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PLAN

MATTHEW PALAVIDIS VICTOR FATTORETTO MATTHEW SHIELDS

## 511-537 Sydney Road, Coburg

Acoustic Assessment

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## **1** INTRODUCTION

Acoustic Logic Pty Ltd (AL) has been engaged by Armitage Jones Pty Ltd to conduct an acoustic assessment for the proposed mixed-use development located at 511-537 Sydney Road, Coburg. This report address noise intrusion from surrounding noise sources into the proposed development as well as set noise emission from site.

The assessment has been based on the documents referenced in Table 1 below.

Company	Document	Reference	Date
Jackson Clements Burrows Architects	Architectural Drawings	Project# 22-076 Revision 3	28 February 2024
Victorian Planning Provisions	Clause 58.04-3	-	2017
-	Australian Standard AS/NZS 2107:2016	-	2016
EPA Victoria	Noise Limit and Assessment Protocol (Noise Protocol)	Publication 1826.4	2021

## **Table 1 – Referenced Documents**

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## **2 SITE DESCRIPTION**

The proposed development is located at 511-537 Sydney Road, Coburg. The proposed development comprises of a common podium from Ground to Level 2 that contains a mixture of car-parking, commercial and residential dwellings. Level 3 has a communal external terrace, with 2 towers rising from the common podium; Buildings A and B.

- Building A: residential dwellings up to level 15.
- Building B: residential dwellings up to level 14.

The subject site is bounded by Sydney Road to the east, mixed use development to the south, vacant land to the north and Ross Street to the west with residential properties further to the west.

Sydney Road is an arterial road which carries the Tram Route 19 and has an Annual Average Daily Traffic (AADT) volume of 18,000 vehicles. Bell Street to the south is also an arterial road which has an Annual Average Daily Traffic (AADT) volume of 35,000 vehicles. Bell Street to the southeast of Elm Grove has an Annual Average Daily Traffic (AADT) volume of 42,000 vehicles.



Figure 1 below shows the subject site and the surrounding environment.

Figure 1: Site Map and surrounding environment (source: Google Maps<sup>™</sup>)

### 2.1 LOCAL NOISE SOURCES

Inspection and testing on site indicate that the dominant noise source impacting the proposed development site is vehicle and tram movement on surrounding roadways, predominately Sydney Road and Bell Street. Traffic from other roadways including Urquhart Street also contributed to the ambient environment.

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## **3 ENVIRONMENTAL NOISE DESCRIPTORS**

Environmental noise constantly varies in level, due to fluctuations in local noise sources including road traffic. Accordingly, a 15-minute measurement interval is normally utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In the case of environmental noise three principle measurement parameters are used, namely  $L_{10},\,L_{90}$  and  $L_{eq.}$ 

The  $L_{10}$  and  $L_{90}$  measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L<sub>10</sub> parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the  $L_{90}$  level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The  $L_{90}$  parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source depends on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the  $L_{90}$  level.

The  $L_{eq}$  parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period.  $L_{ea}$  is important in the assessment of traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of industrial noise.

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### 4 NOISE LEVEL MEASUREMENTS

#### 4.1 MEASUREMENT LOCATIONS

Unattended and attended noise level measurements were conducted at the locations indicated in Figure 1. The noise level measurement locations are described below:

- Location 1 An unattended noise monitor was installed on the eastern boundary of the subject site to measure the traffic noise along Sydney Road. The monitor was installed 1.5m above grade and setback 1m from the property boundary line. The measurements were free-field and had full view of Sydney Road. The monitor was installed on site between 29 March – 5 April 2023.
- Location 2 An unattended noise monitor was installed on 512a Sydney Road, Coburg to measure ambient noise. The monitor was installed 1.5m above grade. The measurements were free-field and had full view of Sydney Road. The monitor was installed on site between 15 – 19 November 2021.
- Location 3 Attended traffic and tram noise level measurements were conducted on the eastern boundary of subject site. The sound level meter was approximately 1.5 metres above grade, had full view of Sydney Road and affected by façade reflections. The measurement was undertaken on 4 April 2023.
- Location 4 Attended traffic noise level measurements were conducted along Bell Street to the south of subject site. The sound level meter was approximately 1.5 metres above grade, had full view of Bell Street and affected by façade reflections. The measurement was undertaken on 4 April 2023.

### 4.2 TIME OF MEASUREMENTS

The unattended noise monitor at Location 1 was installed on site between 29 March – 5 April 2023 and at Location 2 was installed on site between 15 – 19 November 2021. Attended noise level measurements were conducted on 4 April 2023 between 7:00am – 9:00am.

#### 4.3 MEASUREMENT EQUIPMENT

The long-term unattended noise monitoring was conducted with Acoustic Research Lab Pty Ltd NGARA noise monitors. The equipment was calibrated at the beginning and the end of the measurement using a Rion NC-75 calibrator; no significant drift was detected. All measurements were taken on fast response mode.

A Norsonic Nor140 Sound Level Analyser was used for the attended noise level measurements (Location 3 and 4). The equipment was calibrated at the beginning and the end of the measurement using a Rion NC-75 calibrator; no significant drift was detected. All measurements were taken on fast response mode.

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#### 4.4 MEASURED NOISE LEVELS

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The tables below detail the measured noise levels obtained at the subject site. The document must not be used for any

Location	Period	Measured Noise Levels
Location 1 in Figure 1	Day (7.00 – 22.00)	72 dB(A) L <sub>eq,1hr</sub>
facing Sydney Road	Night (22.00 – 7.00)	69 dB(A) L <sub>eq,1hr</sub>
Leasting 2 in Figure 1	Day (7.00 – 22.00)	67 dB(A) L <sub>eq,1hr</sub>
Location 2 in Figure 1	Night (22.00 – 7.00)	65 dB(A) L <sub>eq,1hr</sub>

## Table 2 – Unattended Traffic Noise Level Measurements copyright

### Table 3 – Unattended Background Noise Level Measurements

Period	Time	Measured Background L <sub>90,Period</sub> dB(A) <sup>1</sup>
Day	7am – 6pm (Mon – Sat)	53
Evening	6pm – 10pm (Mon – Sat) 7am – 10pm (Sun)	51
Night	10pm – 7am	45

Note 1 - Measurements were conducted in free field.

## Table 4 – Attended Traffic Noise Level Measurements

Measurement Location	Date and Time of Measurements	Measured Noise Levels dB(A) L <sub>eq,15mins</sub> <sup>1</sup>
	04/04/2023 (7:20am-7:35am)	75
Location 4	04/04/2023 (7:35am-7:50am)	74
(Bell Street)	04/04/2023 (7:50am-8:05am)	75
	04/04/2023 (8:05am-8:20am)	74

Note 1 - Measurements have been corrected by -2.5dB to account for façade reflections.

### Table 5 – Attended Tram Lmax Noise Level Measurements

Measurement Location	Date and Time of Measurements	Measured Noise Levels dB(A) L <sub>Max</sub> <sup>1,2</sup>
Location 3 (Sydney Road)	04/04/2023	79

Note 1 - Measurements have been corrected by -2.5dB to account for façade reflections.

Note 2 - Measurements conducted from numerous tram movements where the 95<sup>th</sup> percentile noise level is presented.

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### 5 ASSESSMENT CRITERIA

Internal traffic noise criteria is typically assessed to Standard D16 at Clause 58.04-3 where applicable.

Where it is not applicable, internal noise levels will be based on Australian Standard AS2107.

#### 5.1 STANDARD D16 AT CLAUSE 58.04-3

Standard D16 of Clause 58.04-3 contains the following condition:

To contain noise sources in developments that may affect existing dwellings.

To protect residents from external and internal noise sources.

#### Standard D16

Noise sources, such as mechanical plants should not be located near bedrooms of immediately adjacent existing dwellings.

The layout of new dwellings and buildings should minimise noise transmission within the site.

Noise sensitive rooms (such as living areas and bedrooms) should be located to avoid noise impacts from mechanical plants, lifts, building services, non-residential uses, car parking, communal areas and other dwellings.

New dwellings should be designed and constructed to include acoustic attenuation measures to reduce noise levels from off-site noise sources.

Buildings within a noise influence area specified in Table D3 should be designed and constructed to achieve the following noise levels:

- Not greater than 35dB(A) for bedrooms, assessed as an LAeq,8h from 10pm to 6am.
- Not greater than 40dB(A) for living areas, assessed LAeq,16h from 6am to 10pm.

Buildings, or part of a building screened from a noise source by an existing solid structure, or the natural topography of the land, do not need to meet the specified noise level requirements.

Noise levels should be assessed in unfurnished rooms with a finished floor and the windows closed.





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Noise Source	Noise influence area The document must not be used for a purpose which may breach any	
Zone interface	copyright	
Industry	300 metres from the industrial 1, 2 and 3 zone boundaries	
Roads		
Freeways, tollways and other roads carrying 40,000 Annual Average Daily Traffic Volume	300 metres from the nearest trafficable lane	
Railways		
Railway servicing passengers in Victoria	80 metres from the centre of the nearest track	
Railway servicing freight outside Metropolitan Melbourne	80 metres from the centre of the nearest track	
Railway servicing freight in Metropolitan Melbourne	135 metres from the centre of the nearest track	

Note: The noise influence area should be measured from the closest part of the building to the noise source.

#### Decision guidelines

Before deciding on an application, the responsible authority must consider:

- The design response.
- Whether it can be demonstrated that the design treatment incorporated into the development meets the specified noise levels or an acoustic report by a suitably qualified consultant submitted with the application.
- Whether the impact of potential noise sources within a development have been mitigated through design, location and siting.
- Whether the layout of rooms within a dwelling mitigates noise transfer within and between dwellings.
- Whether an alternative design meets the relevant objectives having regard to the amenity of the dwelling and the site context.

Based on these conditions, the subject site has been reviewed as follows:

- 1. The development is **<u>not</u>** within 300m of an industrial zone.
- 2. The development is within 300m of a freeway or road carrying an AADT >40,000.
  - A section of Bell Street to the east of Elm Grove does carries an AADT volume > 40,000 at approximately 42,000 vehicles. Only traffic from this portion of Bell Street to the east of Elm Street (200m to the east of site) is required to comply with this criteria.
- Sydney Road and Bell Street immediately to the south of the site (that carry an AADT<40,000) will be designed to AS2107 as note below in Section 5.2. Achieving AS2107 will inherently also result in compliance with Standard D16 At Clause 58.04-3 from the applicable section of Bell Street (east of Elm Grove over 200m away). On that basis no further assessment of Standard D16 at Clause 58.04-3 is required.
- 4. The development is **not** within 80 metres of railway servicing passengers and 135m of freight train line.

### 5.2 AS/NZS 2107:2016

Australian Standard AS/NZS2107:2016 *"Recommended Design Sound Levels and Reverberation Times for Building Interiors"* sets out recommended design sound levels for residential developments depending on locality to minor or major roads. Table 6 below details the criterion set for this development.

	Required Internal Noise Level <sup>1</sup>	
Location	dB(A) L <sub>eq 1hr</sub> (7am – 10pm)	dB(A) L <sub>eq 1hr</sub> (10pm – 7am)
Bedrooms	45 <sup>2</sup>	40
Living Areas	45	N/A

### Table 6 – Internal Noise Criteria (Traffic Noise)

**Note 1:** Assessment is based on apartments suitably furnished ready for occupation. **Note 2:** Bedrooms assessed as living rooms outside 10pm-7am.

#### 5.3 TRAM NOISE CRITERIA

In addition the below nominate criteria will be adopted to address tram pass-by movements

#### Table 7 – Internal Noise Level Criteria – Tram Noise - Airborne

Location	Required Internal Noise Level dB(A) L <sub>max</sub> <sup>1</sup>
Bedrooms (10pm-7am)	55

Note 1: The dB(A) L<sub>max</sub> value is derived as the maximum noise level not exceeded by 95% of tram pass-by events with façade (windows and doors) fully closed and rooms fully furnished. Only assessed during the night time period.

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#### 5.4 PLANT EQUIPMENT NOISE

To ensure that noise emissions from the site do not impact adversely on the amenity of the proposed development residents and surrounding noise sensitive areas, the proposed development should be designed to comply with the EPA Noise Protocol – Part I.

### 5.4.1 Zoning Level

The 'Zoning' level is determined by the Influencing Factor (IF) and is calculated by the formula and the 'Zoning Level versus Influencing Factor' graph nominated in Section 1.1 of the EPA Noise Protocol and VicPlan Mapping. The IF is calculated from the proportion of industrial and commercial land around noise sensitive areas. Review of the surrounding area indicates an IF of approximately **0.27** which results in the zoning limits detailed in Table 8 below.

### Table 8 - Zoning Levels

Period	Zoning Level dB(A)
Day time	55
Evening	49
Night time	44

#### 5.4.2 EPA Noise Protocol – Part I

Table 9 below details the assessment criteria based on both the zoning levels and the measured background noise levels.

### **Table 9 – Noise Limits**

Period	Background dB(A) L <sub>90,Period</sub>	Zoning limit	Classification	Project Noise Limits dB(A) L <sub>eq</sub>
<b>Day</b> Monday – Saturday (7am – 6pm)	53	55	High	<u>59</u>
<b>Evening</b> Monday – Saturday (6pm – 10pm) Sunday (7am – 10pm)	51	49	High	<u>54</u>
<b>Night</b> Monday – Friday (10pm – 7am)	45	44	High	<u>48</u>

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## 6 EVALUATION OF EXTERNAL NOISE INTRUSION

Internal noise levels will primarily be as a result of noise transfer through the windows, doors and roof as these are relatively light building elements that offer less resistance to the transmission of sound. Walls that are proposed to be heavy masonry elements will not require upgrading.

The predicted noise levels through the windows, doors and roof are discussed below. The predicted noise levels have been based on the expected level and spectral characteristics of the external noise, the area of building elements exposed to traffic noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

Glazing/façade treatment was determined based on the measured noise levels and transmission loss of the façade. The constructions set out below are necessary for the satisfactory control of external noise to comply with the internal noise level criteria detailed in Table 6 and 7.

#### 6.1 RECOMMENDED GLAZING

The glass thicknesses shown in the schedule do not consider thermal, structural, safety or any other requirements other than acoustic requirements and thus may require upgrading in some instances. In these instances, increasing the glass thickness beyond the acoustic requirement will be acceptable. Where the glazing thickness has not been specified, standard glazing will be acceptable.

Table 10 below details the minimum R<sub>w</sub> performance requirements for the glazing assembly installed. Where open-able windows or sliding doors are installed, the total Rw performance of the system shall not be lower than the values listed in Table 10. It is noted that the system supplied shall meet the overall minimum Rw ratings nominated based on a laboratory test report for the system. If an alternative system is proposed the system shall be reviewed and will require approval by a suitably qualified acoustic consultant to ensure that the proposed system is acceptable and will ensure compliance with the nominated internal noise design criteria detailed in Table 6 and 7.

Location	Required Glazing Construction <sup>1,2</sup>	Minimum Rw of Installed Window System	Acoustic Seals <sup>2</sup>
	6mm glass <u>or</u> 6/12/6 IGU	29	Yes
Refer to Appendix 1	8mm glass <u>or</u> 6/12/8 IGU	31	Yes
	11.52mm lam <u>or</u> 6/12/11.52 lam IGU	35	Yes

Note 1 – Alternative glazing system may be installed provided they are approved by a suitable qualified acoustic consultant. Note 2 – Mohair Seals in windows and doors are **<u>not</u>** acceptable where acoustic seals are required. Seals in these instances shall be equal to Schlegel Q-lon. Bi-parting sliding doors are not acoustically acceptable.

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#### 6.2 EXTERNAL WALL CONSTRUCTION

External walls which incorporate concrete or masonry elements and as such will not require upgrading acoustically. Lightweight external wall elements are to be treated per markup in Appendix 1.

Penetrations in walls must be sealed gap free with a flexible sealant. Any ventilation openings in the walls would need to be acoustically treated to ensure compliance with the nominated design criteria.

#### 6.3 ROOF CONSTRUCTION

The roof costruction proposed is concrete. Concrete or masonry roof areas will not require upgrading acoustically. If lightweight roof construction is proposed, it shall be reviewed by a suitably qualified acoustic consultant to ensure compliance with the internal traffic noise level criteria detailed in Table 6 and 7 is achieved.

Penetrations in ceilings (such as for light fittings etc.) must be sealed gap free with a flexible sealant. Any ventilation openings in the ceilings would need to be acoustically treated to maintain the acoustic performance of the ceiling construction.

## 7 ASSESSMENT OF PLANT AND EQUIPMENT

To ensure that noise emissions from mechanical plant and equipment serving the development do not impact adversely on the amenity of neighbouring residential properties specifically to the existing residential development to the west, noise emissions from the mechanical plant and equipment shall comply with Noise Protocol – Part I.

Note that the mechanical plant and equipment selections / design have not yet been finalised at this stage. Therefore, to ensure amenity for future residents and nearby noise sensitive receivers is preserved, the mechanical plant and equipment serving the development shall be reviewed during the detailed design stage by a suitably qualified acoustic consultant to ensure that compliance with Noise Protocol – Part I is achieved. This will be achieved by the use of standard acoustic treatment such as internally lined ductwork, acoustic louvres, acoustic attenuators, variable speed drives, and vibration isolation mounts.

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## 8 ASSESSMENT OF VEHICLE ACCESS DOOR

The NSW EPA in its Environmental Noise Control Manual document indicates that maximum noise levels below 50-55 dB (A) inside are unlikely to cause awakening reactions based on apartment windows being open. A level of 55 dB (A) inside the apartment (windows open) would correlate to a noise level of 65 dB (A) outside the window. It is noted that maximum noise levels of 65 dB (A) are achievable at a distance of 1 metre from operation of the unit. In addition, noise levels from operation of the vehicle access door shall comply with Noise Protocol – Part I criteria.

To ensure compliance the following treatment is recommended for the vehicle entry doors:

- The carpark floor surface is to have a broom finish or alternative to address tyre squeal.
- Doors shall be quiet in operation. Teflon guides shall be installed in all rails.
- Ensure that door panels do not rattle, and the operation of any door guides, rollers, etc. is smooth.
- Door guides should be fitted with vibration isolated fixings where required.
- Door motors shall be fitted with a soft start/stop controller to minimise noise.
- The door shall be stopped approximately 5 mm from the slab/ground to ensure the base of the door does not contact the concrete surface.
- Operation of the door shall comply with Noise Protocol Part I.

Isolation of the door structure is shown in the schematic below -

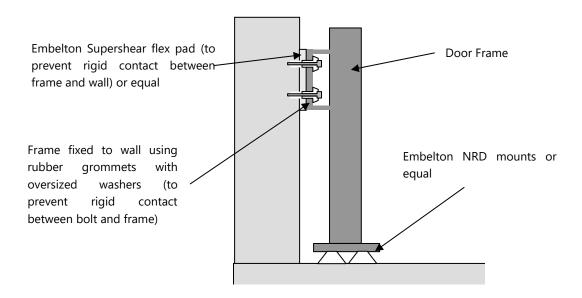


Figure 2 – Isolation of the car park entry door schematic diagram

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## 9 PROPOSED RETAIL & COMMERCIAL

The following requirements shall be incorporated into the proposed retail and commercial tenancies;

- Any amplified music associated with the tenancies will be limited to background music only and be limited by the operator to ensure that they comply with the EPA Noise Protocol Part II requirements.
- Staff are to be instructed not to drop heavy garbage items/bottle into bins they must be placed so as to minimise impact noise.
- All mechanical plant and equipment associated with future tenants must comply with the EPA Noise Protocol – Part I.
- Use of amplified music until close of business is permitted provided that it is background music only (conversation level) and is inaudible within residential dwelling living areas. Music noise shall only be played within the premises. Externally mounted speakers are not acceptable.
- Glass must not be emptied/transferred from one receptacle to another anywhere externally before 7am or after 10pm. Outside this time period all glass must be emptied / transferred within the premises and removed in containers.
- The collection of waste and recycling must only occur during the hours of garbage collection for the remainder of the development.
- Acoustic advice from an appropriately qualified person must be sought prior to the installation of any of any plant that is either located externally or ducted to an external louvre not specifically addressed in this report. This would include, but may not necessarily be limited to:
  - Exhaust Fans (as they are ducted to external areas).
  - Air-conditioning condensers.
  - Refrigeration plant (if external).

Any acoustic treatment must take into account:

- The location of noise sensitive properties
- Ambient noise levels at the nearest potentially affected property (determined by on-site measurement).
- The noise level from the plant item proposed to be installed (based on acoustic data sheets from manufacturer).
- The proposed time at which the plant will be used/operational.
- Allowable noise level based on typical Council acoustic requirements and/or conditions of consent.

Written advice regarding what acoustic treatments, if any must be provided. This advice must be sought prior to the installation of any plant.



## **10 CONCLUSION**

This report details our acoustic assessment for the proposed mixed-use development located at 511-537 Sydney Road, Coburg. This report presents our investigation of external noise intrusion into the development from surrounding noise sources and sets noise emission criteria.

We trust this information is satisfactory. Please contact us should you have any further queries.

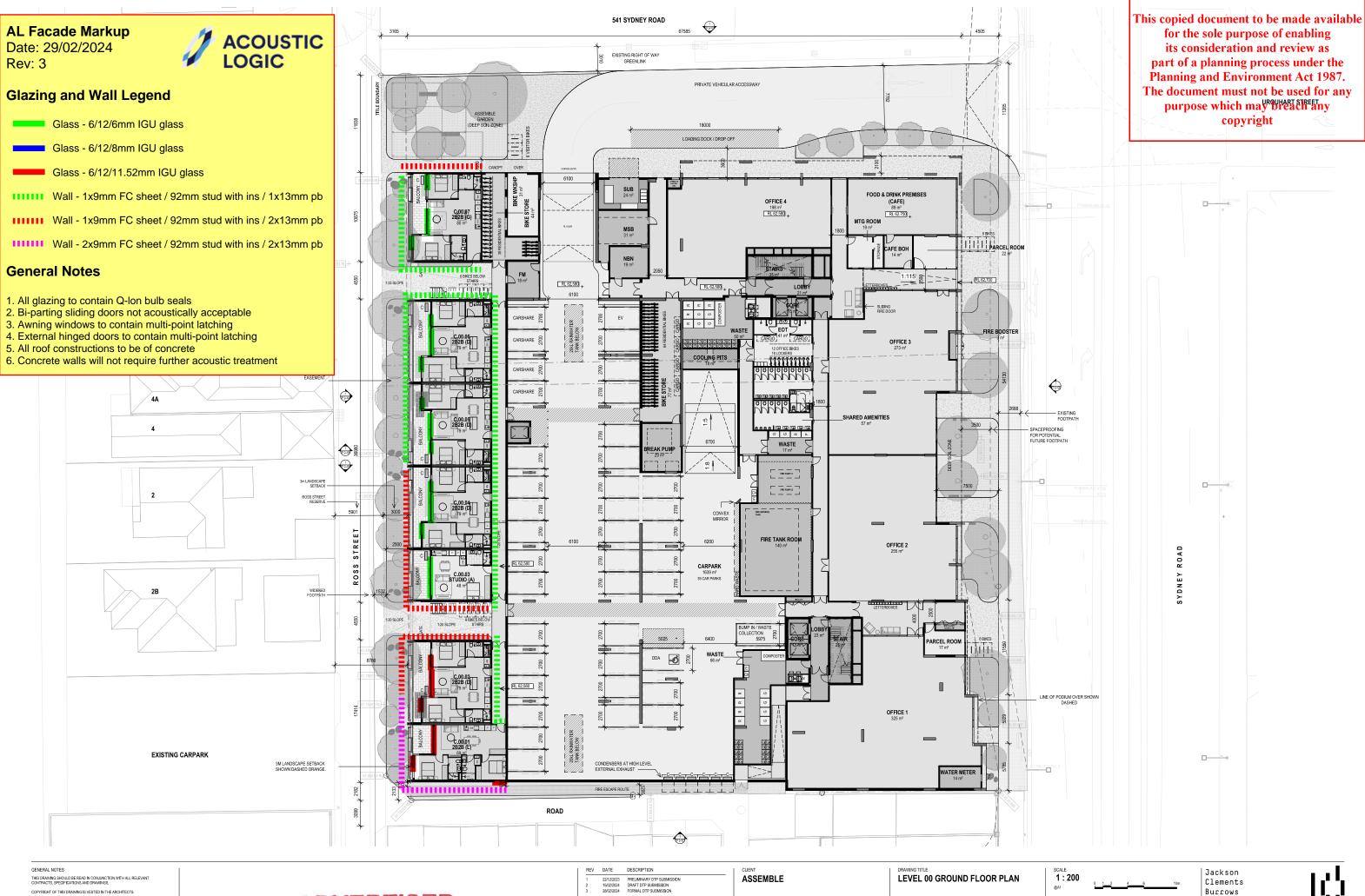
Yours faithfully,

Acoustic Logic Pty Ltd Stanley Sinatra

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### **APPENDIX 1 – FAÇADE MARKUP**

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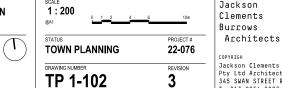
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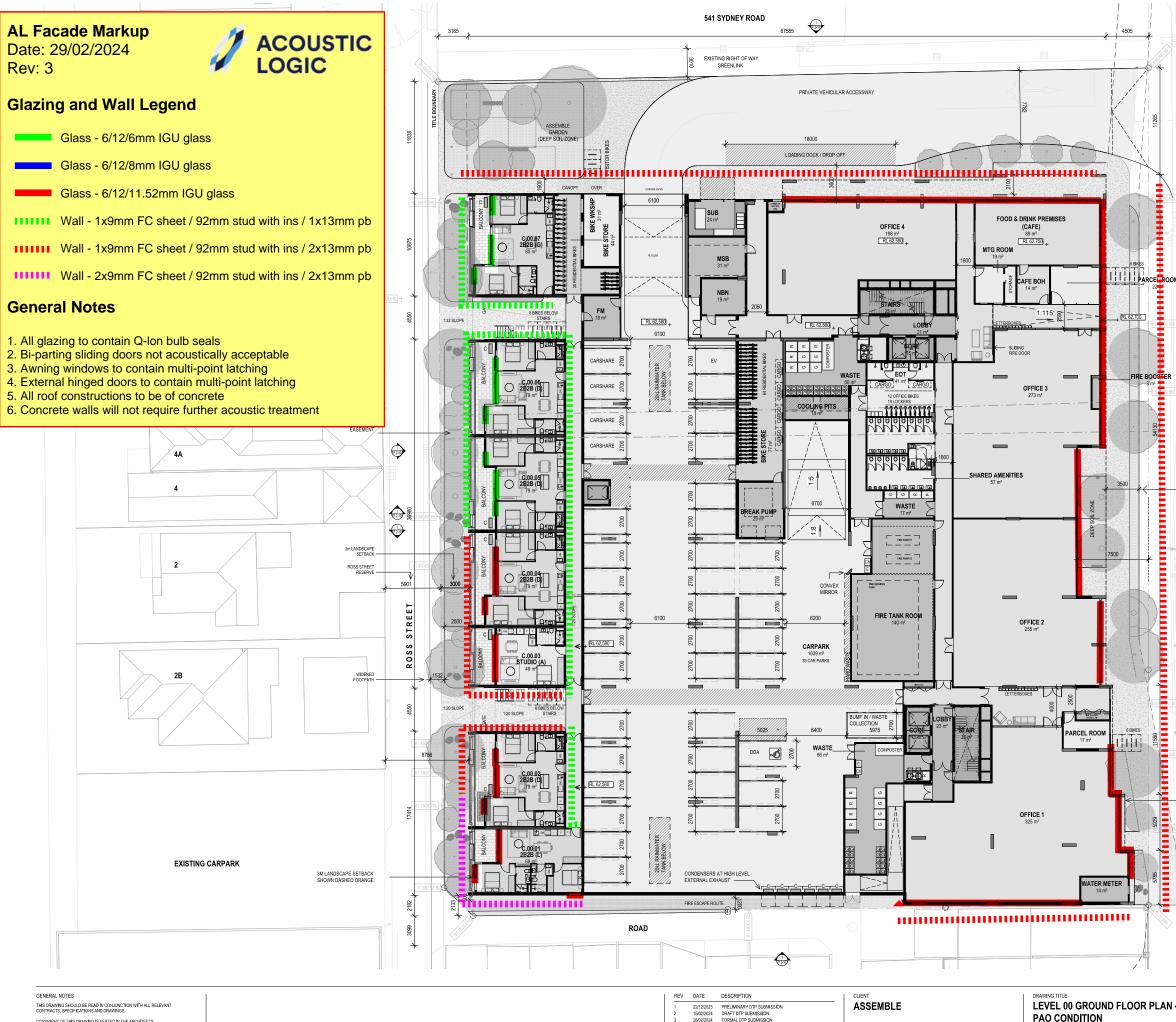
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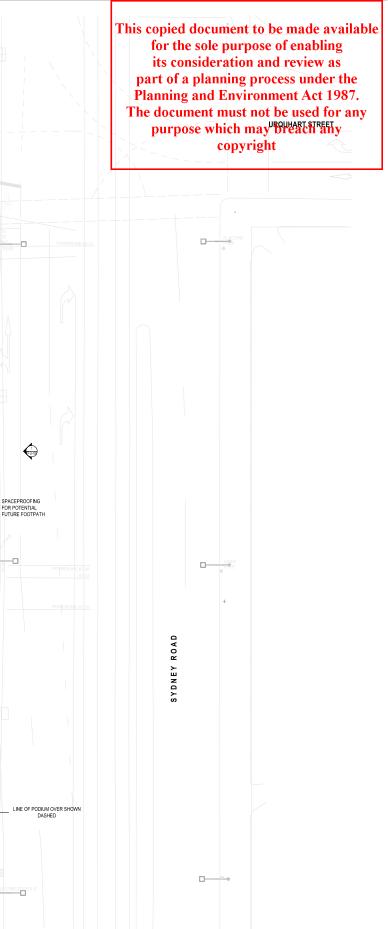
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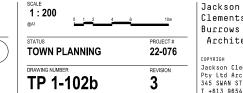


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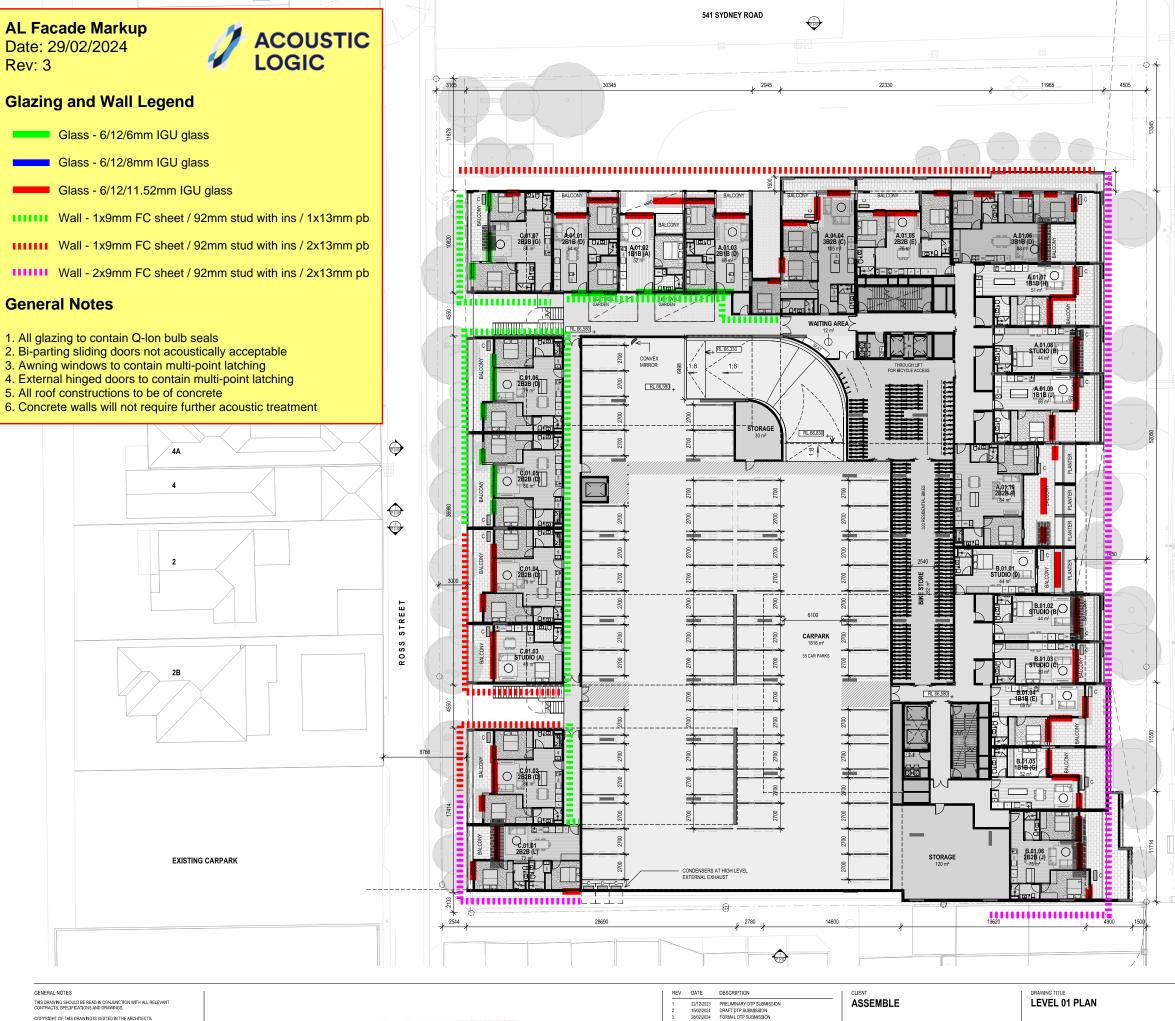




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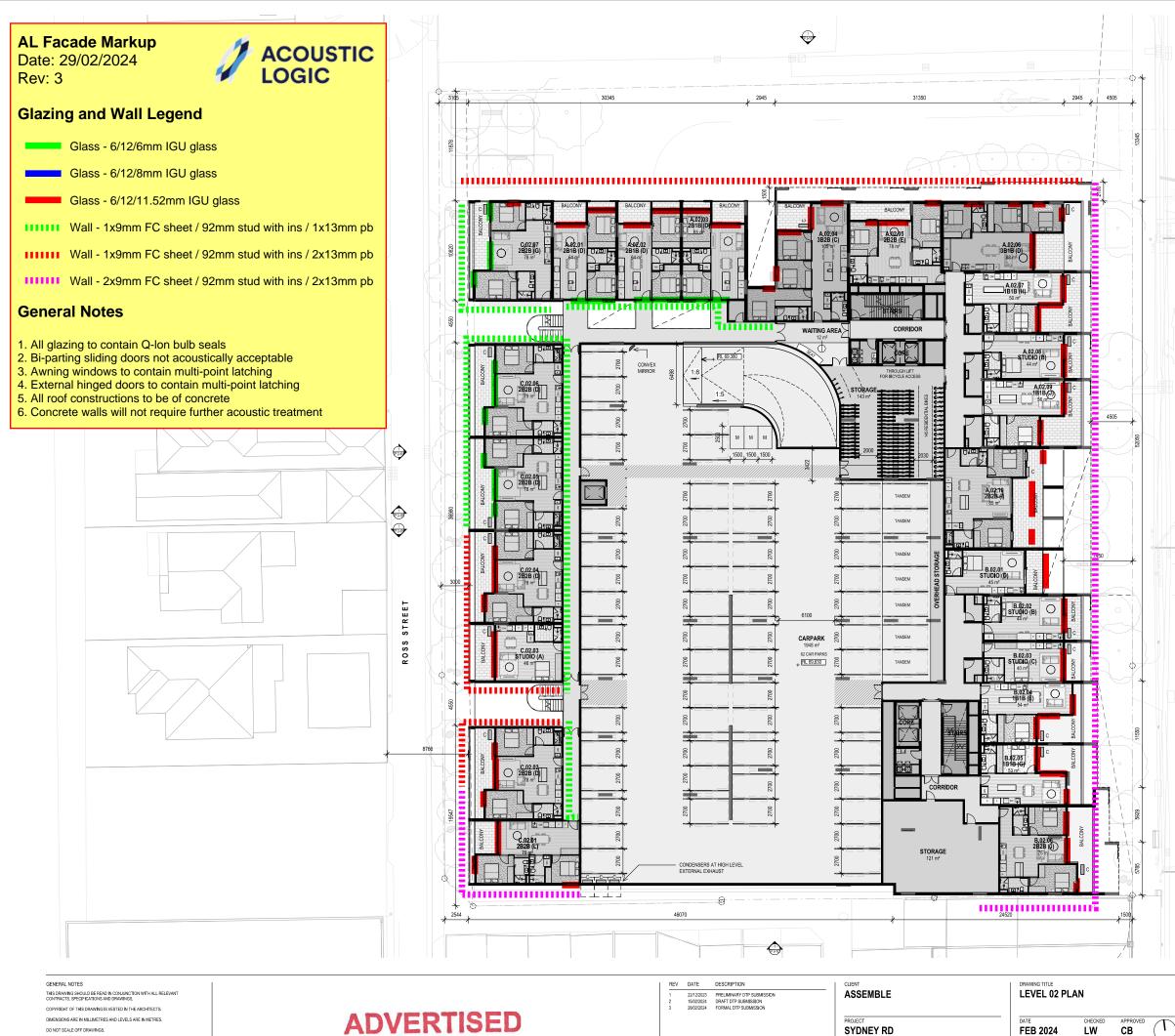
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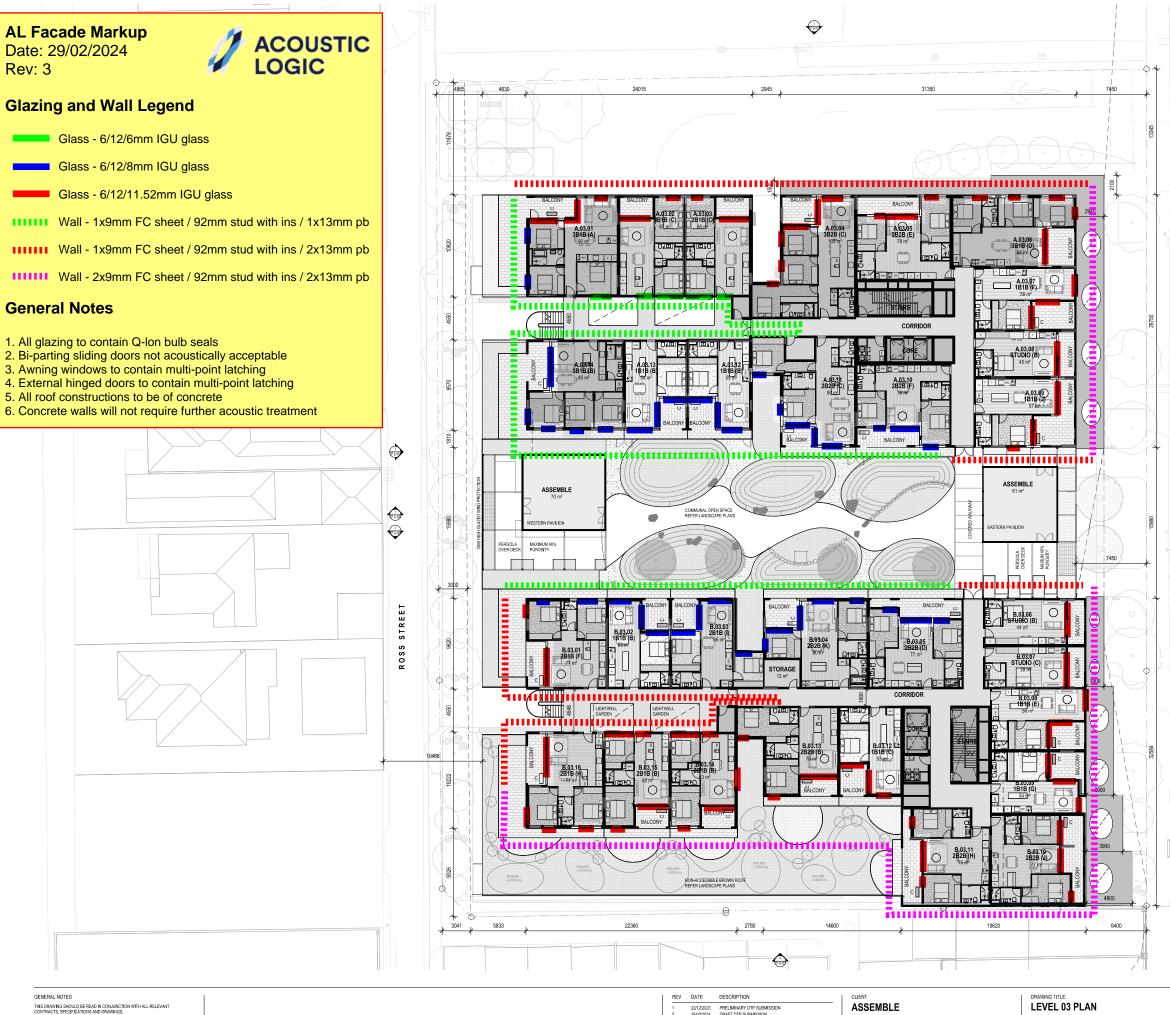
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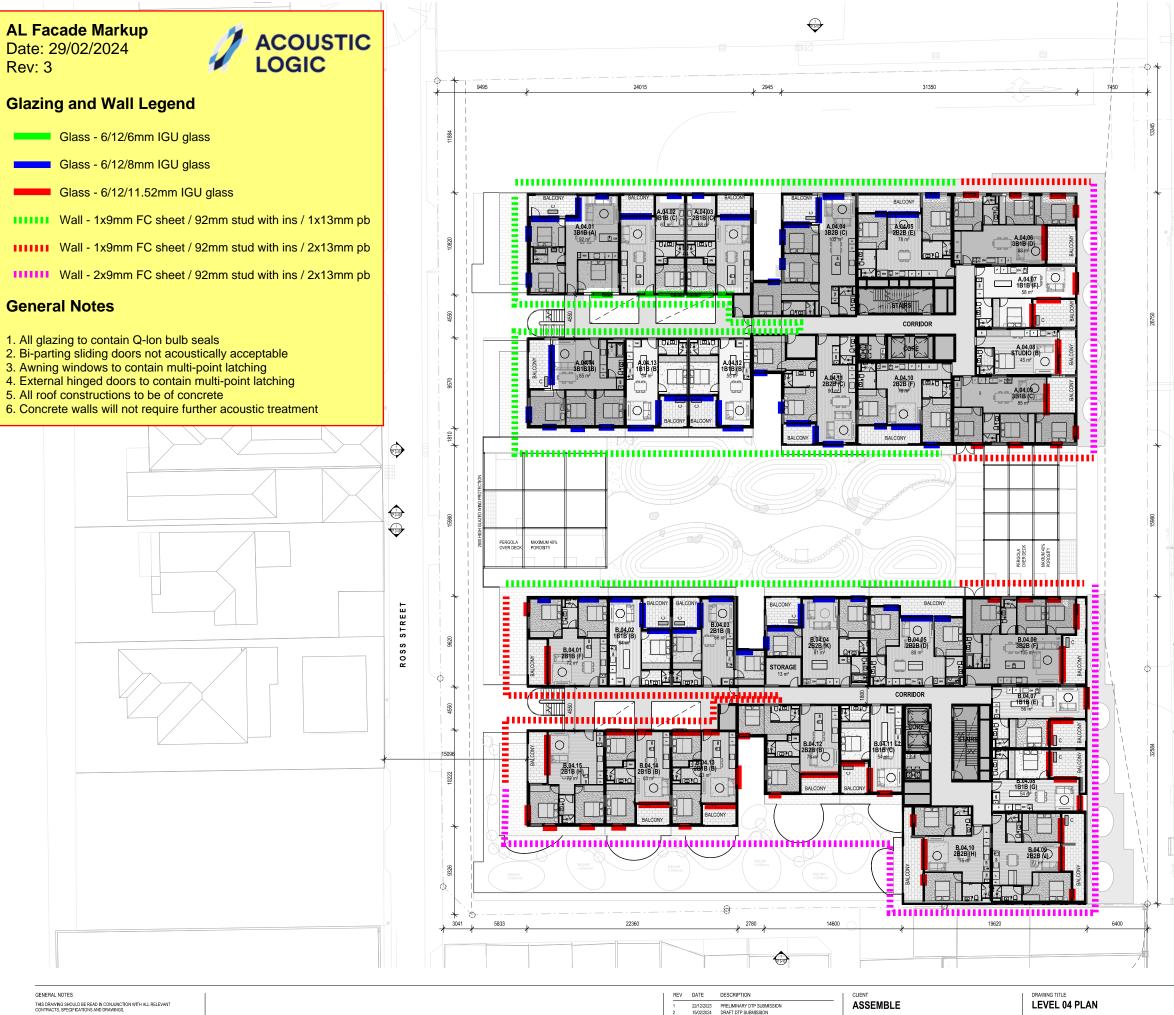
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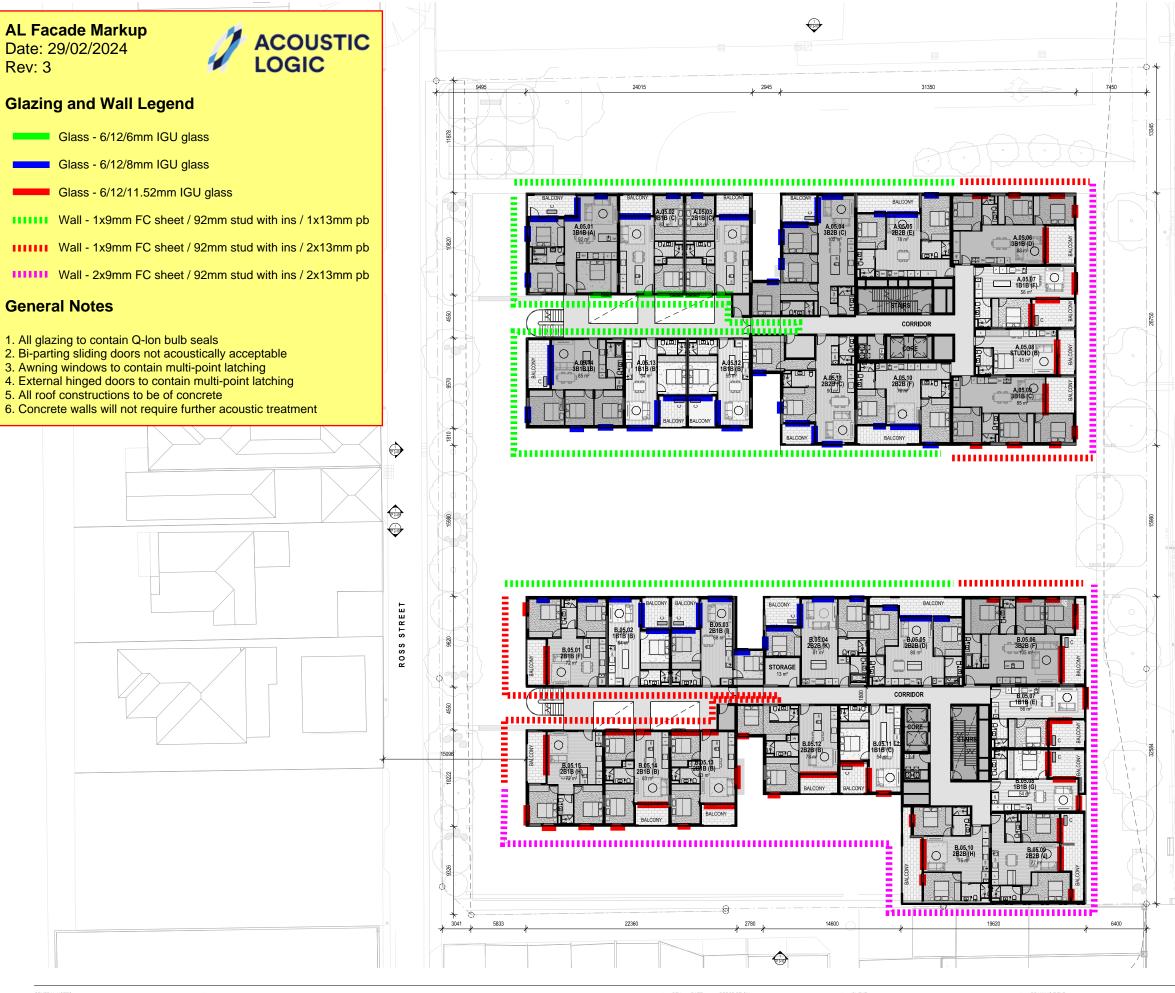
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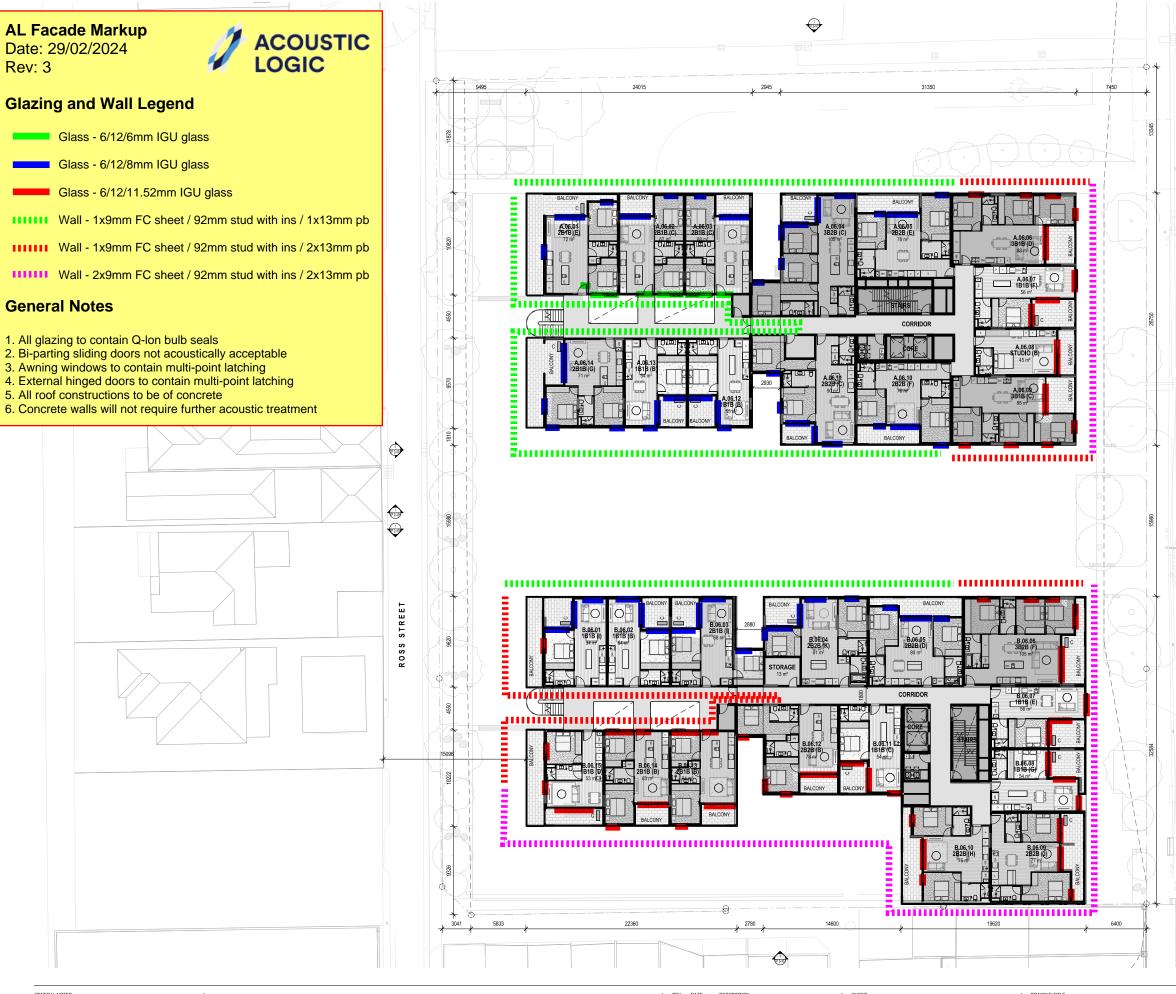
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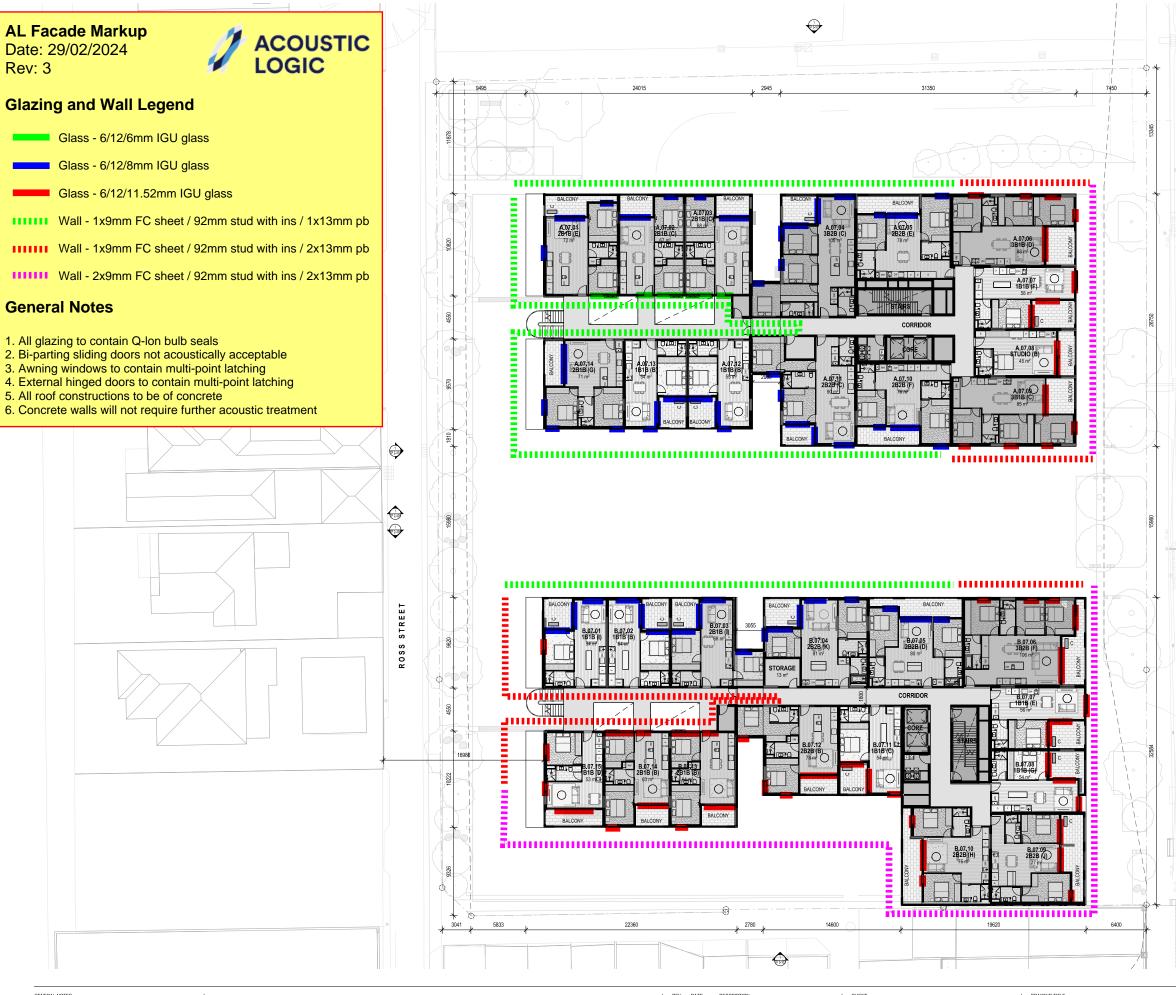


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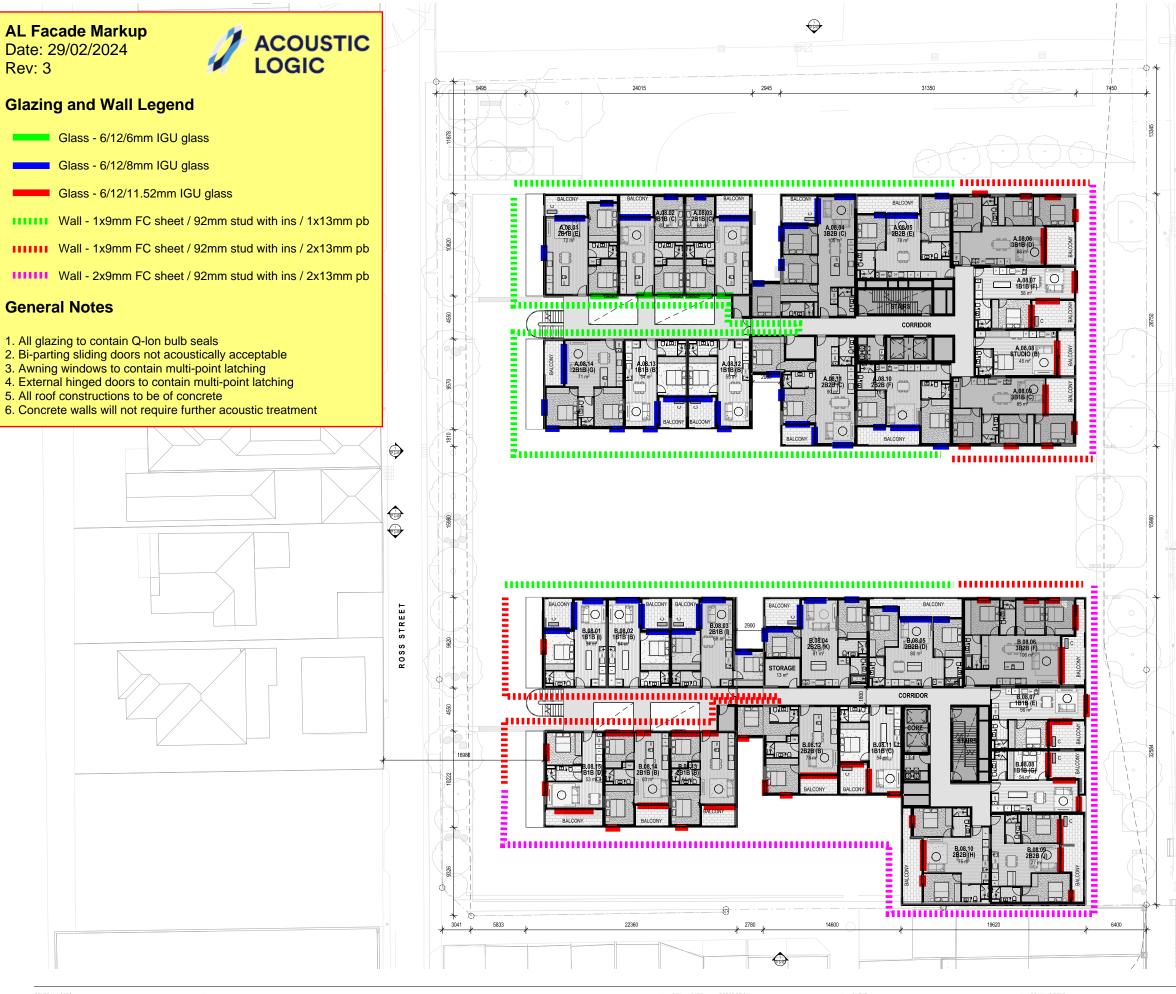
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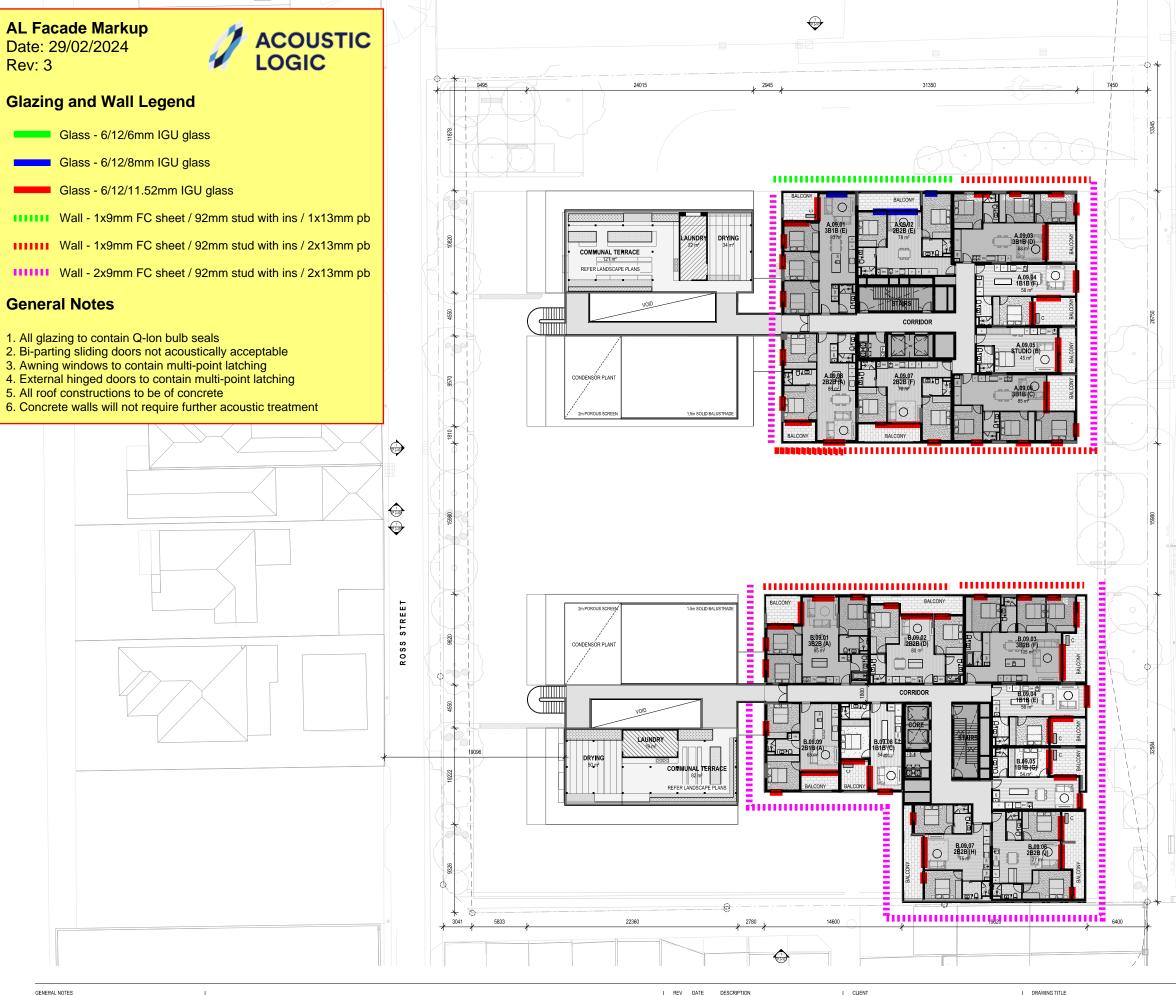
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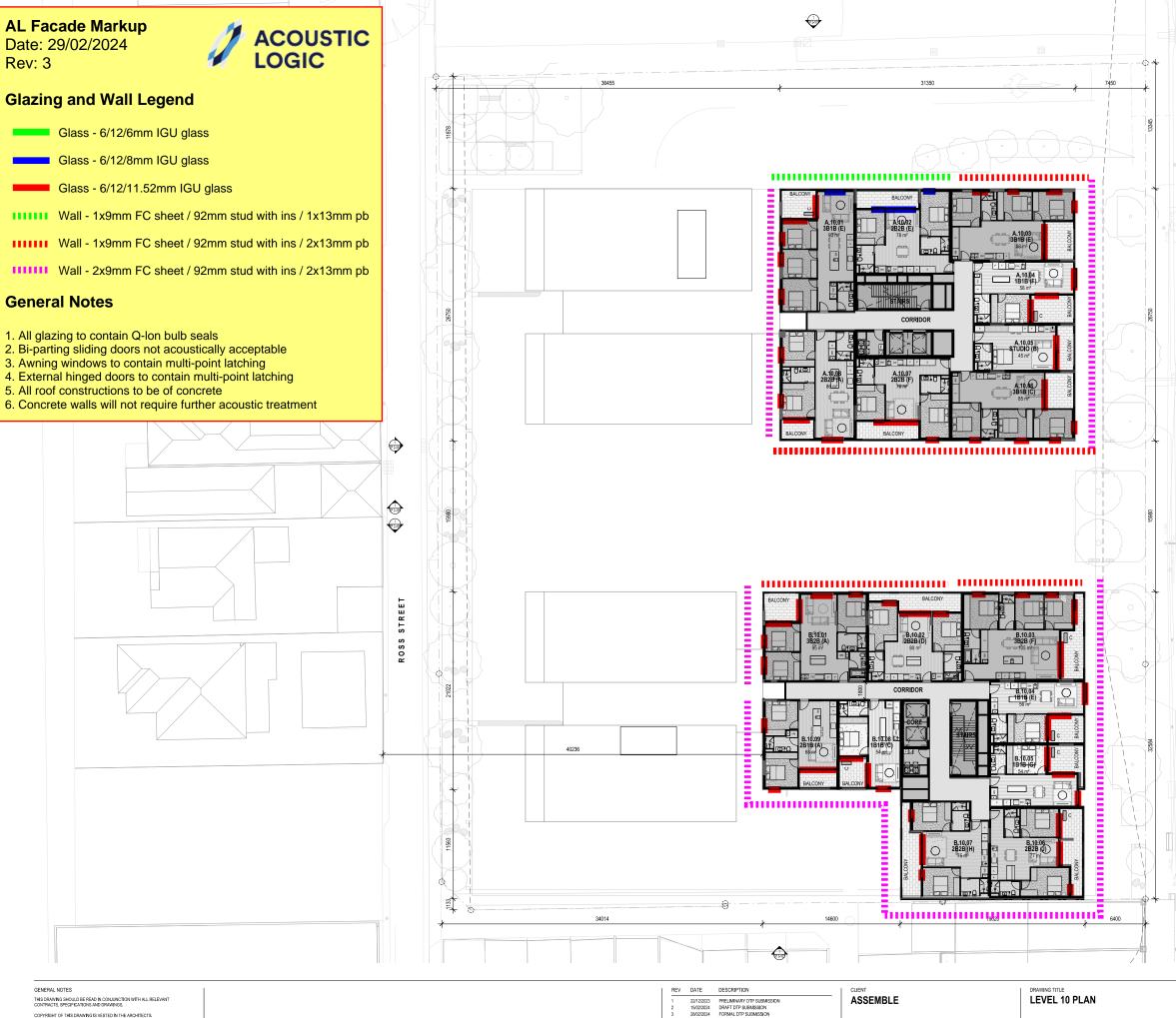
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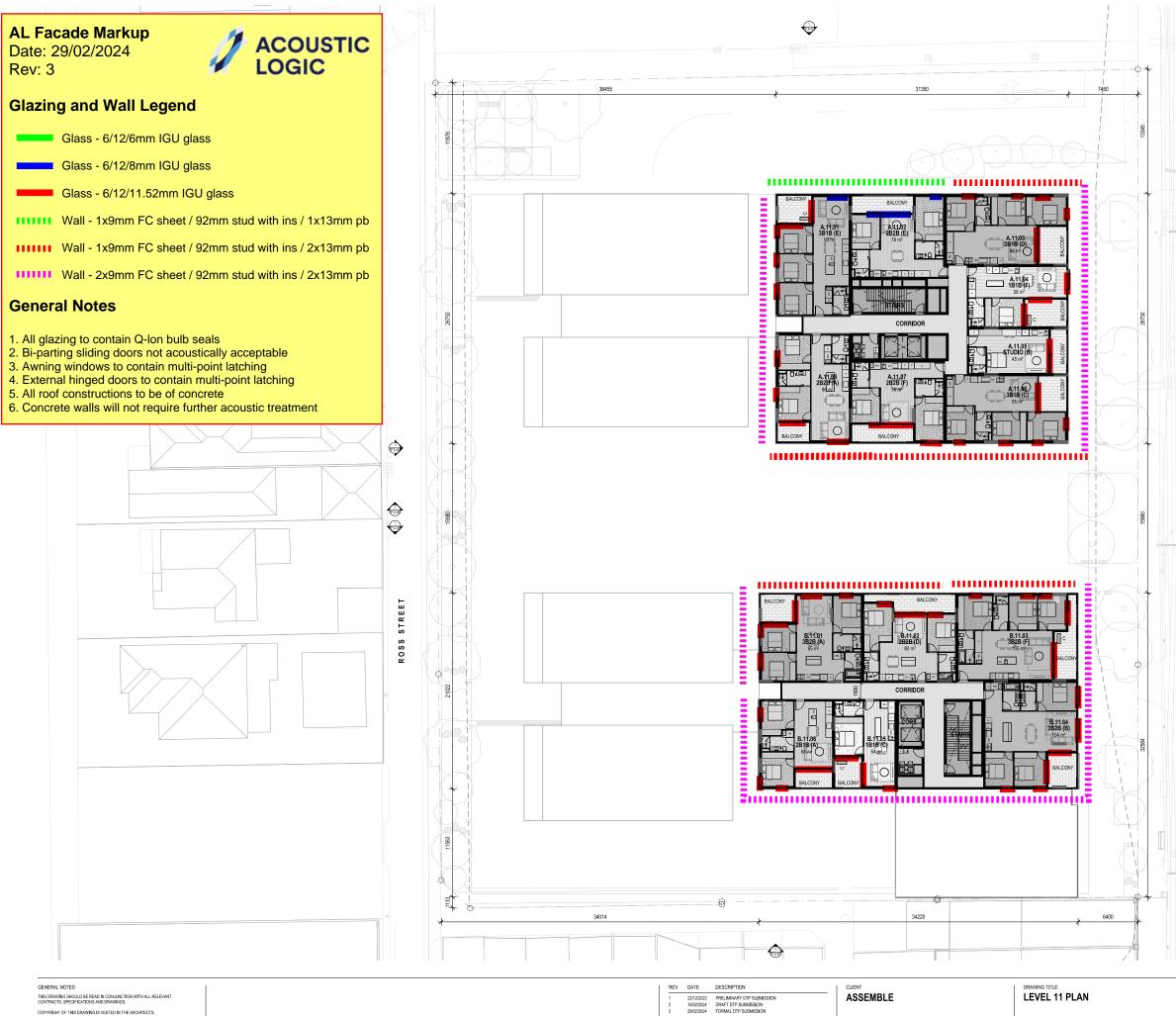
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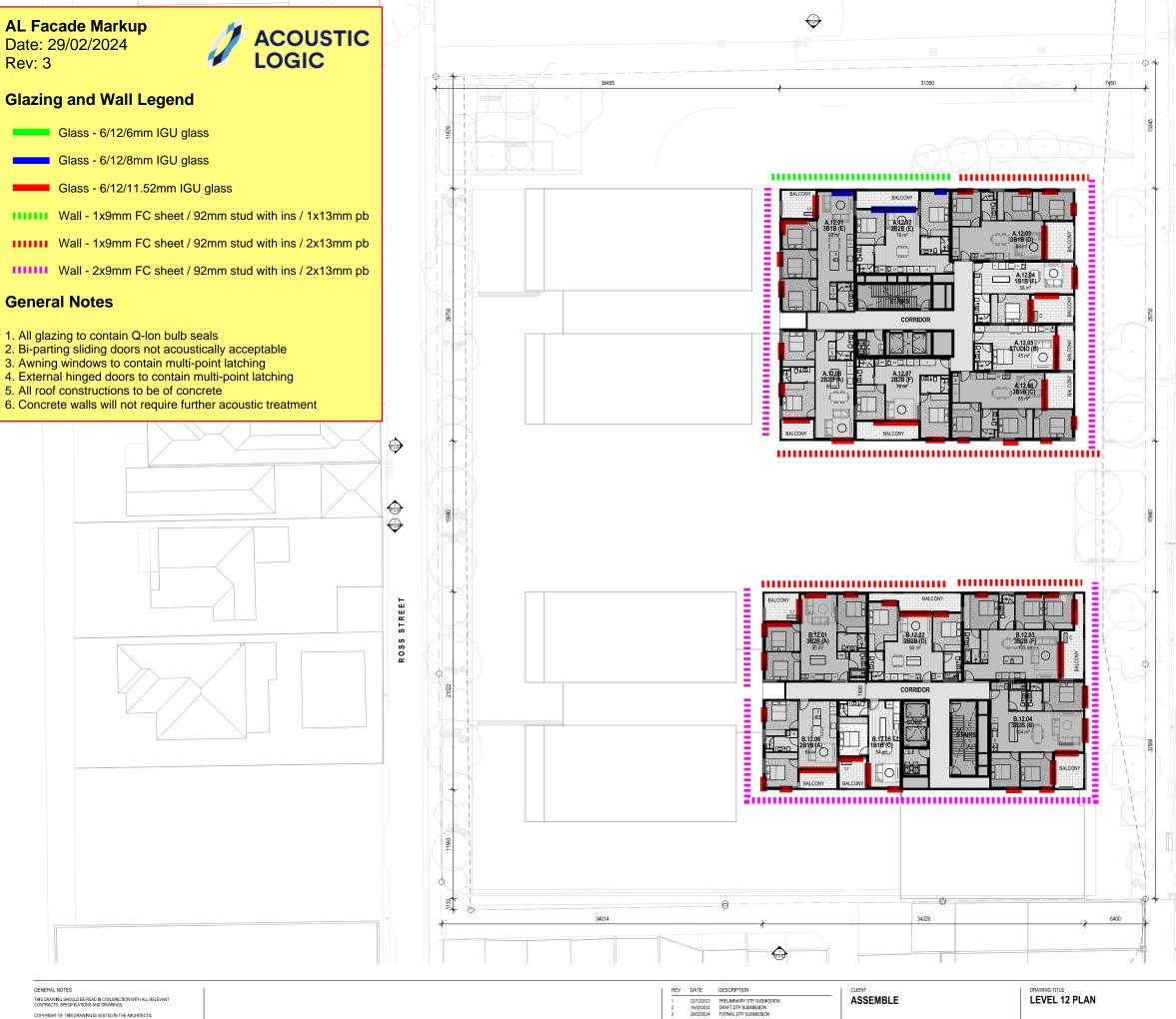
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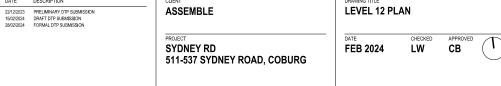




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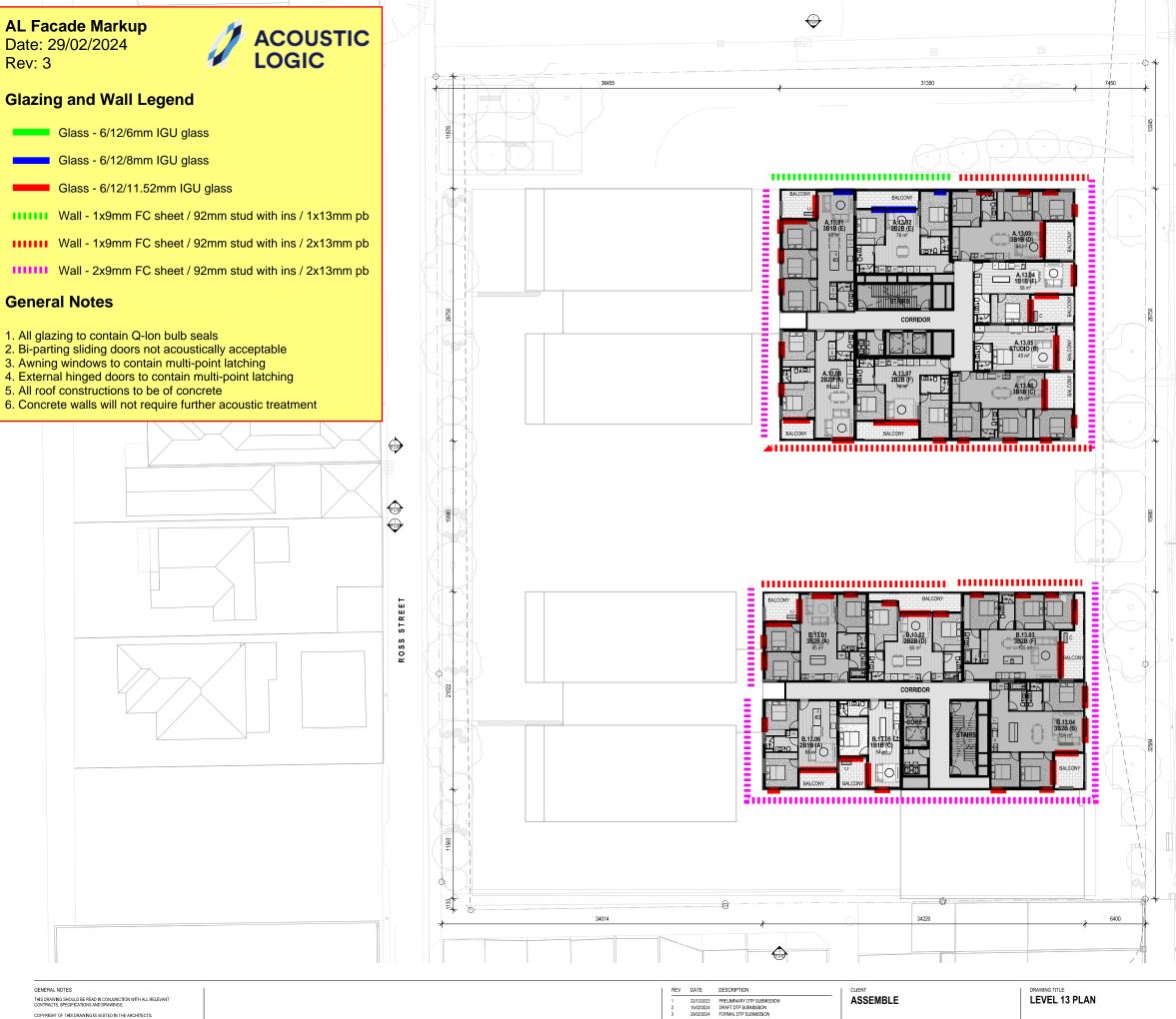
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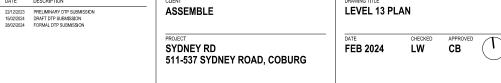




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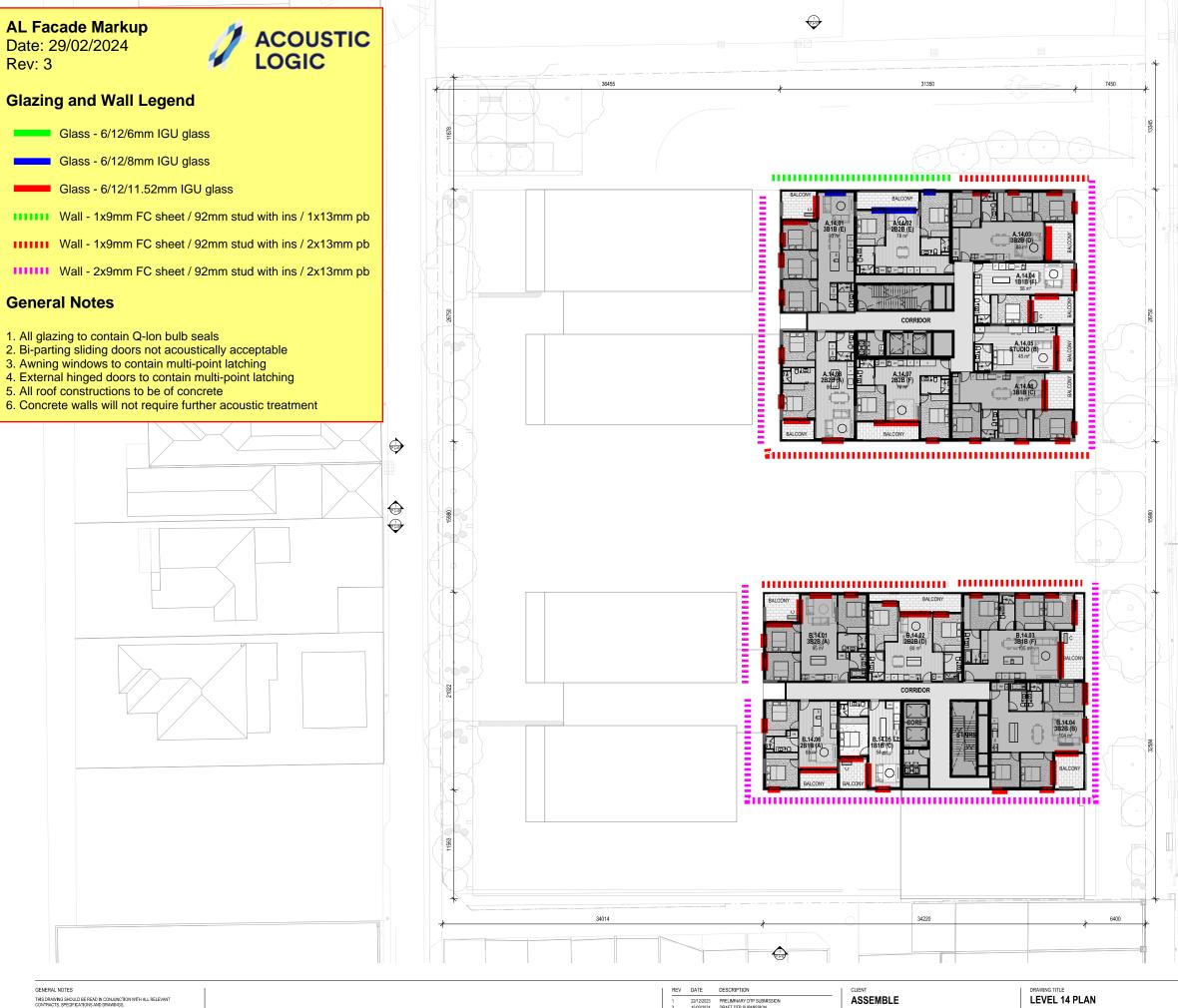
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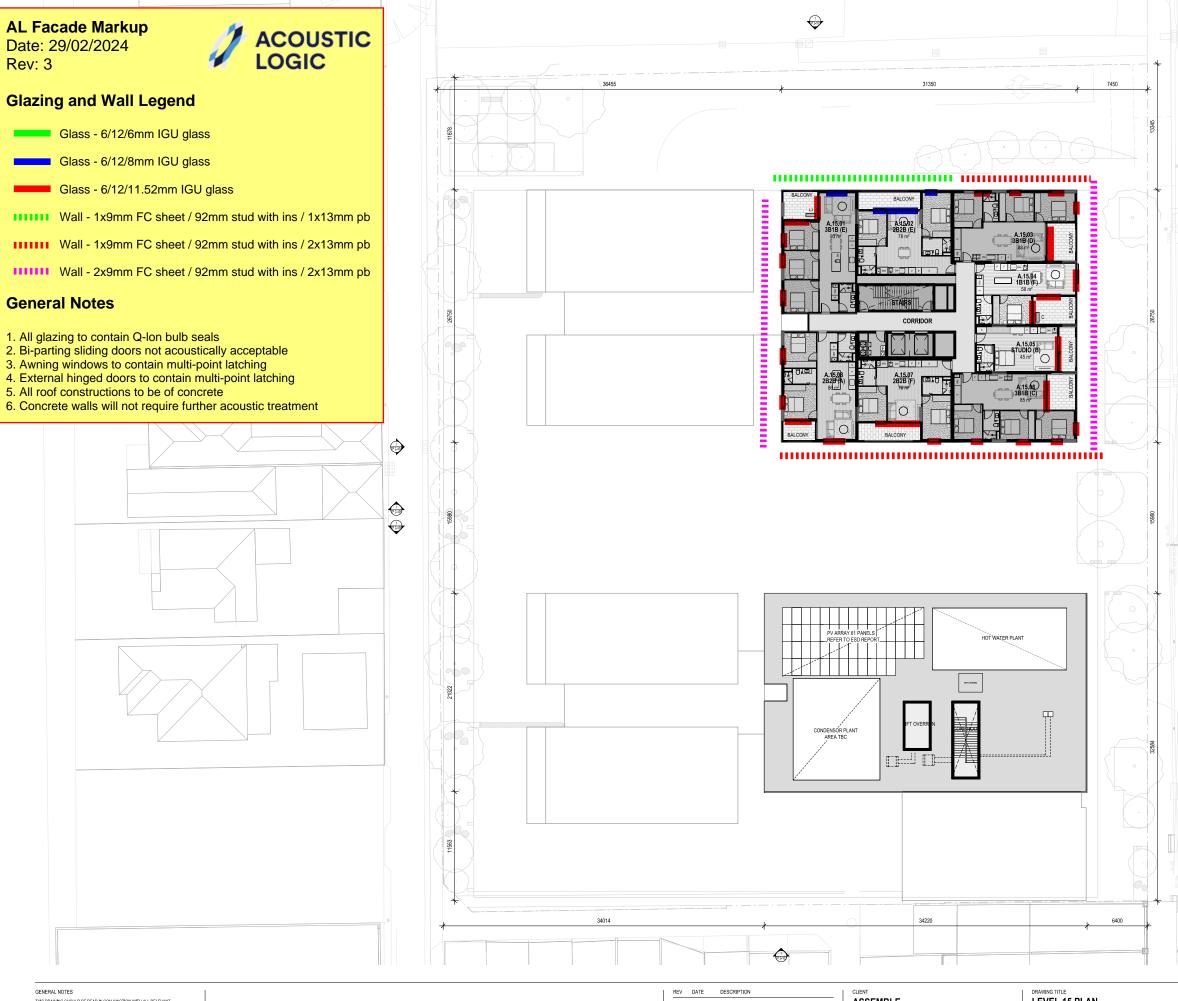
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