

Sustainability Management Plan

For planning submission
259-269 Unley Road, Malvern

Prepared for: Hygge Property

Project No: ADL0128
Date: 13 April 2026
Revision: 02



Project: Sustainability Management Plan

Location: 259-269 Unley Road
Malvern, South Australia

Prepared by: ADP Consulting Pty Ltd
Adelaide

Project No: ADL0128

Revision: 02

Date: 13 April 2026

Rev	Date	Comment	Author	Signature	Technical Review	Signature	Authorisation & QA	Signature
00	06/11/25	Draft	Vany Gunaratnam	VG				
01	12/11/25	Planning Issue	VG	VG	VH	VH	WC	WC
02	13/04/26	Planning Issue	NH	NH	VH	VH	WC	WC

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Planning Future Urban



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Executive Summary

This Sustainability Management Plan outlines the best-practice Ecologically Sustainable Development (ESD) initiatives for the proposed mixed-use development at 259–269 Unley Road, Malvern in South Australia. The project aligns with the South Australian Government’s Net Zero Strategy, the City of Unley’s Climate and Energy Plan, and industry benchmarks such as Green Star Buildings, NCC Section J, and other best practice approaches.

Energy

The development meets NCC Section J requirements through high-performance building fabric, efficient HVAC and lighting systems, and readiness for electrification

Indoor Environmental Quality (IEQ)

Occupant health and comfort are prioritised through natural ventilation, healthy indoor materials, acoustic control, and thermal comfort demonstrated through sample thermal modelling. Daylight access and external views are maximised, complemented by glare control measures, creating a high-quality indoor environment aligned with Green Star best practice. Daylight modelling demonstrates 60% of all spaces exceed best practice daylight as per Green Star methodology.

Water

Water efficiency measures include low-flow fixtures, rainwater harvesting for non-potable uses, and Water Sensitive Urban Design strategies for stormwater quality management. These initiatives reduce potable water demand through rainwater harvesting for toilet flushing.

Waste and Materials

The heritage building on site will be retained and enhanced. Construction waste will be minimised through reuse and recycling, supporting circular economy principles. Best-practice waste systems include dedicated chutes on each level, centralised bulk storage, and separation of general, recycling, and organic streams. Facilities for hard waste, e-waste, and container deposit returns are provided, alongside ventilation, wash stations, and resident education programs.

Transport

Pedestrian safety and amenity are enhanced through removal of hazardous crossovers, improved landscaping, and public realm upgrades. Secure bicycle parking for residents and visitors encourages active transport and reduces car dependency.

Design for People and Nature

The design promotes wellbeing and inclusivity through landscaped communal areas, shading structures, and a pool, while reducing heat island effects. Nature-based strategies include deep soil planting, vertical greening, irrigated garden beds, and biodiversity enhancements, contributing to a greener, more resilient urban environment.

1.1.1 Update to SMP

ADP notes that the daylight, NatHERS and Section J assessments have not been updated in this revision of the SMP. However, the project is committed to meeting Section J requirements and providing best practice daylight outcomes for residents. These assessments will be updated as the design progresses.

2. Introduction

This Sustainability Management Plan outlines the Ecologically Sustainable Development (ESD) initiatives and expected outcomes for the proposed mixed-use development at 259–269 Unley Road, Malvern located in the Traditional land of the Karuna people. The site is well-positioned with convenient access to the Adelaide CBD and is close to boutique shopping, restaurants, and other local amenities.

The project aims to create a vibrant lifestyle that integrates daily life, commerce and connection to nature. The architectural approach balances heritage elements with modern sustainable design reflecting Malvern's history.

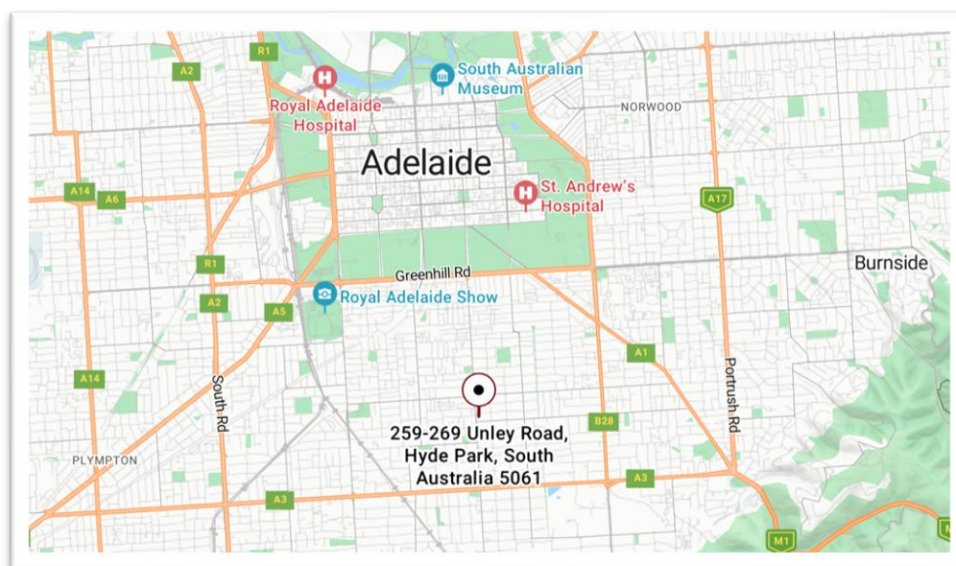
The purpose of this report is to explain how best-practice ESD principles will be incorporated into the development. It identifies key sustainability objectives, proposed design strategies, and demonstrates how the project will meet and, where possible, exceed the requirements of the City of Unley.

2.1 Project Overview

The proposed development, located within the City of Unley consists of the following:

- > Site Area: Approximately 3,385 m²
- > Building Form: 7 levels of mixed-use development
- > Residential Component: 68 apartments with a total residential floor area of 8,871 m²
- > Non-Residential Component:
 - Ground Floor & Level 1: Retail (café/restaurant) and office spaces totalling approximately 1,900 m²
 - Amenities & Community Facilities: Integrated throughout the development.
- > Landscaping: 394 m² of landscaped area on the ground floor and distributed across upper levels
- > Car Parking: Approximately 168 spaces across three basement levels.

Figure 1 Development Site



2.1.1 Statutory Context

Planning

The development is to comply with the Planning and Design Code for City of Unley under urban corridor (main street) zone. Desired Outcome 5.1 (DO 5.1) sets a broad objective for built form and amenity within the relevant zone but does not include explicit sustainability requirements. However, it can be interpreted to support sustainable outcomes by encouraging development that integrates quality design, amenities, landscaping and green infrastructure.

Deemed-to-Satisfy/Designated Performance Feature 5.1 (DTS/DPF 5.1) requires a minimum side boundary setback, which provides opportunities to incorporate sustainability measures such as tree planting, permeable surfaces, and water-sensitive urban design elements like rain gardens or infiltration zones. These features help reduce stormwater runoff, mitigate urban heat island effects, and enhance biodiversity connectivity. While neither clause mandates ESD measures directly, they create design flexibility that can be leveraged to achieve environmental performance objectives and improve overall sustainability outcomes for the site.

Best practice waste management, active transport design elements, inclusive design and other sustainable design elements goes beyond the Designed Outcomes to achieve sustainable outcomes.

Building Code

Compliance with the National Construction Code (NCC), particularly Section J – Energy Efficiency, is being considered early in the design process to ensure that the building envelope, glazing, insulation, and services meet or exceed minimum performance standards. By integrating Section J requirements from the outset, we reduce the risk of costly redesigns and enable the project to incorporate passive design strategies such as optimised orientation, thermal performance, and efficient HVAC systems.

This proactive approach not only ensures regulatory compliance but also delivers significant sustainability benefits, including reduced operational energy demand, lower greenhouse gas emissions, and improved occupant comfort. Early alignment with Section J supports the broader environmental objectives of the project and contributes to achieving long-term energy efficiency and resilience.

2.1.2 Best Practice Approach

The project adopts a best-practice approach to Ecologically Sustainable Development by aligning with leading policies and frameworks, including the South Australian Government's Net Zero Strategy, Climate Change Action Plan, and the City of Unley's Climate and Energy Plan. Design strategies aim to support state and local objectives for carbon reduction, climate resilience, and urban greening, while reflecting industry benchmarks such as Green Star Buildings, NCC Section J compliance, and Water Sensitive Urban Design (WSUD) principles. This approach ensures the development contributes to a low-carbon future, enhances liveability, and demonstrates leadership in sustainable design.

3. Sustainability Outcomes

3.1 Sustainability Objectives

The development has been designed with the following objectives:

- > Energy performance
- > Integrated water management
- > Indoor environmental quality
- > Best practice waste management and materials selection
- > Sustainable transport
- > Design for people
- > Design for nature

The following sustainability objectives and initiatives are targeted for the proposed development. These will be further explored and expanded in subsequent design stages.

3.2 Energy Performance

Energy efficiency is a critical component of sustainable development and plays a central role in addressing climate change. Buildings are significant contributors to greenhouse gas emissions, both through operational energy use and embodied carbon in construction. Reducing energy demand and transitioning to low-carbon energy sources directly support the South Australian Government's Net Zero Strategy, which targets a 60% reduction in emissions by 2030 and net zero by 2050. Similarly, the City of Unley's Climate and Energy Plan prioritise carbon-neutral operations and improved energy performance.

By incorporating passive design principles, high-performance building fabric, and electrification readiness, this project demonstrates leadership in energy efficiency and aligns with national and state objectives for a low-carbon future.

The following outlines the objective, initiatives and implementation strategy for energy performance within the proposed development.

Table 1: Energy Performance

Objectives	Initiatives
Reduce energy use and energy peak demand	• Passive design principles are incorporated into architectural design ○ The orientation and building form maximise daylight access. ○ All the amenity areas including the terraces are optimised for daylight and views. • High-performing façade design with effective external shading and high-performing glazing. • Balancing window to wall ratio for energy efficiency with the need for view.

Objectives	Initiatives
	Providing appropriate shading to limit overheating in summer and reduce HVAC reliance.
	7.5 Star NatHERS Average Target
	- Improving energy performance compared to National Construction Code (NCC) Section J requirements - Early section J fabric assessment and sample NatHERS modelling demonstrates that the development can achieve Section J requirements (See Appendix A and B).
All electric development	Building services to be all electric and natural gas to be avoided.
	All car parking spaces are ready to be electric vehicles through increased capacity in the electrical infrastructure.
	High Global Warming Potential (GWP) refrigerants are to be avoided.
	- Maximised daylight access reducing reliance in artificial lighting (See Appendix C for daylight modelling results) - Use of energy efficient LED lighting system.
	Selecting energy efficient equipment and systems within 1 star of best energy efficiency rating available.
On-site renewable energy	Currently about 200m² of space or at least 20% of the suitable roof space is allocated for solar PV as shown on the roof diagram below. About 30kW of solar PV is being proposed. This is subject to further analysis.
Low embodied carbon	Project will consider low embodied materials in tender phase.

3.3 Integrated Water Management

Integrated water management aims to encourage and reward initiatives that reduce the consumption of potable water and improves stormwater quality. Reductions in operational water consumption may be achieved through maximisation of water-efficiency within a project, as well as through the utilisation of reclaimed water sources.

Table 2: Integrated Water Management

Objectives	Initiatives
Reduce potable water consumption	Water efficient fittings, fixtures and appliances: - Showers: 3 Stars (>4.5L/min <6.0 L/min or lower) - Toilets: 4 Stars (3 L/flush or lower) - Taps: 5 Stars (4.5 L/min or lower)

- Urinals: 5 Stars
- Water efficient sub-soil drip irrigation system with moisture sensors and timers

Capture and reuse rainwater from roof and terrace areas to reduce reliance on mains water

- The rainwater collected in 25kL of tank (located in basement) will be reused for toilet flushing serving about 30% of the annual toilet water demand. The tank size has been designed to optimise re-use based on demand and roof space availability. This tank overflows into the 12kL OSD tank.
- This is expected to achieve 15% reduction in portable water use. This has been benchmarked using the Green Star Portable Water Calculator.

To minimise peak storm water outflows from the site and reduce pollutants that enter the public sewer infrastructure or other water bodies

- About 40% flow reduction from post development flows:
 - Pre-development peak flows: 118L/s (1% AEP), 82L/s (5% AEP)
 - Post development outflows: 71L/s (1% AEP), 52L/s (5% AEP)
- Best practice stormwater quality improvement has been achieved as confirmed through a MUSIC modelling.

Quality	Target*	Achieved
TSS	80%	95%
Total Phosphorus	60%	93%
Total Nitrogen	67%	40%
Gross Pollutants	-	100%

*As per City of Unley's requirements. Note the above assessments are subject to change as the design progresses.

- The following design strategies are included in the design to achieve the stormwater quality and flow reduction:
 - 25kL rainwater harvesting for reuse
 - About 12kL On-site Detention (OSD) to control peak discharge to pre-development levels
 - New underground drainage network designed to 5% AEP storm events
- Flood protection is also included in the design:
 - Floor levels set 300mm above the kerb
 - Basement cresting
 - Graded external areas

Refer to Stormwater Management Plan for details.

Table 3: Indoor Environment Quality

Objective	Initiatives
Healthy Air Maintain healthy indoor air quality by preventing outdoor pollutants, ensuring ease of maintenance.	- The ventilation system to be designed to mitigate the entry of outdoor pollutants, for ease of maintenance and cleaning - The operable windows and sliding doors provide cross flow ventilation. - Kitchen and toilet exhaust makeup air via smoke and fire dampers above the apartment door entrances and grille in corridor ceiling and then exhausted to façade. - Waste rooms and carparking air are exhausted to roof. - Any mechanical ventilation system to be designed to provide outside air at 50% improvement over AS1668.2-2012.
Acoustic Comfort Provide acoustic comfort by limiting internal noise to within 5 dB(A) of recommended standards.	- Internal noise levels will not be more than 5dB(A) above the "satisfactory" sound levels provided in Table 1 of AS/NZS 2107:2000. - Reduce persistence of sound below recommended reverberation times in Table 1 of AS/NZ 2107:2016. Subject to installation of ceiling for base build.
Lighting Comfort Ensure visual comfort and accurate colour perception through flicker-free lighting.	- All lights on the project will be flicker free and accurately address the perception of colour in the space. - All lighting levels and quality will comply with best practice guidelines.
Glare Reduction Prevent excessive solar glare through shading devices and facade treatments.	- Efforts to eliminate glare will be implemented, and a Unified Glare Rating (UGR) will be calculated. - All facades will comply with glare reduction through a combination of blinds, screens, fixed devices, or other means.
External Views Promote wellbeing and connection to nature by providing clear external views to 60% of nominated areas.	The majority of occupant area will have clear line of sight to external view.
Healthy Materials Reduce exposure to harmful chemicals by using healthy materials	- Reduced VOCs (95% of all paints, carpets, adhesives and sealants) to meet the Total Volatile Organic Compound (TVOC) Content Limits outlined by industry best practice standards such as Green Star. - All engineered wood products (particleboard, plywood, veneer, MDF and decorative overlaid wood panels) with low formaldehyde emissions, no formaldehyde will comply.
Thermal Comfort	This objective is supported by thermal modelling results, which demonstrate compliance with Section J.

Provide a consistently comfortable indoor environment for occupants

- Representative samples and worse performing have been modelled. This means the final results are expected to align with expectations.

Refer to Appendix A for more details.

Daylight

Maximise access to natural daylight to enhance occupant wellbeing and improve visual comfort

- The daylight modelling assessment was completed against the Green Star Design & As Built v1.3 guidelines and indicates that 60% of the primary nominated floor area can achieve high levels of daylight across the residential and non-residential areas, exceeding the Green Star benchmark of 40%.
- The Level 3 Amenities achieve 100% daylight performance.

Refer to Appendix C for more details.

3.5 Waste

Development aims to implement best practice waste management principles to reduce the amount of waste sent to landfill during the demolition, construction and operational stages of the project.

Construction Waste

At least 80% of waste generated during construction and demolition diverted from landfill.

Operational Waste

A comprehensive Waste and Recycling Management Plan (refer to Waste Management plan) provided that calculates the reduction in the amount, by weight, of the buildings overall operational waste and confirm the waste storage facilities are provided to meet the general space, access, amenity and management requirements.

- Waste and recycling chutes are provided for residents in each level
- Bulky waste or recycling needs to be taken directly to central waste storage area
- Bulk bins in the back of house area
- Waste storage rooms area with easy access to loading bay
- Ability to separate waste, including the following:
 - General waste
 - Comingled recycling
 - Organic recycling
- Ability to store and organise external drop off facilities or on-call for the following other waste/recycling streams, such as hard waste or e-waste.
- 10-cent Container Deposit Scheme to be managed by residents and tenants separately
- Easy bin accessibility for mobility-impaired persons
- Bins washing stations
- Adequate ventilation in waste storage spaces

- Best practice waste management education to building residents and tenants to be provided

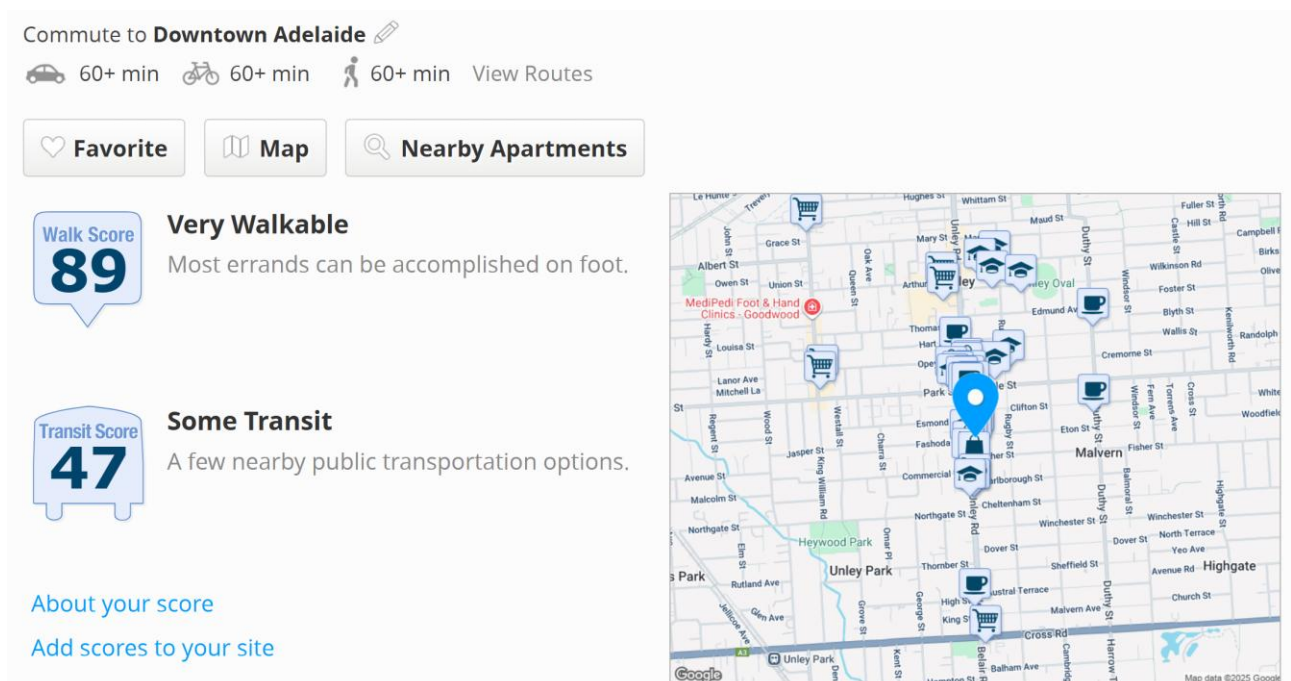
Refer to the Waste Management Plan for more details.

3.6 Transport

Sustainable Transport aims to reward projects that facilitate a reduction of the dependency of occupants on fossil-fuel private car use as an important means of reducing overall greenhouse gas emissions. If reliance on individual motor vehicle transportation is to be reduced, it is necessary to maximise alternative transportation options. The development site has readily accessible public transport options and selection of sites within proximity of a diversity of amenities demonstrated by the walkscore as shown below.

- 259 Unley Road has a Walk Score of 89 out of 100. This location is Very Walkable so most errands can be accomplished on foot.
- 259 Unley Road is a 25 minute walk from the BEL Belair to City at the Unley Park Railway Station stop.
- This location is in the Malvern neighbourhood in Adelaide.
- Nearby parks include Heywood Park, Windsor St Linear Park and Orphanage Park.
- The facilitation and encouragement of the use of alternative transport options, such as bicycles or electric vehicles.
- Pedestrian friendly design through the removal of two dangerous crossovers from Unley Road landscaping, improved amenity and greening
- Bike parking for residents and visitors

Figure 4 Walk Score



Refer to Transport Report for more details.

3.7 Design for people

The development aims to deliver an inclusive, comfortable, and socially connected living environment that meets the needs of a diverse community, including downsizers. The design provides a range of apartment layouts and bedroom options, ensuring flexibility for different lifestyles. High-quality communal spaces, landscaped areas, and easy access to local amenities promote wellbeing and convenience. Inclusive design principles ensure accessibility for all, while strategies such as thermal comfort optimisation and heat island reduction through landscaping enhance liveability. These initiatives create a vibrant, adaptable development that prioritises health, comfort, and community engagement.

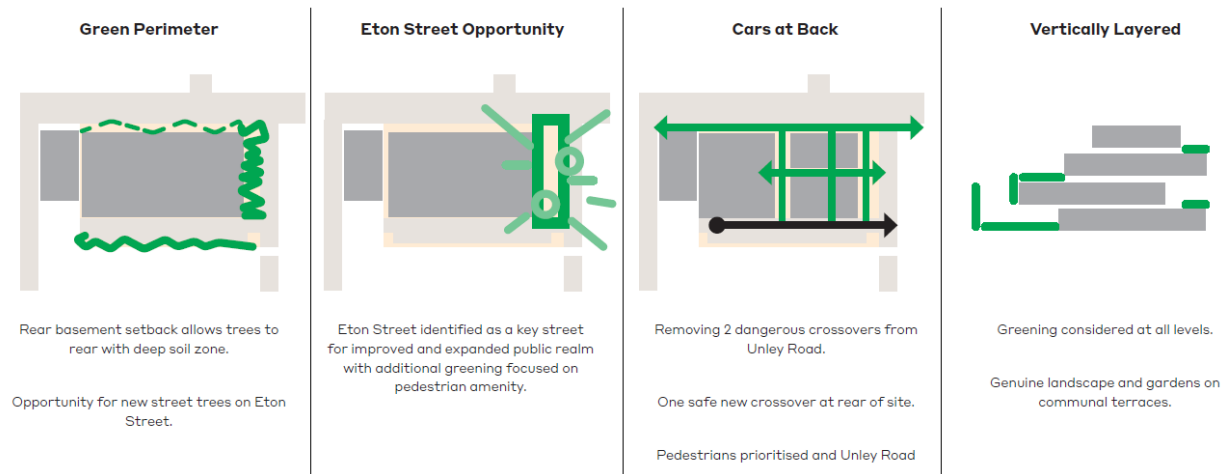
Some of the design for people initiatives are:

- Side street, Eton Street to be improved and expanded as public realm with landscaping and pedestrian friendly design
- 1.5m depth pool surrounded by landscaped areas
- Shelter and pergolas to provide comfortable outdoor spaces
- The ground floor serves as a vibrant, mixed-use space that enhances the public realm.
- It integrates retail, commercial, and residential functions, creating a fine-grain, human-scaled experience.
- The design enhances pedestrian access and fosters community interaction.
- Podium as a Community Hub
 - The podium level is designed as a new 'village square' to foster community interaction.
 - It offers residential amenities alongside commercial spaces.
 - The design ensures flexibility and comfort, supporting diverse activities.
 - The podium serves as the vibrant heart of the development.

3.8 Design for nature

The development integrates natural elements into the built environment to enhance biodiversity, improve microclimate, and create a resilient, attractive landscape. Strategies include deep soil planting zones, vertical greening on façades, irrigated garden beds, and landscaped lobby areas to soften the urban edge. Additional measures such as new street trees, expanded public realm on Eton Street, and biodiversity-sensitive planting reduce heat island effects and support ecological health. These initiatives create a green, connected environment that complements the architectural design and promotes wellbeing.

Figure 5 Landscaping approach (extract from Landscaping Report)



Refer to Landscape Report for more details.

Appendix A

Thermal Modelling

NatHERS Modelling Results

Consultant Advice Notice

From	Aishwarya Salvi	Advice No	CAN-ESD-02
Project No	ADL0128	Project Name	259-269 Unley Road
Date	3/11/2025	Pages	5
Subject	Preliminary NatHERS Assessment	Revision	1

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Introduction

This CAN provides preliminary NatHERS results for a sample set selected with a focus on apartments likely to achieve lower ratings based on orientation and layout for Unley Road Development. The sample set is based on drawings provided by Woods Bagot Schematic Design Set Rev C, dated 08.08.2025. Hero v4.1 software is used to assess the sample apartments.

NatHERS Targets

NCC 2022 Requirements

The multi-residential development consists of Class 2 apartments. The National Construction Code (NCC) 2022 requires that buildings achieve the following performance for the building fabric when modelled in accordance with an approved House Energy Rating Software:

- The average energy rating of all Sole Occupancy Units is not less than 7.0 Stars
- Each Sole Occupancy Unit has an energy rating of not less than 6 Stars
- A Whole of Home (WOH) energy rating ≥ 50 using a NatHERS software tool

Additionally, the following load limits are applied based on the NatHERS zone and council requirements:

- A maximum heating load for individual apartments of 54 MJ/m2yr
- A maximum cooling load for individual apartments of 45 MJ/m2yr

Section J General Requirements

All new building work, including work to alter an existing building, must comply with the NCC requirements

- All new roofs, walls, floors and glazing must comply with the NCC fabric provisions
- All sections of the building must be sealed in accordance with Part J5 of the NCC.
- Walls and Roofs that are directly in contact with metal must have a thermal break.

Whole of Home

As required by NCC 2022 NatHERS, to provide an additional assessment and rating for 'Whole of Home' energy use, accounting for the home's appliances, solar and batteries. This assessment gives a second performance rating out of 100. For Class 2 sole occupancy units, we require a Whole of Home performance rating of ≥ 50 . To achieve the targeted rating of 50, the following energy commitments must be implemented:

Table 1: Energy commitments for Class 2 development

Appliance or System	Technology	Performance level/rating
Heating and Cooling	Reverse Cycle Ducted (TBC)	Zones Energy Rating Level (ZERL) rating: 4.0 stars
Hot Water	Heat Pumps with a COP of 3.0 or higher	N/A
Cooking	Electric Cooktop and Oven (TBC)	N/A
Lighting power density	5.0 W/m ²	N/A
PV solar panels	50 kW system proposed for Apartments	N/A
Pool and Spa	Common Pool in the Amenities area	N/A

*ADP notes that a whole of home assessment has not been completed yet and the requirements are subject to either this or a J1V5 assessment that will be undertaken during the construction stage.

General Project Information

The table below summarises the general project information that forms the basis of this advice.

Table 2 General Project Information

Parameters	Parameters
Building Class	Class 2
NCC Climate Zone	5
NatHERS Climate Zone	16
Applicable NCC version	NCC 2022

Assumption of Current Design

The current results are based on the layouts and window placements, as detailed in Appendix. These include the extent of windows and the assigning of sliding or awning properties to windows in place of fixed glazing, applicable to all similar apartment types across all levels and buildings.

Glazing

Table 3 below identifies the thermal performance requirements of the glazing to achieve the NatHERS performance requirements for this project.

Table 3 Glazing thermal performance specification

Window Type	U-value (W/m ² . K)	SHGC
All Windows (L01-05 2500mm height)	≤ 3.0	0.3
All Windows (L06-07 2950mm height)		

The other elements of the building envelope have been detailed in Table 4. Please note that the glazing chosen above needs to meet the VLT values, which will be specified in the ESD daylight report.

Opaque Fabric

Tabulated below are the assumptions used in the rating of this development as per the current architectural drawings. Changes to any of the listed assumptions may alter the performance and invalidate the energy rating details in this advice.

Table 4 Building Fabric Construction Assumptions

Building Element	Assumptions
Floor and Construction - Between apartments	Suspended concrete slab Uninsulated
Floor Construction – (Above plant rooms, car parks, exposure and Balconies)	Suspended concrete slab with thermal break tape R2.0 added insulation
Floor coverings	- Tiles (bathrooms) - Carpet (bedrooms) - Timber (living, kitchen)
Ceiling construction - Between apartments (3000 mm height)	Suspended concrete slab with thermal break tape Uninsulated
Ceiling construction / Roof Construction (3000 mm height) Below the terraces	Suspended concrete slab with thermal break tape R4.0 added insulation
Ceiling construction (3000 mm height) (Below balconies)	Suspended concrete slab with thermal break tape R2.0 added insulation
Wall construction (External)	Concrete Wall with thermal break tape R2.5 added insulation
Wall construction (Between apartments /risers /corridors /stairs /lifts)	Lightweight plasterboard R1.5 added insulation
Wall construction - Internal within apartments	Lightweight Uninsulated
Entry doors	Sealed and weather-stripped
Exhaust fans	Kitchen, Bathrooms and Laundry – 1 each Sealed and weather-stripped
Recessed downlights	Uncovered and sealed

*Note: The above-listed assumptions are subject to change as the design drawings get developed further (window schedules, door schedules, elevations, section drawings etc).

Thermal Break Tape, providing an insulation of R0.2, is applied to all exposed walls, ceilings/roofs in all apartments.

Preliminary Rating Results

The table below outlines the individual apartment ratings. This provides an indication of the minimum and average ratings expected.

Table 5 NatHERS test exercise results

	Heating Load (MJ/m2 per annum)	Cooling Load (MJ/m2 per annum)	Star Rating
Minimum	N/A	N/A	6.1
Maximum	44.6	44.4	N/A
Average	N/A	N/A	7.6

Table 6 Individual Apartment Ratings

Level	Markup No.	Heating Load (MJ/m2 yr)	Cooling Load (MJ/m2 yr)	Star Rating
1	1	37	10.3	7.9
1	2	20.8	14.8	8.5
1	3	10	33.6	8.1
2	4	36.9	13.9	7.7
5	5	17	18.2	8.5
5	6	24.3	14.4	8.4
5	7	23.6	19	8.2
5	8	17.7	34.9	7.6
6	9	15.6	43.1	7.3
7	10	40.6	39.6	6.2
7	11	44.6	37.6	6.1
7	12	30.9	44.4	6.4

Discussion and Next Steps

- The results of the selected sample set meet all the requirements outlined in the NatHERS Targets Section, provided the facade adjustments detailed in Appendix are incorporated.
- The architect, client and façade consultant are requested to review and confirm the assumptions used for this assessment. Please note that any changes or adjustments to the current specifications will require a re-run of the energy models, and a separate Consultant Advice Notice (CAN) will need to be issued to reflect the updates.
- Subject to confirmation of all assumptions, WBA will need to incorporate the recommended window changes from **Error! Reference source not found.** into all similar apartment types and orientations across all levels of the development.

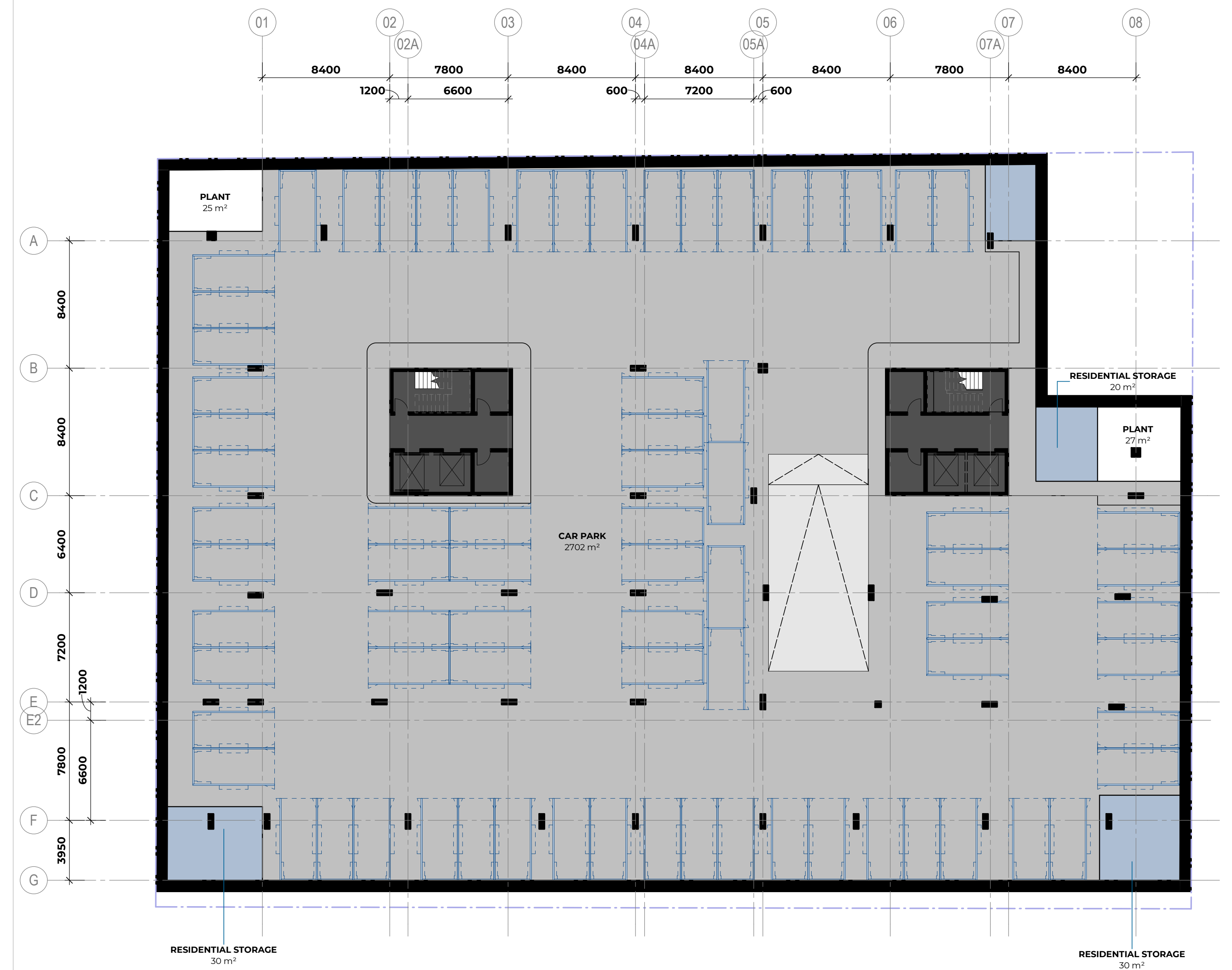
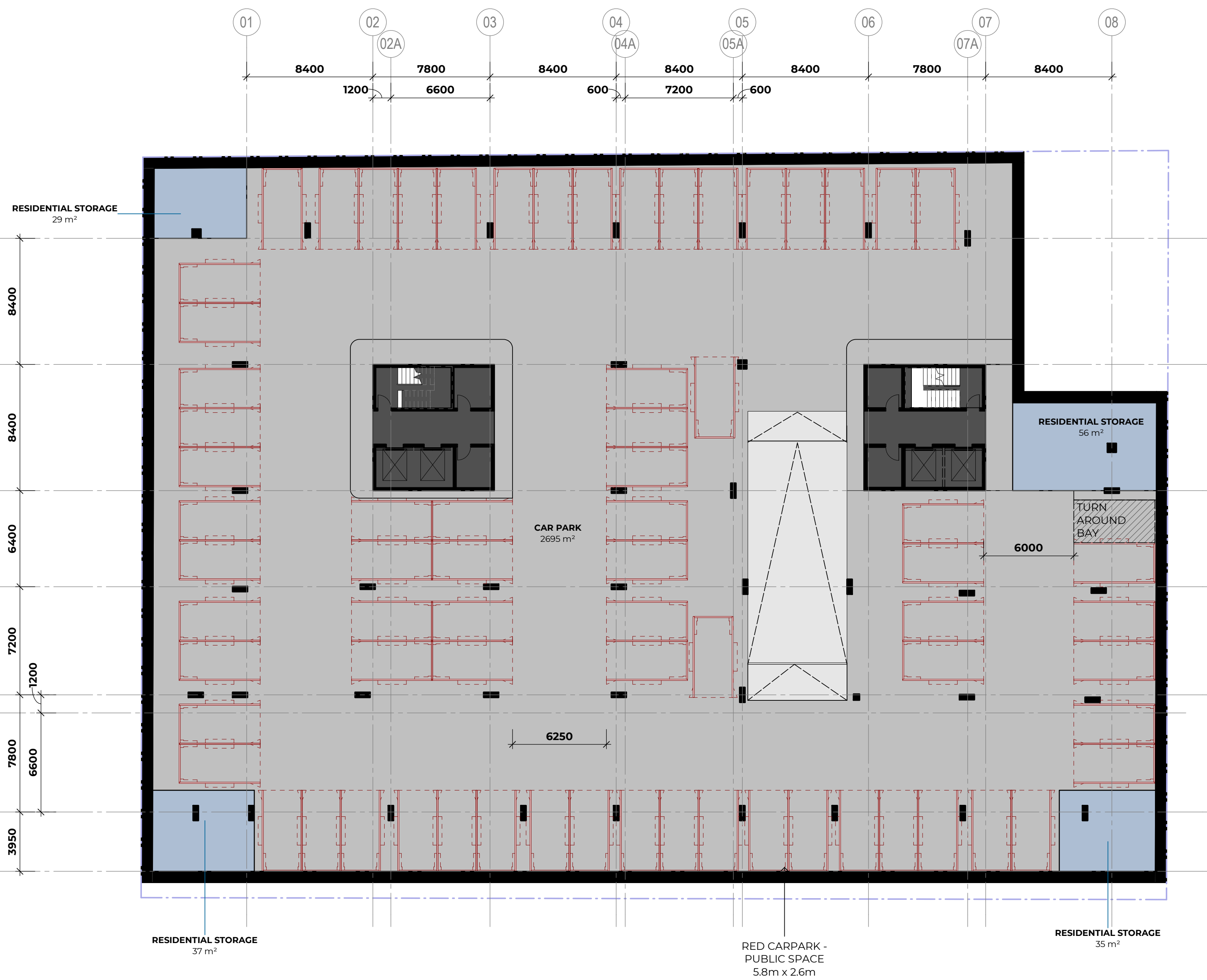
Final HERO Modelling and Certification

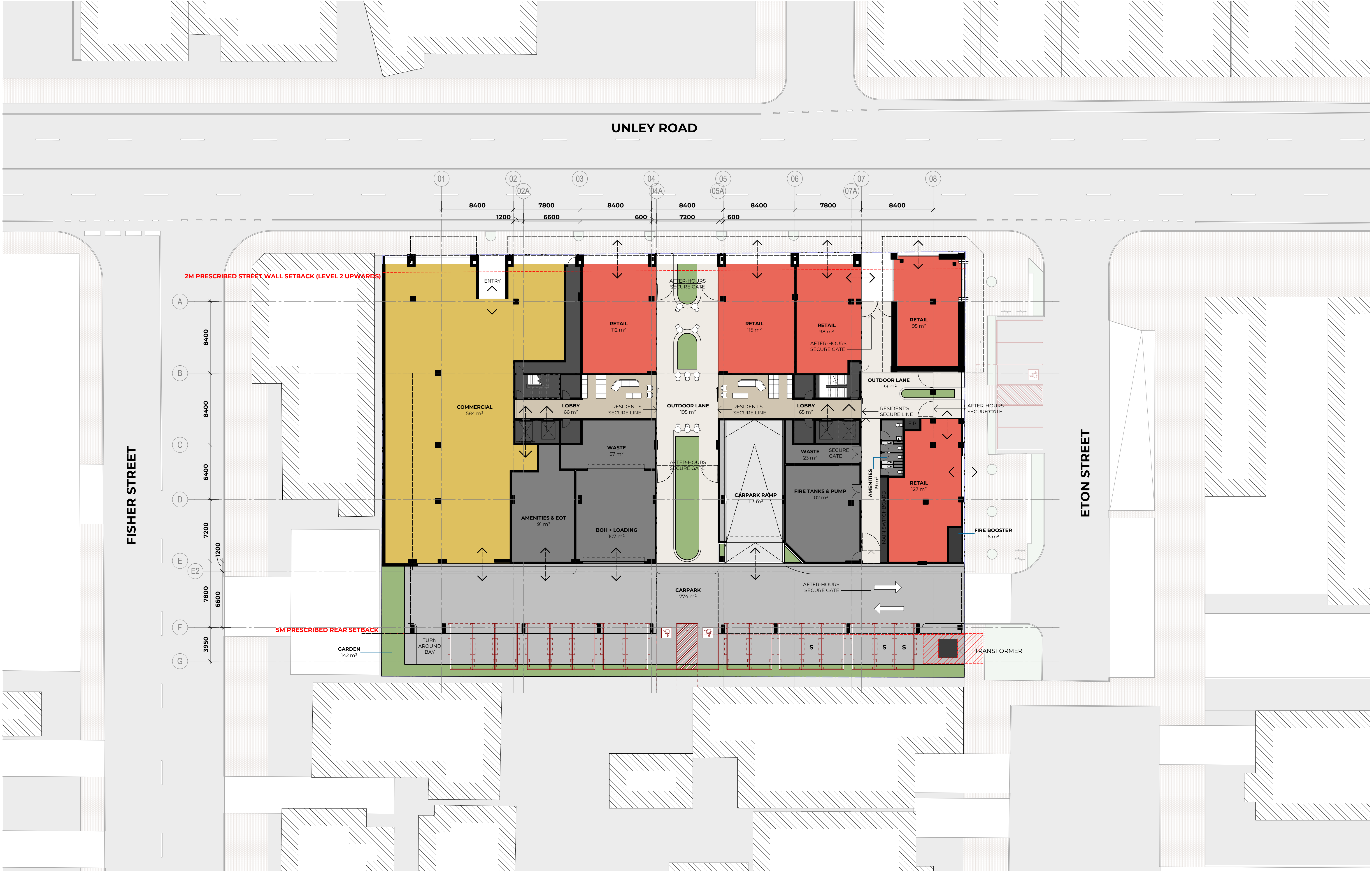
In order to complete the final HERO calculations (typically undertaken prior to construction) and issue star rating certificates for each dwelling, the following items are required:

- Complete set of construction issue architectural drawings.
- Drawings showing wall, floor and roof build-ups, including details (R-values) of insulation.
- Window schedules detailing the type and dimensions of all windows.
- Elevations and sections of building(s).
- Details of actual glazing being installed. This will include the following:
 - Brand/manufacturer.
 - Glazing product/build up (i.e. 6mm thick glazing/12mm air gap/6mm thick glazing, etc.).
 - Glazing overall U-value, including frame. If multiple types of glazing are proposed, all values are required.
 - Glazing SHGC value(s).

Aishwarya Salvi
 Consultant | Sustainability
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Appendix





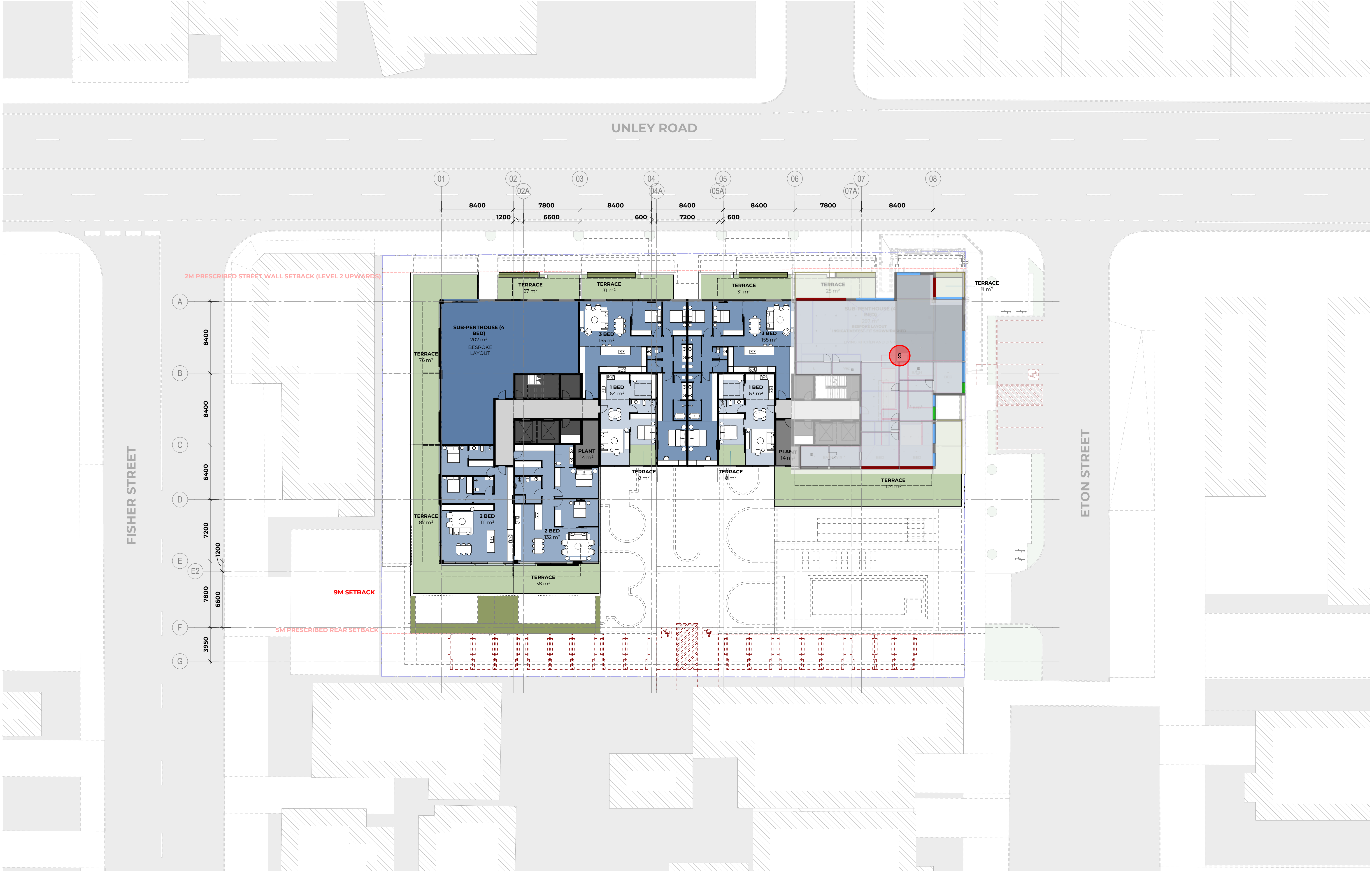




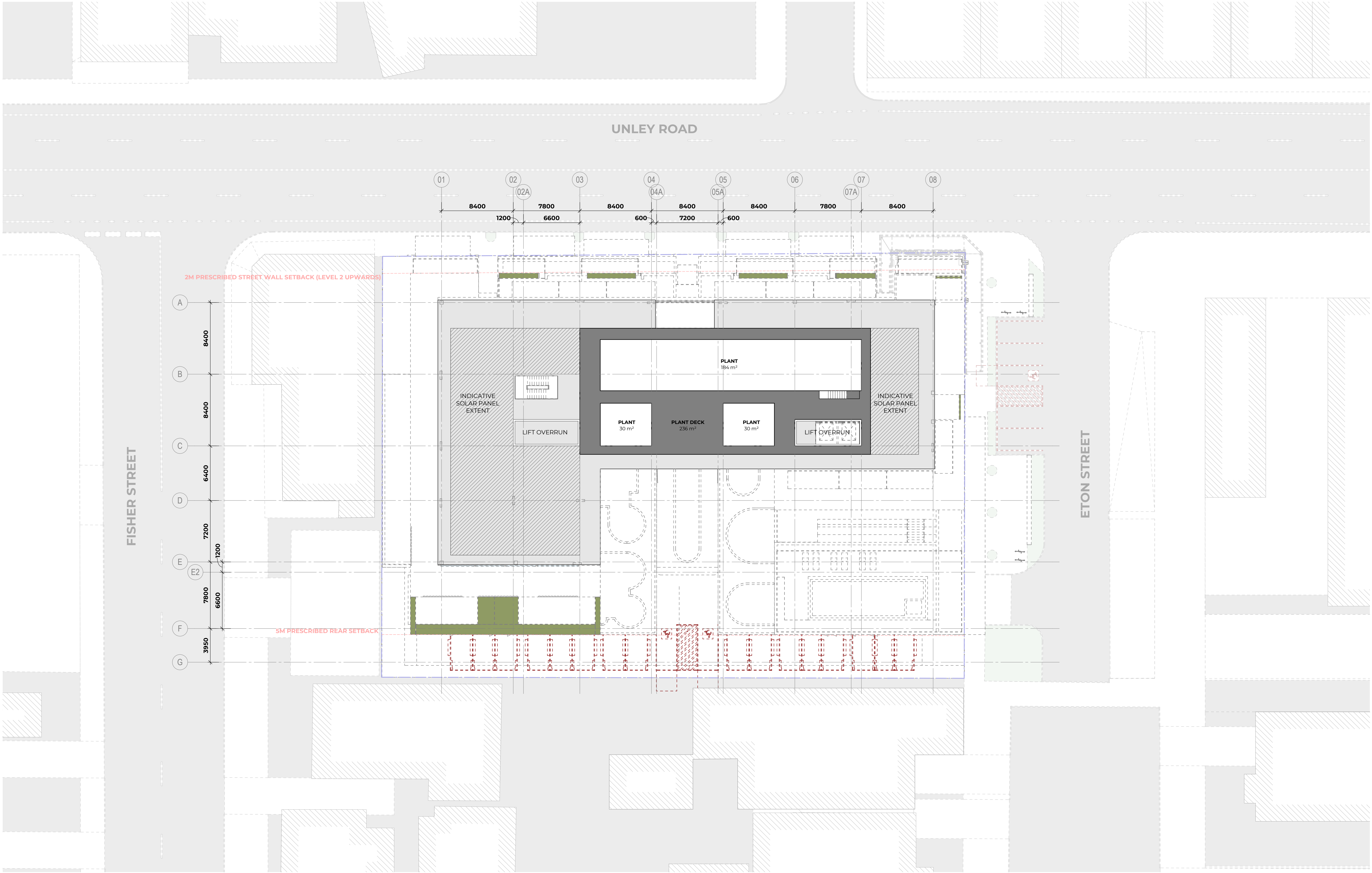












Appendix B

Section J Assessment

Non-residential Area

Consultant Advice Notice

From	Vany Gunaratnam	Advice No	CAN-ESD-03
Project No	ADL0128	Project Name	259-269 Unley Road
Date	10/11/2025	Pages	7
Subject	Section J Preliminary Assessment	Revision	0

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Introduction

The following advice note has been prepared to outline the NCC 2022 Section J Part J4 compliance requirements for the subject project at 259-269 Unley Road, Malvern South Australia. The proposed development includes residential apartments with communal amenities, and commercial areas.

This preliminary assessment is based on one typical floor and proposed façade design. A full Section J assessment is to be completed once the design progresses. A J1V3 modelling may be required to demonstrate compliance with section J. The contents of this CAN outline the minimum requirements for building fabric elements; however, it should be noted that some insulation values or fabric performance parameters may require adjustment during the detailed Section J process to achieve full compliance.

This Section J DTS advice has been based on the following documents:

- Architectural drawings by Woods Bagot dated 06/11/2025
- Façade and Elevations dated 06/11/2025
- NCC 2022 Volume One

Table 1 General project information

Building Class	2
Climate Zone	5
Applicable NCC version	NCC 2022
Assessment pathway	Deemed-to-Satisfy

The report considers walls and glazing enveloping the thermal boundary. Figure 1 below demonstrates the thermal envelope on the Ground Floor of the Unley Road development. The appendix shows the thermal boundary at each level, the ceiling and floor insulation



Figure 1 Highlighted Thermal Envelope of Ground Floor

The development requires compliance with the NCC2022 Section J requirements to ensure appropriate energy efficiency measures. When forming the thermal envelope for the non-residential areas of the development, which impacts the insulation of walls and thermal performance of glazing, energy and cost efficiency were considered.

[NCC Section J Energy Efficiency Compliance Requirements.](#)

In 2006, energy efficiency provisions were introduced in Volumes One and Two of the National Construction Code (NCC) by the Australian Building Board (ABCB) as part of a comprehensive strategy undertaken by the Commonwealth, State and Territory Governments to reduce greenhouse gas (GHG) emissions. The energy efficiency provisions require buildings to achieve minimum levels of energy efficiency and are designed to improve the thermal performance of buildings, reduce the use of artificial heating and cooling, and improve the energy performance of building services.

To achieve compliance with Section J of the NCC 2022 Volume One (Amendment 1), the Performance Requirements of part J4D6 must be met. This is done through evaluation of all non-residential area, which in this project is the entire development.

[Thermal Bridging](#)

Since the 2019 update to the National Construction Code (NCC), the consideration of thermal bridging has become a mandatory component in the calculation of a building thermal performance. Thermal bridging occurs when a conductive material, metal framing such as steel, creates a direct path for heat to bypass the insulation layer. In buildings, this can significantly reduce the effective R-value of the building envelope. The 2022 NCC requires that the thermal resistance of walls, roofs, and floors now account for this heat transfer, especially where metal framing interrupts insulation layers.

Section J Part J4 Requirements

Opaque Components

The thermal performance of the opaque components has been assessed using the minimum requirements listed in NCC Section J.

Table 2 outlines the required thermal performance parameters for all opaque components of the building thermal envelope (see attached Insulation Markup for thermal envelope). It specifies the total resistance (R_T , in $m^2 \cdot K/W$), which includes the effects of thermal bridging in its calculation. Where relevant, the table also sets limits on the solar absorption (SA) of materials.

Table 2 Opaque components' performance requirements

Section J	NCC 2022 Minimum
J4D4 Roof and Ceiling Construction	$R_T > 3.70$, $SA < 0.45$
J4D6 Walls	$R_T > 1.40$, $SA < 0.10^*$
J4D7 Floors	$R_T > 2.00$

Translucent Components

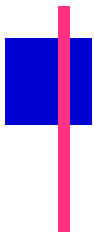
The thermal performance of the proposed glazing system has been assessed using the ABCB Glazing Calculator, in accordance with the Deemed-to-Satisfy Provisions of NCC 2022 Section J4D6.

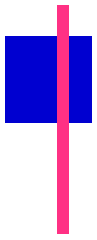
Table 3 outlines the thermal performance parameters for all translucent components of the building thermal envelope. This applies to the entire glazing system, including both the glass and its frame. The table specifies requirements for thermal conductivity (U_W in $W/m^2 \cdot K$), solar heat gain coefficient ($SHGC_W$), and visible light transmittance (VLT) of the materials of 0.6 to meet daylight requirements. When choosing glazing, double glazing is recommended as single glazing may not comply with Section J requirements, particularly as the development progresses.

Table 3 Translucent components' performance requirements for non-residential components

Section J	NCC 2022 Minimum
J4D6 Glazing	$U_W < 3.8$ $SHGC_W < 0.27$

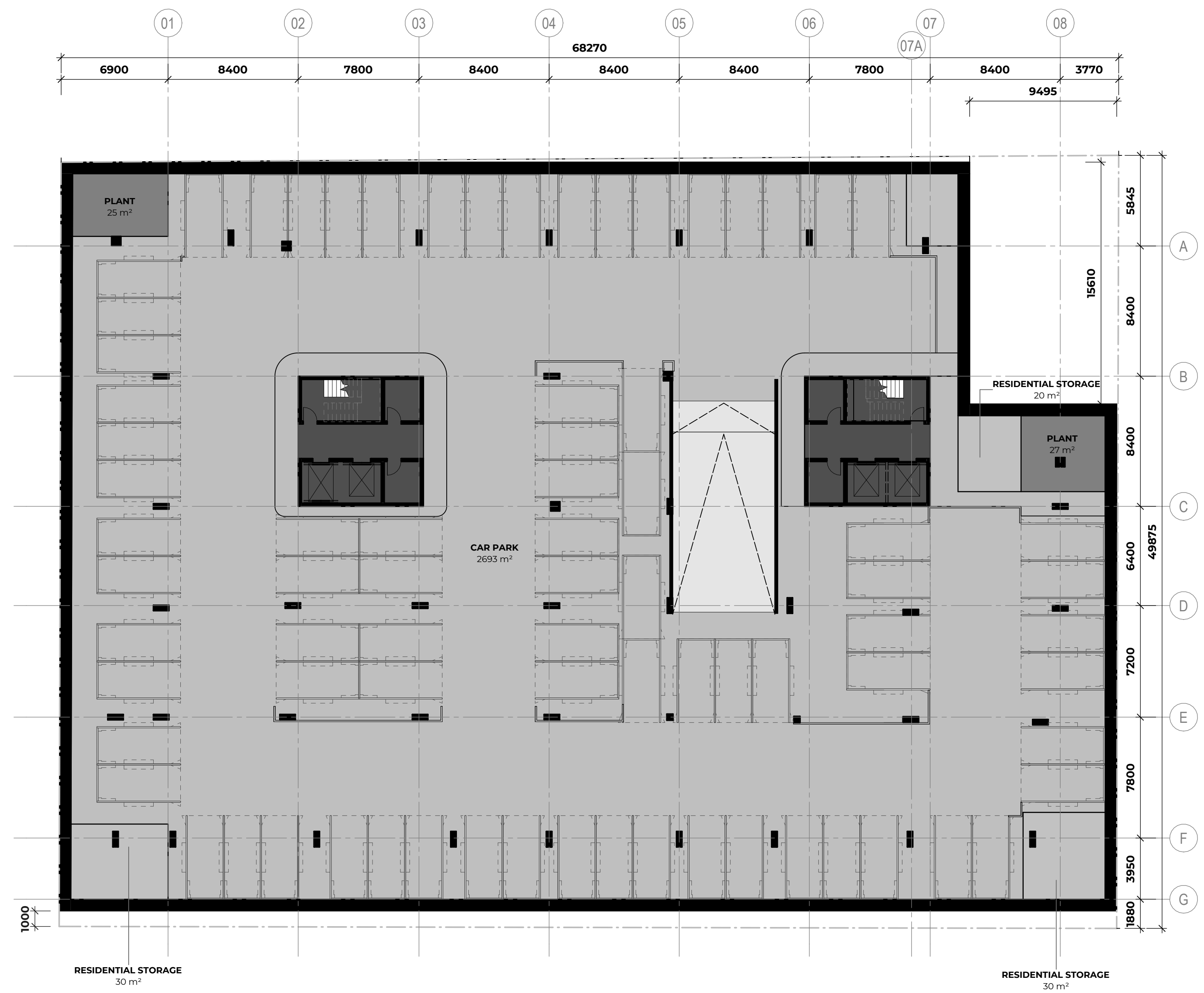
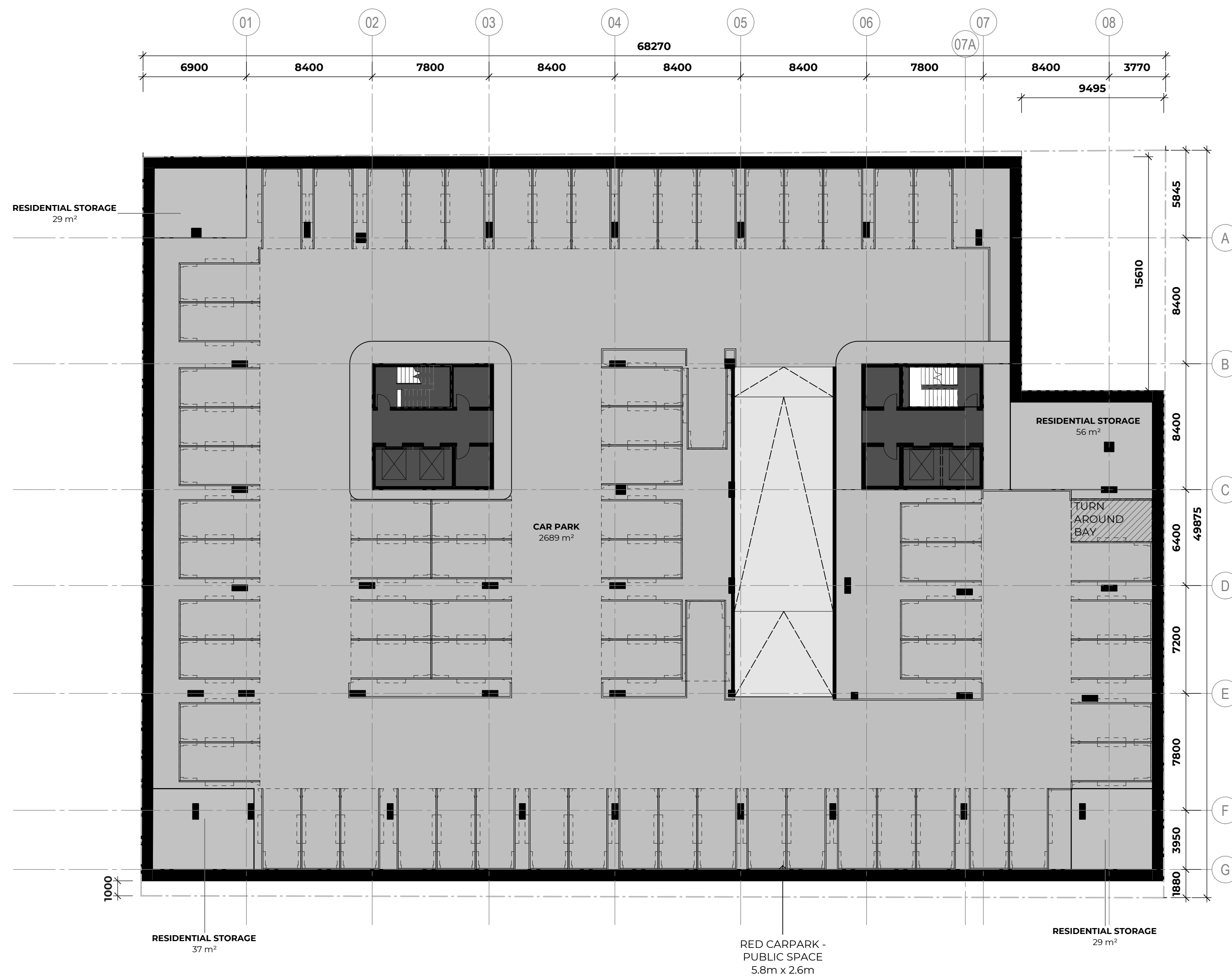
Vany Gunaratnam
Associate | Sustainability
ADP Consulting Pty Ltd

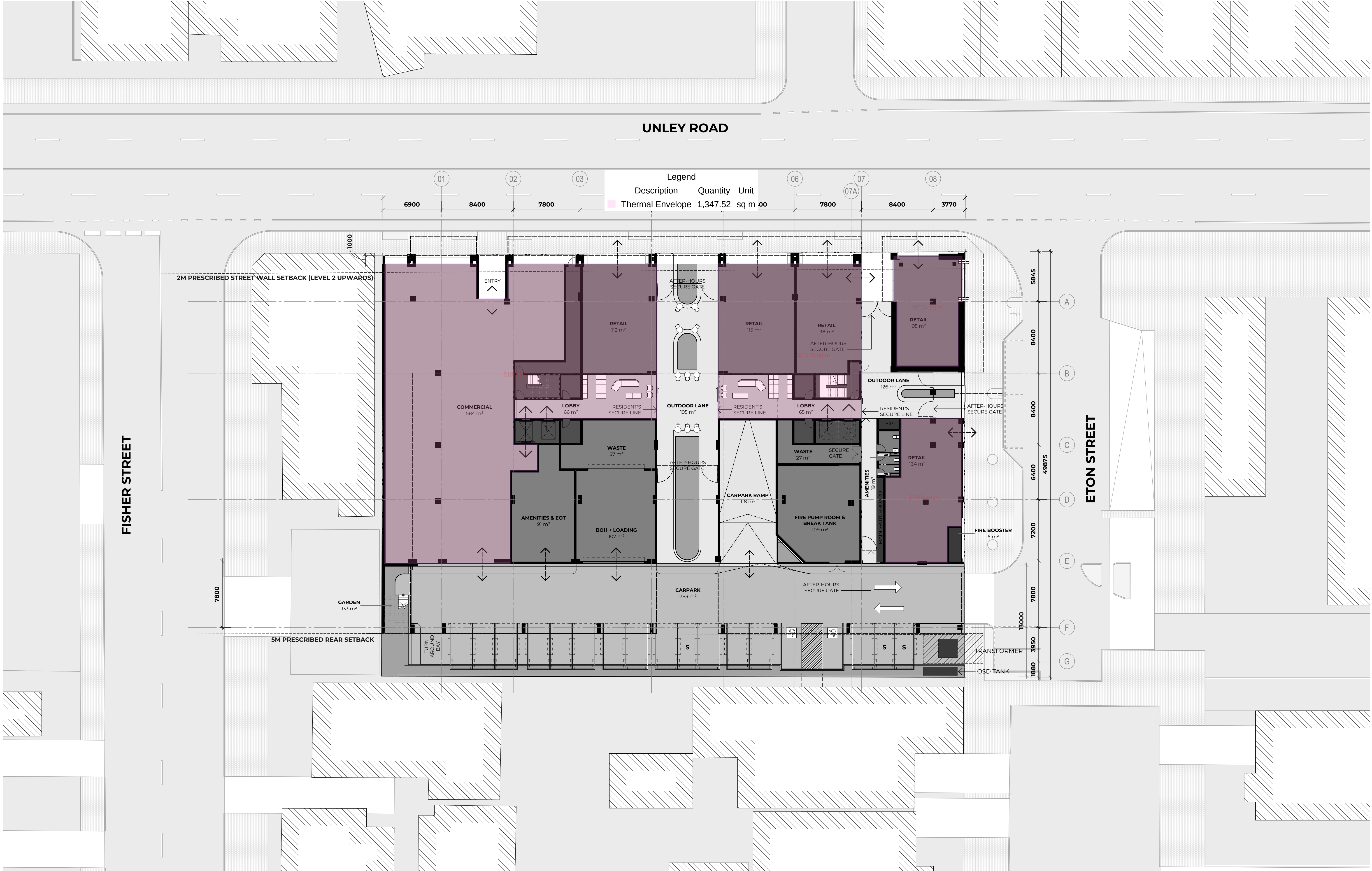


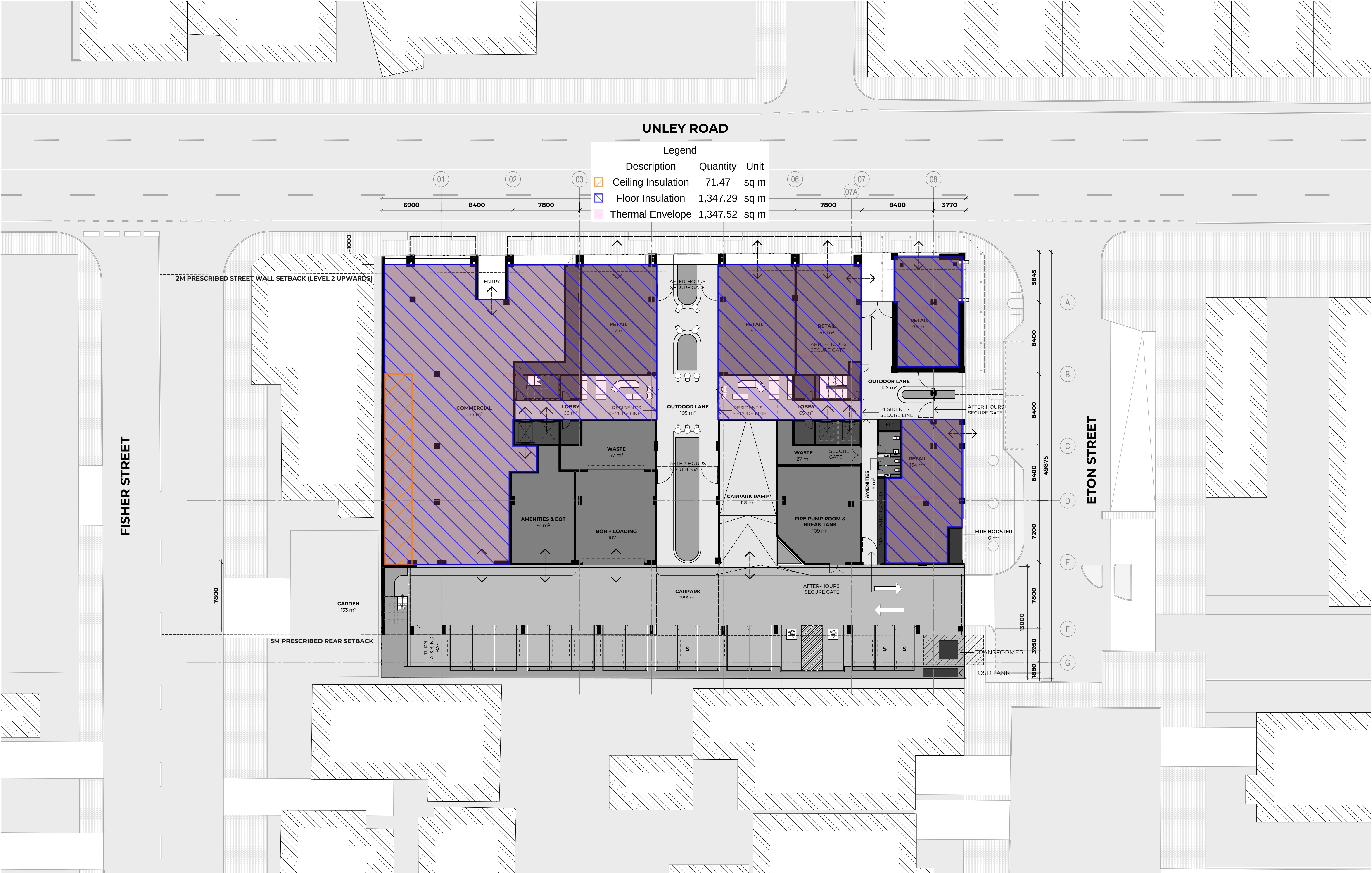


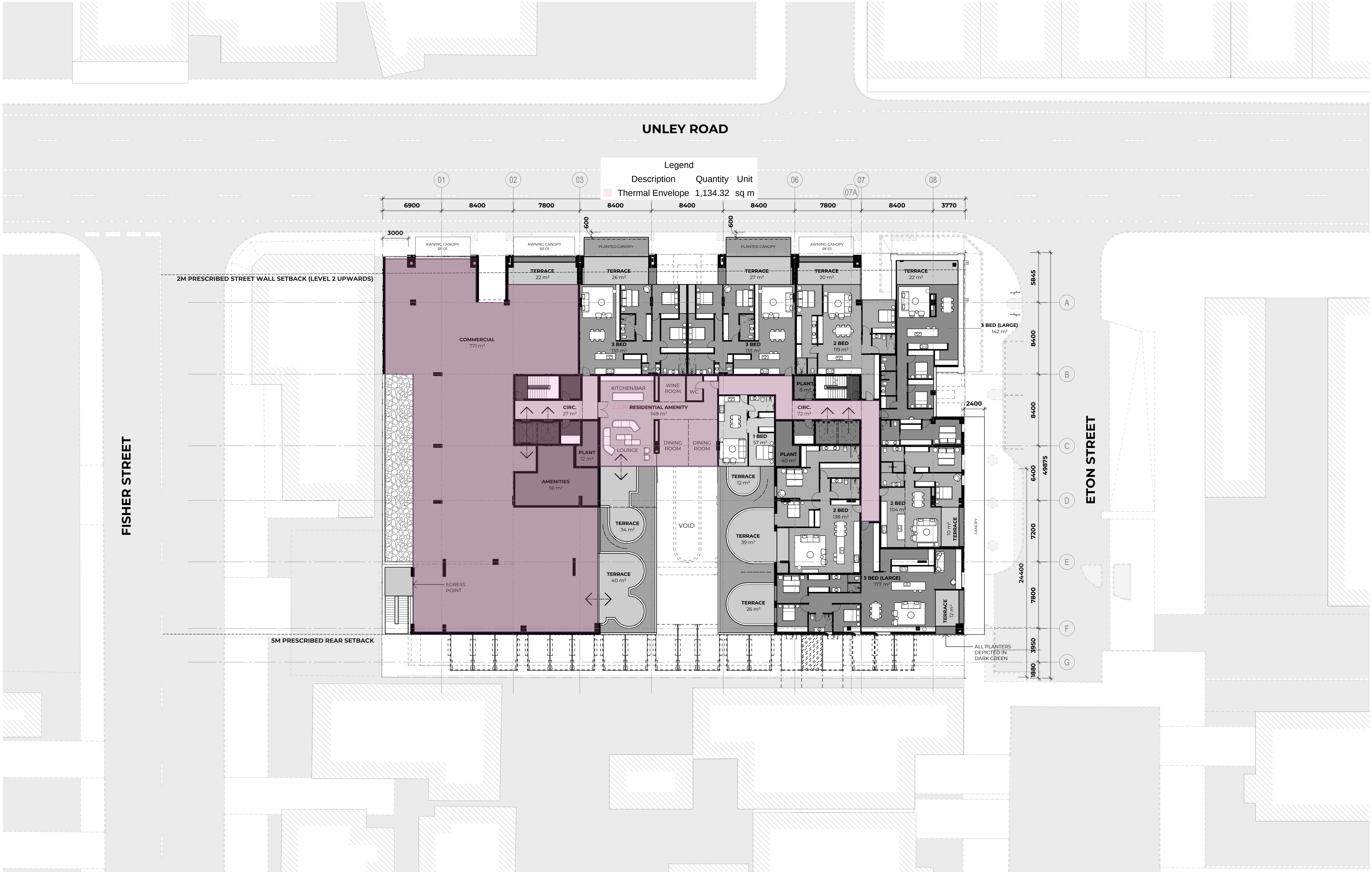
Appendix A: Thermal Envelope

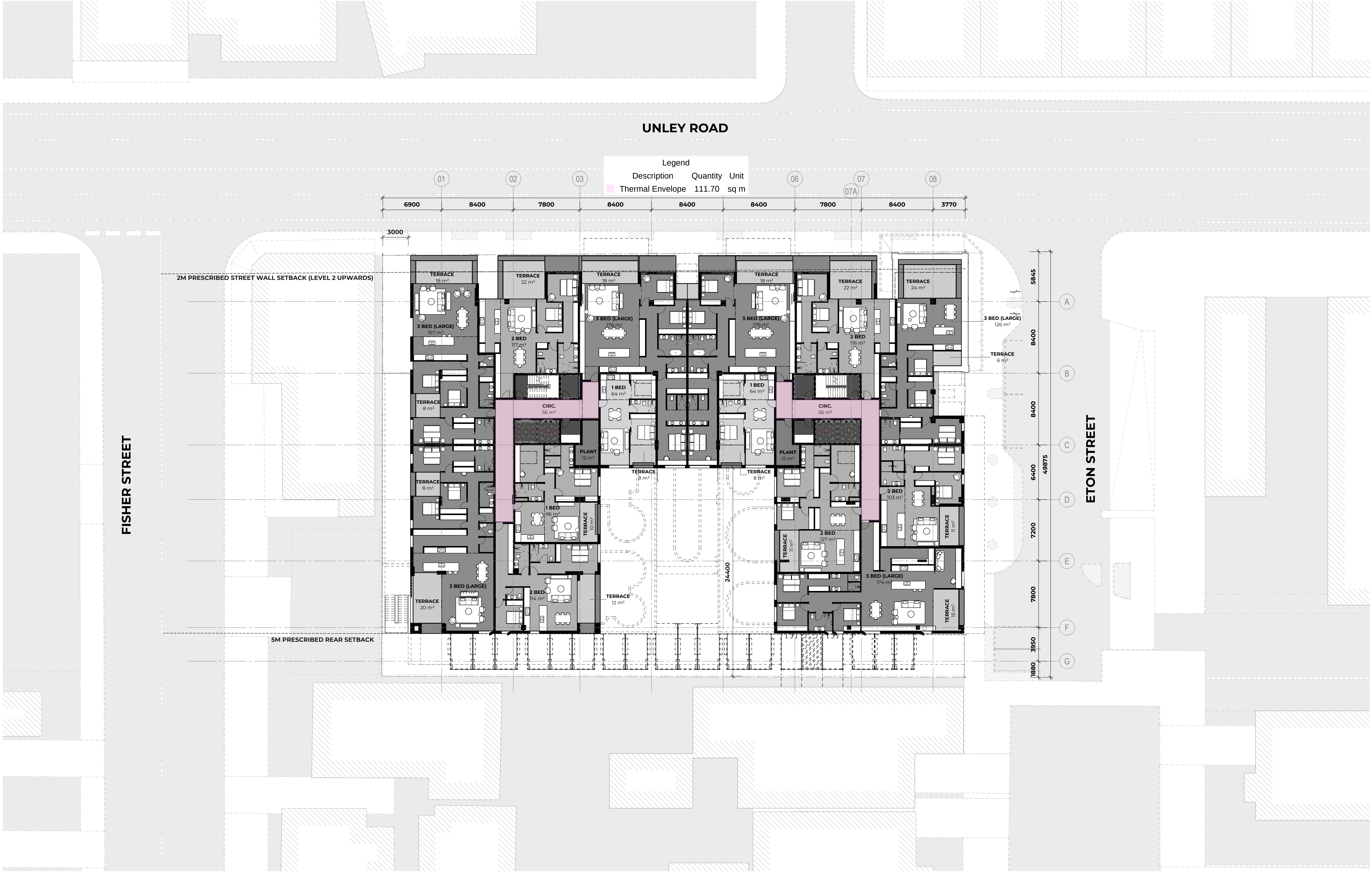


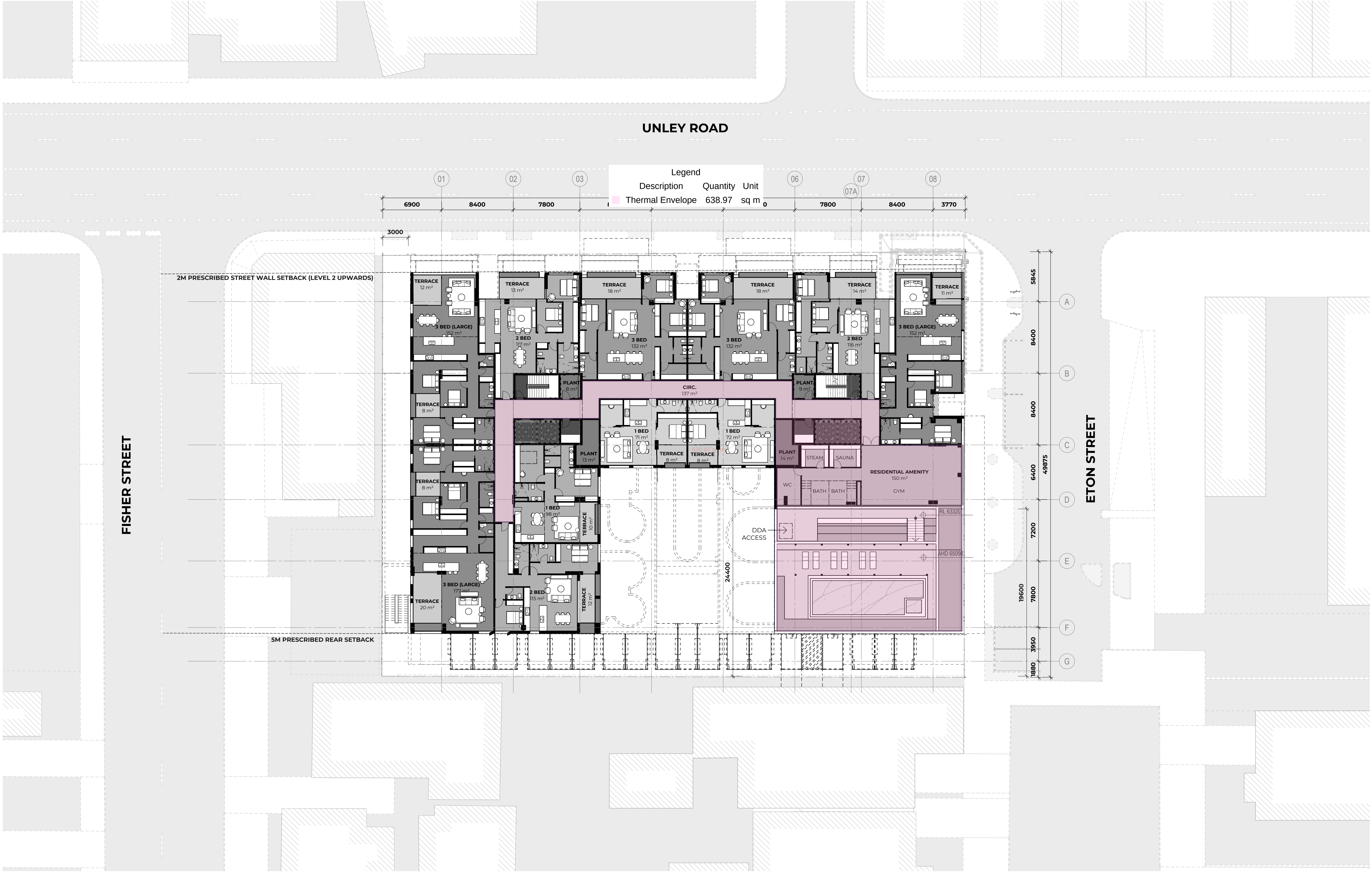


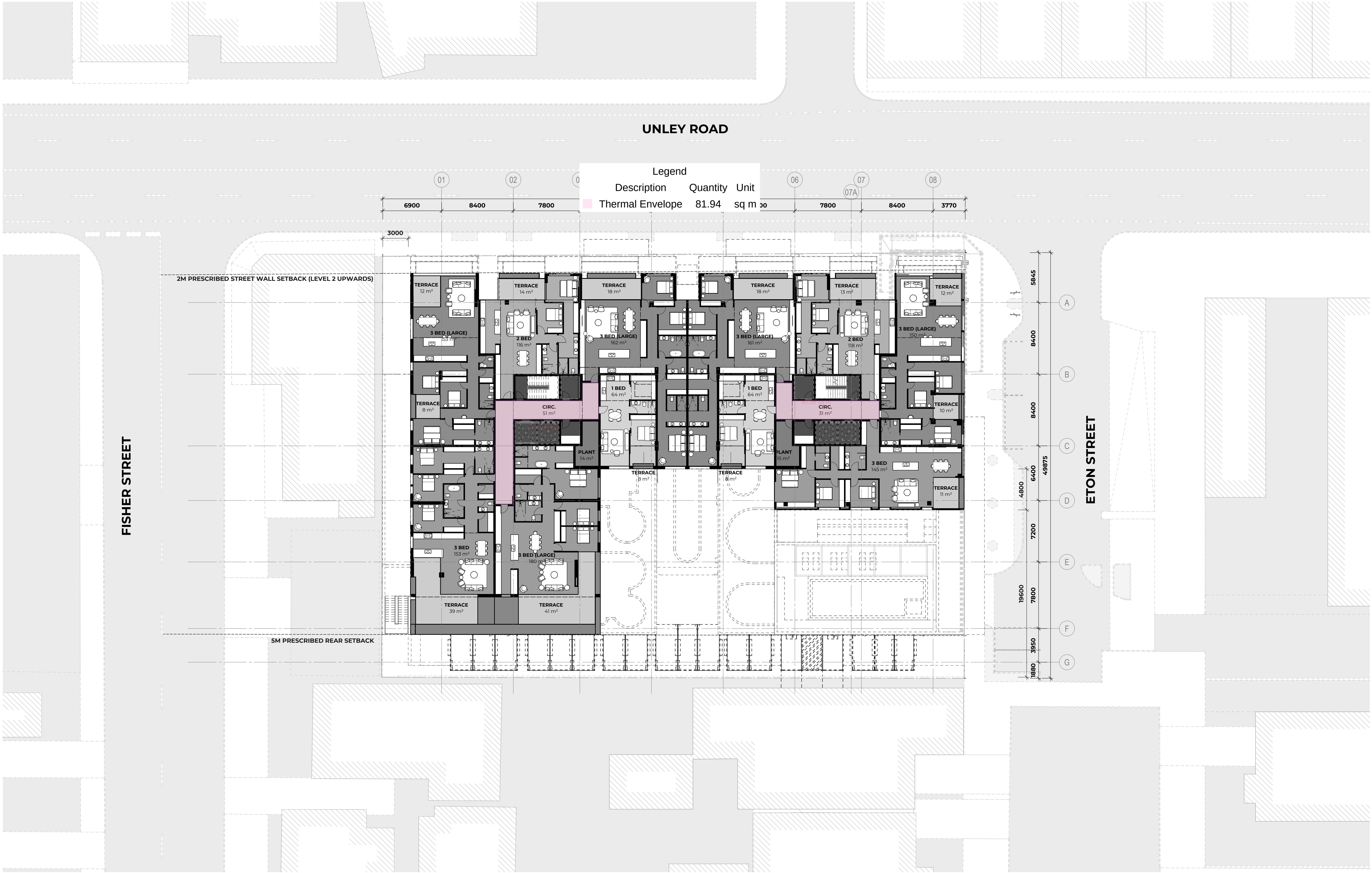


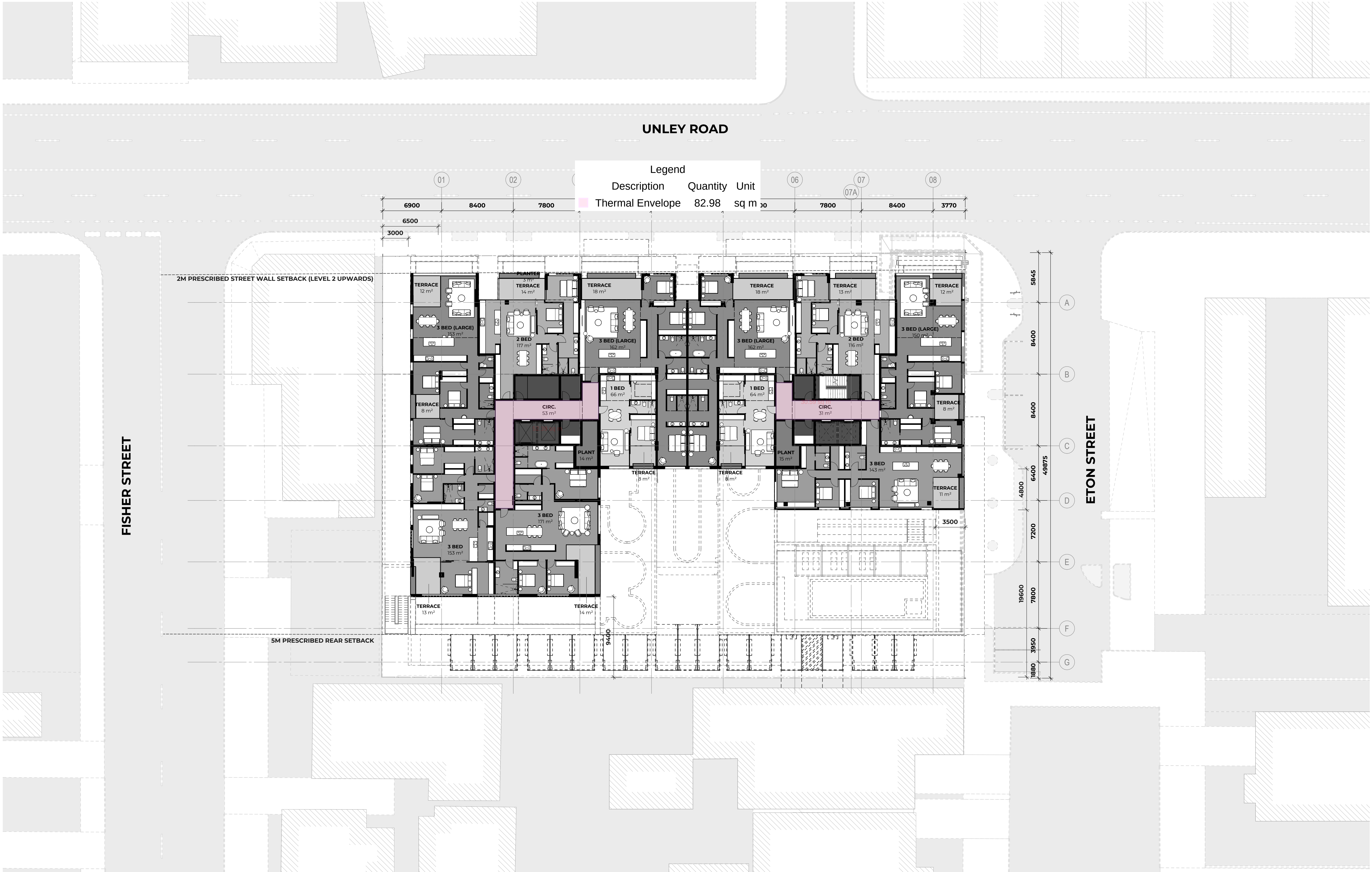


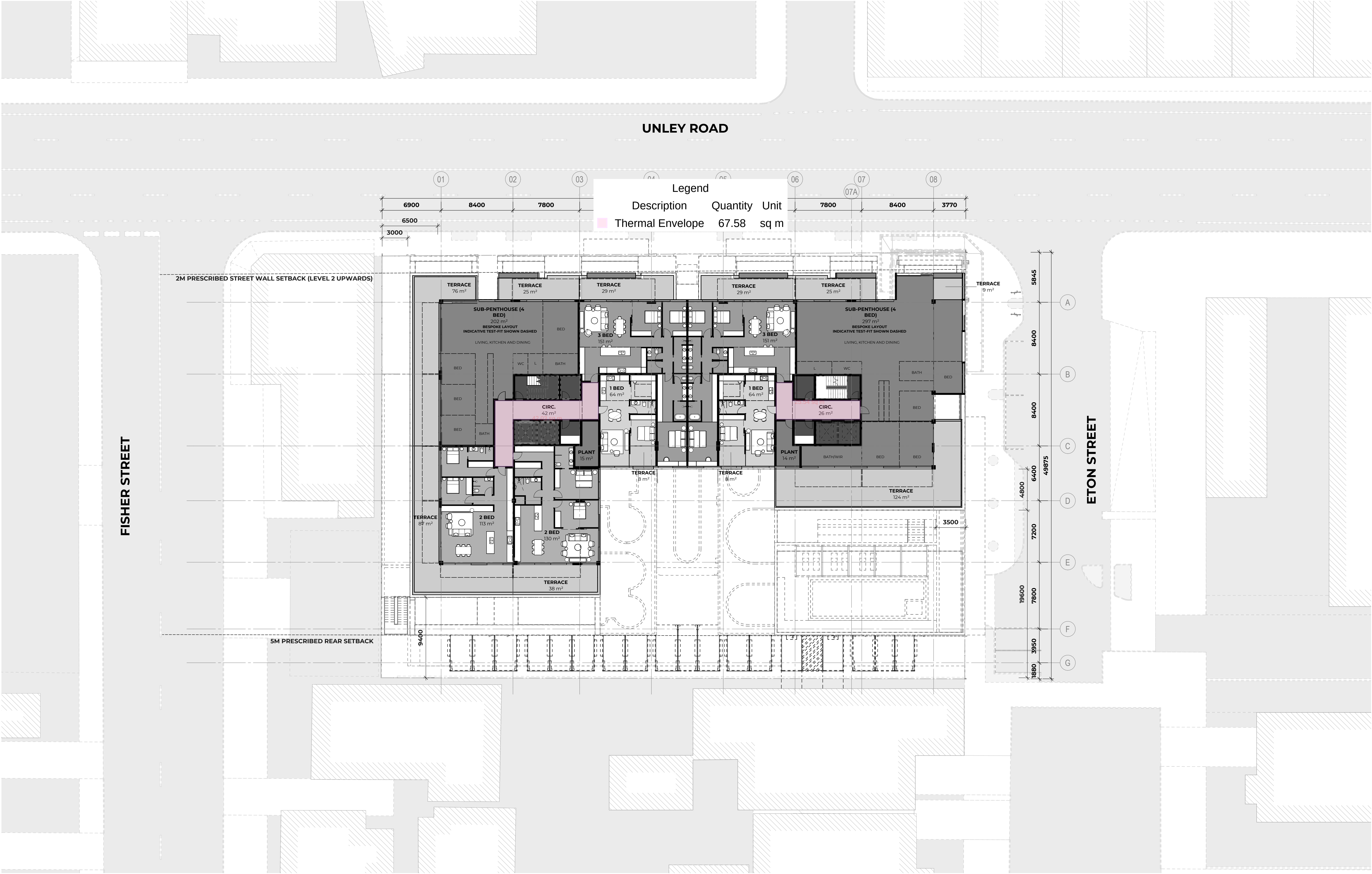


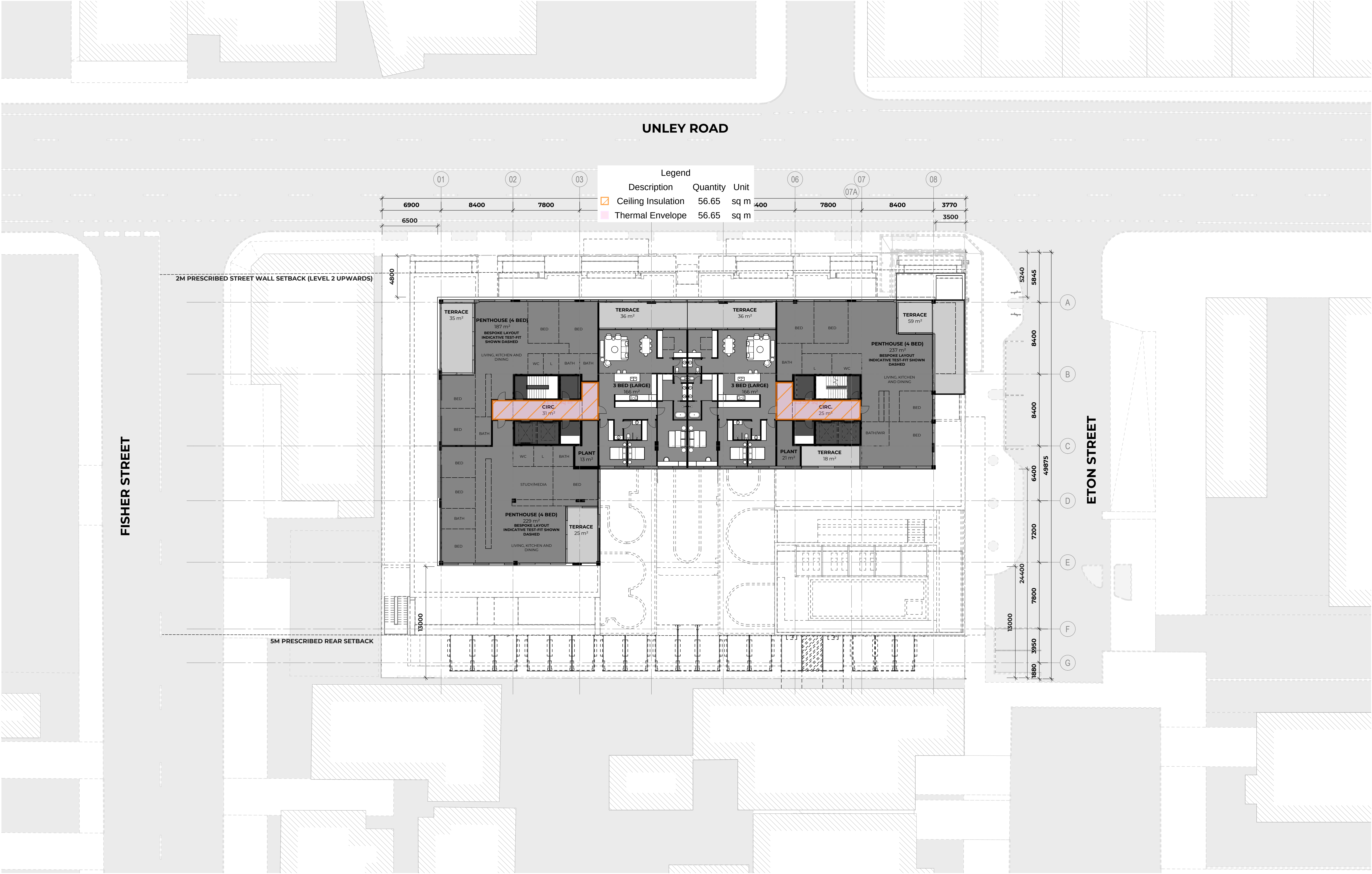


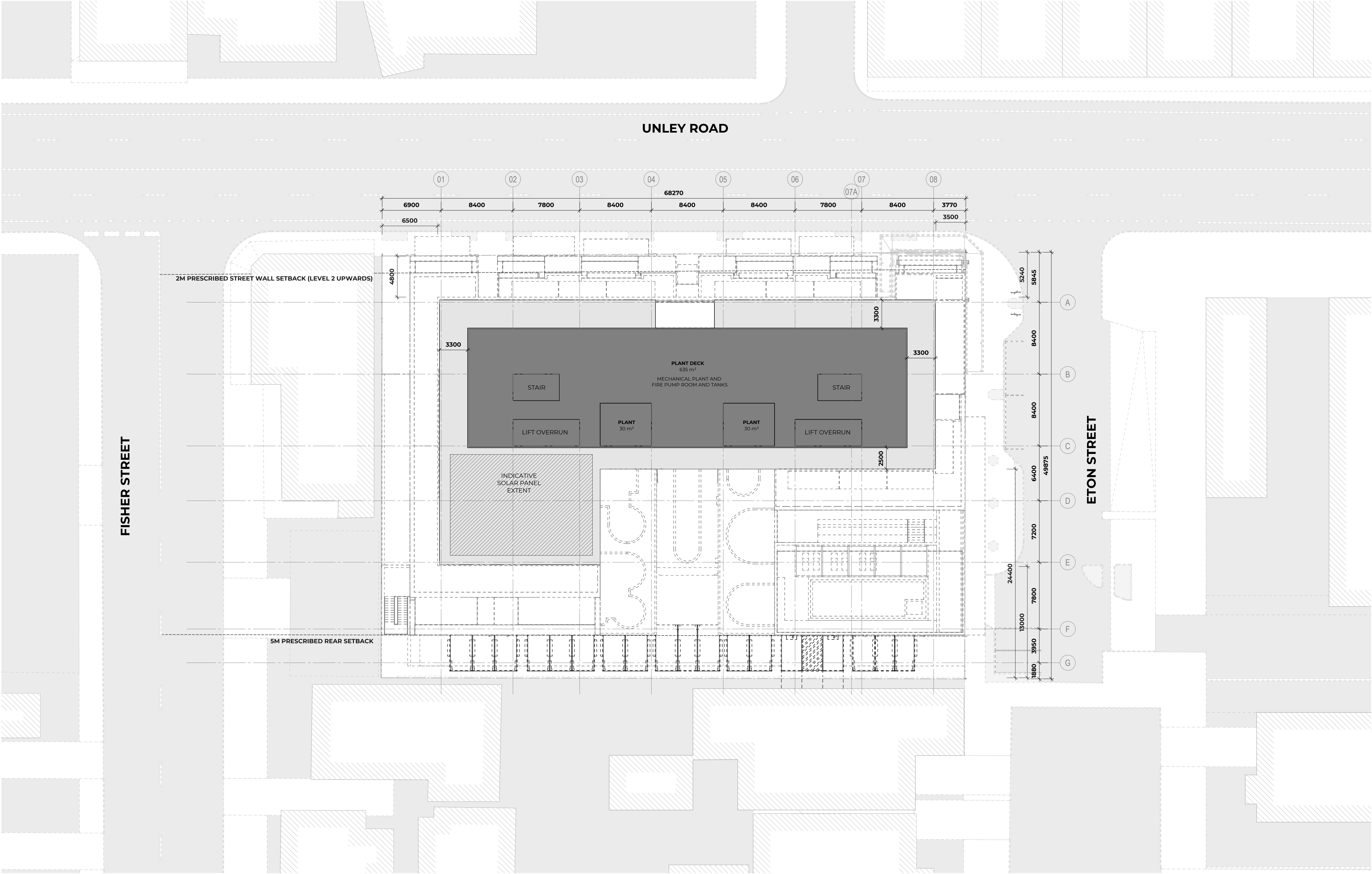


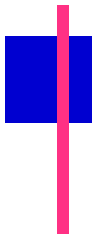












Appendix B: NCC2022 Wall-Glazing Calculations



NCC 2019 and 2022 Wall-Glazing Calculator

Pair with the Wall and Glazing Recorder - Modelled after the v3.0 (Open-source) calculator

Wall and glazing energy efficiency in Class 2-9 buildings - Method 2 of Specification J1.5a, NCC 2019. NCC2022 has yet to be updated with its own Glazing Calculator

Building name and description

ADL0128 Unley Road

Classification

Other

Climate Zone

5

Calculated Area-Weighted U-Value

1.07

Allowable Area-Weighted U-Value

2.00

Building total U-Value allowance met

54%

Calculated Representative Air-Conditioning Energy Value

156.5

Allowable Representative Air-Conditioning Energy Value

186.5

Building total SHGC allowance met

84%

Check Values

Visible

Wall Element Requirements

Met

Display Glazing Element Requirements

-

Use of this calculator does not guarantee compliance with the NCC. The disclaimer and a version update check are available at the bottom of the page.

Element Description					U-Value		SHGC and Shading				
ID	Description (optional)	Element Type	Facing Sector	Area (m ²)	U-Value	U-Value Element share of allowance used	SHGC	Glazing Height (m)	Shading Height (m)	Shading Projection (m)	SHGC Element share of allowance used
1	North Walls Ground	Wall	North	213.45	0.70	3% of building total					Not counted
2	North Walls Level 1	Wall	North	72.28	0.70	1% of building total					Not counted
3	North Walls Level 3	Wall	North	64.16	0.70	1% of building total					Not counted
4	East Walls Ground	Wall	East	40.55	0.70	1% of building total					Not counted
5	East Walls Level 1	Wall	East	114.67	0.70	2% of building total					Not counted
6	East Walls Level 3	Wall	East	63.81	0.70	1% of building total					Not counted
7	South Walls Ground	Wall	South	256.33	0.70	4% of building total					Not counted
8	South Walls Level 1	Wall	South	135.08	0.70	2% of building total					Not counted
9	South Walls Level 3	Wall	South	56.35	0.70	1% of building total					Not counted
10	West Walls Ground	Wall	West	231.28	0.70	4% of building total					Not counted
11	West Walls Level 1	Wall	West	66.70	0.70	1% of building total					Not counted
12	Internal Walls Ground	Wall	Internal	514.30	0.70	8% of building total					Not counted
13	Internal Walls Level 1	Wall	Internal	309.99	0.70	5% of building total					Not counted
14	Internal Walls Level 2	Wall	Internal	306.99	0.70	5% of building total					Not counted
15	Internal Walls Level 3	Wall	Internal	362.58	0.70	6% of building total					Not counted
16	Internal Walls Level 4	Wall	Internal	230.58	0.70	4% of building total					Not counted
17	Internal Walls Level 5	Wall	Internal	233.25	0.70	4% of building total					Not counted
18	Internal Walls Level 6	Wall	Internal	194.24	0.70	3% of building total					Not counted
19	Internal Walls Level 7	Wall	Internal	184.53	0.70	3% of building total					Not counted
20	North Glazing Ground S1	Glazing	North	31.25	4.00	3% of building total	0.4	3.175	3.3	2.29	0% of building total
21	North Glazing Ground S2	Glazing	North	11.33	4.00	1% of building total	0.4	3.175	2.5	1.98	0% of building total
22	North Glazing Level 1	Glazing	North	22.14	4.00	2% of building total	0.4	2.7			0% of building total
23	North Glazing Level 3	Glazing	North	20.65	4.00	2% of building total	0.4	2.95			0% of building total
24	East Glazing Level 1	Glazing	East	40.56	4.00	4% of building total	0.4	2.95	3.4	0.3	18% of building total
25	East Glazing Level 3	Glazing	East	63.72	4.00	6% of building total	0.4	2.95			28% of building total
26	South Glazing Level 1 S1	Glazing	South	56.78	4.00	5% of building total	0.4	2.5			0% of building total
27	South Glazing Level 1 S2	Glazing	South	14.00	4.00	1% of building total	0.4	2.5			0% of building total
28	South Glazing Level 3	Glazing	South	3.15	4.00	0% of building total	0.4	0.715			0% of building total
29	West Walls Ground S1	Glazing	West	109.28	4.00	10% of building total	0.4	3.235	3.3	3.265	21% of building total
30	West Walls Ground S2	Glazing	West	10.25	4.00	1% of building total	0.4	4.1			5% of building total
31	West Walls Ground S3	Glazing	West	15.63	4.00	1% of building total	0.4	3.235	2.5	2.045	7% of building total
32	West Walls Ground S4	Glazing	West	15.42	4.00	1% of building total	0.4	4.1	5.1	4.5	4% of building total
33	West Walls Level 1 S1	Glazing	West	21.40	4.00	2% of building total	0.4	2.37			10% of building total
34	West Walls Level 1 S2	Glazing	West	10.71	4.00	1% of building total	0.4	3.4			5% of building total
35	West Walls Level 1 S3	Glazing	West	21.28	4.00	2% of building total	0.4	2.66	2.95	3.2	4% of building total
36						Not counted					Not counted
37						Not counted					Not counted
38						Not counted					Not counted
39						Not counted					Not counted
40						Not counted					Not counted
41						Not counted					Not counted
42						Not counted					Not counted
43						Not counted					Not counted

Overall Wall Percentage

89%

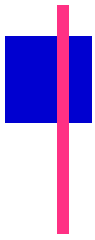
Overall Window Percentage

11%

Disclaimer:

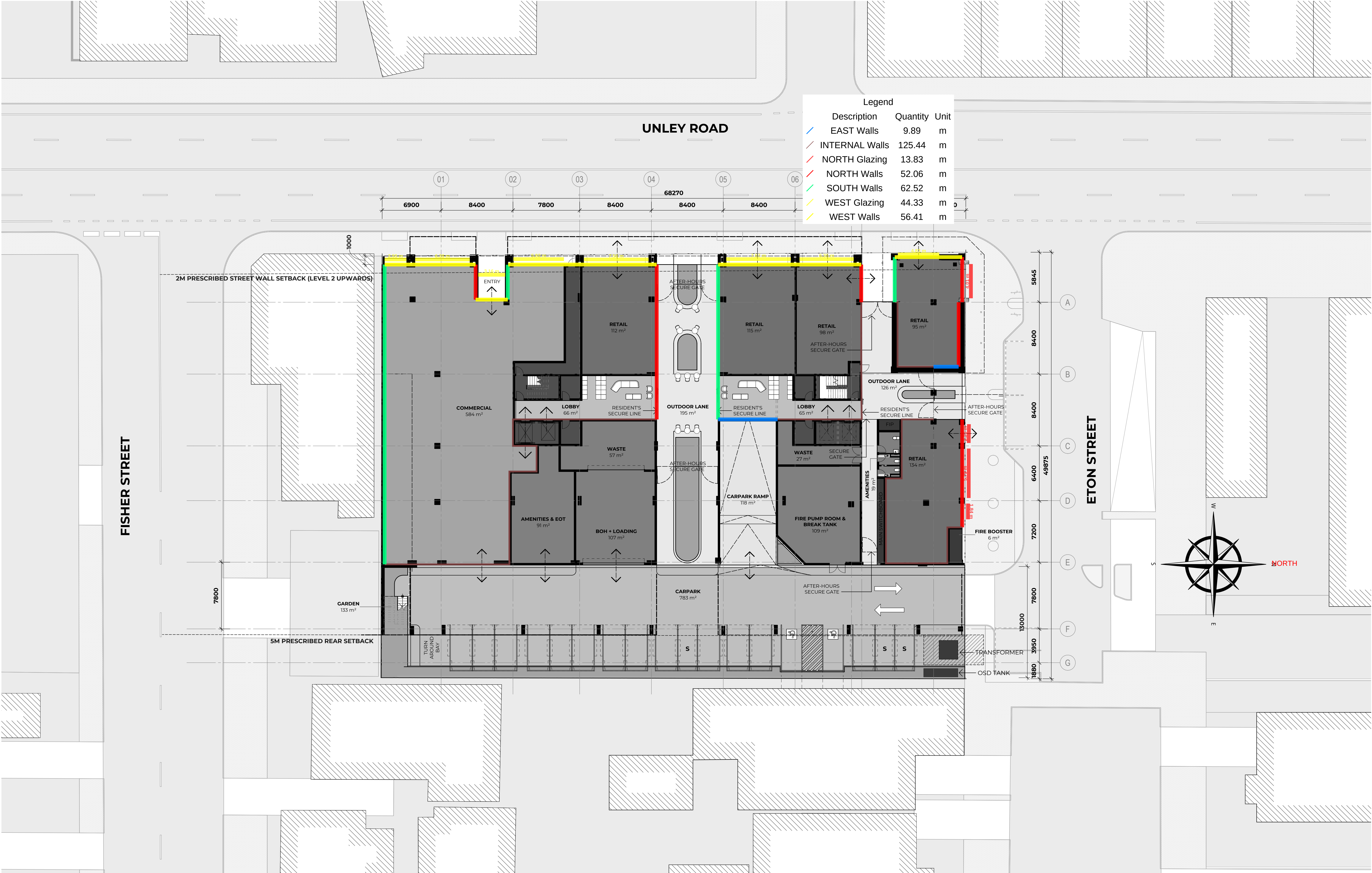
This calculator has been developed to assist in developing a better understanding of the glazing energy efficiency parameters of NCC 2019. While the author believes that the calculator, if used correctly, is likely to produce accurate results, it is provided "as is" and without any representation or warranty of any kind, including that it is fit for any purpose or of merchantable quality, or functions as intended or at all. Your use of this calculator is entirely at your own risk and the author accepts no liability of any kind.

Based on the Wall-Glazing Calculator v3.0 made by Alex Zeller (available at [this link](#)).

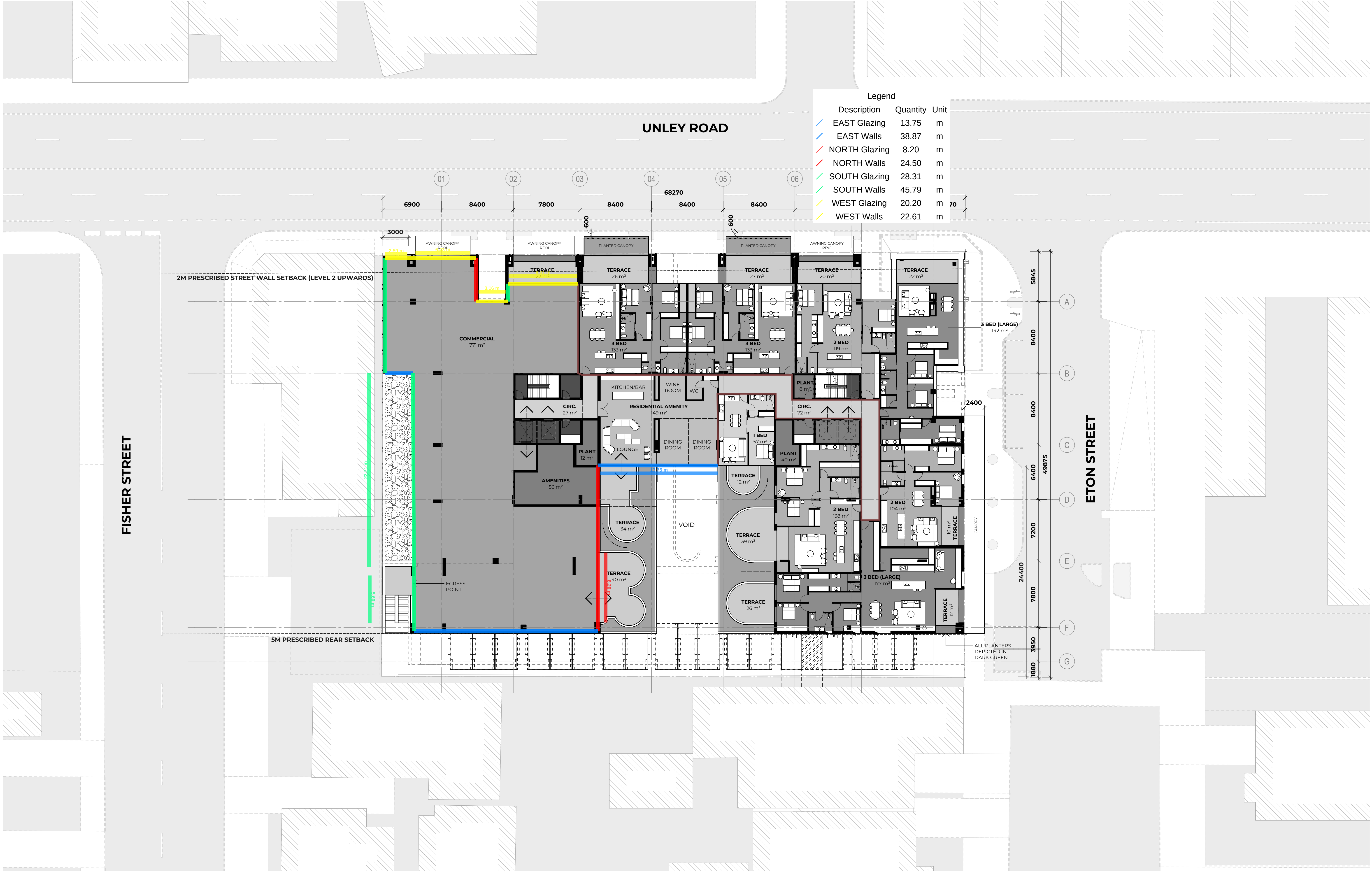


Appendix C: Wall-Glazing Markups

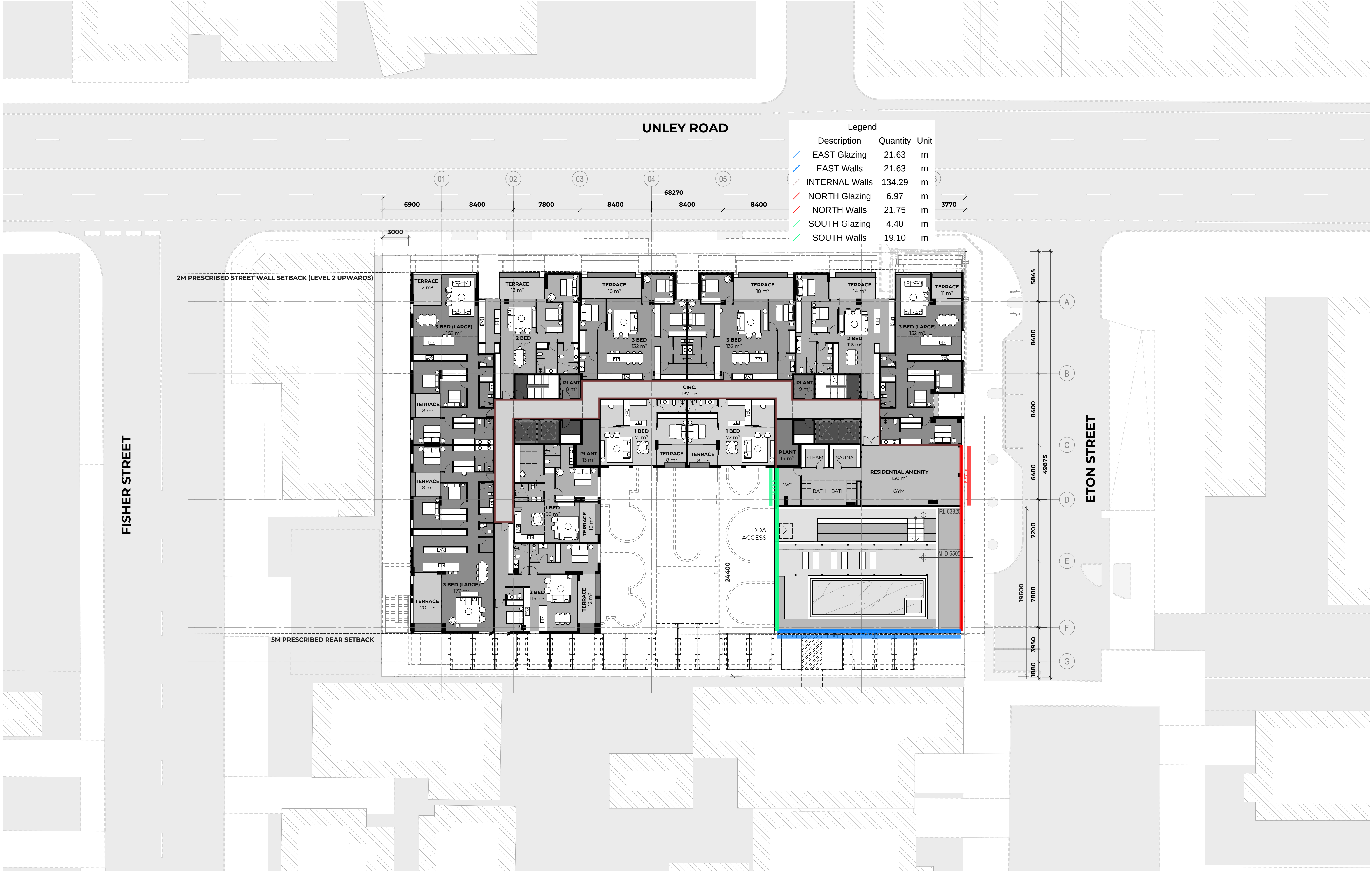


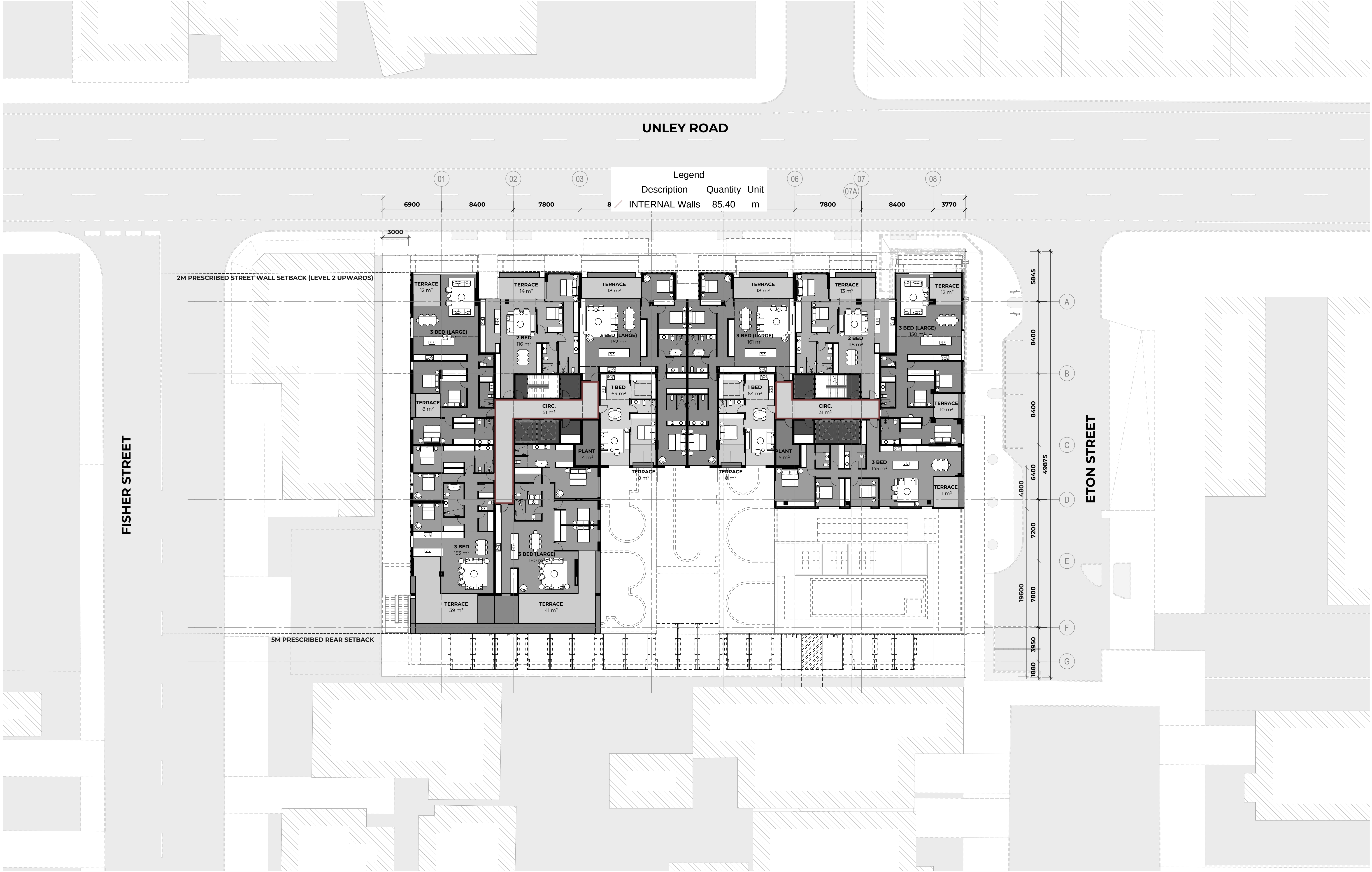


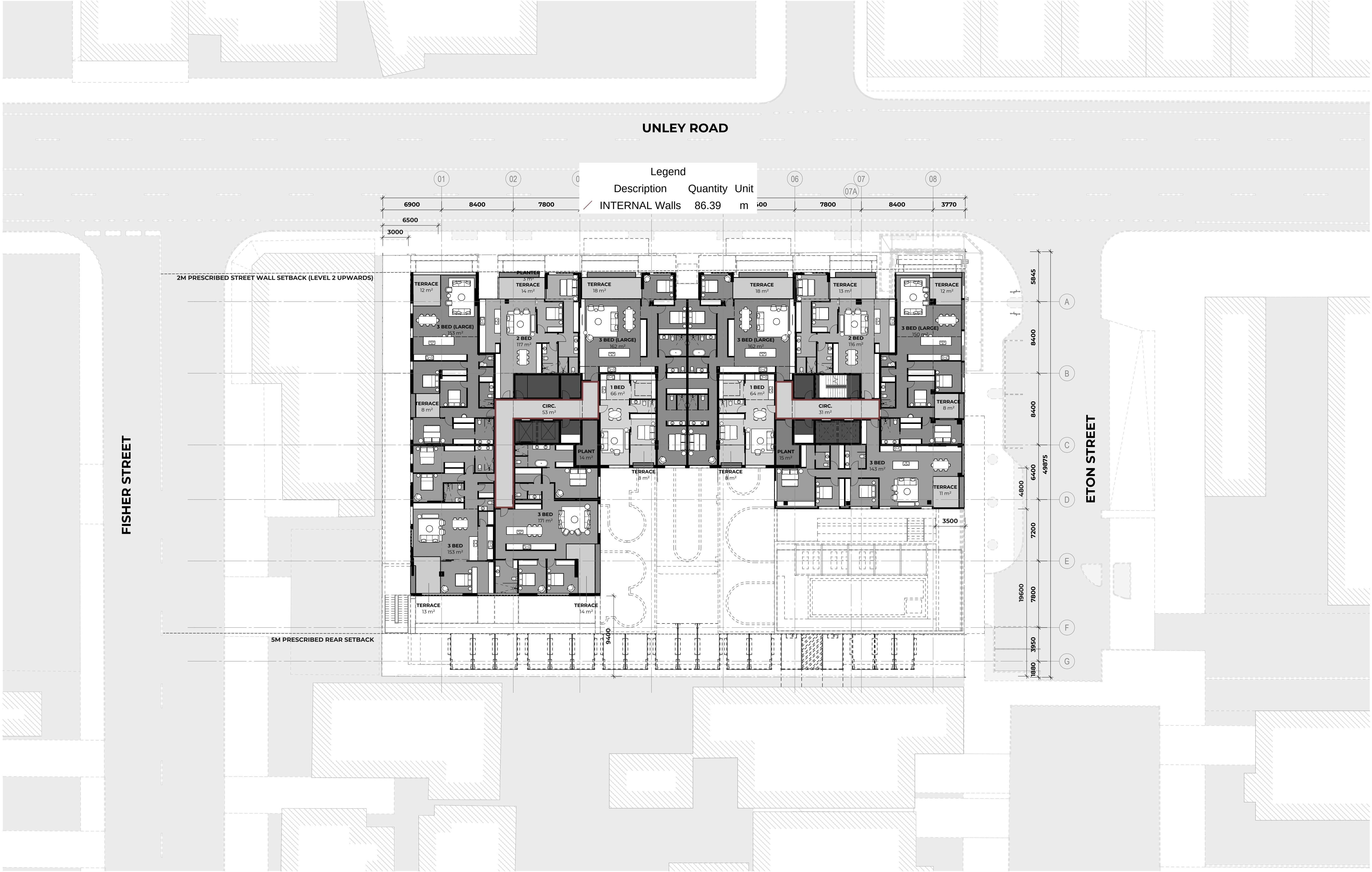
Legend			
Description	Quantity	Unit	
EAST Walls	9.89	m	
INTERNAL Walls	125.44	m	
NORTH Glazing	13.83	m	
NORTH Walls	52.06	m	
SOUTH Walls	62.52	m	
WEST Glazing	44.33	m	
WEST Walls	56.41	m	

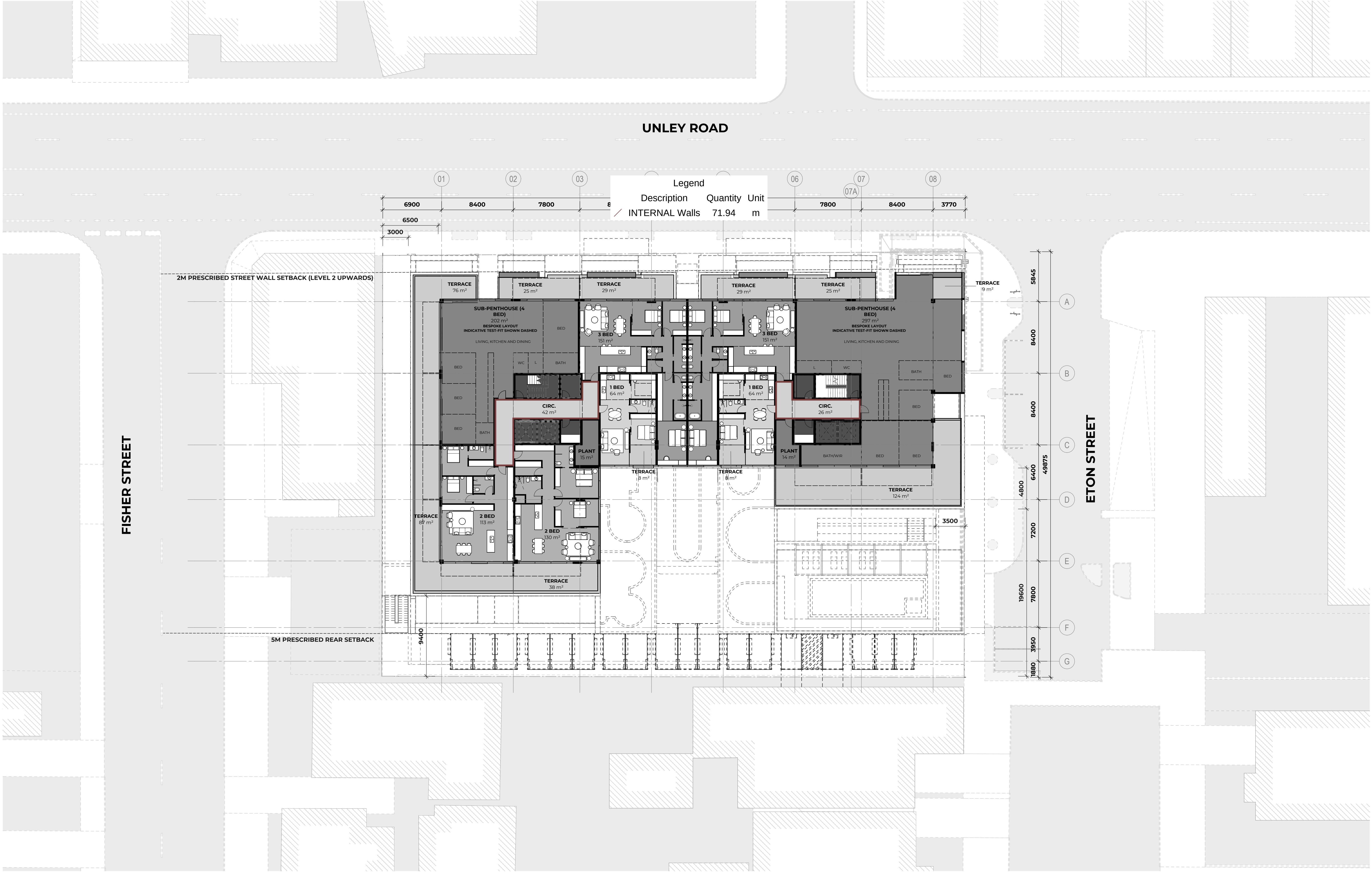


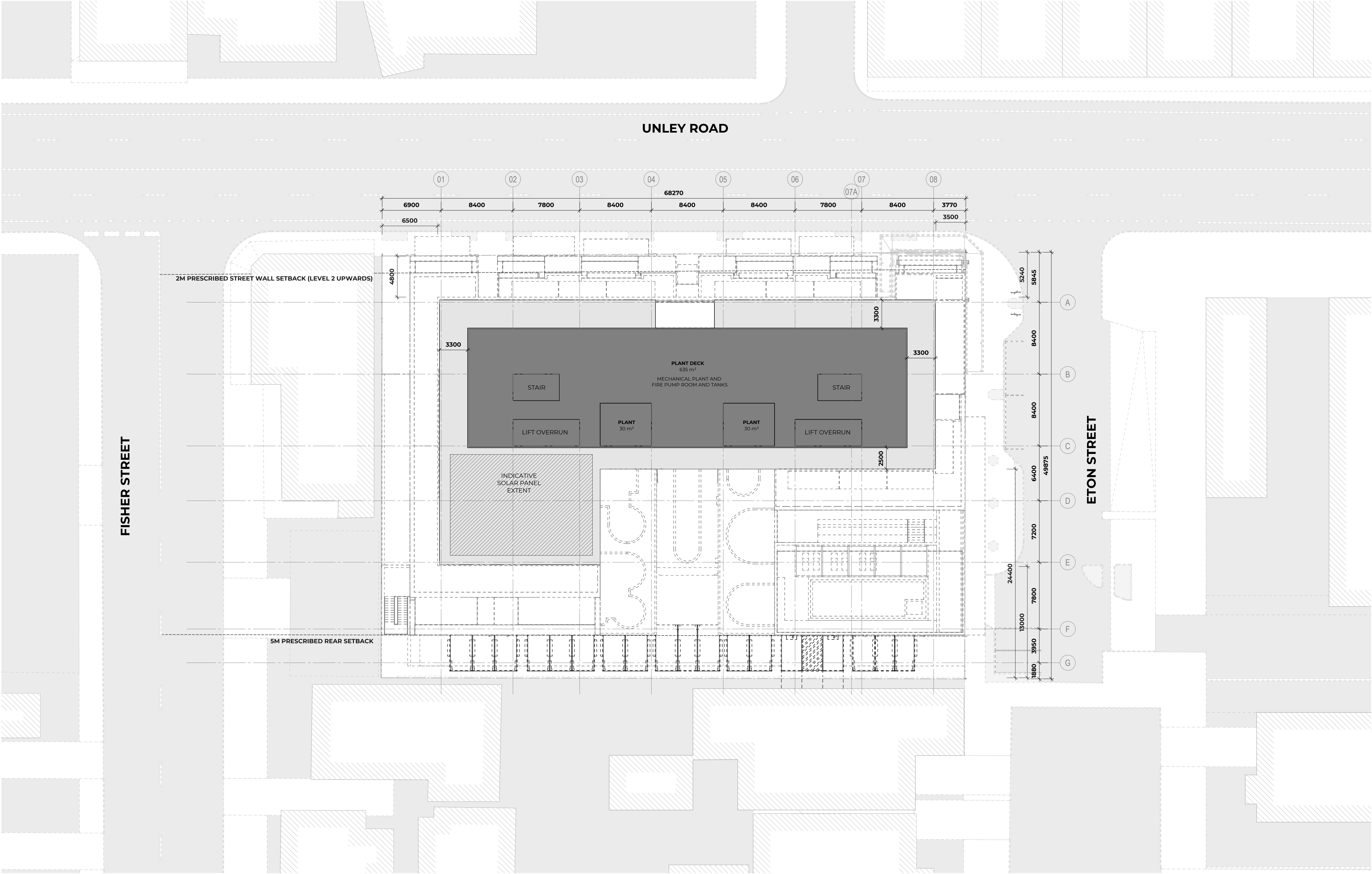
Legend		
Description	Quantity	Unit
EAST Glazing	13.75	m
EAST Walls	38.87	m
NORTH Glazing	8.20	m
NORTH Walls	24.50	m
SOUTH Glazing	28.31	m
SOUTH Walls	45.79	m
WEST Glazing	20.20	m
WEST Walls	22.61	m

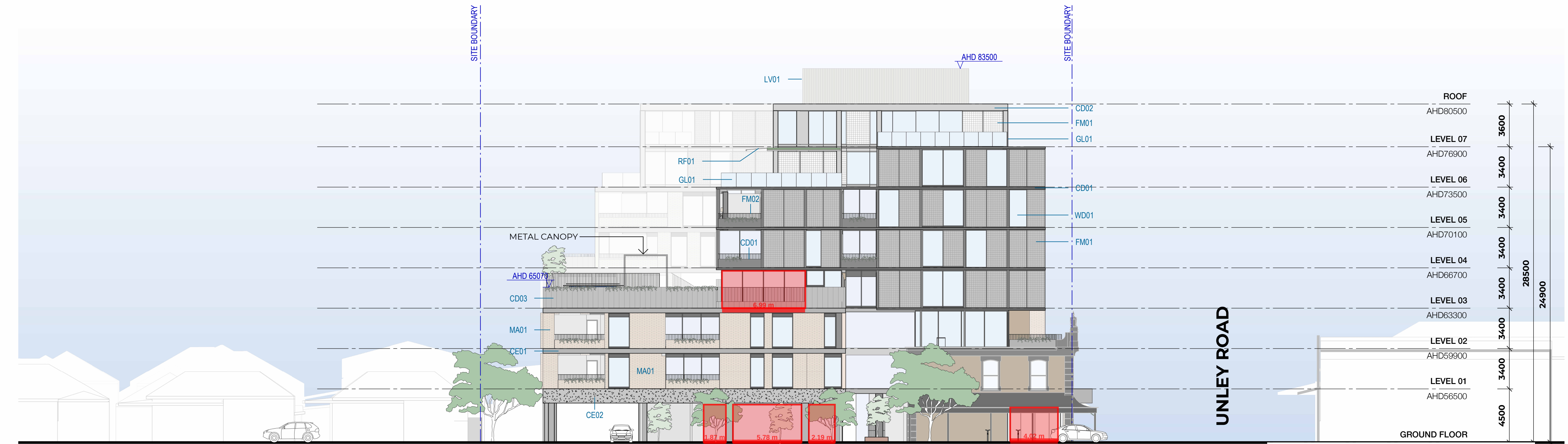












2. North Elevation

ETON STREET



1. East Elevation

Legend			
	Description	Quantity	Unit
	East Glazing L1	36.24	sq m
	East Glazing	63.35	sq m
	EAST Glazing	35.27	m
	North Glazing Ground S1	31.25	sq m
	North Glazing Ground S2	11.33	sq m
	North Glazing L3	22.08	sq m
	NORTH Glazing	20.85	m

FACADE MATERIAL SCHEDULE

CE01 OFF-FORM CONCRETE
CE02 CONCRETE WITH PEBBLECRETE TEXTURE

CD01 METAL CLADDING - DARK
CD02 METAL CLADDING - LIGHT
CD03 METAL CLADDING - VERTICAL (LIGHT)

FM01 SCREEN (OPERABLE IN AREAS)
COLOUR TO MATCH CD01/CD02 ADJACENT
FM02 FABRICATED METAL BALUSTRADE

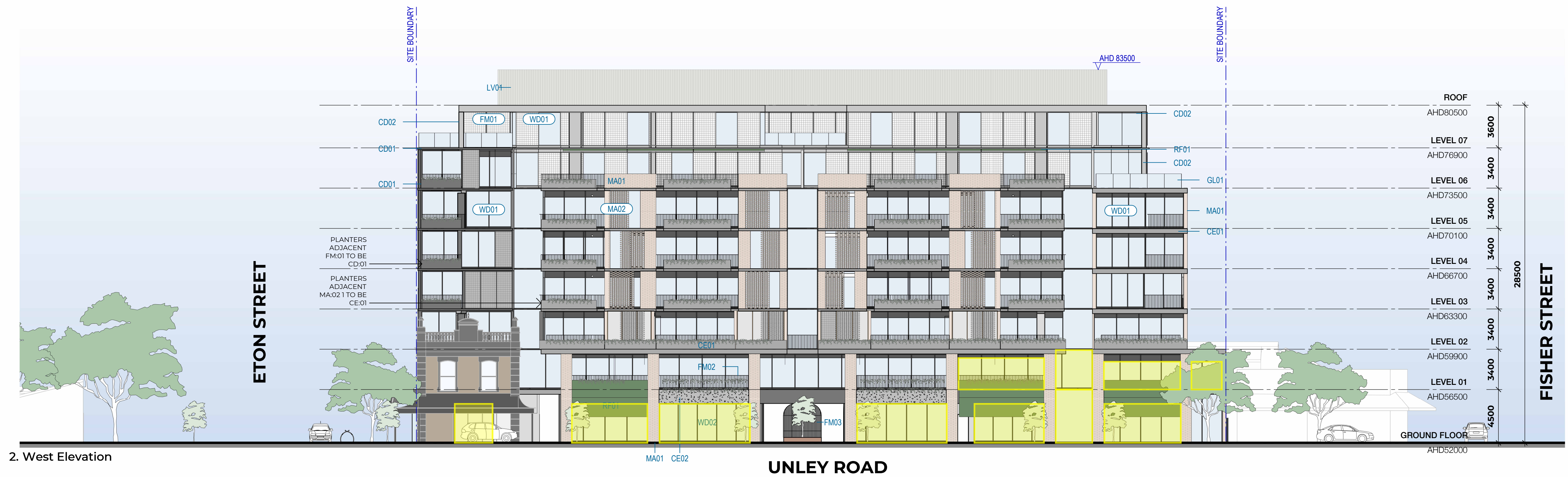
GL01 GLASS BALUSTRADE

LV01 LOUVERED PLANT SCREEN - VERTICAL METAL FINISH

MA01 MASONRY - LIGHT BRICK
MA02 MASONRY - LIGHT BRICK HIT AND MISS SCREEN

RF01 AWNING SHADES - GREEN (COLOUR TBC)

WD01 GLAZING (RESIDENTIAL) - WITH INTEGRATED OPERABLE AWNING WINDOWS AND DOORS
WD02 GLAZING (RETAIL) - WITH INTEGRATED OPERABLE DOORS
WD03 GLAZING (COMMERCIAL)



2. West Elevation



1. South Elevation

FACADE MATERIAL SCHEDULE

- CE01** OFF-FORM CONCRETE
CE02 CONCRETE WITH PEBBLECRETE TEXTURE
CD01 METAL CLADDING - DARK
CD02 METAL CLADDING - LIGHT
CD03 METAL CLADDING - VERTICAL (LIGHT)
FM01 SCREEN (OPERABLE IN AREAS)
COLOUR TO MATCH CD01/CD02 ADJACENT
FM02 FABRICATED METAL BALUSTRADE
GL01 GLASS BALUSTRADE

- LV01** LOUVERED PLANT SCREEN - VERTICAL METAL FINISH
MA01 MASONRY - LIGHT BRICK
MA02 MASONRY - LIGHT BRICK HIT AND MISS SCREEN
RF01 AWNING SHADES - GREEN (COLOUR TBC)
WD01 GLAZING (RESIDENTIAL) - WITH INTEGRATED OPERABLE AWNING WINDOWS AND DOORS
WD02 GLAZING (RETAIL) - WITH INTEGRATED OPERABLE DOORS
WD03 GLAZING (COMMERCIAL)

Legend

Description	Quantity	Unit
South Glazing	70.85	sq m
SOUTH Glazing	28.28	m
West Glazing	186.09	sq m

Appendix C

Daylight Assessment

Consultant Advice Notice

From	Vickie Huang	Advice No	CAN-ESD-01
Project No	ADL0128	Project Name	Unley Road Apartments
Date	12/11/2025	Pages	3
Subject	Daylight modelling	Revision	02

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Dante Bruno	Woods Bagot	Dante.Bruno@woodsbagot.com

Introduction

The purpose of this Consultant Advice Notice (CAN) is to communicate the results of the daylight modelling undertaken for the development at 259-269 Unley Road, Malvern SA. The modelling has been completed against industry benchmarks defined within the Green Star Design & As Built v1.3 guidelines.

Methodology

The daylight study is being conducted using the Daylight Factor method, which calculates the ratio of light levels inside a building to the light levels outside the building. The higher the daylight factor, the better the daylight provision to the indoor space. Daylight Factor calculations rely on a standard overcast sky model and is not dependent on time, season or location-based inputs.

Daylight modelling is being conducted using the Rhino 3D modelling software which uses the Climate Studio parametric modelling plugin to model daylight factor results.

Assessment criteria

The Daylight credit under Green Star Design & As Built v1.3 guidelines aims to recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants. The daylight requirements, using the daylight factor methodology, high levels of daylight are deemed to have the following:

- DF1.5 or greater for residential primary spaces (i.e. living rooms and dining rooms)
- DF2.0% or greater for all other primary spaces (i.e. retail FOH, commercial, amenities etc.)

Where an overall floor area of 40% or more is achieved for the development, this is considered as achieving the Green Star benchmarks for high levels of daylight.

Assumptions

Description	Parameter	Comments
Daylight framework	Green Star Design & As Built v1.3	Residential living and dining $\geq$ DF1.5 Retail, commercial, and amenities $\geq$ DF2.0
Architectural drawings		Dated 10/10/2025
Rhino Model		Received 20/10/2025
Glazing visible light transmissivity (VLT)	External glazing $>40\%$	VLT is inclusive of frame (total system value)
Floor reflectance	38%	Interior floor
Wall reflectance	81%	Matte white
Ceiling reflectance	81%	Matte white
Balustrades	70%	
Screens	30%	Including hit-miss brick and screening on L06
Analysis Surface	Floor	
Overshadowing	Adjacent property and buildings, per current surrounding context.	No adjacent planned or equitable development scenarios.
Sky	10,000 lux CIE Overcast Sky, where the ground ambient light level $\approx$ 10,000 Lux	Standard
Software	Rhino 3D with ClimateStudio (Radiance engine) plug in.	
Exclusions (non-residential)	Secondary and tertiary spaces (e.g. back of house, bike and EOT facilities, corridors, stairs, bathrooms etc.)	
Exclusions (residential)	Secondary and tertiary spaces (e.g. kitchens, bedrooms, bathrooms etc.)	

Results

The results from the daylight modelling assessment are as follows:

Room	DF threshold	Nominated area (m2)	Compliant area (m2)	Compliant area (%)
Living 1F	1.5%	1060	655.0	62%
Living 2F	1.5%	2884	2004.2	69%
Living 3F	1.5%	2216	1304.6	59%
Living 4F	1.5%	794	617.9	78%
Living 5F	1.5%	592	438.3	74%
Living 6F	1.5%	442	197.5	45%
Living 7F	1.5%	305	78.0	26%
Amenity 1F	2.0%	103.3	70.3	69%
Amenity 3F	2.0%	81.0	81.0	100%
Office 1F	2.0%	763.3	364.5	48%
Office GF	2.0%	569.2	141.1	25%
Retail GF	2.0%	426.6	203.3	48%
TOTAL	-	6084.1	10236.3	59.4%

Conclusion

The daylight modelling assessment was completed against the Green Star Design & As Built v1.3 guidelines and indicates that 60% of the primary nominated floor area can achieve high levels of daylight across the residential and non-residential areas, exceeding the Green Star benchmark of 40%.

Adjacent buildings have been accessed as per current scenarios, and no planned or equitable development scenarios have been considered.

Regards,

Vickie Huang

Associate | Sustainability

ADP Consulting Pty Ltd

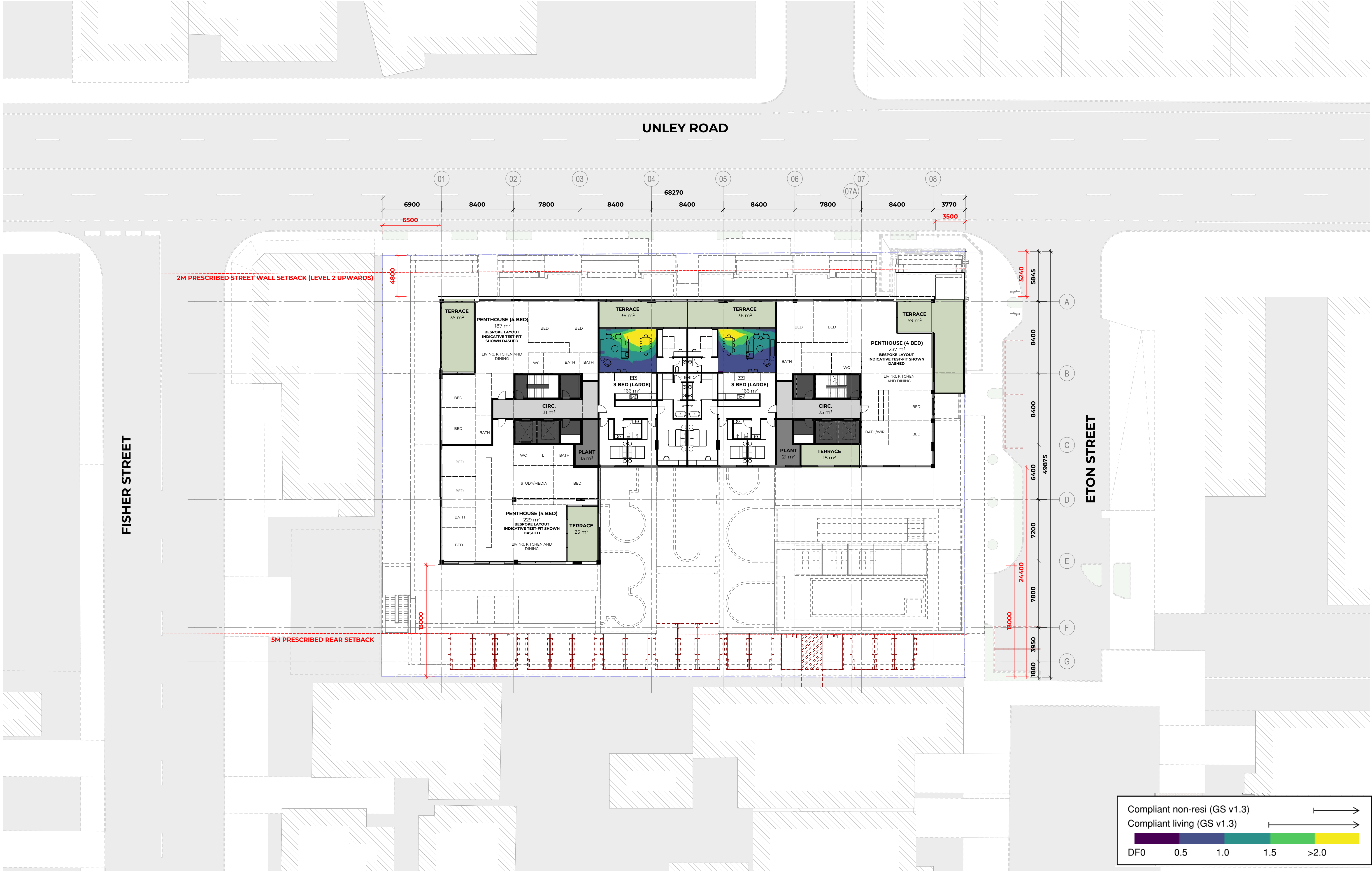












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