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F&B Tenancy Acoustic Assessment

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1 INTRODUCTION

This report has been prepared to assess noise impacts associated from future licenced food and beverage tenancies to be located at 711 Hunter Street, Newcastle West development.

This report will:

- Identify relevant noise emission criteria applicable to the tenancies.
- Identify nearby noise sensitive receivers and any project site noise sources with the potential to adversely impact nearby developments.
- Predict noise emissions and assess them against established acoustic criteria.
- If necessary, determine building and/or management controls necessary to ensure ongoing compliance with noise emission goals.

The following documents have been used in accordance with this assessment:

- Newcastle Development Control Plan (DCP) 2012;
- NSW EPA – 'Noise Policy for Industry' ("NPfI") October 2017; and
- NSW Liquor & Gaming noise emission guidelines.

The subject site and local context are indicated in Figure 2.

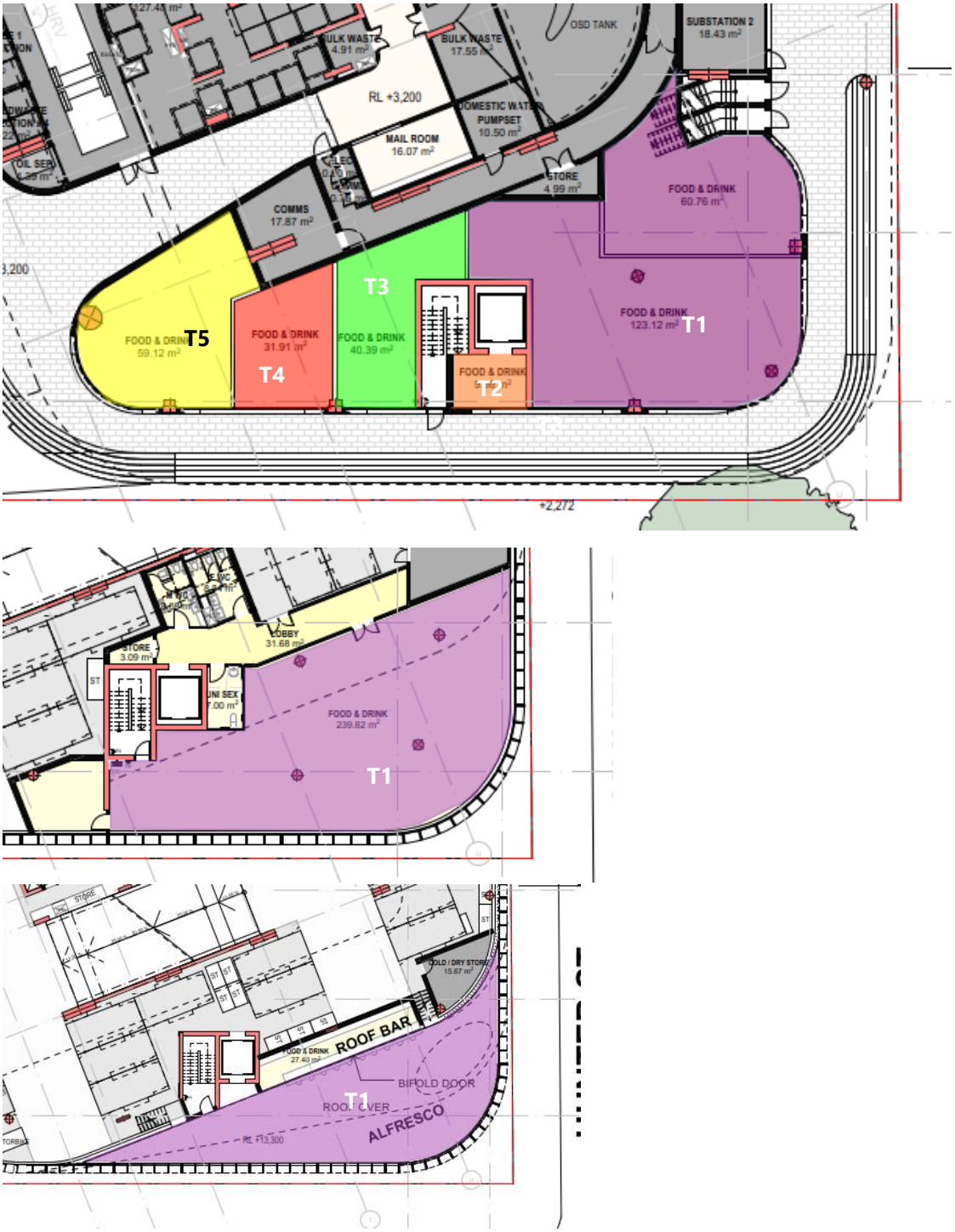
This assessment is conducted using the architectural drawings prepared by Plus Architecture, job number 20623, dated 7/11/2022.

The report has been prepared for the sole purpose of a development application assessment and should not be used or relied on for any other purpose.

2 SITE DESCRIPTION

The project site is located at 711 Hunter Street, Newcastle East. At this stage, usage and operators are unknown and fit-out layouts and capacities have not been finalised. As such, capacities have been based on square meterage, with an allowance of one person per square metre as per BCA requirements. This represents a worst-case scenario and is likely to be conservative given the fit-out will reduce standing floor area currently shown on plans.

The primary noise emitting tenancy has been identified as the 3-level corner tenancy (T1), which is designated as a licenced venue offering food and beverage and live entertainment. The figures below show the location of the proposed tenancies within the development.



Figures 1 a,b,c – Proposed F&B Tenancies – North Tower

Figure 1d – Proposed F&B Tenancies – SouthTower

2.1 SENSITIVE RECEIVERS

The following table lists the nearest/potentially most impacted sensitive receivers surrounding the site. An aerial photo of the site indicating nearby noise sensitive receivers and measurement locations is presented in Figure 2.

Table 1 – Sensitive Receivers

Receiver (Refer Figure 1)	Receiver Type	Comment
R1	Residential/Commercial	Commercial development and residential tower currently under construction to the east
R2	Residential/Commercial	Commercial development and residential tower north of the site
C1	Commercial	Commercial tower currently under construction bounding the site to the west.
C2	Commercial	Commercial development to the south
C3	Commercial	Commercial development to the south/south west
P1	Passive Recreation	Birdwood Park to the south west

In addition to external receivers, this assessment will consider residents within the development, to ensure the acoustic amenity of future residents is maintained. The worst affected residents are those on level 5 of the development.

Figure 2 – Site Plan Showing Local Context

- Residential Receiver
- Commercial Receiver
- Site

3 AMBIENT NOISE MONITORING

3.1 NOISE DESCRIPTORS

Ambient noise constantly varies in level from moment to moment, so it is not possible to accurately determine prevailing noise conditions by measuring a single, instantaneous noise level.

To quantify ambient noise, a 15 minute measurement interval is typically utilised. Noise levels are monitored on a continuous basis over this period, and statistical and integrating techniques are used to characterise the noise being measured.

The principal measurement parameters are:

L_{eq} - 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 noise impact as it closely corresponds with how humans perceive the loudness of steady state and quasi-steady state noise sources (such as traffic noise).

L_{90} – This is commonly used as a measure of the background noise level as it represents the noise level heard in the quieter periods during the measurement interval. The L_{90} parameter is used to set noise emission criteria for potentially intrusive noise sources since the disturbance caused by a noise source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

L_{10} is used in some guidelines to measure noise produced by an intrusive noise source since it represents the average of the loudest noise levels produced at the source. Typically, this is used to assess noise from licenced venues.

L_{max} is the highest noise level produced during a noise event, and is typically used to assess sleep arousal impacts from short term noise events during the night. It is also used to assess internal noise levels resulting from aircraft and railway ground vibration induced noise.

L_1 is sometimes used in place of L_{max} to represent a typical noise level from a number of high level, short term noise events.

3.2 AMBIENT NOISE MEASUREMENTS

Attended and unattended background noise measurements were obtained in order to characterise the existing noise environment. Details of the noise measurements including measurement equipment, locations and conditions are provided in the DA Acoustic Assessment (ref: 20220898.1/1910A/R1/RF, dated 19/10/22).

The following table summarises the measured RBL's for surrounding residential receivers.

Table 2 – Summary of Background Noise Levels

Location	Rating Background Noise Level dB(A)$L_{90(period)}$			
	Daytime (7:00am to 6:00pm)	**Evening (6:00pm – 10:00pm)**	**Night (10:00pm – 12:00am)**	**Night (10:00pm - 7:00am)**
Surrounding residential	59	52	44	43

Background noise spectra were also measured on site and adjusted for the day/evening/night periods. The following table presents the night-time L_{90} spectrum.

Table 3-Background Noise Level Spectrum dB(A) L_{90}

	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Background Noise Spectrum	59	49	46	43	41	40	35	27	20	44

4 PROJECT CRITERIA

Noise emission goals for the assessment of the general operation of the venue have been determined in accordance with the requirements of the following:

- Newcastle Development Control Plan (DCP) 2012;
- Liquor and Gaming NSW;
- NSW EPA 'Noise Policy for Industry' (NPfI) 2017.

4.1 NEWCASTLE DCP 2012

The Newcastle DCP is silent on noise emissions from the operation of licenced venues.

4.2 NSW LIQUOR AND GAMING

When assessing noise emissions from licensed premises, noise emissions must comply with the acoustic requirements generally imposed by the NSW LG. These guidelines relate to noise generated by patrons and by music. The requirements are set out below:

- *The L_{10} noise level emitted from the premises shall not exceed 5dB above the background L_{90} sound level in any Octave Band Centre Frequency (31.5kHz to 8kHz inclusive) between the hours of 7.00am to 12.00 midnight when assessed at the boundary of the nearest affected residential premises.*

- *L_{10} noise level emitted from the premises shall not exceed the background L_{90} sound level in any Octave Band Centre Frequency (31.5kHz to 8kHz inclusive) after midnight when assessed at the boundary of the nearest affected residential premises.*

- *After midnight, noise emissions from the Place of Public Entertainment are to be inaudible within any habitable rooms in nearby residential properties.*

The following assessment criteria have been determined based on the noise levels measured. These apply when measured outside the open window of a residential facade. The most sensitive period will be between 10pm and 12am as this is the quietest period in which the premises will operate.

We note that the criteria applies to each individual tenancy.

Table 4 – NSW Liquor & Gaming Noise Emission Objectives Criterion (dB(A) $L_{10,15min}$) – surrounding and internal residents

Time	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
7:00am – 6:00pm (BG+5dB)	67	69	66	63	61	60	55	47	40	**64**
6a:pm – 10:00pm (BG+5dB)	60	62	59	56	54	53	48	40	33	**57**
10:00pm – 12:00am (BG+5dB)	52	54	51	48	46	45	40	32	25	**49**

4.3 NSW EPA NOISE POLICY FOR INDUSTRY 2017 (MECHANICAL PLANT)

Criteria to assess noise emissions from the mechanical plant associated with the proposed tenancies have been developed using the NPfI.

The DA Acoustic Assessment (ref: 20220898.1/1910A/R1/RF, dated 19/10/22) summarises the ambient noise data obtained, and the derivation of trigger levels for each of the receivers. The criteria are summarised in the following table.

Table 5 – Project Trigger Levels

Receiver Location	Period	Trigger Noise Level (dB(A) $L_{eq,15min}$)
Residential development surrounding site	Day (7am-6pm)	58
	Evening (6pm-10pm)	48
	Night (10pm-7am)	43 **Max Event:** 48 L_{eq} 58 L_{max}
	Night Shoulder Period (10pm-12am)	43 **Max Event:** 49 L_{eq} 59 L_{max}
Commercial	When in use	63

5 NOISE EMISSION ASSESSMENT

This section of the report examines the potential noise impacts from the licenced venue. The main potential sources will be patron noise within internal areas and amplified music. Noise from the various activities associated with the proposal has been predicted at the potentially affected receivers as identified in Section 2.

The noise predictions are based on typical noise levels likely to be generated within the venue. These emission levels are corrected for distance attenuation, barrier effects, transmission loss of partitions (where applicable) and the orientation of the respective receivers to determine the resultant noise level at the potentially affected properties.

5.1 ASSUMPTIONS ADOPTED WITH RESPECT TO NOISE EMISSION CALCULATIONS

Predicted noise levels within the venue are made based on the following assumptions:

- The recommendations in Section 6 are implemented.
- Venue capacities as follows:
    - Ground floor internal area:
        - Approximately 180 people (based on 1 person per square metre of seating area).
    - Ground floor outdoor area:
        - Approx 15 people (based on 1 person per square metre of seating area).
    - Level 2 internal area:
        - Approximately 240 people (based on 1 person per square metre of seating area).
    - Level 3 rooftop bar:
        - Day Time (7am to 6pm): 200 people
        - Evening Time (6pm-10pm): 100 people

- That music sound pressure levels are controlled as follows:
    - Up to 75 dB(A) L_{10} at all operation times in external areas up to 10pm.
    - Up to 90 dB(A) L_{10} at all operation times in internal areas in T1.
    - Music sound spectrums as follows:

Noise Source	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Amplified background Music (external)	71	77	73	72	71	66	57	59	75
Amplified live music (internal)	103	101	91	84	81	79	78	74	90

- That typical patron vocal sound power levels are:
    - Up to 77dB(A)L_{10}, 1 in 2 speaking (raised voice)
    - A typical sound spectrum of a patron as follows:

Noise Source	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Raised Voice	62	70	70	76	73	68	59	47	77

5.2 PREDICTED NOISE EMISSIONS

Predicted noise levels from the primary T1 tenancy are presented below. Predictions assume a single tenant operates over three levels. Noise predictions have been made to the nearest external residents being the 1 National residential apartments under construction to the east across National Park Street. Compliance at this receiver will result in compliance at all other external receivers located farther from the site due to the inherent additional distance attenuation and shielding from surrounding buildings. In addition, predictions have been made to the nearest residents within the development site located on level 5.

Table 6- Predicted Noise Emissions to R2

Time Period	Frequency	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Day (7am-6pm)	Predicted Noise Levels dB L_{10}	55	57	55	53	59	56	51	42	31	60
	Criteria dB L_{10}	67	69	66	63	61	60	55	47	40	64
	Compliance	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Evening (6pm-10pm)	Predicted Noise Levels dB L_{10}	57	59	55	51	54	53	48	39	29	57
	Criteria dB L_{10}	60	62	59	56	54	53	48	40	33	57
	Compliance	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Night (10pm-12am)	Predicted Noise Levels dB L_{10}	52	54	49	36	33	29	23	<10	<10	45
	Criteria dB L_{10}	52	54	51	48	46	45	40	32	25	46
	Compliance	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Table 7- Predicted Noise Emissions to Internal Residents Level 5

Time Period	Frequency	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Day (7am-6pm)	Predicted Noise Levels dB L_{10}	43	45	45	42	45	39	31	23	11	44
	Criteria dB L_{10}	67	69	66	63	61	60	55	47	40	64
	Compliance	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Evening (6pm-10pm)	Predicted Noise Levels dB L10	42	44	43	39	42	36	28	20	<10	41
	Criteria dB L10	60	62	59	56	54	53	48	40	33	57
	Compliance	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Night (10pm-12am)	Predicted Noise Levels dB L10	41	43	35	19	15	<10	<10	<10	<10	22
	Criteria dB L10	52	54	51	48	46	45	40	32	25	49
	Compliance	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

5.2.1 Remaining Tenancies

Noise emissions from the remaining tenancies (T2-T9), based on internal and external floor area are expected to be significantly lower than those from T1, and as such, provided the recommendations in Section 6 are implemented, will comply with NSW LG noise emission criteria should they be leased as licensed food and beverage premises.

5.3 MECHANICAL PLANT

Detailed acoustic design of mechanical plant cannot be undertaken at this preliminary stage as plant selections and locations are not finalised. Cumulative assessment of plant noise with other noise sources is recommended when conducting the acoustic design of plant items.

Compliance with the requirements of NSW EPA will be achieved, provided that detailed acoustic review of new plant items is undertaken once selected and standard acoustic treatments (such as in-duct attenuation, barriers, appropriate location of plant items etc) are adopted.

6 RECOMMENDATIONS

Building Controls:

- Minimum 10.38mm laminated glazing (min Rw 35) to be installed to facades of all food and beverage tenancies.
- Underside of awnings to external dining areas to have absorptive lining with minimum NRC of 0.8.

Management Controls:

- Venue capacities as follows:

  T1 Multistorey tenancy:

  - Ground floor internal area:
    - Approximately 180 people (based on 1 person per square metre of floor area).
  - Ground floor outdoor area:
    - Approx 15 people (based on 1 person per square metre of floor area).
  - Level 2 internal area:
    - Approximately 240 people (based on 1 person per square metre of floor area).
  - Level 3 rooftop bar:
    - Day Time (7am to 6pm): 200 people
    - Evening Time (6pm-10pm): 100 people

  T2-T9

  - Internally:
    - 1 person per square metre of floor area.
  - Outdoor area:
    - 1 person per square metre of floor area. Assumes 1 metre wide seated area around tenancies.

- Operating hours as follows:
    - External areas to be closed at 10pm except for ground floor outdoor area of multistorey tenancy (T1) which may operate until midnight.
    - Internal areas may operate until midnight.
- Doors and windows to remain closed at all times except for patron ingress/egress.
- Management should ensure that patrons depart the premises in a prompt and orderly manner at closing times.
- Prominent notices shall be placed to remind patrons that a minimum amount of noise is to be generated when leaving the premises.
- Speakers are to be vibration isolated using Embelton NRD mounts.
- Music sound pressure levels to be controlled as follows:

    - Background music in external areas to be limited to 75dB(A) L_{10} uniform sound pressure level during all operational hours when use of the terrace is permitted.

    - Background music limited to 75dB(A) L_{10} uniform sound pressure level may be played internally in tenancies T2-T9 during all operating hours

    - Live music permitted within internal areas of multistorey tenancy. To be limited to 90 dB(A) uniform internal sound pressure level during all operational hours measured at any point 1.5m from an external window or door.

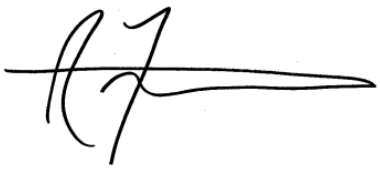
7 CONCLUSION

Acoustic Logic has assessed noise impacts associated with the proposed licenced food and beverage tenancies at 711 Hunter Street, Newcastle West.

Provided that the recommendations in Section 6 of this report are adopted, noise emissions will comply with NSW LG criteria for licenced/entertainment venues as well as noise emission requirements of the NSW EPA's NPfI 2017.

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

Yours faithfully,



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