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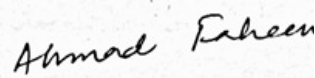

Clifton & Gilpin Pty Ltd C/- HIP V. HYPE

427 Albert Street, Brunswick

**Town Planning Acoustic Report- DFP
Preliminary Submission**

30T-24-0041-TRP-90698-0

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1 Introduction

Vipac Engineers & Scientists Ltd (Vipac) has been engaged by HIP V. HYPE to provide an Acoustic Report for the town planning submission of the proposed development at 427 Albert Street, Brunswick. For the purposes of this report, the 427 Albert Street, Brunswick shall be referred to as the development. The acoustic terminology is given in Appendix A.

2 References

- AS/NZS 2107:2016 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors;
- Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues, Publication 1826.4, May 2021;
- Better Apartments Design Standards – Victoria State Government;
- EPA Publication 1254.2 Noise Control Guidelines;
- Environmental Protection Act 2017;
- Environment Protection Regulations 2021 (the Regulations);
- Traffic Volume Data for Victoria, Vic Roads, April 2019;
- Development Drawings provided by Austin Maynard Architects dated 24th July 2024;
- NSW Road Noise Policy, March 2011.
- Merri-bek Planning Scheme- last updated by VC244 on 16/02/2024

3 Drawings

Vipac received the drawings set by HIP V. HYPE Pty Ltd. The Updated drawings are listed in Table 3-1.

Table 3-1: Development drawing details

Drawing Description	Drawing Number	Revision	Issue Date
Basement Levels; Mezz & B	A109	A	24/7/2024
Level Ground	A100	A	24/7/2024
Level 01	A101	A	24/7/2024
Level 02	A102	A	24/7/2024
Level 03	A103	A	24/7/2024
Level 04	A104	A	24/7/2024
Level 05	A105	A	24/7/2024
Level 06	A106	A	24/7/2024
Level 07	A107	A	24/7/2024
Level 08 (rooftop)	A108	A	24/7/2024

4 Development Description

The current site consists of commercial and retail areas to be demolished for the proposed development at 427 Albert Street, Brunswick. The future development consists of an 8-storey mixed use residential and commercial building. A subset of the development ground floor architectural drawing is shown in Figure 4-1, a relevant sample of architectural drawings can be found in 0Appendix C. The development will consist of the following:

- Basement Level 1 and Level M: Carparks and utilities
- Level 1 – Level 7: Residential tenancies
- Level 8 (Rooftop): Communal area and mechanical services

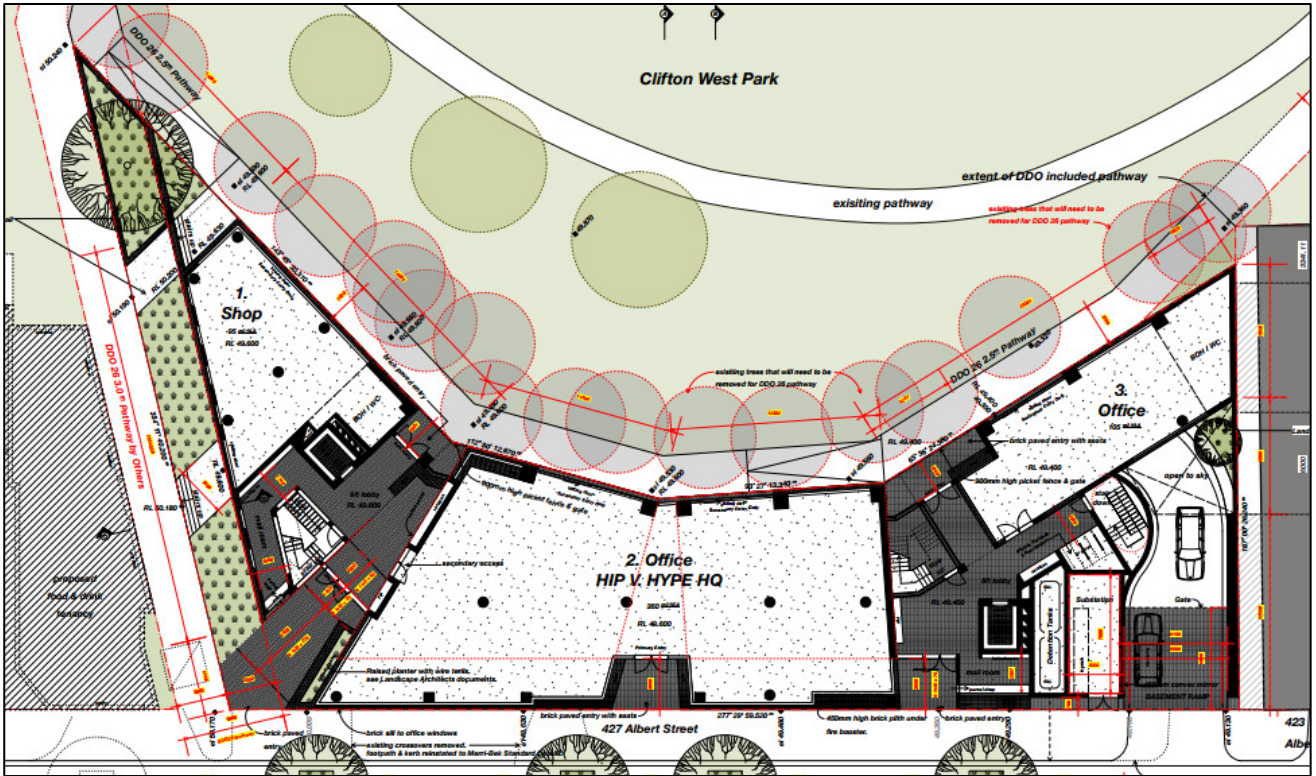


Figure 4-1: Ground Level Architectural Drawing

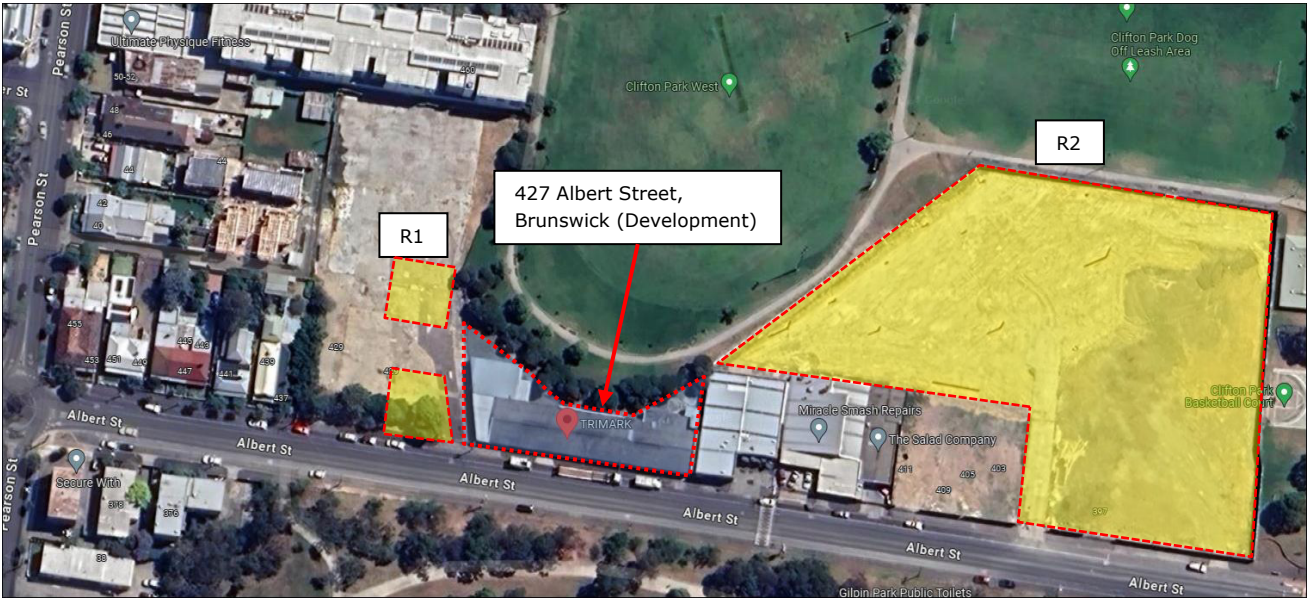


Figure 4-2: Development Location and Surroundings

Figure 4-2 shows the development site and surroundings of this project. The development is bounded by the following sensitive receivers. It should be noted that these receivers are approved developments which are being built or will be built in the future:

- 429 Albert Street, Brunswick (R1): approved two 8 storey buildings (with roof top terraces) containing dwellings and food and drink premise
- 395-411 Albert Street, Brunswick (R2): approved multi 11 storeys residential apartments.

The development site is zoned Mixed Use Zone (MUZ1). The surrounding zones are predominantly Public Park and Recreation Zone (PPRZ), Neighbourhood Residential Zone (NRZ1).

Sensitive receiver R1 has the lowest background noise and shortest distance to the development. If the development is predicted to comply at this receiver, then all other receivers at a greater distance from the development are predicted to comply.

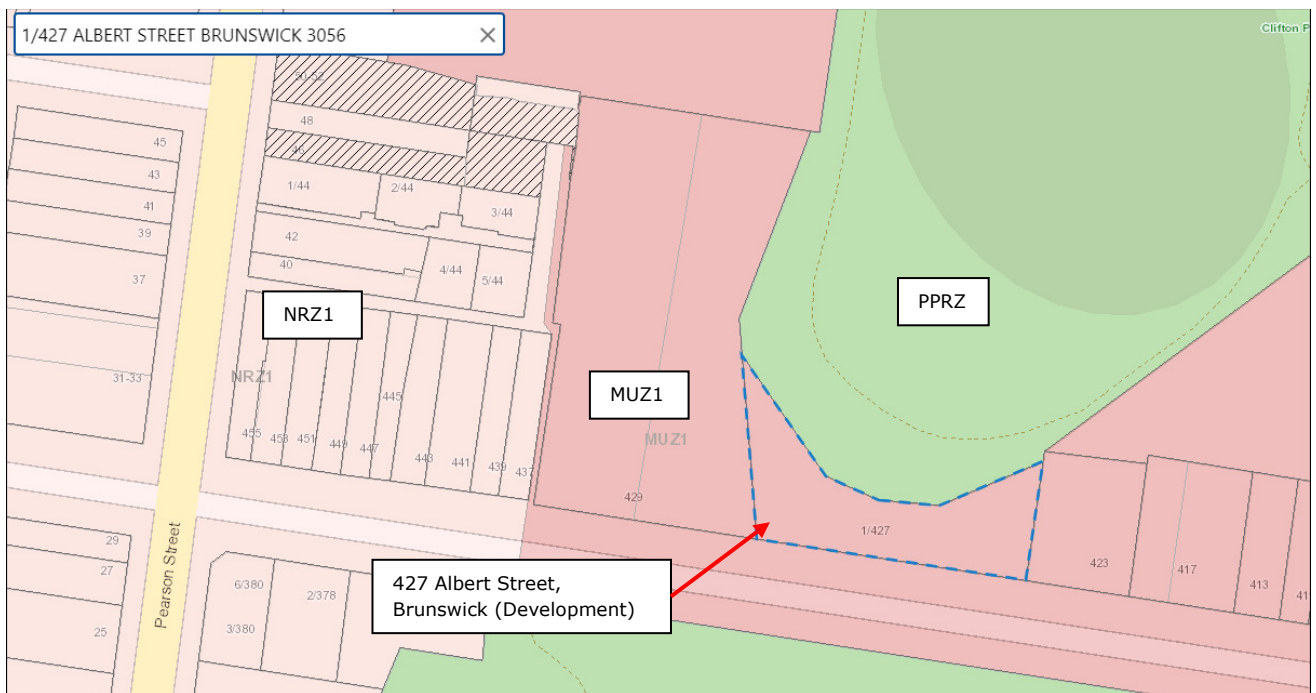


Figure 4-3: zoning areas around the development

5 Regulatory Framework

A range of guidelines and legislation if used in Victoria to assess environmental noise and vibration. This section provides an overview of the key documents and guidelines that are applicable to the proposed development.

5.1 Victorian Legislation

A summary of the relevant Victorian legislation is provided in Table 5-1.

Table 5-1: Relevant Victorian Noise Legislation

Document	Overview
<i>Environmental Protection Act 2017</i> (the Act)	<p>The Act provides the overarching legislative framework for the protection of the environment in Victoria. It establishes a general environmental duty to minimise the risks of harm to human health or the environment from pollution or waste, including noise, so far as reasonably practicable.</p> <p>The Act does not specify noise limit values but prohibits the emission of unreasonable or aggravated noise from non-residential premises.</p>
<i>Environment Protection Regulations 2021</i> (the Regulations)	<p>The objectives of the Regulations are to further the purposes of, and give effect to, the Act. The Regulations also define outdoor sensitive areas, commercial, industrial and trade premises, as well as indoor, outdoor and live entertainment venues and events.</p> <p>Part 5.3 of the Regulations sets out requirements that are specific to environmental noise. Division 1 states that the prediction, measurement, assessment or analysis of noise within a noise sensitive area for the purposes of the Act or the Regulations must be conducted in accordance with the Noise Protocol (see below). Division 3 stipulates requirements that are specific to commercial, industrial and trade premises. The Division defines assessment time periods, minimum noise limit values, management of cumulative noise from multiple premises, noise sensitive areas where assessment requirements apply, definition of frequency spectrum as a prescribed factor, and a definition for unreasonable and aggravated noise.</p>
EPA Publication 1826 <i>Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues</i> (Noise Protocol)	<p>The Noise Protocol defines the method for setting the noise limits for new existing commercial, industrial and trade premises and entertainment venues in Victoria.</p> <p>It also outlines the steps that must be followed to undertake an assessment (measurement or prediction) of the effective noise level within a noise sensitive area or at an alternative assessment location.</p>
General Environmental Duty (GED)	<p>The General Environmental Duty (GED) is outlined in Part 3.2 of the Environmental Protection Act 2017 (the Act) which came into effect 1 July 2021.</p> <p>The GED requires anyone engaging in an activity posing a risk of harm to human health and/or the environment from pollution (including noise) and waste, to minimise those risk to prevent harm as far as reasonable practicable. Commercial premises are therefore required to continue to review and eliminate or reduce the risk of harm from any emission of noise as far as reasonable practicable, even if they are compliant with the Noise Protocol.</p>
Clause 58.04-3 of the Victorian Planning Provisions (VPP)	<p>The proposed development will be required to comply with the requirements of Clause 58 of the Victorian Planning Provisions (VPP).</p> <p>The clause requires that noise impacts associated with the development are adequately addressed. This includes external and internal noise sources.</p>

5.2 Standards and Guidelines

A summary of relevant standards and guidelines referenced in Victorian noise assessment is presented in Table 5-2.

Table 5-2: Relevant Victorian References and Guidelines

Reference	Overview
Australian/New Zealand Standard AS/NZS 2107:2016 "Acoustics - Recommended design sound levels and reverberation times for building interiors" (AS 2107)	Provides recommendations for acceptable internal noise levels. Table 1 of AS 2107 presents the recommended internal noise levels for residential dwellings.
EPA Publication 1254.2 Noise Control Guidelines (EPA Publication 1254)	EPA Publication 1254 provides advice for the management of noise from a range of activities and noise sources. The guidelines are primarily intended to be used by municipal officers to assist in the resolution of complaints or to avert a possible noise nuisance. Some elements of the guidelines have been prepared so that they could be incorporated into a permit condition of a development or embodied as a local law.
Sleep disturbance criteria sourced from NSW Road Noise Policy 2011 (Sleep disturbance criteria)	The provisions of this document are often referred to in Victoria for general guidance on potential sleep disturbance. Based on a review of research into sleep disturbance, the NSW policy nominates maximum external night-time noise levels at noise sensitive locations which are unlikely to disturb sleep.

6 Existing Noise Environment

6.1 Background Noise Measurements

Attended noise measurements were conducted on the 8th of Feb 2024 in general accordance with the Noise Protocol procedures. Due to construction activity adjacent to the development and sensitive receiver R1, daytime measurements have been conducted at an equivalent location (L1) and evening and night time measurements have been conducted near the sensitive receiver R1 (L2). Figure 6-1, Figure 6-2 and Figure 6-3 show the two locations of measurements. Two 15 minutes measurements with fast response for day, evening and night periods have been measured as presented in Table 6-1 and arithmetic average is presented in Table 6-2.

Field calibration of the sound level meter was performed before and after each measurement set, no significant drift from the reference signal was noted. All measurement locations were sufficiently distant from reflective surfaces such that nearfield level corrections were not required. Instrumentation used for the noise measurements is presented in Appendix B.

Table 6-1: Noise Measurement Values

Location	Time [dd-mm-yyyy hh:mm]	Duration [hh:mm]	Noise Level [dBA] L _{A90}	Notes
L1	8/02/2024 14:12	00:15:44	43	Day
L1	8/02/2024 14:28	00:16:33	43	Day
L2	8/02/2024 20:49	00:15:12	44	Evening
L2	8/02/2024 21:04	00:15:41	45	Evening
L2	8/02/2024 23:38	00:15:07	31	Night
L2	8/02/2024 23:53	00:19:56	33	Night

Table 6-2: Background Noise Measurement Values

Day Time L _{A90}	Evening Time L _{A90}	Night Time L _{A90}
43 dB(A)	45 dB(A)	32 dB(A)



Figure 6-1: Locations of noise measurements



Figure 6-2: Noise background measurement location L1- day time



Figure 6-3: Noise background measurement location L2- evening and night time

7 Acoustic Criteria (Noise Protocol)

According to the Noise Protocol, noise limits for sensitive receiver R1 in Figure 4-2 are determined based on a two-part procedure – determination of the existing background noise levels (percentile sound pressure level L_{A90}) and zoning levels. Table 7-1 shows the established noise protocol limits. Figure 7-1 shows the zone map for sensitive receiver R1.

Table 7-1: Noise control limits for the development and surrounding residences [dBA]

Period	Zoning level	Background level, L_{A90}	Background level assessment	Noise limit
Day	53	43	Neutral	53
Evening	47	45	High	48
Night	42	32	Low	40

The time periods defined in the regulations are summarised in Table 7-2.

Table 7-2: Assessment Periods

Period	Day and time
Day	07:00 – 18:00 Monday to Saturday
Evening	18:00 – 22:00 all days
	07:00 – 18:00 Sundays and public holidays
Night	22:00 – 07:00



Figure 7-1: Zone map for sensitive Receiver R1

8 Noise Impacts

8.1 Noise Affecting the Development

The development site is subject to noise from the following external sources:

- Industrial zoned land and associated premises to the north east and south of development;
- Road traffic noise from Albert Street;
- Potential mechanical plant from adjacent premises;
- Sporting club training at Clifton Park;
- Adjacent commercial uses.

There are no noise limits applicable to vehicles on public roads, so the design of the development must control external traffic noise ingress to within appropriate limits internally. This is discussed further in Section 9.

8.2 Potential Noise Emissions from the Development

Noise from the development that may affect noise-sensitive receivers within the site boundary and beyond the site boundary include:

- Mechanical services equipment, including roof fans and air-conditioning equipment;
- Patron (resident) noise from the rooftop amenities;
- Carpark entrance door;
- Waste collection and deliveries.

The various noise impacts and relevant criteria are discussed in Section 10.

8.3 Internal Noise Transfer

Noise transfer internally between apartments is addressed via legislative requirements in the National Construction Code (NCC - also known as the Building Code of Australia (BCA)). This is discussed further in Section 11.

9 Noise Affecting the Development (External Noise Intrusion)

9.1 Recommended Interior Noise Levels

Merri-bek planning scheme Clause 58.04-3 (Noise impacts objectives) recommends design criteria for conditions affecting the acoustic environment within occupied spaces. The Victorian *Better Apartments Design Standards* also provide the same acoustic design criteria for apartments. Recommended design sound pressure levels (SPL) for residential occupancies are given in Table 9-1. These values are applicable to steady state or quasi-steady state sounds and are the reference criteria for selection and assessment of building components that exclude noise both external to the building (e.g., traffic noise, industrial noise), and within the building (e.g., building services noise).

Table 9-1 - Design sound levels for background noise, AS/NZS 2107 & Better Apartments Design Standards

Type of Occupancy	Design Sound Level Range, L_{Aeq} [dBA]
Buildings within a noise influence area specified in Table 9-2	
Living areas	$L_{Aeq,16h(0600-2200)}$ 40
Sleeping areas (night time)	$L_{Aeq,8h(2200-0600)}$ 35

Table 9-2 shows the noise influence area according to the Better Apartments Design Standards and Merri-bek planning scheme Clause 58.04-3.

Table 9-2 Noise influence area according to Better Apartments Design Standards

Noise Source	Noise source type	Noise influence area
Zone interface	Industrial zone 1, 2 & 3	300m to the zone boundary
Road	Freeways and tollways	300m
	Other roads	300m and carrying 40,000 Annual Average Daily Traffic Volume
Railway	Railway servicing passengers in Victoria	80m
	Railway servicing freight in non Metropolitan Melbourne	80m
	Railway servicing freight in Metropolitan Melbourne	135m

According to Table 9-2, only Railways within 80m from the development servicing passengers within Victoria should be assessed. The railway is farther than 80m therefore railway noise is not required for assessment in this report.

The roads that should be assessed are the freeways and tollways within 300m influencing area and the roads within 300m and carrying 40000 annual average daily traffic volume. All of the roads in the surrounding road network are well below these criteria and therefore do not require assessment.

Potential noise emissions from the industrial zones within 300m of the of the zone boundary should be considered as part of this assessment (addressed in Section 9.2 of this report).

9.2 Industrial Zones to the North East and South of Development

Potential noise emissions from the adjacent industrial zones to the north east and south of the development (as depicted in Figure 9-1) has the potential to impact the dwellings of the development.

Due to the noise from major construction activities adjacent to the development and industrial zones, noise from this industrial zones at the development could not be included in the noise measurements carried out for this site.

A detailed assessment should be conducted at the design development stage to confirm noise emissions from the industrial zones (and associated businesses) are compliant with the criteria in Section 9.1.

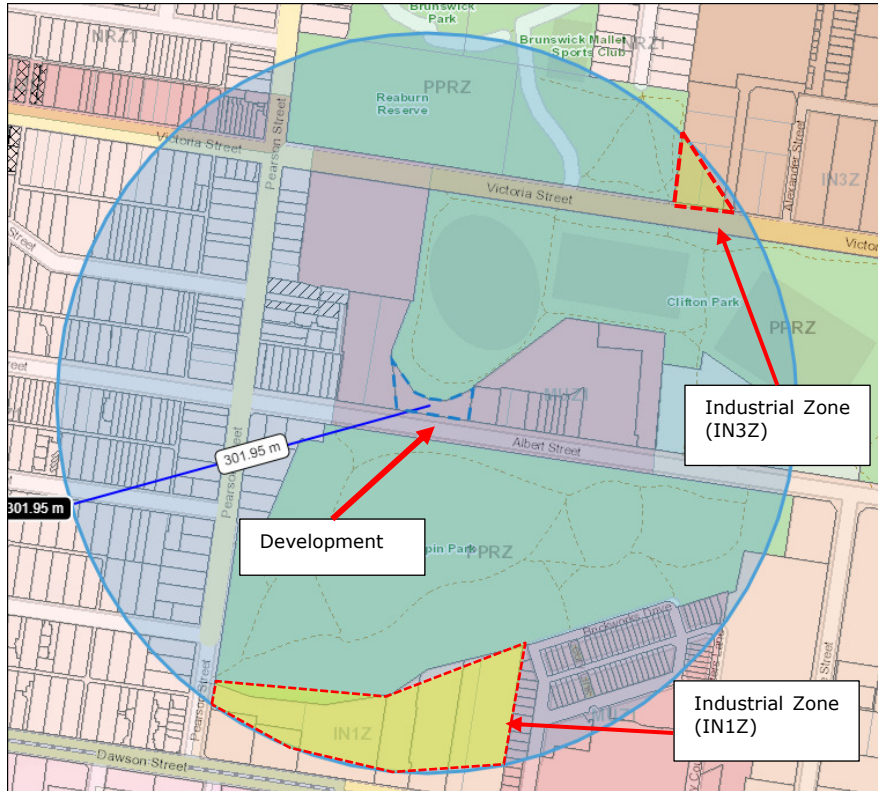


Figure 9-1: Industrial zone to the north east of the development

9.3 Sporting Club Training at Clifton Park

There are no statutory noise criteria for public open space to a residential development in Victoria. Therefore, the recommended interior noise levels established based on Merri-bek planning scheme Clause 58.04-3 (Noise impacts objectives) and Better Apartment Design Standards is recommended to be applied for this assessment.

Due to the noise from major construction activities adjacent to the development and Clifton Park, conducting noise measurements at the Clifton Park was not possible and the noise measurements conducted by Acoustic Logic for the 395-411 Albert Street development (20221216JDA_R3_Planning_Permit_Report) have been used for this assessment.

Measurements have been conducted in 2 locations as depicted in Figure 9-2 and the measurement values are given in



Figure 9-2: measurement locations at the Clifton Park

Table 9-3: Noise Measurements at Clifton Park

Location	Time [dd-mm-yyyy hh:mm]	Duration [hh:mm]	Noise Level [dBA] $L_{Aeq,15min}$	Notes
L1	5-5-2022 18:00	00:15	55	AFL Training
L1	5-5-2022 18:15	00:15	51	AFL Training
L1	5-5-2022 18:30	00:15	51	AFL Training
L1	5-5-2022 18:45	00:15	53	AFL Training
L2	2-5-2022 19:00	00:15	48	Soccer Training

The noise from Clifton Park Dog Off Leash Area is predicted to be low. Moreover, the noise from the sport activities at Clifton Park Synthetic Soccer Pitch is predicted to be attenuated by shielding effect of the new development at 395-411 Albert Street. The major sport activity that would affect the development is the AFL training adjacent to the development.

To achieve the design sound levels in Section 9.1, external noise intrusion from AFL training field for the worst-case scenario has been assessed. Façade acoustic requirements for the treatment of external noise are summarised in Table 9-4.

A detailed assessment should be conducted at the design development stage to confirm noise emissions from the Clifton Park are compliant with the recommended criteria in Section 9.1.

Table 9-4 Acoustic Performance Requirements for Building Façade

Façade Component	Minimum Acoustic Performance	Example Construction*
Glazing	R _w 29	R _w 30 - 6.38mm laminated glass, R _w 35 - 10.38mm laminated glass, R _w 38 - 14.38mm laminated glass.

*Example construction provided as a guide only. The builder/glazier etc should confirm with respective suppliers all appropriate products to achieve the specified acoustic performance rating as a minimum.

9.4 Adjacent Commercial Uses

There are no commercial premises in close proximity to the development at the moment. However, the future approved development at 429 Albert Street is going to be mixed use development with roof top terraces and food and drink premise.

A detailed assessment should be conducted at the design development stage to confirm noise emissions from the rooftop terrace and food and drink premise at 429 Albert Street are compliant with the recommended criteria in Section 9.1.

9.5 Sleep Disturbance

The Department of Environment, Climate Change and Water NSW published the *NSW Road Noise Policy* in March 2011, which compares a number of sleep disturbance criteria. The provisions of the document are often referred to in Victoria for general guidance on potential sleep disturbance. The NSW policy notes that from the research on sleep disturbance to date it can be concluded that:

- *Maximum internal noise levels below 50-55 dB L_{Amax} are unlikely to awaken people from sleep.*
- *One or two noise events per night, with maximum internal noise levels of 65-70 dB L_{Amax} are not likely to affect health and wellbeing significantly.*

An open window provides an outside to inside noise reduction of approximately 10 dBA. Based on these NSW EPA findings, a noise level of 60-65 dBA outside an open bedroom window would be unlikely to cause awakening reactions.

9.6 Road traffic noise from Albert Street (Clause 58.04-3 of VPP)

According to Clause 58.04-3 of the Victoria Planning Provisions (VPP), as the Annual Average Daily Traffic Volume on the Albert Street adjacent to the site is less than 40,000 vehicles, the development is not in a noise influence area and therefore the internal noise level requirements under Clause 58.04-3 do not apply and a road traffic noise assessment is not required for town planning purposes. It is noted that this does not necessarily mean the development will not be impacted by road traffic noise emissions, rather it is recommended that a road traffic noise intrusion assessment be conducted at the design development stage to ensure external façade requirements sufficiently attenuate road traffic noise emissions to comply with the criteria detailed in Section 9.1.

9.7 Offsite Mechanical Plant Noise Emissions

Potential mechanical plant noise emissions from adjacent properties has the potential to impact the dwellings of the development. It is necessary to consider the impact in relation to the likely requirement of external façade treatment for road traffic noise during design development stage. It is anticipated that any potential mechanical plant noise from offsite commercial tenancies will be sufficiently attenuated as the external façade treatment requirements for road traffic noise will likely exceed the requirements for attenuation of mechanical plant noise alone. A detailed assessment of any potential offsite mechanical plant noise will be conducted at the design development stage to confirm compliance with the criteria in Section 9.1.

10 Potential Noise Emissions from the Development

10.1 Plant Servicing Individual Dwellings

Noise emissions from any fixed domestic plant such as air conditioners shall be controlled to comply with EPA Noise Protection Regulation S.R. No. 47/2021. lists the prohibited hours prescribed in the Environment Protection Regulations 2021.

Table 10-1: Prohibited times for domestic plant

Prescribed Items	Prohibited Hours
Heating equipment (including central heating, a hot water system or a heat pump, air conditioner or split system used for heating)	Monday – Friday: before 7am and after 10pm Weekends & public holidays: before 9am and after 10pm
An air conditioner, evaporative cooler or split system used for cooling	Monday – Friday: before 7am and after 11pm Weekends & public holidays: before 9am and after 11pm

During the Day and Evening period, noise from residential equipment may be unreasonable if it interferes with the use of residential premises on an ongoing/recurring basis and include the following:

- includes clearly noticeable rattles or vibrations;
- is the dominant sound heard over background sounds, such that the loudness of the noise makes people in the relevant area move away or raise their voices to hold a normal conversation;
- is noticeable, such that it can be clearly heard over the background sounds, even when not paying specific attention, and has at least one distinctive and prominent tonal, impulse or intermittent character;
- is detectable over the background sounds when listening intently and two or more-character adjustments apply (for example when the noise is both tonal and intermittent, or when it is tonal and impulsive), or;
- the assessed noise level exceeds the background noise level by more than 5dB at the measurement point in the relevant area.

Noise from residential equipment is deemed unreasonable if audible in any habitable room (room other than a kitchen, storage area, bathroom, laundry, toilet or pantry) within any other residence, regardless of whether any door or window giving access to the room is open. This does not apply where the equipment is used in the case of an emergency. It also doesn't apply to when a heat health alert is in effect in the weather forecast district in which the item is located.

Table 10-2 provides the recommended noise limits for residential equipment.

Table 10-2: Recommended noise criteria for domestic plants

Period	Criteria
Day/ Evening	Background $L_{90} + 5$ dB(A) within a habitable room of any other residence
Night (Prohibited hours)	Inaudible within a habitable room of any other residence

Note: the developer will need to undertake a formal acoustic review by a suitably qualified engineer for all mechanical plant and equipment used in the development to ensure it complies with EPA noise protocol.

10.2 Mechanical Plant Noise at Residential Properties

Mechanical plant noise must be controlled at any affected residential property in accordance with the Noise Protocol. Affected residential properties include apartments within the development, and residences in the vicinity of the development. The time periods defined in the regulations are summarised in .

Table 10-3: Assessment Periods

Period	Day and Time
Day	07:00 – 18:00 Monday to Saturday
Evening	18:00 – 22:00 all days
	07:00 – 18:00 Sundays and public holidays
Night	22:00 – 07:00

A reverse calculation was conducted to determine the allowable component noise level of onsite mechanical plant to residences in the vicinity of the development prior to the inclusion of any potential acoustic treatment/screening.

It is assumed that mechanical equipment will be located in the designated rooftop plant deck location as per shown in Figure 10-1, and/or individual condenser units located on residential balconies of the development.

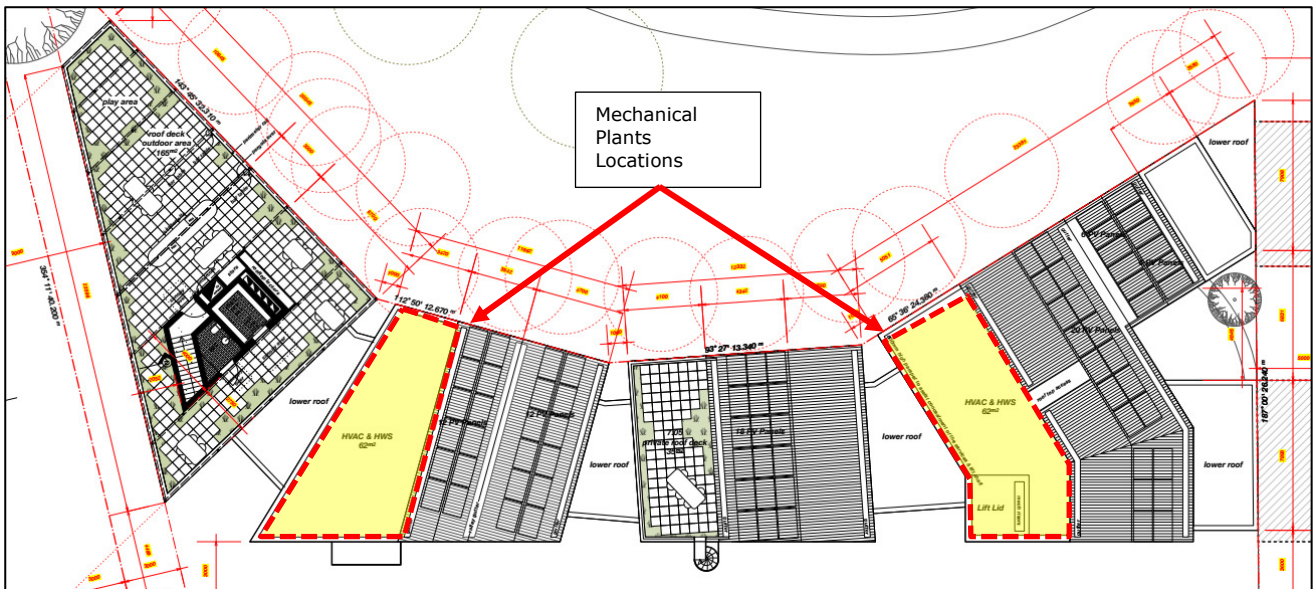


Figure 10-1: Rooftop Plant Deck

Based on the criteria detailed in Section 07, and assessment to the nearest, most exposed sensitive receptor (R1), the allowable combined mechanical noise levels without acoustic screening are presented in Table 10-4.

Table 10-4 - Preliminary Mechanical Plant Allowable Combined Noise Level Predictions

Plant Location	Total allowable SPL at 1m from the mechanical plant to achieve compliance, L_{Aeq}		
	Day	Evening	Night
Rooftop Plant Deck	77	72	64

Acoustic screening of mechanical plant may result in higher allowable noise source levels. A detailed mechanical plant assessment should be conducted prior to the final selection of plant equipment. Compliance with the noise limits should then be checked once plant selections are finalised.

10.3 Car Park Noise Impact

Noise from any car park entry doors are required to comply with the Noise Protocol. Noise from operation of the door must achieve the night-time noise limit as detailed in Table 7-1 at the nearby noise-sensitive receivers and apartments within the development.

Measures to achieve the noise limits will be detailed during the project detailed design stage. As a guide, the following best practices incorporated into a typical design are as follows:

- Any operational or interlock mechanisms must operate smoothly and slowly, without significant impact noise at the extremes of travel. There must be no impact noise associated with the mechanism during vehicle ingress and egress;
- Door and automation mechanisms should be isolated from the basement structure using appropriate vibration isolation measures;
- The carpark ramp incline should be as low a gradient as possible and should incorporate angled transitions at top and bottom to reduce the impact of vehicles entering and exiting the ramp;
- There should be no speed humps in the carpark;
- There should be no significant surface profiling on the carpark ramp that might increase tyre noise generation
- Drainage grates must be securely restrained to avoid any “crashing” or “banging” of grates as vehicles drive over them;
- Expansion joints in trafficked areas in the carpark should be avoided wherever possible;
- The use of a protective floor surface that reduces tyre squeal associated with vehicle movement should be considered, such as those available from Flowcrete or similar.

10.4 Waste Collections

In Victoria EPA Publication 1254 - *Noise control guidelines* the noise control guidelines for the industrial waste collection are provided and they are summarised below. These guidelines should be incorporated into the permit condition for garbage trucks operating for this development. presents the schedule for garbage trucks at shops.

Table 10-5: Schedule for garbage trucks at shops

One collection per week	
Monday to Saturday	6:30 am – 8 pm
Sundays and public holidays	9 am – 8 pm
Two or more collections per week	
Monday to Saturday	7 am – 8 pm
Sundays and public holidays	9 am – 8 pm

In addition, the following attention should be paid.

- Refuse bins should be located at sites that provide minimal annoyance to residential premises.
- Compaction should be carried out while the vehicle is moving.
- Bottles should not be broken up at collection site.
- Noisy verbal communication between operators should be avoided where possible.

Car Park entry ramps soffit section not included. Any potential surface treatment requirements to the lower ground carpark to reduce potential noise emission to NSRs would be assessed and recommended in the Detailed Design stage.

10.5 Retail Shop Noise

Noise from the ground level retail shop must comply with the noise protocol limits provided in Table 7-1. However, at this stage the specific retail tenant is unknown and therefore no noise assumptions can be made at this time. Therefore, noise from the retail shop should be assessed during detailed design stage or an independent noise impact assessment can be conducted by the retail tenant prior to occupying the space.

11 NCC Requirements for Internal Partitions

The *National Construction Code* (or *NCC*, previously known as *Building Code of Australia*) gives the requirements for sound insulation between dwellings in multi-residential buildings (Class 2).

11.1 NCC Requirements for Inter-tenancy Walls

The *NCC* performance requirements and deemed-to-satisfy provisions for walls are summarised in Table 11-1. This table also recalls the *NCC* requirements for doors from units to common areas (e.g. apartment entry doors).

Required airborne sound insulation performance is expressed in terms of the weighted standardized level difference [$D_{nT,w}$] and the weighted standardized level difference with spectrum adaptation term [$D_{nT,w} + C_{tr}$]. These rating indices are determined in accordance with *AS/NZS 1276.1* or *ISO 717.1* using results from in-situ measurements.

Deemed-to-satisfy provisions are expressed in terms of the weighted sound reduction index R_w and the weighted sound reduction index with spectrum adaptation term [$R_w + C_{tr}$]. These rating indices are determined in accordance with *AS/NZS 1276.1* or *ISO 717.1* using results from laboratory measurements.

Table 11-1: NCC Requirements for Airborne Sound Insulation of Walls and Doors

Partition	In-situ performance requirement	Deemed to satisfy provision
Wall separating two sole occupancy units	$D_{nT,w} + C_{tr} \geq 45$ dB	$R_w + C_{tr} \geq 50$ dB
Wall separating a unit from common areas or buildings of other classification	$D_{nT,w} \geq 45$ dB	$R_w \geq 50$ dB
Door assembly in wall separating a unit from a common area	$D_{nT,w} \geq 25$ dB	$R_w \geq 30$ dB

Certain walls require impact sound insulation rating, and these must be of a discontinuous construction. This is summarised in Table 11-2.

Table 11-2: NCC Requirements for Impact Sound Insulation of Walls

Partition	Discontinuous construction
Wall separating a wet area ¹ in one unit from a habitable room (other than kitchen) in an adjacent unit	<ul style="list-style-type: none"> for masonry wall, where wall ties are required to connect leaves, wall ties are of the resilient type for walls other than masonry, there must be no contact between the leaves except at the periphery; a 20 mm discontinuity in the construction is required
Wall separating a unit from a plant room or a lift shaft	

Note: Because they share the same space as living room areas, **open kitchen** areas are considered habitable rooms when they are receiving rooms and wet areas when they are source rooms.

11.2 NCC Requirements for Floors

The *NCC* performance requirements and deemed-to-satisfy provisions for floors are summarised in Table 11-3.

Required airborne sound insulation performance of floors and deemed to satisfy provisions are expressed in terms of [$D_{nT,w} + C_{tr}$] and [$R_w + C_{tr}$], respectively.

Required impact sound insulation performance of floors is expressed in terms of the weighted standardised impact sound level [$L_{nT,w}$]. This rating index is determined in accordance with *AS ISO 717.2-2004* using results from in-situ measurements.

Deemed-to satisfy provisions are expressed in terms of the weighted normalised impact sound level [$L_{n,w}$]. This rating index is determined in accordance with *AS ISO 717.2-2004* using results from laboratory measurements.

An acoustic underlay should be added to roof top areas directly above apartments to reduce impact noise below and achieve an $L_{nT,w} \leq 50$ dB.

¹ a bathroom, a sanitary compartment, a laundry or a kitchen

Table 11-3: NCC Requirements for Airborne and Impact Sound Insulation by Floors

Insulation Type	In-situ performance requirement	Deemed to satisfy provision
Airborne sound insulation of floors	$D_{nT,w} + C_{tr} \geq 45$ dB	$R_w + C_{tr} \geq 50$ dB
Impact sound insulation of floors	$L_{nT,w} \leq 62$ dB	$L_{n,w} \leq 62$ dB

11.3 NCC Requirements for Services Ducts and Pipes

Ducts and pipes for storm water, soil waste or water supply that serve or pass through more than one unit must be contained by a construction providing sound insulation. The NCC criterion for airborne sound insulation performance of this partition is recalled in Table 11-4.

Table 11-4: NCC Requirements for Sound Insulation of Ducts and Pipes

Room	Required Airborne Sound Insulation Rating
Habitable room (other than kitchen)	$[R_w + C_{tr}] \geq 40$ dB
Kitchen or non-habitable room	$[R_w + C_{tr}] \geq 25$ dB

Note: Because they share the same space as living room areas, open kitchen areas are considered habitable rooms when they are receiving rooms and wet areas when they are source rooms.

12 Conclusion

Vipac Engineers & Scientists Ltd (Vipac) has been engaged by HIP V. HYPE Pty Ltd to provide an Acoustic Report for the town planning submission of the proposed development at 427 Albert Street, Brunswick. The assessments contained within this document follow the methodology and criteria specified in relevant Australian standards, guidelines and policies. Based on the assessment contained in this report, the development can comply with the established acoustic criteria.

Appendix A Glossary of Terms

Term	Definition
dB	Decibel Magnitude of the sound pressure level.
dBA	A-weighted Decibels. The 'A'-weighting adjusts the measured levels to better reflect the sensitivity of the human ear to different frequencies.
L_{Aeq,T}	The A-weighted continuous equivalent sound pressure level. It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.
L_{A90,T}	The A-weighted sound pressure level exceeded for 90% of the measurement period. L _{A90} is used in Victoria as the descriptor for background noise level.
L_{Amax}	The A-weighted maximum sound pressure level of the measurement period.
Sound pressure level	The ratio in decibels (dB) of the sound pressure at a given receiver position to a reference pressure of $2 \cdot 10^{-5}$ Pa. The sound pressure level depends, amongst other parameters, on the sound power level of the source and the distance separating the source and the receiver.

Appendix B Instrumentation

Instrument	Model/Type	Serial No.	Next Calibration
Bruel & Kjaer sound level meter (class 1)	2250	3028180	11/07/2024
Bruel & Kjaer Sound Calibrator	4231	2465704	15/03/2024



Appendix C Development Architectural Drawings



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Davidson Avenue, Brunswick East
 Phone: 03 9377 1111
 Email: info@amarchitects.com.au
 Website: www.amarchitects.com.au

General Notes

1. This acoustic report is to be read in conjunction with the acoustic report prepared for the proposed development at 427 Albert Street, Brunswick East, Victoria.
2. All DDO areas are provided with a general noise level of 55 dB(A) L_{eq} per hour.
3. All DDO areas are provided with a general noise level of 55 dB(A) L_{eq} per hour.
4. All DDO areas are provided with a general noise level of 55 dB(A) L_{eq} per hour.

Better Apartment Living

427 Albert Street, Brunswick 3056

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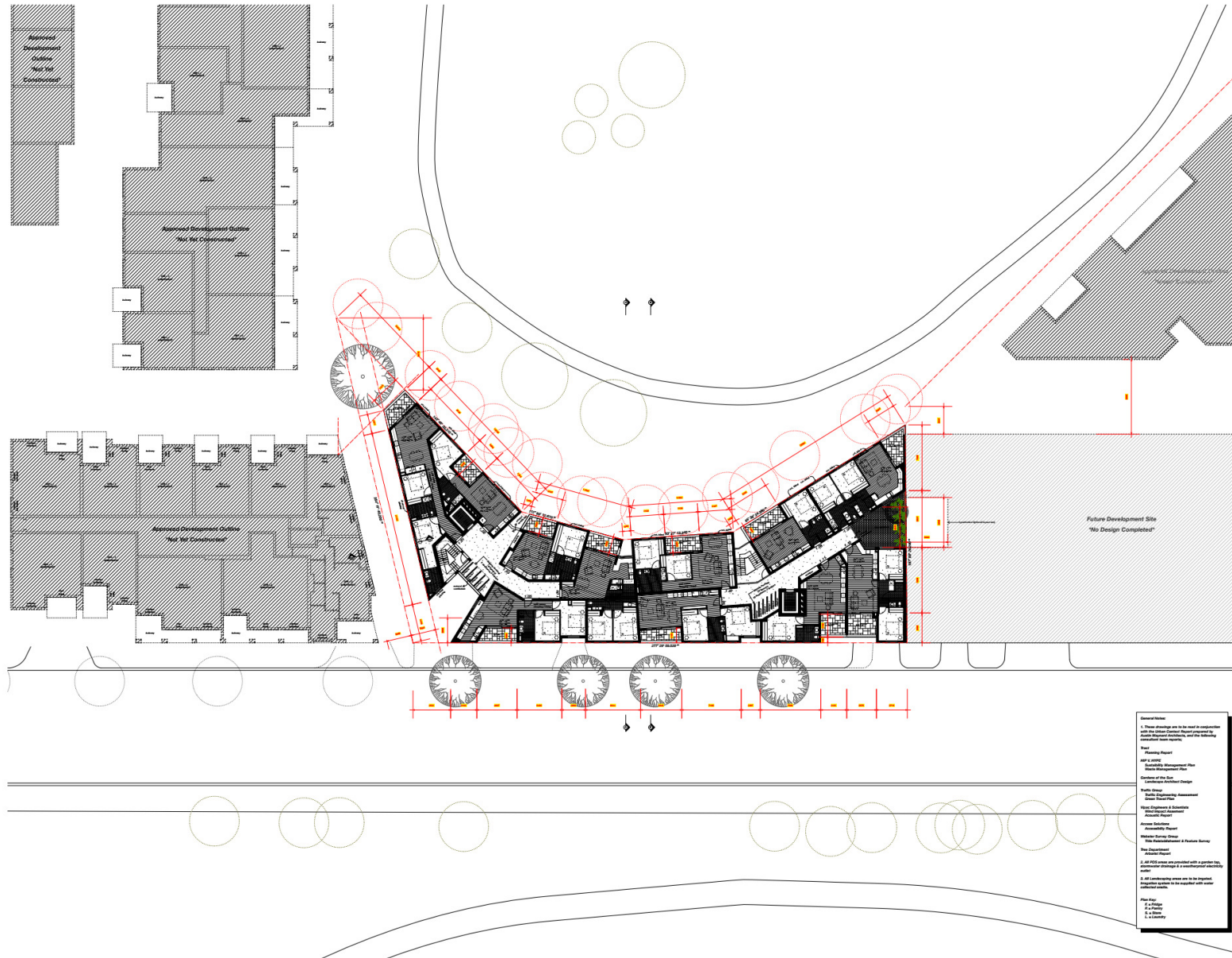
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gustin maynard architects

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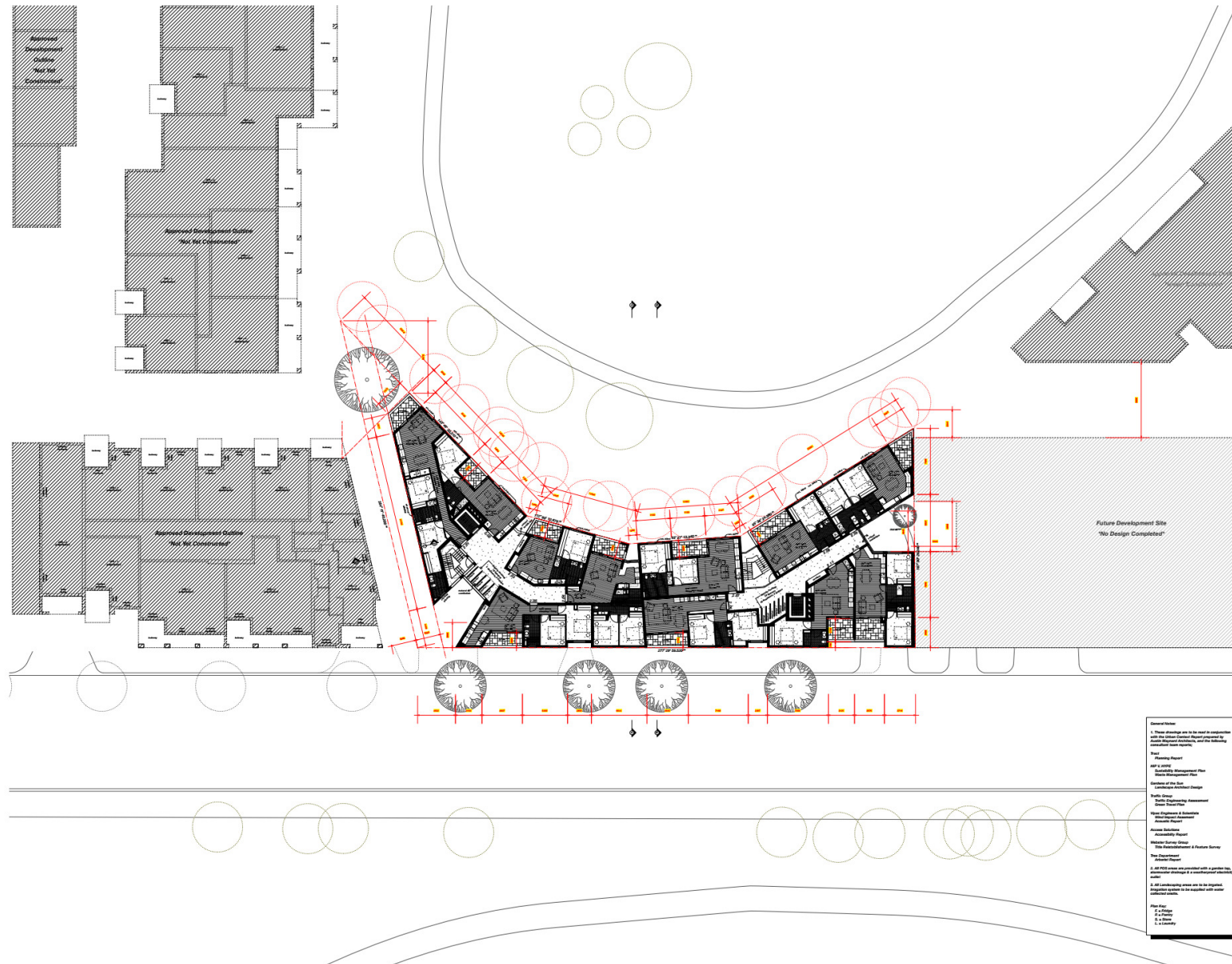
Legend/Notes

1. These drawings are to be used as a guide only and are not to be used for construction purposes. All dimensions are to be confirmed on site.
2. All dimensions are to be confirmed on site.
3. All dimensions are to be confirmed on site.
4. All dimensions are to be confirmed on site.

Plan No:
 1. 10/24
 2. 10/24
 3. 10/24
 4. 10/24
 5. 10/24

Better Apartment Living
 427 Albert Street, Brunswick 3056
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 Plan: Level One
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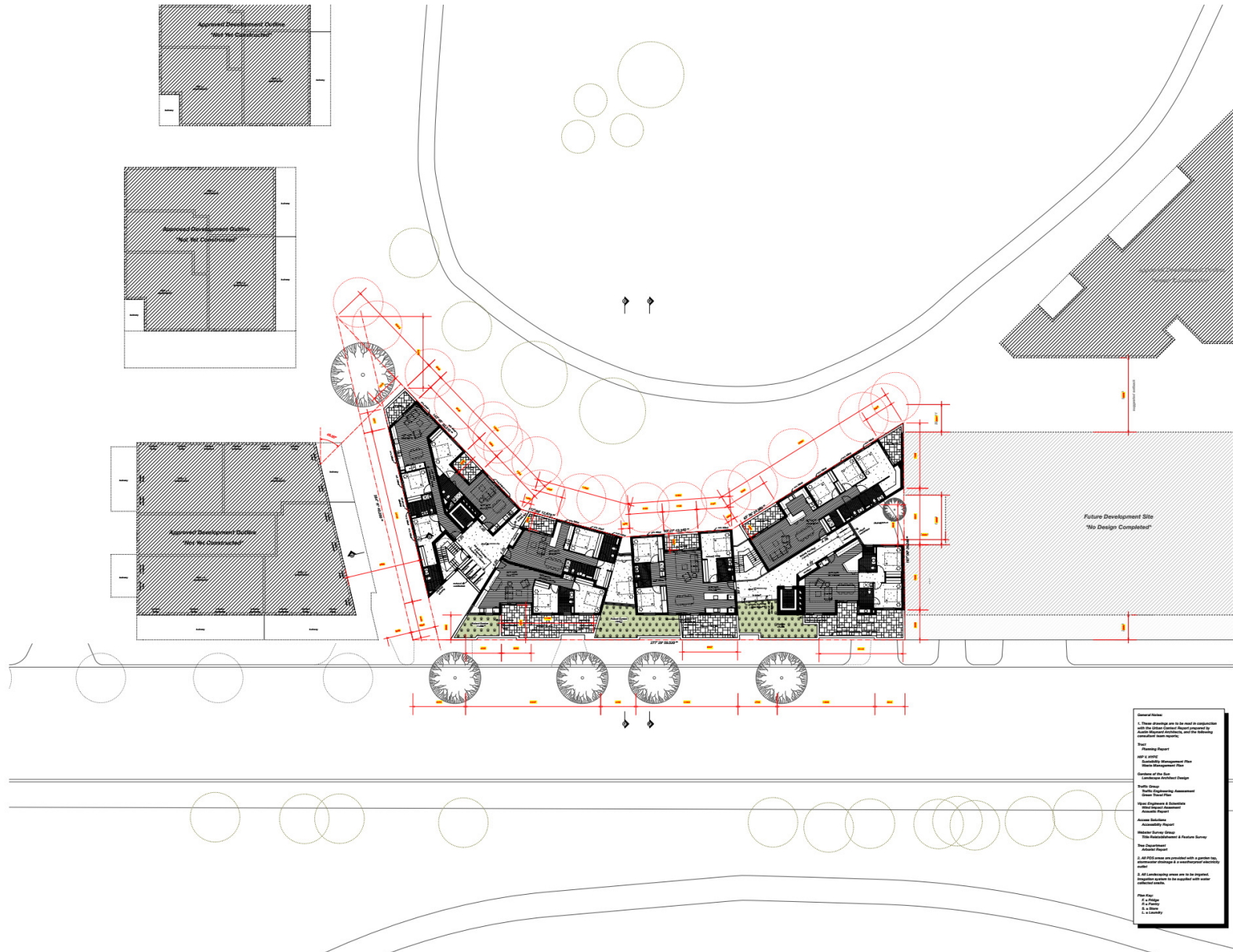


JUSTIN MAYNARD ARCHITECTS

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 Brunswick East, VIC 3086
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 Brunswick East, VIC 3086

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 5. All VLS lines are provided with a green line, and all VLS lines are provided with a red line.

Better Apartment Living
 427 Albert Street, Brunswick 3056
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 Plan: Level Two
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 23/10/2024
A 102 A



austin maynard architects

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Plan File:

- 1. A - Plan
- 2. B - Section
- 3. C - Elevation

Better Apartment Living

427 Albert Street, Brunswick 3066

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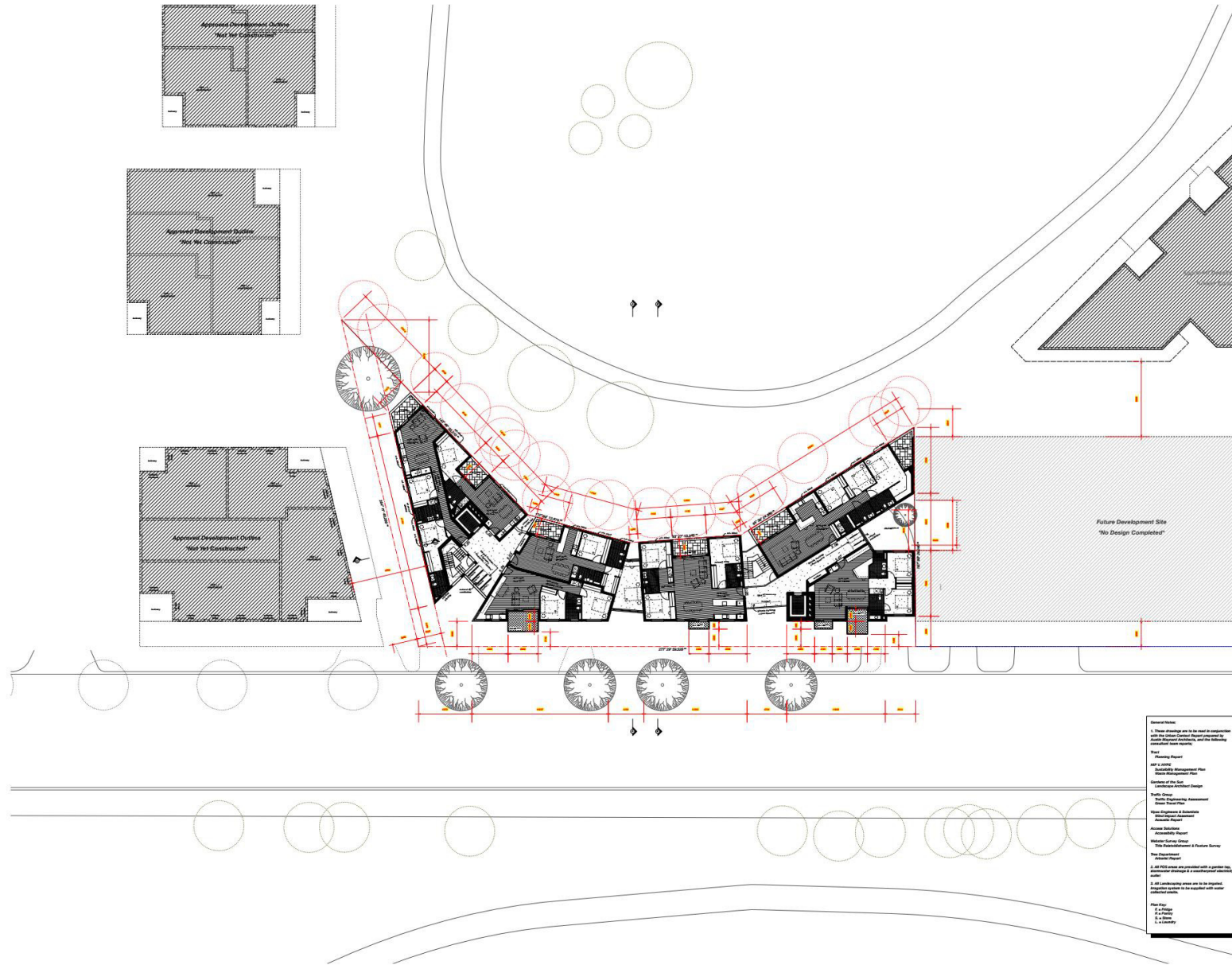
Plan: Level Four

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John Lee	Mark Lee	Mark Lee

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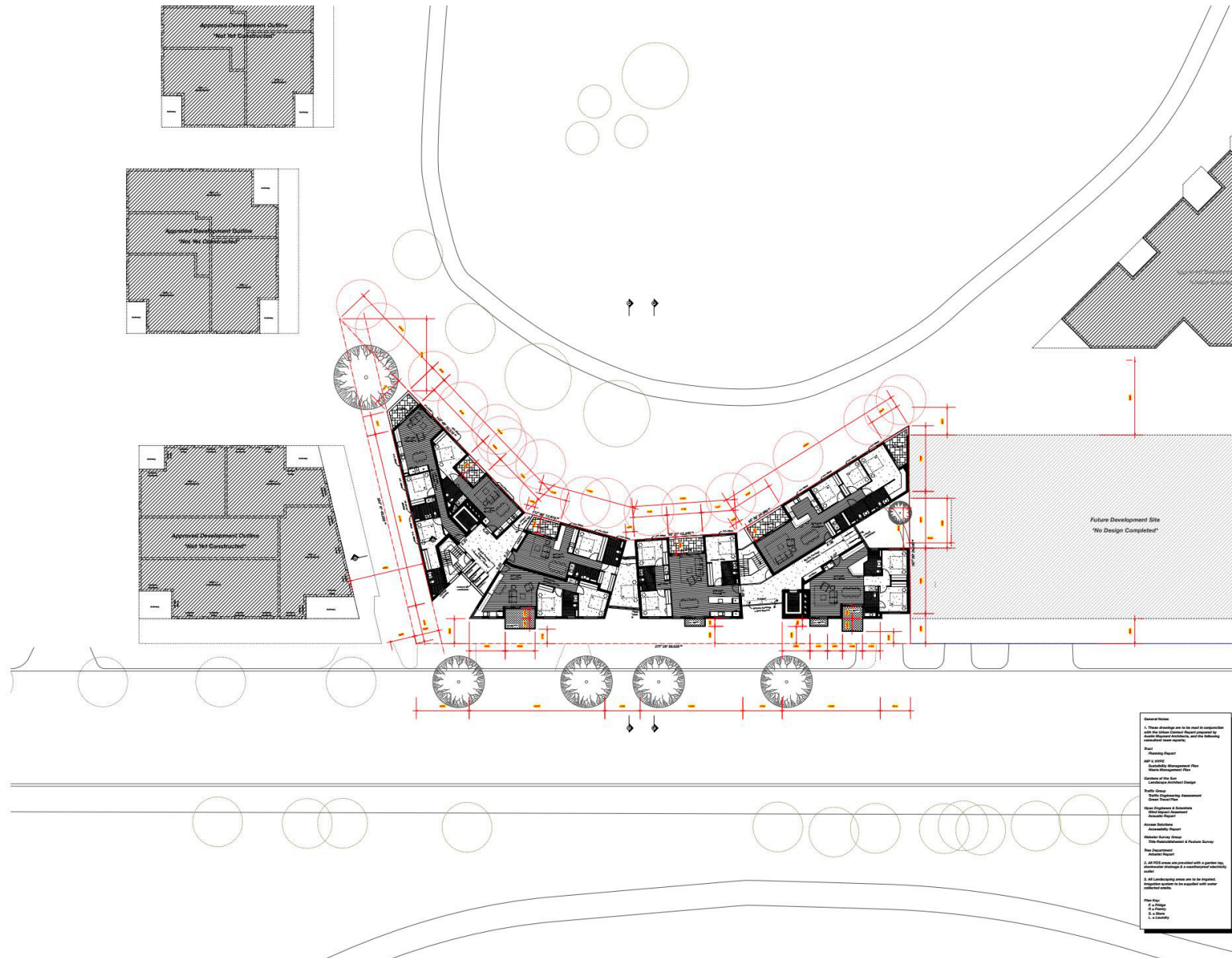
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Clifton & Gilpin Pty Ltd C/- HIP V. HYPE
 427 Albert Street, Brunswick
 Town Planning Acoustic Report- DFP Preliminary Submission

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5. All dimensions are to the centerline of the building unless otherwise stated.
6. All dimensions are to the centerline of the building unless otherwise stated.
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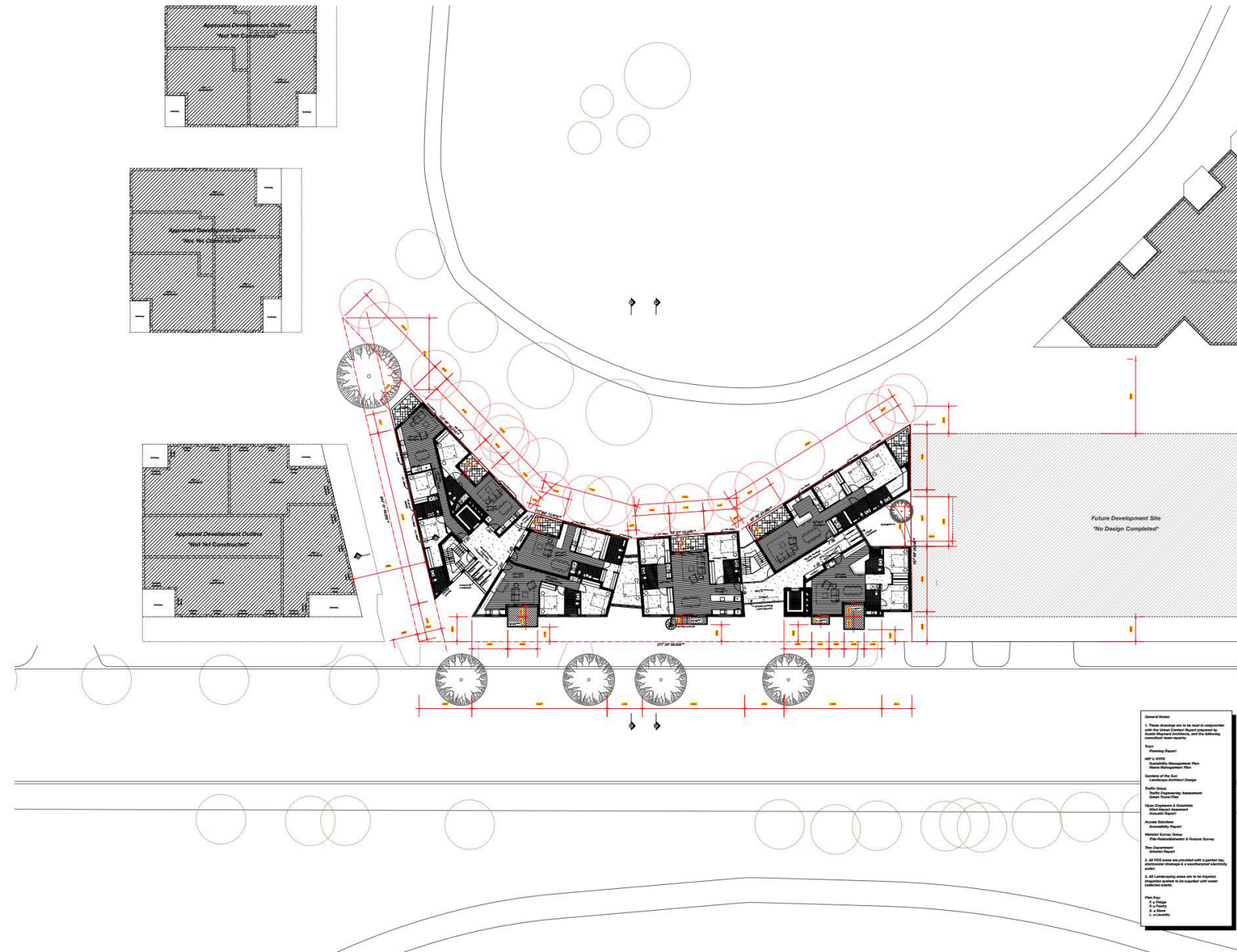
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- 2. All dimensions are to the centerline of the building unless otherwise stated.
- 3. All dimensions are to the centerline of the building unless otherwise stated.
- 4. All dimensions are to the centerline of the building unless otherwise stated.
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- 7. All dimensions are to the centerline of the building unless otherwise stated.
- 8. All dimensions are to the centerline of the building unless otherwise stated.
- 9. All dimensions are to the centerline of the building unless otherwise stated.
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Better Apartment Living
 427 Albert Street, Brunswick 3056
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 Plan: Level Six
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Planning Report

- HIP V. HYPE
- Site Specific Management Plan
- Statement of Environmental Effects
- Statement of the Significance of the Site
- Landmarks/Heritage Design

Traffic Study

- Traffic Impact Assessment
- Design Traffic Data

Other Studies & Assessments

- Acoustic Study
- Accessibility Study
- Market Survey Study
- Site Subdivision & Future Survey

The Developer

- HIP V. HYPE

Other Notes:

- All DFP notes are provided with a separate site, submitted alongside a completed acoustic study.
- All accessibility notes are to be provided, together with a site specific accessibility study.

Plan Set

- 1. Site Plan
- 2. Floor Plan
- 3. Section
- 4. Elevation

Better Apartment Living

427 Albert Street, Brunswick 3056

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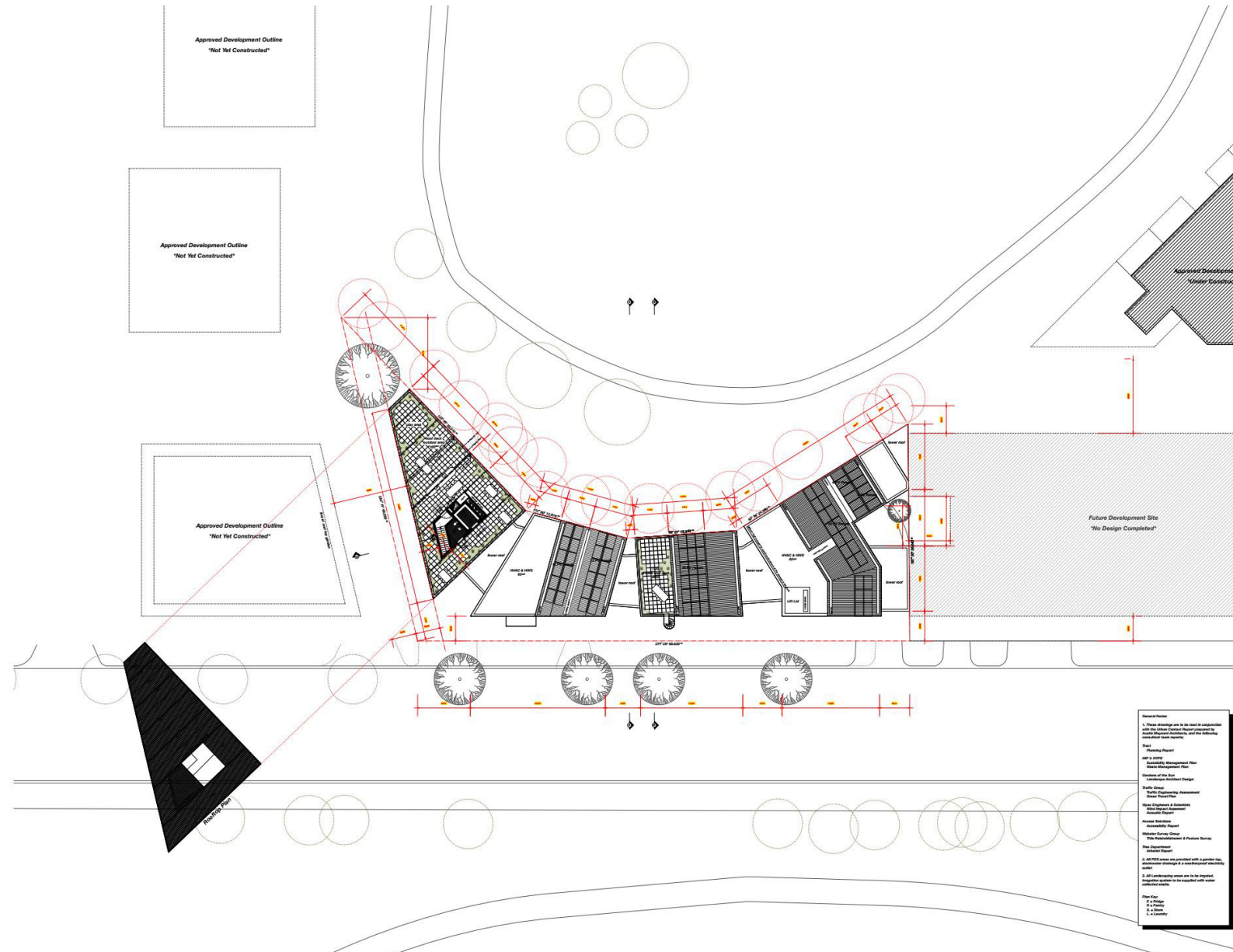
Plan: Level Seven

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Document Details

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Project Name	Better Apartment Living
Client	Clifton & Gilpin Pty Ltd
Project Address	427 Albert Street, Brunswick 3056
Project Type	Residential Development
Project Stage	Pre-Construction
Project Status	Approved
Project Reference	240210 427 Albert - A 000 - PMB File/Level
Project File Name	240210 427 Albert - A 000 - PMB File/Level
Project File Path	240210 427 Albert - A 000 - PMB File/Level
Project File Size	1,033
Project File Date	10/10/24
Project File Author	AM
Project File Version	1.0
Project File Status	Approved
Project File Type	PDF
Project File Extension	.pdf
Project File Size (KB)	1,033
Project File Size (MB)	0.001
Project File Size (GB)	0.000
Project File Size (TB)	0.000
Project File Size (PB)	0.000
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Project File Size (KB)	0.000
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Better Apartment Living
427 Albert Street, Brunswick 3056

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Plan: Level Eight (Rooftop)

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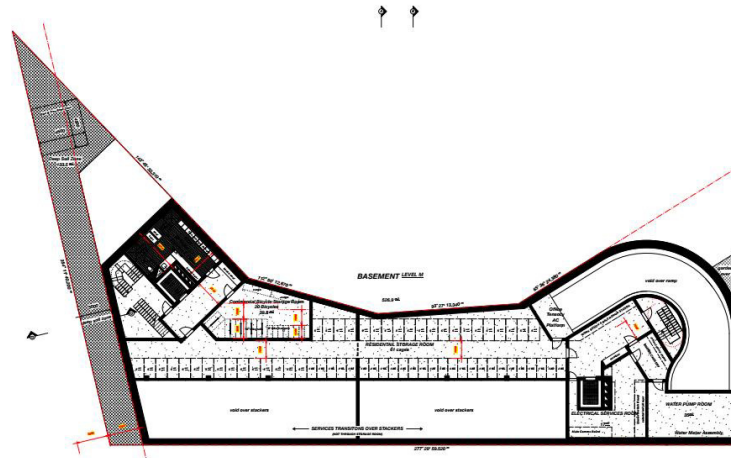
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General Notes

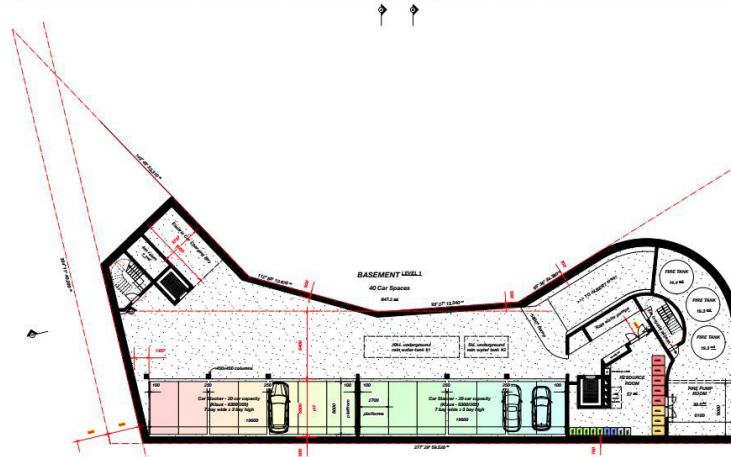
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 - Planning Report
 - JPE & JPEE
 - Landmarks Management Plan
 - State Management Plan
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3. All dimensions are provided unless otherwise stated.
4. All dimensions are provided unless otherwise stated.

Plan Key

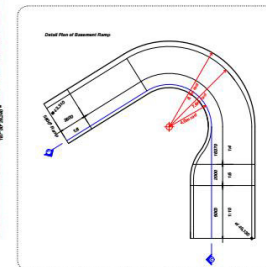
- = Floor
- = Ceiling
- = Wall
- = Window
- = Staircase



Plan: Basement Level B1



Plan: Basement Level B2



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 427 Albert Street, Brunswick
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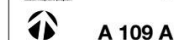
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