Environmental Noise Assessment

Proposed Mixed Use Development – Minor Change

At 11-23 Macarthur Avenue, Hamilton

On behalf of 5Point Projects PTY LTD

25BRA0113 R01_0

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Revision Record

No.	Author	Reviewed/Approved	Description	Date
A	S Yorke	A Ashworth	Internal draft	01/08/2025
0	S Yorke	A Ashworth	Client issue	01/08/2025

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Executive Summary

Colliers (previously TTM) was engaged by 5Point Projects PTY LTD to undertake an updated environmental noise assessment of a proposed mixed-use development located at 11-23 Macarthur Avenue, Hamilton as part of a minor change application. The assessment was based on the Northshore Hamilton Priority Development Area (PDA) Development Scheme (October 2022) with additional reference to the Brisbane City Council City Plan 2014 Planning Scheme for the purpose of more detailed noise assessment guidelines.

City Plan 2014 planning scheme codes and overlays were utilised where relevant and acceptable outcomes applied. Waste collection at the loading dock is recommended to operate between 6am – 8pm.

Aircraft noise was assessed and façade attenuation requirements for habitable rooms were recommended.

Façade treatments for aircraft noise are expected to also adequately mitigate any other potential external noise sources which are expected to be at a lower noise impact level.

It is recommended that mechanical plant with the potential to adversely impact nearby sensitive receivers is acoustically screened in accordance with code acceptable outcomes. Furthermore, it is also recommended that a mechanical plant noise assessment is conducted once plant selections are finalised to ensure noise emissions comply with criteria.

Compliance with the Northshore Hamilton PDA scheme (and City Plan 2014 planning scheme) is predicted to be achieved based on the recommendations outlined in Section 7 of this report.

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1 Introduction

1.1 Background

Colliers (previously TTM) was engaged by 5Point Projects PTY LTD to undertake an updated environmental noise assessment of a proposed mixed-use development located at 11-23 Macarthur Avenue, Hamilton as part of a minor change application. This report will form part of a development application for consideration by relevant authorities.

1.2 References

This report is based on the following:

- Northshore Hamilton Priority Development Area (PDA) Development Scheme (October 2022)
- Brisbane City Council *City Plan 2014*
- Development plans shown in Appendix A
- Site inspection, noise measurements, analysis and calculations conducted by Colliers

1.3 Scope

The assessment includes the following:

- Description of the development site and proposal
- Measurement of existing ambient noise levels and statement of assessment criteria relating to environmental noise emissions
- Assessment of aircraft noise onto the development
- Assessment of noise generated by the development onto nearby sensitive receivers
- Assessment of offsite noise intrusion on the residential component of the development
- Details of noise control recommendations to be incorporated to achieve predicted compliance.

2 Site Description

2.1 Site Location

The site is described by the following:

- Part 7 Wharf Street, Part 11 Wharf Street, 11 Macarthur Avenue, Part 23 Macarthur Avenue, and Part 1A Macarthur Avenue, Hamilton Qld 4007

The site locality is shown in Figure 1.

Figure 1: Site Locality

2.2 Description of Surrounding Environment

The site is bound by MacArthur Avenue to the north, Wharf St to the east, internal road to the south and a residential multistorey development to the west. The current acoustic environment primarily consists of local road traffic noise from MacArthur Avenue and intermittent aircraft pass-by noise.

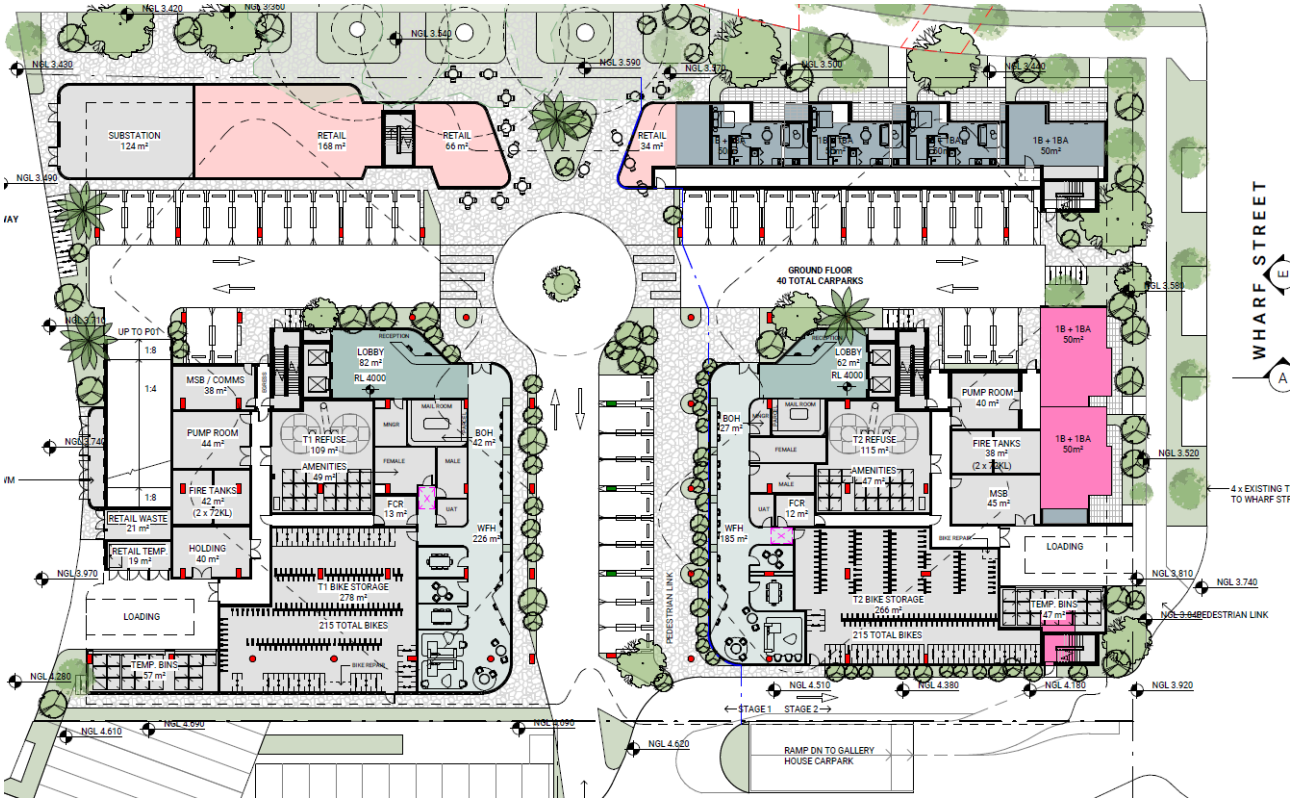
3 Proposed Development

3.1 Development Description

The proposal is a mixed-use development comprising two residential towers with retail ground floor tenancies and podium car parking. Operating hours for retail use is proposed to be between 6am – 10pm.

A plan of the development is shown in Figure 2. Further development plans are provided in Appendix A.

Figure 2: Proposed Development Plan – Ground Floor



4 Measurements

4.1 Equipment

The following equipment was used to measure existing noise levels:

- ARL Ngara environmental noise monitor (SN# 8782A5)
- RION NC-73 acoustical calibrator (SN# 10697023)

All equipment was calibrated by a National Association of Testing Authorities (NATA) accredited laboratory. The equipment was field calibrated before and after the measurement session. No significant drift from the reference signal was recorded.

4.2 Unattended Noise Monitoring

Unattended noise monitoring was conducted to establish the existing ambient noise levels between Friday 2nd December and Monday 12th December, 2022. The noise monitor was located as shown in Figure 3. The monitor position was considered representative of the ambient noise levels experienced at the site and surrounds with consideration to access and security requirements.

Figure 3: Noise Monitoring Location

The ambient noise monitor was in a free-field location and 1.5m above ground level. The monitor was set to measure statistical noise levels in 'A'-weighting, 'Fast' response, over 15 minute intervals. Ambient noise levels were measured in accordance with Australian *Standard AS1055:2018 Acoustics – Description and Measurement of Environmental Noise* (AS1055).

Weather during the monitoring period was generally fine with rain recorded on the 2nd and 8th December (source: Bureau of Meteorology). Weather affected data was excluded from the analysis.

4.3 Noise Source Measurements

Noise levels associated with typical activities which may impact noise sensitive receivers were taken from similar investigations conducted by Colliers. Measurements were conducted generally in accordance with Australian Standard AS1055.

4.4 Results of Noise Measurements

4.4.1 Ambient Noise Levels

Table 1 presents the measured ambient noise levels. The Rating Background Level (RBL) was determined in accordance with the BCC *Noise Impact Assessment Planning Scheme Policy* (NIAPSP). Graphical presentation of the measured levels is shown in Appendix B. The measurement results were used to determine the assessment criteria for the development.

Table 1: Measured Ambient Noise Levels

Time Period	Measured Noise Levels, dB(A)	
	RBL L_{90}	L_{eq}
Daytime (7am – 6pm)	51	60
Evening (6pm – 10pm)	49	59
Night time (10pm – 7am)	42	54

5 Noise Criteria

The applicable noise criteria codes for the site location are the Northshore Hamilton PDA Development Scheme October 2022 and relevant references to the Brisbane City Plan 2014.

5.1 Northshore Hamilton PDA Scheme

Northshore Hamilton PDA Development Scheme (October 2022) states in relation to noise criteria:

2.5.9.1 Noise

Development manages the noise amenity expectations of different land uses, especially sensitive land uses, with consideration for the variety of noise sources that may contribute to background noise levels in the PDA, such as aircraft operations, transport noise, marine activities, industrial activities and mixed-used urban environments.

Development is designed, sited and constructed to:

i. mitigate exposure of occupants to noise impacts from:

a. industrial noise sources,

b. airport and aviation facilities,

c. marine facilities,

d. designated transport noise corridors, and

ii. meet building standards for recommended sound levels for building interiors, and

iii. achieve minimum acoustic environmental values for indoor and outdoor areas.

The site is not located within a transport noise corridor or an industrial amenity overlay (based on City Plan 2014 overlay mapping). The site is not located adjacent to the port marine facilities and is shielded from the port by surrounding buildings to the south and west. Furthermore, passenger cruise ships do not use the port anymore.

Hence the applicable, potential noise assessment aspects are aircraft noise, onsite activities, and offsite loading dock (adjacent to the west).

Façade treatments required for aircraft noise are expected to adequately attenuate any potential external noise, such as the adjacent loading dock (west).

The Northshore Hamilton PDA Scheme provides only general descriptions of noise assessment requirements. To provide additional guidance for noise assessment requirements and parameters, City Plan 2014 was referenced. This assessment considers that relevant noise aspects may be addressed by referencing the performance and/or acceptable outcomes of City Plan 2014.

Onsite noise activities may be addressed by using acceptable outcomes within City Plan 2014.

5.2 City Plan 2014

As outlined in Section 5.1, City Plan 2014 is referenced to provide additional noise assessment guidance missing from the general noise assessment descriptions of the PDA Scheme. Table 2 summarises relevant planning scheme references for the site for the noise assessment.

Table 2: Planning Scheme – Relevant Guidance

Location	Zone	Development Code	Overlay Code
Site	Mixed-Use High Density Zone (Northshore Hamilton PDA)	Multiple Dwelling Code Centre or Mixed-Use Code	Airport Environs

5.2.1 Multiple Dwelling Code

The development includes residential accommodation units which are applicable for assessment under the *Multiple Dwelling Code*. Table 3 summarises the relevant acoustic requirements that apply to the site.

Table 3: Multiple Dwelling Code

Performance Outcomes	Acceptable Outcomes
PO22 Development that includes mechanical plant (including air conditioning plant, heat pumps and swimming pool pumps) ensures it is located, designed and attenuated to achieve the following criteria: • $L_{Aeq,adj,T}$ emitted from mechanical plant is not greater than the rating background level plus 3 at a sensitive use not associated with the development. Note — Where T is • Day (7am to 6pm): 11hr, • Evening (6pm to 10pm): 4hr, • Night (10pm to 7am): 9hr. Where • $L_{Aeq,adj,T}$ is the A-weighted equivalent continuous sound pressure level during measurement time T, adjusted for tonal and impulsive noise characteristics, determined in accordance with the methodology described in the Noise impact assessment planning scheme policy. • The rating background level is determined in accordance with the methodology described in the Noise impact assessment planning scheme policy. Note—A noise impact assessment report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO22** Development ensures mechanical plant is acoustically screened from nearby sensitive uses.

It is recommended acoustic screening is utilised for exposed mechanical plant with the potential to impact adjacent sensitive receivers as per *Acceptable Outcome AO22.*

Performance Outcomes	Acceptable Outcomes
PO35 Development where not in a zone in the centre zones category or the Mixed use zone, ensures that car parking, hardstand or manoeuvring areas are: a. located to minimise noise and fumes disturbance on residents within and adjoining the site; b. acoustically and visually screened to: i) minimise the reflection of headlights into dwelling windows; ii) attenuate noise impacts; c. landscaped to: i) soften the visual appearance of at grade hardstand areas; ii) enhance pedestrian safety; iii) improve visual amenity for the streetscape and urban area; iv) provide shade for pedestrians and reduce the impact of glare and radiant heat from car parking areas. Note—where in a zone in the centre zones category or the Mixed use zone, the car parking provisions of the Centre or mixed use code apply.	**AO35.1** Development where not in a zone in the centre zones category or the Mixed-use zone, ensures that a hardstand or manoeuvring area situated at or above ground level is: a. located a minimum of 3 metres vertically and horizontally from any habitable window on site to minimise noise disturbance on residents; b. screened to prevent the reflection of car headlights onto dwelling windows adjoining or opposite the site. **AO35.2** Development where not in a zone in the centre zones category or the Mixed use zone ensures any vehicle movement or vehicle parking areas along the side or rear boundary are: b. acoustically screened from adjoining dwellings to a minimum height of 1.8m; c. provided with a vegetated buffer next to any movement or parking areas: i) a minimum of 1m wide along the side boundary; ii) a minimum of 2m wide along the rear boundary; iii) planted at a pot size and density sufficient to screen up to 1.5m above ground level at establishment.

Car parking areas (ground and above) are located a minimum of 3m (vertically and horizontally) from any habitable window onsite or offsite. The building façade to the west has a minimum separation of 20m. The site is adjoined by roadways and easements and therefore is separated (not adjoining) from nearby buildings. Additionally, carpark surfaces are recommended to be appropriately surfaced to address tyre noise impacts.

5.2.2 Centre or Mixed Use Code

The proposed development includes retail use that is applicable for assessment by the *Centre or Mixed Use Code*. Table 4 summarises the primary acoustic requirements that apply.

Table 4: Centre or Mixed-Use Code

Performance Outcomes	Acceptable Outcomes
PO1 Development: (a) has hours of operation which are controlled so that the use does not detrimentally impact on the amenity of adjoining residents; (b) where not located in a Special entertainment precinct identified in a neighbourhood plan, does not result in noise emissions that exceed the noise (planning) criteria in Table 9.3.3.3.F, low frequency noise criteria in Table 9.3.3.3.G and night-time noise criteria in Table 9.3.3.3.H in a sensitive zone or a nearby sensitive use. Note—A noise impact assessment report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO1.1** Development: (a) for accommodation activities, dwelling unit or emergency services has unlimited hours of operation; (b) for a club, if licensed, function facility, hotel or nightclub entertainment facility does not generate noise which is clearly audible and detectable, or impacts on the amenity of a resident, in a dwelling or other sensitive use; Note-Development for a club, if licensed, function facility, hotel or nightclub entertainment facility is not expected to achieve this outcome. (c) for any other use: i. Where in the Principal centre zone or Major centre zone has unlimited hours of operation; ii. Where in District centre zone, Neighbourhood centre zone or Mixed use zone: a. Has hours of operation, including deliveries, which are limited to 6am to 10pm; or b. Does not generate noise which is clearly audible and disturbing in a dwelling or other sensitive use; iii. Where in any other zone: a. Has hours of operation, including for deliveries, which are limited to 6am to 8pm; or b. Does not generate noise which is clearly audible and disturbing in a dwelling or other sensitive use.
	AO1.2 Development ensures mechanical plant or equipment is acoustically screened from an adjoining sensitive use.
PO7 Development mitigates impacts on residential amenity in or adjoining the building through: (a) providing an outdoor dining area that is appropriately located (b) ensuring external dining and entertainment areas are visually and acoustically screened from an adjoining dwelling.	**AO7** Development provides for external dining or entertainment areas to be: (a) located in or directly adjacent to the public realm (b) visually and acoustically screened from an adjoining dwelling.
PO62 Development of garages, driveways and parking structures minimise impacts on the amenity of neighbouring dwellings.	**AO62.1** Development for a car park: (a) provides a 2m-high acoustic fence and a landscaped area 1.5m wide where located adjacent to a neighbouring dwelling; (b) is acoustically screened where the car park is used at night and where located adjacent to a neighbouring dwelling.

Performance Outcomes	Acceptable Outcomes
	AO62.2 (a) Development for a driveway or vehicle movement area is screened by a 2m-high acoustic fence along the side or rear boundary if located adjacent to a residential dwelling.
	AO63.2 Development is designed and constructed to ensure refuse and recycling collection and storage facilities do not have any odour, noise or visual impacts which are detectable and disturbing at the site or adjoining sites. Note—Refer to the Refuse planning scheme policy for further guidance.

All accommodation activities comply with *Acceptable Outcome A01.1 (a)* as these activities are allowed unlimited hours of operation.

The site is located in a Mixed-use zone (Northshore Hamilton PDA) and therefore *Acceptable Outcome A01.1 (c)(ii)* is relevant and allows hours of operation, including deliveries, from 6am to 10pm. Retail proposed hours of operation are between 6am – 10pm in compliance with the code allowed hours.

It is recommended acoustic screening is utilised for exposed mechanical plant with the potential to impact adjacent sensitive receivers to comply with *Acceptable Outcome AO1.2.*

Outdoor dining is appropriately located with separation by roads and enclosed by the podium level above. Additionally, habitable rooms have upgraded facades in accordance with aircraft noise requirements which are expected to be adequate. An acoustic barrier is recommended to screen an onsite private open space area (see the recommendations in Section 7).

Car parking spaces for the non-residential uses are minimal. Nonetheless, car parking areas (ground and above) are located within the building envelope with screening as shown on the elevation plans. The site is adjoined by roadways and easements and therefore is separated (not adjoining) from nearby buildings. Additionally, carpark surfaces are recommended to be appropriately surfaced to address tyre noise impacts

5.2.3 Aircraft Noise

The site is located within the ANEF (Aircraft Noise Exposure Forecast) 20-25 zone of the Brisbane Airport. The Airport Environs Overlay Code performance outcome related to acoustics for this development is detailed in Table 5.

Table 5: Airport Environs Overlay Code Performance Outcome PO8

Performance Outcomes	Acceptable Outcomes
PO8 Development for a sensitive use adequately attenuates for aircraft noise in buildings to protect the health and wellbeing of occupants by complying with the internal noise criteria in Table 8.2.2.3.B. Note—A noise impact assessment report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO8.1** Development for a childcare centre, community care centre, community residence, dual occupancy, dwelling house, dwelling unit, educational establishment, health care services, hospital, multiple dwelling, relocatable home park, residential care facility, retirement facility or rooming accommodation located in the ANEF 20-25 sub-category: (b) provides external windows and doors which are acoustically rated to a minimum of Rw 30. (c) ensures that the roof, ceiling and insulation combination is acoustically rated to a minimum of Rw 45. (d) ensures that external walls are acoustically rated to a minimum of Rw 50.
	AO8.2 Development for short-term accommodation or tourist park located in the ANEF 25-30 sub-category: (e) provides external windows and doors which are acoustically rated to a minimum of Rw 30; (f) ensures that the roof, ceiling and insulation combination is acoustically rated to a minimum of Rw 45; (g) ensures that external walls are acoustically rated to a minimum of Rw 50.

Table 8.2.2.3.B of Performance Outcome PO8 is detailed in Table 6.

Table 6: Performance Outcome PO8 - *Table 8.2.2.3.B—Internal noise criteria*

Sensitive use	Activity of internal space	L_{AMax} 'S' time weighting
Dwelling unit Multiple dwelling	Sleeping areas	50dB(A)
	Other habitable rooms	55dB(A)

6 Assessment – Aircraft Noise

Aircraft noise was assessed as a noise source with the potential to impact the proposed development and the assumptions and results of the assessment are presented in the following sections.

6.1 ANEF Zone

The site is located within the ANEF (Aircraft Noise Exposure Forecast) 20-25 zone of Brisbane Airport. In accordance with AS2021, the proposed development is 'Conditionally Acceptable' which means the development may require noise attenuation treatments to provide an acceptable level of amenity for future residents.

6.2 Predicted Aircraft Noise Levels

AS2021 provides an assessment method to determine the predicted aircraft noise level at the site location based on aircraft type and proximity to the airport runway.

Aircraft types operating from Brisbane Airport were determined from the online service 'WebTrak' of Air Services Australia. The Aircraft Event Levels from Webtrak historical data (July 2024 – Jun 2025) for the nearest noise monitoring terminal (Bulimba) are presented in Figure 4.

Figure 4: Aircraft Event Levels - Bulimba Noise Monitoring Terminal (WebTrak)

Aircraft Event Levels

This table shows the top 15 aircraft types by event count and level.

Aircraft Type	Average Event Level	Event Counts			
		Total	Max/day	Min/day	Avg/day
A332	75.2	777	8	1	2.1
B77W	73.6	647	6	1	1.8
B738	71.9	9394	101	4	25.7
A320	71.3	2692	15	1	7.4
B788	70.9	570	5	1	1.6
A21N	70.8	940	7	1	2.6
E190	70.4	8886	40	3	24.3
A359	70.2	1484	8	1	4.1
B737	70	647	6	1	1.8
F100	69.8	3049	17	1	8.4
B38M	69.6	723	9	1	2
BE20	69.1	634	10	1	1.7
F70	68.5	3516	23	1	9.6
DH8D	68.5	2899	28	1	7.9
SF34	68.3	1128	12	1	3.1

The aircraft types in Figure 4 are sorted in descending order of 'average event level'. Based on consideration of aircraft noise level and frequency of aircraft events, the selected aircraft types for this assessment were the A332 and B77W.

In accordance with AS2021, the distance coordinates for the site location relative to the aerodrome runway are presented in Table 7.

Table 7: Distance Coordinates for Site Location as per AS2021

Distance Coordinate	Distance (m)
DL	7500
DT	10,000
DS	350
Site elevation difference to aerodrome	Less than 10m

Based on the distance coordinates in Table 7 and Tables 3.7(A) and 3.7(B) of AS2021, the predicted highest aircraft noise levels at the development location is presented in Table 8.

Table 8: AS2021 Aircraft Noise Level Predictions at the Site

Aircraft Type	Arrival Aircraft Noise Level dB(A) L_{max}	Departure Aircraft Noise Level dB(A) L_{max}	Highest Aircraft Noise Level dB(A) L_{max}
Airbus A332/A333	72	76	76
B773	74	78	**78**

6.3 Façade Attenuation

Acoustic design calculations were conducted based on habitable room floor layouts and acoustic treatments demonstrate compliance with internal criteria is achievable.

In accordance with AS2021, based on the highest predicted aircraft noise level (Table 8), and the internal noise criteria of the Airport Environs Overlay Code (Table 6), acoustic façade treatments for habitable rooms are presented in Table 9. Calculations are included in Appendix C.

Table 9: Aircraft Noise Façade Treatments – Habitable Rooms

Habitable Room	Required Aircraft Noise Reduction (ANR)	Component	Habitable Rooms Weighted Sound Reduction Min. R_W
Sleeping areas	26	Glazing	34
		External walls	40
		Roof (top floor) (concrete slab)	50
Other habitable rooms (living room)	21	Glazing	30
		External walls	40
		Roof (top floor) (concrete slab)	50

7 Recommendations

Recommended noise mitigation measures are presented in this section to achieve predicted compliance with the relevant assessment criteria.

7.1 Façade Treatment

An aircraft noise assessment was conducted in accordance with AS2021 as presented in Section 6. Indicative acoustic treatments for aircraft noise mitigation based on typical apartment rooms are presented in Table 10.

Table 10: Aircraft Noise Indicative Façade Treatments – Habitable Rooms

Habitable Room	Required Aircraft Noise Reduction (ANR)	Component	Habitable Rooms Weighted Sound Reduction Min. R_W
Sleeping areas	26	Glazing	34
		External walls	40
		Roof (top floor) (concrete slab)	50
Other habitable rooms (living room)	21	Glazing	30
		External walls	40
		Roof (top floor) (concrete slab)	50

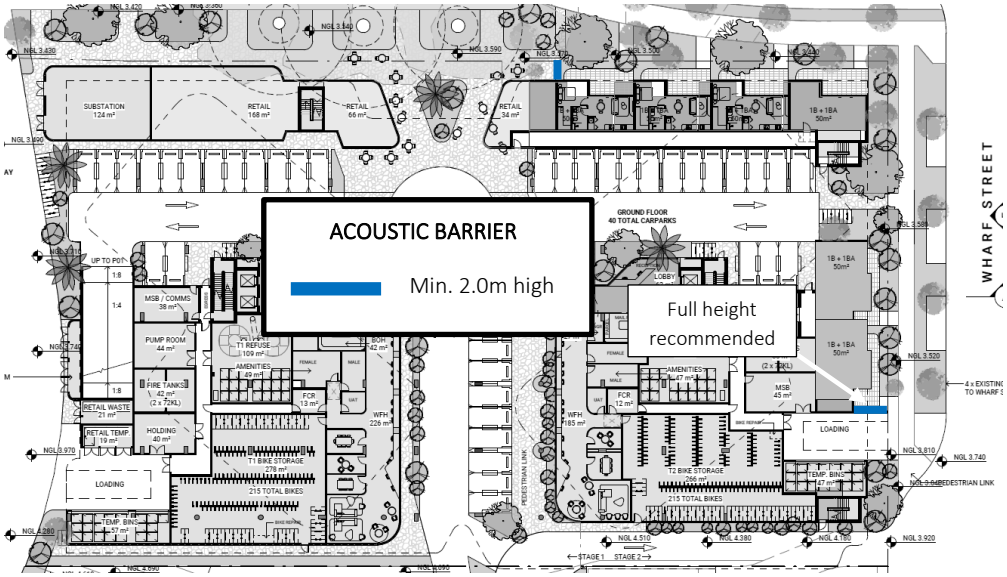
Façade treatments for aircraft noise are expected to adequately mitigate any other potential external noise sources which are expected to be at a lower noise impact level.

7.2 Management Strategies

The following management strategies are recommended to achieve predicted compliance and minimise noise annoyance:

a. Acoustic barriers as shown in Figure 5. Solid (no gaps/holes) and min. 12.5kg/m^2.

Figure 5: Recommended Acoustic Barriers



b. Waste collection at the loading dock to operate between 6am – 8pm.

c. Carpark surfaces to be appropriately surfaced to reduce tyre noise impacts from the development. This means a standard concrete car park finish, without extra treatment of polishing or painting (other than line marking).

d. Any speed humps should be bitumen, concrete (as part of the slab), or rubber, and not metal.

e. Any grates or other protective covers in the car park and access driveways must be rigidly fixed in position to eliminate movement and be maintained.

7.3 Mechanical Plant

As detailed mechanical plant selections are not available at this stage, it is not possible to carry out a detailed examination of any attenuation measures that may be required to achieve the noise criteria.

To comply with planning scheme acceptable outcomes for mechanical plant, we recommend the following for plant with the potential to adversely impact nearby sensitive receivers:

> *Development ensures mechanical plant is acoustically screened from nearby sensitive uses.*

The definition of 'acoustically screened' is provided in Table SC1.2.3.B of Brisbane City Plan 2014, Schedule 1 Definitions:

> *The source of noise is completely screened from view of habitable rooms (including balconies, patios, decks and verandas) of an adjoining sensitive use by solid, gap free material and construction e.g. acoustic fence, building, or enclosure.*
>
> *Acoustic barrier: Solid, gap free barrier with minimum surface density of 12.5kg/m^2*

Furthermore, it is also recommended that a mechanical plant noise assessment is conducted once plant selections are finalised to ensure noise emissions comply with criteria.

8 Conclusion

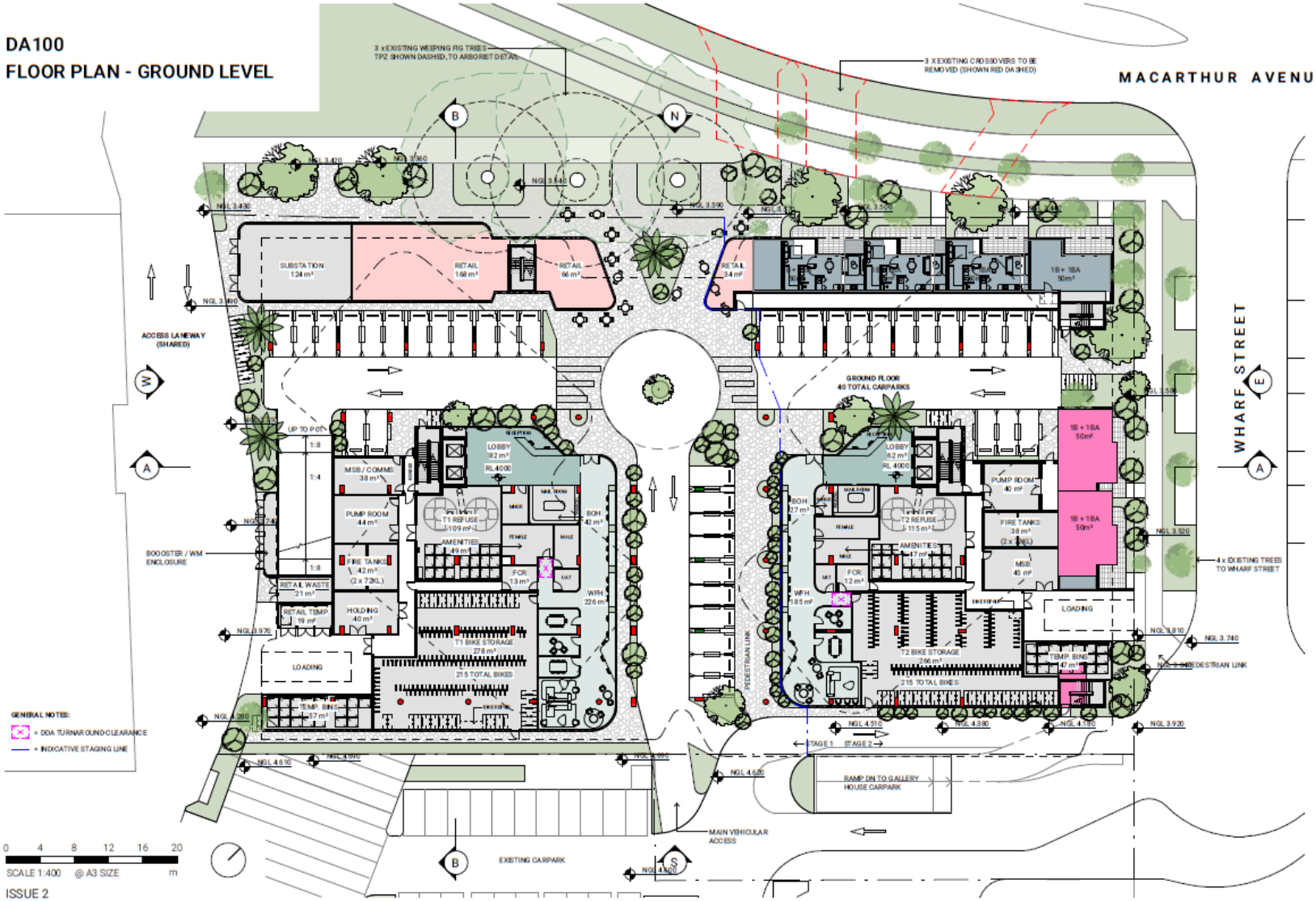
Colliers (previously TTM) was engaged by 5Point Projects PTY LTD to undertake an environmental noise assessment of a proposed mixed-use development located at 11-23 Macarthur Avenue, Hamilton.

Compliance with the Northshore Hamilton Priority Development Area (PDA) planning scheme (and Brisbane City Council *City Plan 2014* planning scheme) is predicted to be achieved based on the recommendations outlined in Section 7 of this report.

Appendix A Development Plans

plus architecture

DA100
FLOOR PLAN - GROUND LEVEL



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71084 | PORTSIDE | 11-23 MACARTHUR STREET, HAMILTON | BRISBANE

JULY 2025 | MINOR CHANGE APPLICATION | PLUS ARCHITECTURE

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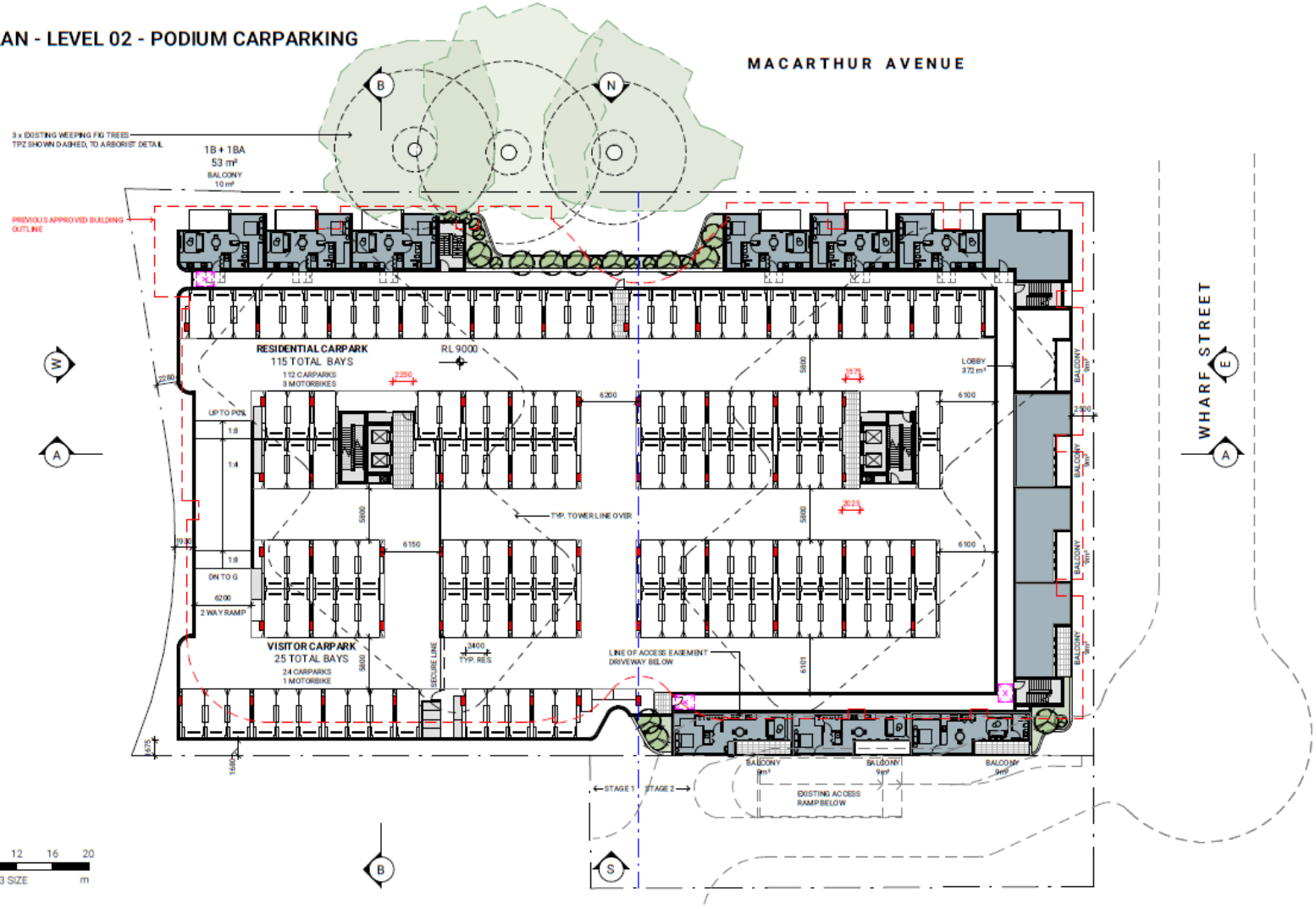
plus architecture

DA101
FLOOR PLAN - LEVEL 02 - PODIUM CARPARKING



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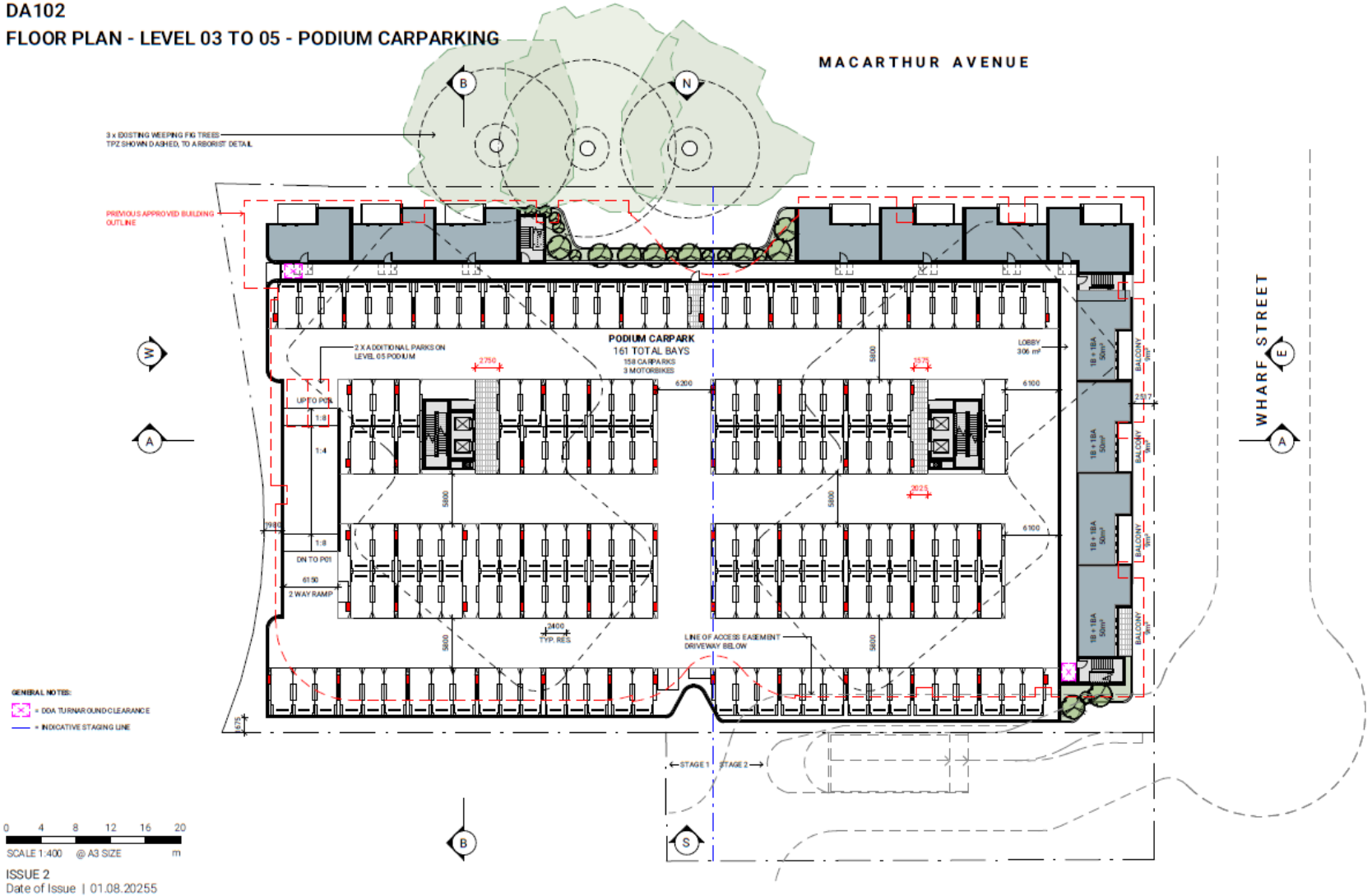
plus architecture

Site: 11-23 Macarthur Avenue, Hamilton
Reference: 25BRA0113 R01_025BRA0113 R01_0

DA102
FLOOR PLAN - LEVEL 03 TO 05 - PODIUM CARPARKING



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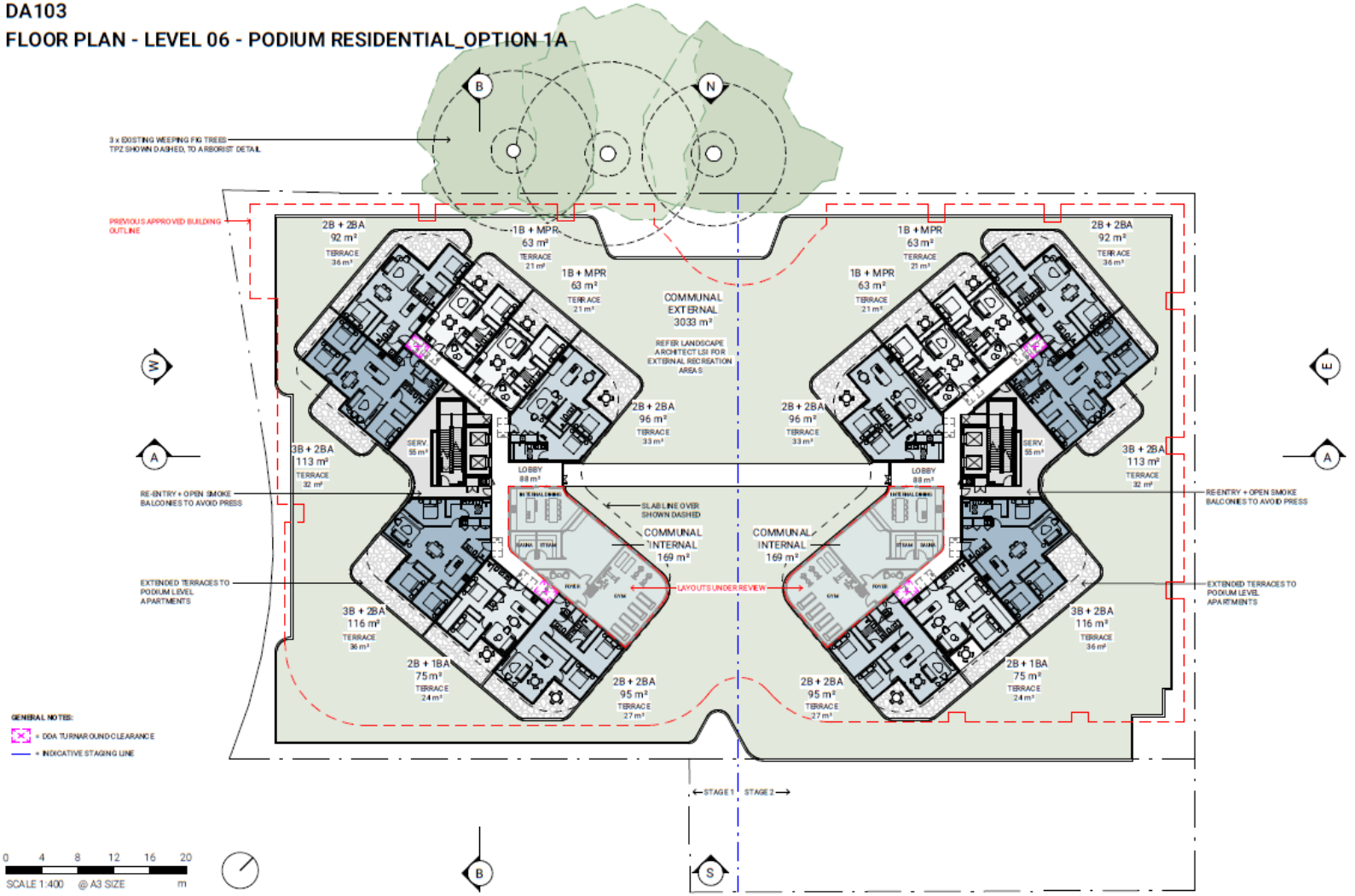
DA103
FLOOR PLAN - LEVEL 06 - PODIUM RESIDENTIAL_OPTION 1A



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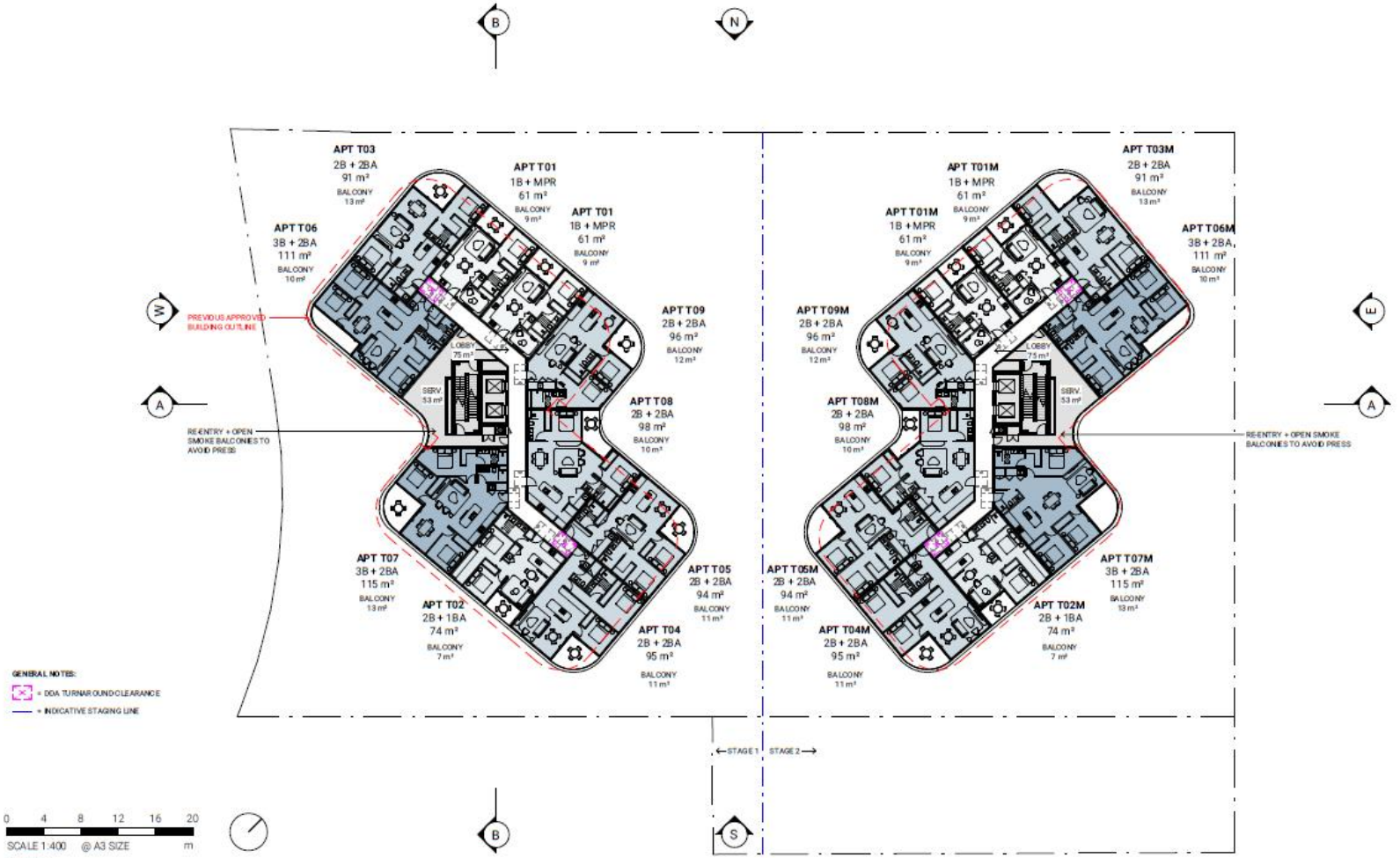
71084 | PORTSIDE | 11-23 MACARTHUR STREET, HAMILTON | BRISBANE

JULY 2025 | MINOR CHANGE APPLICATION | PLUS ARCHITECTURE

DA104
FLOOR PLAN - LEVEL 07 TO 24 - TYPICAL RESIDENTIAL



ISSUE 3
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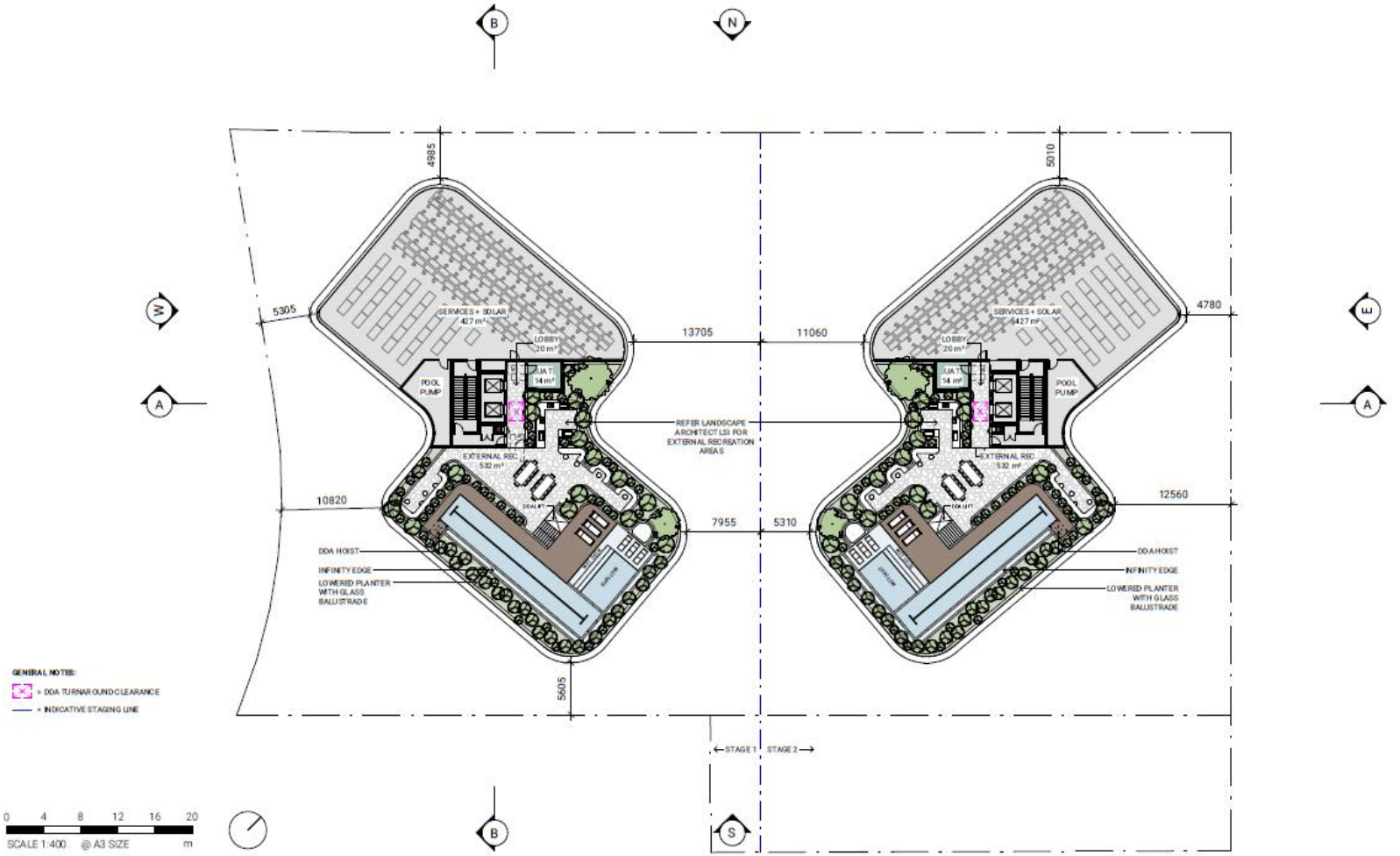
plus architecture

Site: 11-23 Macarthur Avenue, Hamilton
Reference: 25BRA0113 R01_025BRA0113 R01_0

DA105
FLOOR PLAN - LEVEL 25 - ROOFTOP RECREATION



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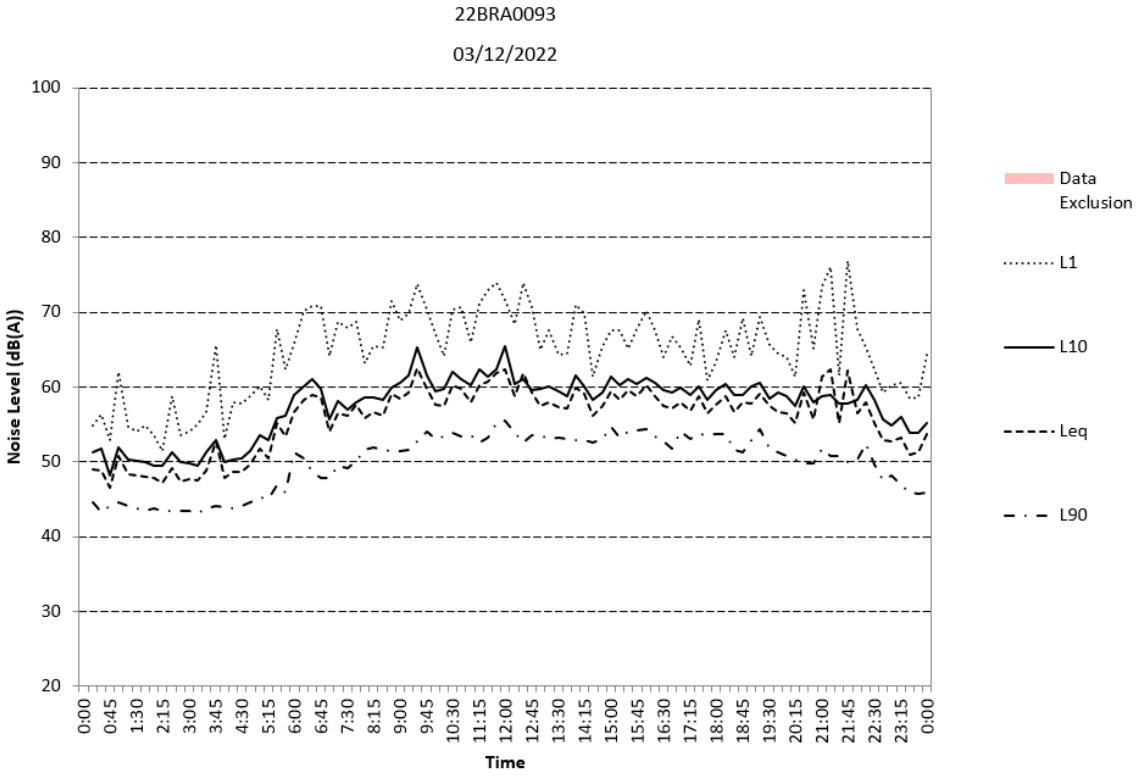
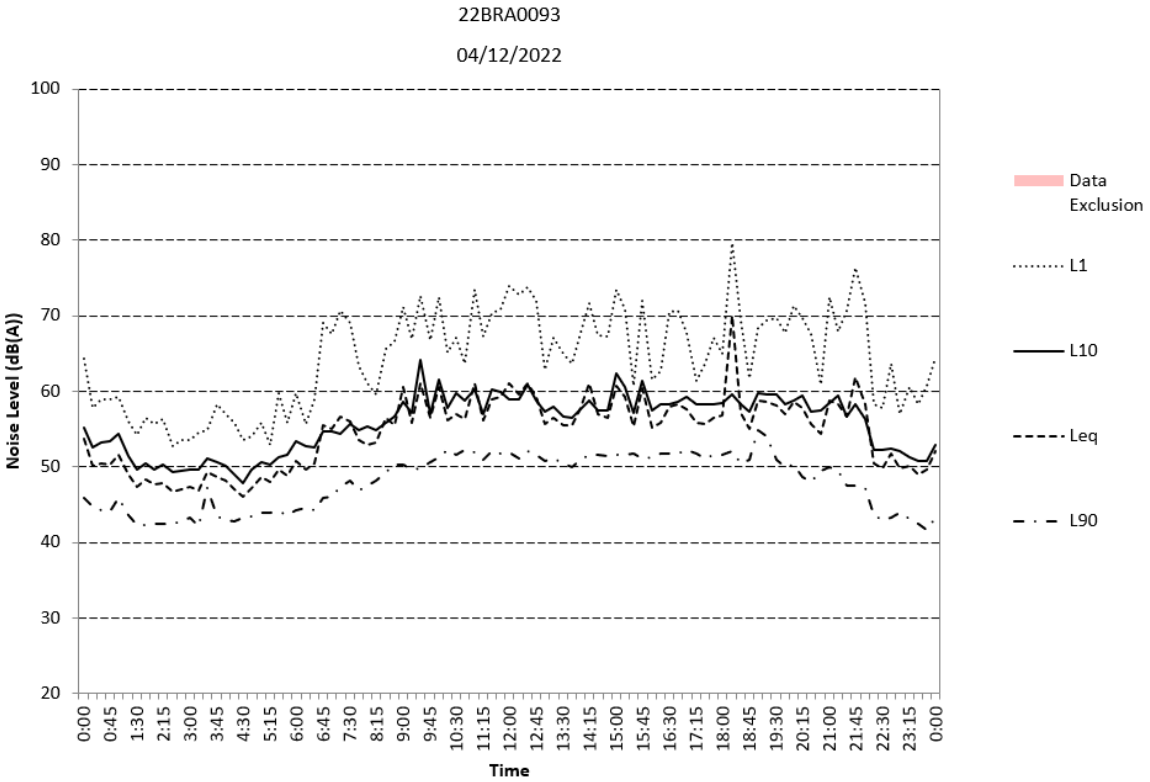
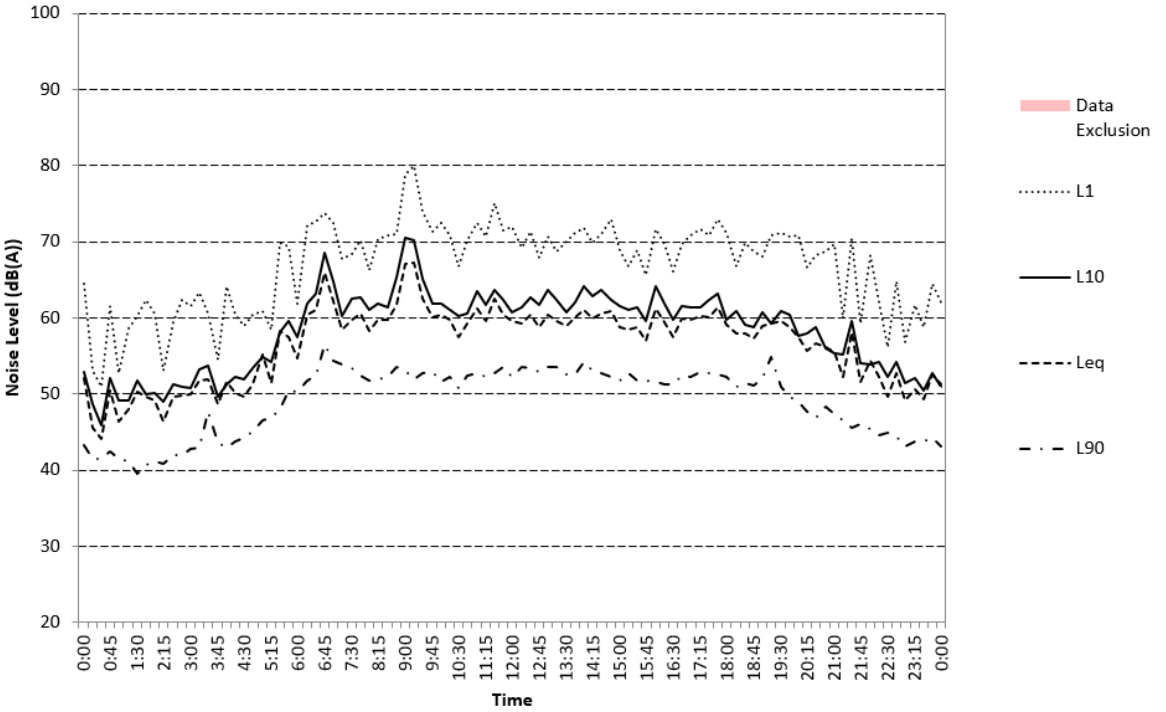
Appendix B Unattended Noise Monitoring Graphs


22BRA0093
03/12/2022
Noise Level (dB(A))
Time
Data Exclusion
L1
L10
Leq
L90


22BRA0093
04/12/2022
Noise Level (dB(A))
Time
Data Exclusion
L1
L10
Leq
L90

22BRA0093

05/12/2022



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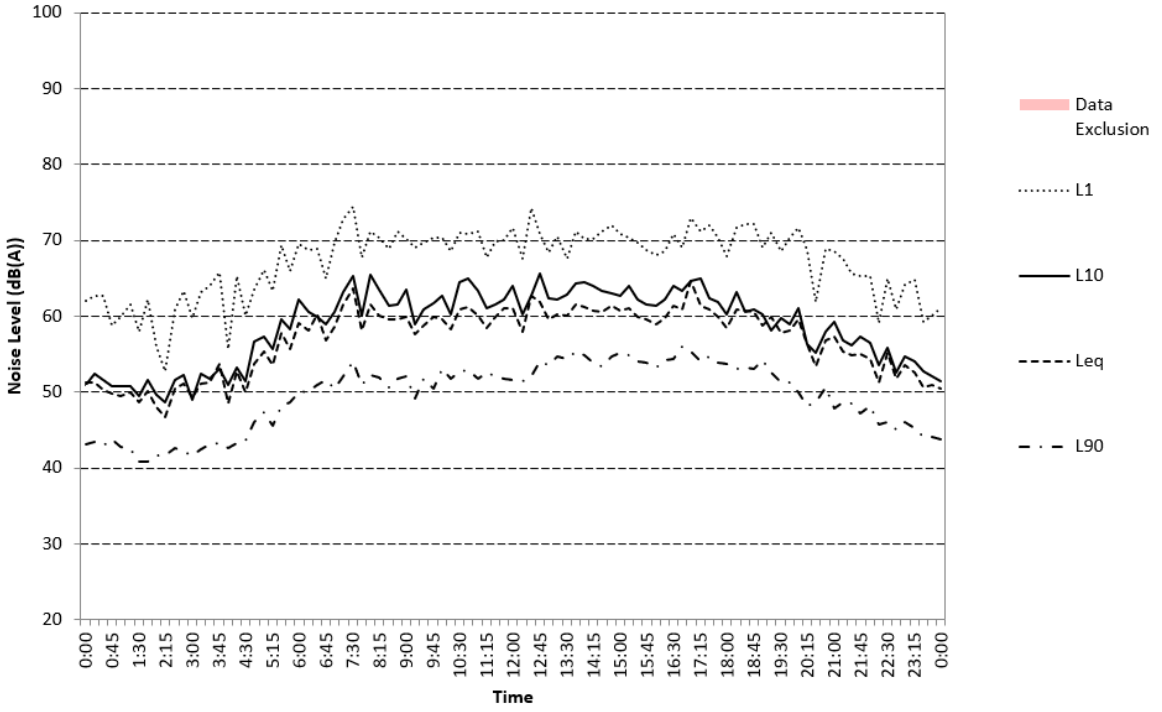

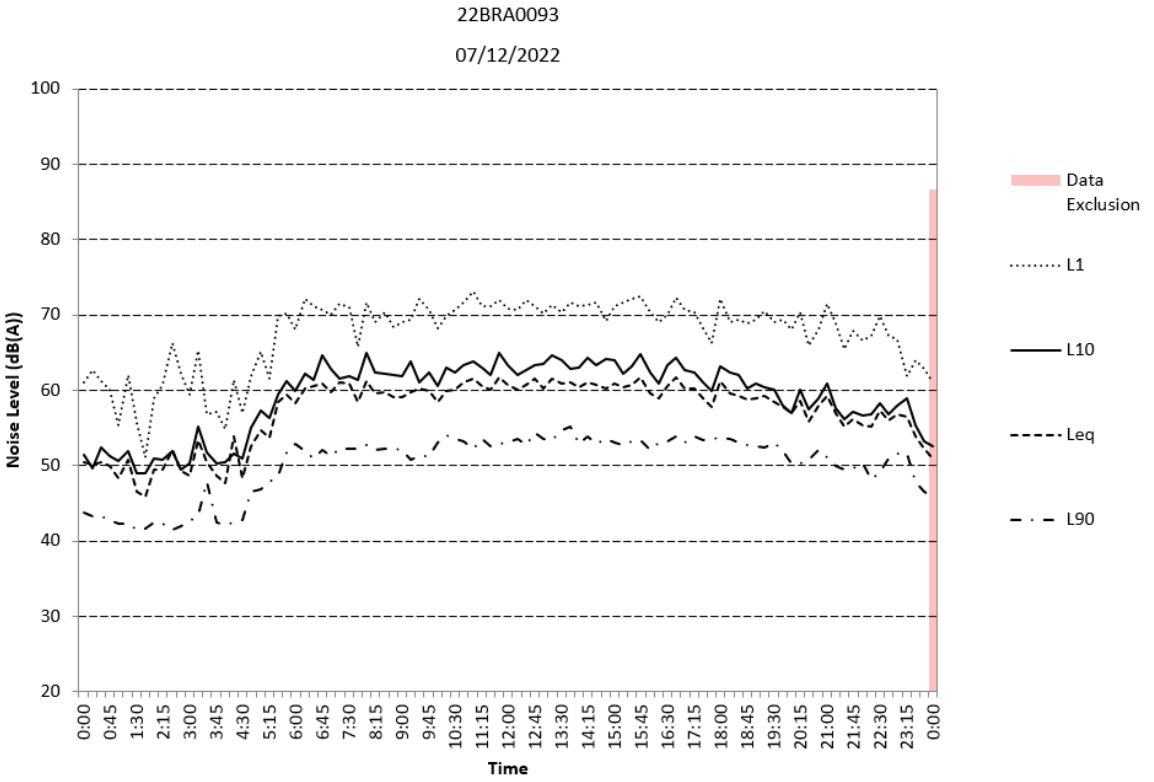
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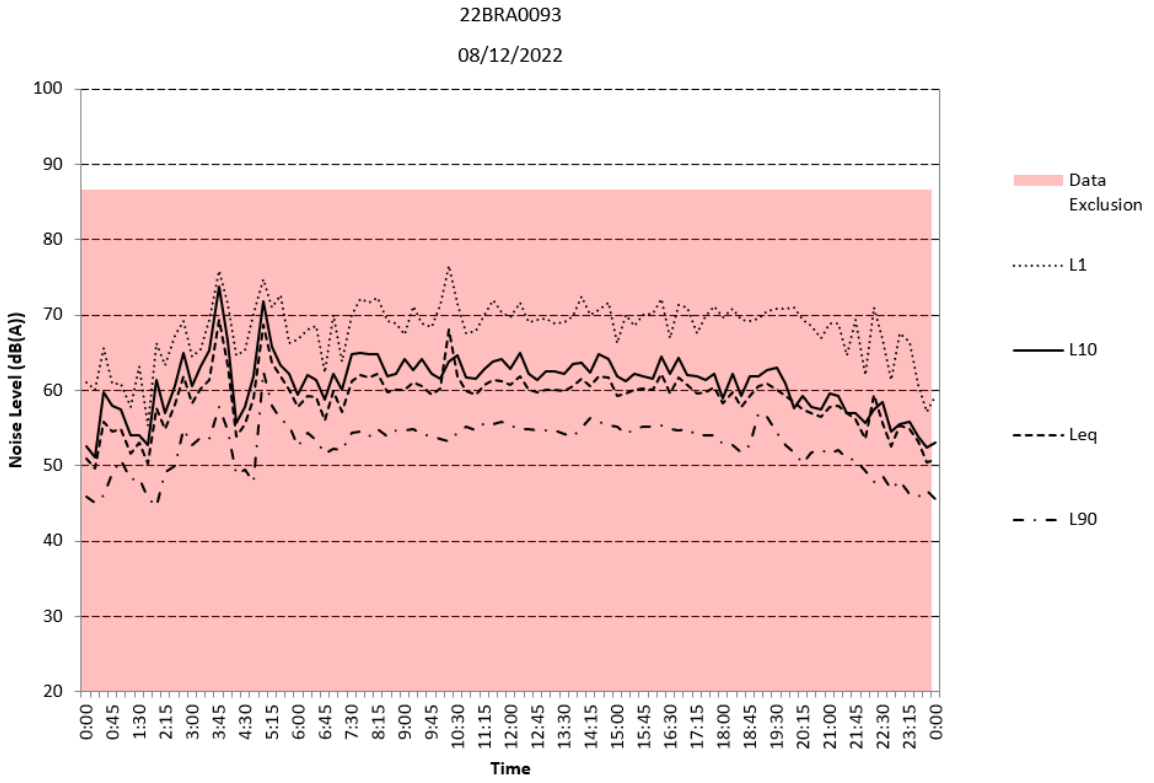
07/12/2022
Noise Level (dB(A))
Time
Data Exclusion
L1
L10
Leq
L90

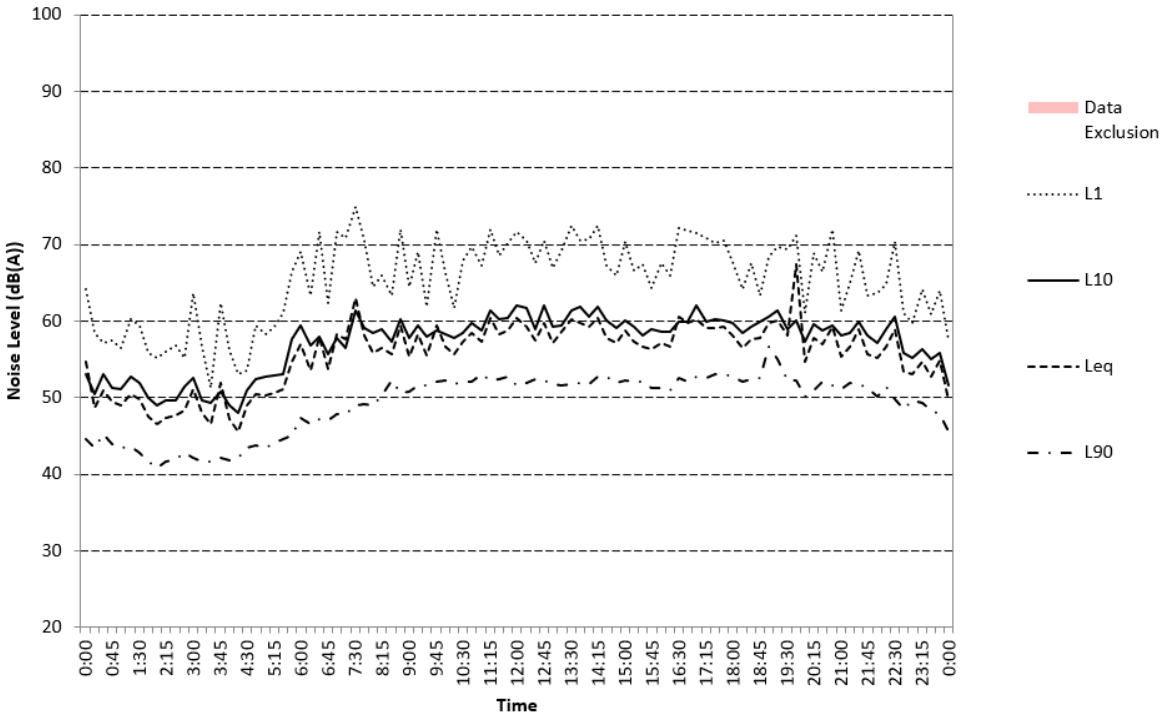

22BRA0093
08/12/2022
Noise Level (dB(A))
Time
Data Exclusion
L1
L10
Leq
L90

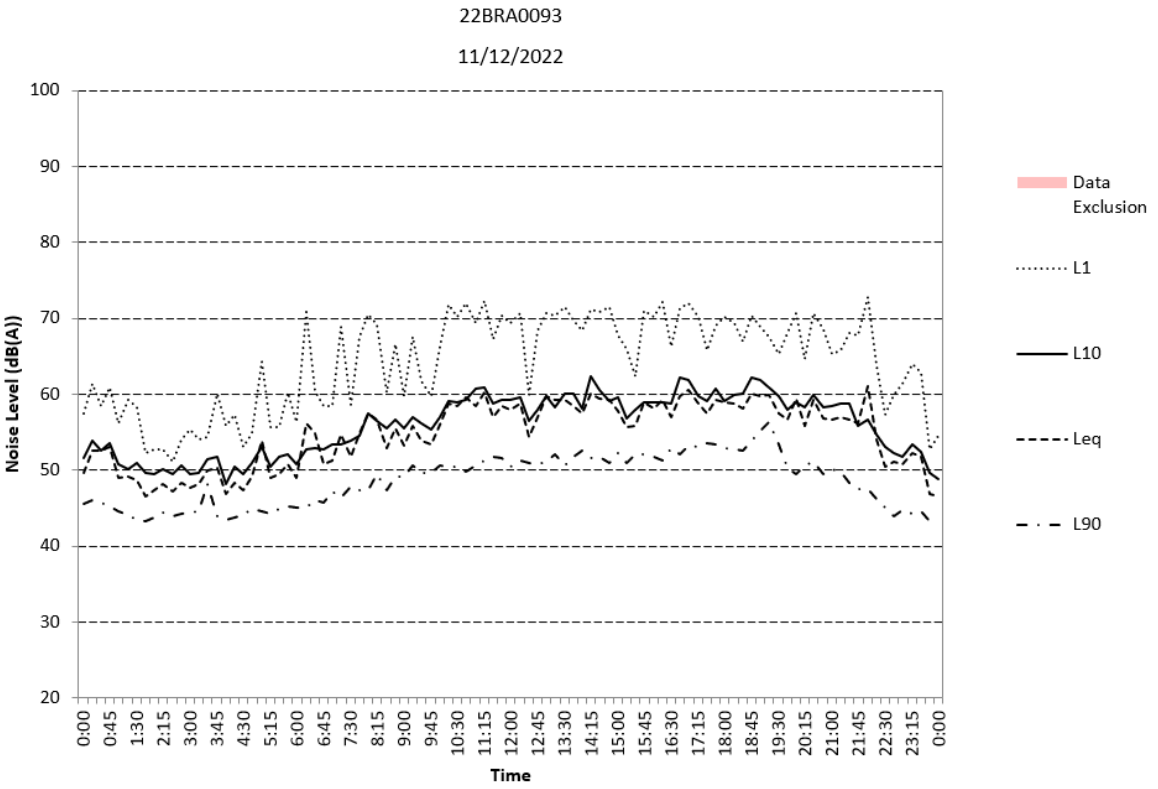
22BRA0093

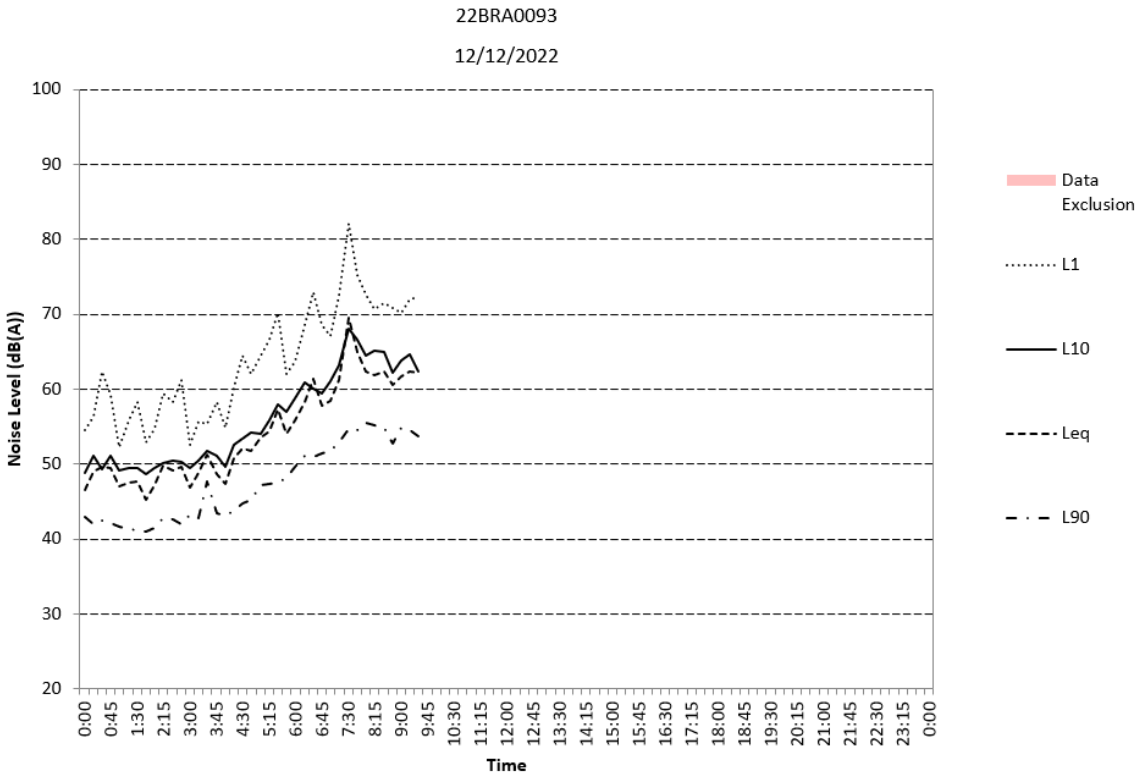
09/12/2022

22BRA0093

10/12/2022




22BRA0093
11/12/2022
Noise Level (dB(A))
Time
Data Exclusion
L1
L10
Leq
L90


22BRA0093
12/12/2022
Noise Level (dB(A))
Time
Data Exclusion
L1
L10
Leq
L90

Appendix C Calculations

Aircraft Noise

AS2021:2000 Calculations

Building Component	Aircraft noise dB(A)	Indoor Design dB(A)	ANR dB(A)	Element Area (S_x) (m^2)	Floor Area (S_f) (m^2)	Ceiling Height (m)	RT60 (s)	Components (unit)	Orientation Kc dB(A)	ANARc dB(A)	Estimated R_w	Adjusted R_w
Sleeping area												
Glazing	78	50	28.0	8	11	2.7	0.5	1	6	27.19274621	32	34
										Overall Rw	32.19274621	34
Other habitable room (living room)												
Glazing	78	55	23.0	11	32	2.7	1.3	1	6	22.74031268	28	30
										Overall Rw	27.74031268	30
Sleeping area (top floor)												
Glazing	78	50	28.0	8	11	2.7	0.5	2	6	30.20304617	35	34
Roof/ceiling	78	50	28.0	11	11	2.7	0.5	2	6	31.48847478	36	50
										Overall Rw	35.89314567	37.55615636
Other habitable room (living room) (top floor)												
Glazing	78	55	23.0	11	32	2.7	1.3	2	6	25.75061263	31	30
Roof/ceiling	78	55	23.0	32	32	2.7	1.3	2	6	30.46787486	35	50
										Overall Rw	33.72051281	35.85338982