N_{cy}} = 0.92$ ✓	

FLOOR SLAB DESIGN

The Slab with the worst load case is when the slab is under a load of 4kpa and the reinforced slab with a self-weight of 25 kN/m3.

Ultimate limit state checks (AS4100)			
	Requirement	**Member Capacity**	**Design Action**
Bending (kNm)	$M^* < \phi M_s$	$\phi M_s = 340$	$M^* = 139.93$ ✓
	$M^*/\alpha_m < \phi M_b$	$\phi M_b = 81.62$	$M^*/\alpha_m = 55.97$ ✓
Shear (kN)	$V^* < \phi V_v$	$\phi V_v = 595$	$V^* = 144.25$ ✓
Shear bending interaction (kN)	$V^* < 0.6\ \phi V_v$	$0.6\ \phi V_v = 357$	$V^* = 144.25$ ✓
Combined actions	-	–	-

8. PROJECT BUILDING STATUTORY AND COMPLIANCES

AUSTRALIAN STANDARDS

- AS/NZS 1170.0:2002 (Structural design actions; General principles)
- AS/NZS 1170.1:2002 (Structural design actions; Permanent, Imposed and other actions)
- AS/NZS 1170.2:2011 (Structural design actions; Wind actions)
- AS 4100 (Steel structural design)

9. NCC REPORT

SECTION A: GOVERNING EQUIREMENTS

PART A6: Building Classification

A6.2 Class 2 Buildings

(1) A Class 2 building is a building containing two or more sole-occupancy units.
(2) Each sole-occupancy unit in a Class 2 building is a separate dwelling.

A6.6 Class 6 Buildings

A Class 6 building is a shop or other building used for the sale of goods by retail or the supply of services direct to the public, including—

(1) an eating room, café, restaurant, milk or soft-drink bar; or

A6.9 Class 9 Buildings

A Class 9 building is a building of a public nature that includes one or more of the following sub-classifications:

(2) Class 9b — an assembly building including a trade workshop or laboratory in a primary or secondary school.

SECTION B: STRUCTURE

Construction method

The design of this building has been determined with the project brief and the client's preferences in mind but at the same it was ensured that it was a practical and feasible design. To minimise transportation costs and difficulties, the modules weren't completely pre-fabricated. However, the different components required have been chosen and designed in a manner which will allow for an easy and straight-forward assembling and construction process. The major components required such as the roof, walls, columns and flooring will be delivered to the site ready for construction. The ability to re-arrange and modify the layout of components allows the contractors to work efficiently and with no unnecessary complications. Moreover, this particular method of construction is also extremely sustainable and beneficial for the environment as once the design life of the structure is met, it will be simple and straight-forward to disassemble and re-sold or be recycled for a new project.

Design Assumptions

To ensure the safety of the future patrons and maximise the design-life of the structure, it is essential to equip the structure with the right materials to be prepared for different situations and calculate the different loadings experienced to safety-proof the structure to a high level. The first step to do so was to identify the different design loads acting on the entire structure which were then modelled onto SpaceGass for calculations. Through SpaceGass, the calculations for critical moments, shear and axial forces were conducted and accurate results were obtained.

- The slab is assumed to have a unit weight of 25kN/m3.
- The Factor of safety is assumed to be 2 for pad footing.
- The design is for common accommodation therefore the roof will be non-accessible with on access allowed for maintenance.
- All internal and external walls are non-load bearing walls.

ASSESSEMENT AND APPLICATION OF NCC | BUILDING CODE OF AUSTRALIA 2019 - VOLUME 1

Loading Criteria

Referring the Australian Standards AS 1770.1, Table 3.1 imposed loads was determined to the building.

- General Areas around the apartment, bedrooms, kitchen were determined to be 2 kPa
- Non-accessible roof was determined to be 0.5 kPa
- Common areas, Corridors, Café and Office were determined to be 4 kPa

Critical loading was identified at a tributary area of 20.30 m2. Calculations were performed for uniformly Distributed load acting on each column for critical loading combinations.

SECTION C: FIRE RESISTANCE:

C1.1 Type of Construction Required

Rise in storeys	Class of building
4 or more	2A

C1.2 Calculation in the Rise of Storeys:

The design of 49 Victoria project will be followed Victoria Street design guidelines with maximum 5-8 storeys (up to 26 m). The proposal design will be 4 storeys with ground floor podium and three residential levels above which will be up to 13m in total.

C1.3 Buildings of Multiple classification

The proposal of 49 Victoria project will be include 4 storeys with ground level for commercial purpose and multi residential for three levels above. Therefore, it's a

A6.2 Class 2 Buildings

(1) A Class 2 building is a building containing two or more sole-occupancy units.
(2) Each sole-occupancy unit in a Class 2 building is a separate dwelling.

A6.6 Class 6 Buildings

A Class 6 building is a shop or other building used for the sale of goods by retail or the supply of services direct to the public, including—

(1) an eating room, café, restaurant, milk or soft-drink bar; or

A6.9 Class 9 Buildings

A Class 9 building is a building of a public nature that includes one or more of the following sub-classifications:

(1) Class 9b — an assembly building including a trade workshop or laboratory in a primary or secondary school.

C1.4 Mixed Types of Construction

A building may be of mixed Types of construction where it is separated in accordance with C2.7 and the Type of construction is determined in accordance with C1.1 or C1.3.

C1.5 Two storey Class 2, 3 or 9c buildings

The design of this building has been complied with this section due to its provided two exits.

C1.6 Class 4 parts of buildings

N/A

C1.7 Open spectator stands and indoor sports stadiums

N/A

C1.8 Lightweight construction

Lightweight construction is discussed in terms of tests taken and requirements which must be satisfied when used as a wall system. This criterion must be met with wall systems requiring an FRL (Fire Resistance Level) or any space which could be used as a fire exit such as lift shafts or fire isolated stairs.

As the main construction method for 49 Victoria is lightweight construction there for it required to have an RFL.

C1.9 Non-combustible building elements

(a) In a building required to be of Type A or B construction, the following building elements and their components must be non-combustible:

(i) External walls and common walls, including all components incorporated in them including the facade covering, framing and insulation.

(ii) The flooring and floor framing of lift pits.

(iii) Non-loadbearing internal walls where they are required to be fire-resisting.

<u>SECTION D: ACCESS AND EGRESS</u>:

D1: Provision for escape

D1.0 Deemed-to-Satisfy Provisions

(a) Where a Deemed-to-Satisfy Solution is proposed, Performance Requirements DP1 to DP6, DP8 and DP9 are satisfied by complying with—

(i) D1.1 to D1.17, D2.1 to D2.25 and D3.1 to D3.12; and

(ii) in a building containing an atrium, Part G3; and

(iv) for a building containing an occupiable outdoor area, Part G6; and

(b) Where a Performance Solution is proposed, the relevant Performance Requirements must be determined in accordance with A2.2(3) and A2.4(3) as applicable.

(c) Performance Requirement DP7 must be complied with if lifts are to be used to assist occupants to evacuate a building.

D1.1 Application of Part

N/A

D1.2 Number of exist required

The section D1.2 outlines number of exits required. The design of 49 Victoria is complied with this section due to it has at least to exits for the class 2 building.

D1.3 When fire-isolated stairways and ramp are required

The section D1.3 outlines when the fire-isolated stairway and ramp are required. The project 49 Victoria is compliance with this section due to it has the fire isolated stairway that complied with the building classification.

D1.4 Exit travel distances

ASSESSEMENT AND APPLICATION OF NCC | BUILDING CODE OF AUSTRALIA 2019 - VOLUME 1

The section D1.4 outlines Exit and travel distance for class 2 building are

(A) 6 m from an exit or from a point from which travel in different directions to 2 exits is available: or

(B) 20 m from a single exit serving the storey at the level of egress to a road or open space; and

These elements are complied in the exit travel distance design of 49 Victoria project. (Refer to the construction drawing package)

D1.5 Distance between alternative exits

The section D1.5 outlines Distance between alternative exits for class 2 building is 45m apart. This is complied in the design of 49 Victoria project. (Refer the construction drawing package)

D1.6 Dimensions of exits and paths of travel to exits

The section D1.6 outlines the Dimensions of exits and paths of travel to exits. The design of 49 Victoria has 2040mm door height and corridor 1800mm, there for it is compliance with this section. (Refer the construction drawing package)

D1.7 Travel via fire-isolated exits

The section D1.7 outlines the Travel via fire-isolated exits. The design of 49 Victoria project is complied with all the categories required in this section.

D1.8 External stairways or ramp in lieu of fire-isolated exits

The section D1.8 outlines External stairways or ramp in lieu of fire-isolated exits. The design of 49 Victoria project is complied with all the categories required in this section.

D1.9 Travel by non-fire-isolated stairways or ramps

The section D1.9 outlines Travel by non-fire isolated stairway or ramps. There is a non-fire isolated stairway in design of 49 Victoria project. However, it is complied with all the categories required in this section by provide a continuous means of travel by its own flights and landings from every storey served to the level at which egress to a road or open space is provided. (Refer the construction drawing package)

D1.10 Discharge from exits

The section D1.10 outlines Discharge from exits. The design of 49 Victoria project is complied with all the categories required in this section.

D1.11 Horizontal exits

There is no horizontal exit in the design of 49 Victoria project

D2: Construction of Exits

D2.0 Deemed-to-Satisfy Provisions

(a) Where a Deemed-to-Satisfy Solution is proposed, Performance Requirements DP1 to DP6, DP8 and DP9 are satisfied by complying with—

(i) D1.1 to D1.16, D2.1 to D2.25 and D3.1 to D3.12; and

(ii) in a building containing an atrium, Part G3; and

(iii) in a building in an alpine area, Part G4; and

(iv) for a building containing an occupiable outdoor area, Part G6; and

(v) for additional requirements for Class 9b buildings, Part H1; and

(vi) for public transport buildings, Part H2; and

(vii) for farm buildings and farm sheds, Part H3.

D2.1 Application of Part

Not apply for Class 2 buildings

D2.2 Fire-isolated stairways and ramps

The section D2.2 outlines Fire-isolated stairway and ramps. The design of 49 Victoria project is complied with all the categories in this section because the stairway that is required to be within a fire-resisting shaft must be constructed—

(a) of non-combustible materials; and

(b) so that if there is local failure it will not cause structural damage to, or impair the fire-resistance of, the shaft.

D2.4 Separation of rising and descending stair flights

The section D2.4 outlines Separation of rising and descending stair flights. The design of 49 Victoria project is complied with all the categories required in this section.

D2.13 Goings and risers

The section D2.13 outlines Going and Risers for the stair way construction. The stairway designed in project 49 Victoria is complied with all the categories in this section. (Refer the construction drawings package)

D2.14 Landings

The section D2.14 outlines Landings in a stairway. This section will be complied in the design stairway of 49 Victoria project.

D2.15 Thresholds

The section D2.15 outlines Thresholds of a doorway. This section will be complied in the design of 49 Victoria project.

D2.17 Handrails

The section D2.17 outlines Handrails design. This section will be complied in the design of 49 Victoria project.

D3: Access for people with a disability

D3.1 Deemed -to-Satisfy Provisions

(a) Where a Deemed-to-Satisfy Solution is proposed, Performance Requirements DP1 to DP6, DP8 and DP9 are satisfied by complying with—

(i) D1.1 to D1.16, D2.1 to D2.25 and D3.1 to D3.12; and

(ii) in a building containing an atrium, Part G3; and

(iii) in a building in an alpine area, Part G4; and

(iv) for additional requirements for Class 9b buildings, Part H1; and

(v) for public transport buildings, Part H2.

(b) Where a Performance Solution is proposed, the relevant Performance Requirements must be determined in accordance with A2.2(3) and A2.4(3) as applicable.

(c) Performance Requirement DP7 must be complied with if lifts are to be used to assist occupants to evacuate a building.

D3.2 Access to buildings

The section D3.2 outlines Access to buildings for people with a disability. The design of 49 Victoria is complied with all the requirements of this section.

D3.6 Signage

The section D3.6 outlines Signage to building for people with disability. This requirements in this section will be complied with the design of 49 Victoria.

D3.7 Hearing augmentation

The section D3.7 outlines Hearing augmentation.

ASSESSEMENT AND APPLICATION OF NCC | BUILDING CODE OF AUSTRALIA 2019 - VOLUME 1

(a) A hearing augmentation system must be provided where an inbuilt amplification system, other than one used only for emergency warning, is installed—

(i) in a room in a Class 9b building

This section will be complied with the design of the project.

D3.8 Tactile indicators

The section D3.8 outlines Tactile indicators to building for people with disability. This requirement will be incorporated into the design of 49 Victoria project.

D3.12 Glazing on an accessway

The section D3.12 outlines Glazing on an accessway. On an accessway, where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1. This requirement will be complied in the design for entrance glazing of 49 Victoria project.

SECTION E: SERVICES AND EQUIPMENT

Leave this section

SECTION F: HEALTH AND AMENITY

F3 Room heights

F4 Light and ventilation

F5 Sound transmission and insulation

The structure was designed with careful consideration given to the position of the sun and the prevailing winds, and a sizable atrium was positioned in the building's core. The layout of 49 Victoria will allow natural light to penetrate the apartments as well as the rest of the building. Additionally, the vast atrium that will be located in the building's midsection will contribute to the creation of natural ventilation across the entire structure. In order to be in compliance with the NCC 2019, the room height in each apartment will be designed at least 2.4 metres.

SECTION G ANCILLARY PROVISIONS

Leave this section

SECTION H: SPECIAL USE BUILDINGS

Leave this section

SECTION J: ENERGY EFFICIENCY

J0 Energy efficiency

J1 Building fabric

J3 Building sealing

J5 Air-conditioning and ventilation system

J6 Artificial lighting and power

J7 Heated water supply and swimming pool and spa pool plant

J8 Facilities for energy mornitoring

10. VISUALIZATION

NORTH WEST VIEW

SOUTH WEST VIEW

COMMUNAL AREA - CAFE

OUT DOOR AREA - PAVILION

RESTAURANT

ENTRANCE

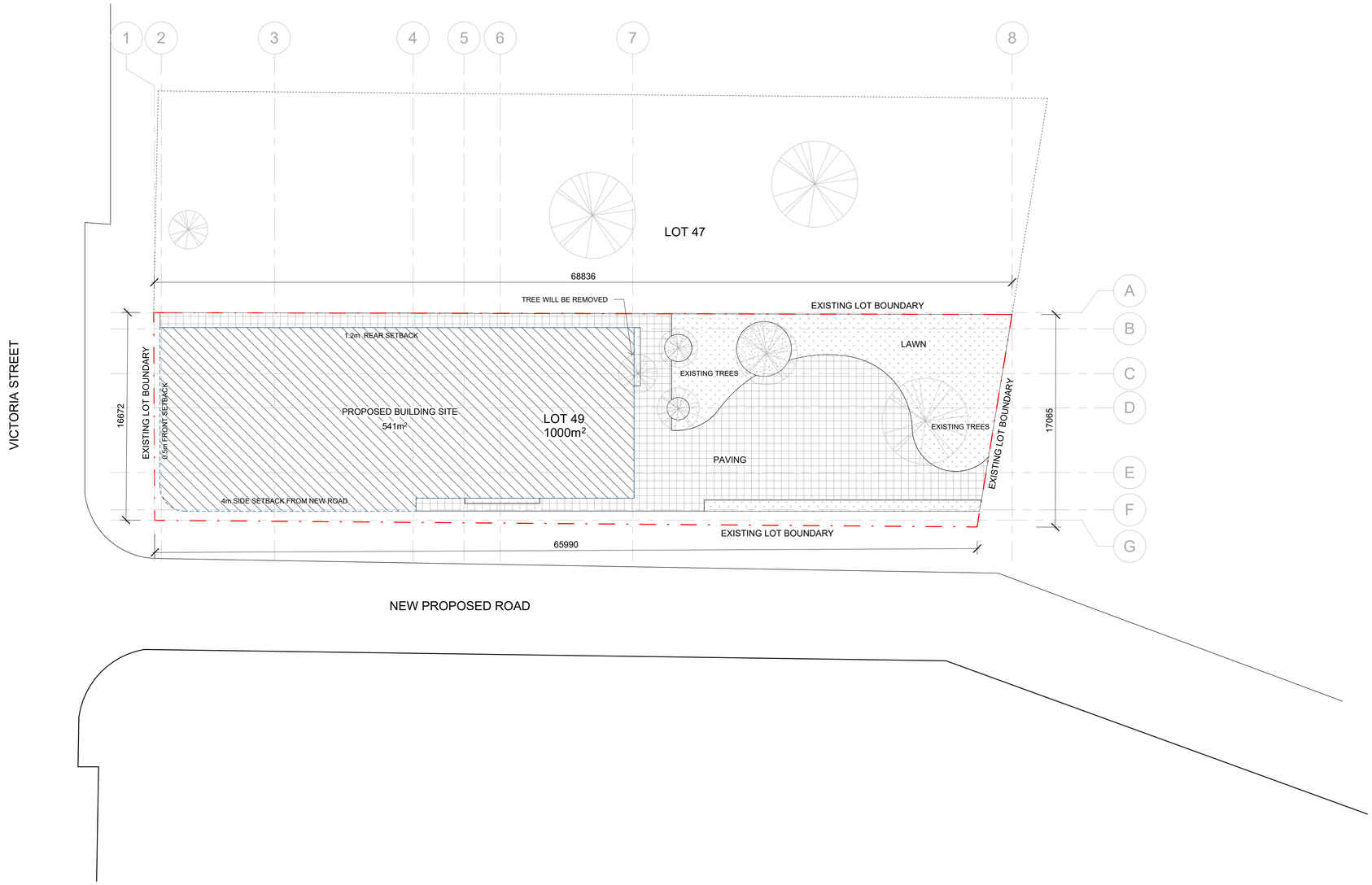
ENTRANCE LOBBY

ATRIUM - LOBBY

VIEW TO ATRIUM FROM LEVEL 2

VIEW TO LEVEL 3 GARDEN

11. CONSTRUCTION DRAWING



1 / A101 SITE PLAN

1 : 200

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

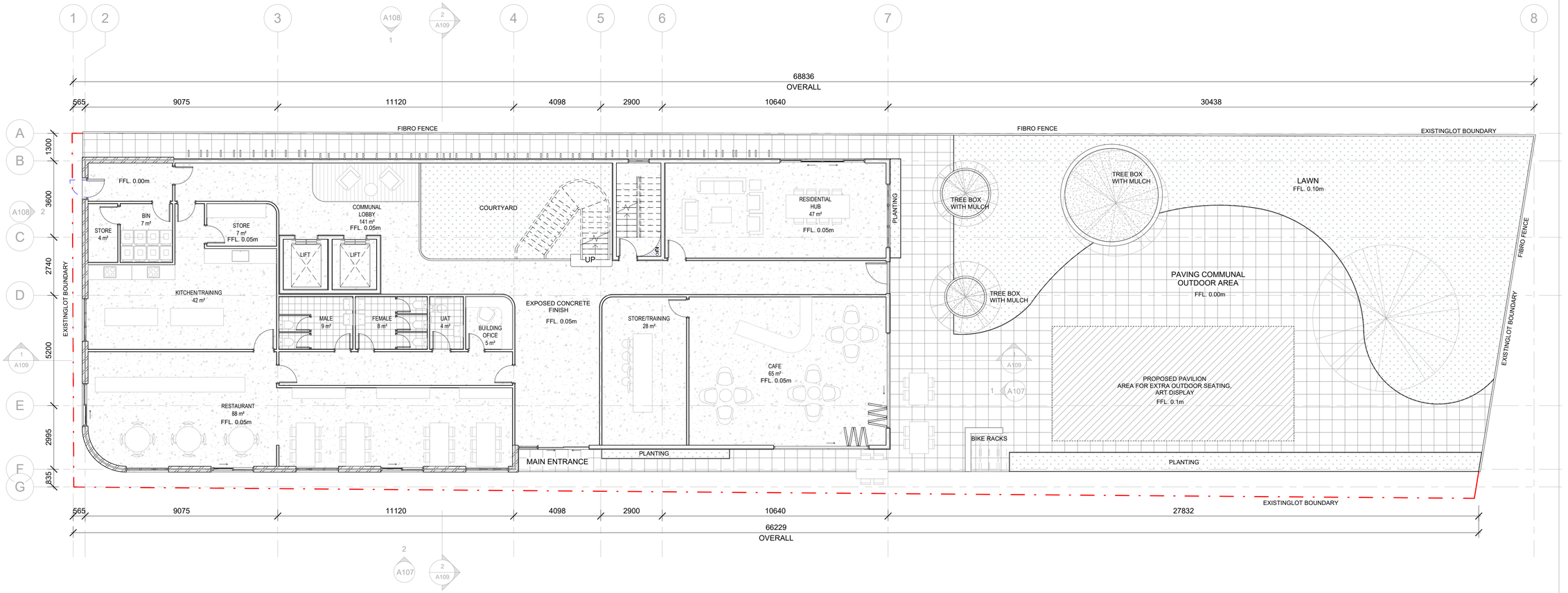
DRAWING NAME

SITE PLAN

SCALE 1 : 200 (A1)

0 1 2 3 4 5 6 M

PROJECT No.	DRAWING No.	REV
0001	A101	



1 / A102 GROUND FLOOR

1 : 100

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

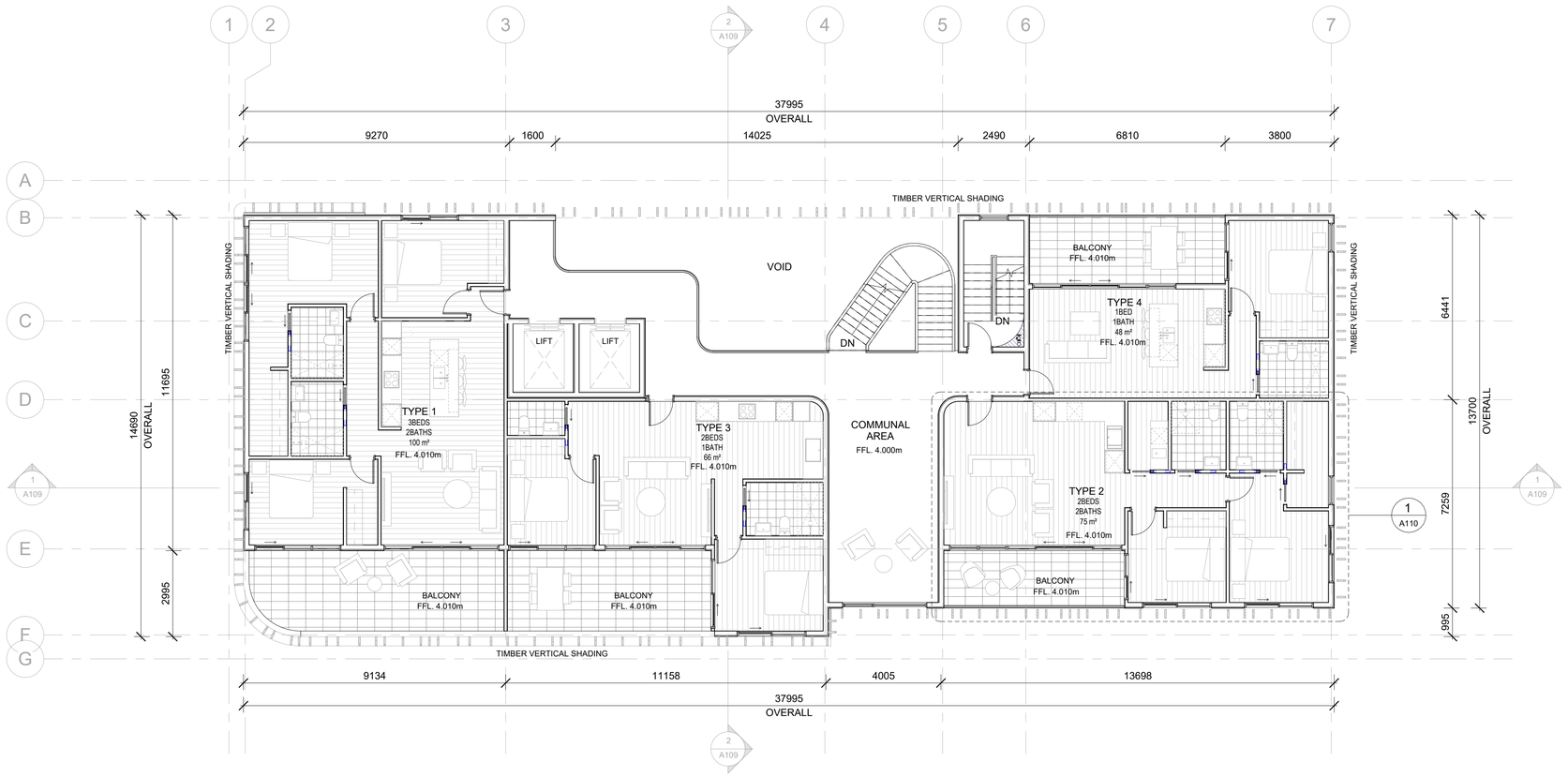
DRAWING NAME

GROUND FLOOR PLAN

SCALE 1 : 100 (A1)

0 1 2 3 4 5 6 M

PROJECT No.	DRAWING No.	REV
0001	A102	



1 / A103 LEVEL 1

1 : 100

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

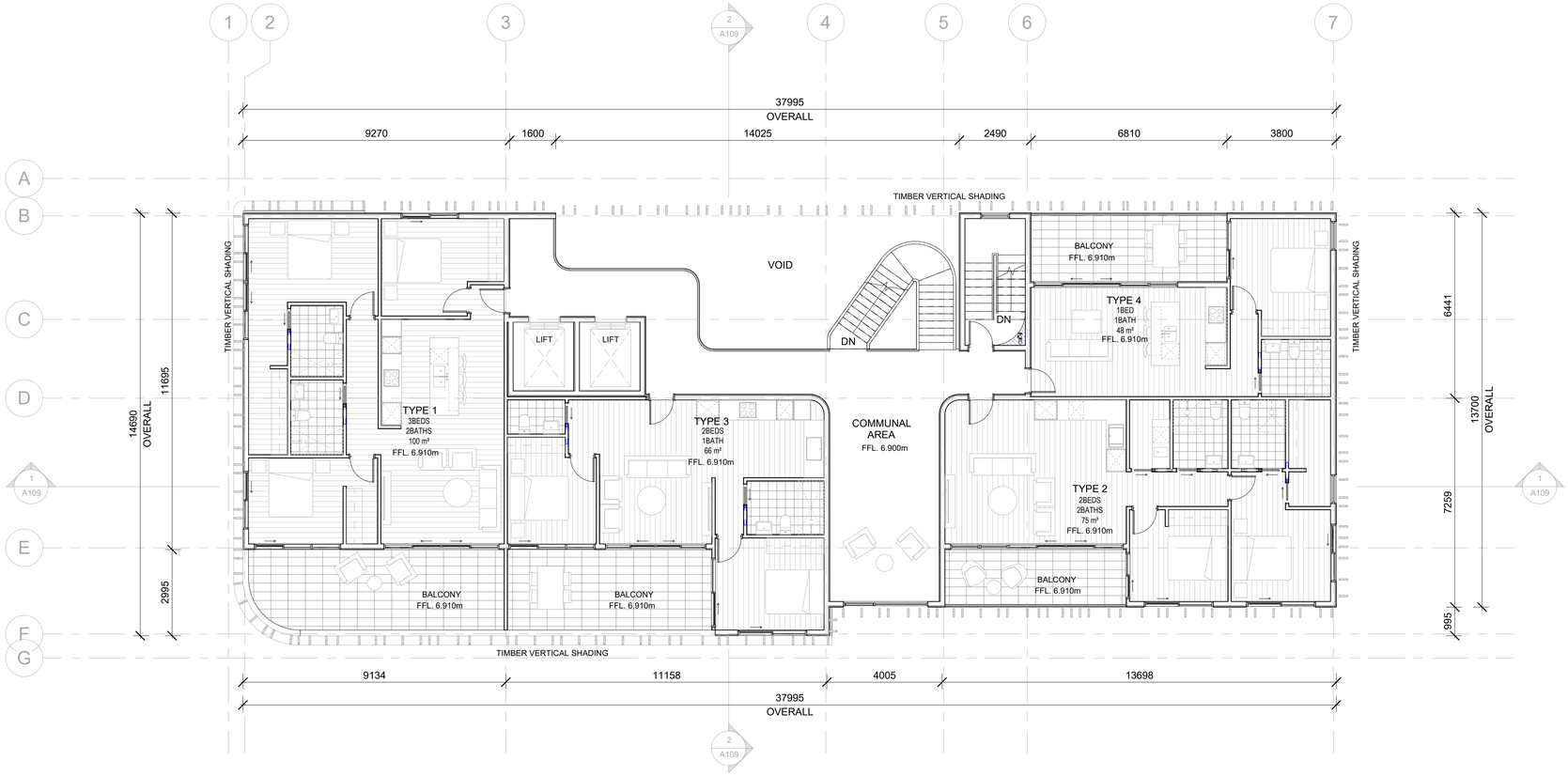
DRAWING NAME

LEVEL 1 PLAN

SCALE 1 : 100 (A1)

0 1 2 3 4 5 6 M

PROJECT No.	DRAWING No.	REV
0001	A103	



1
A104
LEVEL 2
1 : 100

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

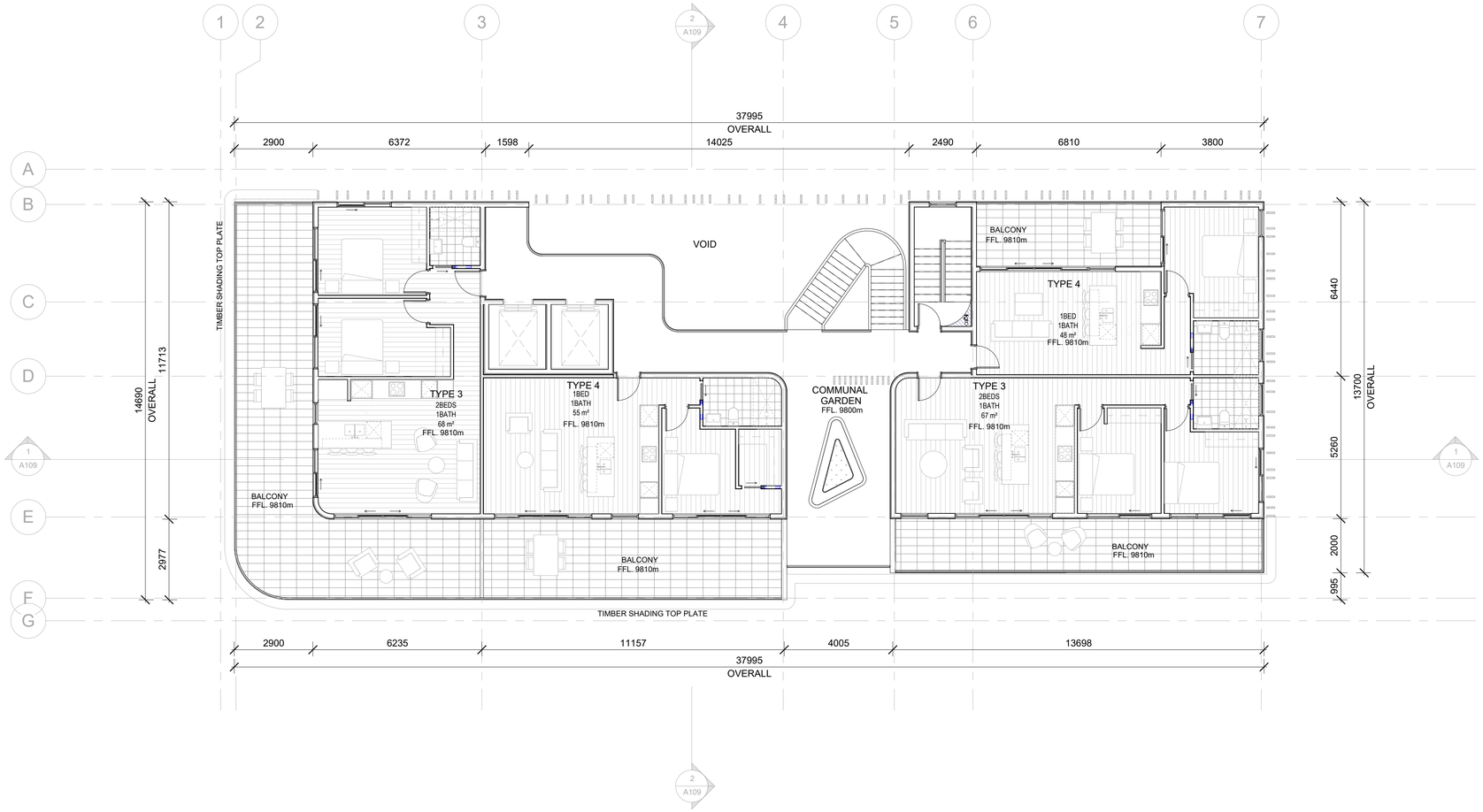
DRAWING NAME

LEVEL 2 PLAN

SCALE 1 : 100 (A1)

0 1 2 3 4 5 6 M

PROJECT No.	DRAWING No.	REV
0001	A104	



1 / A105 LEVEL 3

1 : 100

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

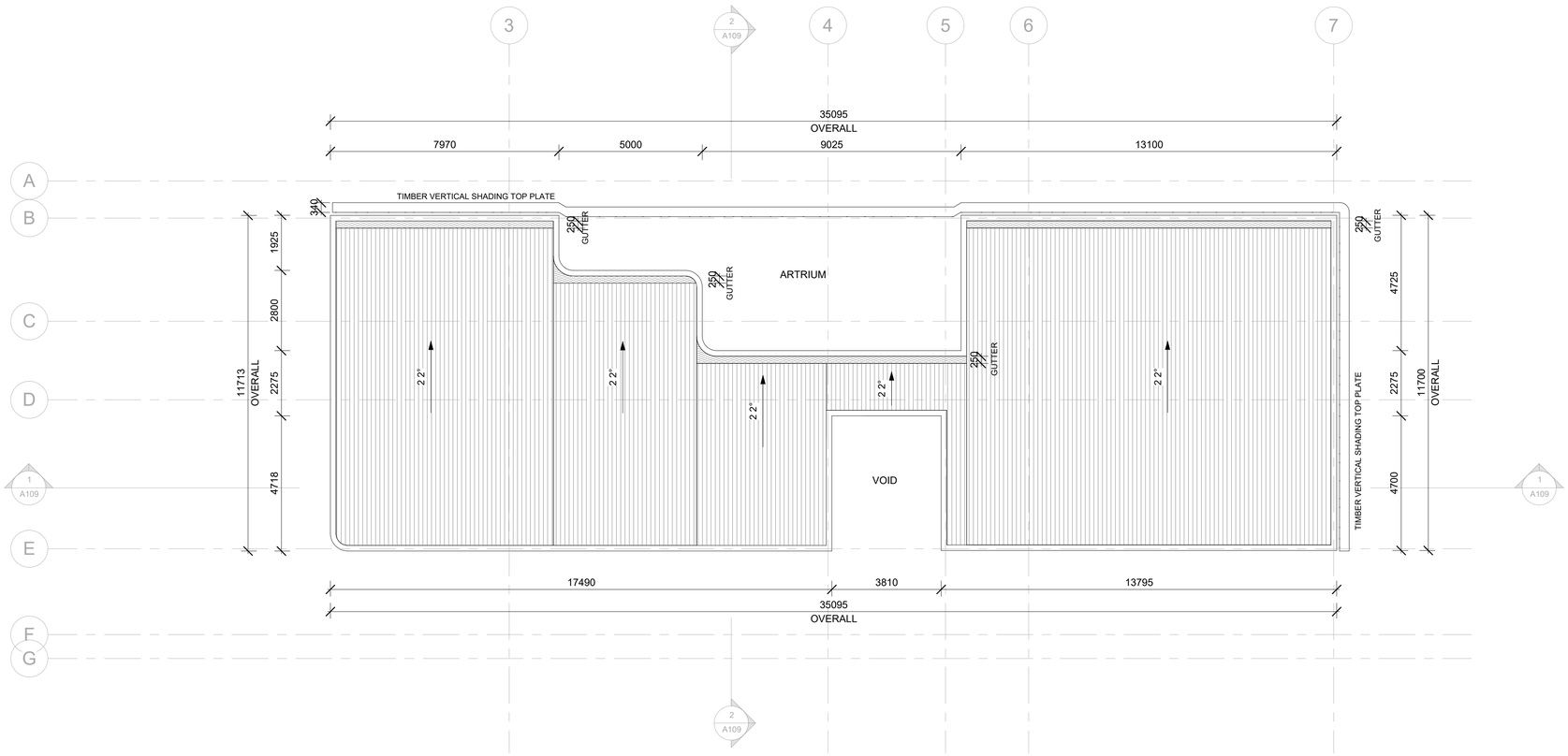
DRAWING NAME

LEVEL 3 PLAN

SCALE 1 : 100 (A1)

0 1 2 3 4 5 6 M

PROJECT No.	DRAWING No.	REV
0001	A105	



1 / A106 ROOF
1 : 100

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

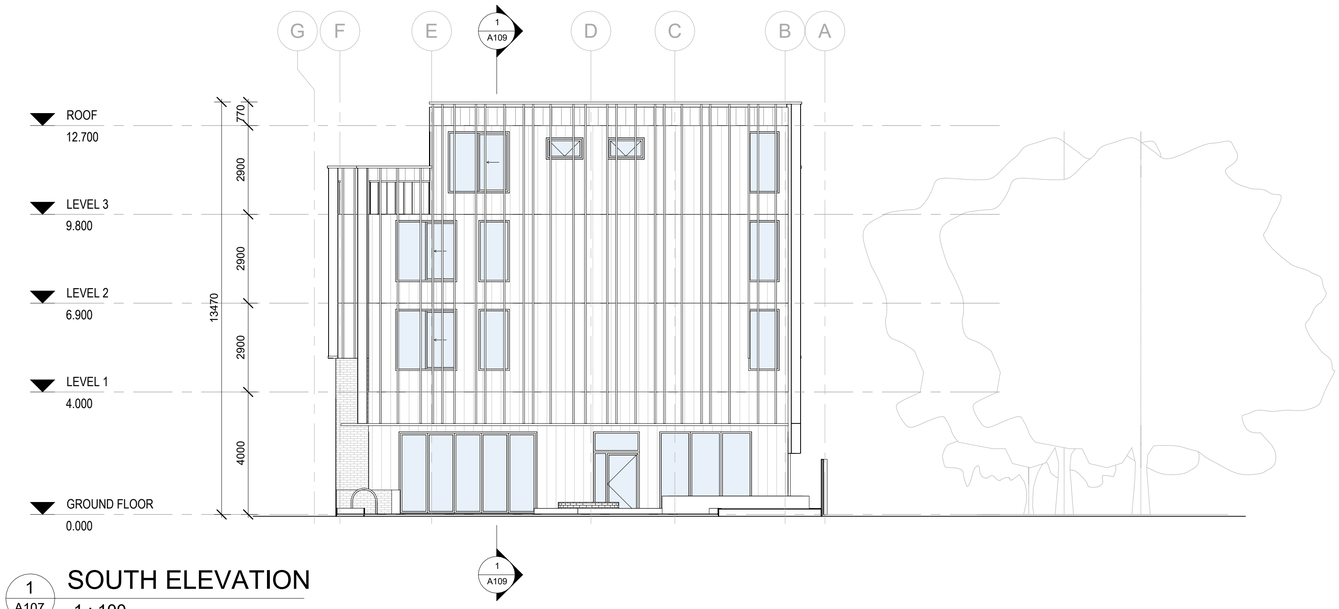
DRAWING NAME

ROOF PLAN

SCALE 1 : 100 (A1)

0 1 2 3 4 5 6 M

PROJECT No.	DRAWING No.	REV
0001	A106	



1 / A107 SOUTH ELEVATION

1 : 100

2 / A107 WEST ELEVATION

1 : 100

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

DRAWING NAME

ELEVATIONS

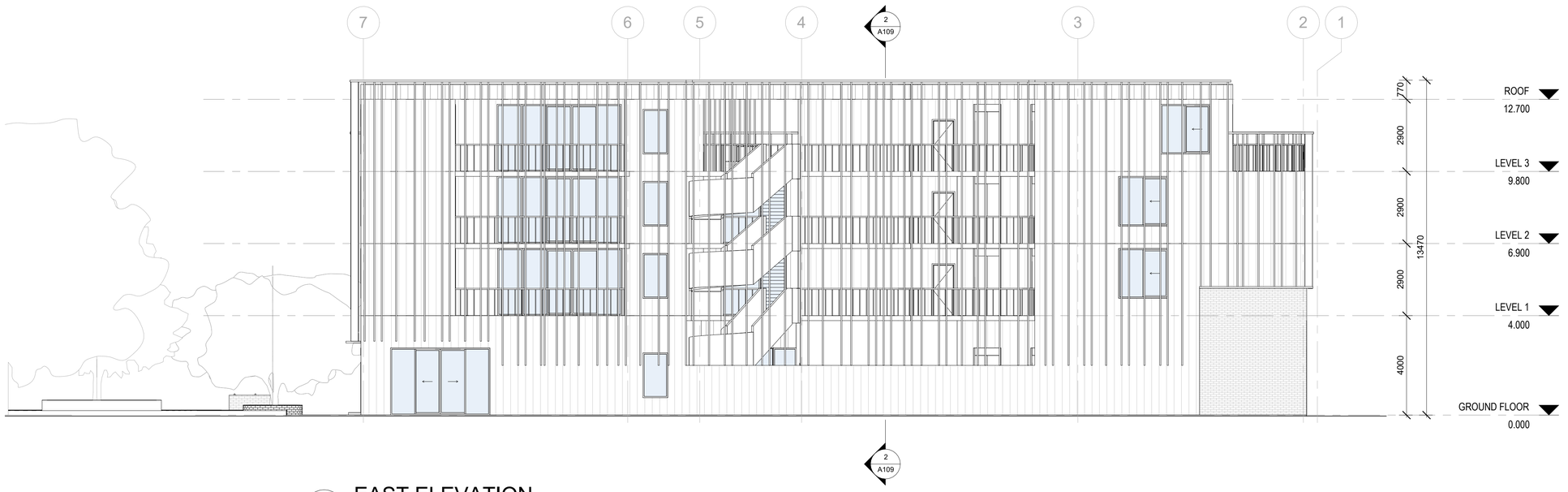
SCALE 1 : 100 (A1)

0 1 2 3 4 5 6 M

PROJECT No.	DRAWING No.	REV
0001	A107	

2 A108 NORTH ELEVATION

1 : 100



1 A108 EAST ELEVATION

1 : 100

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

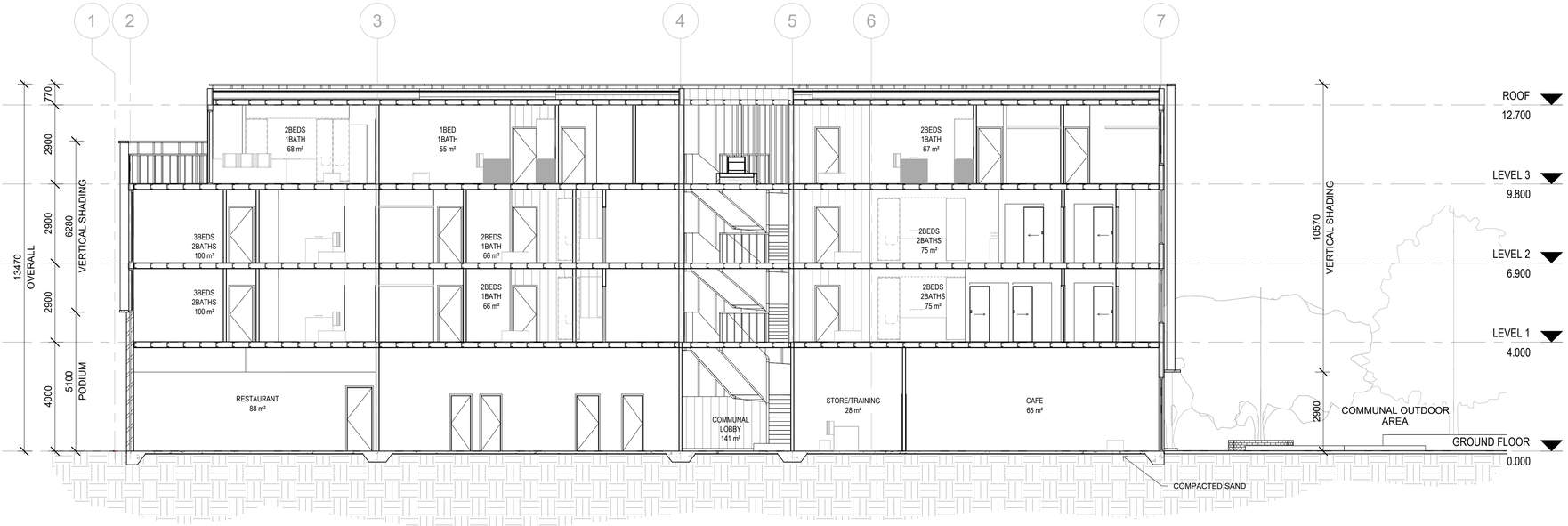
DRAWING NAME

ELEVATIONS

SCALE 1 : 100 (A1)

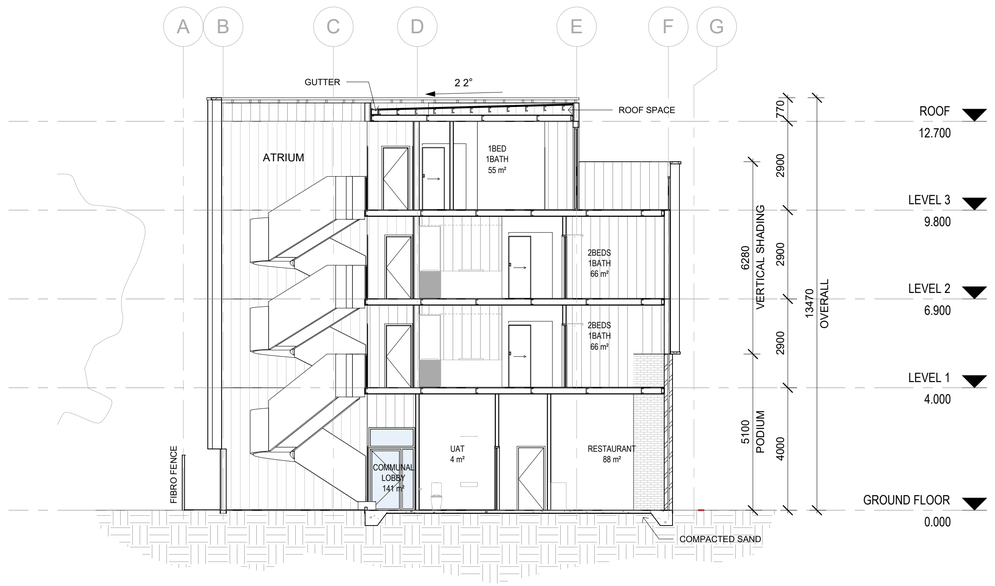
0 1 2 3 4 5 6 M

PROJECT No.	DRAWING No.	REV
0001	A108	



1 / A109 SECTION 1

1 : 100



2 / A109 SECTION 2

1 : 100

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

DRAWING NAME

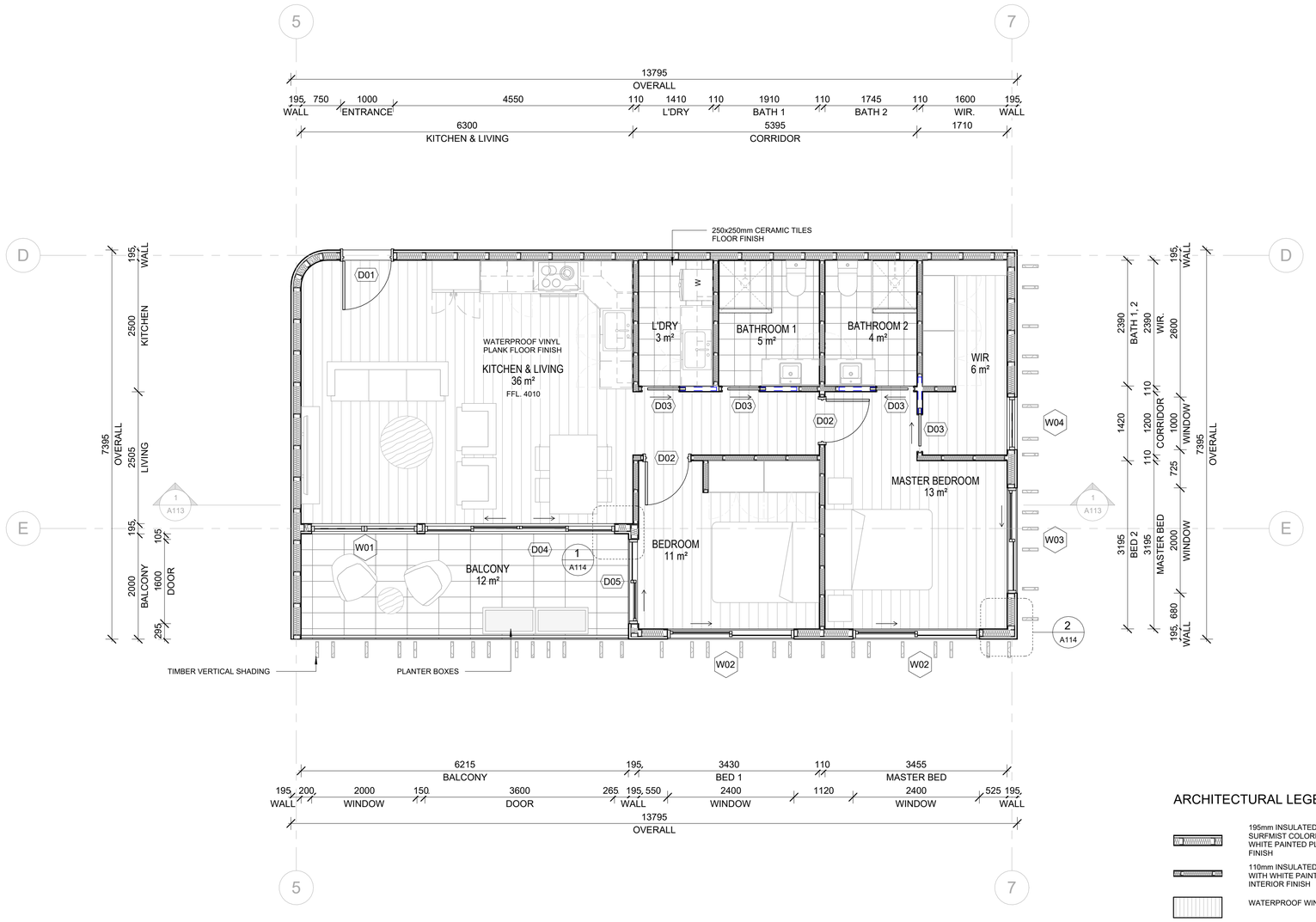
SECTIONS

SCALE

1 : 100 (A1)

0 1 2 3 4 5 6 M

PROJECT No.	DRAWING No.	REV
0001	A109	



ARCHITECTURAL LEGEND

- 195mm INSULATED STEEL STUDWALL, SURFMIST COLORBOND EXTERIOR FINISH, WHITE PAINTED PLASTERBOARD INTERIOR FINISH
- 110mm INSULATED INTERNAL STEEL STUDWALL, WITH WHITE PAINTED PLASTERBOARD INTERIOR FINISH
- WATERPROOF WINYL PLANK FLOOR FINISH
- 250x250mm CERAMIC TILES FLOOR FINISH FOR LAUNDRY, TOILET, BATHROOMS
- 300x600mm CERAMIC TILE FOR BALCONY
- FFL. FINISH FLOOR LEVEL

1 / A110 TYPE 2 MODULE FLOOR PLAN

1 : 50

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

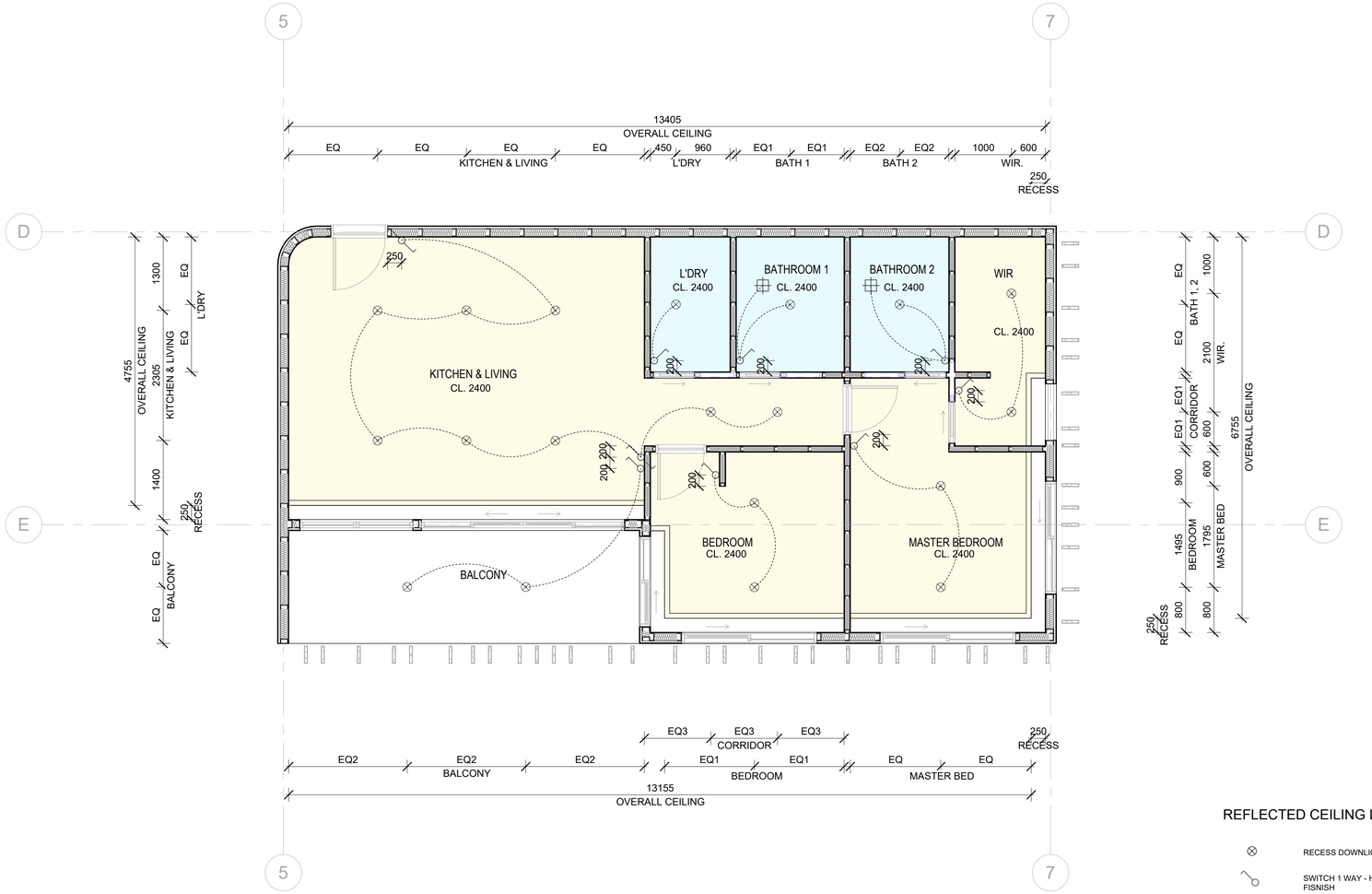
DRAWING NAME

TYPE 2 MODULE FLOOR PLAN

SCALE 1 : 50 (A1)

0 0.5 1 1.5 2 2.5 3 M

PROJECT No.	DRAWING No.	REV
0001	A110	



1 / A111 REFLECTED CEILING PLAN

1 : 50

REFLECTED CEILING LEGEND

- RECESS DOWNLIGHT
- SWITCH 1 WAY - HEIGHT 1100 ABOVE FLOOR FISNISH
- SWITCH 2 WAYS - HEIGHT 1100 ABOVE FLOOR FINISH
- EXHAUST FAN
- MOISTURE PAINTED PLASTERBOARD
- PAINTED PLASTERBOARD
- CL xxxx — ABOVE FLOOR FINISH CEILING LEVEL

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

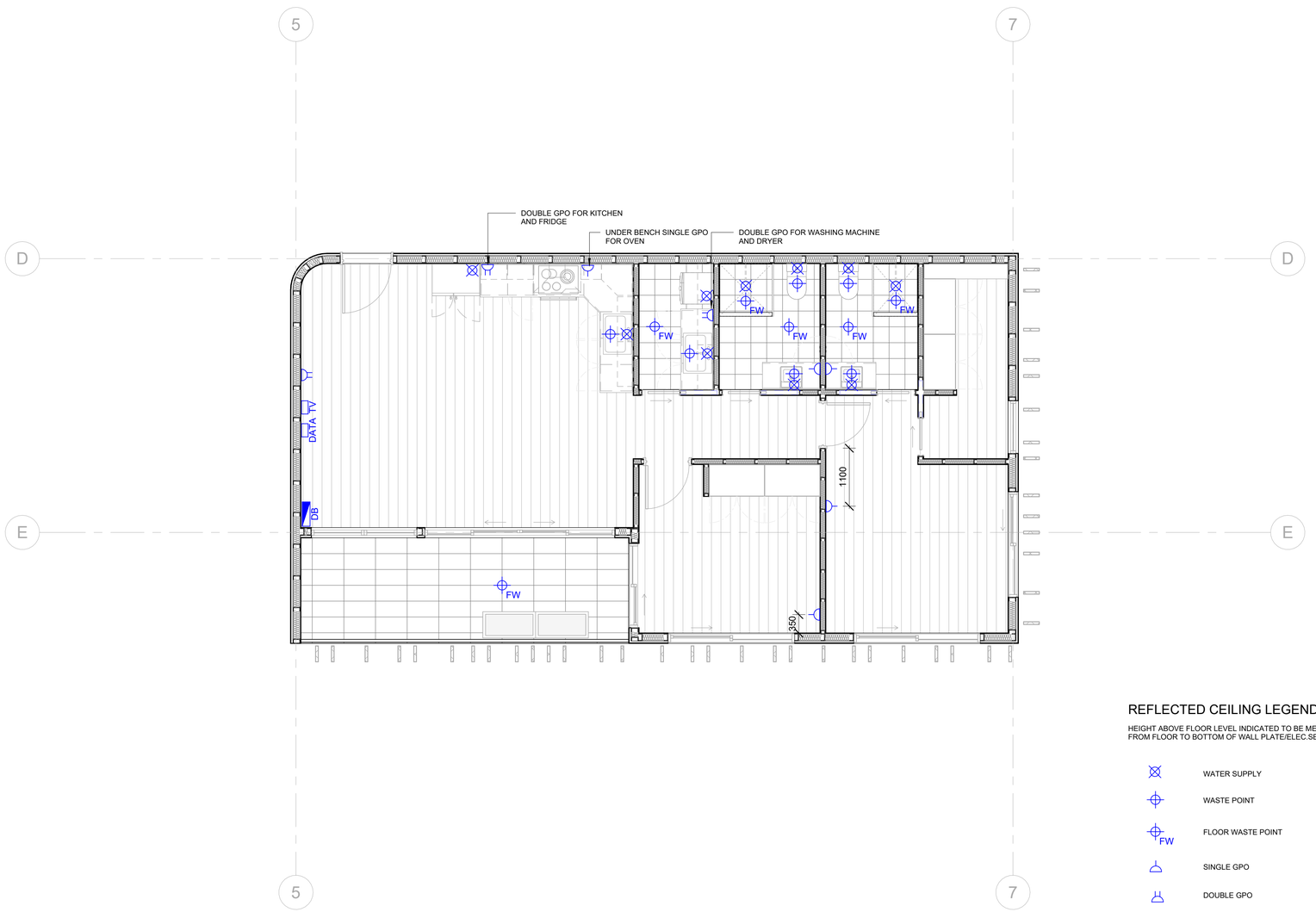
DRAWING NAME

REFLECTED CEILING PLAN

SCALE 1 : 50 (A1)

0 0.5 1 1.5 2 2.5 3 M

PROJECT No.	DRAWING No.	REV
0001	A111	



1 A112 SERVICES PLAN

1 : 50

REFLECTED CEILING LEGEND

HEIGHT ABOVE FLOOR LEVEL INDICATED TO BE MEASURED FROM FLOOR TO BOTTOM OF WALL PLATE/ELEC.SERVICES

- WATER SUPPLY
- WASTE POINT
- FW — FLOOR WASTE POINT
- SINGLE GPO
- DOUBLE GPO
- TV — TV POINT (RJ45 CONNECTION)
- DATA — NETWORK/INTERNET DATA POINT
- DB — DISTRIBUTION BOARD

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

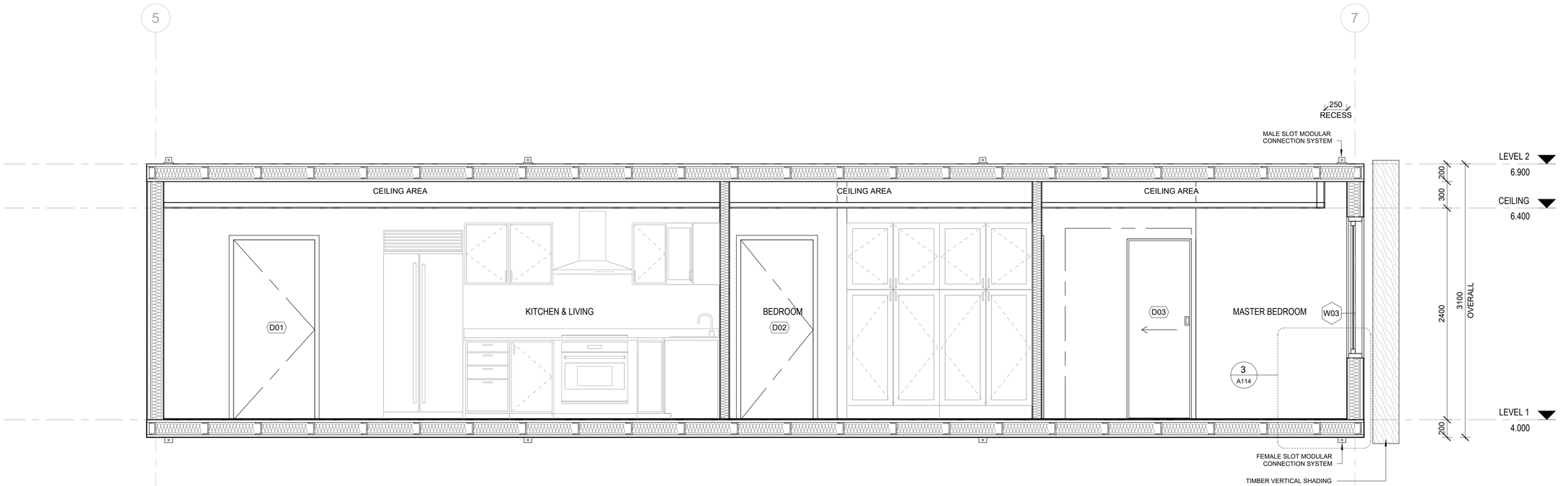
DRAWING NAME

SERVICES PLAN

SCALE 1 : 50 (A1)

0 0.5 1 1.5 2 2.5 3 M

PROJECT No.	DRAWING No.	REV
0001	A112	



1
A113

INTERNAL ELEVATION 1

1 : 25

2
A113

INTERNAL ELEVATION 2

1 : 25

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

DRAWING NAME

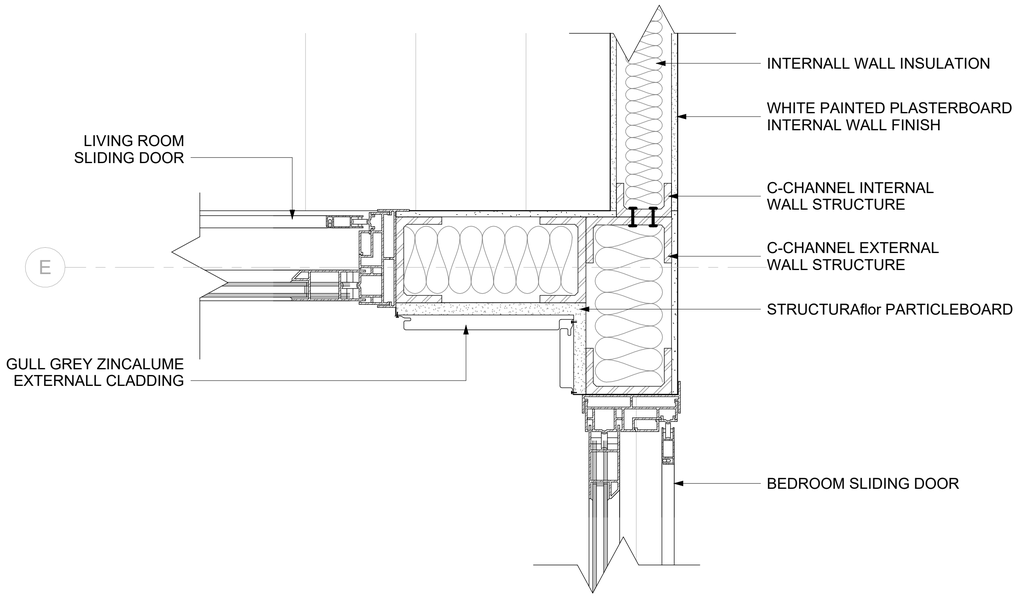
INTERNAL ELEVATIONS

SCALE

1 : 25 (A1)

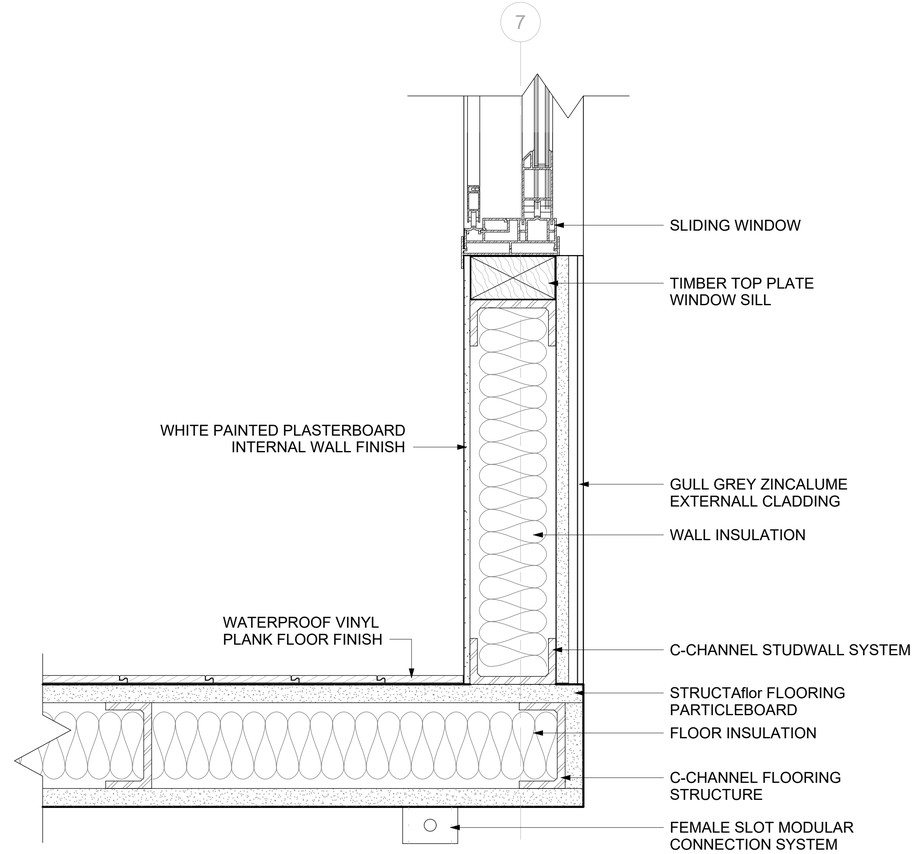
0 0.2 0.4 0.6 0.8 1.0 1.2M

PROJECT No.	DRAWING No.	REV
0001	A113	



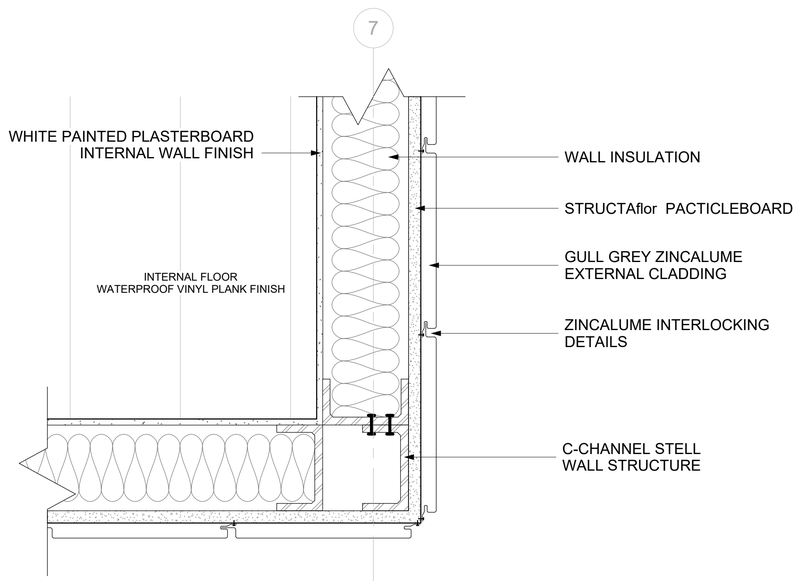
1 A114 PLAN DETAIL 1

1 : 5



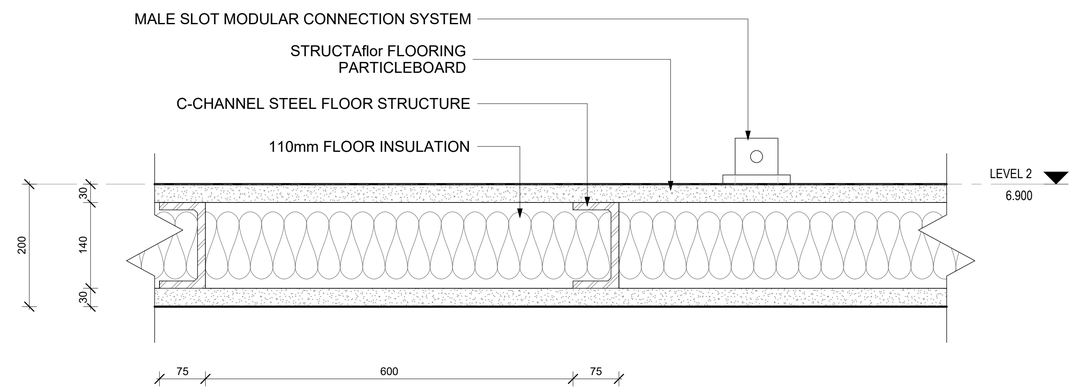
3 A114 INTERNAL ELEVATION DETAIL 1

1 : 5



2 A114 PLAN DETAIL 2

1 : 5



4 A114 INTERNAL ELEVATION DETAIL 2

1 : 5

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

DRAWING NAME

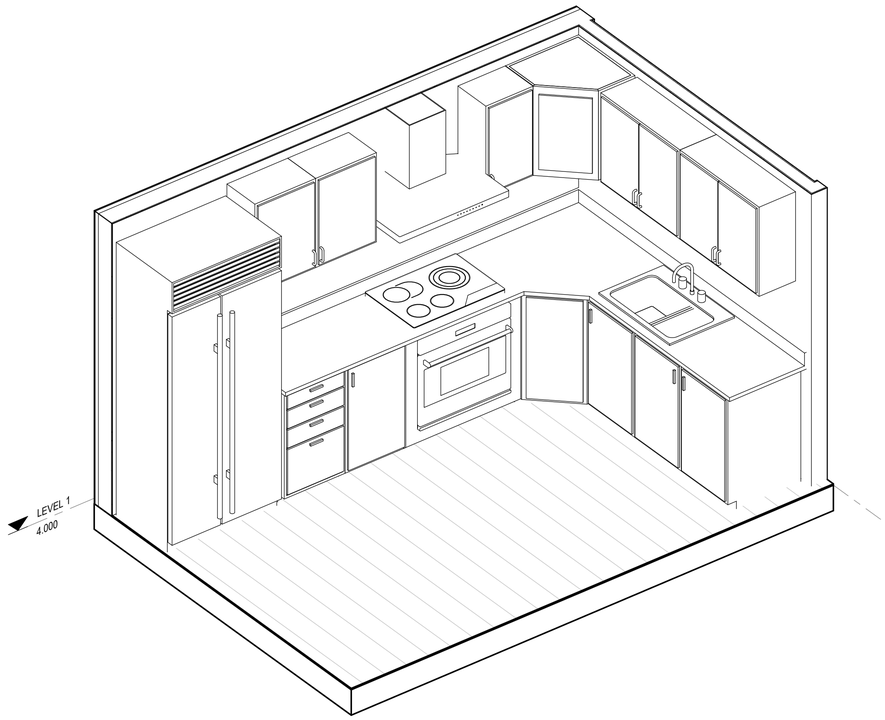
DETAILS

SCALE

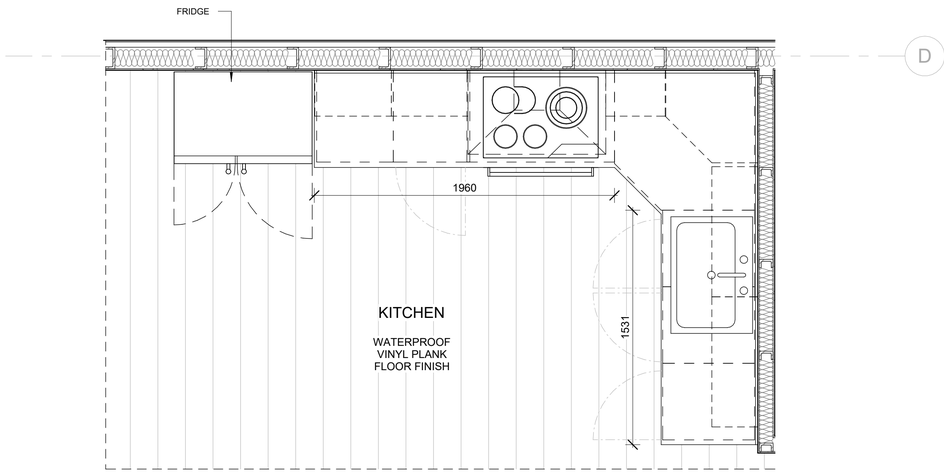
1 : 5 (A1)

0 0.1 0.2 0.3 0.4 0.5 0.6 M

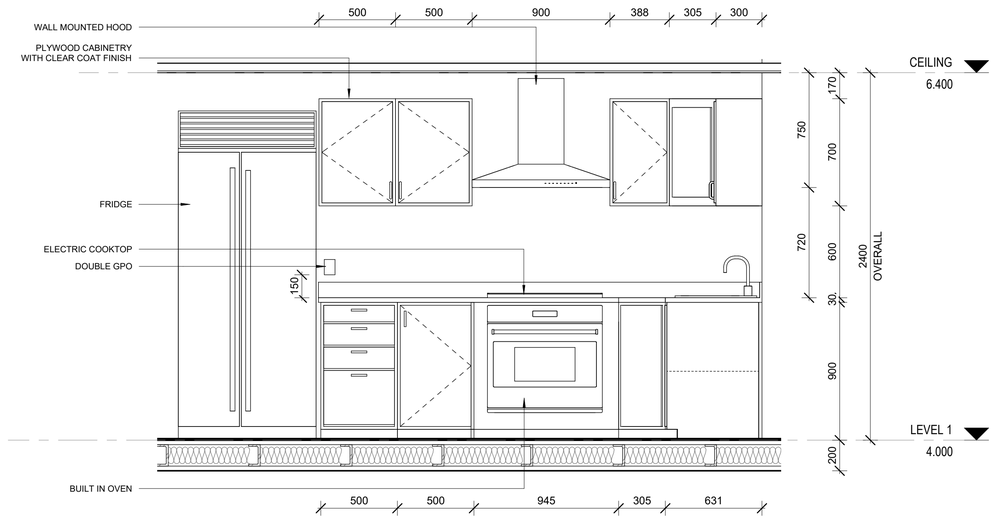
PROJECT No.	DRAWING No.	REV
0001	A114	



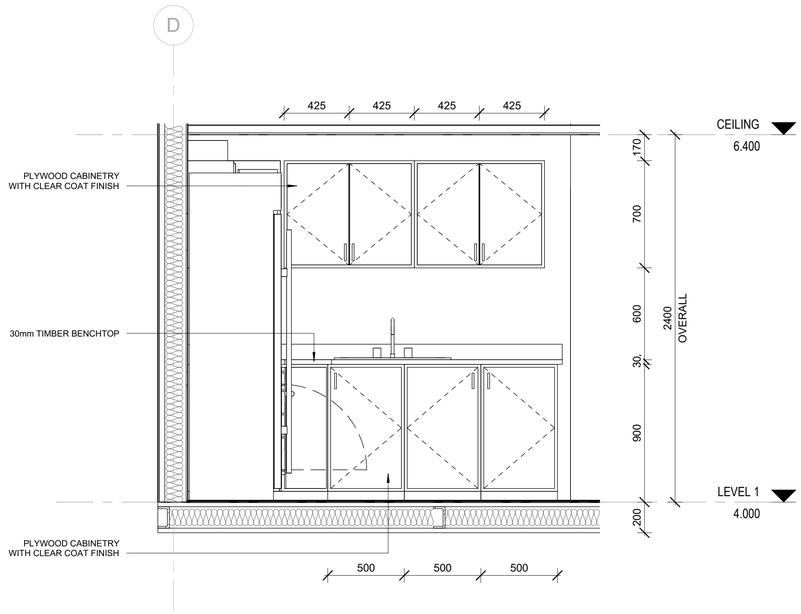
1 A115 KITCHEN ISOMETRIC



2 A115 KITCHEN PLAN
1 : 20



3 A115 KITCHEN ELEVATION 1
1 : 20



4 A115 KICHEN ELEVATION 2
1 : 20

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

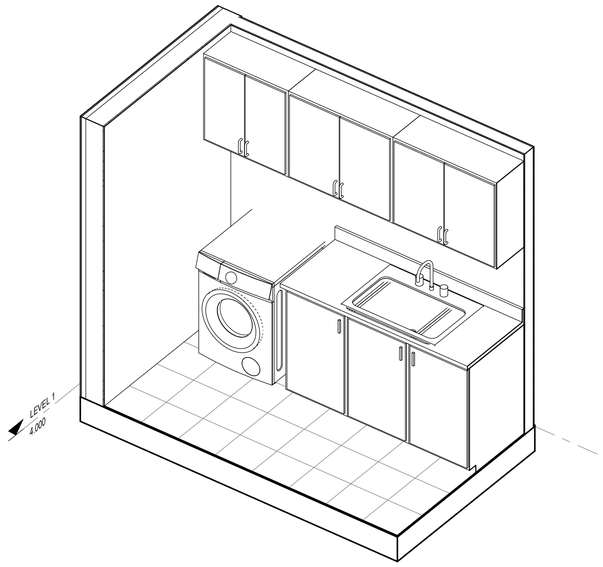
DRAWING NAME

KITCHEN DETAILS

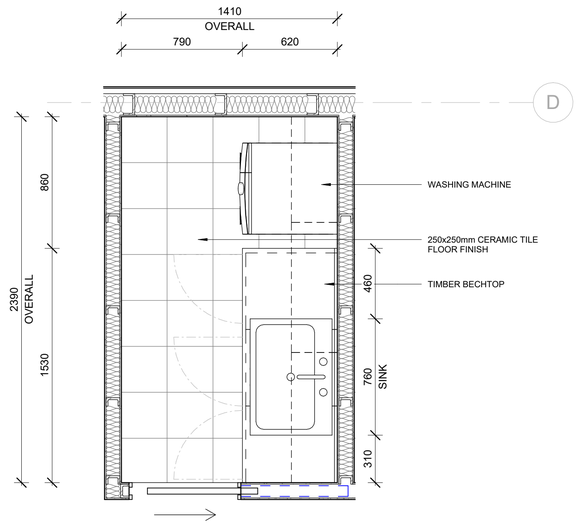
SCALE 1 : 20 (A1)

0 0.2 0.4 0.6 0.8 1.0 1.2M

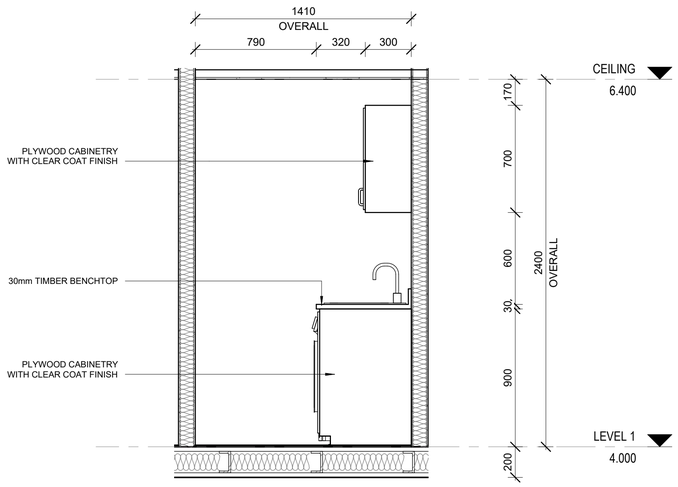
PROJECT No.	DRAWING No.	REV
0001	A115	



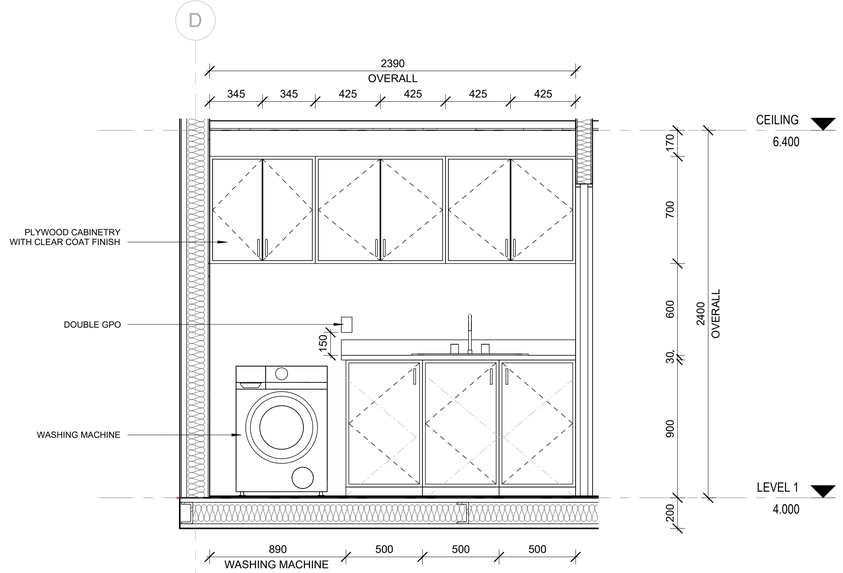
1 A116 LAUNDRY ISOMETRIC



2 A116 LAUNDRY PLAN
1 : 20



3 A116 LAUNDRY ELEVATION 1
1 : 20



4 A116 LAUNDRY ELEVATION 2
1 : 20

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

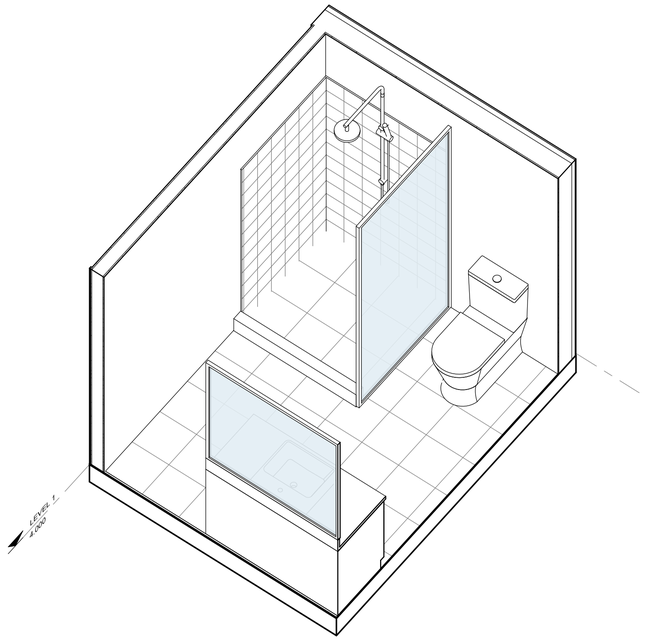
DRAWING NAME

LAUNDRY DETAILS

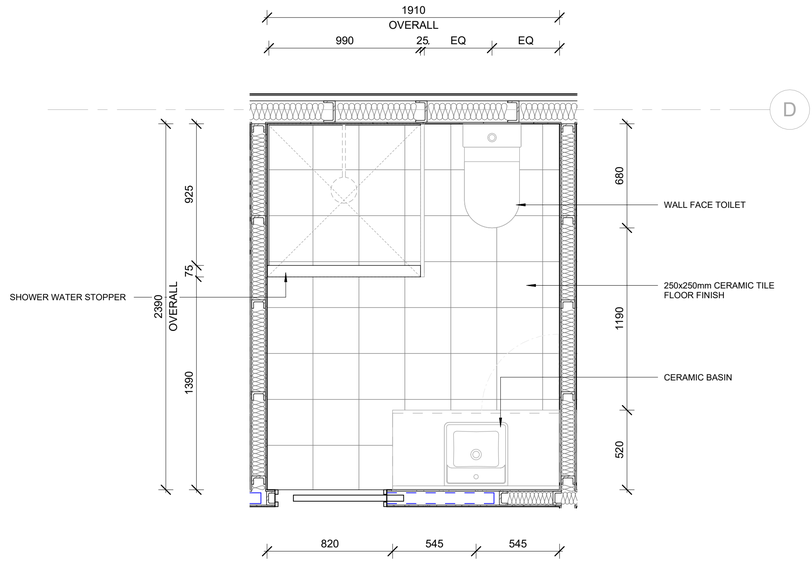
SCALE 1 : 20 (A1)

0 1 2 3 4 5 6 M

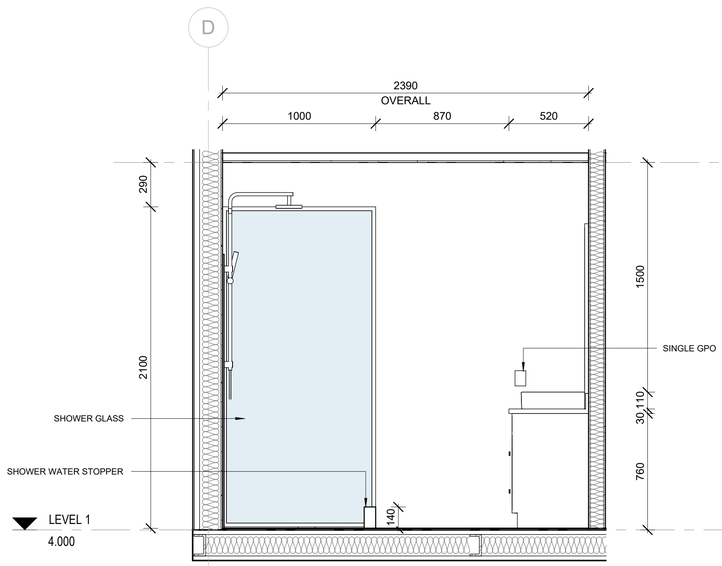
PROJECT No.	DRAWING No.	REV
0001	A116	



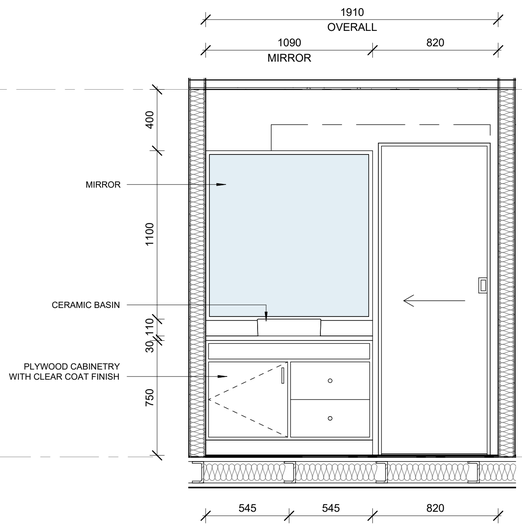
1 A117 BATHROOM ISOMETRIC



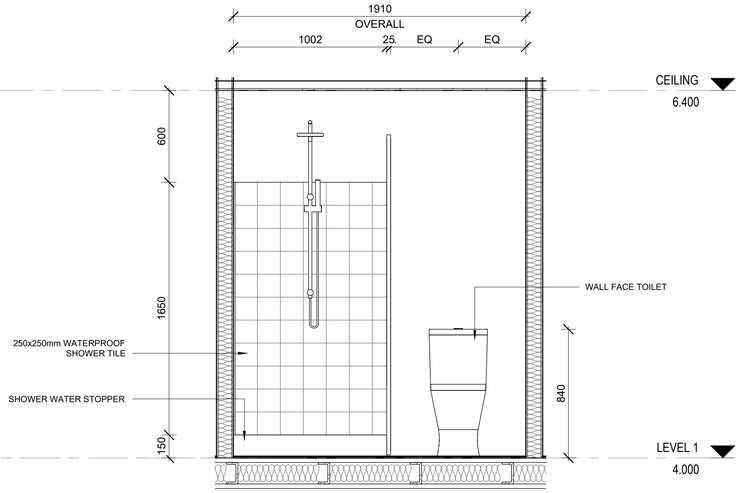
2 A117 BATHROOM PLAN
1 : 20



3 A117 BATHROOM ELEVATION 1
1 : 20



4 A117 BATHROOM ELEVATION 2
1 : 20



5 A117 BATHROOM ELEVATION 3
1 : 20

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

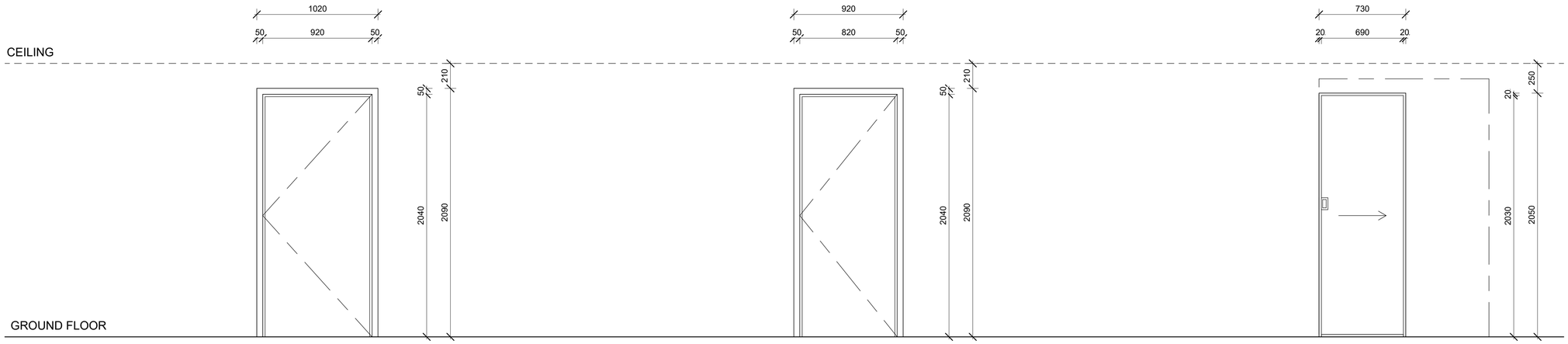
DRAWING NAME

BATHROOM DETAILS

SCALE 1 : 20 (A1)

0 1 2 3 4 5 6 M

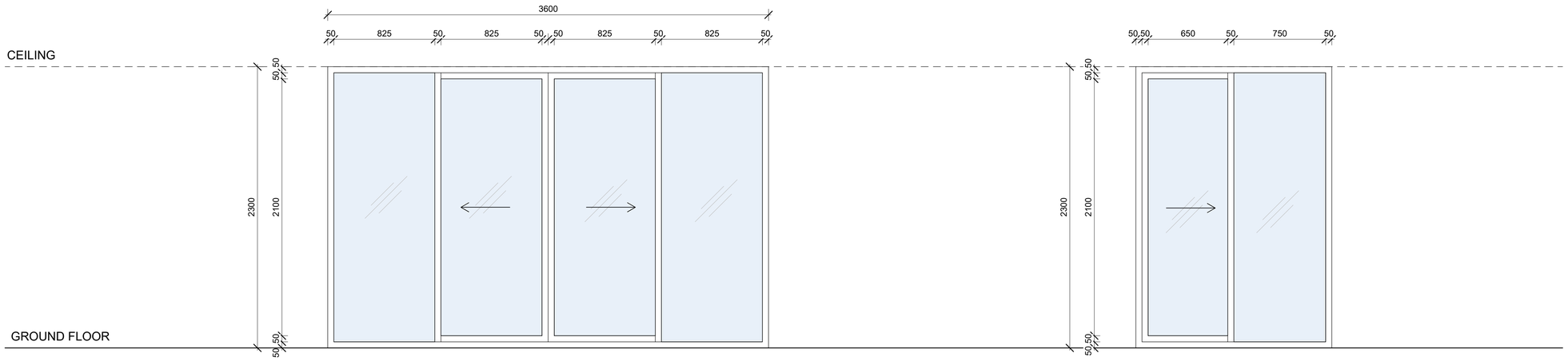
PROJECT No.	DRAWING No.	REV
0001	A117	



DOOR MARK	D01		
DOOR TYPE	FLUSH PANEL - FRONT ENTRANCE		
FRAME	TIMBER FRAME		
PANEL	TIMBER PANEL		
HANDLE	STAINLESS STELL COATED BLACK AISI304		
APPLIED FINISH	CLEAR COATED WHITE FRAMED		

DOOR MARK	D02	**COUNT**	2
DOOR TYPE	FLUS PANEL - BEDROOM, MASTER BEDROOM		
FRAME	TIMBER FRAME		
PANEL	TIMBER PANEL		
HANDLE	STAINLESS STELL COATED BLACK AISI304		
APPLIED FINISH	CLEAR COATED WHITE FRAMED		

DOOR MARK	D03	**COUNT**	4
DOOR TYPE	CAVITY SLIDING - LAUNDRY, BATHROOM, TOILET		
FRAME	TIMBER FRAME		
PANEL	TIMBER PANEL		
HANDLE	STAINLESS STELL COATED BLACK AISI304		
APPLIED FINISH	CLEAR COATED WHITE FRAMED		



DOOR MARK	D04
DOOR TYPE	SLIDING - LIVING AND BALCONY ACESS
FRAME	NIGHT SKY ALUMINIUM FRAME
PANEL	GLASS
HANDLE	STAINLESS STELL COATED BLACK AISI304
GLAZING	DOUBLE GLAZING

DOOR MARK	D05
DOOR TYPE	SLIDING - BEDROOM
FRAME	NIGHT SKY ALUMINIUM FRAME
PANEL	GLASS
HANDLE	STAINLESS STELL COATED BLACK AISI304
APPLIED FINISH	DOUBLE GLAZING

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

DRAWING NAME

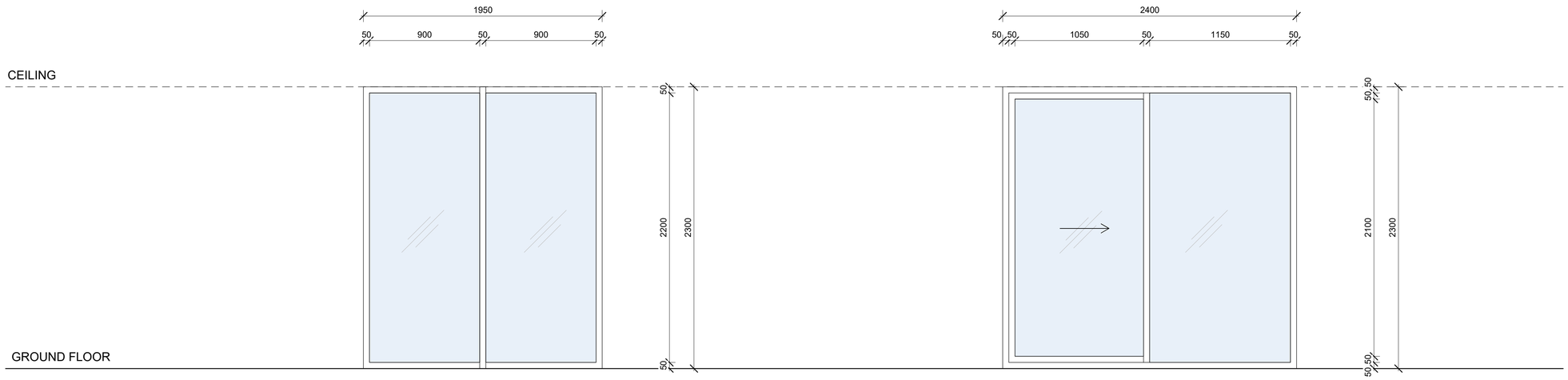
DOOR SCHEDULE

SCALE

1 : 20 (A1)

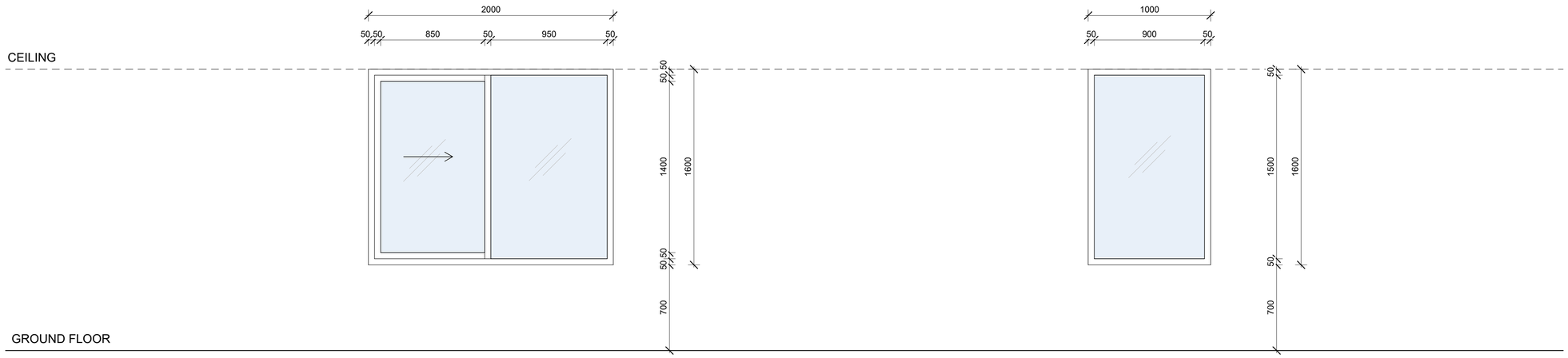
0 0.2 0.4 0.6 0.8 1.0 1.2M

PROJECT No.	DRAWING No.	REV
0001	A118	



WINDOW MARK	W01
WINDOW TYPE	FIXED WINDOW - LIVING ROOM
FRAME	NIGHT SKY ALUMINIUM FRAME
PANEL	GLASS
HANDLE	STAINLESS STELL COATED BLACK AISI304
GLAZING	DOUBLE GLAZING

WINDOW MARK	W02	**COUNT**	2
WINDOW TYPE	FULL HEIGHT SLIDING - BEDROOM		
FRAME	NIGHT SKY ALUMINIUM FRAME		
PANEL	GLASS		
HANDLE	STAINLESS STELL COATED BLACK AISI304		
APPLIED FINISH	DOUBLE GLAZING		



WINDOW MARK	W03
WINDOW TYPE	SLIDING - MASTER BEDROOM
FRAME	NIGHT SKY ALUMINIUM FRAME
PANEL	GLASS
HANDLE	STAINLESS STELL COATED BLACK AISI304
GLAZING	DOUBLE GLAZING

WINDOW MARK	W04
WINDOW TYPE	FIXED WINDOW - WIR.
FRAME	NIGHT SKY ALUMINIUM FRAME
PANEL	GLASS
HANDLE	STAINLESS STELL COATED BLACK AISI304
APPLIED FINISH	DOUBLE GLAZING

ARCH 6107

PRAXIS STUDIO

STUDENT

THANG LE - 18215119

PROJECT NAME

49 VICTORIA

DRAWING NAME

WINDOW SCHEDULE

SCALE

1 : 20 (A1)

0 1 2 3 4 5 6 M

PROJECT No.	DRAWING No.	REV
0001	A119	