RODNEY STEVENS ACOUSTICS
Acoustic Consultants
Member Australian Acoustical Society

Proposed Additions

Honey Suckle Hotel

Lot 31 Wharf C, Honeysuckle Drive, Newcastle

Acoustical Assessment

REPORT R170528R1

Revision 0

Prepared for:

ALH Group

13 November 2017

PO Box 522
Wahroonga NSW 2076
P 02 9943 5057
F 02 9475 1019
mail@rodneystevensacoustics.com.au

ABN 78 149 311 455
rodneystevensacoustics.com.au

Proposed Additions

Lot 31 Wharf C, Honeysuckle Drive, Newcastle

Acoustical Assessment

PREPARED BY:

Rodney Stevens Acoustics Pty Ltd
Telephone: 61 2 9943 5057 Facsimile 61 2 9475 1019
Email: info@rodneystevensacoustics.com.au
Web: www.rodneystevensacoustics.com.au

DISCLAIMER

Reports produced by Rodney Stevens Acoustics Pty Ltd are prepared for a particular Client's objective and are based on a specific scope, conditions and limitations, as agreed between Rodney Stevens Acoustics and the Client. Information and/or report(s) prepared by Rodney Stevens Acoustics may not be suitable for uses other than the original intended objective. No parties other than the Client should use any information and/or report(s) without first conferring with Rodney Stevens Acoustics.

The information and/or report(s) prepared by Rodney Stevens Acoustics should not be reproduced, presented or reviewed except in full. Before passing on to a third party any information and/or report(s) prepared by Rodney Stevens Acoustics, the Client is to fully inform the third party of the objective and scope and any limitations and conditions, including any other relevant information which applies to the material prepared by Rodney Stevens Acoustics. It is the responsibility of any third party to confirm whether information and/or report(s) prepared for others by Rodney Stevens Acoustics are suitable for their specific objectives.

DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
R170528R1	Revision 0	13 November 2017	Desmond Raymond	Rodney Stevens	Rodney Stevens

TABLE OF CONTENTS

1 INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (RSA) has been engaged by ALH Group to prepare a Noise Assessment for the proposed additions at Honey Suckle Hotel located at Lot 31 Wharf C, Honeysuckle Drive, Newcastle NSW.

ALH Group requires a statement addressing patron noise to accompany the Development Application (DA) for the proposal. The primary purpose of the assessment is to determine the noise impact from the operation of the Hotel to the nearest residential dwellings and where required provide in-principle design advice to achieve the requirements of acoustic amenity.

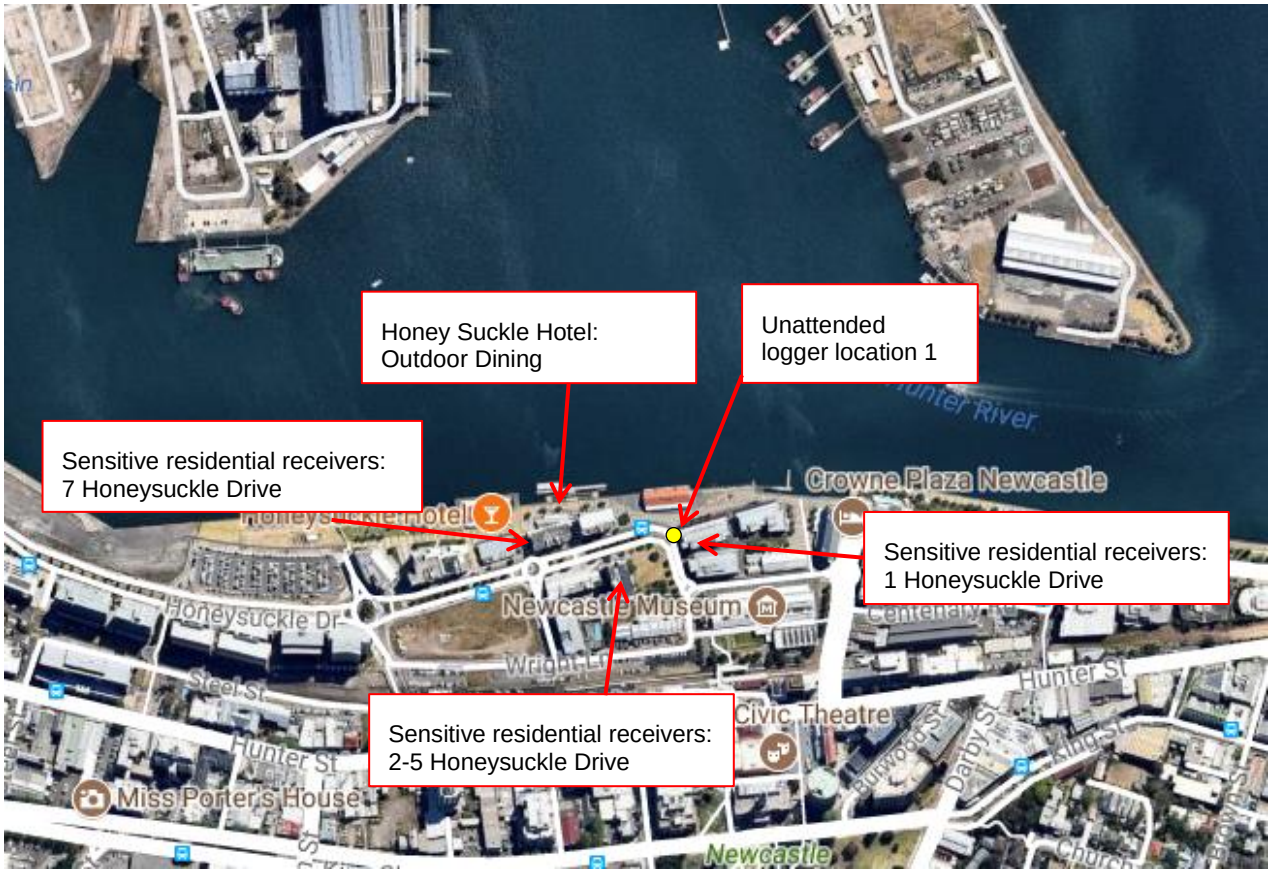
Specific acoustic terminology is used in this report. An explanation of common acoustic terms is provided in Appendix C.

2 PROJECT OVERVIEW

2.1 Proposed Development

The proposed development is located at Honey Suckle Hotel, Lot 31 Wharf C, Honeysuckle Drive, Newcastle. The project area and its surrounding environment are presented in Figure 2-1 below.

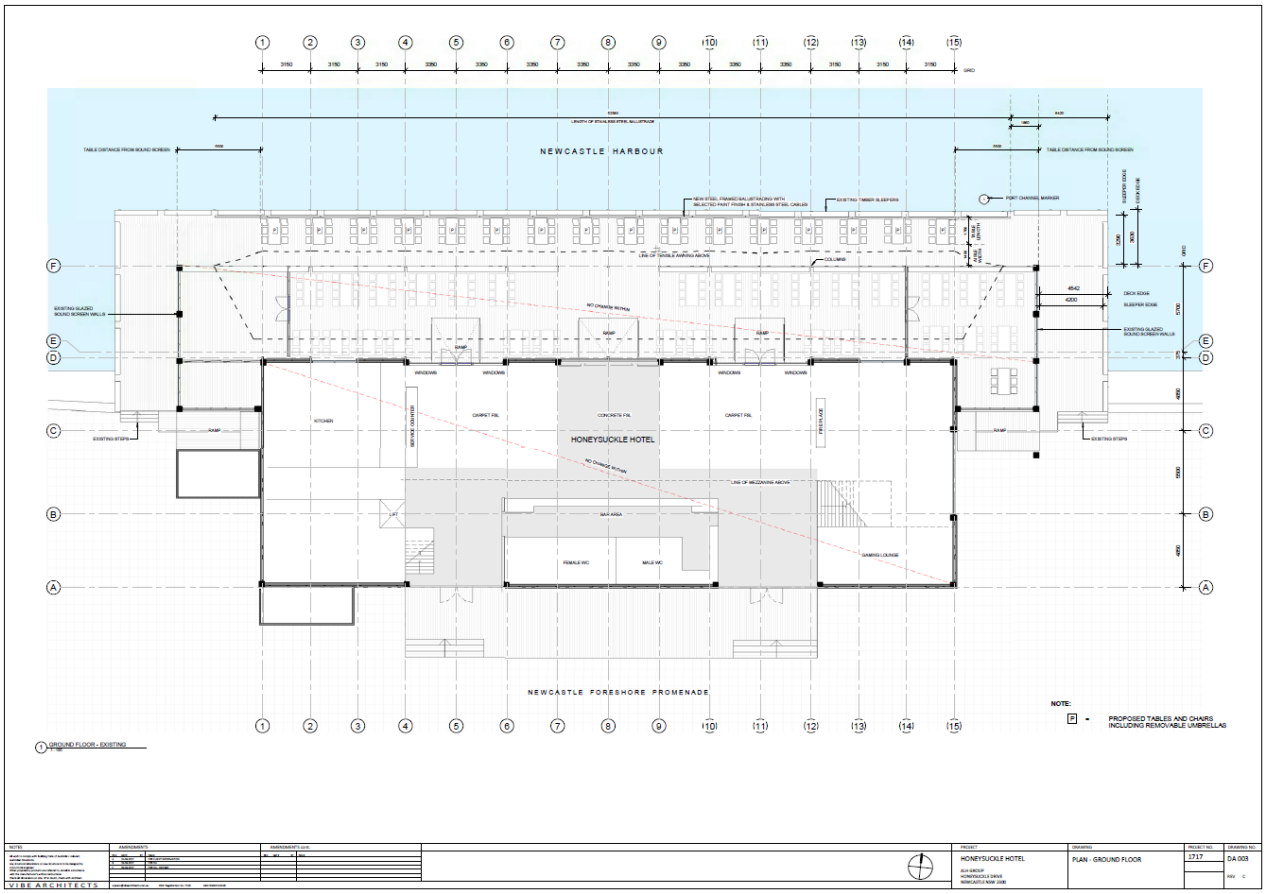
Figure 2-1 Project Area and Surrounding Environment



Aerial image courtesy of © 2017 nearmap ltd

The proposal is for the addition of an outdoor dining area which includes the addition of 16 tables and 96 chairs. The proposed site layouts of the development site are presented in Figure 2-1 below.

Figure 2-2 Proposed Outdoor Dining Floor Plan



The hours of operation of the hotel and restaurant are as follows:

- Monday to Thursday: 10.00 am – 11.00 pm
- Friday and Saturday: 10.00 am – 12.00 am
- Sunday: 10.00 pm – 10.00 pm

The outdoor deck area is to operate between the hours of 10:00 am and 10:00 pm, seven (7) days a week. No patrons are permitted in this area after 10:00 am.

A maximum of 2 special events per calendar year are permitted at which time the hotel and restaurant use may be extended until 1.00pm, on a public holiday, night preceding a public holiday or on a Friday or Saturday night. During special events, use of the outdoor deck area must cease by 10:00 pm. Any additional events to this are to be subject to a separate approval by Newcastle City Council.

Current restrictions to the venue in relation to any outdoor deck includes:

- Outdoor seating to 120 chairs and 20 tables
- Maximum number of 120 patrons

3 EXISTING NOISE ENVIRONMENT

Unattended noise monitoring for the development was carried out between 20 October and 27 October 2017 at the location shown in Figure 2-1.

The location was selected after a detailed inspection of the project area giving consideration to other noise sources that may influence the readings, the proximity of noise-sensitive receivers and security issues for the noise monitoring device and gaining permission for access from the residents or landowners. The results of the ambient noise monitoring are shown in Table 3-1.

Instrumentation for the survey comprised of a RION NL-42 Environmental Noise Logger (serial number 572558) fitted with a microphone windshield. Calibration of the logger was checked prior to and following measurements. Drift in calibration did not exceed ±0.5 dBA. All equipment carried appropriate and current NATA (or manufacturer) calibration certificates.

3.1 Noise Results

From the measured noise levels, the results have been summarised and presented in Table 3-1. These results represent the current Rated Background Noise Levels (RBL) at the monitoring locations. The monitored baseline noise levels are detailed in Table 3-1.

Table 3-1 Measured Existing Noise Levels Corresponding Assessment Time Periods

Location	Measurement Descriptor	Measured Noise Level – dBA re 20 µPa		
		Daytime 7.00 am – 6.00 pm	Evening 6.00 pm – 10.00 pm	Night Time 10.00 pm – 7.00 am
1 Honeysuckle Drive	LAeq[1]	63	60	55
	RBL (Background)[2]	50	50	44

Note 1: The LAeq is essentially the average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.
Note 2: The RBL noise level is representative of the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

The results of the background noise spectra are presented in Table 3-2.

Table 3-2 Background Noise Spectra

Description	Ambient Noise Levels per Octave Bands - dB									Overall - dBA
	32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz	
L_{90} Background Noise Level – Daytime	18	29	36	41	43	41	37	30	20	50

4 ASSESSMENT CRITERIA

The environmental goals for the operational noise emissions from the proposed additions are based upon the L&G NSW noise criteria for use.

4.1 Liquor and Gaming NSW

L&G NSW guidance for the assessment of noise from licensed premises is published in EPA's *Noise Guide for Local Government* and reproduced as follows:

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

4.2 Project Specific Noise Goals

Project specific noise criteria based on the measured ambient noise and L&G NSW requirements as described in Section 4.1 are summarised in Table 4-1.

Table 4-1 Project Specific Noise Criteria

Time Period	Overall dBA	Octave Band Centre Frequency (Hz)[1]								
		31.5	63	125	250	500	1K	2K	4k	8k
Daytime (7am – 12am)	55	23	34	41	46	49	46	42	35	25

4.3 Operational Noise – NSW EPA Industrial Noise Policy

Responsibility for the control of noise emissions in New South Wales is vested in Local Government and the EPA.

The EPA oversees the Industrial Noise Policy (INP) January 2000 which provides a framework and process for deriving noise criteria. The INP criteria for industrial noise sources have two (2) components:

- Controlling the intrusive noise impacts for residents and other sensitive receivers in the short term; and
- Maintaining noise level amenity for particular land uses for residents and sensitive receivers in other land uses.

Intrusiveness Criterion

For assessing intrusiveness, the background noise generally needs to be measured. The intrusiveness criterion essentially means that the equivalent continuous noise level (L_{Aeq}) of the source should not be more than 5 dB(A) above the measured Rated Background Level (RBL), over any 15 minute period.

Amenity Criterion

The amenity criterion is based on land use and associated activities (and their sensitivity to noise emission). The cumulative effect of noise from industrial sources needs to be considered in assessing the impact. The criteria relate only to other industrial-type noise sources and do not include road, rail or community noise. The existing noise level from industry is measured. If it approaches the criterion value, then noise levels from new industrial-type noise sources, (including air-conditioning mechanical plant) need to be designed so that the cumulative effect does not produce total noise levels that would significantly exceed the criterion.

Area Classification

The INP characterises the "Urban" noise environment as an area with an acoustical environment that:

- Is dominated by 'urban hum' or industrial source noise
- Has through traffic with characteristically heavy and continuous traffic flows during peak periods
- Is near commercial districts or industrial districts

Has any combination of the above

Where 'urban hum' means the aggregate sound of many unidentifiable, mostly traffic-related sound sources.

This area may be located in either a **rural, rural-residential, environment protection zone** or **scenic protection zone**, as defined on a council-zoning map (Local Environmental Plan (LEP) or other planning instrument).

Project Specific Noise Levels

Having defined the area type, the processed results of the unattended noise monitoring have been used to determine project specific noise criteria. The intrusive and amenity criteria for nearby residential premises are presented in Table 4-2. These criteria are nominated for the purpose of assessing potential noise impacts from the proposed development.

In this case, the ambient noise environment is not controlled by industrial noise sources and therefore the amenity criteria become equal to the Recommended Amenity Criteria for Residences in an Urban Area (ie ANL or Acceptable Noise Level). For each assessment period, the lower (ie the more stringent) of the amenity or intrusive criteria are adopted. These are shown in bold text in Table 4-2.

Table 4-2 Operational Noise Criteria

Receiver	Time of Day	ANL [1] $L_{Aeq(15min)}$	Measured RBL [2] $L_{A90(15minute)}$	Measured L_{Aeq} Noise Level	Criteria for New Sources	
					Intrusive $L_{Aeq(15min)}$	Amenity [3] $L_{Aeq(15min)}$
Residential	Day	60	50	63	55	**53**
	Evening	50	50	60	55	**50**
	Night	45	44	55	49	**45**
Commercial	When in use	65	-	-	-	**65**

Note 1: ANL = “Acceptable Noise Level” for residences in Urban Areas.
Note 2: RBL = “Rating Background Level”.
Note 3: Assuming existing noise levels are unlikely to decrease in the future
Note 4: Current measured RBL meets the ANL requirement

The project specific noise criteria for the operation of the operation of mechanical plants is derived to be $L_{Aeq(15min)}$ 53 dBA for the daytime period, $L_{Aeq(15min)}$ 50 dBA for the evening period and $L_{Aeq(15min)}$ 45 dBA for the night time period.

The project specific noise criteria for any commercial premises is $L_{Aeq(15min)}$ 65 dBA when the commercial premises are in operation.

5 NOISE ASSESSMENT

5.1 Patron Noise Assessment

The proposed additions to the Hotel will see an addition of up to 96 patrons. Calculations of noise transmitted from Honey Suckle Hotel have been made based on a typical patron sound power spectrum as based on the sound power levels derived from Table 16.1 in “*Handbook of Acoustical Measurements and Noise Control*” by C.M. Harris. Harris documents a typical casual male voice being 53 dBA at 1 m, a typical normal voice is 58 dBA at 1 m, a typical raised voice is 65 dBA at 1 m, a typical loud voice is 75 dBA at 1 m and shouting is 88 dBA at 1 m. Applying a standard conversion of + 8 dBA to convert sound pressure level at 1 m to a sound power level, the sound power level of a typical raised voice equates to 78 dBA.

Table 5-1 outlines the sound power spectrum of a patron talking with a raised vocal effort.

Table 5-1 Typical Sound Pressure Level of 1 Person with Normal Voice at 1m – Lp

Scenario	Resultant Noise Level per Octave Band (dB)								Overall (dBA)
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
1 Patron – Normal Voice	58	48	51	54	46	41	39	35	58

This spectrum and overall noise level is believed to be a reasonable approximation of the typical scenario that could be expected from patrons using the outdoor dining area.

The following operational scenario has been assumed for the purposes of this assessment:

- 96 people

Table 5-2 Overall Patron Sound Power Level – L_W

Scenario	Resultant Noise Level per Octave Band (dB)								Overall (dBA)
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
96 patrons	78	68	71	74	66	61	59	55	78

The 32 Hz octave band has not been assessed due to the limited availability of transmission loss (TL) data in this low (bass) frequency band. It is also very likely that even if noise emission in this low frequency

octave band exceeds the noise criterion; it will be very close to, if not below, the human threshold of hearing at the receivers.

5.2 Predicted Patron Noise Impacts

Predictive resultant noise spectrums based on the proposed additions have been calculated for patron emission at neighbouring residential receivers are presented in Table 5-3. The following assessment was conducted with the following assumptions:

- Heights of receivers are assumed to be 1.5 m above their respective floor level
- Shielding provided by the existing Hotel structure including the existing acoustic screening
- No live music or DJs in the outdoor Beer garden or outdoor areas of the outdoor dining area

Table 5-3 Noise Assessment at Nearby Noise Sensitive Receiver

Receivers	Resultant Sound Pressure Level per Octave Band (dB)								Overall (dBA)
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
7 Honeysuckle Drive									
Impact – Daytime	23	7	9	9	0	0	0	0	13
Criterion 7am to midnight	34	41	46	49	46	42	35	25	55
Exceedance	-	-	-	-	-	-	-	-	-
2-5 Honeysuckle Drive									
Impact – Daytime	19	3	5	5	0	0	0	0	9
Criterion 7am to midnight	34	41	46	49	46	42	35	25	55
Exceedance	-	-	-	-	-	-	-	-	-
1 Honeysuckle Drive									
Impact – Daytime	18	16	24	33	31	28	24	14	37
Criterion 7am to midnight	34	41	46	49	46	42	35	25	55
Exceedance	-	-	-	-	-	-	-	-	-

The predicted noise levels show compliance to the established noise criteria.

6 RECOMMENDATIONS

The predicted noise levels at the nearest residential receivers shows compliance to the established noise criteria. The predictive modelling has taken into account the existing building façades. In order to preserve acoustic amenity, the following measures are recommended to be incorporated within the Hotel design:

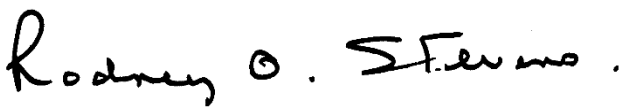
- There is to be no amplified music in the form of live bands and DJ
- Outdoor dining is to be closed at 12:00am
- Signs should also be posted at exit doors reminding patrons to leave the premises in an orderly and quiet manner

7 CONCLUSION

Rodney Stevens Acoustics has conducted a Noise Impact Assessment for the proposed additions to the Honey Suckle Hotel located at Lot 31 Wharf C, Honeysuckle Drive, Newcastle NSW. The assessment has predicted the noise impact to the nearest residential dwellings. The noise modelling resulted in compliance to the NSW EPA Industrial Noise Policy and OLGR Requirements.

It is envisaged that the addition of the outdoor deck area will not have an adverse acoustic impact to the nearby residences. The predicted noise levels to the nearby residents with the operation of the outdoor deck with 96 patrons in the outdoor area

Approved:-



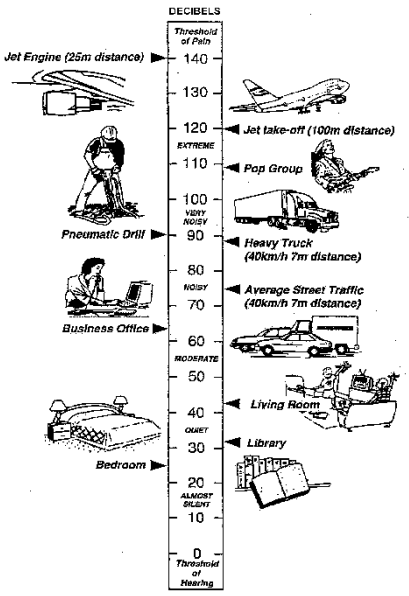
Rodney Stevens - MAAS

Appendix A – Acoustic Terminology

A-weighted sound pressure	The human ear is not equally sensitive to sound at different frequencies. People are more sensitive to sound in the range of 1 to 4 kHz (1000 – 4000 vibrations per second) and less sensitive to lower and higher frequency sound. During noise measurement an electronic '*A-weighting*' frequency filter is applied to the measured sound level *dB(A)* to account for these sensitivities. Other frequency weightings (B, C and D) are less commonly used. Sound measured without a filter is denoted as linear weighted dB(linear).
Ambient noise	The total noise in a given situation, inclusive of all noise source contributions in the near and far field.
Community annoyance	Includes noise annoyance due to: ▪ character of the noise (e.g. sound pressure level, tonality, impulsiveness, low-frequency content) ▪ character of the environment (e.g. very quiet suburban, suburban, urban, near industry) ▪ miscellaneous circumstances (e.g. noise avoidance possibilities, cognitive noise, unpleasant associations) ▪ human activity being interrupted (e.g. sleep, communicating, reading, working, listening to radio/TV, recreation).
Compliance	The process of checking that source noise levels meet with the noise limits in a statutory context.
Cumulative noise level	The total level of noise from all sources.
Extraneous noise	Noise resulting from activities that are not typical to the area. Atypical activities may include construction, and traffic generated by holiday periods and by special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.
Feasible and reasonable measures	Feasibility relates to engineering considerations and what is practical to build; reasonableness relates to the application of judgement in arriving at a decision, taking into account the following factors: ▪ Noise mitigation benefits (amount of noise reduction provided, number of people protected). ▪ Cost of mitigation (cost of mitigation versus benefit provided). ▪ Community views (aesthetic impacts and community wishes).

- Noise levels for affected land uses (existing and future levels, and changes in noise levels).

Impulsiveness	Impulsive noise is noise with a high peak of short duration or a sequence of these peaks. Impulsive noise is also considered annoying.
Low frequency	Noise containing major components in the low-frequency range (20 to 250 Hz) of the frequency spectrum.
Noise criteria	The general set of non-mandatory noise levels for protecting against intrusive noise (for example, background noise plus 5 dB) and loss of amenity (e.g. noise levels for various land use).
Noise level (goal)	A noise level that should be adopted for planning purposes as the highest acceptable noise level for the specific area, land use and time of day.
Noise limits	Enforceable noise levels that appear in conditions on consents and licences. The noise limits are based on achievable noise levels, which the proponent has predicted can be met during the environmental assessment. Exceedance of the noise limits can result in the requirement for either the development of noise management plans or legal action.
Performance-based goals	Goals specified in terms of the outcomes/performance to be achieved, but not in terms of the means of achieving them.
Rating Background Level (RBL)	The rating background level is the overall single figure background level representing each day, evening and night time period. The rating background level is the 10^{th} percentile min L_{A90} noise level measured over all day, evening and night time monitoring periods.
Receptor	The noise-sensitive land use at which noise from a development can be heard.
Sleep disturbance	Awakenings and disturbance of sleep stages.
Sound and decibels (dB)	Sound (or noise) is caused by minute changes in atmospheric pressure that are detected by the human ear. The ratio between the quietest noise audible and that which should cause permanent hearing damage is a million times the change in sound pressure. To simplify this range the sound pressures are logarithmically converted to decibels from a reference level of 2 x 10-5 Pa. The picture below indicates typical noise levels from common noise sources.



dB is the abbreviation for decibel – a unit of sound measurement. It is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure.

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)*.

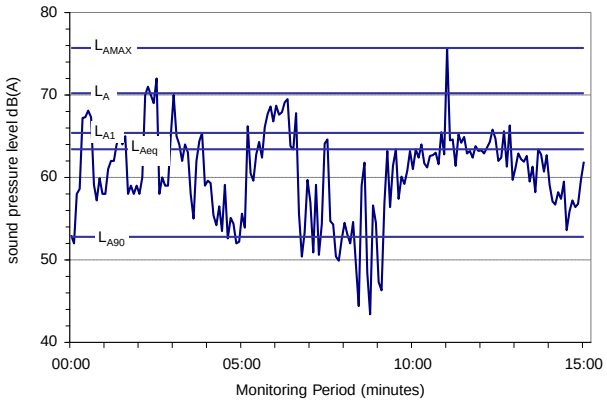
Sound Pressure Level (SPL)

The level of noise, usually expressed as SPL in *dB(A)*, as measured by a standard sound level meter with a pressure microphone. The sound pressure level in *dB(A)* gives a close indication of the subjective loudness of the noise.

Statistical noise levels

Noise levels varying over time (e.g. community noise, traffic noise, construction noise) are described in terms of the statistical exceedance level.

A hypothetical example of A weighted noise levels over a 15 minute measurement period is indicated in the following figure:



Key descriptor

- LAmax Maximum recorded noise level.

- L_{A1} The noise level exceeded for 1% of the 15 minute interval.
- L_{A10} Noise level present for 10% of the 15 minute interval. Commonly refer
- L_{Aeq} Equivalent continuous (energy average) A-weighted sound pressure le
- L_{A90} Noise level exceeded for 90% of time (background level). The average

Threshold	The lowest sound pressure level that produces a detectable response (in an instrument/person).
Tonality	Tonal noise contains one or more prominent tones (and characterised by a distinct frequency components) and is considered more annoying. A 2 to 5 dBA penalty is typically applied to noise sources with tonal characteristics.

Appendix B – Calibration Certificates

Acoustic Research Labs Pty Ltd
Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3.2013

Calibration Certificate

Calibration Number C17322

Client Details Rodney Stevens Acoustics Pty Ltd
1 Majura Close
St Ives Chase NSW 2075

Equipment Tested/ Model Number : Rion NL-42EX
Instrument Serial Number : 00572558
Microphone Serial Number : 170393
Pre-amplifier Serial Number : 72896

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	22.2°C	**Ambient Temperature :**	22.8°C
Relative Humidity :	36.6%	**Relative Humidity :**	35.9%
Barometric Pressure :	99.76kPa	**Barometric Pressure :**	99.65kPa

Calibration Technician : Lucky Jaiswal
Calibration Date : 03/07/2017
Secondary Check: Riley Cooper
Report Issue Date : 04/07/2017

Approved Signatory : Juan Aguero

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 2 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
31.5 Hz to 8kHz	*±0.16dB*	*Temperature*	*±0.05°C*
12.5kHz	*±0.2dB*	*Relative Humidity*	*±0.46%*
16kHz	*±0.29dB*	*Barometric Pressure*	*±0.017kPa*
Electrical Tests			
31.5 Hz to 20 kHz	*±0.12dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

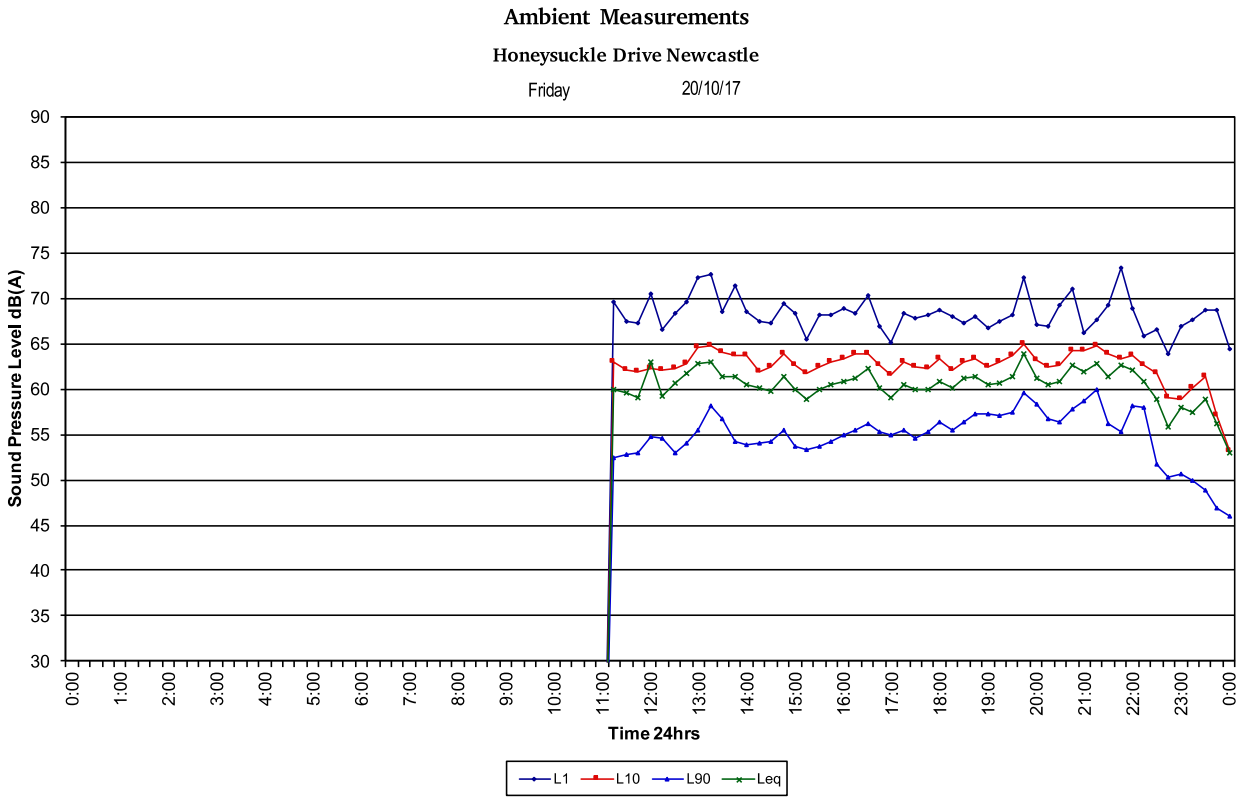
Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025.

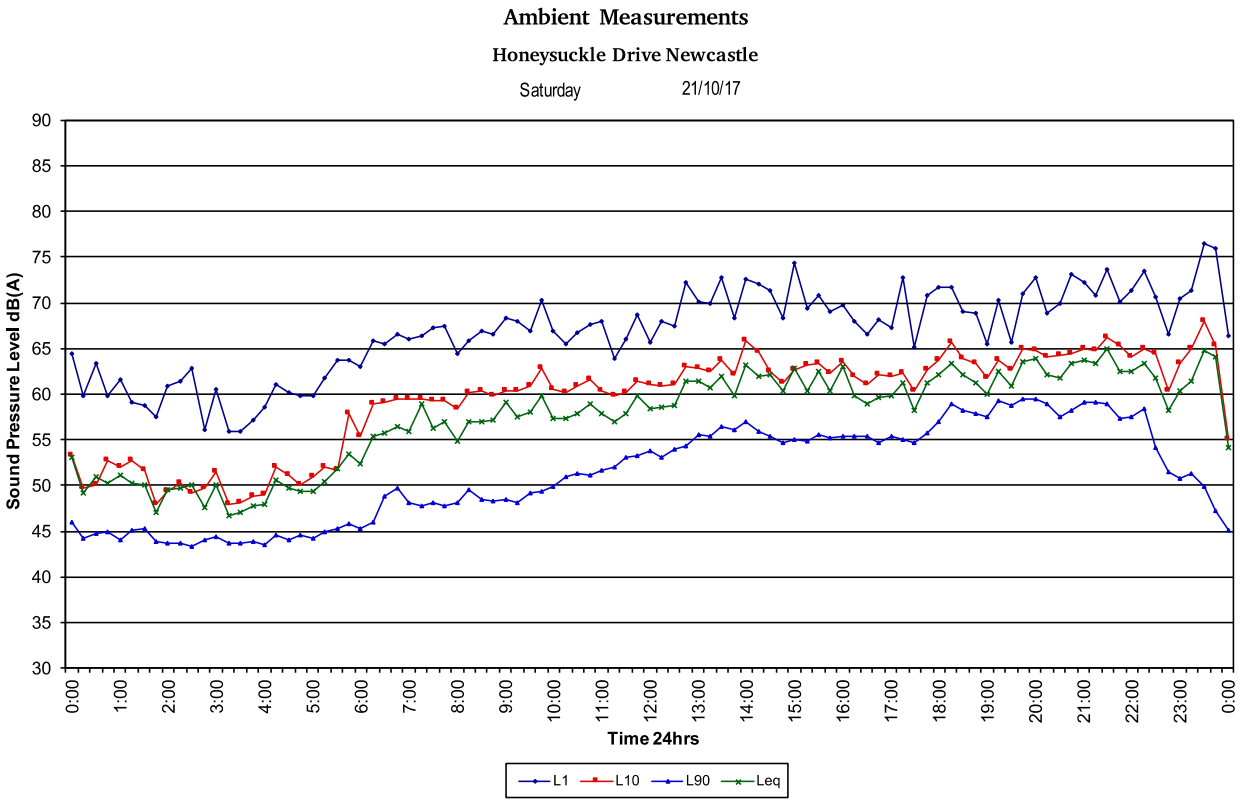
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1

Appendix C – Unattended Noise Monitoring Results

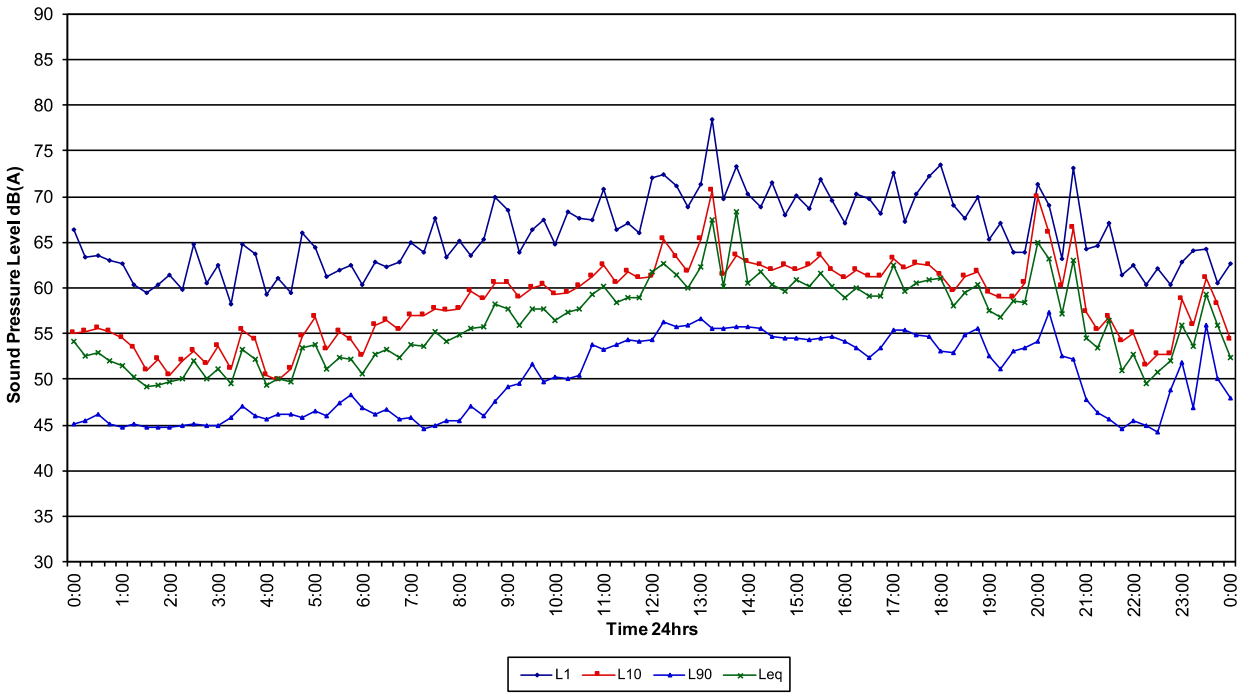




Ambient Measurements

Honeysuckle Drive Newcastle

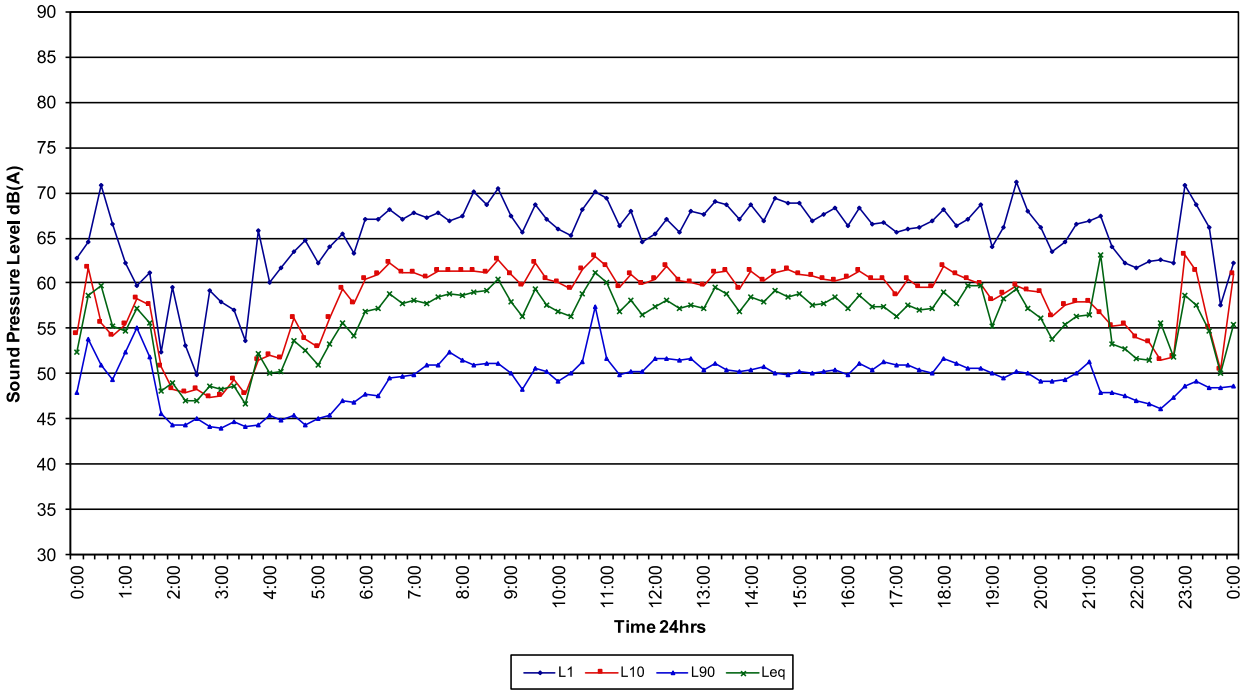
Sunday 22/10/17



Ambient Measurements

Honeysuckle Drive Newcastle

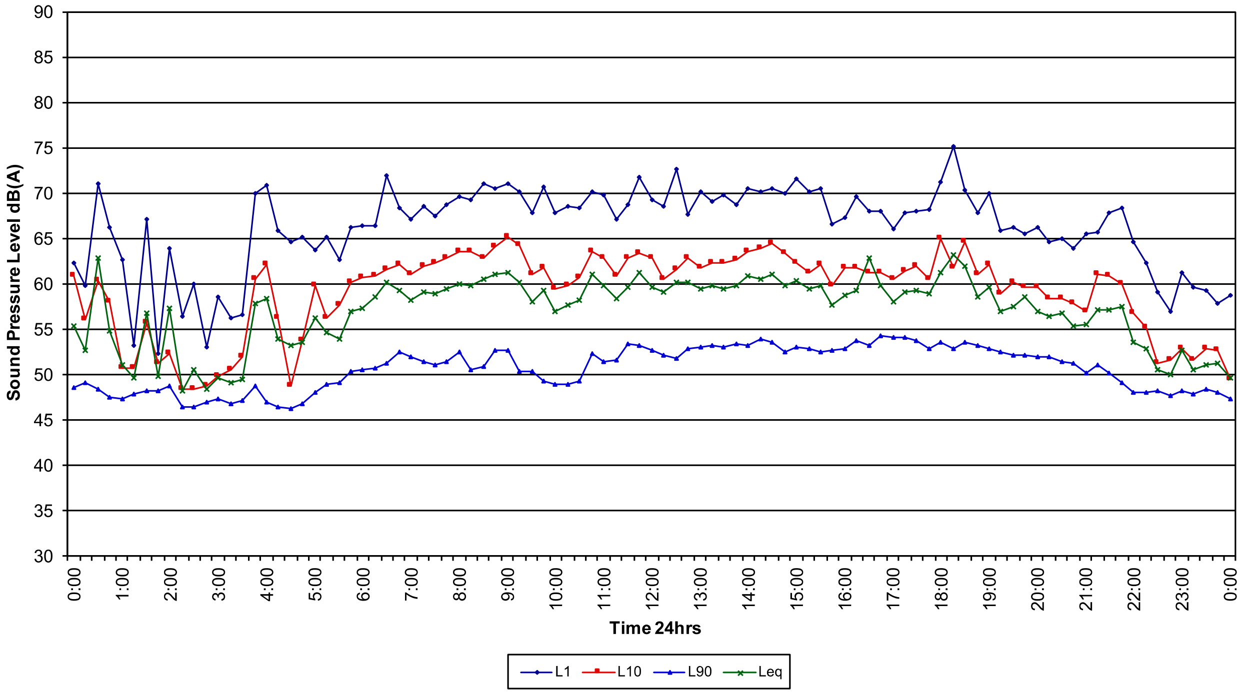
Monday 23/10/17



Ambient Measurements

Honeysuckle Drive Newcastle

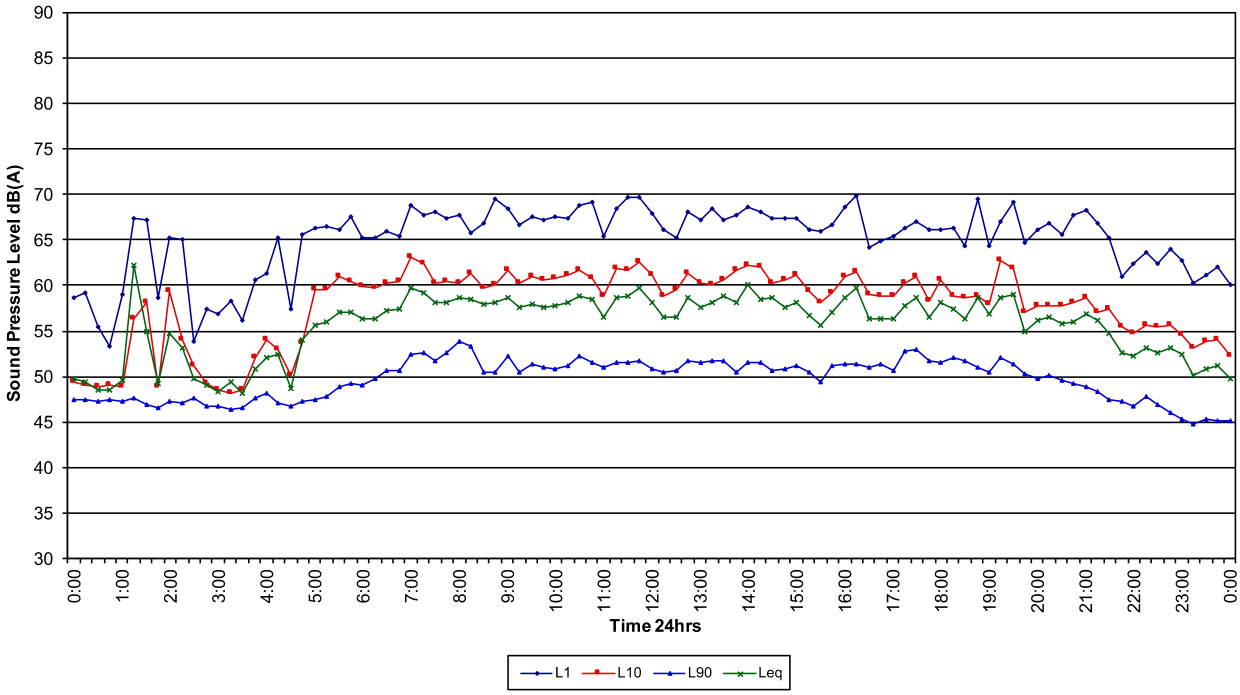
Tuesday 24/10/17



Ambient Measurements

Honeysuckle Drive Newcastle

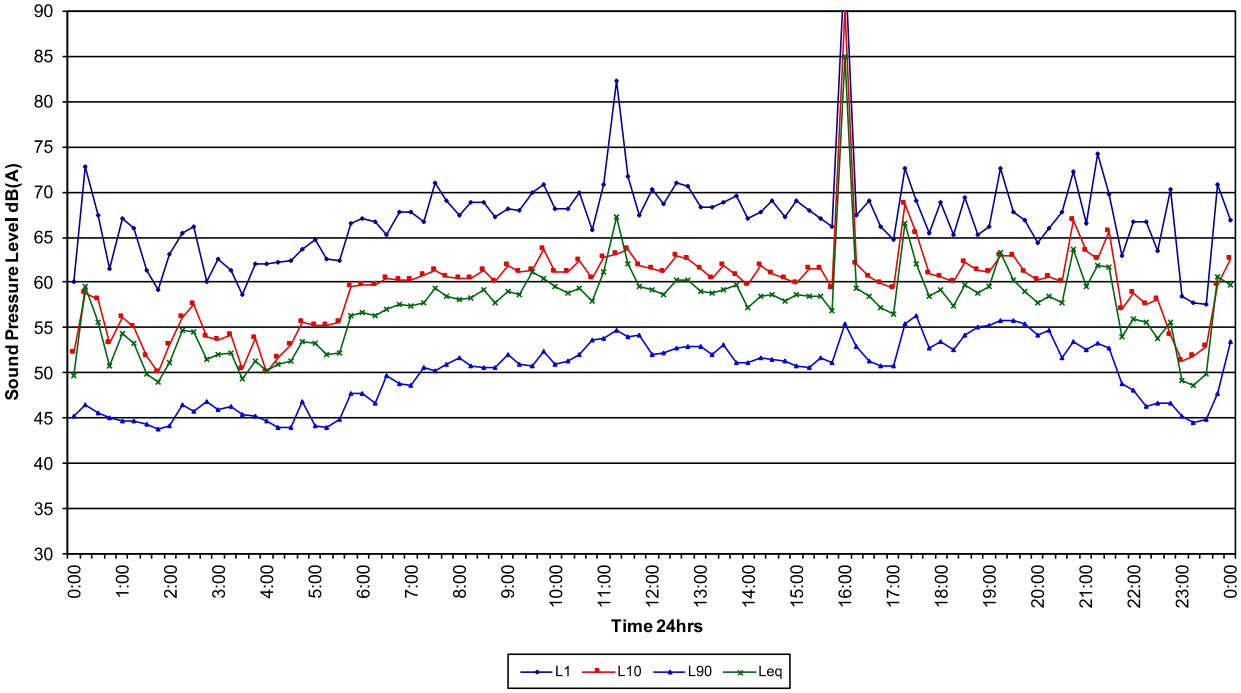
Wednesday 25/10/17



Ambient Measurements

Honeysuckle Drive Newcastle

Thursday 26/10/17



Ambient Measurements

Honeysuckle Drive Newcastle

Friday 27/10/17