ATTACHMENT 5: NOISE ASSESSMENT

RAPT CONSULTING

Noise Assessment – Raymond Terrace Bowling Club

Prepared for

Raymond Terrace Bowling Club C/O Monteath & Powys

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Relationships Attention Professional Trust

Document Details

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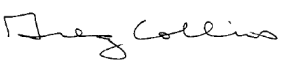
2223480_231113	0	13 November 2023	Gregory Collins - MAAS	
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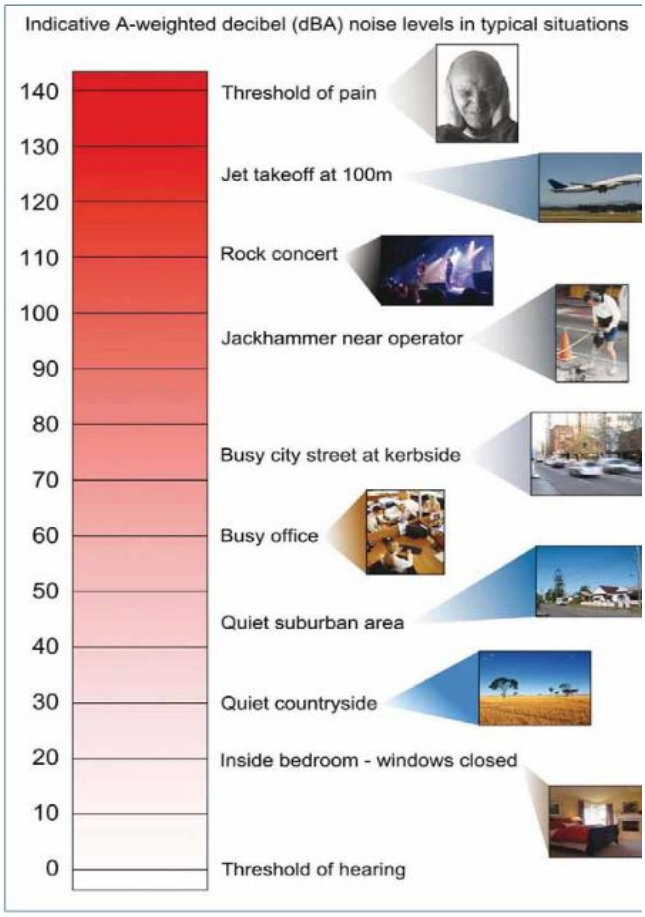
Glossary of Acoustic Terms

Term	Definition
dB	Decibel is the unit used for expressing the sound pressure level (SPL) or power level (SWL) in acoustics. The picture below indicates typical noise levels from common noise sources. 
dB(A)	Frequency weighting filter used to measure 'A-weighted' sound pressure levels, which conforms approximately to the human ear response, as our hearing is less sensitive at very low and very high frequencies.
$L_{Aeq(period)}$	Equivalent sound pressure level: the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.
$L_{A10(period)}$	The sound pressure level that is exceeded for 10% of the measurement period.

$L_{A90(period)}$	The sound pressure level that is exceeded for 90% of the measurement period.
L_{Amax}	The maximum sound level recorded during the measurement period.
Noise sensitive receiver	◗ An area or place potentially affected by noise which includes: ◗ A residential dwelling. ◗ An educational institution, library, childcare centre or kindergarten. ◗ A hospital, surgery or other medical institution. ◗ An active (e.g. sports field, golf course) or passive (e.g. national park) recreational area. ◗ Commercial or industrial premises. ◗ A place of worship.
Rating Background Level (RBL)	The overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period.
Feasible and Reasonable (Noise Policy for Industry Definition)	**Feasible** mitigation measure is a noise mitigation measure that can be engineered and is practical to build and/or implement, given project constraints such as safety, maintenance and reliability requirements. Selecting **Reasonable** measures from those that are feasible involves judging whether the overall noise benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the mitigation measure. To make a judgement, consider the following: ◗ Noise impacts ◗ Noise mitigation benefits ◗ Cost effectiveness of noise mitigation ◗ Community views.
Sound power level (SWL)	The sound power level of a noise source is the sound energy emitted by the source. Notated as SWL, sound power levels are typically presented in dB(A).

1. Introduction

1.1 Background

RAPT Consulting has been engaged to undertake a noise assessment for Raymond Terrace Bowling Club C/O Monteath & Powys to inform a Development Application (DA) for alterations and additions to the Raymond Terrace Bowling Club and construction of a six-storey 50 room hotel including 5 serviced apartments, restaurant, bar, swimming pool, gym, function space and office spaces.. The site includes both Lot 23 DP 1088281 and Lot 1 Section 23 DP 758871.

The proposed development will be one (1) development application to be constructed/delivered in three (3) stages. The stages include the following:

1. Alterations and Additions to Raymond Terrace Bowling Club - Including associated parking and the reshaping of the croquet lawn facing Port Stephens Street which includes additional parking for stage one (1) only

2. Demolition of the existing shade over the Bowling Greens and the construction of a new Bowling Green roof to overhang the Raymond Terrace Bowling Club roof, and

3. Construction of the Hotel - Including associated parking and demolition.

The siteplan is shown in Figure 1-1 below.

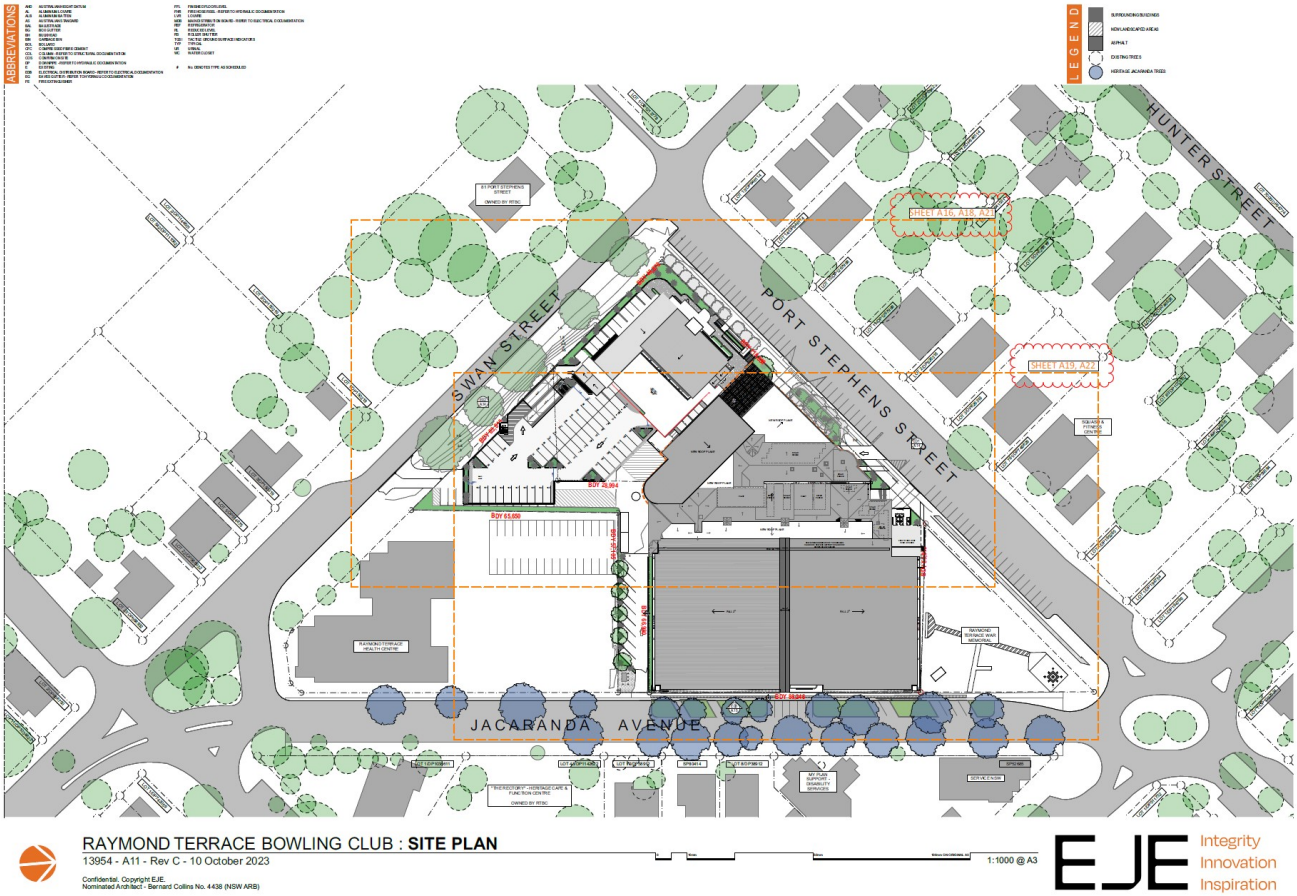


Figure 1-1 Site Plan (Source: EJE Architecture)

The site and surrounding area is shown in Figure 1-2.

Figure 1-2 Site and Surrounding Area

1.2 Assessment Objectives

This acoustic assessment considers the potential impacts of the operation of the proposal. The purpose is to assess potential noise from the proposal and to recommend mitigation measures where required.

The outcomes of this assessment include recommendations where necessary for potential noise mitigation and management measures designed to achieve an acceptable noise amenity for residential (dwelling) occupants and other sensitive receivers surrounding the study area.

1.3 Scope

The acoustic assessment scope of work included:

- Initial desk top review to identify noise sensitive receptors from aerial photography
- Undertake noise measurements to determine ambient and background noise levels
- Establish project noise goals for the operation of the proposal
- Identify the likely principal noise sources during operation and their associated noise levels
- assessment of potential noise impacts associated with operation aspects of the project
- provide recommendations for feasible and reasonable noise mitigation and management measures, where noise objectives may be exceeded.

1.4 Relevant Guidelines

The relevant policies and guidelines for noise and vibration assessments in NSW that have been considered during the preparation of this assessment include:

- Noise Policy for Industry (NPfI), Environment Protection Authority (EPA), 2017
- Noise Guide for Local Government (NGfLG) Environment Protection Authority (EPA), 2013

1.5 Limitations

The purpose of this report is to provide an independent noise assessment for the proposal.

It is not the intention of the assessment to cover every element of the acoustic environment, but rather to conduct the assessment with consideration to the prescribed work scope.

The findings of the noise assessment represent the findings apparent at the date and time of the assessment undertaken. It is the nature of environmental assessments that all variations in environmental conditions cannot be assessed and all uncertainty concerning the conditions of the ambient environment cannot be eliminated. Professional judgement must be exercised in the investigation and interpretation of observations.

In conducting this assessment and preparing the report, current guidelines for noise were referred to. This work has been conducted in good faith with RAPT Consulting's understanding of the client's brief and the generally accepted consulting practice.

No other warranty, expressed or implied, is made as to the information and professional advice included in this report. It is not intended for other parties or other uses.

2. Existing Environment

2.1 Receptors

The area surrounding the proposal is zoned RE2 Private Recreation. A map showing the land use zonings in the vicinity of the proposal are shown in Figure 2-1.

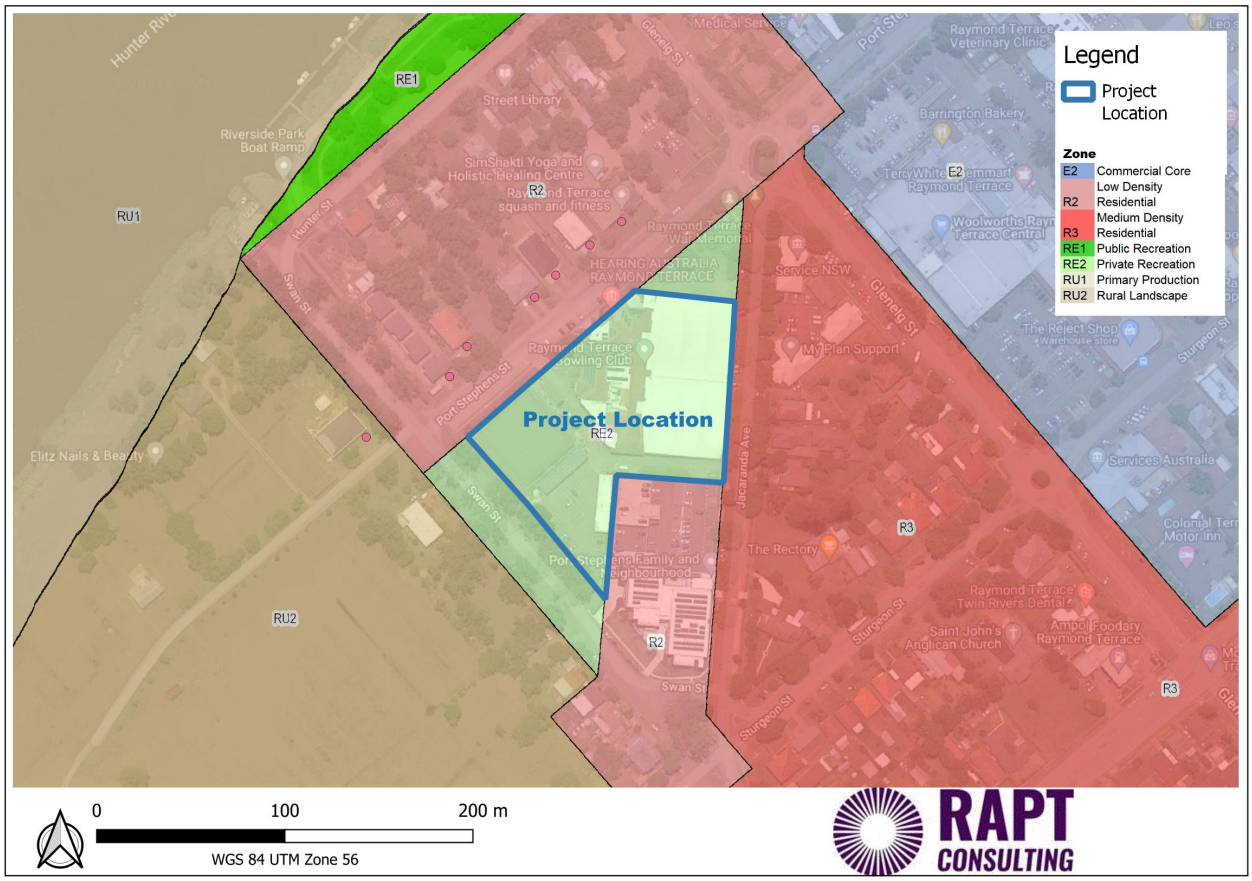


Figure 2-1 Land Use Zonings

Closest receptors to the proposal assessed in this acoustic assessment are identified in Table 2-1 and Figure 2-2.

Table 2-1 Nearest Assessed Receptors to Study Area

Receiver ID	Location	Receptor Type	Easting	Northing
R1	128-130 Port Stephens Street	Residential	381821	6374182
R2	1 D Swan Street	Residential	381865	6374214
R3	114 Port Stephens Street	Residential	381874	6374230
R4	110 Port Stephens Street	Residential	381910	6374256
R5	108 Port Stephens Street	Residential	381921	6374268
R6	106 Port Stephens Street	Residential	381940	6374284
R7	Raymond Terrace Squash and Fitness	Commercial	381957	6374296

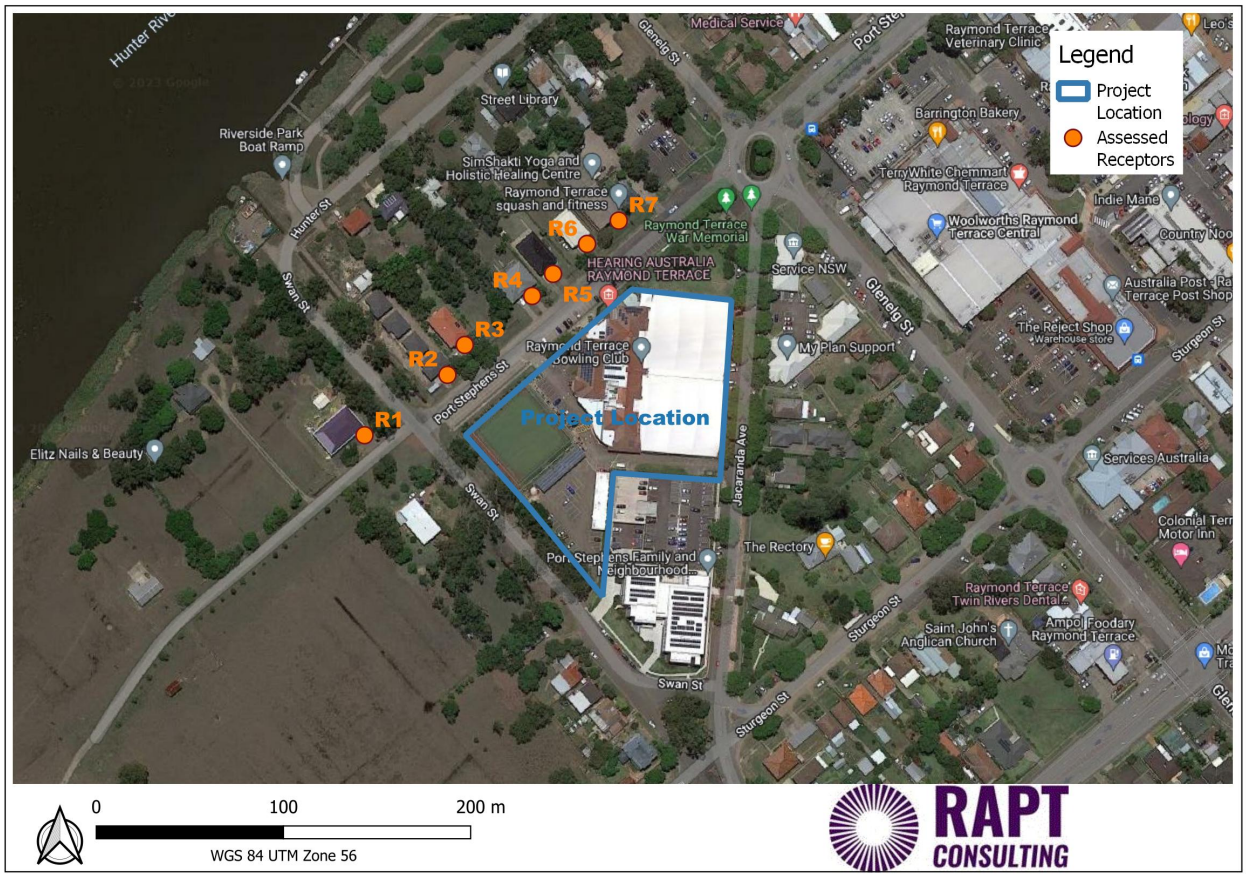


Figure 2-2 Receptors Surrounding the Proposal Site

2.2 Background and Ambient Noise

To establish background and ambient noise levels, noise monitoring was undertaken by RAPT Consulting from 7 June to 13 June 2023. The monitoring was undertaken at R3 114 Port Stephens Street to capture representative noise levels for properties to the west of the site.

Site observations noted the location was considered indicative of the local ambient noise environment and the site also presented as secure locations whereby minimising the risk of theft or vandalism to the monitoring equipment. Additionally, they are considered as acceptable locations for determination of the background noise with consideration to the NSW Environment Protection Authority's (EPA's) – Noise Policy for Industry (NPfI). During site visits it was noted that traffic and natural wildlife primarily described the ambient noise environment and is indicative of a sub-urban noise environment.

The monitoring location is shown in Figure 2-3 and 2-4.

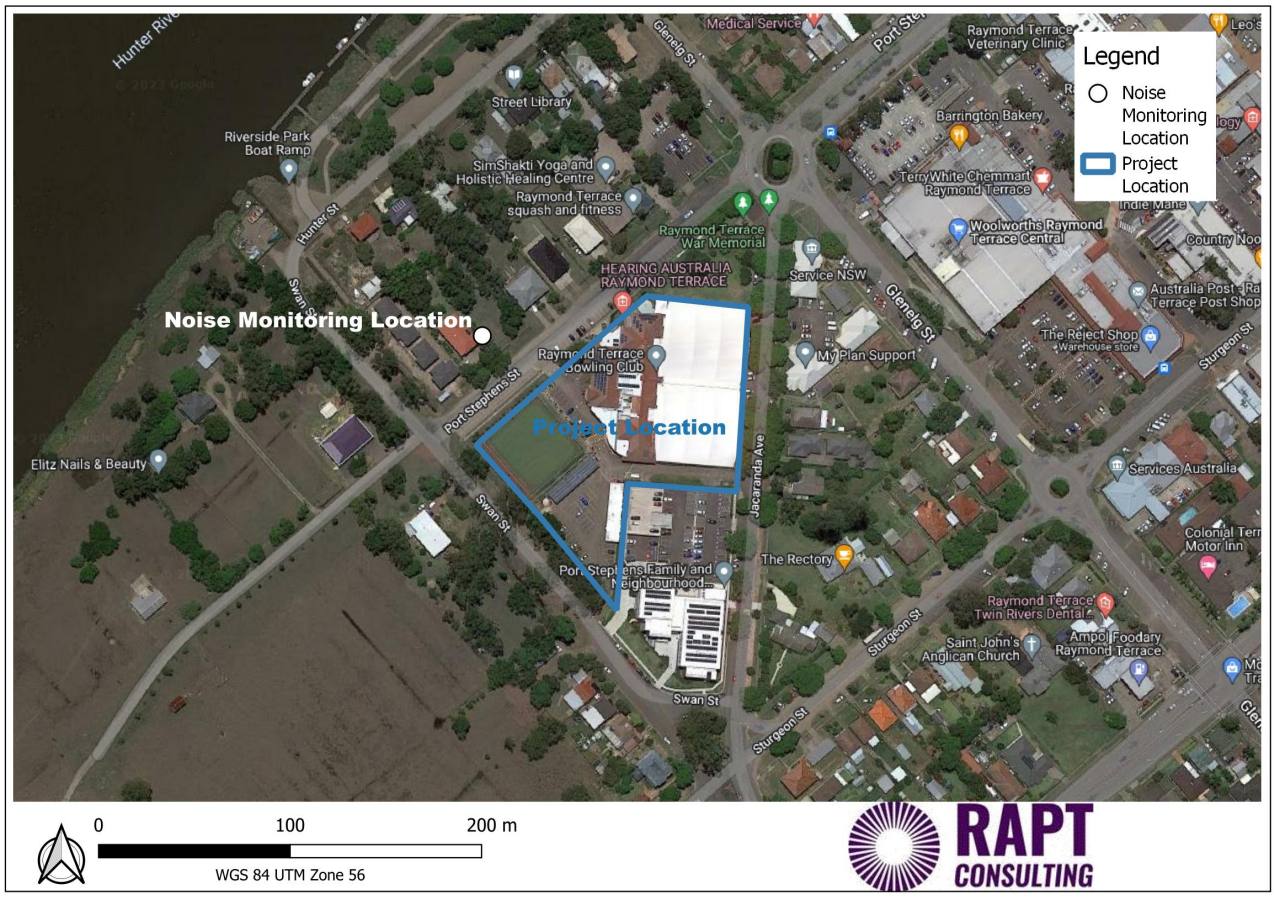


Figure 2-3 Noise Monitoring Location

Figure 2-4 Noise Monitoring Location

Monitoring was undertaken using a RION NL-42 noise logger with Type 2 Precision. Calibration was checked prior to and at the conclusion of the measurements with no significant drift. These loggers are capable of measuring continuous sound pressure levels and are able to record L_{Amin}, L_{A90}, L_{A10}, L_{Amax} and L_{Aeq} noise descriptors. The instrument was programmed to accumulate environmental noise data continuously over sampling periods of 15 minutes for the entire monitoring period.

The noise surveys were conducted with consideration to the procedures described in Australian Standard AS 1055:2018, "Acoustics – Description and Measurement of Environmental Noise" and the NSW Noise Policy for Industry (NPfI). Calibration was checked before and after each measurement and no significant drift occurred. The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672.1-2019-Electroacoustics – Sound level meters – Specifications.

The L_{A90} descriptor is used to measure the background noise level. This descriptor represents the noise level that is exceeded for 90 percent of the time over a relevant period of measurement. In line with the procedures described in the EPA's NPfI, the assessment background level (ABL) is established by determining the lowest tenth-percentile level of the L_{A90} noise data acquired over each period of interest. The background noise level or rating background level (RBL) representing the day, evening and night-time assessment periods is based on the median of individual ABL's determined over the entire monitoring duration. The RBL is representative of the average minimum background sound level, or simply the background level.

The L_{Aeq} is the equivalent continuous noise level which would have the same total acoustic energy over the measurement period as the varying noise actually measured, so it is in effect an energy average.

Weather information for the unattended noise logging was obtained from the Bureau of Meteorology Williamtown AWS for the monitoring period and any data adversely affected by rain, wind (more than 5 m/s as per NPfI) or extraneous noise were discarded.

The RBL and ambient LAeq levels are provided in Table 2-2 below.

Table 2-2 Background and Ambient Noise Monitoring Results

Rating background level, L_{A90}, dB(A)				Ambient noise levels, L_{Aeq} dB(A)			
Day[1]	Evening[1]	Night[1]	Night[2]	Day[1]	Evening[1]	Night[1]	Night[2]
40	37	30	35	53	47	43	39

Note 1 *Day: 7:00 to 18:00 Monday to Saturday and 8:00 to 18:00 Sundays & Public Holidays*
Evening: 18:00 to 22:00 Monday to Sunday & Public Holidays
Night: 22:00 to 7:00 Monday to Saturday and 22:00 to 8:00 Sundays & Public Holidays

Note 2 *Night Time 10:00pm to 11:00pm in line with club operating hours*

3. Noise Objectives

3.1 Liquor and Gaming NSW

Noise from licensed premises are regulated by Liquor and Gaming NSW and have the following noise guidelines which are provided in Figure 3-1.

Current noise condition

The L_{A10}* noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5Hz–8kHz inclusive) by more than 5dB between 7:00 am and 12:00 midnight at the boundary of any affected residence.

The L_{A10}* noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5Hz–8kHz inclusive) between 12:00 midnight and 7:00 am 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 12:00 midnight and 7:00 am.

* For the purpose of this condition, the L_{A10} can be taken as the average maximum deflection of the noise emission from the licensed premises.

This is a minimum standard. In some instances the Director may specify a time earlier than midnight in respect of the above condition.

Interior noise levels which still exceed safe hearing levels are in no way supported or condoned by the Director.

Figure 3-1 NSW Liquor and Gaming Noise Requirements

It is understood the bowling club operates from 9:30am to 11:00pm. Target noise levels are provided for residences in Table 3-1.

Table 3-1 Project Noise Goals dB(A)

	Day 7am to 6pm	Evening 6pm to 10pm	Night 10:00pm to 11:00pm
Background Level $L_{A90(Period)}$	40	37	35
NSW Liquor and Gaming Noise Level (Background + 5)	45	42	40

4. Assessment of Potential Impacts

4.1 Operational Noise

Assessment approach

Acoustic modelling was undertaken using Bruel and Kjaer's "Predictor" to predict the effects of site noise. Predictor is a computer program for the calculation, assessment and prognosis of noise propagation. Predictor calculates environmental noise propagation according to ISO 9613-2, "Acoustics – Attenuation of sound during propagation outdoors". The method predicts the sound pressure level under meteorological conditions favourable to propagation from sources of known sound emission. These conditions are for downwind propagation or equivalently under a well-developed moderate ground based temperature inversion. Terrain topography, ground absorption, atmospheric absorption and relevant shielding objects are taken into account in the calculations.

Other Key assumptions in the model include:

- topographical information was obtained from NSW Government Spatial Services
- all areas were modelled considering a conservative ground factor of 0.8
- all ground floor residential receivers were modelled at 1.5 metres above the ground surface.

Site layout and building structures were based on information provided at the time of the assessment.

Primary onsite environmental noise sources will be in the form of patrons conversing and background music which could be in the form of a stereo speaker. It is understood live amplified music at the premises such as band performances will not be taking place.

Guest Noise

Guest noise in the form of human normal to raised voice has been sourced from RAPT Consulting's database and has been assessed with a sound power level of 70 dB(A). Based on 1 metres^2 per person the outdoor alfresco area has a capacity of 199 guests plus 10 people in the play zone. Guest noise has been assumed to be operating from the outdoor alfresco area in the form of 100 persons conversing as it has been assumed that 50% of persons are conversing at any one time as not all persons will be speaking simultaneously.

The Association of Australasian Acoustical Consultants Guideline for Child Care Centre Acoustic Assessment Version 3.0 describes 10 children between the ages of 3-5 as having a sound power level of 87 dB(A) and has been adopted for this assessment.

The hotel pool has the capacity for 35 persons. Guest pool noise has been assumed to be operating from the pool area in the form of 18 persons conversing as it has been assumed that 50% of persons are conversing at any one time as not all persons will be speaking simultaneously.

Background Music and Occupants

Different noise sources can be perceived in dining and social areas. First, sound ambience is generally dependent of the service proposal for each particular place. Managers and owners will select background music or televisions to fit with target customers Typically, background music or televisions in restaurants and social areas is set at a level for patrons to be able to converse comfortably. Previous experience suggests generally, cumulative noise levels in restaurants and social areas can range from 67 – 83 dB(A) and mainly depends on occupant density. An external noise level of 75 dB(A) has been assumed for the purposes of this assessment operating in the alfresco inclusive of gaming machines and hotel pool area.

Mechanical Plant

At this stage, the mechanical plant has not been selected for the development. However, it is not uncommon for the mechanical plant not to be selected prior to submitting a development application. Mechanical plant may consist of an air conditioning system and exhaust fans. A typical range of sound power levels for mechanical plant is given in Table 4-1 below.

Table 4-1 Typical Mechanical Plant Sound Power Levels

Plant Type	SWL dB(A)
Small (single fan) condenser	65
Medium (double fan) condenser	70
Large (double fan) condenser	80

For the purposes of this assessment it has been assumed the equivalent of two large double fan condensers are on the roof top of the building.

To simulate a reasonable worst-case scenario, received noise produced by anticipated activities outlined above have been simulated. Tables 4-2 – 4-3 and Figures 4-1 - 4-2 shows the cumulative results of the modelling assessment.

Table 4-2 Alfresco Operational Modelled Results dB(A)

Receiver ID	Operational Result	Receptor Type	Project Noise Trigger Level Day/Evening/Night	Comply Yes/ No
R1	32	Residential	45 / 42 / 40	Yes
R2	39	Residential	45 / 42 / 40	Yes
R3	40	Residential	45 / 42 / 40	Yes
R4	39	Residential	45 / 42 / 40	Yes
R5	38	Residential	45 / 42 / 40	Yes
R6	36	Residential	45 / 42 / 40	Yes
R7	34	Commercial	-	-

Table 4-3 Hotel Pool Operational Modelled Results dB(A)

Receiver ID	Operational Result	Receptor Type	Project Noise Trigger Level Day/Evening/Night	Comply Yes/ No
R1	13	Residential	45 / 42 / 40	Yes
R2	15	Residential	45 / 42 / 40	Yes
R3	14	Residential	45 / 42 / 40	Yes
R4	16	Residential	45 / 42 / 40	Yes
R5	15	Residential	45 / 42 / 40	Yes
R6	14	Residential	45 / 42 / 40	Yes
R7	20	Commercial	-	-

Figure 4-1 Alfresco Noise Modelling Results Leq(15min) dB(A)

Figure 4-2 Hotel Pool Noise Modelling Results Leq(15min) dB(A)

The results of the modelling indicate compliance is expected at all assessed residential receptors.

While compliance with operational project noise trigger levels is expected, it is recommended the site as part of its plan of management have measures in place to particularly to deal with any unexpected excessive noise from patrons. This could include but not be limited to:

- Ensure all employees are trained to assist patrons to minimise noise, particularly patrons leaving the site
- Place signage in appropriate areas requesting patrons to respect the neighbours in terms of noise and to leave quietly
- Request patrons leave the site if they are being excessively noisy
- Management and staff shall immediately address complaints relating to noise and where possible act immediately to satisfy the complaint. Any complaint made should be recorded in the Complaints Register and dealt with. If required, the site shall meet with neighbours to address ongoing matters as they arise and to ensure contingency plans are in place
- Strict adherence to the approved hours of operation.

5. Conclusion

This noise assessment has been undertaken to inform a Development Application (DA) for alterations and additions to the Raymond Terrace Bowling Club and construction of a six storey 50 room hotel including 5 serviced apartments, restaurant, bar, swimming pool, gym, function space and office spaces.

Based on the results and the information provided regarding the development, compliance with all noise goals is expected for the development on neighbouring residences and commercial operators. Recommendations have been made for management to have measures in place to particularly to deal with any unexpected excessive noise from patrons. Therefore, from an acoustics perspective the findings suggest the proposal is acceptable.