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188-202 Swan Street, Cremorne

Acoustic Assessment for Planning

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1 INTRODUCTION

Acoustic Logic Pty Ltd (AL) has been engaged to conduct an acoustic assessment of potential external noise and vibration impact on the proposed residential development located at 188-202 Swan Street, Cremorne. This study assesses potential noise and vibration from Swan Street to the north of site, the rail corridor to the south of site and nearby commercial uses.

The assessment has been conducted based on the following documentation.

Table 1 – Referenced Documents

Prepared By	Document	Reference	Date
Cox Architecture	Architectural Drawings	TP21-0600, TP21-0700, TP21-0800, TP21-0900, TP21-1001, TP21-1011, TP21-1021, TP21-1031, TP21-1041, TP21-1051, TP21-1141	27/03/2026
		TP21-1111, TP21-1121, TP21-1131	25/09/2025
City of Yarra	Clause 53.06-3 of the Planning Scheme	-	04/05/2022

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2 SITE DESCRIPTION

The proposed residential development is located at 188-202 Swan Street, Cremorne as shown in Figure 1. Potential noise impacting the subject development will be the traffic and tram noise along Swan Street to the north of site, train noise from the rail corridor to the south of site, and patron and music noise from nearby commercial uses identified below. Noise from nearby commercial uses including mechanical plant and equipment serving these uses also has the potential to impact the subject site.



Figure 1 – Subject site and external noise sources (source: Google Maps)

2.1 LOCAL NOISE SOURCES

Acoustic Logic attended the site on multiple occasions. The following observations were made with respect to the subject site and its surrounding environment.

- 1) Noise sources impacting the subject site are those associated traffic and tram noise along Swan Street to the north of site and the train noise (including horns) from the rail corridor to the south of site.
- 2) Noise from the rooftop mechanical services to the west of site will be addressed to the recommended internal noise levels of AS2107. The acoustic treatment on the development to address road/rail noise will be sufficient to also address noise from the rooftop mechanical services.
- 3) Noise from nearby licensed venues will be addressed to the requirements of Clause 53.06 of the Yarra Planning Scheme.

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2.1.1 Music Noise from Nearby Licensed Venues

The venues indicated below have been identified as Licensed Venues and are located nearby to the subject site.

- **Richmond Social:** Richmond Social is located at 157 Swan Street approximately 20m to the north of site over Swan Street. The Richmond Social liquor license contains the following conditions:

AMENITY

The licensee shall not cause or permit undue detriment to the amenity of the area to arise out of or in connection with the use of the premises to which the licence relates during or immediately after the trading hours authorised under this licence.

In the bistro -

- (a) background music, or
- (b) light acoustic music, or
- (c) lightly amplified instrumental music

is permissible until 1am on Friday, Saturday and Sunday mornings.

Background music only is allowed in the outdoor area until 10pm. No music is allowed in the outdoor area after 10pm.

No live music is allowed in the remainder of the premises at any time.

No live entertainment is allowed in any part of the premises between 3am and 7am on any morning.

Based on the above, as only lightly amplified music is allowed internally, and no music is allowed externally after 10pm, noise from patrons within the outdoor area is expected to be the primary noise potentially impacting the subject site during the night period.

- **Fargo & Co.:** Fargo and Co. is located at 216 Swan Street approximately 30 metres to the east of site. Fargo and Co. is licensed to operate until 3:00am for internal areas and until 1:00am for the outdoor terrace. Measurements have been undertaken to determine noise levels within the outdoor terrace areas and potential impact on the subject site.

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3 ENVIRONMENTAL NOISE DESCRIPTORS

Environmental noise constantly varies in level, due to fluctuations in local noise sources including traffic and rail. 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 principal 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_{10} 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_{eq} is important in the assessment of traffic and rail noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of industrial noise.

The L_1 parameter (or the noise level exceeded for 1% of the time) is used during the night period to assess potential sleep arousal effects due to transient noise sources.

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4 ASSESSMENT CRITERIA

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4.1 NOISE

4.1.1 Standard D16 at Clause 58.04-3

Standard D16 at Clause 58.04-3 of the Yarra Planning Scheme 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.

Table D3 Noise influence area

Noise Source	Noise influence area
Zone interface	
Industry	300 metres from the industrial 1, 2 and 3 zone boundary
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 **not** within 300m of an industrial zone.
2. The development is **not** within 300m of a freeway or road carrying an AADT >40,000
3. The development **is within** 80m of a train line.

Based on the above, the criteria based on Standard D16 is applicable for the development to address train noise intrusion from the nearby rail corridor. The applicable criteria are detailed below.

Table 2 – Internal Train Noise Level Criteria

Location	Internal Design Noise Level ¹
Apartment Living Rooms	40 dB LAeq(16hr) (6am – 10pm)
Apartment Bedrooms	35 dB LAeq(8hr) (10pm – 6am)

Note 1 – With external windows and doors closed. Apartments are unfurnished with finished floor

As the Standard D16 is not applicable for external traffic noise intrusion, the apartment internal traffic noise level shall be designed to ensure compliance with the criteria nominated in Australian Standards 2107:2016 further detailed in Section 4.1.2.

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4.1.2 AS 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 3 below details the criterion set for the proposed development.

Table 3 – Internal Traffic Noise Level Criteria

Location	Internal Design Noise Level ¹	
	Day (7am – 10pm) dB L _{Aeq,1hr}	Night (10pm – 7am) dB L _{Aeq,1hr}
Apartment Bedrooms	35 - 45	35 - 40
Apartment Living Rooms	35 - 45	N/A

Note 1 - Noise level within furnished room ready for occupation with external windows and doors closed.

4.1.3 Sleep Disturbance Criteria - Rail

In Victoria there are currently no statutory standards to assess maximum noise level intrusion into residential developments from rail generated noise. In lieu of this the following New South Wales rail noise intrusion criteria has been adopted.

Rail Infrastructure Corporation (RIC) and State Rail Authority (SRA) nominated criteria for residential development in their publication 'Interim Guidelines for Councils – Consideration of Rail Noise and Vibration in the Planning Process' dated 2003 which are accessed internally with windows closed. Table 4 below details the maximum internal noise level criteria for rail noise suitable for this development.

Table 4 – Internal Noise Level Criteria – Rail Noise – Apartments

Location	Required Internal Noise Levels
Bedrooms	55 dB L _{AMax} ^{1,2}

Note 1 – The dB L_{AMax} value is derived as the maximum noise level not exceeded by 95% of train pass-by events.

Note 2 - Noise level within furnished room ready for occupation with external windows and doors closed.

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4.1.4 Music Noise

EPA Publication 1826.5 Part II details the methodology to be used in assessing environmental noise emissions such that residential amenity may be preserved. The acoustic criteria are determined by measuring the background noise levels over an extended period and then deriving effective noise limit. The effective noise limit is the L_{Aeq} for the day/evening period and is derived from the measured $L_{A90} + 5dB$. The effective noise limit for the night period is $L_{OCT90} + 8 dB$. Table 5 and Table 6 below details the criteria based on the background measurements detailed in Table 16 and 17 (Section 5.7).

Table 5 – Music Noise Limits dB

Period	Time	Project Noise Limits dB
Day / Evening	Monday to Saturday: 7am-11pm Sunday: 9am-10pm	48 L_{Aeq}
Night	Monday to Friday: 11pm-7am Saturday: 11pm-9am Sunday: 10pm-7am	Refer Table 6

Table 6 – Music Noise Limits dB (Night)

Period	Music Noise Level Limits dB L_{OCT10}^1						
	63Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Night	46	46	46	44	41	33	25

Note 1 - Based on the background noise levels presented in Table 17.

Where the above limits are exceeded externally then the following internal noise criteria shall be adopted based on external windows and doors closed in accordance with the requirements of Clause 53.06-3 of the Yarra Planning Scheme. Music noise levels internally within the subject site are to be designed to not exceed the internal background L_{90} noise level plus 8 dB shown in Table 7 below with apartments suitably furnished ready for occupation with external windows and doors closed. The criteria are applicable at the centre of habitable rooms.

Table 7 – EPA Publication 1826.5 – Part II Noise Limits dB – Internally

Location	Period	Music Noise Limits dB						
		63	125	250	500	1k	2k	4k
Living Rooms	Day / Evening	$L_{Aeq} \leq \text{Internal } L_{A90} \text{ Background} + 5$						
Bedrooms	Night	40 ¹	30 ¹	20 ¹	20 ¹	15 ¹	10 ¹	10 ¹
		<i>or</i> $L_{(OCT)eq} \leq \text{Internal } L_{(OCT)90} \text{ Background} + 8dB$						

Note 1: Base noise limits under EPA Publication 1826.5 Part II.

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4.1.5 Internal Patron Noise Level Criteria

The following criteria are proposed based on providing internal amenity to apartments within the development which has been based on Australian Standards AS2107:2016. Table 8 below presents internal noise criteria based on typical repeatable level in apartments suitably furnished, ready for occupation with external façade windows and doors closed.

Table 8 – Internal Design Noise Criteria (Patron Noise)

Location	Required Internal Noise Level	
	dB L _{Aeq} 1hr (7am – 10pm)	dB L _{Aeq} 1hr (10pm – 7am)
Bedrooms / Studio	35	30
Living rooms	35	35

Note 1: Bedrooms are assessed as living areas outside the night period of 10pm to 7am. Assessment is based on apartments suitably furnished ready for occupation.

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4.2 VIBRATION

4.2.1 Tactile vibration within the development

The development will be potentially subject to tactile vibration from the adjacent rail corridor due to the proximity from the subject site. The following criteria have been nominated to protect the amenity of future residents within the proposed development.

4.2.2 Criteria

The criteria nominated are those recommended in Australian Standard AS2670.2 - 1990 "Continuous and shock-induced vibration in buildings (1Hz to 80Hz)" and have been used on similar residential developments in Melbourne.

The standard nominates a base frequency-dependant criteria (curve) for vibration in the three axes. The vertical axis has been used as the base curve for this development.

The standard provides multiplication factors to the base curve depending on the use of the space under investigation and the time of day. The multiplication factor which has been used for this investigation is that given for residential spaces during the night-time period as this is the most stringent applicable criteria, namely 1.4.

Figure 2 below details the criteria for this development.

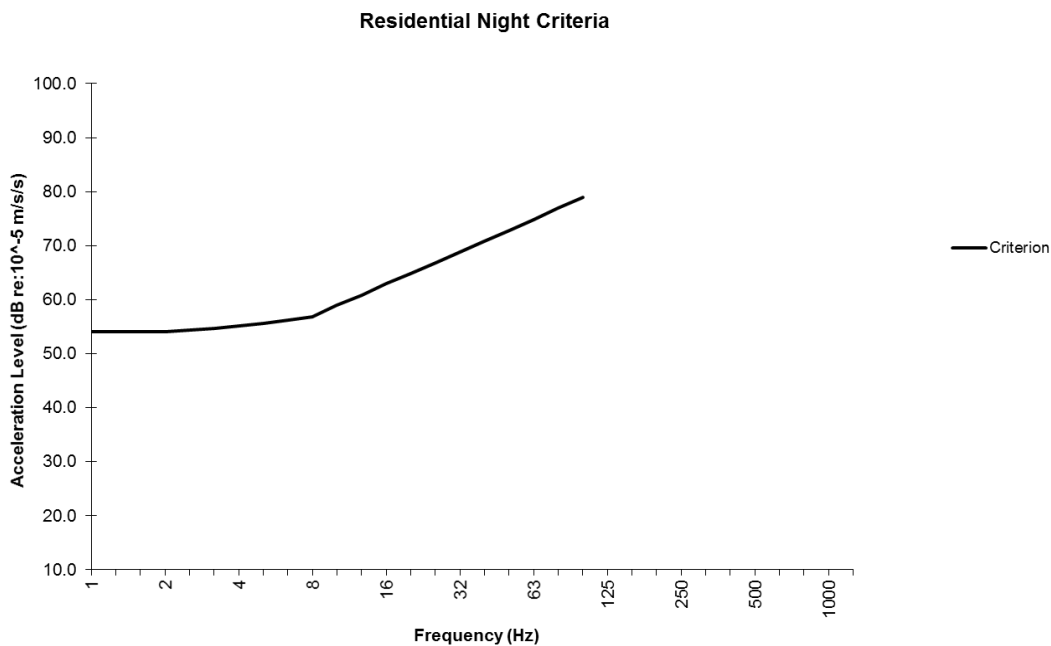


Figure 2 – Tactile Vibration Criteria within the development

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5 NOISE LEVEL MEASUREMENTS

Noise measurements were conducted around the proposed site as presented below.

5.1 MEASUREMENT EQUIPMENT

- Unattended noise monitoring at Location 1 was conducted using a Rion NL-52 Noise Monitor. The noise monitor was programmed to store 15-minute statistical noise levels through the monitoring period. Equipment was calibrated at the beginning and the end of the measurements using a Rion NC-74 calibrator; no significant drift was detected. All measurements were taken on fast response mode.
- Unattended noise monitoring at Location 2 was conducted using a Ngara Acoustic Research Laboratories Pty Ltd Noise Monitor. The noise monitor recorded data throughout the monitoring period and was post-processed to provide the required data. Equipment was calibrated at the beginning and the end of the measurements using a Rion NC-74 calibrator; no significant drift was detected. All measurements were taken on fast response mode.
- Attended measurements at Location 3 were conducted using a Norsonic Nor 140 Sound Level Meter. Equipment was calibrated at the beginning and the end of the measurements using a Rion NC-74 calibrator; no significant drift was detected. All measurements were taken on fast response mode.
- Attended measurements at Location 4 & 5 were conducted using a Norsonic Nor 140 Sound Level Meter. Equipment was calibrated at the beginning and the end of the measurements using a Rion NC-74 calibrator; no significant drift was detected. All measurements were taken on fast response mode.

5.2 MEASUREMENT LOCATIONS AND TIME OF MEASUREMENTS

Refer to Figure 1 above for measurement locations, and *Appendix 1-Site Photos*.

Location 1: Unattended noise monitoring was conducted between 30 October and 6 November 2025 to the north of site facing Swan Street. Noise monitor was installed on the roof of the existing building approximately 6 metres above street level. Noise monitor had full view of Swan Street and was not impacted by façade reflections.

Location 2: Unattended noise monitoring was conducted between 30 October and 6 November 2025 to the south of site facing the rail corridor and East Richmond station. Noise monitor was installed on the roof of the existing building approximately 6 metres above street level. Noise monitor had full view of Swan Street and was not impacted by façade reflections.

Location 3: Attended noise measurements were conducted on 6 November 2025 between 2:00pm and 2:30pm on the roof of the existing building at the western site boundary overlooking adjacent mechanical services.

Location 4 & 5: Attended noise measurements were conducted on the evening of 28 March 2026 between 10:30pm and 11:30pm within the Fargo & Co. Level 1 external area and within the carpark to the east of site and south of Fargo & Co.

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5.3 TRAFFIC NOISE LEVELS

Results of traffic noise levels measurements are provided in Table 9 below.

Table 9 –Unattended Traffic Noise Measurements – Location 1

Location	Day	Period	Measured Noise Levels
Location 1 – North of Site (~6m above street level)	Thursday 30 October	Day (6:00-22:00)	63 dB L _{Aeq,16hr}
		Night (22:00-6:00)	59 dB L _{Aeq,8hr}
	Friday 31 October	Day (6:00-22:00)	63 dB L _{Aeq,16hr}
		Night (22:00-6:00)	61 dB L _{Aeq,8hr}
		Morning (6:00-7:00)	64 dB L _{Aeq,1hr}
	Saturday 1 November	Day (6:00-22:00)	64 dB L _{Aeq,16hr}
		Night (22:00-6:00)	63 dB L _{Aeq,8hr}
		Morning (6:00-7:00)	62 dB L _{Aeq,1hr}
	Sunday 2 November	Day (6:00-22:00)	61 dB L _{Aeq,16hr}
		Night (22:00-6:00)	63 dB L _{Aeq,8hr}
		Morning (6:00-7:00)	59 dB L _{Aeq,1hr}
	Monday 3 November	Day (6:00-22:00)	66 dB L _{Aeq,16hr}
		Night (22:00-6:00)	60 dB L _{Aeq,8hr}
		Morning (6:00-7:00)	66 dB L _{Aeq,1hr}
	Tuesday 4 November	Day (6:00-22:00)	62 dB L _{Aeq,16hr}
		Night (22:00-6:00)	61 dB L _{Aeq,8hr}
		Morning (6:00-7:00)	64 dB L _{Aeq,1hr}
	Wednesday 5 November	Day (6:00-22:00)	63 dB L _{Aeq,16hr}
Night (22:00-6:00)		58 dB L _{Aeq,8hr}	
Morning (6:00-7:00)		64 dB L _{Aeq,1hr}	
Thursday 6 November	Morning (6:00-7:00)	65 dB L _{Aeq,1hr}	

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5.4 TRAIN NOISE LEVELS

Results of train noise levels measurements are provided in Table 10 and Table 11 below.

Table 10 – Unattended Train Noise Measurements (L_{Aeq}) – Location 2

Location	Day	Period	Measured Noise Levels
Location 2 – South of Site (~6m above street level)	Thursday 30 October	Day (6:00-22:00)	63 dB $L_{Aeq,16hr}$
		Night (22:00-6:00)	55 dB $L_{Aeq,8hr}$
	Friday 31 October	Day (6:00-22:00)	64 dB $L_{Aeq,16hr}$
		Night (22:00-6:00)	58 dB $L_{Aeq,8hr}$
	Saturday 1 November	Day (6:00-22:00)	61 dB $L_{Aeq,16hr}$
		Night (22:00-6:00)	60 dB $L_{Aeq,8hr}$
	Sunday 2 November	Day (6:00-22:00)	60 dB $L_{Aeq,16hr}$
		Night (22:00-6:00)	60 dB $L_{Aeq,8hr}$
	Monday 3 November	Day (6:00-22:00)	63 dB $L_{Aeq,16hr}$
		Night (22:00-6:00)	55 dB $L_{Aeq,8hr}$
	Tuesday 4 November	Day (6:00-22:00)	61 dB $L_{Aeq,16hr}$
		Night (22:00-6:00)	58 dB $L_{Aeq,8hr}$
	Wednesday 5 November	Day (6:00-22:00)	64 dB $L_{Aeq,16hr}$
		Night (22:00-6:00)	55 dB $L_{Aeq,8hr}$

Table 11 – Unattended Train Noise Measurements (L_{Amax}) – Location 2

Measurement Location	Measured Noise Levels
Location 2 – South of Site (~6m above street level)	95 dB L_{Amax}

Note 2: Measured level is taken as the 95th percentile L_{max} of train pass-bys/horn blasts over the measurement period

5.5 SERVICES NOISE LEVELS

Results of noise levels measured on the western site boundary overlook mechanical services adjacent to the site are provided in Table 12 below.

Table 12 – Measured Noise Levels – Adjacent Services Measurements

Measurement Location	Date and Time of Measurements	Measured Noise Levels dB $L_{Aeq,15mins}$
Location 3 – Western Site Boundary - Roof	6/11/2025 (2:00pm-2:15pm)	62
	6/11/2025 (2:15pm-2:30pm)	62

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5.6 MUSIC NOISE LEVELS

5.6.1 Fargo & Co

Results of noise levels measured within the Fargo & Co. Level 1 external area and within the carpark to the east of site and south of Fargo & Co. are presented below.

Table 13 – Measured Noise Levels – Attended Music Noise Measurements

Measurement Location	Date and Time of Measurements	Measured Noise Levels L _{A10, 15mins} dB
Location 4 – Within Fargo & Co. External Area	28/03/2026 (10:30pm)	86 ¹
Location 5 – Within Carpark 20 metres to south of Fargo & Co. 1.5m above ground level	28/03/2026 (11:00pm)	61 ²

Note 1 – Noise level primarily influenced by music noise spilling through entry door into internal area and patrons within external area.

Note 2 – Low frequency music noise and patron noise from Fargo & Co. was audible during measurements

Based on the measurements conducted, the following music noise level is predicted at the nearest impacted façade of the subject site.

Table 14 – Predicted Music Noise Level at Eastern Façade of Subject Site

Location	Predicted Music Noise Level dB L ₁₀		
	63 Hz	125 Hz	250 Hz
Level 1 Bedroom Eastern Façade adjacent to Royal Place	≤68	≤68	≤69

5.6.2 Swan Street

Measured levels between 12:00am and 1:00am at the logger location to the north of site facing Swan Street are presented below. Noise includes noise from traffic on Swan Street, music noise from nearby venues is expected to be lower than presented.

Table 15 – Measured Noise Level Northern Façade of Subject Site

Location	Date	Measured Noise Level dB L ₁₀ ¹		
		63 Hz	125 Hz	250 Hz
Location 1 – North of Site (~6m above street level)	Saturday 1/11/2025 (12:00am-1:00am)	69	63	62
	Sunday 2/11/2025 (12:00am-1:00am)	69	64	63

Note 1 – Highest 15-minute L₁₀ Noise level within the period

5.7 BACKGROUND NOISE LEVELS

Typical background noise levels measured at the logger location at the south of site are presented below. The typical noise level during the evening period between 9:00pm and 11:00pm and during the night period between 2:00am and 3:00am are presented below. These represent typical lowest background noise levels when music noise may be emitted from nearby venues.

Table 16 –Measured Background Noise Levels South of Site – Evening Period

Location	Date	Measured Noise Level dB L _{A90} ¹
Location 2 – South of Site (~6m above street level)	Thursday 30/10/2025	46
	Friday 31/10/2025	46
	Saturday 1/11/2025	49
	Sunday 2/11/2025	47
	Monday 3/11/2025	44
	Tuesday 4/11/2025	44
	Wednesday 5/11/2025	43

Note 1 - Typical lowest noise level during the night period between rail movements.

Table 17 –Measured Background Noise Levels South of Site – Night Period

Location	Date	Measured Noise Level dB L ₉₀ ¹						
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Location 2 – South of Site (~6m above street level)	Friday 31/10/2025	42	41	41	39	35	26	19
	Saturday 1/11/2025	43	42	40	38	36	30	21
	Sunday 2/11/2025	45	43	42	41	38	32	23
	Monday 3/11/2025	43	42	44	45	45	45	41
	Tuesday 4/11/2025	38	38	38	36	34	29	22
	Wednesday 5/11/2025	44	42	41	39	37	29	22
	Thursday 6/11/2025	40	40	39	36	33	25	17

Note 1 - Typical lowest noise level during the night period between rail movements.

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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.

6.1 RECOMMENDED GLAZING

The minimum glazing requirements schedule for this development is detailed in **Appendix 2 – Façade Mark-up**. 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 18 below details the minimum Rw 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 18. 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.

Table 18 – Minimum External Glazing Requirements / Performance

Location	Required Glazing Construction ¹	Minimum Rw of Installed Window System	Acoustic Seals ²
Refer Appendix 2	6/12/6mm lam IGU	29	Yes
	6/12/11.52mm IGU	35	Yes
	6/12/13.52mm lam IGU	37	Yes
	6/12/11.52mm IGU // 100mm airgap // 10.76 Glazing	35/35 ³	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 not acceptable where acoustic seals are required. Seals in these instances shall be equal to Schlegel Q-Ion.

Note 3 – Rating for each glazing system with airgap between.

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6.2 EXTERNAL WALLS

Concrete or masonry walls will be sufficient to address external noise intrusion and will not require further acoustic treatment. Lightweight external walls shall be designed to ensure compliance with nominated internal noise criteria.

Penetrations in walls must be sealed gap free with a flexible sealant. Any ventilation openings in should be acoustically treated to maintain the acoustic performance of the external wall construction.

6.3 FAÇADE OPENINGS FOR MECHANICAL VENTILATION

Ventilation openings shall be reviewed by a suitably qualified acoustic consultant and may require additional acoustic treatment such as a non-return air damper at the façade.

6.4 ROOF

The roof is proposed to be constructed of concrete and will not require further acoustic treatment.

6.5 PROVISION OF NOISE MASKING

Assessment indicates that based on predicted noise level at the façade, internal compliance with base noise limits detailed in EPA Publication 1826.5 Part II is not achievable. On this internal noise level criteria have been adopted based on $L_{OCT90} + 8$ dB.

Based on predicted music noise levels, to address low background noise levels within apartments impacted by music noise, the background shall be artificially raised via air-conditioning operation. Compliance with internal noise limits is based on air conditioning units operating when music noise is emitted from nearby venues. These will provide sufficient noise masking to ensure compliance with the internal EPA Publication 1826.5 Part II criteria.

Using the air conditioning unit to artificially increase the background noise within the affected apartments rather than a separate noise masking system provides future residents with improved amenity based on the following:

- During the significant periods of the day and night where music doesn't occur, residents will be able to have lower background noise levels if desired (by turning off their AC unit). This is similar to the ability residents have to control compliance with internal noise limits by closing windows while still having the option to open windows for ventilation during periods without music or when the desire for fresh air is considered preferable to strict compliance with internal noise limits (e.g. during periods of minor exceedance).
- Energy saving of the development generally due to not having noise masking systems and associated amplifiers continuously operating.

Note the following recommendations:

1. Internal compliance is achieved based on the predicted music noise level at the façade of the subject site and operation of AC units. Future residents of the site should be made aware of the condition of compliance by incorporating the requirement into the contract of sale for affected apartments.
2. The noise level requirements for air conditioning units are detailed in Table 19. The noise levels of air conditioning unit have been based on an air conditioning unit operation measured by AL in a similar typical apartment suitably furnished room ready for occupation.

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Table 19 – Indicative Noise Masking Requirements

Operation	Sound Pressure Levels dB*			
	63Hz	125Hz	250Hz	500Hz
<i>Air conditioning unit</i>				
Typical AC noise levels L ₉₀	42	39	36	31
EPA Publication 1826.5 Internal Noise Criteria (L ₉₀ Background + 8dB)	50	47	44	39

Note * - noise levels are indicative only and shall be finalised during the detailed design phase of the project.

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7 VIBRATION ASSESSMENT

7.1 MEASUREMENTS

Vibration measurements were conducted to determine the impact from train movements on the development site.

7.1.1 Measurement Locations

Rail vibration measurements were conducted in the following locations (refer to Figure 1):

- Location A – Vibration monitoring at ground level at the southeastern corner of site approximately 13m from the centre of the nearest train line
- Location B – Vibration monitoring at ground level at the southwestern corner of site approximately 13m from the centre of the nearest train line

7.1.2 Time of Measurements

Attended vibration measurements were conducted on the 6 November 2025 between 2:30pm and 3:30pm.

7.1.3 Measurement Equipment

Railway induced ground vibration levels surrounding the proposed building site were measured using the following equipment.

- Svan 958 Sound and Vibration Analyser connected to a Dytran 3233A triaxial accelerometer.

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7.1.4 Measured Vibration Levels

The measured tactile vibration at each location is compared to the Residential Night Criteria curve below.

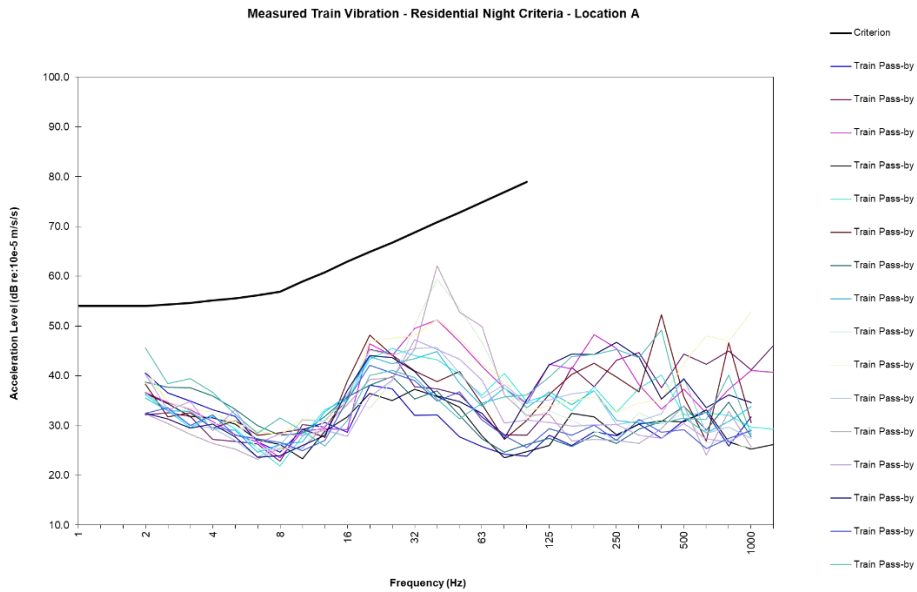


Figure 3 – Measured Vibration Level from Trains at Location A

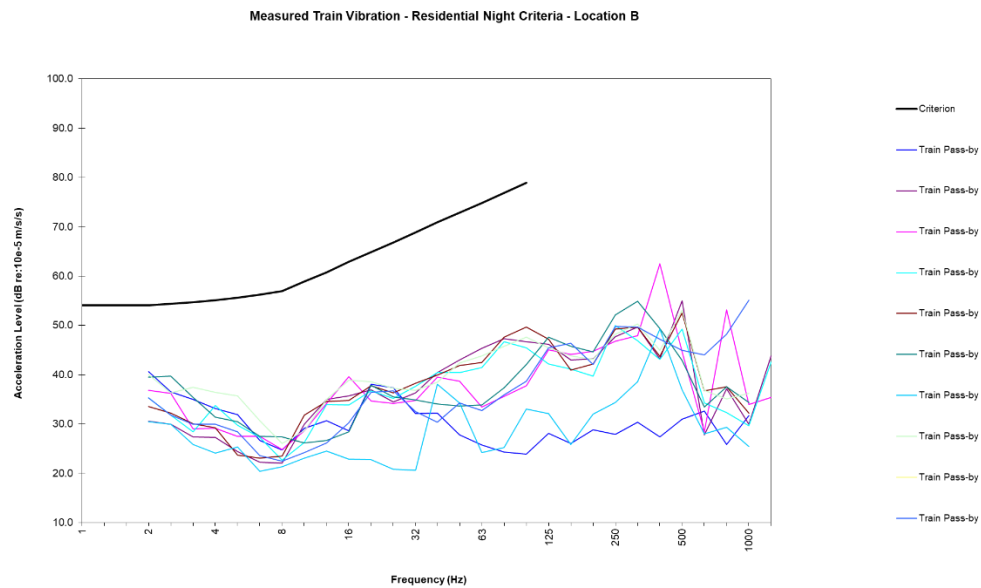


Figure 4 – Measured Vibration Level from Trains at Location B

The above figures indicates that the measured train movements adjacent to the development site complies with night criteria tactile vibration levels of residential apartments in line with Australian Standard AS2670.2 – 1990. No further vibration isolation of the building is required.

8 MECHANICAL PLANT AND EQUIPMENT SERVING PROPOSED DEVELOPMENT

Plant and equipment selections/design have not yet been finalised. To ensure amenity for future residents and nearby noise sensitive receivers is preserved, mechanical plant and equipment shall be designed to ensure compliance with the EPA Publication 1826.5. This will be achieved by the use of standard acoustic treatment such as selecting quiet equipment, screening, internally lined ductwork, acoustic louvres, acoustic attenuators, variable speed drives, and vibration isolation mounts.

9 CONCLUSION

This report presents our assessment of potential external noise and vibration impact on the proposed residential development located at 188-202 Swan Street, Cremorne.

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

Yours faithfully,

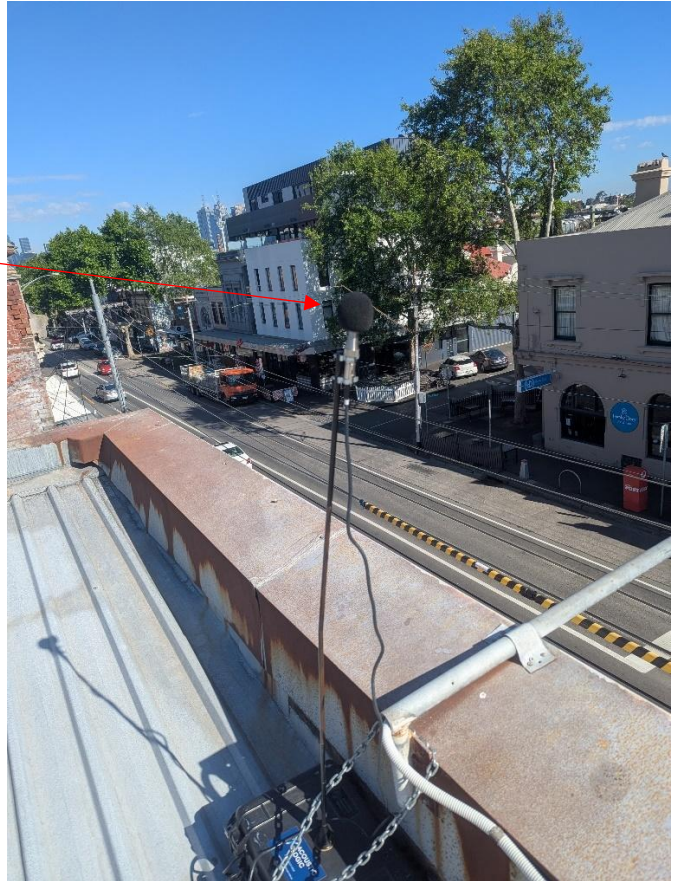


Acoustic Logic Pty Ltd
Edward Thatcher

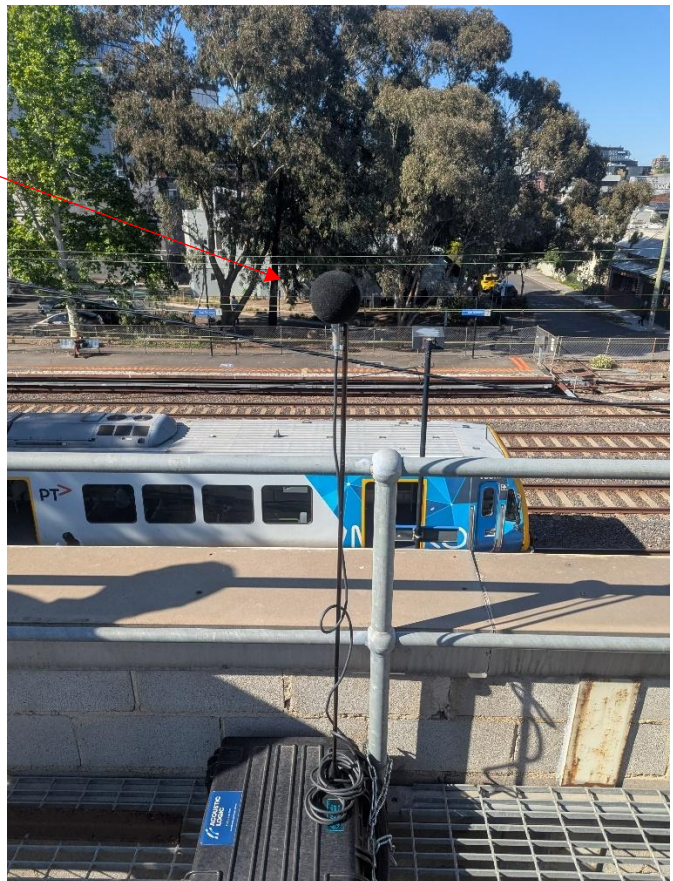
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APPENDIX 1 - SITE PHOTOS

Noise Monitor to north of site facing Swan Street



Noise Monitor to south of site facing rail corridor



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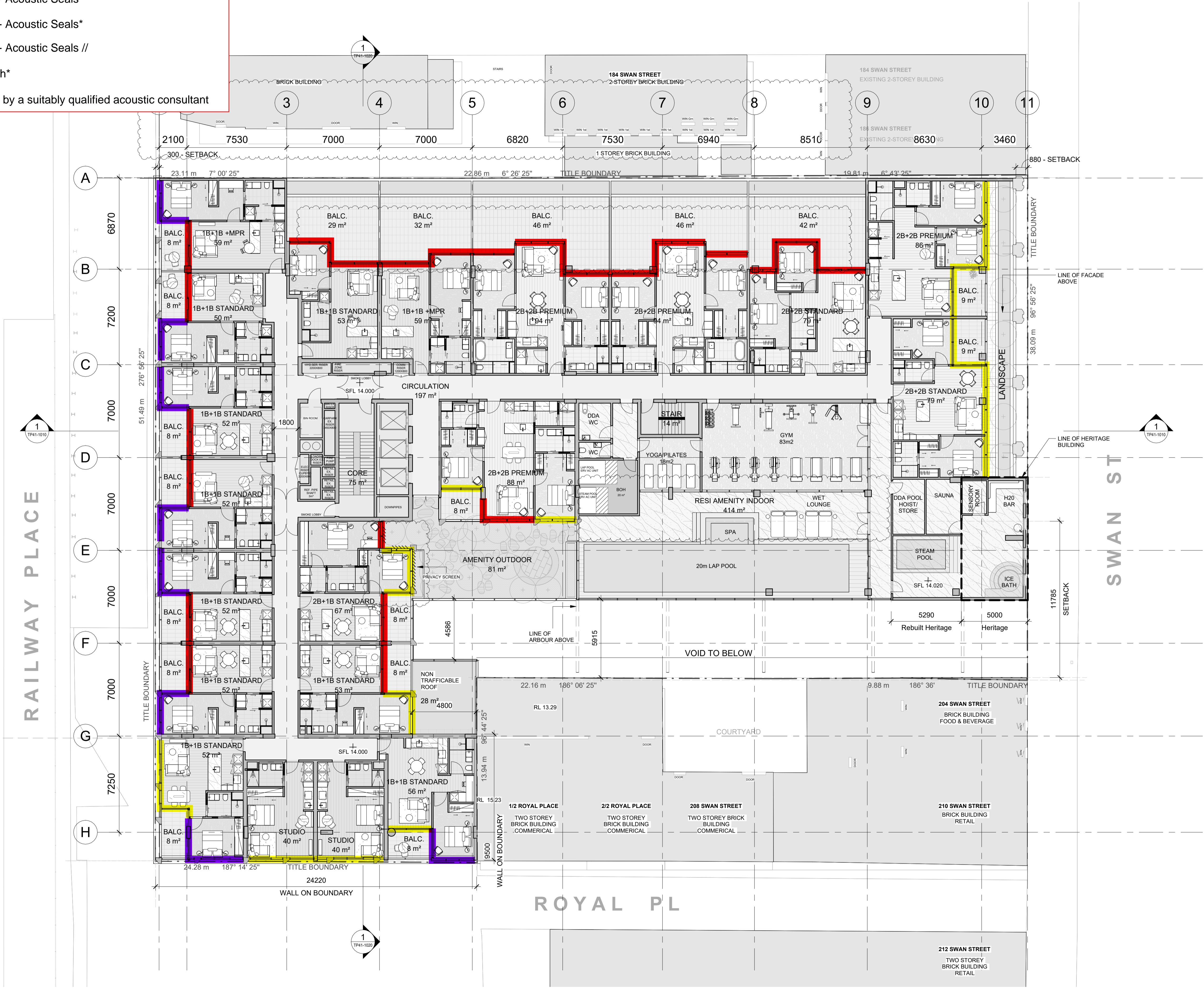
Minimum Glazing Requirement - Acoustics

- 6/12/11.52 IGU + Acoustic Seals*
- 6/12/13.52 IGU + Acoustic Seals*
- 6/12/11.52 IGU + Acoustic Seals //
100mm airgap
10.76 jockey sash*

* or equivalent approved by a suitably qualified acoustic consultant

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6	RFI RESPONSE	HK	12/12/2025
7	TOWN PLANNING	NA	27/03/2026



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Minimum Glazing Requirement - Acoustics

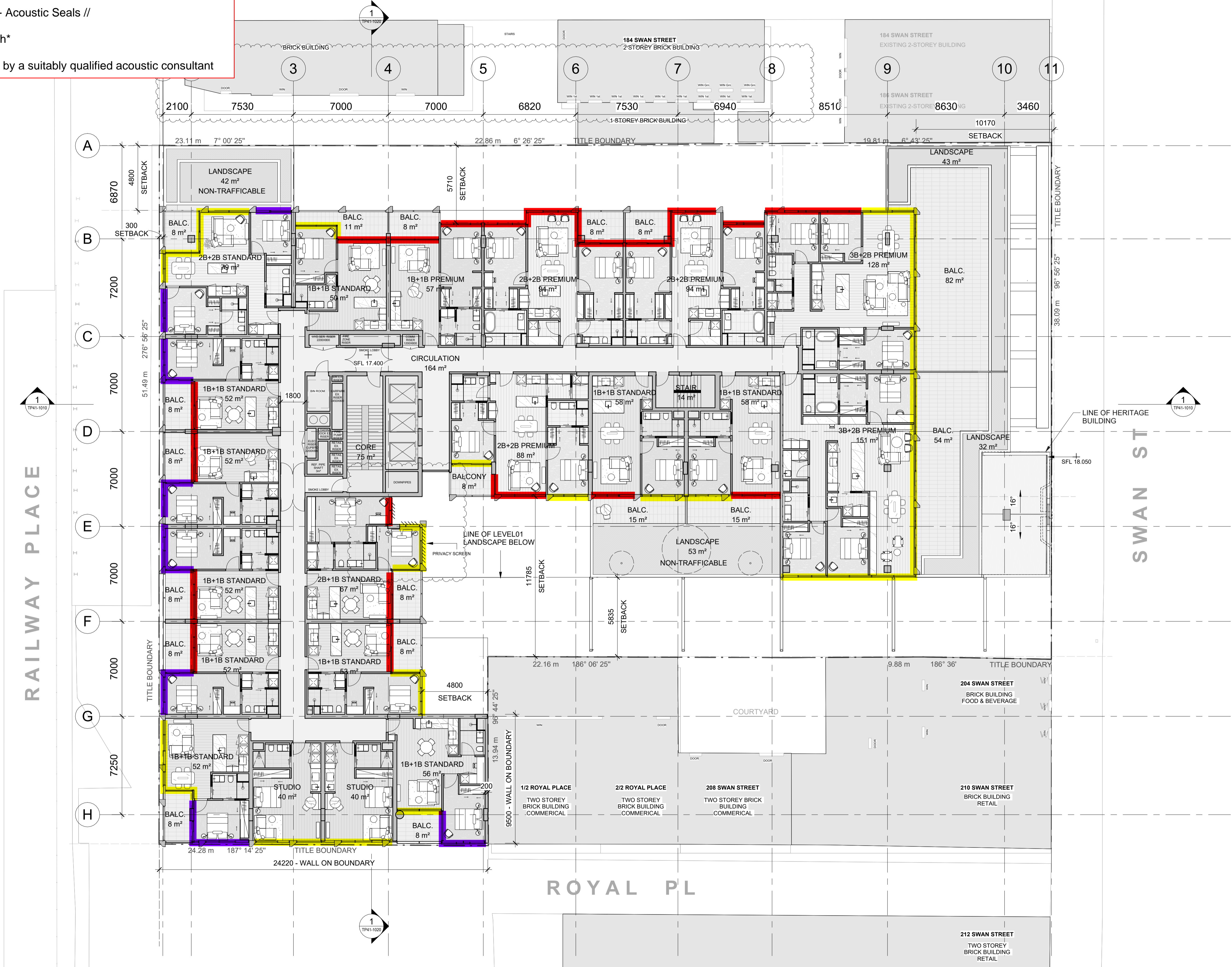
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100mm airgap
10.76 jockey sash*

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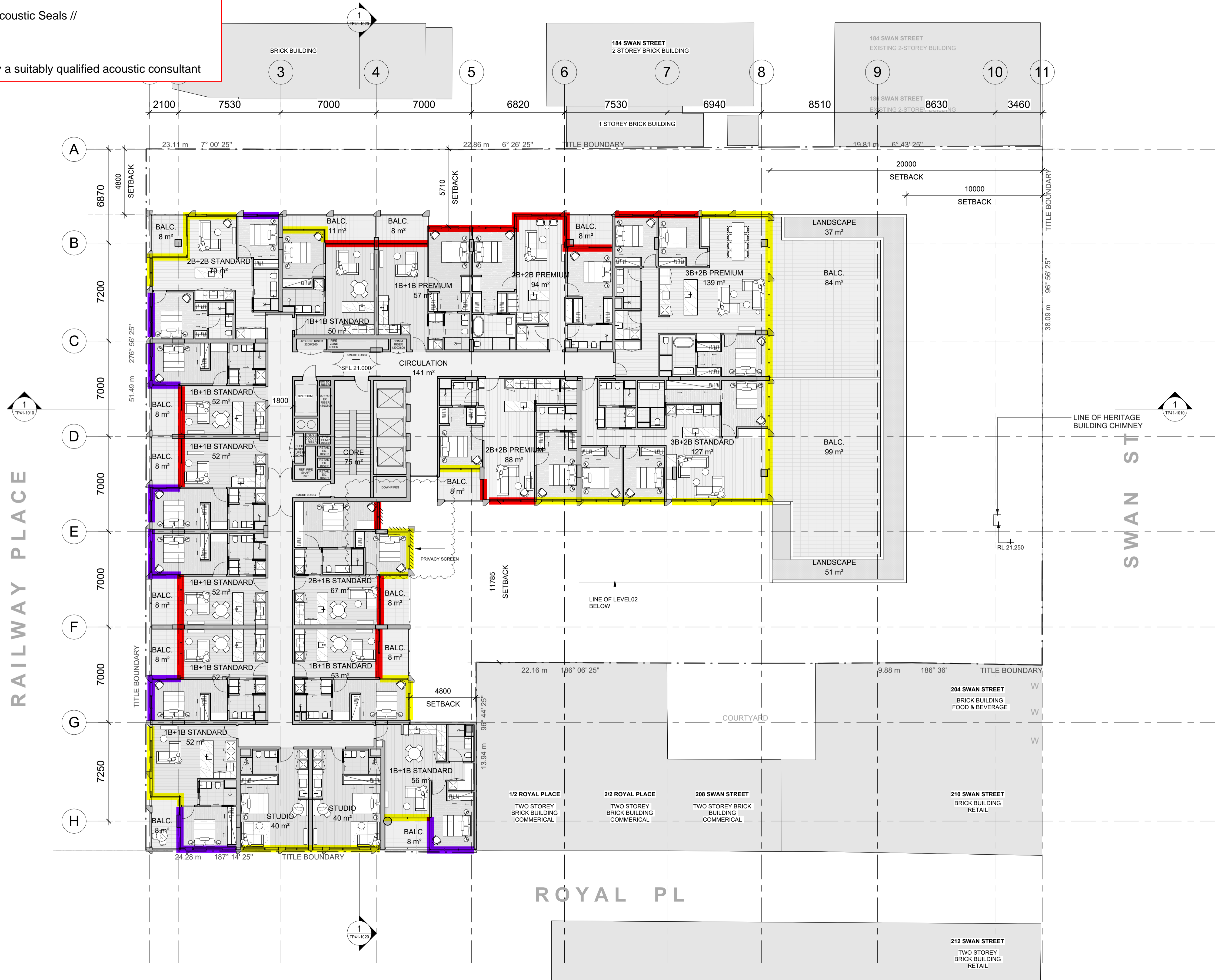
Minimum Glazing Requirement - Acoustics

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- 6/12/13.52 IGU + Acoustic Seals*
- 6/12/11.52 IGU + Acoustic Seals // 100mm airgap 10.76 jockey sash*

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6	RFI RESPONSE	HK	12/12/2025
7	TOWN PLANNING	NA	27/03/2026



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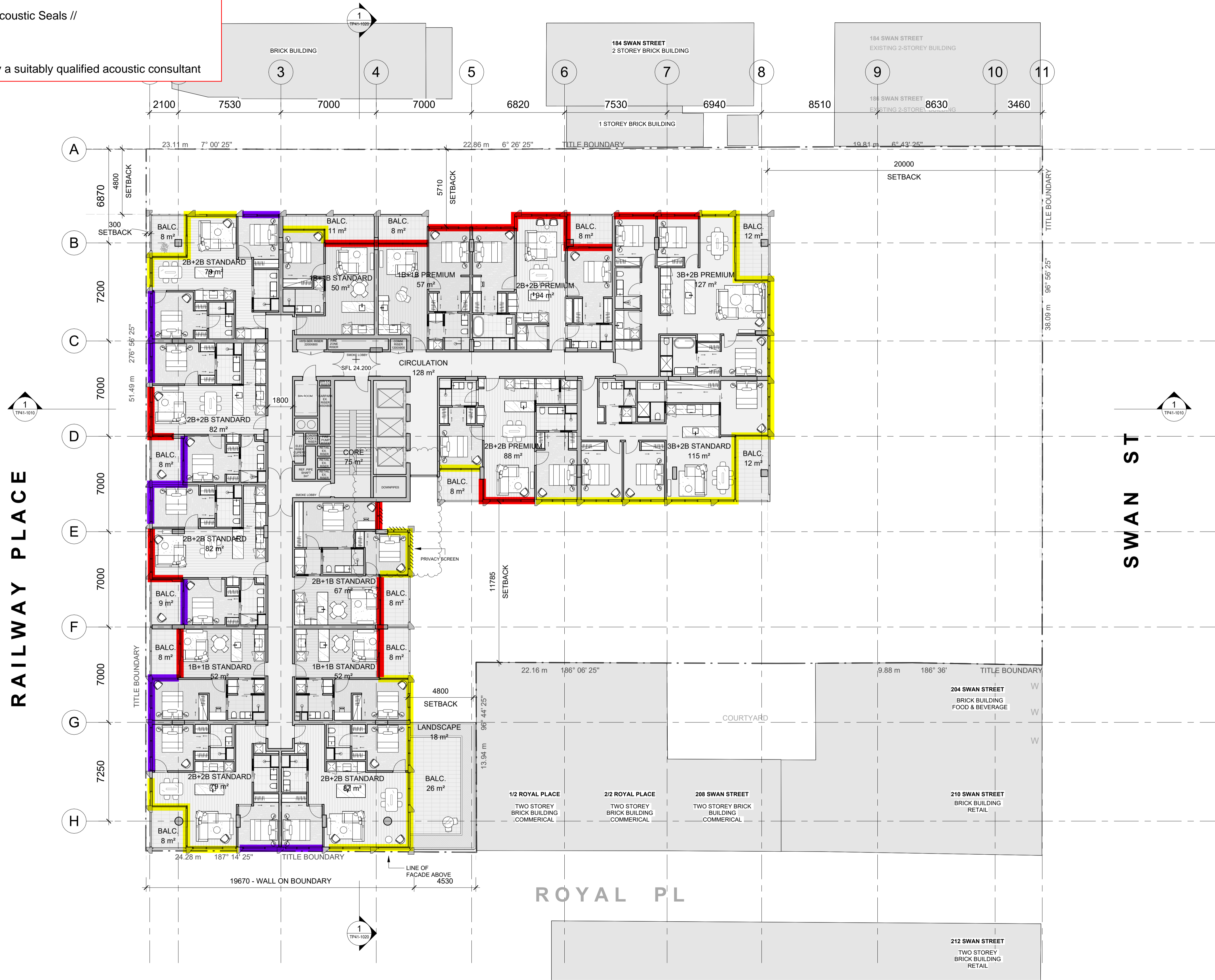
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- 6/12/11.52 IGU + Acoustic Seals //
100mm airgap
10.76 jockey sash*

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Minimum Glazing Requirement - Acoustics

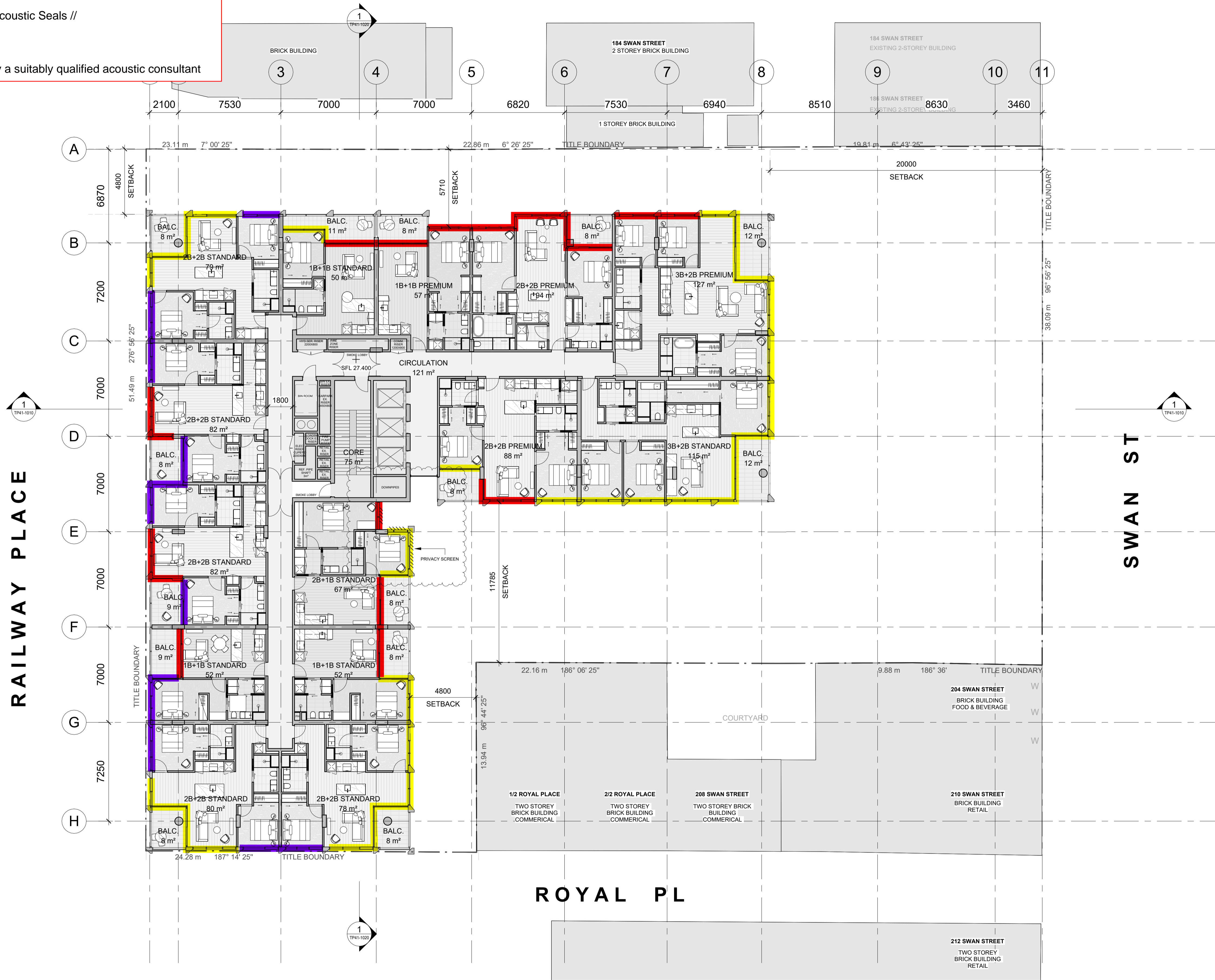
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100mm airgap
10.76 jockey sash*

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RAILWAY PLACE

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Project: 188-202 SWAN ST

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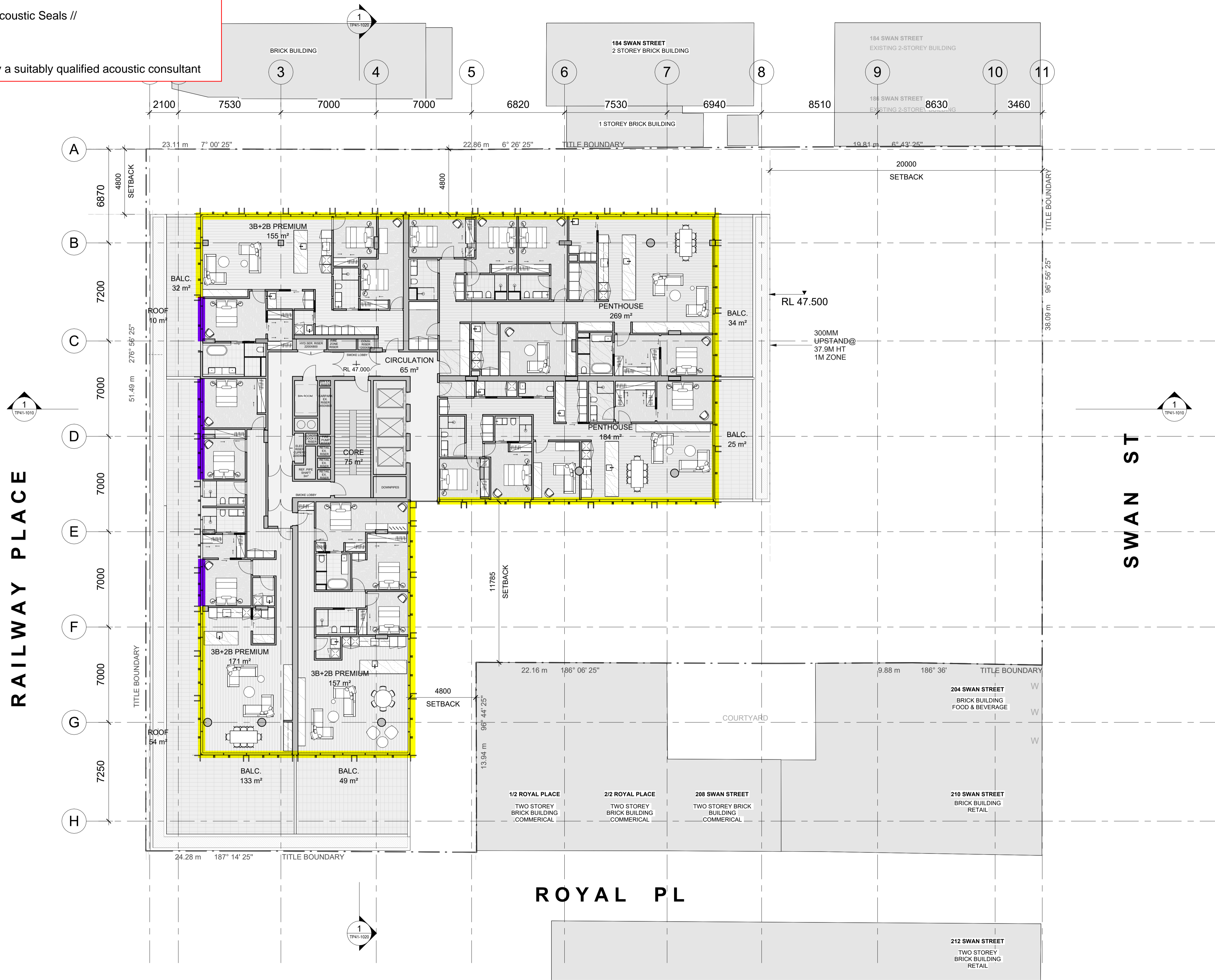


Minimum Glazing Requirement - Acoustics

- 6/12/11.52 IGU + Acoustic Seals*
- 6/12/13.52 IGU + Acoustic Seals*
- 6/12/11.52 IGU + Acoustic Seals //
100mm airgap
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RAILWAY PLACE

SWAN ST

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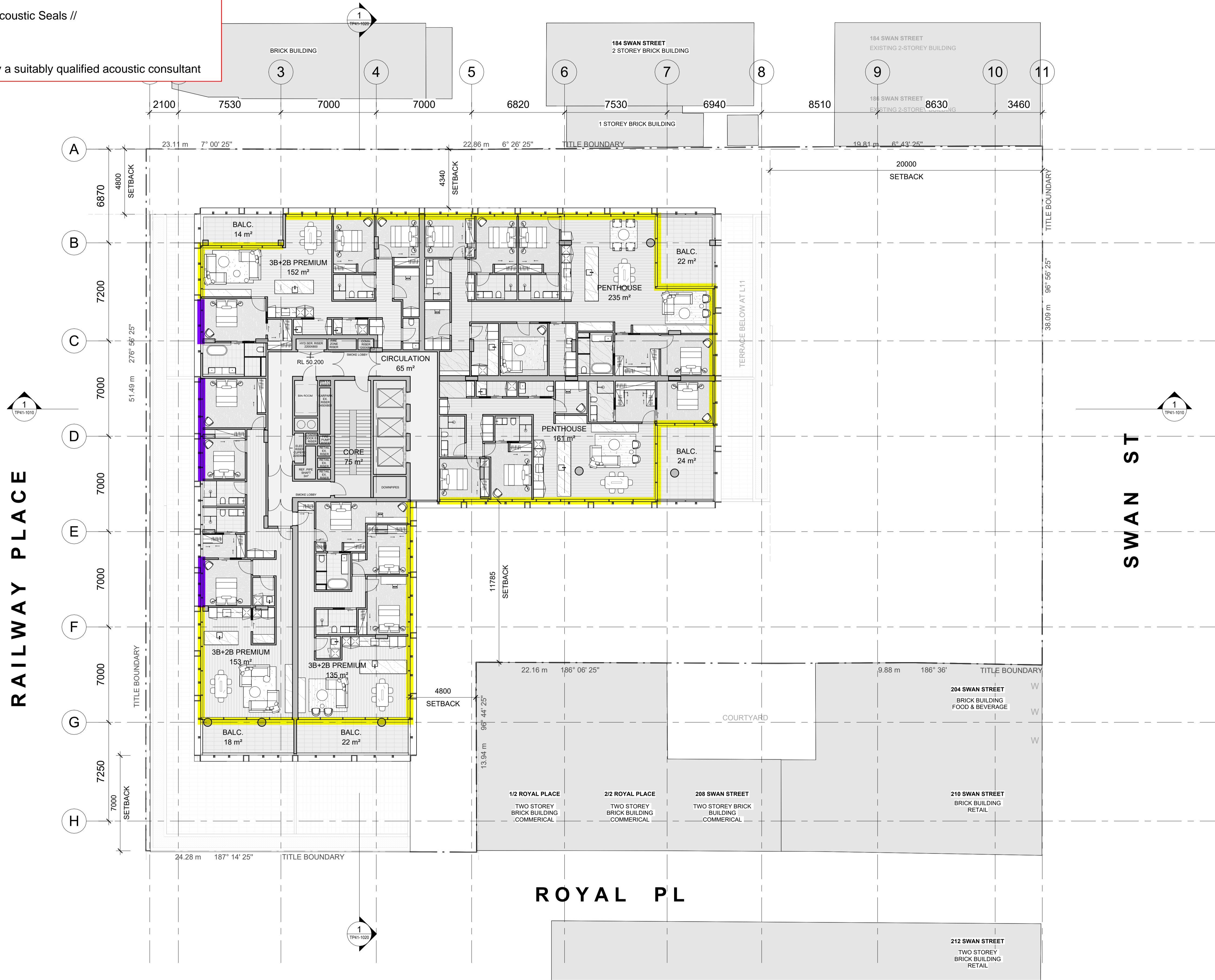
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Minimum Glazing Requirement - Acoustics

- 6/12/11.52 IGU + Acoustic Seals*
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- 6/12/11.52 IGU + Acoustic Seals //
100mm airgap
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