RAPT CONSULTING

Noise Assessment – 57 Carrington Street West Wallsend, NSW

Prepared for
Allambi Care

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Document Details

Noise Assessment – 57 Carrington Street West Wallsend, NSW

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1. Introduction

1.1 Background

RAPT Consulting has been engaged to undertake a desktop noise assessment for the proposed change of use to the ground floor of a property at West Wallsend (previously The Clyde Inn) being 57 Carrington Street, West Wallsend.

1.2 Purpose

The purpose of this assessment is to address information requested from The NSW Department of Planning Industry and Environment regarding the change of use application:

"Noise – preference is for something to be prepared by a qualified noise consultant – even if just a brief statement (one-two pages) that addresses any relevant noise criteria and confirms no impact to any sensitive land uses nearby."

1.3 Scope

The noise assessment scope of works included:

- Initial desk top review to identify key environmental noise catchment areas and noise sensitive receptors from aerial photography
- Ascertain background noise levels for the vicinity based on land use description with consideration to Australian Standard AS 1055:2018, "Acoustics – Description and Measurement of Environmental Noise" and the NSW Noise Policy for Industry (NPfI).
- Establish project noise trigger levels were established for the development with consideration to the AAAC Guideline for Child Care Centre Acoustic Assessment, and NSW publication Noise Policy for Industry (NPfI)
- ascertain the noise contribution of the proposal to the overall ambient noise environment and assess against established project noise trigger levels.

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

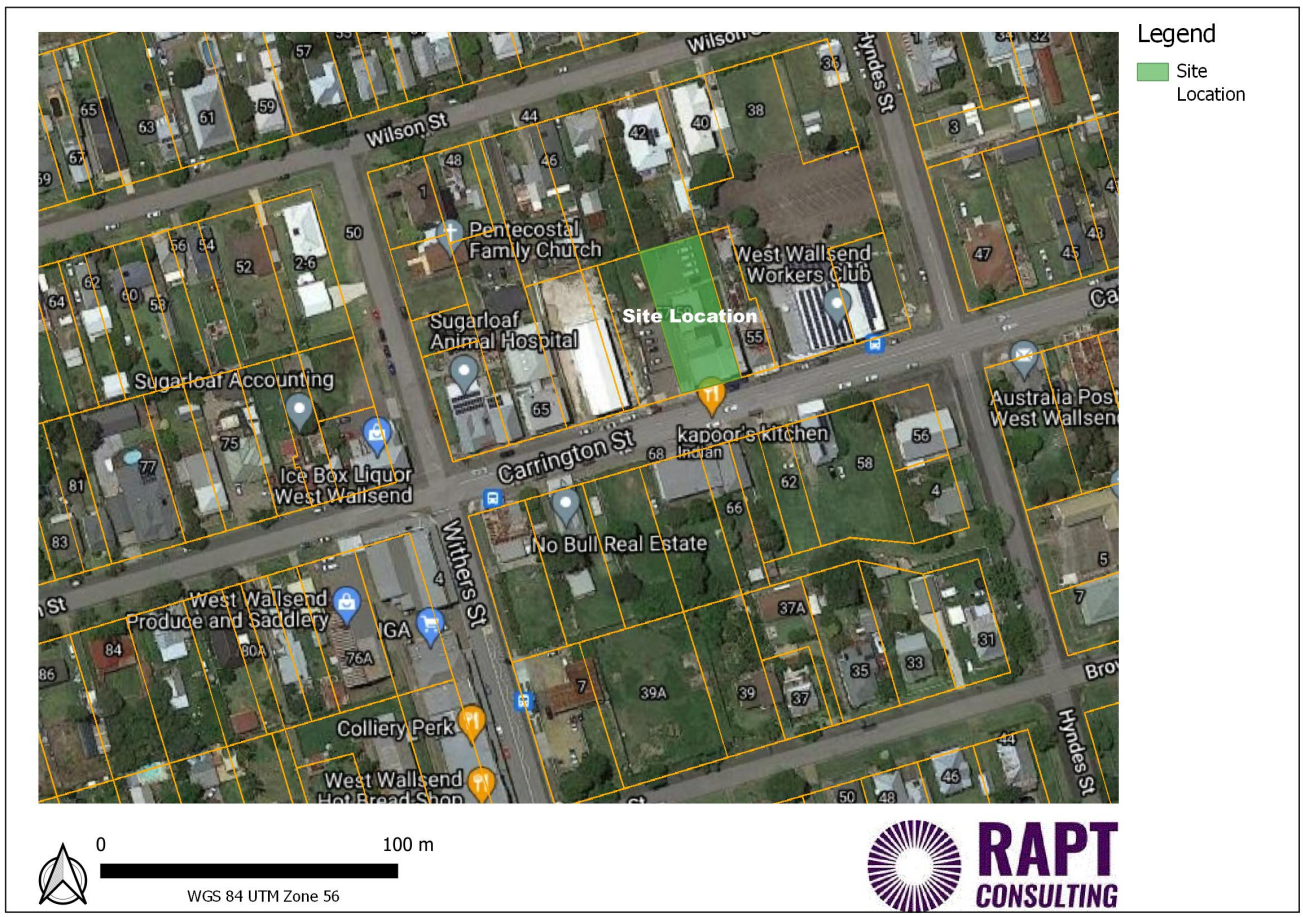


Figure 1-1 Site and Surrounding Area

This assessment has been undertaken with consideration to:

- Association of Australian Acoustic Consultants (AAAC) Guideline for Child Care Centre Acoustic Assessment, (October 2013)
- Noise Policy for Industry (NPfI) (NSW EPA, 2017)
- AS 1055.1 Acoustics – Description and measurement of environmental noise.

1.4 Limitations

The purpose of the 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 and vibration 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

The area surrounding the site is zoned B1 Neighbourhood Centre, R2 Low Density Residential and R3 Medium Density Residential. A map showing the land use zonings in the vicinity of the proposal is shown in Figure 2-1.

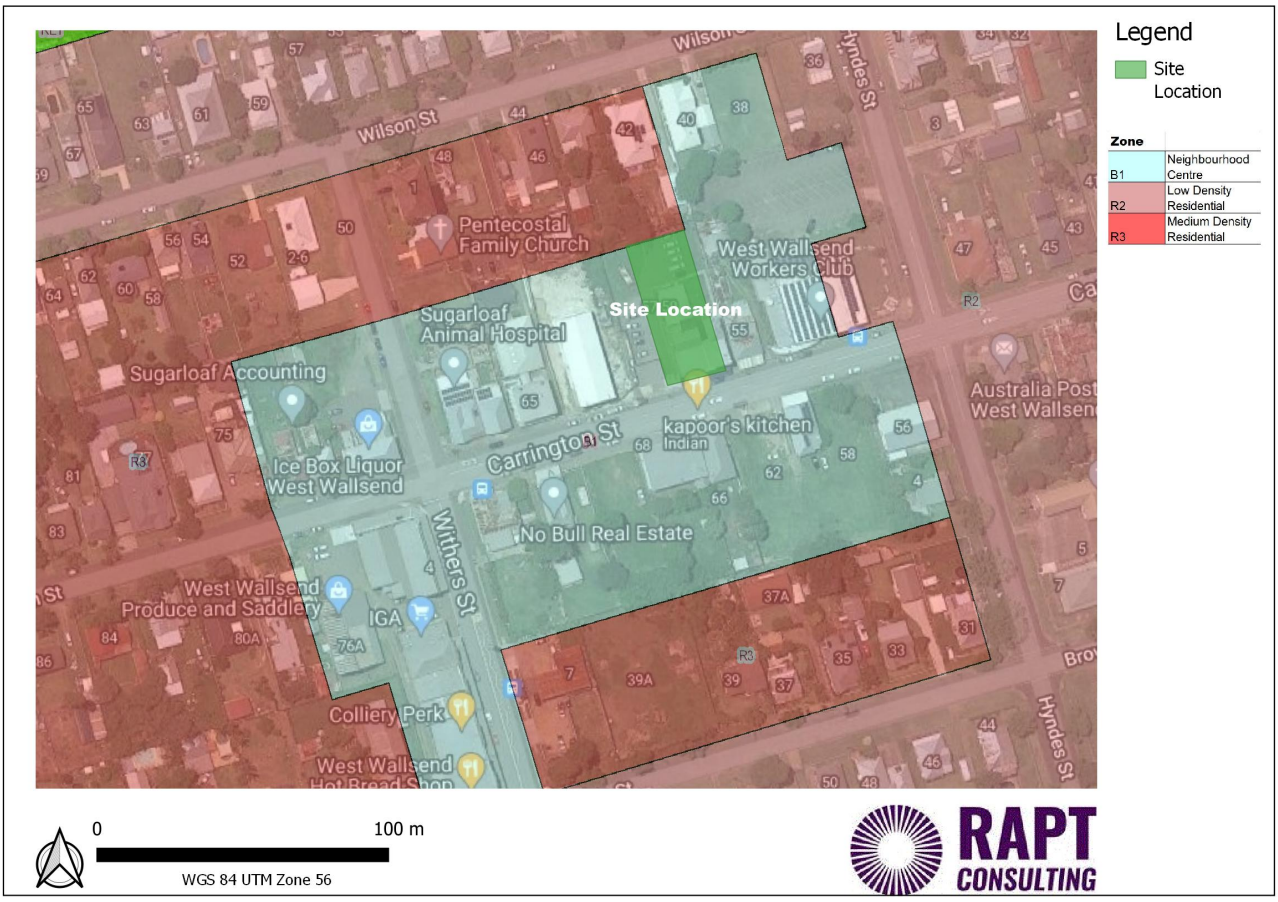


Figure 2-1 Land Use Zonings

For the purposes of this desktop assessment, AS 1055 has been utilised to establish background noise levels. As the proposal will be operating during daytime hours only, typical background noise levels for daytime sub-urban environments Category R2 2reas with low density transportation is provided in Table 2-1.

Table 2-1 Adopted Background Noise Levels

Noise Category Area	R2	Daytime 7:00 – 18:00 Average Background Noise Level dB L_{A90}
R2	Areas with Low Density Transportation	45

The L_{A90} descriptor is used to measure the background noise level. This descriptor represents the noise level that is exceeded for 90 per cent of the time over a relevant period of measurement. The L_{A90} descriptor is used to establish the Rating Background Noise Level (RBL) according the NPfI.

3. Noise Objectives

3.1 AAAC Child Care Guideline

We note that the EPA Noise Policy for Industry noise trigger levels are not strictly applicable to school developments. They are primarily intended to assess noise emissions from industrial/commercial developments.

The NPfI is not intended to be applicable to schools, and there are no criteria specifically relating to noise emissions from primary and secondary schools. Some noise emissions will be consistent with those from industrial or commercial premises. These include external mechanical plant and activity-related noise generated during the use of such spaces as the hall, music facilities and performance spaces and industrial technology workshops. It is therefore reasonable and appropriate to consider these sources of noise in the context of the NPfI.

However, noise from school children engaged in outdoor play cannot be assessed in the same manner as noise generated by the use of learning facilities such as classrooms, technology workshops, gymnasium and hall. The EPA's NPfI has previously been referred to for the assessment of such classroom and activity noise emissions (and noise from mechanical plant) however, the policy does not present appropriate criteria for the assessment of noise from outdoor areas.

A guideline for the assessment of noise from childcare centres has been prepared by the Association of Australasian Acoustical Consultants (AAAC). The document, *AAAC Guideline for Child Care Centre Acoustic Assessment*, *October 2013*, provides criteria for the assessment of noise associated with outdoor play. The guideline has been placed before the Land and Environment Court during matters involving Child Care Centre applications.

Since the time in which children are involved in outdoor play is limited, the potential impact associated with these noise emissions is minimised. The AAAC considers a total limit of 2 hours outdoor play per day at a child-care facility reasonable to apply a criterion that the L_{Aeq},15min noise level emitted from the outdoor play area not exceed the background noise level by more than 10dB at the assessment location.

3.2 Operational Noise

The NPfI doesn't contain specific procedures for the assessment of noise emissions from schools, particularly for outdoor play areas. However, it is also provided as a guide for determining potential noise impacts and applicable criteria.

The New South Wales *Noise Policy for Industry* (NPfI) provides guidance on the assessment of operational noise impacts. The guidelines include both intrusive and amenity criteria that are designed to protect receivers from noise significantly louder than the background level and to limit the total noise level from all sources near a receiver.

Intrusive noise levels set by the NPfI control the relative audibility of operational noise compared to the background level. Amenity criteria limit the total level of extraneous noise. Both sets of criteria are calculated and the lower of the two in each time period normally apply. Intrusive criteria are simply 5 decibels above the measured (or adopted) background level with a minimum of 40 dB(A) for daytime and 35 dB(A) for evening and night time.

Amenity noise levels are determined based on the overall acoustic characteristics of the receiver area and the existing level of noise excluding other noises such as traffic and insects. Residential receiver areas are characterised into 'urban', 'suburban', 'rural' or other categories based on land uses, the existing level of noise from industry, commerce, and road traffic. Project amenity noise levels are the recommended amenity noise level (Table 2.1 of the NPfI) minus 5 dB(A) and plus 3 dB(A) to convert from a period level to a 15-minute level. The project noise trigger level is the lower value between the intrusive and the amenity noise levels.

The NPfI noise criteria are planning levels and are not mandatory limits required by legislation however the noise criteria assist the regulatory authorities to establish licensing conditions. Where noise criteria are predicted to be exceeded, feasible and reasonable noise mitigation strategies should be considered. In circumstances where noise criteria cannot be achieved negotiation is required to evaluate the economic, social and environmental costs and benefits of the development against the noise impacts.

The NPfI is generally intended for large and complex industrial sources and recommends considerable monitoring and assessment measures that may not always be applicable to certain situations. However, the NPfI is also referred to for determining operational noise goals for this proposal.

Nearest residential receptors are considered sub-urban. NPfI and AAAC Target noise levels are provided for residences and commercial premises in Table 3-1.

Table 3-1Project Noise Trigger Levels

	Day 7 am to 6 pm
Rating Background Level $L_{A90(Period)}$	45
Project Intrusive Noise Level, $L_{Aeq(15min)}$	50
Project Amenity Noise Level (Sub-Urban), $L_{Aeq(Period)}$	50
Project Amenity Noise Level $L_{Aeq(15min)}$	53
NPfI Project Trigger Level Residential $L_{Aeq(15min)}$	**50**
AAAC Guideline Noise Goal Residential $L_{Aeq(15min)}$	**55**
Commercial Premises (When in use) $L_{Aeq(15min)}$	**63**
Active Recreation (When in use) $L_{Aeq(15min)}$	**53**

4. Assessment of Potential Impacts

The school's main operation hours will be between 8:30am and 5:00pm. The student's attendance hours will range between 9:00am and 3:00pm.

The school will cater for high school students who are in Year 7 to Year 10. Their ages will range from 12 years of age until 16/17 years of age. Majority of students who will be attending the school will be offered a Life Skills Curriculum.

The school's enrolment capacity will be up to 20 students.

Enrolment and attendance patterns for each student will vary during the day, meaning not all 20 students are likely to be on site at once.

Students will have access to outdoor play times varied throughout the day to minimise the number of students in the area.

The main outdoor play times will be around 10:15am to 10:30am (first break), 12:30pm to 1:00pm (lunch). The fenced outdoor play area will be located at the rear of the property and will have outdoor BBQ and table facilities and sensory/garden beds. A focus of the outdoor area will be a calm space for students.

The proposed site layout is shown in Figure 4-1. The fenced outdoor area is marked with a red X.

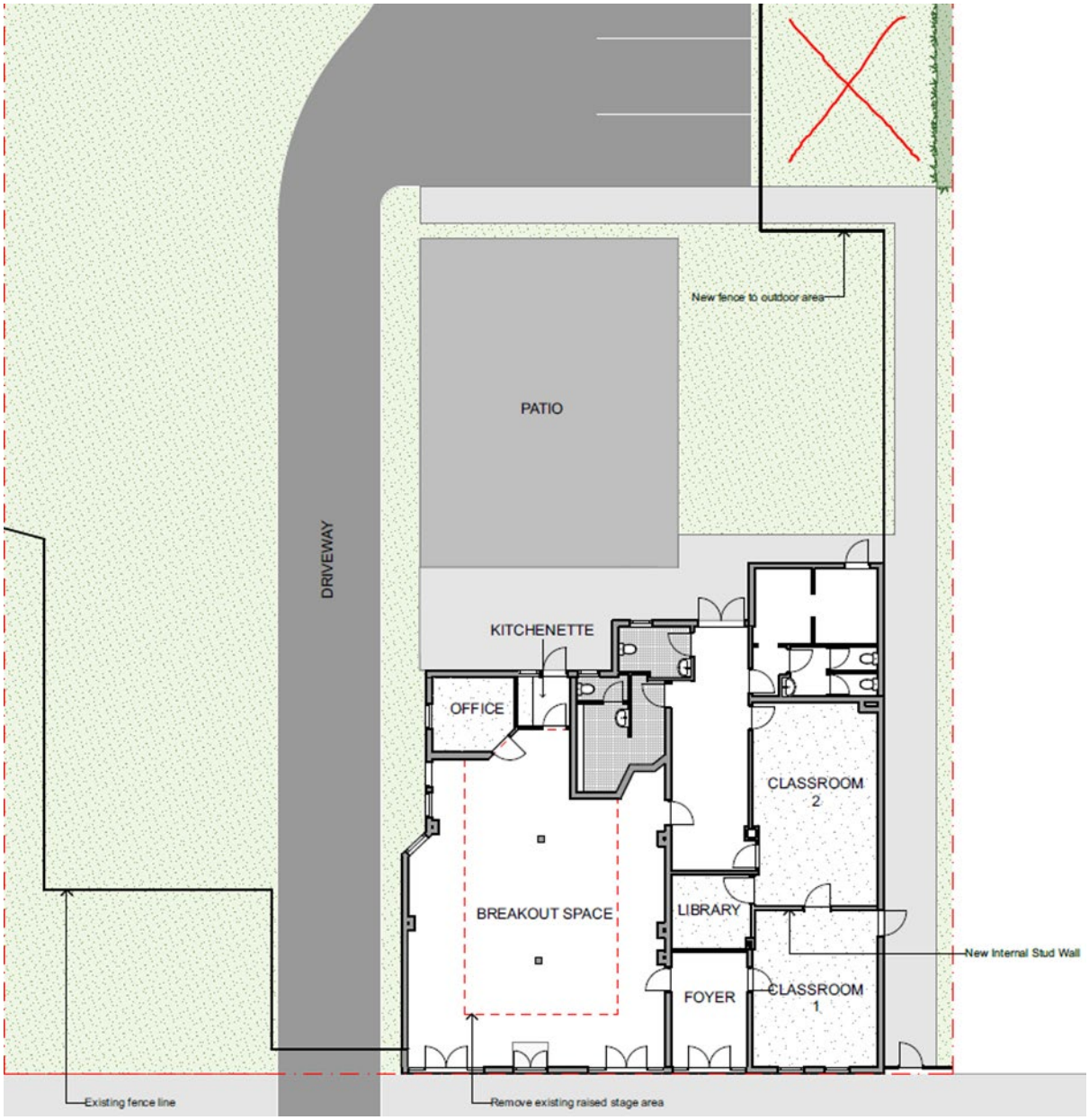


Figure 4-1 Proposed Site Layout

The school is not anticipated to use bells, horns or an intercom system. Therefore the primary noise sources will be in the form of mechanical equipment and outdoor activities during the above mentioned operating times.

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". Terrain topography, ground absorption, atmospheric absorption and relevant shielding objects are taken into account in the calculations.

Modelling results are based on available information provided and should only be used as a guide for comparative purposes. Site layout and building structures were based on information provided at the time of the assessment.

Primary Noise Sources

Student and faculty noise in the form of human raised voice has been sourced from RAPT Consulting's database. The sound level of normal and raised conversation is generally between 50 and 65 dB(A) at 1 metre. A sound level of 65 dB(A) for student noise has been assumed to be operating from the outdoor area in the form of 10 students conversing respectively as it is not expected every person would be conversing at one time.

We have assumed one kitchen exhaust fan will be required, typically vertical fans with the outlet located 1 metre above roof level over the kitchen. Refrigeration and air conditioning plant will also be required. A sound power level of 70 SWL dB(A) for these sources has conservatively been assumed with data sourced from RAPT Consulting's database.

To simulate a worst-case scenario, received noise produced by anticipated activities of outdoor students and faculty and mechanical plant have been simulated. Figure 4-2 shows the results of the modelling in the worst case scenario.

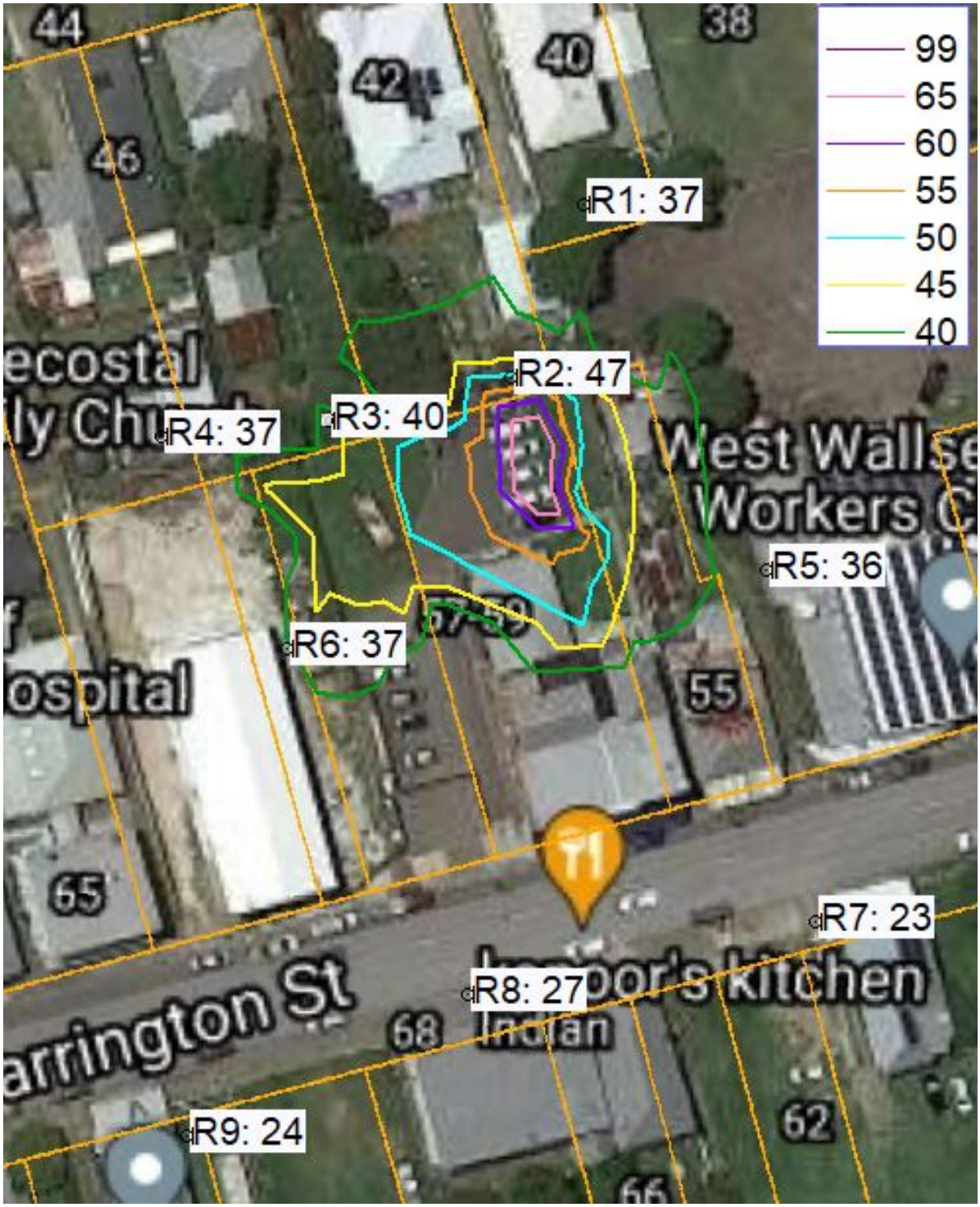


Figure 4-2 Cumulative Noise Modelling Results Leq(15min) dB(A)

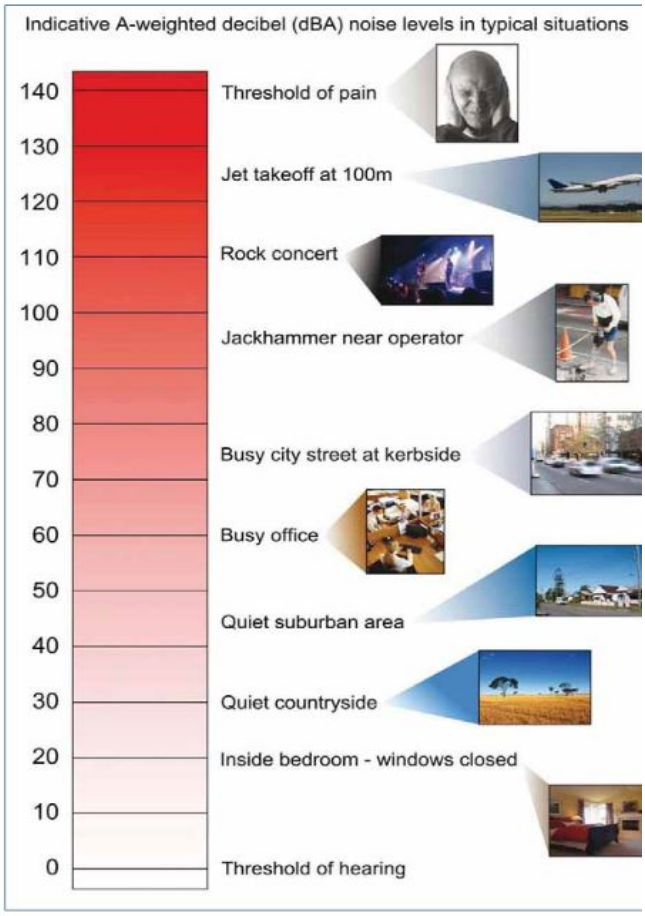
These are worst case scenarios with all people conversing and mechanical plant operating with no attenuation measures in place other than buildings and other environmental factors. In reality, it is highly unlikely for this scenario to occur where all of these items are operating simultaneously at their sound power levels. Actual noise levels received can be expected to be significantly lower. Based on this assessment compliance can be expected for the development at residential receptors and for commercial receptors.

5. Conclusion

RAPT Consulting has undertaken a noise assessment for the proposed change of use to the ground floor of a property at West Wallsend (previously The Clyde Inn) being 57 Carrington Street, West Wallsend.

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.

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).