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Acoustic Environmental & Impact Assessment Report

For proposed Polish Club



at

No. 73-75 Norton St, Ashfield

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1.0 INTRODUCTION

Acoustic, Noise & Vibration Solutions Pty Ltd has been commissioned to prepare an acoustic impact assessment for the proposed Ashfield Polish Club located at No. 73-75 Norton St, Ashfield (Figure 1 – Site Location).

This report has been prepared to form part of the development application to be submitted to the Inner West Council and provides supporting design and assessment information relating to the noise issues associated with the Club development.

The existing Polish Club is currently located at No. 73-75 Norton Street in the suburb of Ashfield. The existing Polish club will be demolished in order to construct a multi-storey mixed use development. The architectural plans by Red Design Group & Nordan Jago Architects for the proposed development comprises:

- Three (3) levels of basement parking, accommodating for residents & club patrons;
- Relocated Polish Club and facilities associated on ground floor; and,
- Seven (7) storeys of residential apartments with a total of eighty-eight (88) apartments.

1.1 SCOPE OF REPORT

Part 1 of the following report will assess the noise impact from the operation of the Polish Club on the surrounding residential receivers, including the proposed residential units to be located above the club.

The report will assess noise including but not limited to the following:

- Patron noise;
- Entertainment noise (live music);
- Noise from gaming areas;
- Noise from proposed mechanical plant & equipment; and,
- Noise from the use of the Club's loading dock.

As per our calculations and the acoustical study below, noise produced by the operation of the Polish Club will comply with the requirements of the NSW Environmental Protection Authority (EPA), NSW Noise Policy for Industry (2017), NSW Office of Liquor, Gaming & Racing (OLGR) noise recommendations, and Inner West Council requirements, provided all noise control items in Section 7 of this report are adhered to.

This commission involves the following:

- Inspect the site and environs.
- Measure the background noise levels at critical locations and times.



- Prepare an Environmental Noise Impact Report.
- Establish acceptable noise level criterion.
- Quantify noise emissions from the proposed Polish Club
- Calculate the level of noise emission, taking into account building envelope
- Transmission loss, screen walls and distance attenuation.
- Provide in principle noise control recommendations (if necessary).

The above mentioned noise sources will be quantified and assessed in this report and we will propose practical and effective acoustic treatment measures to ensure that the acoustic amenity of the surrounding residences as well as the future residents of the development is maintained.

Part 2 of the following report will assess the impact of environmental noise on the internal amenity of the proposed Polish Club, as per Australian Standard AS 2107:2016 '*Acoustics – Recommended Design Sound Levels and Reverberations times for Building Interiors*' and Inner West Council requirements.

1.2 PROJECT DESCRIPTION

The proposed development includes the Polish Club and apartments spaces. The proposed Polish Club on the ground floor will comprise of the following;

- Lounge area,
- Bar area,
- Deli and Bakery
- Restaurant and private dining
- Gaming area (indoor and outdoor)
- Function rooms
- Outdoor area
- Lobby
- Administration offices
- Amenities

The residential apartments will be located above the Polish Club. Eighty-eight (88) apartments will be spread across seven (7) storeys.

The proposed three (3) levels of basement parking use will be shared for residential and Club use;

- Basement level 1 for Polish Club parking – seventy-five (75) parking space; and,
- Basement level 2 and 3 for residential parking – total of one hundred and seventeen (117) parking spaces.



PART 1 – PROPOSED POLISH CLUB IMPACT ASSESSMENT

2.0 NOISE EMISSION FROM PROPOSED CLUB ON SURROUNDING RESIDENTIAL ENVIRONMENT

The proposed Polish Club is located on Norton Street in the suburb of Ashfield (Figure 1 – Site Location) and will be located on the ground floor of a proposed multi-storey mixed-use development comprising of seven (7) storeys of residential apartments and three (3) levels of basement parking.

The following aspects of the proposed Polish club require consideration of the noise emission to external noise sensitive receivers for compliance with site noise emission criteria;

- Impact of vehicles entering/exiting within site boundary from Norton Street;
- Loading dock activity and associated deliveries for the Polish Club;
- Impact of additional traffic on Norton Street,
- Parton noise and music outbreak from Polish Club; and,
- Mechanical plants and equipment.

The nearest potential residential receivers impacted from the proposed Polish Club are detailed in Table 2.1 and Figure 2.

Table 2.1 – Noise Sensitive Receivers

Receiver	Location	Description
1.	73-75 Norton Street	Proposed apartments on Level 1, directly above the polish club
2.	65 Norton Street	4 storey residential apartments, east of the site
3.	81 Norton Street	Single storey residence, west of the site
4.	186188, 190, 192 & 194 Liverpool Road	Topshop housing (commercial and residential) north of the site
5.	180 Liverpool Road	Polish House , north of the site
6.	182 Liverpool Road	Uniting Church of Australia, north of the site
7.	1 Joseph Street	Double storey residence, south of the site
8.	4 Joseph Street	3 storey residential apartments, south of the site

For the purpose of this report, the nearest receivers 1 to 6 detailed in the table above are directly impacted by the proposed Polish Club and will be assessed

The following assessment of potential noise emitted by the proposed Club is based on the architectural plans by Red Design Group. All proposed Club facilities will be located on the ground floor (Figure 3 – Proposed Club Layout) as follows:



- Longue area,
- Bar area,
- Deli and Bakery
- Restaurant and private dining
- Gaming area (indoor and outdoor)
- Function rooms
- Outdoor area
- Lobby
- Administration offices
- Amenities

Majority of the proposed amenities and facilities are located indoors, while outdoor seating areas and gaming area is proposed at the north rear of the ground floor building line. The proposed Polish Club will provide entertainment including live music in the form of productions shows or cover bands such as raffles, bingo and poker tournaments.

The proposed operating hours for the Polish Club are as follows;

- Monday to Thursday: 10:00am – Midnight
- Friday: 10:00am – 2:00am
- Saturday: 7:00am – 2:00am
- Sunday: 7:00am – Midnight

Operating hours of the associated facilities within the Polish Club are as follows;

- Restaurant and private dining area
 - Monday to Sunday: 11:00am to 10:00pm
- Deli and Café
 - Monday – Friday: 10:00am to 8:00pm
 - Saturday & Sunday: Closes 30 minutes before Club closing time
- Gaming
 - Opens at 10am daily. Closes 30 minutes before Club closing time
- Function Area will not have set hours

The proposed development will include 75 designated car spaces for club patrons, located in the basement parking of the development. Entry to the car park will be Norton Street. It is expected that most patrons visiting the club will live/work in the local area or will access the site by public transport.

The club will also have its own dedicated enclosed loading dock, with access to the loading dock is made from Norton Street (Figure 4 – Proposed Loading Dock).



A range of mechanical plants and equipment will be included in the proposed development to service the Polish Club, basement parking and residential units above. All proposed mechanical plants and equipment for the Polish Club will connect through the proposed development's mechanical system.

The noise breakout from the development, including the operation of the club and mechanical plant is to comply with the Noise Policy for Industry (2017), Noise Guide for Local Governments, NSW Road Noise Policy and the requirements of the Liquor Administration Board (LAB).

Existing background noise levels in the area are governed by traffic noise from Norton Street and Liverpool Road at the rear.

3.0 NOISE SURVEY, INSTRUMENTATION & RESULTS

Unattended noise measurements were carried out on site in order to determine the existing environmental noise levels for the day [7:00 -18:00], evening [18:00-22:00], and night/early morning noise levels [22:00-7:00] $L_{(A90, 15 \text{ minutes [1hr]})}$ and $L_{(Aeq, 15 \text{ minutes [1 hr]})}$. Noise measurements were carried out for a period of seven (7) days between the 28th April, 2020 and the 5th May, 2020.

Noise logger at Point A was placed on the roof of the existing Polish Club (Figure 5 – Noise Reading Location). An additional noise logger at Point B was placed at the rear of the site facing Liverpool Road.

The measurement procedure and the equipment used for the noise survey are described below. All sound pressure levels are rounded to the nearest whole decibel. All measurements were taken in accordance with the Australian Standards AS1055 “*Acoustics- Description and Measurements of Environmental Noise*”. The noise readings presented here are carried out using the SVAN 977/957 with the following characteristics:

- Type 1 sound level measurements meeting IEC 61672:2002
- General vibration measurements (acceleration, velocity and displacement) and HVM meeting ISO 8041:2005 standard
- Three parallel independent profiles
- 1/1 and 1/3 octave real time analysis
- Acoustic dose meter function
- FFT real time analysis (1920 lines in up to 22.4 kHz band)
- Reverberation Time measurements (RT 60)
- Advanced Data Logger including spectra logging
- USB Memory Stick providing almost unlimited logging capacity
- Time domain signal recording
- Advanced trigger and alarm functions



- USB 1.1 Host & Client interfaces (real time PC “front end” application supported)
- RS 232 and IrDA interfaces
- Modbus protocol

The noise reading machine Microphone was positioned 1.5m above the ground. The noise reading machines were calibrated prior to and after reading, using our Svantek SV 33A S/N: 90200 Class 1 Calibrator. Any readings affected by strong wind or rain have been disregarded.

The Full Average Statistical Noise Parameters $L_{Aeq, 15 \text{ minutes}}$, $L_{A90, 15 \text{ minutes}}$, $L_{A10, 15 \text{ minutes}}$, $L_{A1, 15 \text{ minutes}}$ are presented in Figures 6 & 7 - Unattended Noise Survey. Summarized results were found to be as follows:

Table 3.1 –Summary of Noise Survey Results (Point A)28th April, 2020 – 5th May, 2020

Location	Time Period	Arithmetic Mean $L_{Aeq, 15min}$ dB(A)	Arithmetic Mean $L_{90, 15min}$ dB(A)	RBL dB(A)
Point A Roof of Existing Polish Club	Day 7am-6pm	53	46	44
	Evening 6pm-10pm	49	44	42
	Night/ Morning 10pm-7am	44	40	40

Table 3.2 –Summary of Noise Survey Results (Point B)28th April, 2020 – 5th May, 2020

Measurement Location	Time Period	Arithmetic Mean $L_{Aeq, 15}$ minutes)	Arithmetic Mean $L_{A90, 15}$ minutes)	RBL
Point B – Northern Boundary	Day 7am-10pm	53	47	44
	Evening 6pm-10pm	50	44	42
	Night /Early Morning 10pm-7am	47	42	38

Since environmental noise levels vary with time, it is not possible to use a specific value to define the acoustic environment of the site. Hence the preferred method of recording and presenting noise measurements is based upon a statistical approach. To accurately determine the environmental noise a 15-20-minute measurement interval is utilised. The three principle parameters are the L_{10} , L_{90} and the L_{eq} .



Conversely the L_{90} level, commonly referred to as the background noise level, is the level that is exceeded for 90% of the time and is considered to be the approximate average minimum noise level. The L_{eq} parameter represents the average noise level during a measurement period. It is derived by integrating the noise levels measured over the 15-minute period.

4.0 ASSESSING NOISE FROM ENTERTAINMENT VENUES & PATRON NOISE

Noise from pubs, clubs and entertainment venues is currently assessed in NSW using a variety of different policies and standards such as the NSW Noise Policy for Industry (2017), the Department of Environment and Conservation (NSW) Noise Guide for Local Government and the NSW Office of Liquor, Gaming & Racing.

The abovementioned policies and standards will assess noise issues relating to the operation of clubs include entertainment noise from live music or pre-recorded music, noise from mechanical services equipment, noise from patrons inside the site and arriving and leaving the site and noise from deliveries to the site's loading dock. These noises differ in character and hence in the way they must be assessed.

Assessment criteria for different kinds of noise in can be divided into a fixed criteria or relative criteria. A fixed rating criterion specifies a limit that the noise should not exceed, for example the NSW Noise Policy for Industry's Amenity Criteria gives a desirable maximum noise levels inside various different buildings and rooms, expressed as L_{Aeq} values.

Relative ratings compare the noise level (L_{Aeq}) with the background noise level without the noise source (L_{A90}) with the noise level emitted by the proposed site allowed to exceed the background noise levels by only a certain amount (eg. Intrusive Criterion in the NSW Noise Policy for Industry). The NSW Noise Policy for Industry will be further discussed in Section 5.2 of our report.

Measurements for entertainment and patron/crown noise are usually carried out at a number of locations within venues. Data is normally obtained on the busiest trading nights when music is played at a maximum and patron number are at their highest, in order to ensure that acoustic control measures are designed using appropriate source levels.

4.1 PREDICTING PATRON NOISE

Predicting noise from entertainment venues (including crowd noise) can be modelled in similar way to traffic noise as it also involves several different factors. However, instead of variable factors such as vehicle number, traffic composition, speed etc; crowd noise has a unique set of variables which enable most crown situations to be assessed.



Typically, patron noise is intermittent as people dine, listen to music or participate in conversation. Studies suggest that crowd noise cannot be encompassed by a single parameter, but rather multiple parameters are required to adequately quantify the noise. Patron noise normally consists of two main components:

- A babble due to multiple, simultaneous, random conversations; and,
- Transients due to events such as people laughing, yelling or cheering

The babble noise is usually represented by the L_{Aeq} parameter as patron noise is quasi-steady with random but minor variability as the number of patrons speaking changes at an instance.

Different factors that may influence the level of crowd noise include

- An individual's voice effort (which is also affected by the background noise level around them);
- The total number of people in the crowd;
- Whether the crowd is directional (i.e. concert) or has a diffused orientation (i.e. restaurant); and,
- Whether the source is synchronized or random with time.

Factors such as background noise level, number of people in the crowd of people, age, gender, and alcohol all contribute to an individual's voice effort. Another major factor affecting voice effort is the level of background noise. As a crowd increases in size, the background noise level increases too as an individual increases their voice effort in order to maintain communication with others in the group/crowd.

The table below presents noise levels at a distance of one (1) metre from the speaker for different vocal efforts.

Table 4.1 – Average Sound Levels of Different Voice Efforts
(Source: Lazarus 1986)

Voice Effort	Average Speech Level dB(A)
Whispering	36
Soft Speaking	42
Relaxed Speaking	48
Relaxed Normal Speaking	54
Raised Normal Speaking	60
Raised Speaking	66
Loud Speaking	72
Very Loud Speaking	78
Shouting	84
Maximal Shout	90



Maximal Shout Individuals	96
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Average Speech levels are also presented in the Pearson, Bennett and Fidell (1977) Report. The noise level from the crowd inside the club can also be estimated using noise levels at one-third octave—band centre as presented by Cyril M. Harris in chapter 16 (Acoustic measurements and noise controls).

Two measurement techniques for patron noise have been implemented that are based on reverberation measurements and free-field measurements. The sound pressure level (SPL) of a crowd can be measured by taking a time and space average of a crown inside an enclosed space such as a restaurant or hotel.

$$L_W = L_P - 10 \log_{10}[\dots]$$

Free-field measurements of crown noise is simpler as its possible to measure LAmax and LAeq levels if measurements are made in the far field (ie open outdoor dining areas). The measured sound pressure levels can be converted into sound power levels using the following equation:

$$L_W = L_P - 20 \log_{10} D + C$$

5.0 ACCEPTABLE NOISE LEVELS

5.1 NOISE GUIDE FOR LOCAL GOVERNMENT

The Department of Environment and Conservation (NSW) published the *Noise Guide for Local Government* in June 2004. The policy is specifically aimed at assessing noise from light industry, shops, entertainment, public buildings, air conditioners, pool pumps and other noise sources in residential areas.

Section 2.2.1 of the Noise Guide for Local Government states that a noise source is generally considered to be intrusive if the noise from the source when measured over a 15-minute period exceeds the background noise by more than 5 dB(A).

Therefore, the acceptable noise criterion at Point A is as follows:

Table 5.1 – Noise Guide for Local Government Criteria at Point A

Time of Day	Point A
Day (7:00-18:00)	46 + 5 = 51 dB (A)
Evening (18:00-22:00)	44 + 5 = 49 dB (A)
Night (22:00-7:00)	40 + 5 = 45 dB (A)



The appropriate regulatory authority (Local Council) may, by notice in writing given to such a person, prohibit the person from causing, permitting or allowing:

1. (a) any specified activity to be carried on at the premises, or
 2. (b) any specified article to be used or operated at the premises,
- or both, in such a manner as to cause the emission from the premises, at all times or on specified days, or between specified times on all days or on specified days, of noise that, when measured at any specified point (whether within or outside the premises,) is in excess of a specified level.

It is an offence to contravene a noise control notice. Prior to being issued with a noise control notice, no offence has been committed.

The Protection of the Environment Operations Act 1997 defines “Offensive Noise” as noise:

1. (a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:
 - (i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or
 - (ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or
2. (b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances prescribed by the regulation.

5.1.1 SLEEP DISTURBANCE

In order to minimize the potential of sleep disturbance due to transient noises from the Club during night hours (10:00pm – 7:00am), Section 2.2.4 of the Noise Guide For Local Government recommends that $L_{A1,1\text{-minute}}$ level of any noise outside a bedroom should not exceed the background noise level by more than 15dB. Therefore, the Sleep Disturbance criteria on Norton Street is as follows:

- $L_{A1,1\text{ minute}} \leq 40 + 15 = 55 \text{ dB(A)}$

5.2 NSW NOISE POLICY FOR INDUSTRY (2017)

The noise from the proposed Club is governed under Section 2 of the Noise Policy for Industry 2017. The above policy seeks to promote environmental well-being through preventing and minimizing noise by providing a frame work and process for deriving noise limits conditions for consent and licenses.

The Noise Policy for Industry 2017 recommends two separate noise criteria to be considered, the Intrusive Noise Criteria and the Amenity Noise Criteria. A project noise trigger level being the lowest of the amenity and the intrusiveness noise level is then determined.



If the predicted noise level L_{Aeq} from the proposed project exceeds the noise trigger level, then noise mitigation is required. The extent of any ‘reasonable and feasible’ noise mitigation required whether at the source or along the noise path is to ensure that the predicted noise level L_{Aeq} from the project at the boundary of most affected residential receiver is not greater than the noise trigger level.

Note* Noise from mechanical plant & equipment is governed under the NSW Noise Policy for Industry. However, Section 1.5 of the above policy, excluded the assessment of noise from amplified music/patron noise from premises. Therefore patron/music noise from the use of the club will be governed under the Noise Guide for Local Government and OLGR.

5.2.1 AMENITY NOISE CRITERIA

The amenity noise levels presented for different residential categories are presented in Table 2.2 of the Noise Policy for Industry 2017. These levels are introduced as guidance for appropriate noise levels in residential areas surrounding industrial areas.

The recommended amenity noise levels for the Polish Club are presented in Table 5.2.1.1 below:

Table 5.2.1.1 - Recommended Amenity Noise Levels

<i>Type of Receiver</i>	<i>Area</i>	<i>Time Period</i>	<i>Recommended Leq Noise Level, dB(A)</i>
Residence	Urban	Day	60
		Evening	55
		Night	45
Commercial Premises	All	When in Use	65

Where a noise source contains certain characteristics such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, a correction is to be applied which is to be added to the measured or predicted noise levels at the receiver, before comparison with the criteria. Shown below are the correction factors that are to be applied:

Table 5.2.1.2 – Modifying Factor Corrections

<i>Factor</i>	<i>Correction</i>
Tonal Noise	+ 5 dB ^{1,2}
Low-Frequency Noise	+ 2 or 5 dB ¹
Intermittent Noise	+ 5 dB
Duration	+ 0 to 2 dB(A)
Maximum Adjustment	Maximum correction of 10 dB(A) ¹ (excluding duration correction)



1. Where a source emits tonal and low-frequency noise, only one 5-dB correction should be applied if the tone is in the low-frequency range, that is, at or below 160 Hz.
2. Where narrow-band analysis using the reference method is required, as outlined in column 5, the correction will be determined by the ISO1996-2:2007 standard.

Correction for duration is to be applied where a single-event noise is continuous for a period of less than two and a half hours in any assessment period. The allowable exceedance of the $L_{Aeq,15min}$ equivalent noise criterion is depicted in Table 5.2.1.3 for the duration of the event. This adjustment accounts for unusual and one-off events and does not apply to regular and/or routine high-noise level events.

Table 5.2.1.3 – Adjustment for Duration as per Fact Sheet C (Noise Policy for Industry 2017)

Allowable duration of noise (one event in any 24-hour period)	Allowable exceedance of $L_{Aeq,15min}$ equivalent project noise trigger level at receptor for the period of the noise event, dB(A)	
	Daytime & evening (7 am–10 pm)	Night-time (10 pm–7 am)
1 to 2.5 hours	2	Nil
15 minutes to 1 hour	5	Nil
6 minutes to 15 minutes	7	2
1.5 minutes to 6 minutes	15	5
less than 1.5 minutes	20	10

According to Section 2.4 of the above policy, the project amenity noise level is determined as follows:

Project amenity noise level for industrial developments = recommended amenity noise level (Table 2.2) minus 5 dB(A)

To convert from a period level to a 15-minute level, a plus 3 is added as per section 2.2 of the policy.

Therefore, the project amenity noise level for the proposed Polish Club is as follows:

Day: $60 - 5 + 3 = 58 \text{ dB(A)}$
Evening: $50 - 5 + 3 = 48 \text{ dB(A)}$
Night: $45 - 5 + 3 = 43 \text{ dB(A)}$

5.2.2 INTRUSIVE NOISE CRITERIA

Section 2.3 of the Noise Policy for Industry summarises the intrusive criteria as below:

$$L_{Aeq,15\text{ minute}} \leq \text{rating background level plus 5}$$



While the background noise level known as $L_{A90,15 \text{ minutes}}$ is the Noise exceeded 90% percent of a time period over which annoyance reactions may occur (taken to be 15 minutes). The RBL is defined as the overall single-figure $L_{A90,15 \text{ minutes}}$ background level representing each assessment period (day/evening/night) over the whole monitoring period.

For the short-term method, the rating background noise level is simply the lowest measured $L_{AF90,15\text{min}}$ level. For the long-term method, the rating background noise level is defined as the median value of all the evening assessment background levels over the monitoring period for the evening

The predicted noise from the source $L_{Aeq,15 \text{ min}}$ is measured as at the most affected point within the most affected residential at the point where the most impact occurs.

Therefore, the acceptable L_{eq} noise intrusiveness criterion for broadband noise during the day, evening & night at Point A is as follows:

- **44 + 5 = 49 dB (A)** during the day
- **42 + 5 = 47 dB (A)** during the evening
- **38 + 5 = 43 dB (A)** during the night

5.2.3 PROJECT NOISE TRIGGER LEVEL

A summary of intrusiveness and amenity noise levels as determined in Sections 5.2.1 & 5.2.2 are shown in Table 5.2.3 below.

Table 5.2.3 - Summary of Intrusiveness and project amenity noise levels

Period	Intrusiveness Noise Level	Project Amenity Noise level
Day Time (7:00 – 18:00)	49	58
Evening Time (18:00 – 22:00)	47	48
Night/Morning Time (22:00 – 7:00)	45	43

The project noise trigger level is the lower (that is, the most stringent) value of the amenity and intrusiveness noise levels for the evening time. Therefore, the project noise trigger levels for the proposed development at Point A are as shown below

Daytime: $L_{Aeq,15 \text{ min}}$ **49 dB(A)**

Evening: $L_{Aeq,15 \text{ min}}$ **47 dB(A)**

Night-time: $L_{Aeq,15 \text{ min}}$ **43 dB(A)**



The noise levels from the proposed Polish Club and associated mechanical plant (not including patron noise & amplified music) will not exceed the project noise trigger level at the most sensitive locations, provided all noise control recommendations in Section 7 of this report are adhered to.

5.3 NSW OFFICE OF LIQUOR, GAMING & RACING (OLGR)

The NSW OLGR have a standard noise condition which states the following:

- The L_{10} noise level emitted from the licensed premises shall not exceed the background noise level in an octave Band Centre Frequency by more than 5dB between 7:00 am and 12:00midnight at the boundary of any affected residence.
- The L_{10} noise level emitted from the licensed premises shall not exceed the background noise level in an octave Band Centre Frequency between 12:00 midnight and 7:00am at the boundary of any affected residence.
- Notwithstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00midnight and 7:00am.

6.0 NOISE BREAKOUT FROM PROPOSED POLISH CLUB

As previously discussed, the proposed Polish Club will include a range of services such as live entertainment and facilities such as gaming rooms, bars, restaurant and function rooms.

The main sources of noise from the proposed Polish Club will be as follows:

- Noise from live music & entertainment
- Noise from gaming machines
- Noise from patrons inside the club
- Noise from patrons outside in the dining area
- Noise from associated mechanical plant & equipment (kitchen exhausts, mechanical ventilation etc)
- Noise from patron vehicles entering/existing basement car park

6.1 NOISE FROM INDOOR PATRON NOISE, LIVE MUSIC & GAMING MACHINES

Based on noise measurements carried out at similar clubs (e.g. Petersham RSL Club); the average number of patrons visiting the club during the week is as follows:



Table 6.1.1 – Average number of patrons visiting the Polish Club

<i>Day of Week</i>	<i>Average No. of Patrons</i>
Sunday – Wednesday	300
Thursday – Saturday	600

Based on noise measurements carried out inside similar clubs, maximum noise levels from the operation of the club occurs during the evening period (6:00pm – 10:00pm) when the number of patrons is at its highest and live music/entertainment is performed. Typical Average noise levels including live band is as follows:

Table 6.1.2 – Typical Noise Level in Octaves for Club operation (1.0m away from band- SPL)

<i>Description</i>	<i>Octave Band Centre Frequencies (Hz)</i>								
Assessed inside during peak evening period (ie. live music playing with large number of patrons and use of gaming machines)	dB(A)	63	125	250	500	1k	2k	4k	8k
	96	92	90	81	88	87	82	74	67

The above might be increased to 107 dB(A) as a typical upper level when heavy rock band is involved.

Another typical noise level in the gaming area with music performing in the background is as follows:

Table 6.1.3 – Typical Noise Level in gaming area (Centre of room SPL)

<i>Description</i>	<i>Octave Band Centre Frequencies (Hz)</i>								
Assessed inside gaming area with patrons, background music and use of gaming machines)	dB(A)	63	125	250	500	1k	2k	4k	8k
	73	52	60	60	63	67	66	62	64

A typical noise level of in other areas of the Club with live music performing is as follows:

Table 6.1.4 – Typical Noise Level in Octaves for Club operation (SPL)

<i>Description</i>	<i>Octave Band Centre Frequencies (Hz)</i>								
Assessed at Entrance to Club at entrance administration desk	dB(A)	63	125	250	500	1k	2k	4k	8k
	62	45	52	53	54	57	55	50	40



The nearest receivers that have the potential to be impacted by the proposed development are as follows (Figure 2 – Nearest Receivers):

Table 6.1.5 – Noise Sensitive Receivers

Receiver	Location	Description
1.	73-75 Norton Street	Proposed apartments on Level 1, directly above the polish club
2.	65 Norton Street	4 storey residential apartments, east of the site
3.	81 Norton Street	Single storey residence, west of the site
4.	186188, 190, 192 & 194 Liverpool Road	Topshop housing (commercial and residential) north of the site
5.	180 Liverpool Road	Pawa Community Care, north of the site
6.	182 Liverpool Road	Uniting Church of Australia, north of the site

The calculations below take into account the distance attenuation between the proposed Club and the sites.

Noise prediction from the club is calculated using Lord Templeton Equitation as follows:

$$L_{p2} = L_{p1} - R_w + 10\log_{10}S - 20\log_{10}r - 17 + DI \text{ dB(A)}$$

Where, L_{p1} is the internal sound pressure level;

R_w is the weighted sound reduction index of the building partition;

S is the area of the partition (m^2);

r is the distance between the receiver and the partition (m);

DI is the directivity index of the façade; and,

The constant 17 becomes 14 for a hemispheric sound source.

Noise Transfer outside the Polish Club to the nearest building façade is calculated *in accordance with ISO 9613.2 – Acoustics – Attenuation of sound during propagation outdoors — Part 2: General method of calculation*

If all acoustic mitigations required are carried as per Sections 7.1 to 7.7 of this report then noise levels from patron and music in the club will comply with the acoustic requirements of the Noise Guide for local Government (background + 5), Sleep Disturbance, and the NSW Office of Liquor, Gaming & Racing (OLGR) as described previously in section 5.1, 5.1.1 & 5.3 of this report.



6.2 NOISE FROM OUTDOOR SEATING AREAS

The Polish Club's proposed Restaurant, Lounge and Deli and Bakery will each have an associated outdoor seating area located adjacent to their indoor seating area (Figure 3 – Proposed Layout). Noise from patrons dining in the outdoor seating areas has the potential to impact the nearest receivers north of the site and proposed residential units to be located above the site.

Table 6.2.1 below lists noise from the *maximum allowable* number of patrons dining outdoors (50 patrons) in addition to noise from the outdoor gaming area at the boundary of the nearest receiver (proposed residential units above).

Table 6.2.1 - LA10 Noise Level from Outside Seating Areas and outdoor gaming at Receiver (Outside Bedroom slider on level 1)- Evening*, **

Description	dB(A)	Octave Band Centre Frequencies (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
L _(A90, 15 minutes)	44	-	31	35	41	40	39	36	31	29
L _{(A90, 15 minutes) +5}	49	-	36	41	46	45	44	41	36	34
Noise levels L _{A10} - *** (Sound Power 50 People outside)	90	-	50	60	74	83	88	78	73	70
Noise levels L _{A10} - *** (Sound Power 14 People outdoor gaming + machines)	99	-	53	81	90	97	95	90	85	75
Predicted L _{A10} Noise Level from outdoor seating and outdoor gaming at Receiver (Outside bedroom slider level 1)	40	**	**	9	24	32	33	38	27	20
Complies OLGR * Criteria L _{A10} < L ₉₀ + 5	Yes ✓ 40 < 44 + 5 dB(A)	Yes ✓	Yes ✓	Yes ✓	Yes ✓	Yes ✓	Yes ✓	Yes ✓	Yes ✓	Yes ✓

Note* Compliance in the evening ensures compliance during the day-as background noise levels during the evening are lower.- Outdoor dining area not operating at night.** Provided recommendations in Section 7.6 of this report are adhered to.*** L10= Leq+3.

6.3 NOISE FROM PROPOSED LOADING DOCK

The proposed Club will also have a loading dock via accessed from Norton St (Figure 4 – Proposed Club Loading Dock). Noise produced by trucks using the proposed loading dock may have an effect on the future residential properties at the proposed site.



The proposed loading dock can accommodate a maximum of (1) truck at a time. The size of accessible trucks is to be confirmed at CC stage; however typical power levels for trucks operating in the loading dock are presented below. The garbage bay is adjacent to the loading dock and garbage trucks accessing the loading dock will contribute as an additional noise source

Table 6.3.1 - Loading Dock Noise Levels

Source	<i>Loading dock and vehicle movement sound power levels, dB Leq</i>						
	<i>Octave band centre frequency (Hz)</i>						
	63	125	250	500	1K	2K	4K
Garbage truck/semi-trailer movement	114	116	111	106	104	103	102
5-10 tonne truck air brake	100	94	91	99	106	107	105
5-10 tonne truck movement	97	96	90	91	94	95	88
Van or small truck movement	95	90	89	88	89	91	83
Unloading of vehicles and bin/skip emptying	109	109	109	108	108	110	110

Noise emission from the loading dock are not expected to exceed existing background noise levels by more than 5 dB(A) at the nearest residential receiver (proposed residential units located above the site) provided the following recommendations are adhered to:

- Loading docks is not used between 10:00pm and 7:00am;
- Loading dock is to be roofed with a minimum 200 mm thick slab;
- Roller door to loading dock is to be closed when loading dock is in use;
- Loading dock slab is to be separated from main structural slab by a minimum 25mm anti-vibration pads/springs; and,
- Columns/walls to be separated from floor finishes using 25mm tubular foam and approved sealant (isolation joint).

We recommend further acoustic assessment of the loading dock use is carried out at CC stage when further design details have been finalised and a traffic report has been prepared for our review.



6.4 NOISE FROM PROPOSED MECHANICAL PLANT & EQUIPMENT

A range of mechanical plant, equipment and ventilation will be included in the proposed Club at No. 73-75 Norton St, Ashfield, such as kitchen and toilets exhausts, mechanical ventilation for all rooms etc.

As per Section 5 of this report, noise emitted by the use of the proposed mechanical plant is assessed by the NSW Noise Policy for Industry (2017) and will need to comply with its requirements. All proposed mechanical plant and equipment for the Polish Club will connect through the proposed development's mechanical system.

As the development is still in DA stage, we have reviewed the preliminary Mechanical Plans by Norton Jago Architects and it appears to comply with the NSW Noise Policy for Industry requirements outlined in Section 5 of this report. We recommend that further acoustic assessment is carried out when the development has been approved and final recommendations will be provided for all associated mechanical plant & equipment.

6.5 PROPOSED OUTDOOR GAMING AREA

The proposed Polish Club will include a gaming area facing the eastern boundary of the site (Figure 8 – Gaming Area). The gaming area will include a small indoor area with 15 seats & poker machines and an adjacent small outdoor area with 14 seats and poker machines as per latest Red Design Group Floor Plan.

In order for the operation of the proposed gaming area to comply with the requirements set out in Section 5 of this report, acoustic treatment (including possible diffusive and absorptive treatment) will need to be incorporated or integrated within the design to control noise propagation into the proposed residential units to be located above the Club and the existing residential receivers.

We recommend the use of any system that provides adequate structural disconnection and insulation between the outdoor area/live music area ceiling and the residential tenancy in the level above. Provided the recommendation in Section 7 of our report is adhered to, the operation of the outdoor gaming area will comply in general with the requirements listed in this report. We recommend details of the acoustic treatment to be included in the construction documentation following the design development phase.

6.6 TRAFFIC GENERATION FROM POLISH CLUB

The development at No.73-75 Norton St, needs to comply with the criteria of the NSW Road Noise Policy, for the potential impact of additional traffic that may be generated by the development, on



nearby residential developments. Table 3 in Section 2.3.1 of the NSW Road Noise Policy, sets out traffic noise assessment criteria as follows:

Table 6.6.1 – NSW Road Noise Policy Traffic Noise Criteria

Road Category	Type of Project/Land Use	Assessment Criteria – dB(A)	
		Day (7am – 10pm)	Night (10pm – 7am)
Local Roads	Existing Residences affected by additional traffic on existing local roads general by land use developments	L _{Aeq} (1 hour) 55 (external)	L _{Aeq} (1 hour) 50 (external)

A preliminary Traffic Impact Assessment Report has been carried out by Barker Ryan Stewart dated May 2020. Predicted noise levels at the building line of the nearest residential receiver (No. 1 Joseph St) due to additional traffic generation (from club operations) on Norton Street are presented in Table 6.6.2 below:

Table 6.6.2 – Predicted Noise from Traffic Generation on Norton Street at 1.0m from facade of residential receiver (No. 1 Joseph St)

Activity	Period	Expected Leq 1hr dB(A) from Additional Traffic Noise (dB(A))	Complies with NSW Road Noise Policy Traffic Noise Criteria-
Residents accessing Basement Car Park	AM Peak Hour	N/A	Yes <55 dB(A)
	PM Peak Hour	56*	Yes <50 dB(A)

Note* Based on Club Trip Generation Numbers listed in Section 5.1 of Traffic Impact Assessment by BRS.

7.0 RECOMMENDATIONS

We recommend the following measures to be placed in order for the operation of the proposed Polish Club to comply with the above noise criteria. The Polish club is to have the following measures incorporate into its design and operation.

7.1 GLAZING

All proposed glazing in the Polish Club façade and external door to achieves Rw of 35. Typically, glazing configurations that achieve Rw of 35 consist of 10.38 mm laminated glazing with acoustic seals.



7.2 ENTRY DOORS

Automatic door closers are to be installed on all entry doors to the proposed Polish Club. This will ensure no noise propagation to the residential units or nearby residential premises.

7.3 STRUCTURAL & INSULATION SYSTEMS

We recommend the use of any system that provides adequate structural disconnection and insulation between the ceiling of areas with live music (or areas with noise levels above 85dB(A) of the Polish Club) and residential units above.

7.4 CONCRETE SLABS & CEILING

The slab of Level 1, between Polish Club and residential unit is a transfer slab (minimum 350mm deep) as shown in Figure 9. Slab soffit is to be lined with 11kg/m³ insulation. Columns/walls supporting slab are to be lined with noise absorbing material of NRC>0.8 (eg. echo soft 50. Columns/walls to be separated from club floor finishes using 25mm tubular foam and approved sealant.

7.5 ANTI-VIBRATION PADS & ISOLATION

Loading Dock slab is to be separated from main structural slab by a minimum 25mm anti-vibration pads/springs. Columns/walls in loading docks is to be separated from floor finishes using 25mm tubular foam and approved sealant/(Isolation joint).

Platforms on isolation pads or a secondary nonstructural slab on isolation pads/springs are to be provided in areas where live music /dancing occur. This will ensure no acoustic vibration is transmitted from the proposed Polish Club to the above residential units.

7.6 OUTDOOR DINING AREA

An awning /slab is to be placed above the outdoor dining area, a minimum 5 metres beyond the above residential unit's balcony edge. The awning is to be lined with noise absorbing material of NRC > 0.8 (e.g. echo soft 25).

A maximum of fifty (50) patrons are allowed in the outdoor dining area at any one time. No music to be played outside outdoor dining area after 10:00 pm.

7.7 OUTDOOR GAMING AREA

Acoustic Louvres are to be used in the Outdoor Gaming Area, facing the Outdoor Dining Area. Fantech Sound Bar Louvre (SBL 1) or similar are to be installed.



7.8 SIGNS

Signage will in place on the premises encouraging members and guests to depart in an orderly and prompt manner. Announcements will be made at regular intervals after 9:00pm asking members and guests to show consideration for neighbours and to depart in an orderly and prompt manner.

7.9 NOISE MANAGEMENT PLAN

A Noise Management Plan should be implemented and should include the following:

- Install a contact number at the front of the Polish Club so that complaints regarding the operation can be made.
- Implement a complaint handling procedure. If a noise complaint is received the complaint should be recorded on a Complaint Form. The Complaint Form should contain the following:
 - Name and address of the complainant
 - Time and date the complaint was received
 - The nature of the complaint and the time/date the noise was heard
 - The name of the employee that received the complaint
 - Actions taken to investigate the complaint and the summary of the results of the investigation
 - Indication of what was occurring at the time the noise was happening (if applicable)
 - Required remedial action (if applicable)
 - Validation of the remedial action
 - Summary of feedback to the complaint

Also, a permanent register of complaints should be held on the premises, which shall be reviewed monthly by staff to ensure all complaints are being responded to. All complaints received shall be reported to management with initial action/investigation commencing within 7 days. The complaint should also be notified of the results and actions arising from the investigation.

7.10 FURTHER ACOUSTIC ASSESSMENT AT CC STAGE

We recommend that further acoustic assessment is carried out at CC stage when a more detailed Statement of Environmental Effects has been provided and Mechanical Services Plans have been prepared for the proposed Polish Club and a more detailed and thorough acoustic assessment can be carried out.



8.0 BCA COMPLIANCE FOR PROPOSED POLISH CLUB & RESIDENTIAL UNITS

The proposed Polish Club is classified as Class 6 and Class 9b under the Building Code of Australia (BCA) Classification of Building, while the residential units located above the club are classified as Class 2 of the BCA.

Sound isolation between tenancies is mainly determined in accordance with section F5 of the BCA. Section F5 of the BCA nominates laboratory acoustic performances of various types of walls and floor construction elements adopted by the building industry.

A building solution is proposed to comply with the Deemed to Satisfy Provisions if Performance Requirements FP5.1 to FP 5.6 are satisfied by complying with section F5.1 to F5.7 of the BCA.

An alternative solution to the Deemed to Satisfy Provisions of F5.1 to F5.7 must be determined in accordance with section A0.10 of the BCA (Relative Performance Requirements).

Section F5 of the BCA acts as a protection from any noise annoyance being transmitted between adjoining sole-occupancy units or from a common space to sole occupancy unit.

The Slab on Top of the Polish Club is a transfer slab with minimum 350mm thick. Therefore, under Section F5 of the BCA Class 2 to 9 Buildings – Volume One, the floor system separating the Polish Club and the residential units above is expected to comply with section F5 of the BCA. In addition the following requirements for the slab are necessary to ensure compliance with the noise criteria:

- The Slab of Level 1, between Polish Club and residential unit is a transfer slab (Minimum 350mm). Slab soffit is to be lined with 11kg/m³ insulation. Columns/walls supporting slab are to be lined with noise absorbing material of NRC > 0.8 (eg. echo soft 50). Columns/walls to be separated from club floor finishes using 25mm tubular foam and approved sealant.
- Loading dock slab is to be separated from main structural slab by a minimum 25mm anti-vibration pads/springs.
- Columns/walls in loading docks is to be separated from floor finishes using 25mm tubular foam and approved sealant (isolation joint).
- In areas of the Club where live music takes places or with noise levels above 85 dB(A), a JBN System (or similar) is to be installed (insulated false ceiling and 12x16mm gyprock).



8.1 FLOORS BETWEEN OCCUPANCY UNITS

The Floors separating sole occupancy units must have both an Impact Sound insulation rating $L_{n,w}+C_l$ no more than 62 and must have an $R_w + C_{tr}$ not less than 50. This is fully detailed in associated Acoustic Report referenced 2020-048 BLD.

8.2 RECOMMENDATIONS

Noise attenuation assessment for the proposed residential units at No. 73-75 Norton St, Ashfield is to be reviewed at CC stage when design specifications for building components has been finalised.

Recommendations will be provided for all building components in order to comply with the above criteria of Section F5 of the BCA.

PART 2 – IMPACT OF SURROUNDING ENVIRONMENT ON INTERNAL AMENITY OF PROPOSED POLISH CLUB

9.0 TRAFFIC & ENVIRONMENTAL NOISE ASSESSMENT

This component of the report has been written to address the environmental noise impacts from traffic and the surrounding environment on the internal amenity of the proposed Polish Club as per the requirements of Australian Standard AS 2107:2016 '*Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors*'.

The site is affected by traffic noise from Liverpool Road (located approximately 40 metres north of the site) as operation of surrounding commercial/retail premises and their associated mechanical plant and equipment.

Australian Standards AS 2107:2016 '*Acoustics – Recommended Design Sound Levels and Reverberations times for Building Interiors*' has formulated the criteria for developments situated in urban areas. The levels have been derived from relevant Australian Standards, the measurements and analysis of noise conditions in other similar developments and standards established in completed projects.

As traffic and environmental noise levels are not constant, a LAeq noise level descriptor is used when assessing this type of noise source. The LAeq is the mean energy level of noise being measured and has been found to accurately describe the level of annoyance caused by traffic noise.

It is usual practice, when we find it necessary to recommend internal sound levels in buildings to refer to Australian Standard AS 2107:2016.



.This standard provides recommended noise levels for steady state such as noise from building services and quasi-steady state sounds, such as traffic and industrial noise.

The noise levels recommended in AS 2107:2016 take into account the function of the area and apply to the sound level measured within the space unoccupied although ready for occupancy. The standard recommends the following noise levels for various commercial building areas.

Table 9.0 - AS 2017:2016 Interior Design Sound Levels

Type of Occupancy	Recommended Design Sound Level LAeq dB(A)	
	Satisfactory	Maximum
General Office & Reception Areas	40	45
Restaurant & Dining Areas	45	50
Corridors & Lobbies	45	50
Toilets/Change Rooms	45	55
Undercover Carparks	55	65

9.1 RECOMMENDATIONS FOR EXTERNAL BUILDING COMPONENTS

To limit the level of noise within the Polish Club and ensure compliance with AS 2017:2016, we recommend the following external building components:

External Building Components	Rw Rating Achieved
All proposed glazing in the club is to be any windows system that achieves a Rw of 35. This includes all Club Skylights and low level glazing. Typically, glazing configurations that achieve a Rw of 35 consist of 10.38mm laminated windows with full perimeter acoustic seals.	39
External walls are to be any wall system that achieves a minimum Rw of 50 (eg. double brick construction, hebel stud system, AFS wall system etc). Note* External Wall Specifications to be confirmed at CC stage.	50



10.0 NOISE IMPACT STATEMENT & CONCLUSION

Measurements and computations presented in this report show that the noise emissions from the proposed Polish Club at No. 73-75 Norton St, Ashfield, will not exceed the noise criteria set out in the NSW Noise Policy for Industry (2017), Section 2.2.1 of the Noise Guide for Local Government, NSW Office of Liquor, Gaming & Racing (OLGR) noise recommendations, and Inner West Council requirements.

Noise control recommendations are outlined in Section 7 and Section 9.1 to ensure compliance through the operation of the proposed Polish Club. The operation of the proposed Club will comply with the relative sections of the EPA and will not create any offensive noise.

The construction of the proposed Polish Club at No. 73-75 Norton St, Ashfield, if carried out as recommended in plans and specifications and including the acoustic recommendations in this report, will meet the required noise measures as per Australian Standard AS 2107:2016 '*Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors*'.

We hope this report meets your requirements. Should you require further explanations, please do not hesitate to contact us.

Yours sincerely,

M. Zaioor
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M.I.E.(Aust), CPEng



11.0 **APPENDIX A**

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Figure 1 - Proposed Site Location

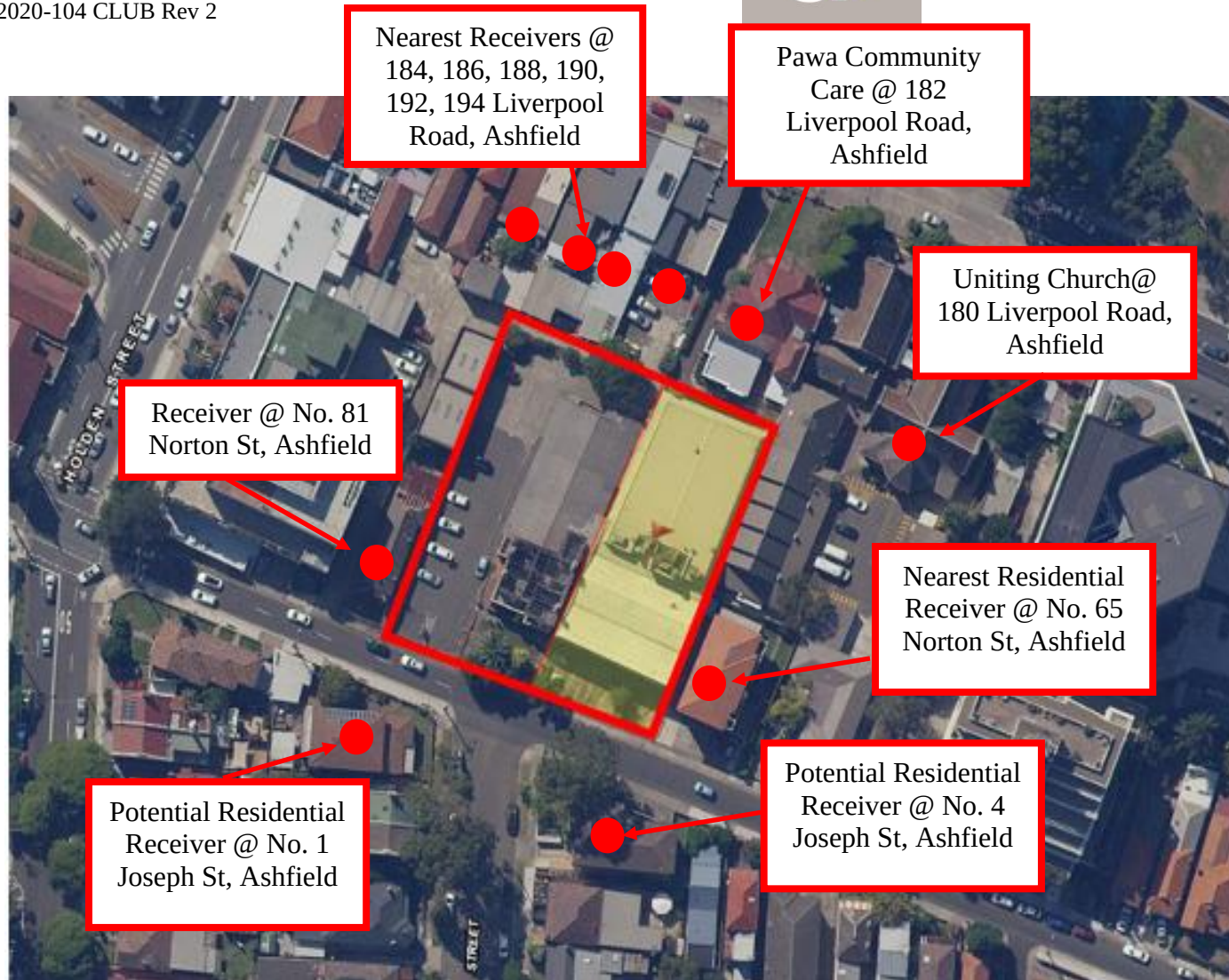


Figure 2 - Nearest Receivers







Figure 5 – Noise Reading Locations (Points A & B)

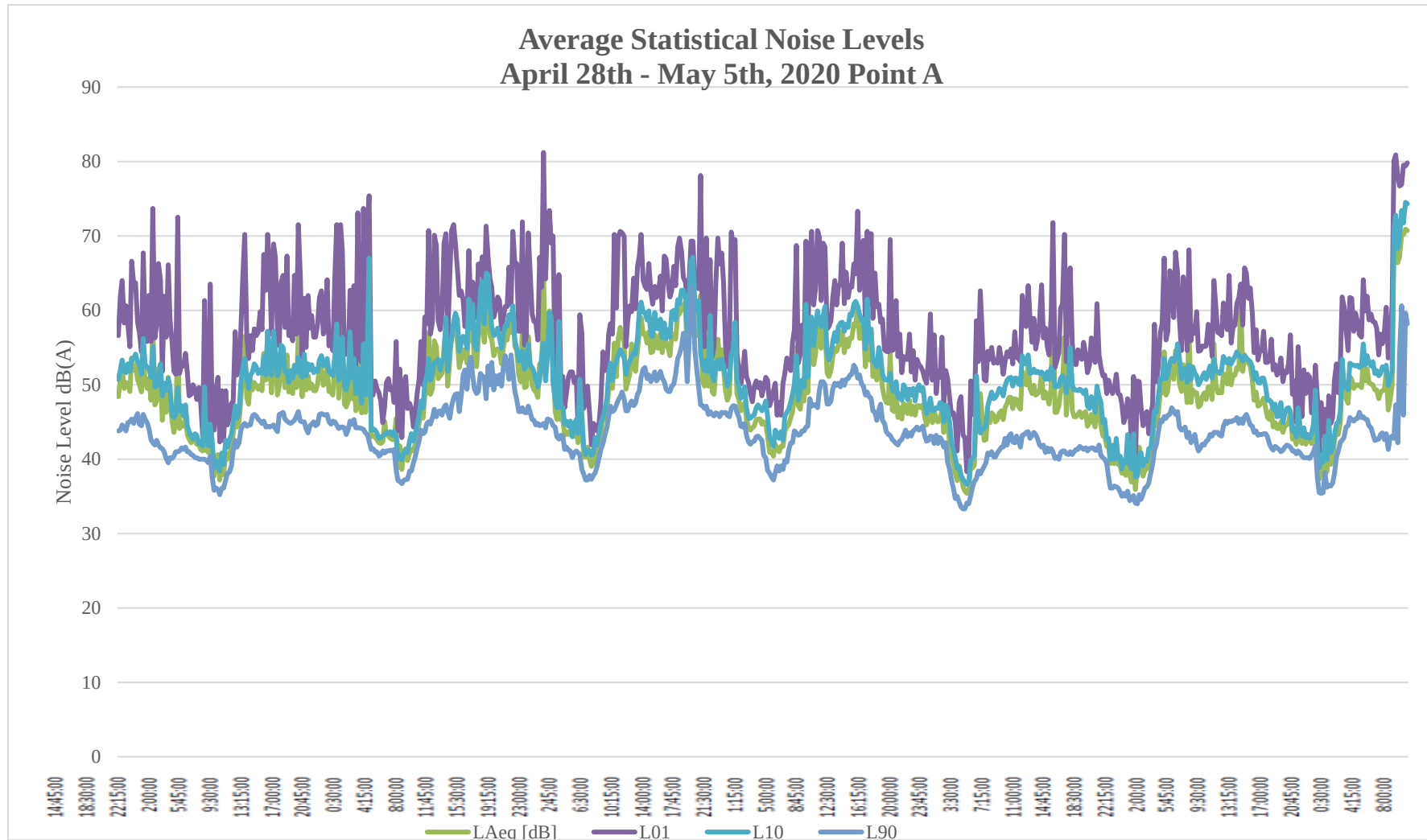


Figure 6 – Unattended Noise Reading Location (Point A)

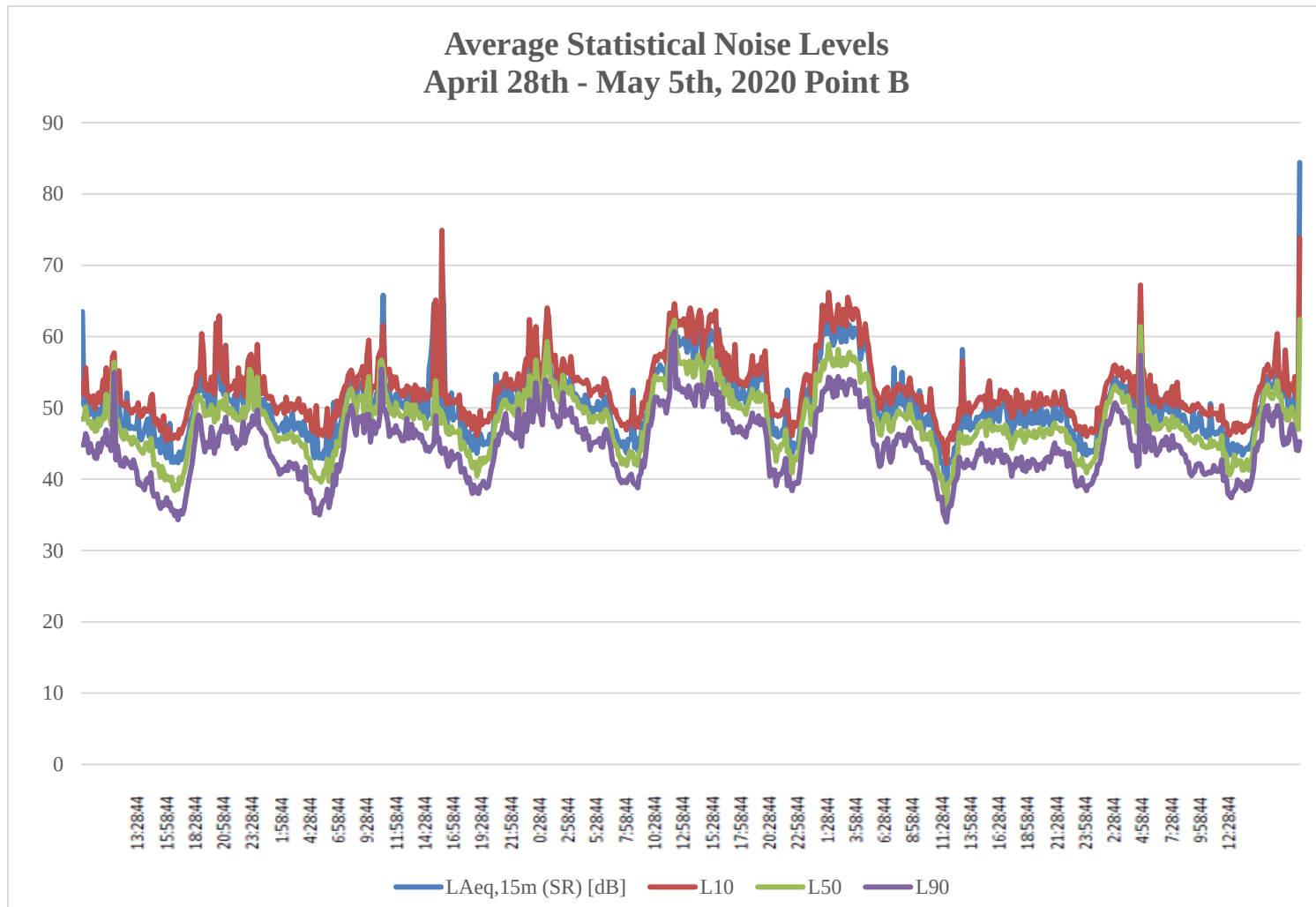


Figure 7 – Unattended Noise Survey Location (Point B)

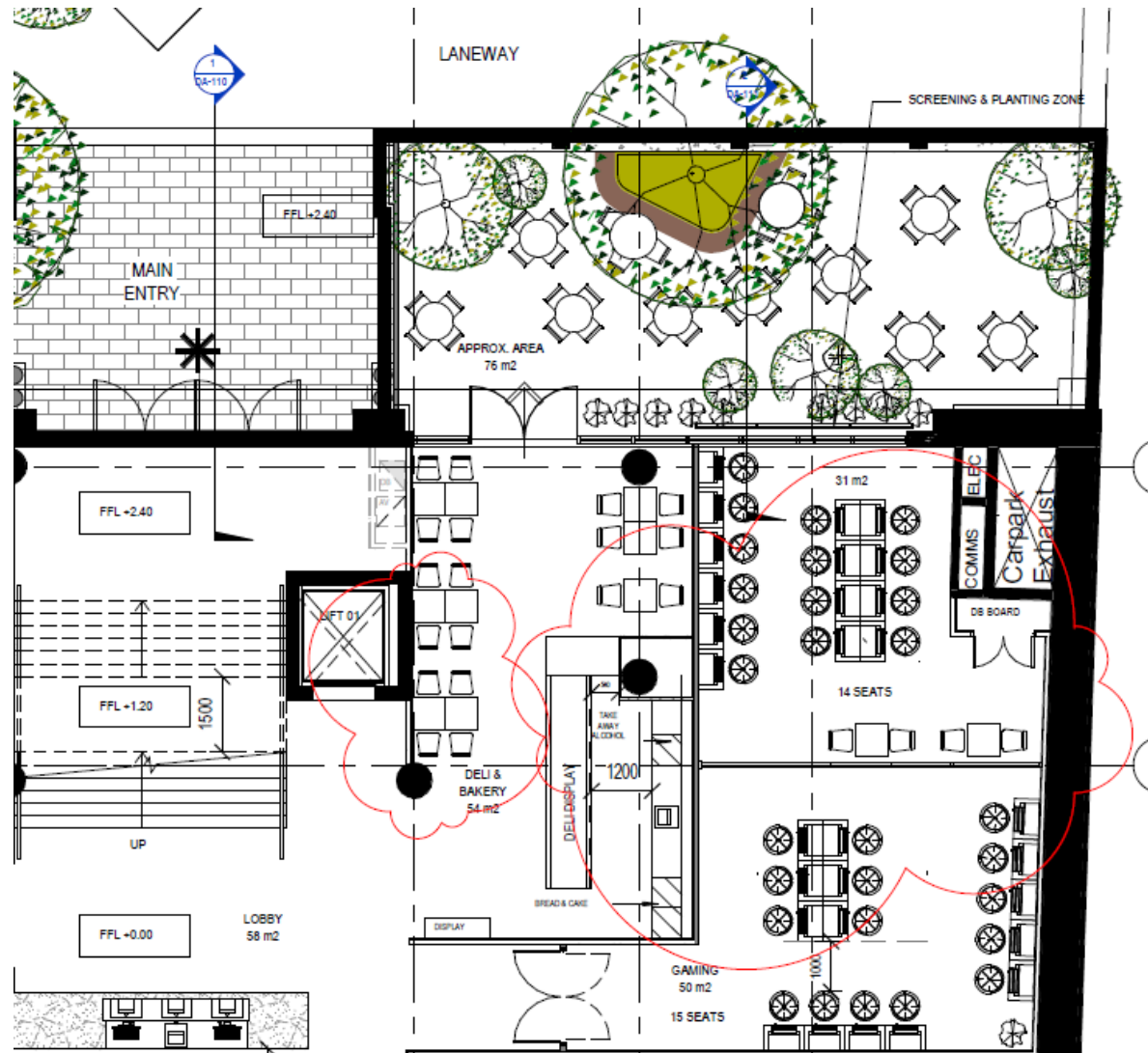
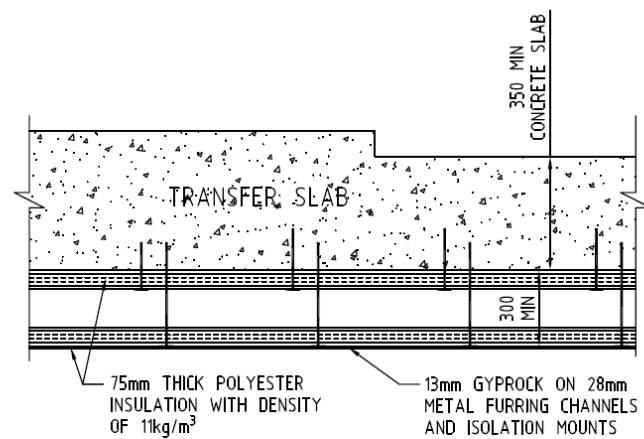
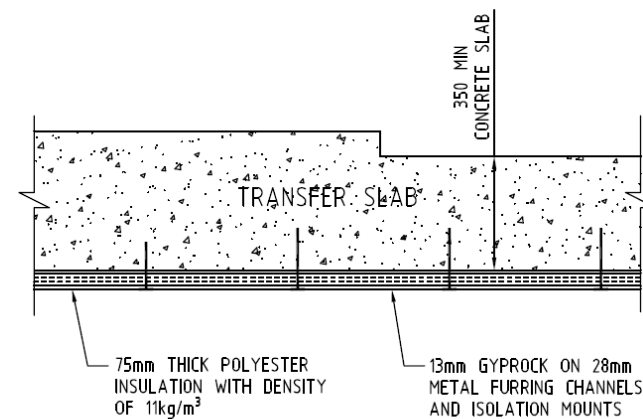


Figure 8 - Gaming Area



1
TRANSFER SLAB & CEILING ABOVE GAMING AREA
& AREAS WITH LOUD MUSIC
Rw 76



2
TRANSFER SLAB & CEILING ABOVE ALL OTHER
AREAS.
Rw 76

Figure 9 - Concrete Slab/Ceiling Detail above Club



12.0 APPENDIX B

Architectural Plans