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PLANS AND DOCUMENTS
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DEVELOPMENT APPROVAL

Approval no: DEV2024/1581/3

Date: 14/08/2025

Queensland Government

Proposed Residential Development
Lot 18A Macarthur Avenue
Hamilton

ACOUSTIC REPORT




Client:
Silverstone Developments
ATTN: Andrew Stevens

Reference:
2024503 R01D Lot 18A Macarthur Avenue Hamilton ENV ACN.docx

Date Issued:
31 July 2025

Document Information

Contact Details

Acoustic Works
Unit 17/10 Benson Street
Toowong QLD 4066
(07) 3393 2222
ABN: 56 157 965 056

PO Box 69
Toowong DC
QLD 4066

Greg Pearce
Email: gpearce@acousticworks.com.au

Mark Enersen
Email: menersen@acousticworks.com.au

Report Register

Date	Revision	Author	Reviewer	Manager
12/12/24	R01A	Marco Scoca	Greg Pearce	GP
17/12/24	R01B	David Dadd	Greg Pearce	GP
12/03/25	R01C	David Dadd	Greg Pearce	GP
31/07/25	R01D	David Dadd	Greg Pearce	GP

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1. Introduction

This report is in response to a request by Silverstone Developments for an aircraft and environmental noise assessment of a proposed residential development to be located at Lot 18A Macarthur Avenue, Hamilton. To facilitate the assessment, noise monitoring was conducted to determine aircraft and ambient noise levels in the locality. Based on the outcomes of the assessment, recommendations for management strategies and acoustic treatments are specified.

2. Site Description

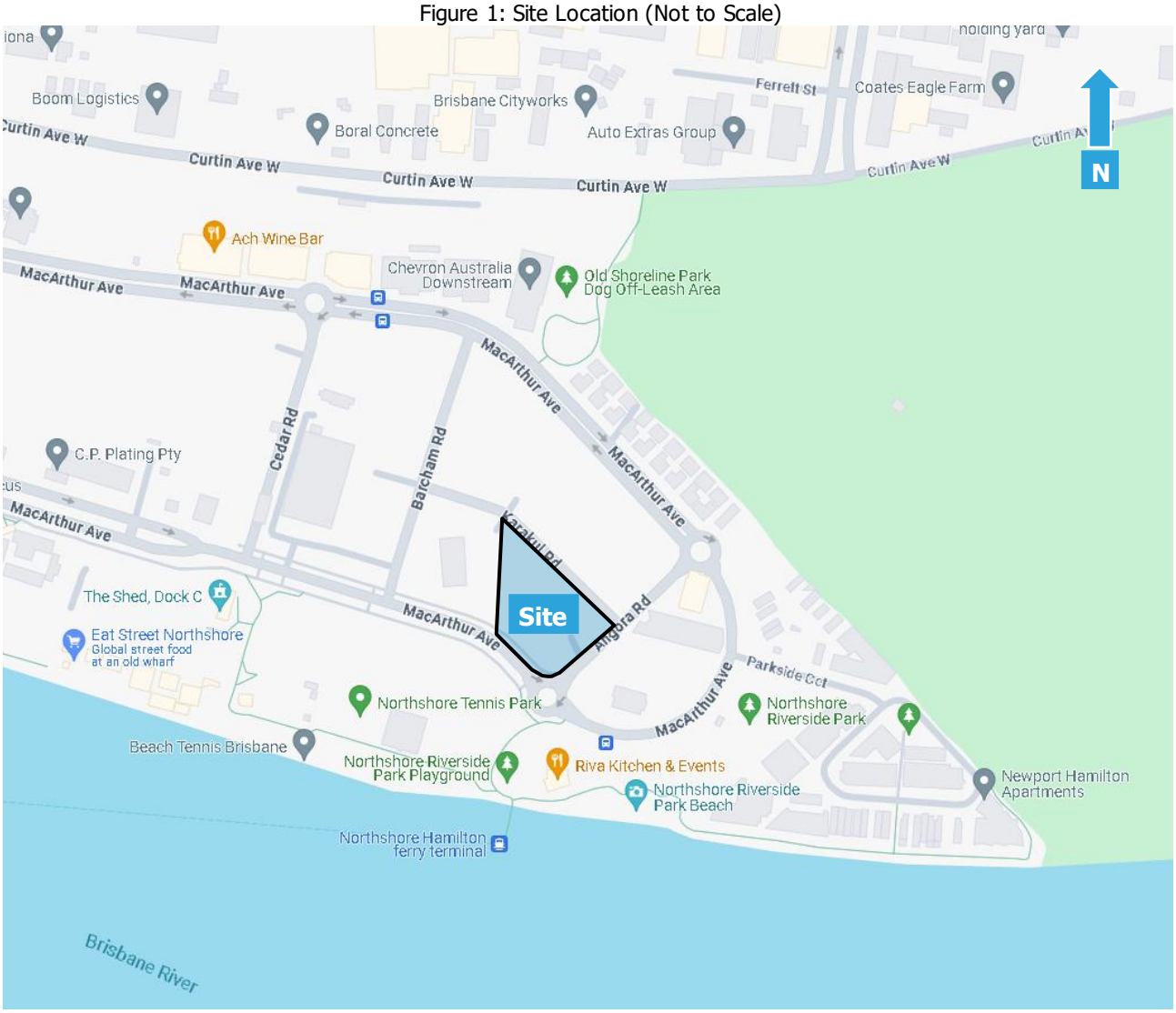
2.1 Site Location

The site is described by the following:

260 Macarthur Avenue, Hamilton
Lot 5 on SP337697

Refer to Figure 1 for site location.

Figure 1: Site Location (Not to Scale)



A comprehensive site survey was conducted on the 18th of August 2024 and identified the following:

a) The development site is currently vacant.
b) The surrounding area consists primarily of residential, warehousing and industrial land uses.
c) Residential land uses are located across Macarthur Avenue to the north and across Angora Road to the southeast.

2.2 Proposal

The proposal is to construct two residential apartment buildings (195 apartments in total) as follows:

- Basement level carparking:
  - 267 spaces servicing both building 1 and building 2.
  - Storage rooms
- Ground floor:
  - Residential apartments.
  - Retail grocer, bottle shop, hairdresser, bakery and restaurant.
  - Car parking spaces (34 spaces), HRV zone, waste areas and lobbies.
- Level 1:
  - Residential apartments.
  - Gym/multipurpose room and pool.
- Levels 2 to 8:
  - Residential apartments.
- Levels 9 to 11:
  - Residential apartments (building one only).

Refer to the Appendices for development plans.

2.3 Acoustic Environment

The surrounding area is primarily affected local road traffic noise and aircraft noise associated with Brisbane Airport.

3. Equipment

The following equipment was used to record noise levels:

- Rion NL42 Environmental Noise Monitor.
- Norsonic NOR140 Sound Level Meter.
- BSWA Technology Co. Ltd Sound Calibrator.

The Rion NL42 Environmental Noise Monitors hold current NATA Laboratory Certification and were field calibrated before and after the monitoring period, with no significant drift from the reference signal recorded.

4. Receivers, Industrial and Noise Monitoring Locations

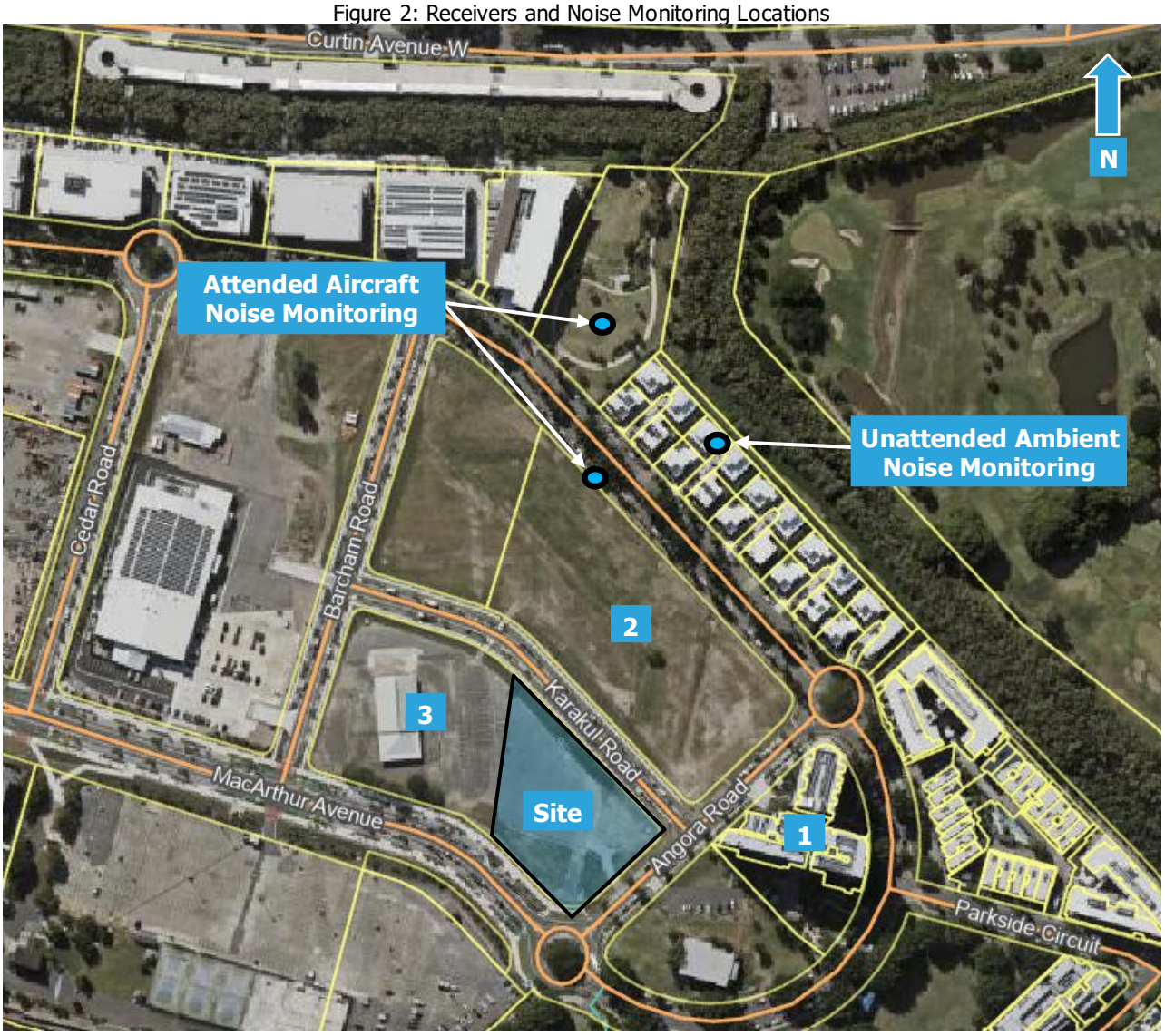
4.1 Receiver Locations

The nearest sensitive receiver locations were identified as follows:

1. Located at 320 MacArthur Avenue to the east of the site is a residential high rise apartment building (emerging community zone).
2. A multi storey residential development is proposed at 280 Macarthur Avenue to the north of the site (emerging community zone).
3. A multi storey residential development is proposed at 280 Macarthur Avenue to the west of the site (emerging community zone).

These locations were chosen as being representative of the nearest sensitive receivers to the proposed development. Refer to Figure 2 for these locations.

Figure 2: Receivers and Noise Monitoring Locations



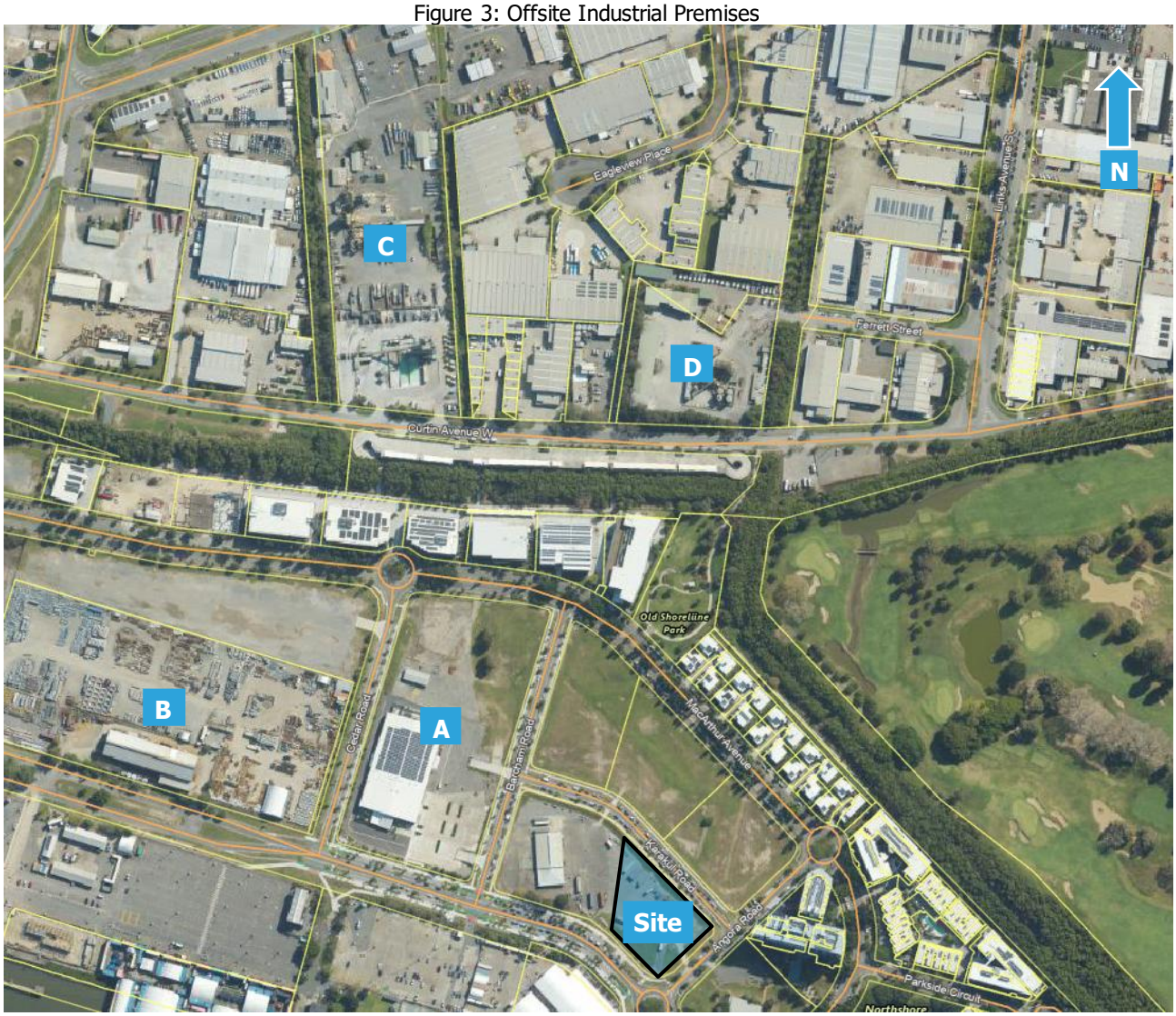
Industrial Land Use Locations

The nearest offsite premises with the potential to adversely impact the acoustic amenity of the proposed development were identified as follows:

A. Located to the west of the site at 240 Macarthur Avenue is 'Vaxxas Biomedical Facility'.
B. 'C.P. Plating' is located at 222a Macarthur Avenue to the west of the site.
C. Located to the northwest of the site at 208 Curtin Avenue and 111 Cullen Avenue is 'Boral Concrete' and 'Boral Asphalt' respectively.
D. 'Brisbane Cityworks' is located to the north of the site at 260 Curtin Avenue

These locations were identified to have the potential to adversely impact proposed onsite noise sensitive receivers.

Figure 3: Offsite Industrial Premises



4.2 Unattended Ambient Noise Monitoring

A Rion NL42 environmental noise monitor was placed in the rear yard of 6/341 Macarthur Avenue to measure ambient noise levels. This location was selected as it was considered being representative of the nearest residential receivers. The monitor was located in a free field position with the microphone approximately 1.4 metres above ground surface level. The noise monitor was set to record noise levels between the 10th and 17th of July 2024.

The environmental noise monitor was set to record noise levels in "A" Weighting, Fast response using 15 minute statistical intervals. Ambient noise monitoring was conducted generally in accordance with Australian Standard AS1055:2018 *Acoustics – Description and measurement of environmental noise*.

Refer to Figure 2 for noise monitoring location.

4.3 Attended Aircraft Noise Measurements

Aircraft noise levels were measured in the immediate vicinity of the site at 351 Macarthur Avenue and at the northern site boundary at 330 Macarthur Avenue in free field locations. The attended noise monitoring was conducted on the 10th and 18th of July 2024.

The sound level meter was set to record noise levels in octave band, linear weighting, slow response, and broadband "A" weighting, slow response. The typical duration for each measurement was between 20 and 30 seconds. Aircraft noise measurements were conducted in accordance with Australian Standard AS2021:2015.

Refer to Figure 2 for the measurement locations.

4.4 Attended Offsite Industrial Noise Measurements

Acoustic Works conducted attended measurements of industrial land uses in the vicinity of the site on Tuesday the 11th of February 2025 between the hours of 2.30pm and 4:30pm to assess noise impacts from the surrounding industrial land uses on the proposed development site. The sound level meter was set to record noise levels in "A" Weighting, Fast response mode.

Refer to Figure 3 for the location of industrial land uses.

5. Measured Noise Levels

The following tables present the measured background noise levels from the unattended noise survey and meteorological conditions.

5.1 Meteorological Conditions

Meteorological observations during the unattended noise monitoring survey were obtained from the Bureau of Meteorology website (http://www.bom.gov.au/climate/data), shown in Table 1 below.

Table 1: Meteorological Conditions – Brisbane

Day	Date	Rainfall (mm)	Wind			
			9am		3pm	
			Speed (km/h)	Direction	Speed (km/h)	Direction
Wednesday	10/07/2024	0	6	WSW	7	W
Thursday	11/07/2024	0	7	WSW	4	ESE
Friday	12/07/2024	0	4	SSW	13	W
Saturday	13/07/2024	0	7	W	17	WSW
Sunday	14/07/2024	0	11	WSW	13	WNW
Monday	15/07/2024	0	4	SW	13	W
Tuesday	16/07/2024	0	9	WSW	20	W
Wednesday	17/07/2024	0	17	W	17	W

5.2 Ambient Noise Levels

The ambient noise levels measured at the monitoring location are as follows:

Table 2: Measured Ambient Noise Levels – All Time Periods

Day	Date	L90 dB(A) (Rating Background Level)			LAeq 9hr
		Day	Evening	Night	Night
Wednesday	10/07/2024	38	44	40	-
Thursday	11/07/2024	41	42	38	51
Friday	12/07/2024	38	43	37	51
Saturday	13/07/2024	38	38	33	49
Sunday	14/07/2024	35	39	31	49
Monday	15/07/2024	40	39	34	50
Tuesday	16/07/2024	43	40	41	53
Wednesday	17/07/2024	44	-	39	-
Overall value		40	40	36	50

Refer to the appendix for a graphical representation of the measured noise levels.

6. Noise Criteria

6.1 Brisbane City Council (BCC) - Environmental Noise Criteria

To ensure a reasonable acoustic amenity is maintained, Brisbane City Council requires environmental noise be assessed in accordance with Noise Impact Assessment PSP (2014). To accurately assess environmental noise, the noise must first be classified as to the type and its duration. Sections 6.1.1 to 6.1.4 breaks down the assessment requirements in relation to the project and considers the criteria in relation to the type of noise being assessed.

6.1.1 Intrusive Noise and Acoustic Amenity

To ensure a reasonable amenity is maintained, the following criteria shall be applied for the assessment of onsite activities to sensitive receivers. The noise criteria as applied by Brisbane City Council in accordance with the Multiple Dwelling Code of the Brisbane City Plan 2014 are as follows:

Table 3: Noise (Planning) Criteria

Criteria Location	Intrusive Noise Criteria	Acoustic Amenity Criteria		
	Day, evening and night $L_{Aeq,adj,T}$ are not greater than the RBL plus the value in this column for the relevant criteria location, where T equals: • Day - 11hr • Evening - 4hr • Night - 9hr	Day, evening and night $L_{Aeq,adj,T}$ are not greater than the values in the column below for the relevant criteria location, where T equals: • Day - 11hr • Evening - 4hr • Night - 9hr		
		Day	Evening	Night
Emerging community zone boundary	5 dB(A)	55 dB(A)	50 dB(A)	45 dB(A)

Further reference is made to PO21 and AO21 of the Brisbane City Council City Plan 2014 Multiple Dwelling Code.

Table 4: Noise (Planning) Criteria – Multiple Dwelling Code

Performance Outcome	Acceptable Outcome
PO21 Development in a zone in the centre zones category or Mixed use zone must: a. be located, designed and constructed to protect bedrooms and other habitable rooms from exposure to noise arising from non-residential activities outside the building; b. be designed and constructed to achieve a minimum reduction in sound pressure level between the exterior of the building and the bedrooms or indoor primary living areas of 30dBA. 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. Note – Site-specific criteria will be identified in a neighbourhood plan for sites within a Special Entertainment Precinct or within the Transport noise corridor overlay.	**AO21** Development in a zone in the centre zones category or the Mixed use zone has a minimum acoustic performance of: a. Rw 35 for glazing (windows and doors) where total area of glazing is greater than 1.8m^2. b. Rw 32 for glazing (windows and doors) where total area of glazing is less than or equal to 1.8m^2.

The noise criteria applicable to this development are as follows:

Table 5: Intrusive Noise Criteria

Time Period	Measured RBL $L_{A90,T}$	Intrusive Criteria dB(A) (RBL L_{A90} + 5 dB(A))
Day 7am – 6pm	40	45
Evening 6pm – 10pm	40	45
Night 10pm – 7am	36	41

Table 6: Acoustic Amenity Criteria

Time Period	Acoustic Amenity Criteria ($L_{Aeq,adj,T}$ dB(A))
Day 7am – 6pm	55
Evening 6pm – 10pm	50
Night 10pm – 7am	45

6.1.2 Night-Time Noise

The night-time noise criteria as applied by Brisbane City Council in accordance the Brisbane City Plan 2014 are as follows:

Table 7: Night-time Noise Criteria

Criteria Location	Where the existing $L_{Aeq,9hr\ night}$ at the criteria location is:	Average of the highest 15 single L_{Amax} events over a given night (10pm-7pm) period is not greater than the following values at the relevant criteria location	The absolute highest single L_{Amax} event over a given night (10pm-7am) period is not greater than the following values at the relevant criteria location
Emerging community zone boundary	< 45dB(A)	50dB(A)	55dB(A)
	45 to 60dB(A)	$L_{eq,9hr\ night}$ + 5dB(A)	$L_{eq,9hr\ night}$ + 10dB(A)
	> 60dB(A)	65dB(A)	70dB(A)

Based on the measured noise levels in Section 5 the night-time noise criteria is as follows:

Table 8: Applicable Night-time Noise Criteria

Criteria Location	Measured $L_{Aeq,9h\ night}$ dB(A)	Criteria Average L_{Amax} dB(A)	Criteria Highest L_{Amax} dB(A)
Emerging community zone boundary	50	55	60

6.1.3 Mechanical Plant

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.*
>
> *Where T is:*
>
> - *(7am to 6pm): 11hr*
> - *(6pm to 10pm): 4hr*
> - *(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 noise criteria applicable to this development are as follows:

Table 9: Applicable Noise Criteria

Time Period	Criteria dB(A) ($RBL\ L_{90}$ + 3 dB(A))
Day 7am – 6pm	43
Evening 6pm – 10pm	43
Night 10pm – 7am	39

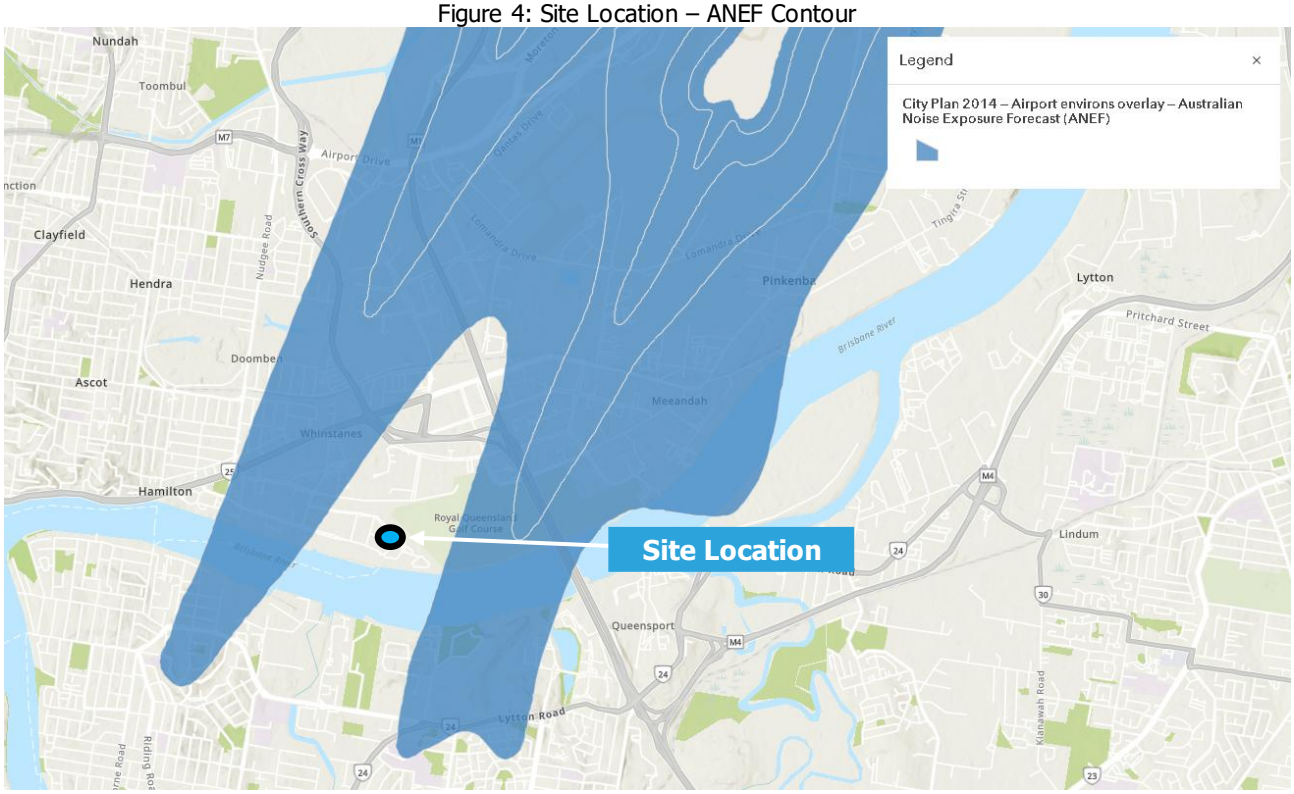
6.2 Aircraft Noise

As per AS2021:2015 *"Acoustics - Aircraft Noise Intrusion - Building Siting and Construction for the Assessment of Aircraft Noise"*, the actual location of the 20 ANEF contour is difficult to define accurately. As a result, aircraft noise may still be assessed for building sites outside but near to the 20 ANEF contour.

The requirement for assessment of aircraft noise comes under the Brisbane City Plan 2014, in accordance with AS2021:2015 *"Acoustics - Aircraft Noise Intrusion - Building Siting and Construction for the Assessment of Aircraft Noise"*.

As seen in Figure 4, the site is located outside the ANEF 20-25 noise contour for Brisbane Airport however, to ensure the proposed development isn't adversely impacted, aircraft noise was assessed utilising attended aircraft noise measurements.

Figure 4: Site Location – ANEF Contour



The indoor design sound levels for residential developments are contained in Table 3.3 of AS2021:2015. The indoor design sound levels are as follows:

Table 10: Aircraft Noise Internal Criteria

Use	Activity of Internal Space	Indoor Design Sound Level L_{Amax} 'S' Time Weighting
Multiple Dwelling	Sleeping areas	50dB(A)
	Other habitable rooms	55dB(A)
	Bathrooms, toilets, laundries	60dB(A)

7. Environmental Assessment

7.1 Onsite Activities

Noise associated with the development was assessed based on previous measurements of similar activities. The calculations assume that the nominated activities are located at the closest representative point to the development site. Any relevant shielding, building transmission loss or recommended acoustic screens are taken into account for these activities.

7.1.1 Noise Levels Due to Patrons

Noise associated with patrons is based on a technical paper '*Prediction of Noise from Small to Medium Sized Crowds*' (Hayne et al, 2011). The paper was based upon attended noise measurements conducted at a sample of premises to account for range of patron numbers. Based on the measured levels, the resulting analysis determined that the Sound Power Level (LAeq, T) of a small-medium crowd could be predicted by the following equation:

$$L_{WAeq} = 15 \log (\text{number of patrons}) + 64 \text{ dBA (approx. maximum 100 patrons)}$$

Using the above formulae, the predicted overall patron sound power level the proposed restaurant is presented in Table 11.

Table 11: Predicted Sound Power Levels of Patrons

Location	Number of Patrons Assessed	Predicted L_{Aeq} Sound Power Level dBA	Predicted L_{Aeq} Sound Pressure Level dBA
Restaurant	100	94	86

Based on omnidirectional radiation into free space, the equivalent source sound pressure levels when measured at 1m are taken to be 8dB(A) lower than the sound power levels presented. This has been calculated using the methodology contained in Chapter 6 of Engineering Noise Control Theory and Practice (Fourth Edition) by David A. Bies and Colin H. Hansen.

7.1.2 Intrusive Noise and Acoustic Amenity

The average maximum noise source levels and predicted impacts at the nearest receiver locations are shown in Table 12 as follows. L_{Aeq} results are not shown where the calculated total is less than 0dBA.

Table 12: Average Noise Levels from Site Activities

Receiver	Receivers 1. 320 MacArthur Avenue (E) 2. 280 Macarthur Avenue (N) 3. 280 Macarthur Avenue (W) Description	Source @1m dB(A)	Correction dB(A)*	Corrected dB(A)	Number of events day	Number of events eve	Number of events night	Duration per event	Distance (m)	Barrier (height (m)) No	Barrier screening dB	Building TL or shield dB	Room Correction dB	Dist atten. @-6dB/dd	LAeq adj,T ext. dB(A) Day	LAeq adj,T ext. dB(A) Eve	LAeq adj,T ext. dB(A) Night	Intrusive Compliance LAeq Day	Intrusive Compliance LAeq Eve	Intrusive Compliance LAeq Night	Amenity Compliance LAeq Day	Amenity Compliance LAeq Eve	Amenity Compliance LAeq Night
	Criteria																	45	45	41	55	50	45
1	Car door closure	75	2	77	200	100	50	2	82			-15		-38.276	4	5		Yes	Yes	Yes	Yes	Yes	Yes
	Car passby	69		69	200	100	50	15	64					-36.124	22	23	17	Yes	Yes	Yes	Yes	Yes	Yes
	Car start	74	2	76	200	100	50	2	82			-15		-38.276	3	4		Yes	Yes	Yes	Yes	Yes	Yes
	Gym activities	80		80	11	4	9	3600	66			-24		-36.391	20	20	20	Yes	Yes	Yes	Yes	Yes	Yes
	Amplified music (gym/multi purpose room)	80		80	11	4	9	3600	66			-24		-36.391	20	20	20	Yes	Yes	Yes	Yes	Yes	Yes
	Patron noise (restaurant)	86		86	11	4	9	3600	116			-24		-41	21	21	21	Yes	Yes	Yes	Yes	Yes	Yes
	Amplified music (restaurant)	80		80	11	4	9	3600	116			-24		-41.289	15	15	15	Yes	Yes	Yes	Yes	Yes	Yes
	Recreation area	75		75	11	4		3600	103			-20		-40.257	15	15		Yes	Yes	n/a	Yes	Yes	n/a
	Deliveries	88		88	1			60	65			-20		-36.258	4			Yes	n/a	n/a	Yes	Yes	Yes
	Retail activities	73		73	11	4	9	3600	72			-10		-37.147	26	26	26	Yes	Yes	Yes	Yes	Yes	Yes
	Trolley stacking (supermarket carpark)	87		87	11	4	9	10	82			-15		-38.276	8	8	8	Yes	Yes	Yes	Yes	Yes	Yes
	Total														30	30	29	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
	Criteria																	45	45	41	55	50	45
2	Car door closure	75	2	77	200	100	50	2	59					-35.417	22	23	16	Yes	Yes	Yes	Yes	Yes	Yes
	Car passby	69			200	100	50	15	20					-26.021				Yes	Yes	Yes	Yes	Yes	Yes
	Car start	74	2	76	200	100	50	2	59					-35.417	21	22	15	Yes	Yes	Yes	Yes	Yes	Yes
	Gym activities	80		80	11	4	9	3600	44			-24		-32.869	23	23	23	Yes	Yes	Yes	Yes	Yes	Yes
	Amplified music (gym/multi purpose room)	80		80	11	4	9	3600	44			-24		-32.869	23	23	23	Yes	Yes	Yes	Yes	Yes	Yes
	Patron noise (restaurant)	86		86	11	4	9	3600	76			-24		-38	24	24	24	Yes	Yes	Yes	Yes	Yes	Yes
	Amplified music (restaurant)	80		80	11	4	9	3600	76			-24		-38	18	18	18	Yes	Yes	Yes	Yes	Yes	Yes
	Recreation area	75		75	11	4		3600	66			-20		-36	19	19		Yes	Yes	n/a	Yes	Yes	n/a
	Deliveries	88		88	1			60	45			-5		-33	22			Yes	n/a	n/a	Yes	Yes	Yes
	Retail activities	73		73	11	4	9	3600	66			-10		-36	27	27	27	Yes	Yes	Yes	Yes	Yes	Yes
	Trolley stacking (supermarket carpark)	87		87	11	4	9	10	59					-35	26	26	26	Yes	Yes	Yes	Yes	Yes	Yes
	Total														33	33	29	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
	Criteria																	45	45	41	55	50	45
3	Car door closure	75	2	77	200	100	50	2	44			-20		-32.869	4	6		Yes	Yes	Yes	Yes	Yes	Yes
	Car passby	69		69	200	100	50	15	44			-20		-32.869	5	6		Yes	Yes	Yes	Yes	Yes	Yes
	Car start	74	2	76	200	100	50	2	44			-20		-32.869	3	5		Yes	Yes	Yes	Yes	Yes	Yes
	Gym activities	80		80	11	4	9	3600	52			-24		-34.32	22	22	22	Yes	Yes	Yes	Yes	Yes	Yes
	Amplified music (gym/multi purpose room)	80		80	11	4	9	3600	52			-24		-34.32	22	22	22	Yes	Yes	Yes	Yes	Yes	Yes
	Patron noise (restaurant)	86		86	11	4	9	3600	30			-24		-30	32	32	32	Yes	Yes	Yes	Yes	Yes	Yes
	Amplified music (restaurant)	80		80	11	4	9	3600	30			-24		-29.542	26	26	26	Yes	Yes	Yes	Yes	Yes	Yes
	Recreation area	75		75	11	4		3600	41					-32.256	43	43		Yes	Yes	n/a	Yes	Yes	n/a
	Deliveries	88		88	1			60	79			-20		-37.953	2			Yes	n/a	n/a	Yes	Yes	Yes
	Retail activities	73		73	11	4	9	3600	80			-15		-38.062	20	20	20	Yes	Yes	Yes	Yes	Yes	Yes
	Trolley stacking (supermarket carpark)	87		87	11	4	9	10	44			-20		-32.869	9	9	9	Yes	Yes	Yes	Yes	Yes	Yes
	Total														43	43	34	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

*Correction due to tonality and impulsiveness as per AS 1055:2018.

Compliance is predicted for all onsite activities on the condition the recommendations in Section 9 are implemented.

7.1.3 Night-time Noise

The maximum noise source levels were determined based on onsite measurements and previous assessments of similar activities.

Table 13: Lmax Noise Levels from Site Activities

Receiver	Receivers 1. 320 MacArthur Avenue (E) 2. 280 Macarthur Avenue (N) 3. 280 Macarthur Avenue (W) Description	Source @1m dB(A)	Correction dB(A)*	Corrected dB(A)	Number of events day	Number of events eve	Number of events night	Duration per event	Distance (m)	Barrier (height (m)) No	Barrier screening dB	Building TL or shield dB	Room Correction dB	Dist atten. @-6dB/dd	LAeq adj, T ext. dB(A) Day	LAeq adj, T ext. dB(A) Eve	Absolute LAmax dBA	LAMax Compliance Night Max
	Criteria																	60
1	Car door closure	75	2	77	200	100	50	2	82			-15		-38.276	4	5	33	Yes
	Car passby	69		69	200	100	50	15	64					-36.124	22	23	42	Yes
	Car start	74	2	76	200	100	50	2	82			-15		-38.276	3	4	32	Yes
	Gym activities	80		80	11	4	9	3600	66			-24		-36.391	20	20	29	Yes
	Amplified music (gym/multi purpose room)	80		80	11	4	9	3600	66			-24		-36.391	20	20	29	Yes
	Patron noise (restaurant)	86		86	11	4	9	3600	116			-24		-41	21	21	30	Yes
	Amplified music (restaurant)	80		80	11	4	9	3600	116			-24		-41.289	15	15	24	Yes
	Recreation area	75		75	11	4		3600	103			-20		-40.257	15	15	24	n/a
	Deliveries	88		88	1			60	65			-20		-36.258	4		41	n/a
	Retail activities	73		73	11	4	9	3600	72			-10		-37.147	26	26	35	Yes
	Trolley stacking (supermarket carpark)	87		87	11	4	9	10	82			-15		-38.276	8	8	34	Yes
	Total														30	30	42	**Yes**
	Criteria																	60
2	Car door closure	75	2	77	200	100	50	2	59					-35.417	22	23	51	Yes
	Car passby	69			200	100	50	15	20					-26.021				Yes
	Car start	74	2	76	200	100	50	2	59					-35.417	21	22	50	Yes
	Gym activities	80		80	11	4	9	3600	44			-24		-32.869	23	23	32	Yes
	Amplified music (gym/multi purpose room)	80		80	11	4	9	3600	44			-24		-32.869	23	23	32	Yes
	Patron noise (restaurant)	86		86	11	4	9	3600	76			-24		-38	24	24	33	Yes
	Amplified music (restaurant)	80		80	11	4	9	3600	76			-24		-38	18	18	27	Yes
	Recreation area	75		75	11	4		3600	66			-20		-36	19	19	28	n/a
	Deliveries	88		88	1			60	45			-5		-33	22		59	n/a
	Retail activities	73		73	11	4	9	3600	66			-10		-36	27	27	36	Yes
	Trolley stacking (supermarket carpark)	87		87	11	4	9	10	59					-35	26	26	52	Yes
	Total														33	33	59	**Yes**
	Criteria																	60
3	Car door closure	75	2	77	200	100	50	2	44			-20		-32.869	4	6	33	Yes
	Car passby	69		69	200	100	50	15	44			-20		-32.869	5	6	25	Yes
	Car start	74	2	76	200	100	50	2	44			-20		-32.869	3	5	32	Yes
	Gym activities	80		80	11	4	9	3600	52			-24		-34.32	22	22	31	Yes
	Amplified music (gym/multi purpose room)	80		80	11	4	9	3600	52			-24		-34.32	22	22	31	Yes
	Patron noise (restaurant)	86		86	11	4	9	3600	30			-24		-30	32	32	41	Yes
	Amplified music (restaurant)	80		80	11	4	9	3600	30			-24		-29.542	26	26	35	Yes
	Recreation area	75		75	11	4		3600	41					-32.256	43	43	52	n/a
	Deliveries	88		88	1			60	79			-20		-37.953	2		39	n/a
	Retail activities	73		73	11	4	9	3600	80			-15		-38.062	20	20	29	Yes
	Trolley stacking (supermarket carpark)	87		87	11	4	9	10	44			-20		-32.869	9	9	34	Yes
	Total														43	43	52	**Yes**

*Correction due to tonality and impulsiveness as per AS1055:2018.

Compliance is predicted for all night-time onsite activities on the condition the recommendations in Section 9 are implemented.

7.2 Offsite Industrial Activities

Table 14 presents the measured noise levels from offsite industrial land uses with locations specified in Figure 3. It is noted that, during multiple site visits, all remaining industrial land uses were inaudible at the nearest site boundary.

Table 14: Offsite Industrial Noise Levels

Attended Noise Monitoring Location	Activity	Measured L_{Aeq} Noise Levels	Measured L_{AMAX} Noise Levels	Measurement Distance from Source (m)	Measured L_{Aeq} Corrected to 1m	Measured L_{AMAX} Corrected to 1m
C.P. Plating (eastern boundary)	Loading/unloading trucks with forklift	54	69	51	89	103
Vaxxas (eastern boundary)	Mechanical plant	55	68	79	93	106
Boral Concrete and Boral Asphalt (southern boundary)	Trucks entering and existing, conveyor belt, silo and car movements	67	81	29	96	111
Brisbane Cityworks (southern boundary)	Trucks entering and existing	67	87	10	87	107

Note measurements were attempted onsite but were highly affected by aircraft activities associated with Brisbane Airport, therefore the source measurements were used to predicted noise impacts.

7.2.1 Intrusive Noise, Acoustic Amenity & Night Time LAmax

The industrial noise source levels and predicted impacts at the nearest onsite unit are shown in Table 15 as follows. The maximum noise source levels were determined based on onsite attended measurements specified in Table 14.

Table 15: Noise Levels from Offsite Industrial Activities

	Source																								
Receiver	1. C.P. Plating 2. Vaxxas 3. Boral Concrete and Boral Asphalt 4. Brisbane Cityworks	Source @1m dB(A)	Correction dB(A)*	Corrected dB(A)	Number of events day	Number of events eve	Number of events night	Duration per event	Distance (m)	Barrier (height (m))	Barrier screening dB	Building TL or shield dB	Room Correction dB	Dist atten. @-6dB/dd	Source AbsLAmax-Leq dB	LAeqadj,T ext. dB(A) Day	LAeqadj,T ext. dB(A) Eve	LAeqadj,T ext. dB(A) Night	Absolute LAmax dBA	Intrusive Compliance LAeq			Amenity Compliance LAeq			LAMax Compliance
	Description									No										Day	Eve	Night	Day	Eve	Night	Night Max
	Criteria																			45	45	41	55	50	45	60
Nearest	C.P. Plating - Loading/unloading trucks with forklift	89		89	9	4	2	1800	293					-49.337	14	36	37	30	54	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Unit	Vaxxas - Plant Noise	93		93	9	4	2	1800	213					-46.568	13	43	43	37	59	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Boral - Truck & car movements, conveyor belt, silo	96		96	9	4	2	1800	471			-20		-53.46	14	19	20	13	37	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Cityworks - Truck movements	87		87	9	4	2	1800	406					-52.171	20	31	32	25	55	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Total															44	44	38	59	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

*Correction due to tonality and impulsiveness as per AS 1055:2018.

Compliance is predicted at the proposed units for all offsite industrial activities. This is on the condition the recommendations in Section 9 are implemented. It is noted that façade treatments required for aircraft noise are predicted to be sufficient for offsite activity noise associated with nearby industrial land uses if any potential exceedance occur within the proposed development.

No onsite activity (other than mechanical plant) was operational at 'Vaxxas' (refer to Figure 3 for location) during the site visits. As a result, maximum noise source levels were determined based on previous assessments of similar activities.

Table 16: Noise Levels from Offsite Industrial Activities (Vaxxas)

	Source																							
Source	1. Vaxxas Biomedical Facility 2. Commercial Premises Description	Source @1m dB(A)	Correction dB(A)*	Corrected dB(A)	Number of events day	Number of events eve	Number of events night	Duration per event	Distance (m)	Barrier (height (m)) No	Barrier screening dB	Building TL or shield dB	Room Correction dB	Dist atten. @-6dB/dd	LAeq adj,T ext. dB(A) Day	LAeq adj,T ext. dB(A) Eve	LAeq adj,T ext. dB(A) Night	Absolute LAmax dBA	Intrusive Compliance LAeq Day	Eve	Night	Amenity Compliance LAeq Day	Eve	Night	LAMax Compliance Night Max
	Criteria																		45	45	41	55	50	45	60
1	Car door closure	75	2	77	200	100	50	2	147					-43.346	14	15	9	43	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car passby	69		69	200	100	50	15	147					-43.346	14	16	9	35	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start	74	2	76	200	100	50	2	147					-43.346	13	14	8	42	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Truck manouevring	86		86	50	25	10	30	147					-43.346	28	30	22	52	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Truck reverse	92	2	94	50	25	10	30	147					-43.346	36	38	30	60	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Truck passby	82		82	50	25	10	30	147					-43	25	26	19	48	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Forklift loading/unloading	82		82	50	25	10	240	147					-43.346	33	35	27	48	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Forklift reverse	89	2	91	50	25	10	30	147					-43.346	33	35	27	57	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Deliveries	85	2	87	1	1	1	60	147					-43.346	15	20	16	53	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Waste collection (collection of industrial waste bin)	93		93	1	1	1	40	147					-43.346	20	24	21	59	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Total														40	41	34	60	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Compliance is predicted at the proposed units for all offsite industrial activities. This is on the condition the recommendations in Section 9 are implemented. It is noted that façade treatments required for aircraft noise are predicted to be sufficient for offsite activity noise associated with nearby industrial land uses if any potential exceedance occur within the proposed development.

8. Aircraft Assessment

8.1 Attended Aircraft Noise Measurements

The noise levels for the various types of aircraft recorded at the measurement location are presented in Table 17.

Table 17: Measured Aircraft Noise Levels

Date	Time 24h	Aircraft	Direction	Action	dBA Lmax slow	dB Lmax (slow) Octave band centre frequency (Hz)						
						63	125	250	500	1k	2k	4k
10/07/24	14:24	Fokker 70	SW	Departing	69.6	75.8	59.9	67.3	64.2	62.6	54.0	41.3
10/07/24	14:39	Boeing 737-838	SW	Departing	59.8	55.5	56.6	52.0	51.7	52.0	43.4	35.6
10/07/24	14:40	Embraer E190AR	SW	Departing	68.4	61.4	60.2	65.6	62.2	56.6	51.2	47.2
10/07/24	14:45	Fokker 100	SW	Departing	66.8	64.3	63.0	69.3	62.2	57.5	46.5	42.0
10/07/24	14:50	Boeing 737-8SA	SW	Departing	61.2	61.7	61.9	57.1	53.0	52.6	46.7	44.9
10/07/24	14:54	E190AR	SW	Departing	68.8	65.3	60.9	69.0	65.3	57.1	53.3	43.9
10/07/24	14:56	Airbus A350-941	SW	Departing	66.1	65.3	60.4	67.6	59.4	54.8	54.2	43.7
18/07/24	9:28	Fokker 100	SW	Departing	69.6	66.4	70.6	71.0	69.8	65.6	55.3	45.3
18/07/24	9.31	Boeing 737-800	SW	Departing	73.3	72.7	75.2	76.3	73.3	67.2	60.5	47.1
18/07/24	9.35	Boeing 737-8FE	SW	Departing	63.5	70.2	68.8	64.2	64.8	55.7	45.1	37.7
18/07/24	9.38	Embraer E190AR	SW	Departing	74.5	68.3	73.2	74.9	75.3	68.9	60.7	45.0
18/07/24	9.40	Boeing 737-8FE	SW	Departing	70.7	72.0	67.2	72.5	71.4	64.4	51.6	34.8
18/07/24	9.44	Fokker 100	SW	Departing	71.3	69.2	72.5	72.4	70.4	66.9	57.8	46.7
18/07/24	9.47	Boeing 737 Max 8	SW	Departing	56.7	63.6	60.5	58.2	56.4	52.4	47.9	46.5
18/07/24	9.50	Boeing 737-838	SW	Departing	75.5	69.1	75.9	76.1	75.0	70.7	62.4	45.6
18/07/24	9.53	Boeing 737-8FE	SW	Departing	66.2	71.3	70.5	65.6	67.8	58.7	48.1	39.3
18/07/24	9.54	Embraer E190AR	SW	Departing	71.4	67.0	67.8	72.5	72.9	65.5	56.3	43.3
18/07/24	9.57	Airbus A330-202	SW	Departing	75.9	76.3	74.5	76.6	77.1	69.9	61.5	47.1
18/07/24	10.01	Embraer E190AR	SW	Departing	64.0	69.8	65.2	65.0	66.4	54.5	44.9	45.8
18/07/24	10.08	Boeing 737-8FE	SW	Departing	62.8	74.0	69.7	66.2	63	54.8	44.8	41.8
18/07/24	10.09	Boeing 737-8FE	SW	Departing	75.4	72.9	71.1	76.5	76.6	69.3	62.4	43.6
18/07/24	10.10	Airbus A330-232	SW	Departing	71.7	68.6	67.5	73.1	70.9	68.2	57.3	45.4
Maximum level in each octave band and corresponding total dBA					75.9	74.0	75.9	76.6	77.1	70.7	62.4	47.2

The maximum measured aircraft noise level was found to be 75.9dBA and therefore used for the purposes of a conservative assessment.

Based on maximum aircraft noise levels, additional façade treatments are required. Refer to Section 9 for recommendations.

9. Recommendations

9.1 Unit Façade Construction

All building treatments for aircraft noise calculated using Australian Standard 2021:2015 "Indoor Design Sound Levels for Determination of Aircraft Noise Reduction".

9.1.1 Unit Glazing

The minimum glazing treatments are presented in Table 18, with the installed glazing system to comply with the following:

- The minimum glass thickness specified shall not be reduced regardless of the R_w performance of the glazing system.
- If compliance cannot be achieved with the minimum R_w ratings, the glazing system shall be upgraded until compliance is achieved.
- Glazing specified with acoustic seals requires a Q-lon seal or an equivalent product, mohair seals are not acceptable.
- The glazier shall provide NATA test reports on request to verify compliance with the minimum R_w ratings. Generic reports are not acceptable.

Table 18: Glazing Treatments for Aircraft Noise Impacts

Location			Rw Rating	Glazing	Acoustic Seals
Level	Unit	Room			
G	Building 1 Units	Living Kitchen Dining	31	6.38mm laminated	yes
		Bedrooms	34	10.38mm laminated	yes
	Building 2 Units	Living Kitchen Dining	31	6.38mm laminated	yes
		Bedrooms	34	10.38mm laminated	yes
1	Building 1 Units	Living Kitchen Dining	31	6.38mm laminated	yes
		Bedrooms	34	10.38mm laminated	yes
	Building 2 Units	Living Kitchen Dining	31	6.38mm laminated	yes
		Bedrooms	34	10.38mm laminated	yes
2 to 8	Building 1 Units	Living Kitchen Dining	31	6.38mm laminated	yes
		Bedrooms	34	10.38mm laminated	yes
	Building 2 Units	Living Kitchen Dining	31	6.38mm laminated	yes
		Bedrooms	34	10.38mm laminated	yes
9 to 11	Building 1 Units	Living Kitchen Dining	31	6.38mm laminated	yes
		Bedrooms	34	10.38mm laminated	yes

Any locations not identified in the Table 18 shall require 4mm float for windows (minimum Rw 22) and 5mm toughened for sliding doors (minimum Rw 23).

9.1.2 Unit Wall Construction

All masonry and blockwork wall systems will comply with the minimum R_W of 45. For lightweight wall systems, we recommend the following:

- 1 layer of 9mm FC, 90mm timber stud with 75mm glasswool batts (density 11kg/m^3) and 2 layers of 13mm fire rated plasterboard.

9.1.3 Unit Roof Construction

For the roof systems, we recommend construction as follows:

- R_W 50 – The proposed concrete slab on the rooftops is predicted to achieve an R_W50.

9.2 Gym and Restaurant Façade Construction

9.2.1 Gym and Restaurant Glazing

The minimum glazing treatments presented in Table 19 are required to comply with the following:

- The minimum glass thickness specified shall not be reduced regardless of the R_w performance of the glass unless the glazier can provider a specific (non-generic) NATA Test report proving the proposed glazing system complies (the test report must be based on the same configuration proposed for the development). Note an estimation or calculated performance will not be accepted.
- If compliance cannot be achieved with the minimum R_w ratings, the glazing system shall be upgraded until compliance is achieved.
- Glazing specified with acoustic seals requires a seal that has been tested with a glazing system or door to achieve an Rw rating in accordance with AS/NZS ISO 717.1, mohair seals are not acceptable.
- The glazier shall provide NATA test reports on request to verify compliance with the minimum R_w ratings. Generic reports are not acceptable.

Table 19: Gym and Restaurant Glazing Treatments

Location	R_W Ratings			Glazing Thickness	Acoustic Seals
	Wall	Roof	Glazing		
Gym	35	35	31	6.38mm	Yes
Restaurant	35	35	31	6.38mm	Yes

9.2.2 Gym and Restaurant Wall Construction

The wall construction recommendations are included in Table 20 below. Note that these are not the only allowable methods of construction for the development, and alternative constructions to achieve the required R_W ratings may also be provided.

Table 20: Gym & Restaurant Wall Construction

Wall Rw	Minimum Wall Treatments
35	Masonry veneer wall at least 110mm thick, 90mm timber studs at 600mm centres, 20mm gap, 10mm plasterboard internal. OR 6mm fibre cement sheeting or sheet metal external, 90mm timber studs at 600m centres, 75mm glasswool insulation (11kg/m^3) or equivalent, 13mm plasterboard internal.

9.2.3 Gym and Restaurant Roof/Ceiling Construction

The roof/ceiling construction recommendations are included in Table 21 below. Note that these are not the only allowable methods of construction for the development, and alternative constructions to achieve the required Rw ratings may also be provided.

Table 21: Gym & Restaurant Roof Construction

Roof Rw	Minimum Roof Treatments
35	Sheet metal roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity.

9.2.4 Gym and Restaurant Entry Doors

Table 22: Gym & Restaurant Entry Door Construction

Door Rw	Minimum Gym Entry Door Construction
28	Fixed so as to overlap the frame or rebate of the frame, constructed of – (i) wood, particleboard or blockboard not less than 33mm thick; or (ii) compressed fibre reinforced sheeting not less than 9mm thick; or (iii) other suitable material with a mass per unit area not less than 24.4kg/m^2; or (iv) solid core timber door not less than 35mm thick fitted with full perimeter acoustically rated seals.

9.3 Alternative Ventilation

We recommend that the proposed gym, restaurant and units presented in Table 18 have the provision for an alternative ventilation system similar to air-conditioning or mechanical ventilation to allow doors and windows to be closed and compliance with AS3671 and NCC requirements.

9.4 Onsite Activities

Based on the predicted noise levels and subjective assessment of the site and surrounds, noise impacts at the receiver locations are predicted to comply with the assessment criteria on the condition the following management plans are implemented:

- Use of the pool area shall be limited to the day and evening periods, between 7am and 10pm.
- All gym and restaurant doors and windows are to be closed during operation.
- Deliveries and waste collection shall be limited to the daytime period, between 7am and 6pm.
- Amplified music within the restaurant and gym is to be limited to 80dB(A) measured at 1 metre from the speaker.
- Carpark and ramp finished surfaces should consist of materials which provide low tyre squeal characteristics. Any traversable drainage grates must be securely fastened.

9.4.1 Onsite Mechanical Plant

No information regarding mechanical services was available at the time of the assessment. We recommend that any new mechanical plant is designed to comply with the criteria stated in Section 6.2.2 with an assessment by qualified acoustic consultant to be conducted prior to installation.

9.5 Offsite Activities

Based on the predicted noise levels and subjective assessment of the site and surrounds, noise impacts at the nearest onsite receiver locations are predicted to comply with the assessment criteria. It is noted that façade treatments required for aircraft noise are predicted to be sufficient for offsite activity noise associated with nearby industrial land uses if any potential exceedance occur within the proposed development.

10. Conclusion

An aircraft and environmental noise assessment was conducted for the proposed residential development to be located at Lot 18A Macarthur Avenue, Hamilton. The development is predicted to satisfy all the relevant noise assessment requirements on the condition that the recommendations in Section 9 are implemented.

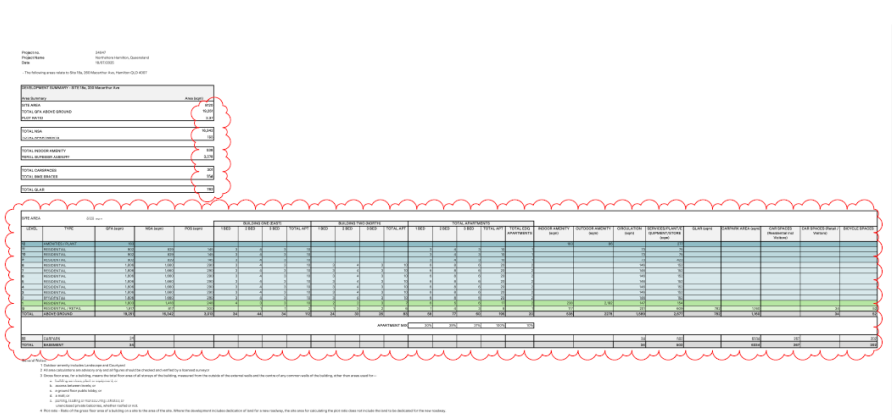
If you should have any queries, please do not hesitate to contact us.

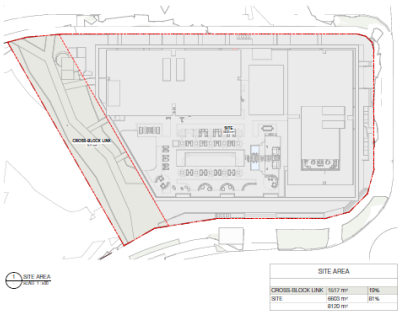
Report Prepared By

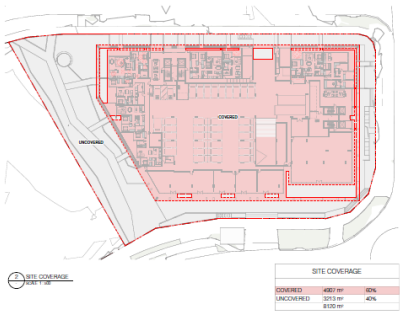
David Dadd B. Applied Sc. MAAS
Senior Acoustic Consultant
acousticworks)))

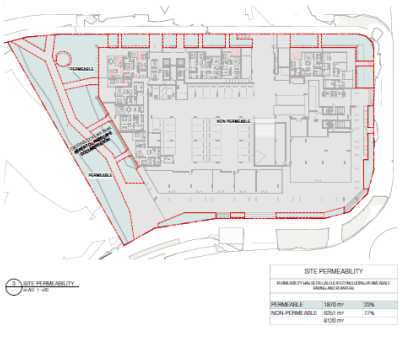
11. Appendices

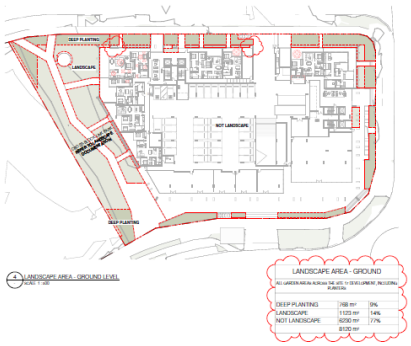
11.1 Development Plans

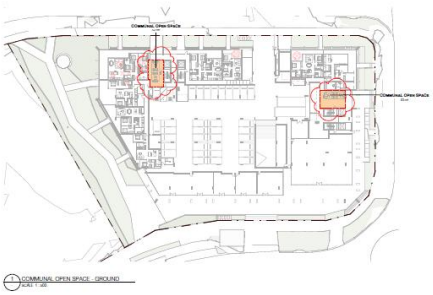


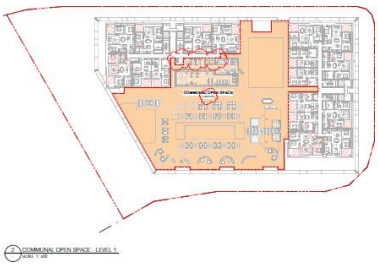


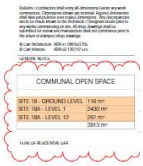


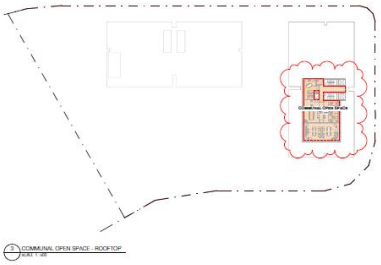





COMMUNAL OPEN SPACE
COMMUNAL OPEN SPACE
1 COMMUNAL OPEN SPACE - GROUND

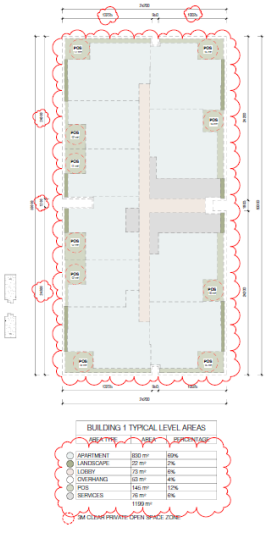

COMMUNAL OPEN SPACE
2 COMMUNAL OPEN SPACE - LEVEL 1


COMMUNAL OPEN SPACE
SITE 18 - GROUND LEVEL 110 m²
SITE 18A - LEVEL 1 2430 m²
SITE 18A - LEVEL 12 282 m²
2822.5 m²

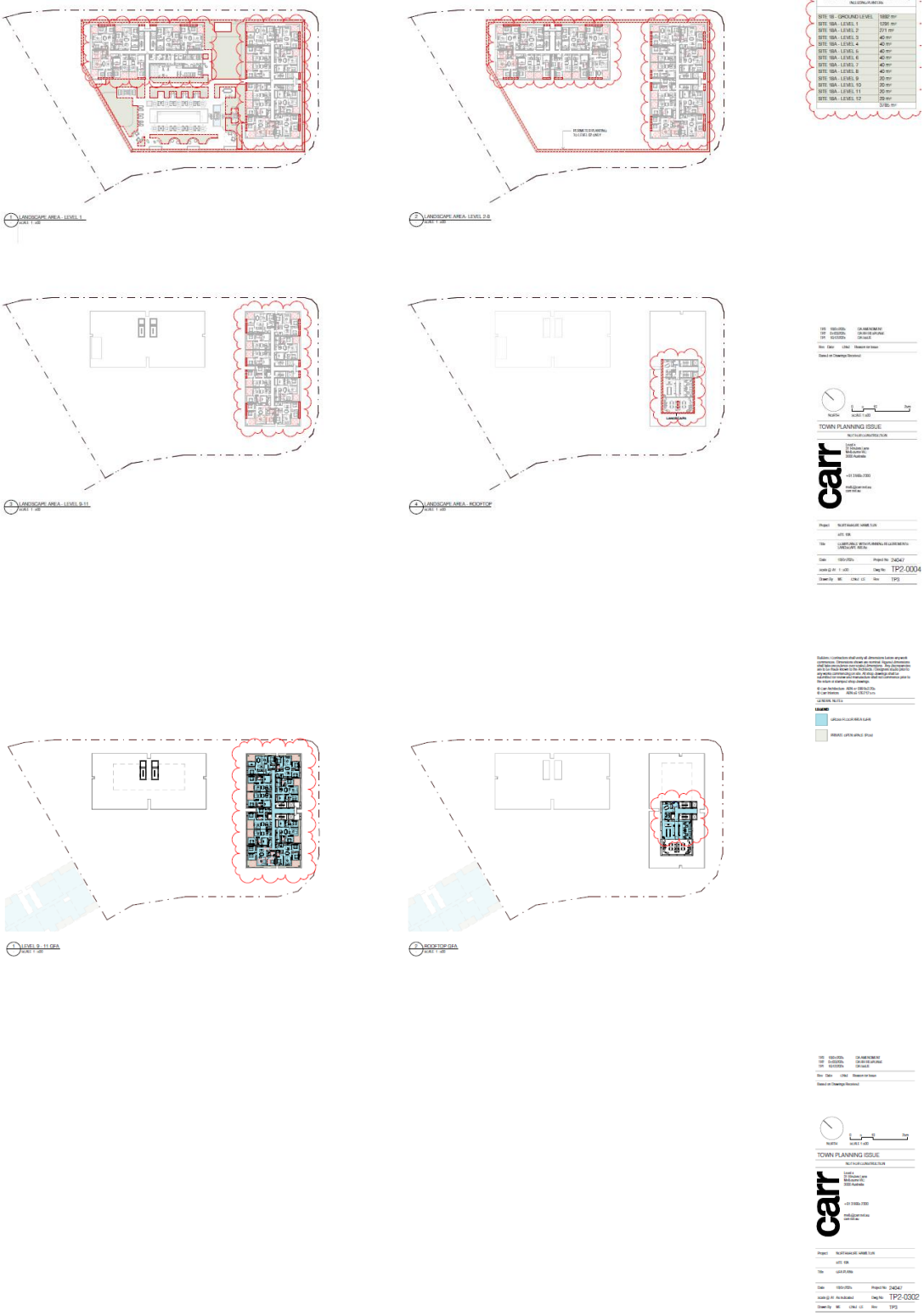

COMMUNAL OPEN SPACE
3 COMMUNAL OPEN SPACE - ROOFTOP


TOWN PLANNING ISSUE
carr
TP2-0005

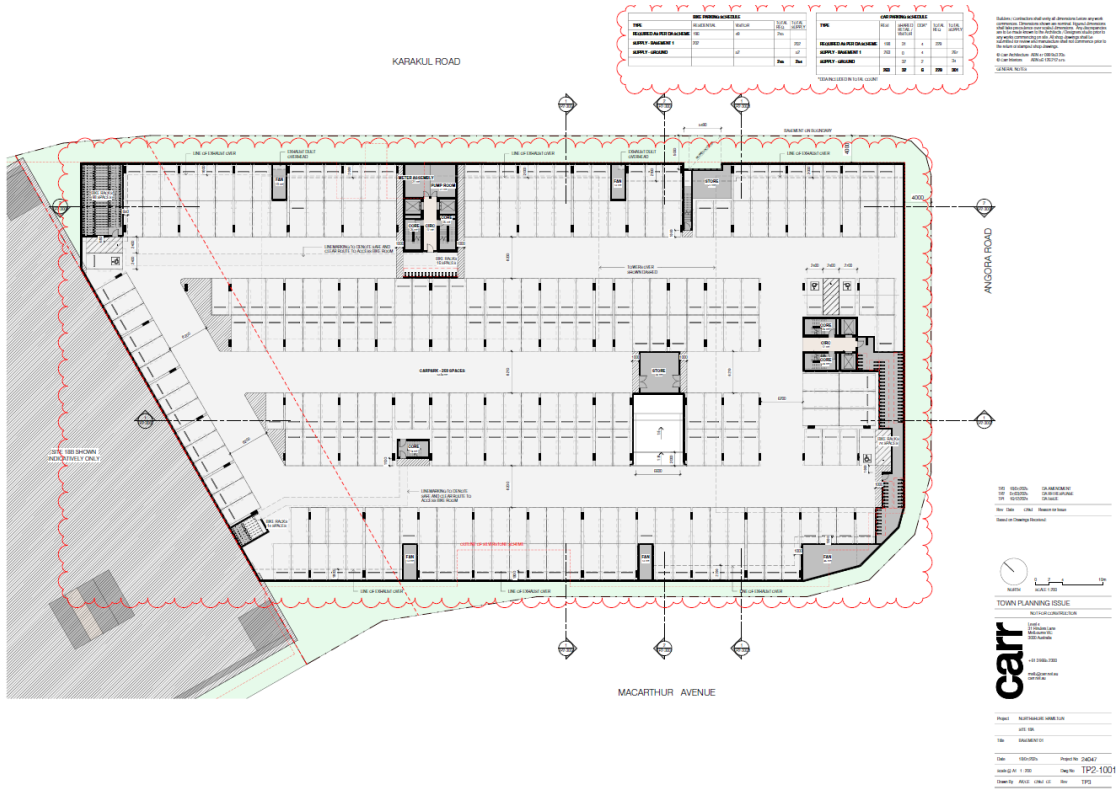

BUILDING 2 TYPICAL LEVEL AREAS
AREA TYPE AREA PERCENTAGE
APARTMENT 600 m² 69%
LANDSCAPE 20 m² 2%
LOBBY 73 m² 6%
OVERHANG 53 m² 4%
POS 146 m² 12%
SERVICES 76 m² 6%
1128 m²
3M CLEAR PRIVATE OPEN SPACE ZONE

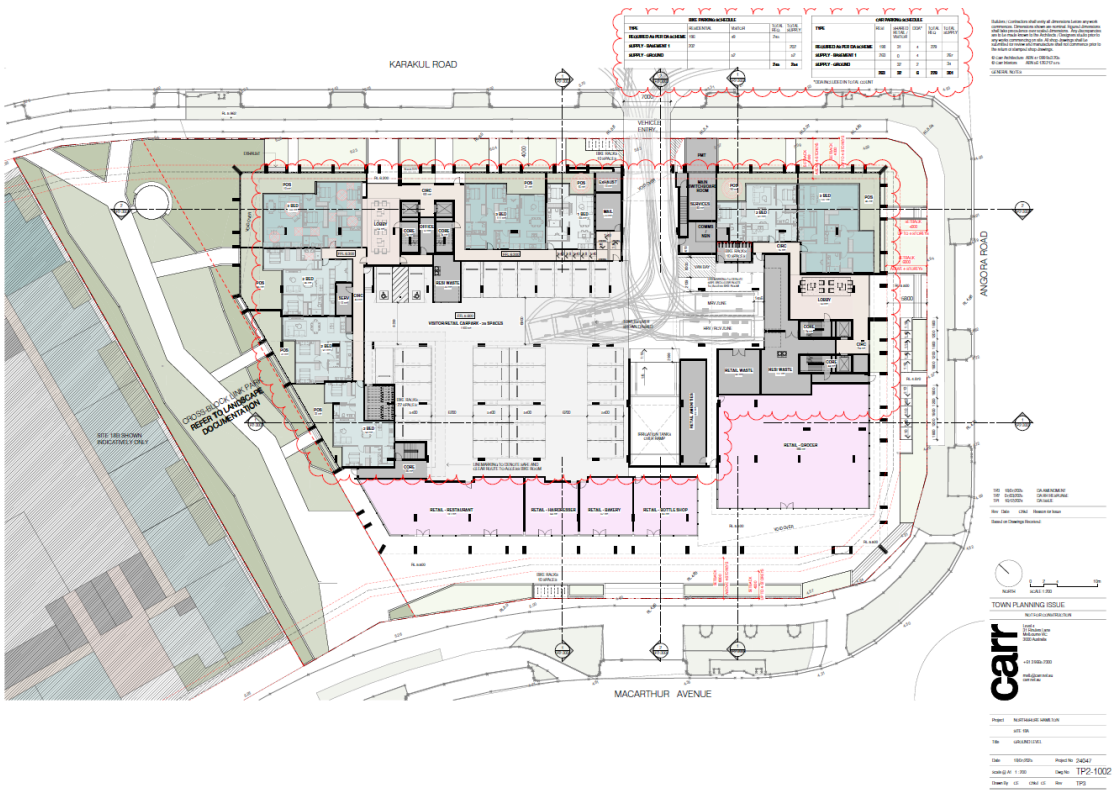

BUILDING 1 TYPICAL LEVEL AREAS
AREA TYPE AREA PERCENTAGE
APARTMENT 600 m² 69%
LANDSCAPE 22 m² 2%
LOBBY 73 m² 6%
OVERHANG 53 m² 4%
POS 146 m² 12%
SERVICES 76 m² 6%
1128 m²
3M CLEAR PRIVATE OPEN SPACE ZONE

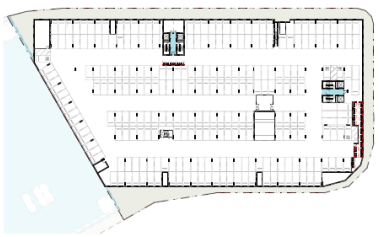

TOWN PLANNING ISSUE
carr
TP2-0006


LANDSCAPE AREA - WHOLE BUILDING
TOWN PLANNING ISSUE
carr
TP2-0004
TOWN PLANNING ISSUE
carr
TP2-0302


KARAKUL ROAD
ANGORA ROAD
MACARTHUR AVENUE
BUILDING TWO
BUILDING ONE
COMMUNAL TERRACE
REFER LANDSCAPE ARCHITECT FOR MORE DETAIL
CROSSOVER, LINK PARK
REFER TO LANDSCAPE DOCUMENTATION
TOWN PLANNING ISSUE
carr
TP2-1003

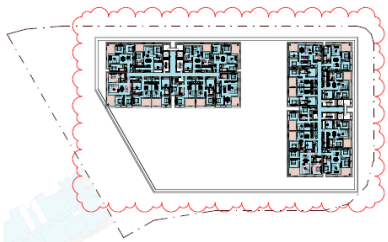

KARAKUL ROAD
ANGORA ROAD
MACARTHUR AVENUE
TOWN PLANNING ISSUE
carr
TP2-1001




1 BASEMENT GFA

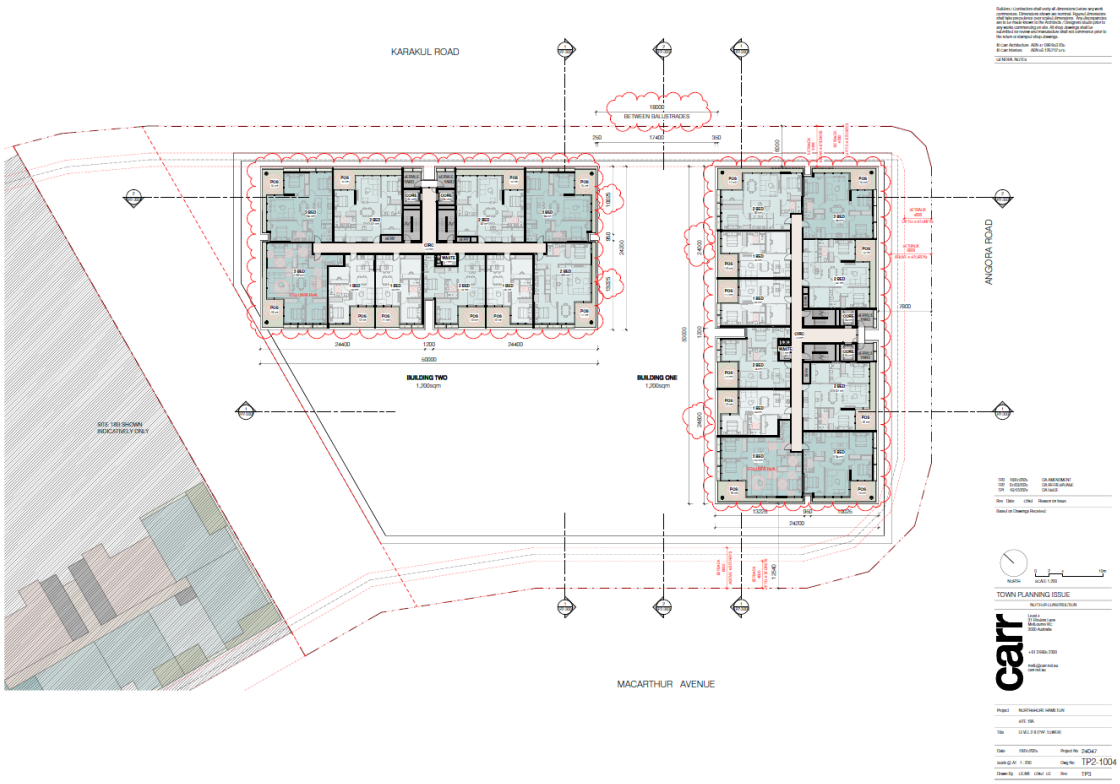

2 GROUND LEVEL GFA

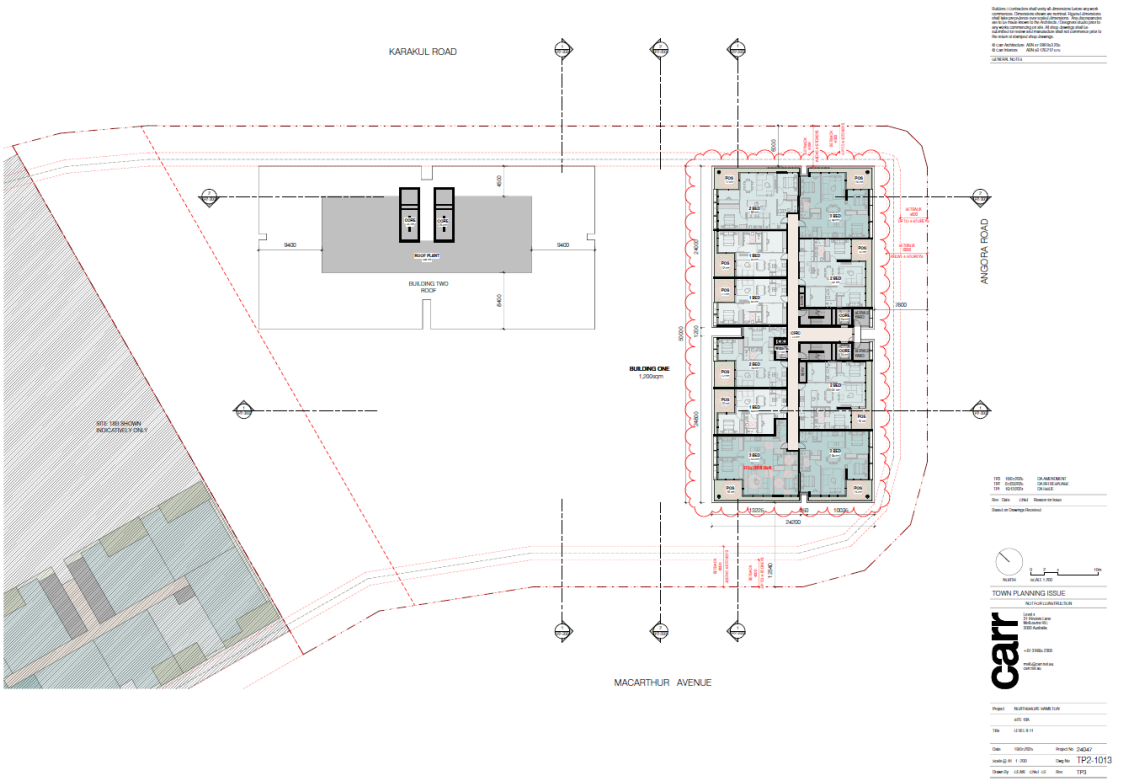

3 LEVEL 1 PODIUM GFA


4 LEVEL 2-8 GFA


1.2M WALKWAY CLEARANCE
3M X 3.3M LIVING AREA
2.2&3M X 2.2M BATHROOM
3.5&M X 3.1M BEDROOM
CLEARANCES
TOWN PLANNING ISSUE
carr
TP2-0402

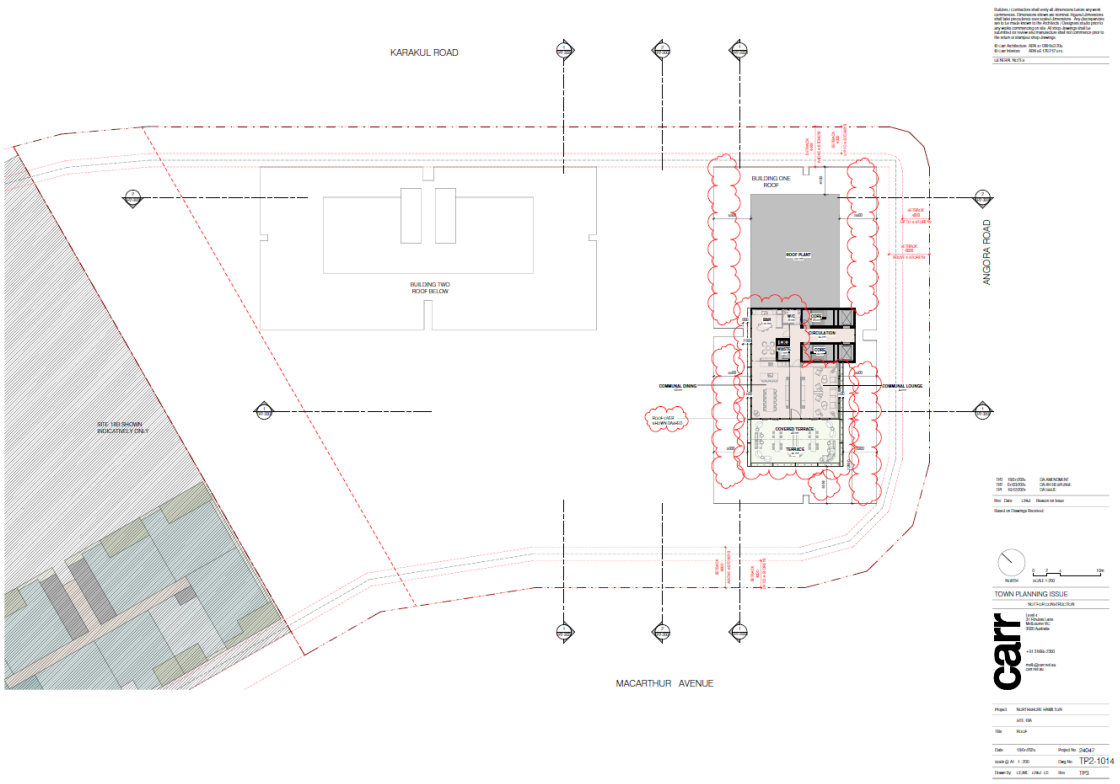

TYPE 2
TYPE 1
TYPE 1
TYPE 1
TYPE 1
TYPE 1
TOWN PLANNING ISSUE
carr
TP2-0401

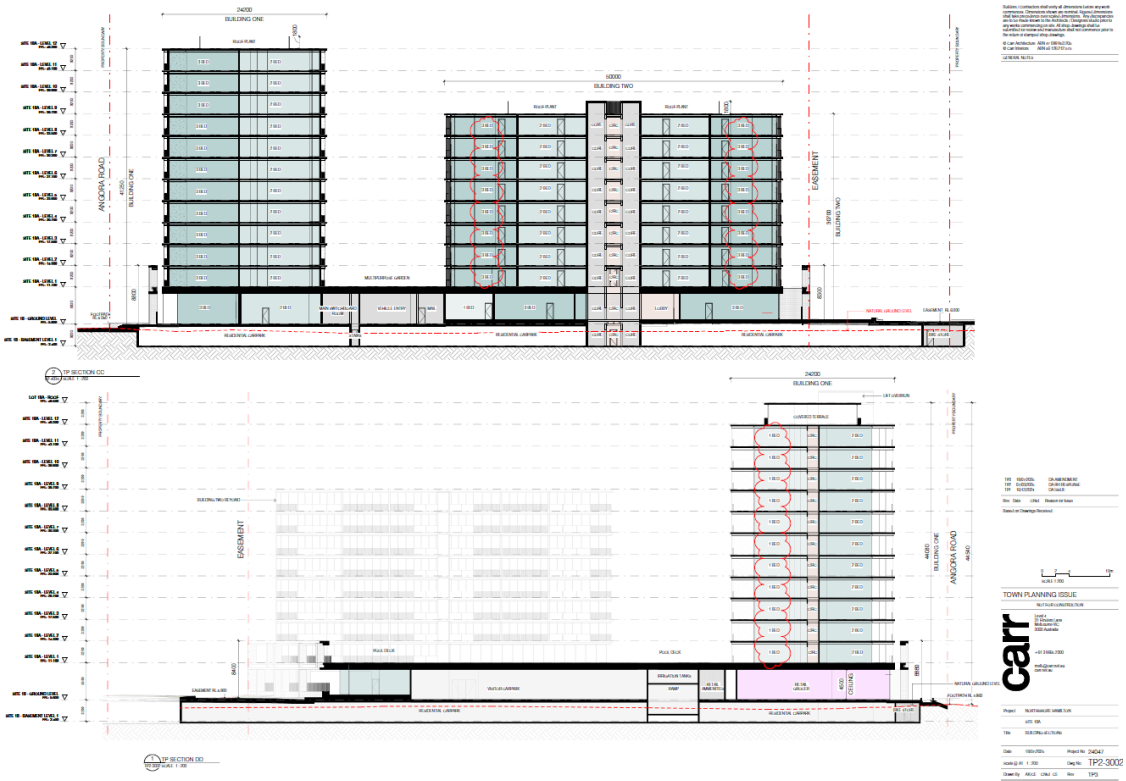

KARAKUL ROAD
BETWEEN BALUSTRADES
ANGORA ROAD
BUILDING TWO
1,200sqm
BUILDING ONE
1,200sqm
SITE LIES SHOWN INDICATIVELY ONLY
MACARTHUR AVENUE
TOWN PLANNING ISSUE
carr
TP2-1004

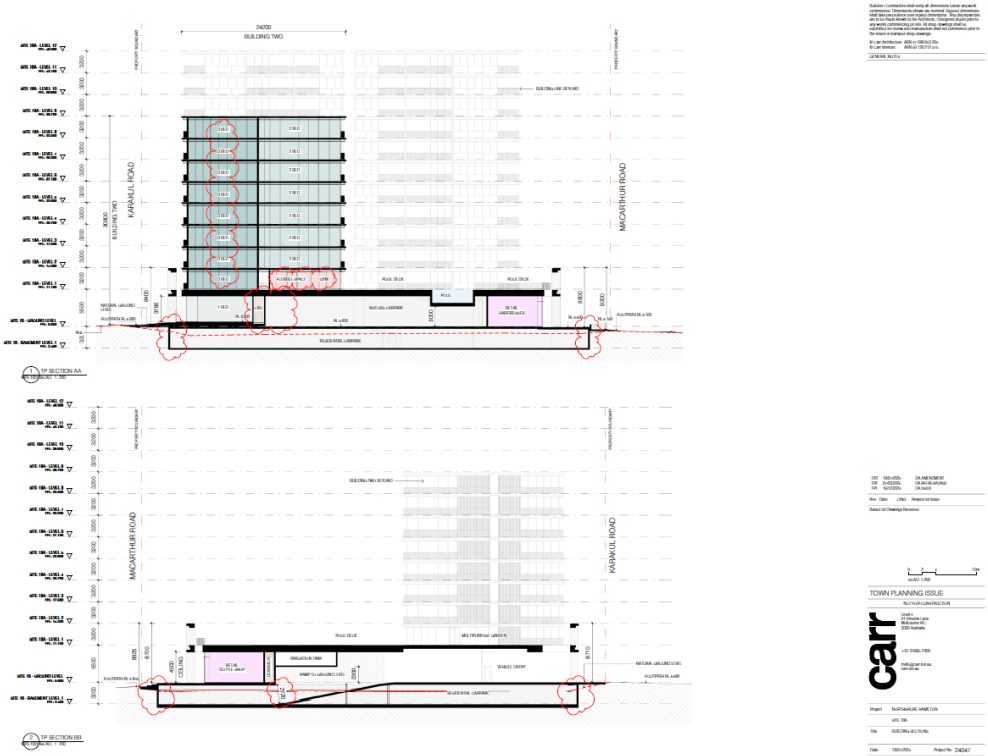

KARAKUL ROAD
ANGORA ROAD
BUILDING TWO
ROOF
BUILDING ONE
1,200sqm
SITE LIES SHOWN INDICATIVELY ONLY
MACARTHUR AVENUE
TOWN PLANNING ISSUE
carr
TP2-1013


1 PROPOSED EAST ELEVATION
2 PROPOSED WEST ELEVATION
TOWN PLANNING ISSUE
carr
TP2-2002

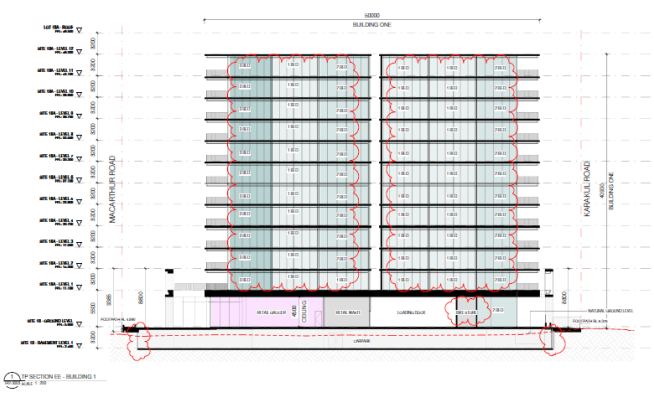

1 PROPOSED NORTH ELEVATION
2 PROPOSED SOUTH ELEVATION
TOWN PLANNING ISSUE
carr
TP2-2001


KARAKUL ROAD
BUILDING ONE ROOF
BUILDING TWO ROOF BELOW
ROOF PLANT
ANGORA ROAD
COMMUNAL DINING
COMMUNAL LOUNGE
COVERED TERRACE
TERRACE
MACARTHUR AVENUE
TOWN PLANNING ISSUE
carr
TP2-1014


BUILDING ONE
BUILDING TWO
ANGORA ROAD
EASEMENT
TP SECTION CC
TP SECTION DD
TOWN PLANNING ISSUE
carr
TP2-3002

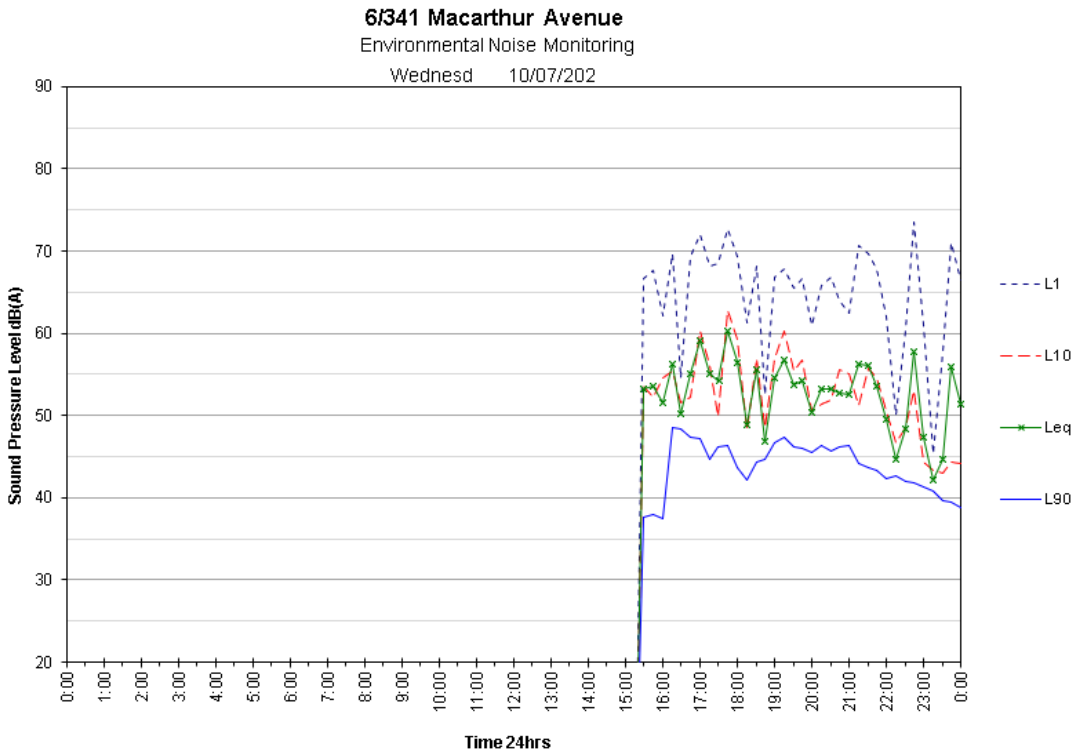

BUILDING TWO
KARAKUL ROAD
MACARTHUR ROAD
TP SECTION AA
TP SECTION BB

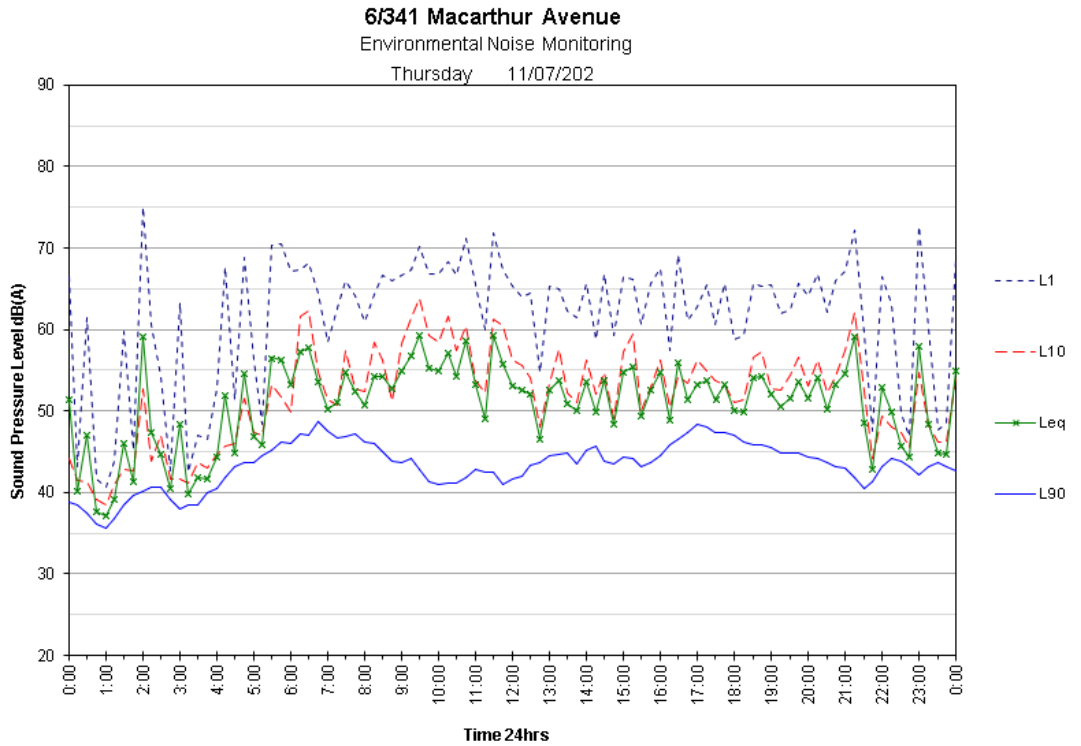

TOWN PLANNING ISSUE
carr
TP2-3001

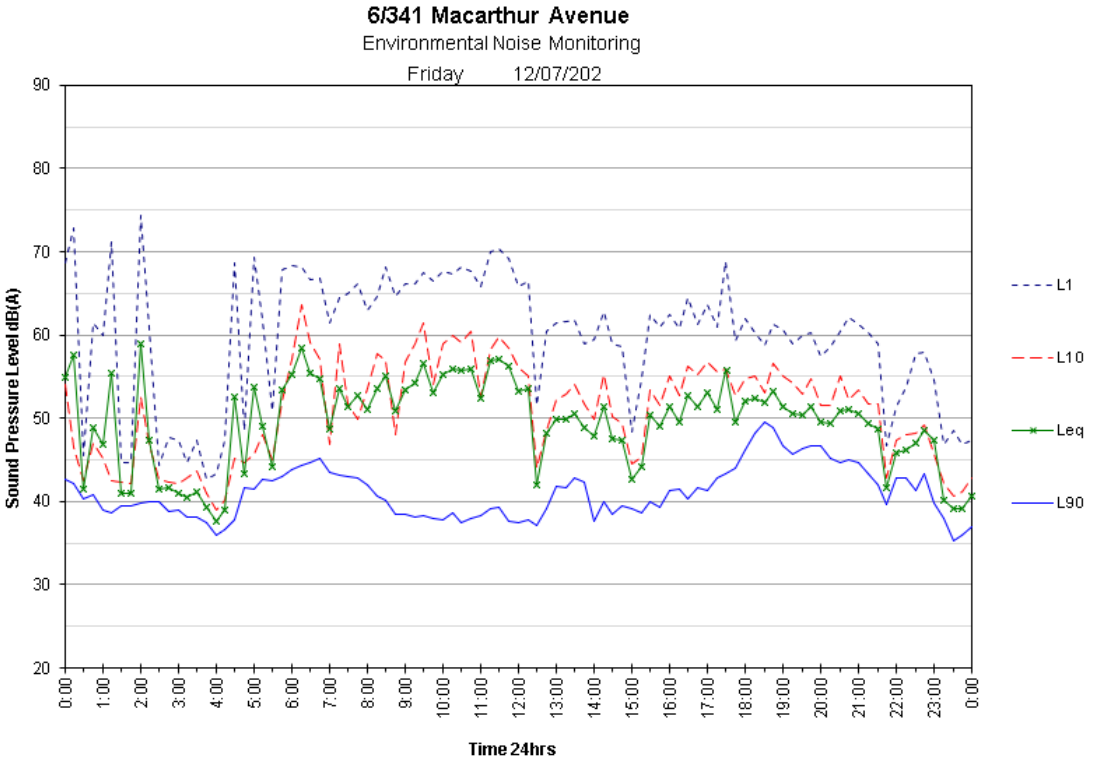

BUILDING ONE
MACARTHUR ROAD
KARAKUL ROAD
TP SECTION EE - BUILDING 1

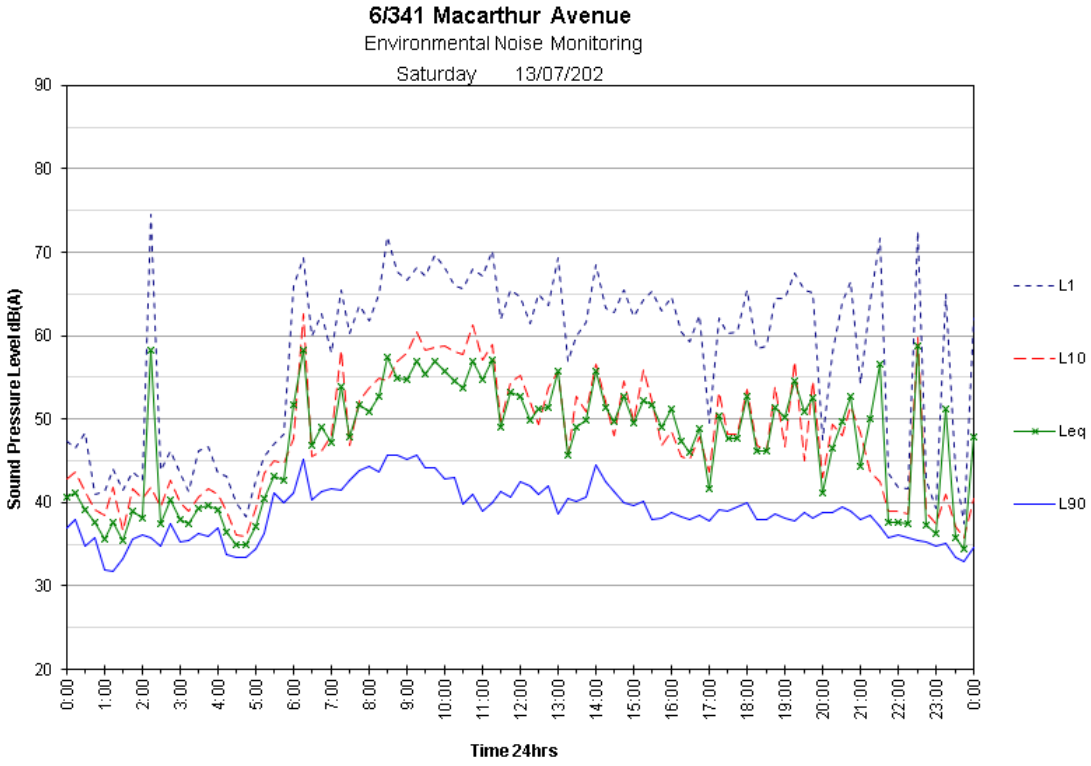

TOWN PLANNING ISSUE
carr
TP2-3003

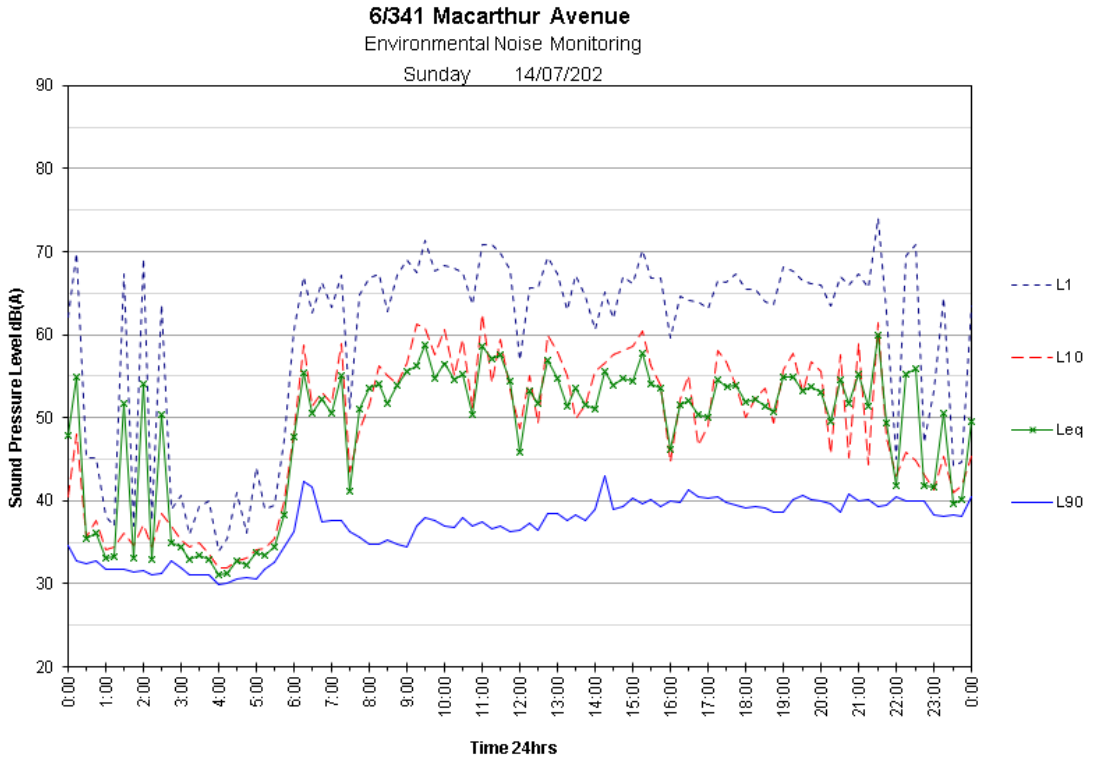
11.2 Noise Monitoring Charts

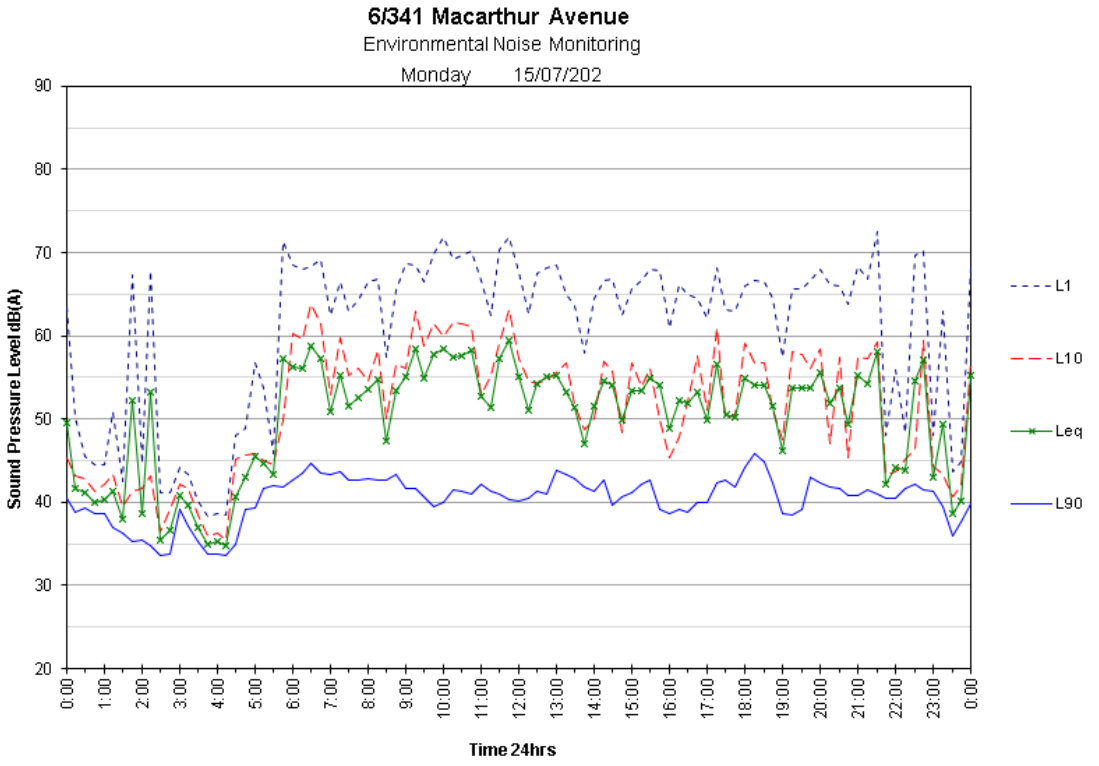


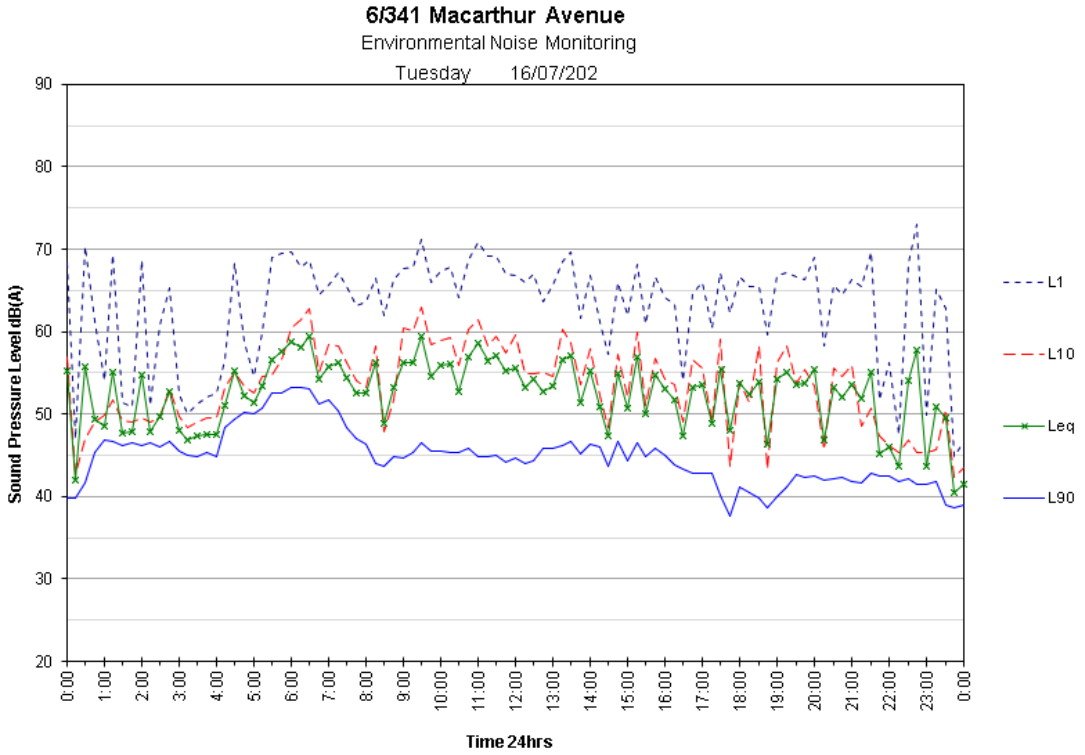


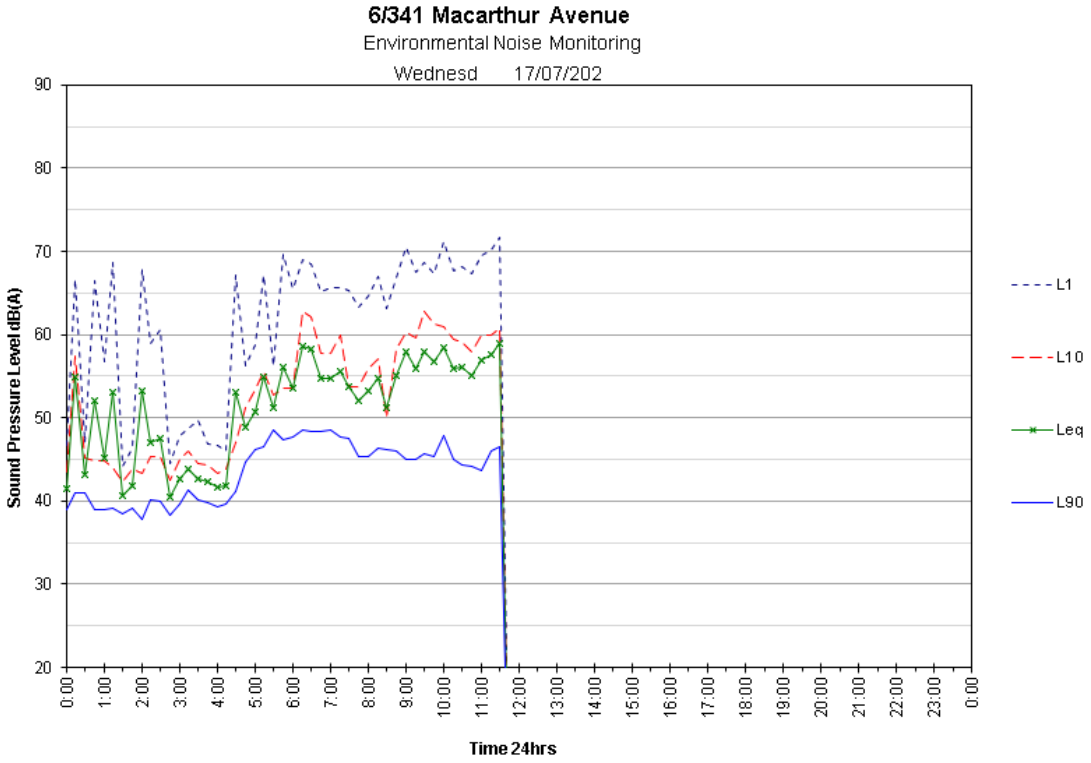

6/341 Macarthur Avenue
Environmental Noise Monitoring
Friday 12/07/202
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


6/341 Macarthur Avenue
Environmental Noise Monitoring
Saturday 13/07/202
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


6/341 Macarthur Avenue
Environmental Noise Monitoring
Sunday 14/07/202
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


6/341 Macarthur Avenue
Environmental Noise Monitoring
Monday 15/07/202
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


6/341 Macarthur Avenue
Environmental Noise Monitoring
Tuesday 16/07/202
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90


6/341 Macarthur Avenue
Environmental Noise Monitoring
Wednesd 17/07/202
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
Leq
L90