RODNEY STEVENS ACOUSTICS
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REPORT 180490R1

Revision 1

Noise Impact Assessment

Proposed Residential Development

824 - 834 Forest Road, Peakhurst

PREPARED FOR:
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1 INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (here forth referred to as RSA), has been engaged by Mono Constructions Pty Ltd care of Zhinar Architects to conduct a road noise impact assessment for the Development Application (DA) lodgment of the proposed residential development at 824-834 Forest Road, Peakhurst.

The report addresses traffic noise impact from Forest Road in addition to any potential noise intrusion from the neighbouring commercial areas to the east and west on the amenity of the proposed residential development.

This assessment is to form part of the supporting documentation for the DA submission to Georges River Council.

Specific acoustic terminology is present throughout this report. An explanation of these acoustic terms is provided in Appendix A

2 PROPOSED DEVELOPMENT

2.1 Site Location

The proposed residential development site is located at 824-834 Forest Road, Peakhurst. At present, it is bounded by residential areas the north, commercial areas to the west and east with Forest Road to the south. The location of the proposed site and surrounding area is presented in Figure 2-1.

Figure 2-1 Site Location

Aerial image courtesy of Near Map © 2018

2.2 Proposed Development

The proposal consists of two, four storey residential apartment building blocks. Both buildings will be provided with basement parking to fulfil requirements stated under Council DCP. The architectural plans of the proposed residential development are presented in Appendix D.

3 EXISTING ACOUSTIC ENVIRONMENT

3.1 Unattended Noise Monitoring

In order to characterize the existing acoustical environment of the area, RSA carried out unattended noise monitoring between Wednesday 26 September and Wednesday 3 October 2018 at the logging location shown in Figure 2-1. The noise monitoring at this location is representative of the acoustic environment at the project site.

RSA selects logger location with consideration to; other noise sources, which may influence readings, equipment security issues and gaining permission for access from other landowners.

Instrumentation for the survey comprised of two NL-42 RION environmental noise loggers (serial numbers: 133013 and 572542) fitted with a microphone windshield. Calibration of the logger was checked prior to and following measurements. Drift in calibration did not exceed ±0.5 dB (A). All equipment carried appropriate and current NATA (or manufacturer) calibration certificates.

4 NOISE CRITERIA

4.1 Road Noise and Vibration Criteria

The determination of an acceptable level of road noise that will impact internal residential spaces requires consideration of the activities carried out within the space and the degree to which noise will interfere with those activities.

As sleep is the activity most affected by traffic noise, bedrooms are considered to be the most sensitive internal living areas. Higher levels of noise are acceptable in living areas without interfering with activities such as reading, listening to the television etc. Noise levels in utility spaces such as kitchens, bathrooms, laundries etc. can be higher.

4.1.1 Georges River Council Requirements

Georges River Council has specific requirements for traffic noise intrusion into residential spaces. These requirements are detailed in the Georges River Council's DCP and pertain to the SEPP (Infrastructure) 2007 they are as follows:

> ***State Environmental Planning Policy (Infrastructure) 2007***
>
> *Appropriate measures must be taken to ensure that the following LAeq levels are not exceeded:*
>
> *In any bedroom in the building – 35 dB(A) at any time between 10 pm and 7 am*
>
> *Anywhere else in the building (other than a garage, kitchen, bathroom or hallway) – 40 dB(A) at any time*
>
> ***Environmental Health***
>
> *An acoustic report is to be prepared by an appropriately qualified acoustic consultant having the technical eligibility criteria required for membership of the Association of Australian Acoustical Consultants (AAAC) and/or grade membership of the Australian Acoustical Society (MAAS). The report shall consider noise intrusion from the road and measures to ensure compliance with SEPP (Infrastructure) 2007. The report should also consider noise emissions from the development including but not limited to proposed mechanical plant (air conditioners, lift shift, automatic roller doors, and ventilation plant for the underground car park) and construction/vibration impacts. The report should be prepared in accordance with the NSW Environment Protection Authority Industrial Noise Policy, EPA's Interim Construction Noise*

Guidelines & NSW DP&I's Development near Rail Corridors and Busy Roads – Interim Guideline

4.1.2 State Environmental Planning Policy (Infrastructure) 2007

Road and Rail Noise Criteria

The NSW Government's State Environmental Planning Policy (Infrastructure) 2007 (SEPP (Infrastructure) 2007) was introduced to facilitate the delivery of infrastructure across the State by improving regulatory certainty and efficiency. In accordance with the SEPP, Table 3.1 of the NSW Department of Planning and Infrastructure's "*Development near Rail Corridors and Busy Roads - Interim Guideline"* (the DP&I Guideline) of December 2008 provides noise criteria for residential and non-residential buildings. These criteria are summarized in Table 4-1.

Table 4-1 DP&I Interim Guideline Noise Criteria

Type of occupancy	Noise Level dB(A)	Applicable time period
Sleeping areas (bedroom)	35	Night 10 pm to 7 am
Other habitable rooms (excl. garages, kitchens, bathrooms & hallways)	40	At any time

Note 1: Airborne noise is calculated as $L_{Aeq\ (15hour)}$ daytime and $L_{Aeq\ (9hour)}$ night-time

The following guidance is provided in the DP&I Guideline:

> *"These criteria apply to all forms of residential buildings as well as aged care and nursing home facilities. For some residential buildings, the applicants may wish to apply more stringent design goals in response to market demand for a higher quality living environment.*
>
> *The night-time "sleeping areas" criterion is 5 dB (A) more stringent than the "living areas" criteria to promote passive acoustic design principles. For example, designing the building such that sleeping areas are less exposed to road or rail noise than living areas may result in less onerous requirements for glazing, wall construction and acoustic seals. If internal noise levels with windows or doors open exceed the criteria by more than 10 dB(A), the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Code of Australia."*

The noise criteria presented in Section 4.1.2 and in Table 4-1 apply to a 'windows closed condition'. Standard window glazing of a building will typically attenuate noise ingress by 20 dB(A) with windows closed and 10 dB(A) with windows open (allowing for natural ventilation). Accordingly, the external noise threshold above which a dwelling will require mechanical ventilation is an $L_{Aeq(9hour)}$ of 55 dB(A) for bedrooms and $L_{Aeq(15hour)}$ of 60 dB(A) for other areas.

Where windows must be kept closed, the adopted ventilation systems must meet the requirements of the Building Code of Australia and Australian Standard 1668 – The use of ventilation and air conditioning in buildings.

5 NOISE IMPACT ASSESSMENT

5.1 Road Traffic Noise

5.1.1 Road Traffic Noise Intrusion Assessment

In order to ascertain the existing noise levels from Forest Road and the commercial developments adjoining the site, the measured noise logger data was processed in accordance to the NSW Road Noise Policy assessment time periods. Table 5-1 details the traffic noise levels.

Table 5-1 Measured Traffic Noise Levels

Logger Location	Noise Level – dB(A) re 20 µPa	
	$L_{Aeq\ (15hour)}$ 07:00 – 22:00	$L_{Aeq\ (9hour)}$ 22:00 to 07:00
834 Forest Road (Front)	70	66
824 Forest Road (Front)	64	62

Traffic noise levels recorded by the noise logger have been corrected to account for distance from the road to the proposed façade. They are representative of the noise levels the proposed façade will encounter.

6 RECOMMENDED NOISE CONTROL TREATMENT

The calculation procedure establishes the required noise insulation performance of each surface component such that the internal noise level is achieved whilst an equal contribution of road noise energy is distributed across each component. Building envelope components with a greater surface area must therefore offer increased noise insulation performance.

The recommended acoustic treatment is based on the following floor finishes:

- Bedrooms: Carpet and underlay
- Living Room Hard Flooring
- Kitchen/Wet Areas: Tiles

The acoustic requirements shown in this report will increase further where the bedroom floor finishes are tiled or timber.

All recommendations must be checked by others to ensure compliance with other non-acoustic requirements that Council or other authority may impose (e.g. Thermal requirements for BASIX compliance).

6.1 Glazing

The R_w rating required for each window may vary from room to room. Recommendations for windows also apply to any other item of glazing located on the external facade of the building in a habitable room unless otherwise stated.

Note that the R_w rating is required for the complete glazing and frame assembly. The minimum glazing thicknesses will not necessarily meet the required R_w rating without an appropriate frame system. It will be

therefore necessary to provide a window glass and frame system having a laboratory tested acoustic performance meeting the requirements in this section.

The window systems must be tested in accordance with both of the following:

- Australian Window Association Industry Code of Practice Window and Door – Method of Acoustic Testing; and
- AS 1191 Acoustics – Method for laboratory measurement of airborne sound insulation of building elements.

It is necessary to submit such Laboratory certification for the proposed glazing systems (i.e. windows and framing systems) (e.g. NAL or CSIRO) for approval by RSA Acoustics prior to ordering or commitment.

The entire frame associated with the glazing must be sealed into the structural opening using acoustic mastics and backer rods. Normal weather proofing details do not necessarily provide the full acoustic insulation potential of the window system. The manufacturers' installation instructions for the correct acoustic sealing of the frame must be followed.

We note that wooden frame systems have low acoustic performance due to the nature of the frame and must **NOT** be used.

It is possible that structural demands for wind and fire loading may require more substantial glass and framing assemblies than nominated above. Where this is the case, the acoustic requirements must clearly be superseded by the structural or fire rating demands.

Based on the predicted internal noise levels, glazed windows and doors certain facades of residential development should have the following minimum Rw rating as indicated in Table 6-1 below.

Table 6-1 In-principle Glazing Recommendations

Location	Glazing Type	Minimum Glazing Rw Rating	Indicative Glazing System
Block A (Units on the Western, Southern & Eastern Façade) (Ground Level)			
Living Rooms	Sliding Doors	Rw 33	10.38mm laminated glass in acoustically sealed frame*
	Windows	Rw 33	10.38mm laminated glass in acoustically sealed frame*
Bedrooms	Sliding Doors	Rw 34	10.38mm laminated glass in acoustically sealed frame*
	Windows	Rw 34	10.38mm laminated glass in acoustically sealed frame*
Block A (Units on the Western, Southern & Eastern Façade) (Level 1 - 4)			
Living Rooms	Sliding Doors	Rw 36	12.38mm laminated glass in acoustically sealed frame*
	Windows	Rw 36	12.38mm laminated glass in acoustically sealed frame*
Bedrooms	Sliding Doors	Rw 36	12.38mm laminated glass in acoustically sealed frame*

	Windows	Rw 36	12.38mm laminated glass in acoustically sealed frame*
Block A (Units on the Northern Façade)			
Living Rooms	Sliding Doors	Rw 27	6.38mm laminated glass in acoustically sealed frame*
	Windows	Rw 27	6.38mm laminated glass in acoustically sealed frame*
Bedrooms	Sliding Doors	Rw 28	6.38mm laminated glass in acoustically sealed frame*
	Windows	Rw 28	6.38mm laminated glass in acoustically sealed frame*
Block B (Units on the Western, Southern & Eastern Façade) (Ground Level)			
Living Rooms	Sliding Doors	Rw 33	10.38mm laminated glass in acoustically sealed frame*
	Windows	Rw 33	10.38mm laminated glass in acoustically sealed frame*
Bedrooms	Sliding Doors	Rw 34	10.38mm laminated glass in acoustically sealed frame*
	Windows	Rw 34	10.38mm laminated glass in acoustically sealed frame*
Block B (Units on the Western, Southern & Eastern Façade) (Level 1 - 4)			
Living Rooms	Sliding Doors	Rw 36	12.38mm laminated glass in acoustically sealed frame*
	Windows	Rw 36	12.38mm laminated glass in acoustically sealed frame*
Bedrooms	Sliding Doors	Rw 36	12.38mm laminated glass in acoustically sealed frame*
	Windows	Rw 36	12.38mm laminated glass in acoustically sealed frame*
Block B (Units on the Northern Façade)			
Living Rooms	Sliding Doors	Rw 27	6.38mm laminated glass in acoustically sealed frame*
	Windows	Rw 27	6.38mm laminated glass in acoustically sealed frame*
Bedrooms	Sliding Doors	Rw 28	6.38mm laminated glass in acoustically sealed frame*
	Windows	Rw 28	6.38mm laminated glass in acoustically sealed frame*

Note *: glazing system are for reference only. Any glazing system to be installed for the development is to achieve the minimum Rw rating indicated above.

It must be noted that due to the distance from the road and mitigation measures such as; a series of overlapping solid screen walls at 2.1m high with landscaping that have been introduced to the front of the site between Block A and Block B buildings. Any road noise to the open central communal area will have been shielded and dissipated to a level well below the 55Leq (15-min) SEPP noise criteria reserved for open spaces.

In regards to glazing recommendations provided they are more than sufficient in providing amenity to all residents.

Please note Rw ratings provided in Table 6-1 rely on the acoustic performance of the window glazing and frame. Rw ratings should be checked with glazing manufacturers and frames should be selected and installed as to not degrade the performance of the glazing. It is also recommended that glazing specifications are reviewed at the detailed design stage, most notably if changes to the glazing area are made throughout the design.

6.2 Detailing

Note that well-detailed construction and careful installation is needed to achieve the required R_w acoustic ratings. All gaps are to be minimised and fully sealed with an acoustic rated sealant, such as FireBan One by Bostik or Sikaflex Pro 2HP by Sika.

6.3 Mechanical Ventilation

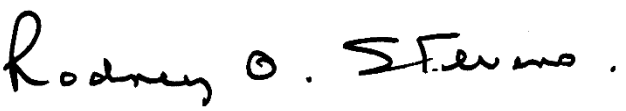
Block A and B will require mechanical or alternate for all facades. Where mechanical ventilation is needed, it must be approved by Council and in accordance with the relevant regulations such as the National Construction Code (NCC Vol.1, Part 4.5 *Ventilation of rooms*) and AS1668.2-2002 *The use of ventilation and air conditioning*.

7 CONCLUSION

Rodney Stevens Acoustics has conducted an acoustic assessment of the proposed residential development at 824-834 Forest Road, Peakhurst. The review has assessed the amenity of the site and compared it with the noise criteria required by Georges River Council and other relevant standards.

A noise survey has been carried out and the processed data has been used to determine traffic noise from Forest Road to the project site. Possible noise intrusion as a result of the adjacent commercial areas was also taken into consideration. Based on the noise impact study conducted, the proposed development is deemed to comply with the SEPP (Infrastructure) 2007-noise criteria with recommendations from this report. It is therefore recommended that planning approval be granted for the proposed development based on acoustics.

Approved: -



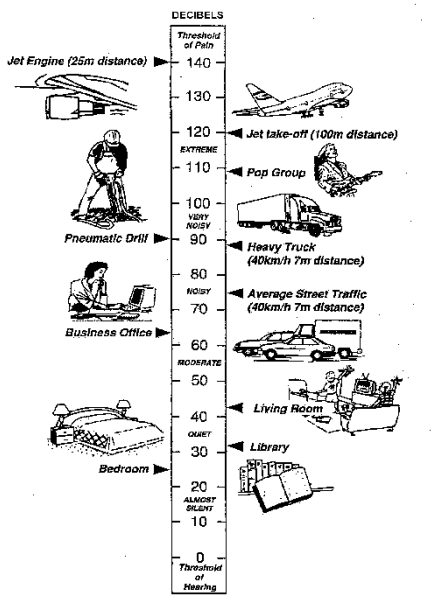
Rodney Stevens

Manager/Principal

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)*.

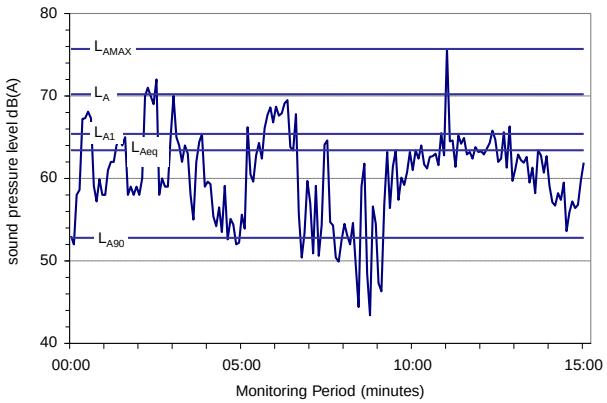
Sound Pressure Level (SPL)

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.

Statistic 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 descriptors:

L_{Amax} 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 referred to the average maximum noise level.

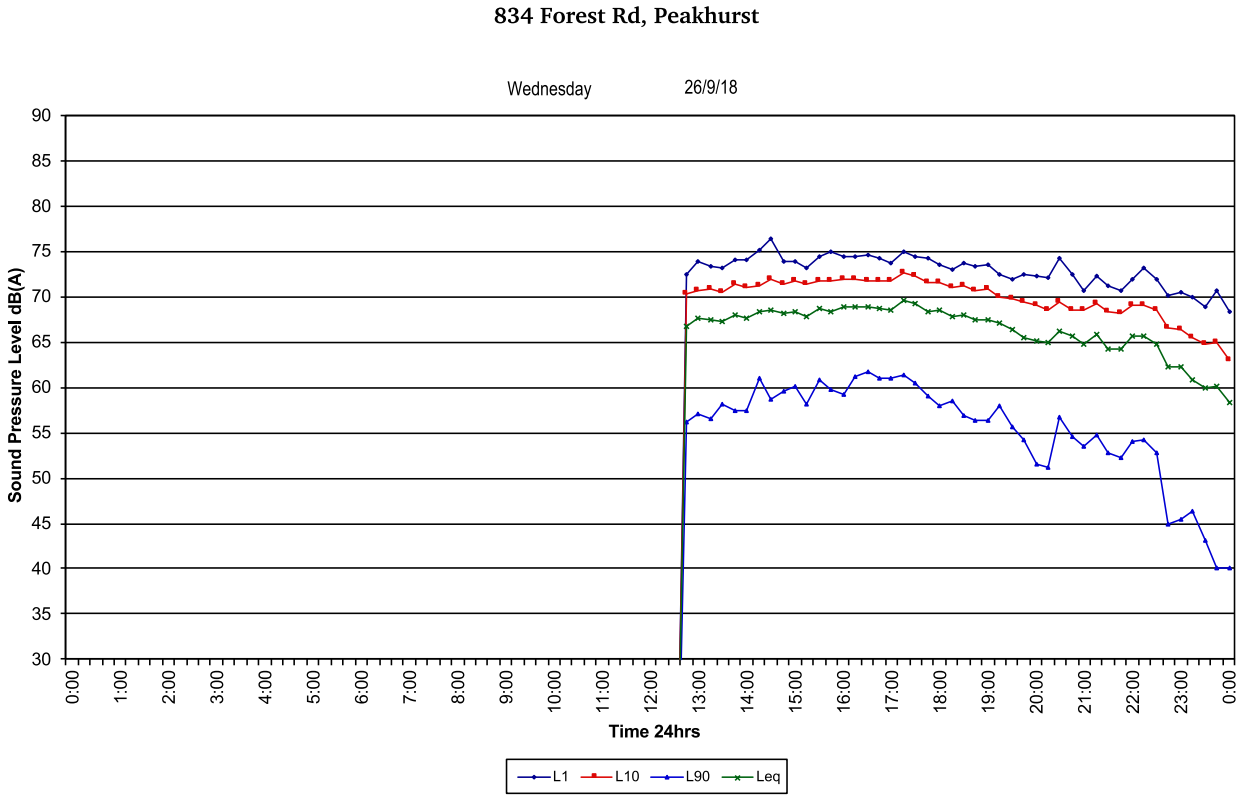
L_{Aeq} Equivalent continuous (energy average) A-weighted sound pressure level. It is defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound.

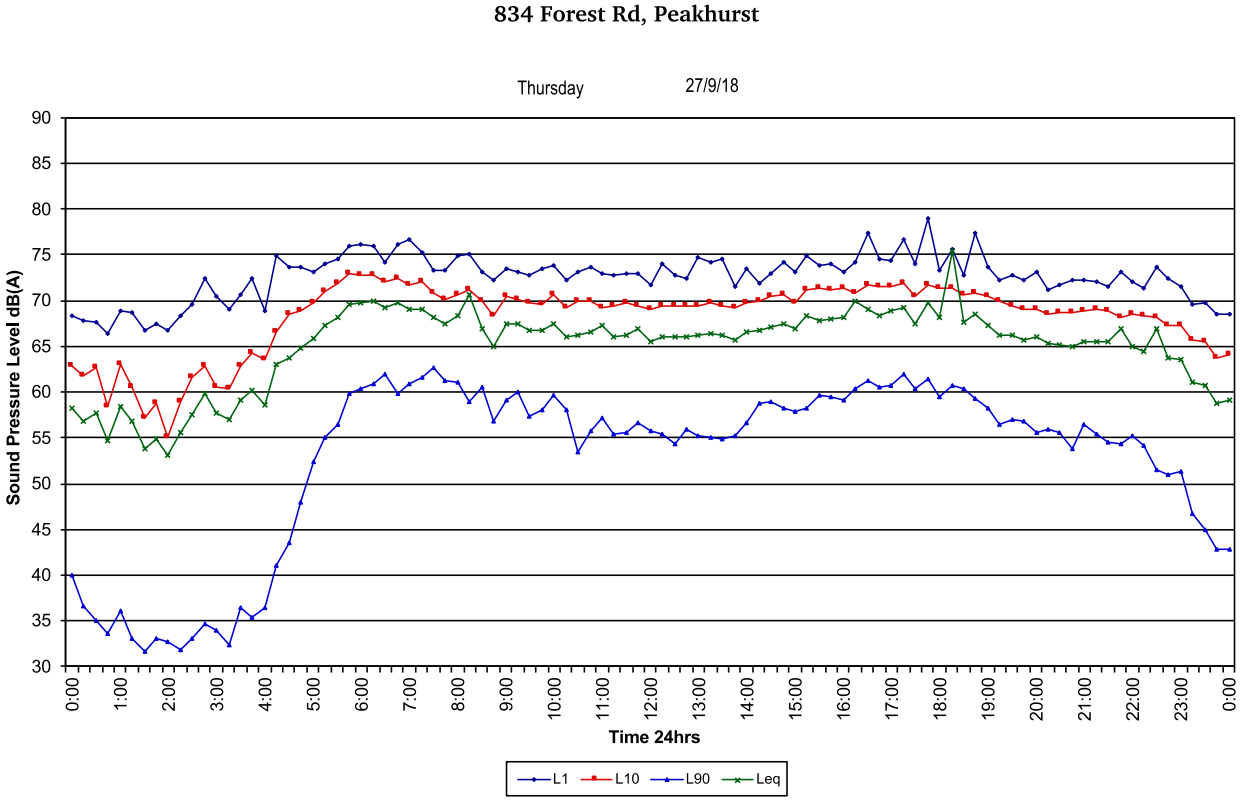
L_{A90} Noise level exceeded for 90% of time (background level). The average minimum background sound level (in the absence of the source under consideration).

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 dB(A) penalty is typically applied to noise sources with tonal characteristics

Appendix B Logger Graphs





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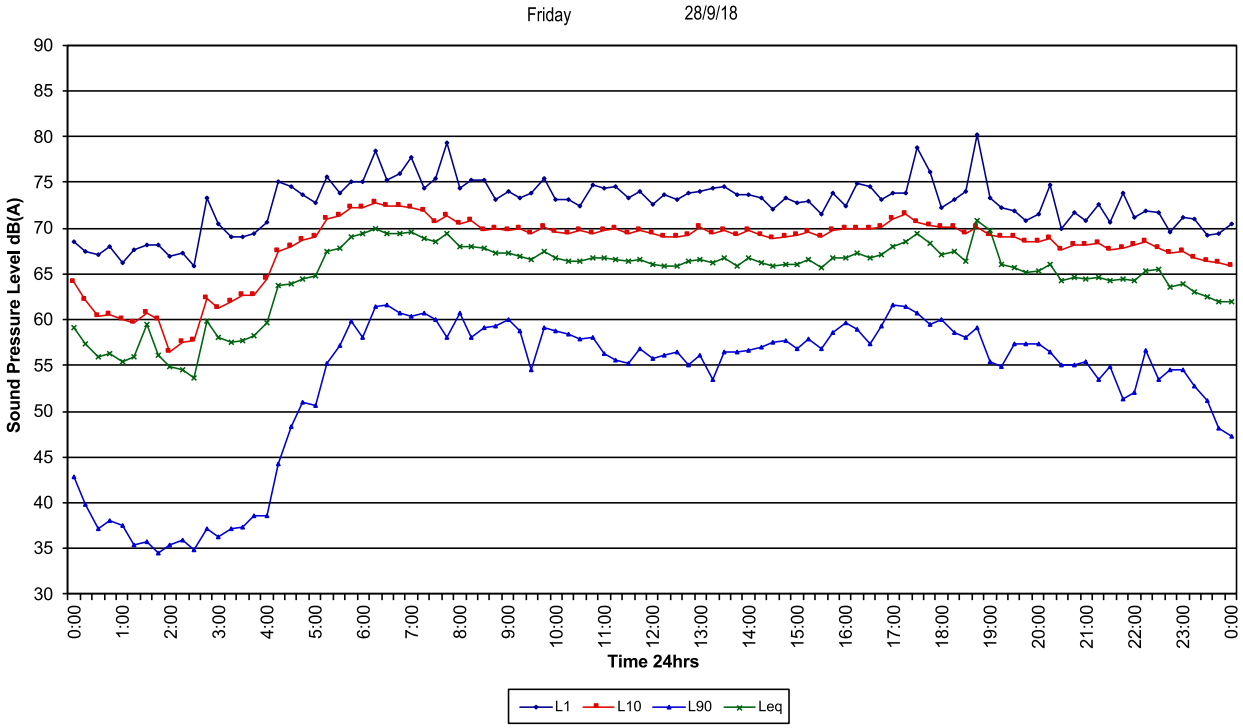

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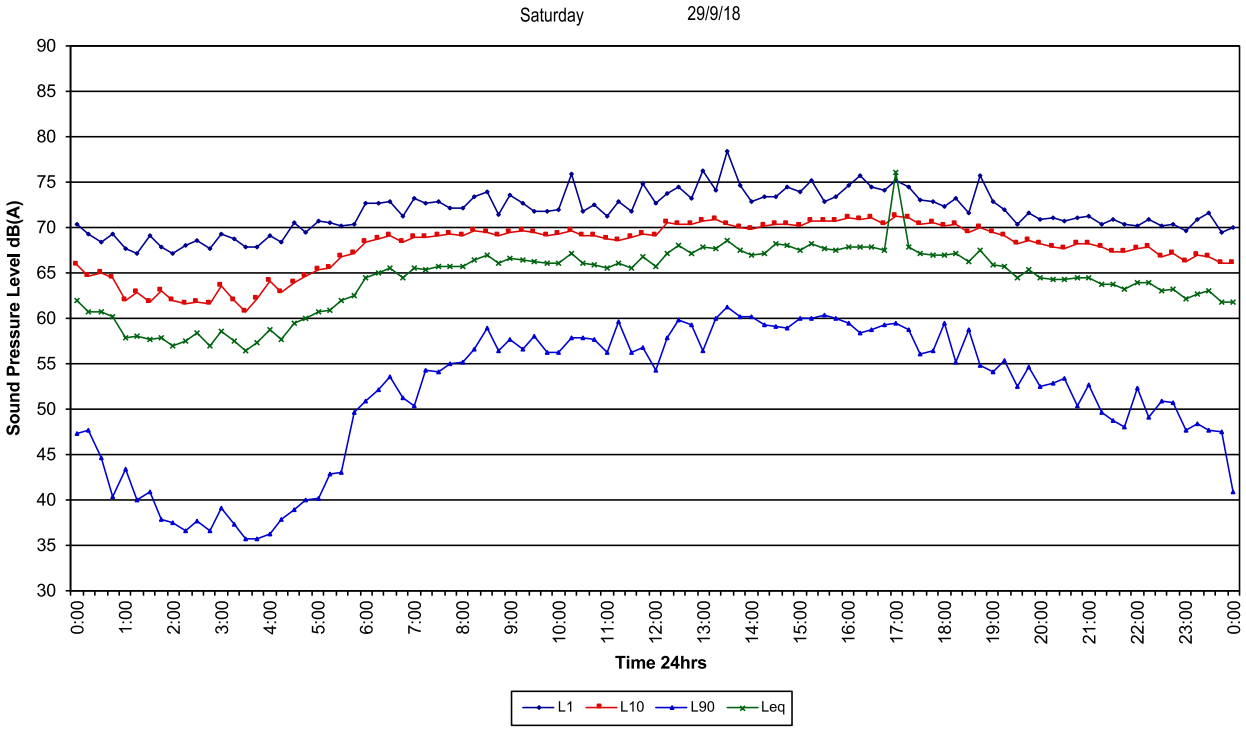

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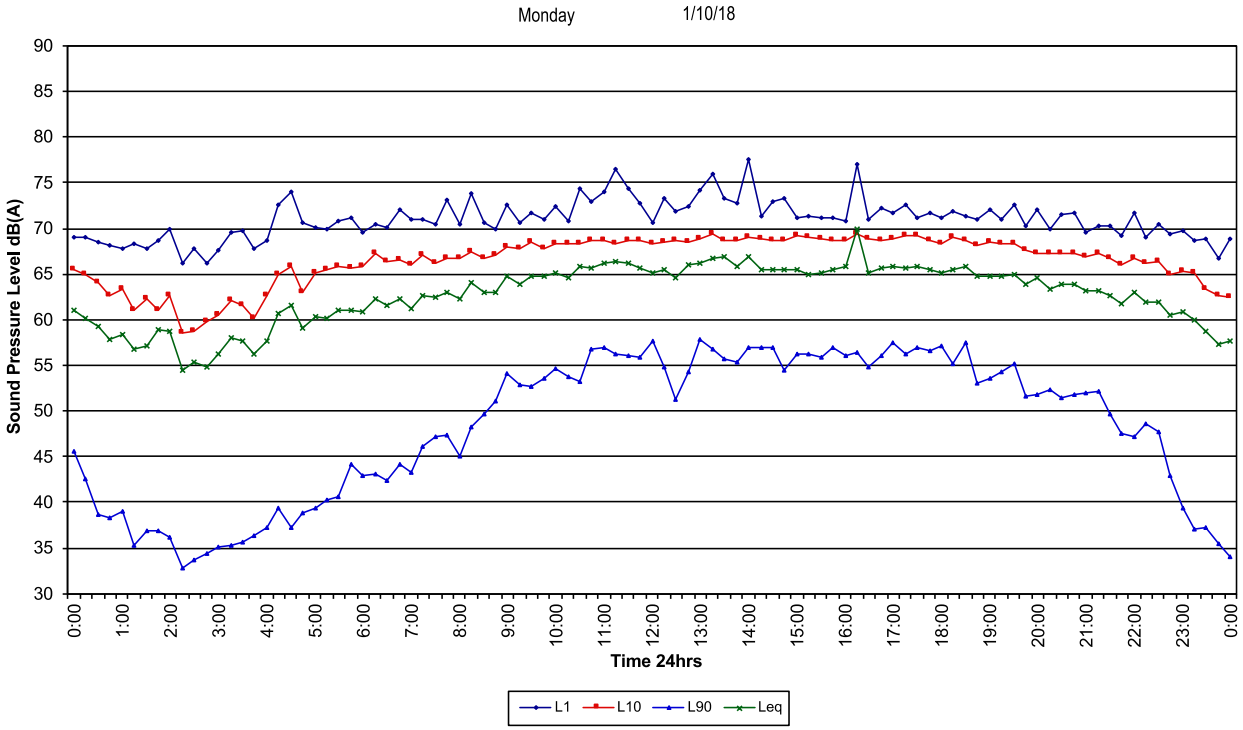

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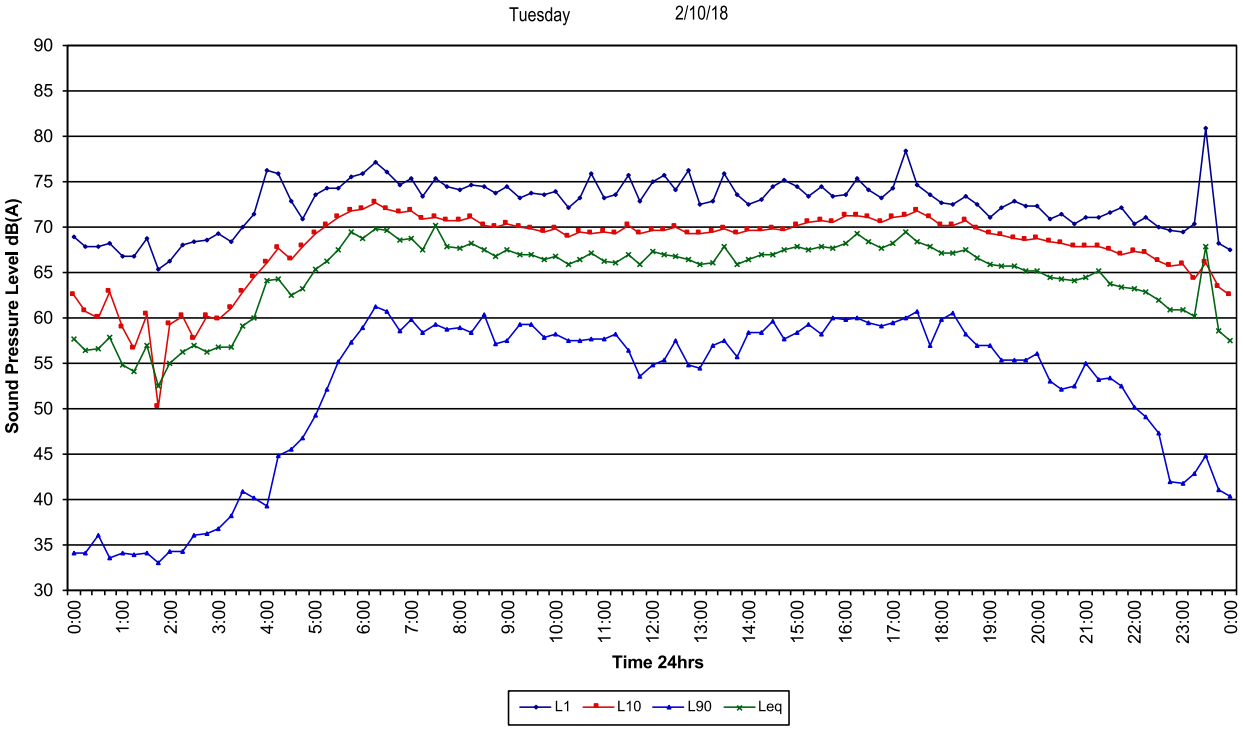

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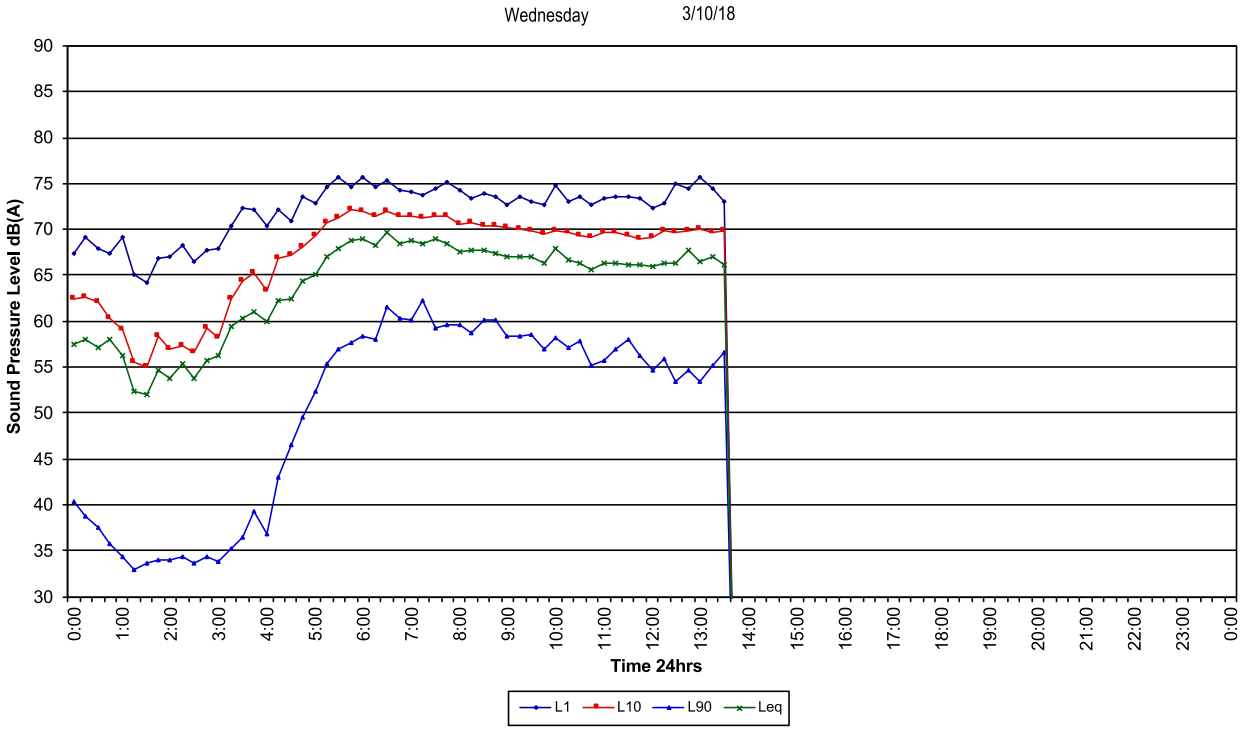

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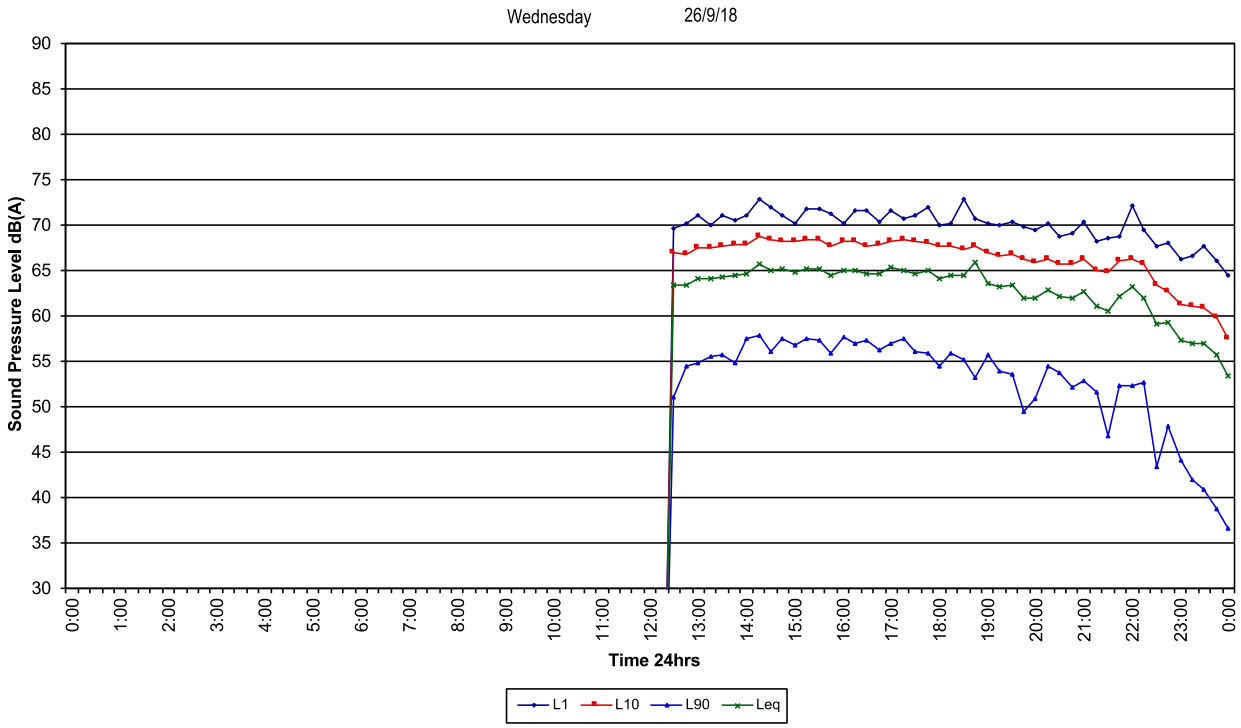

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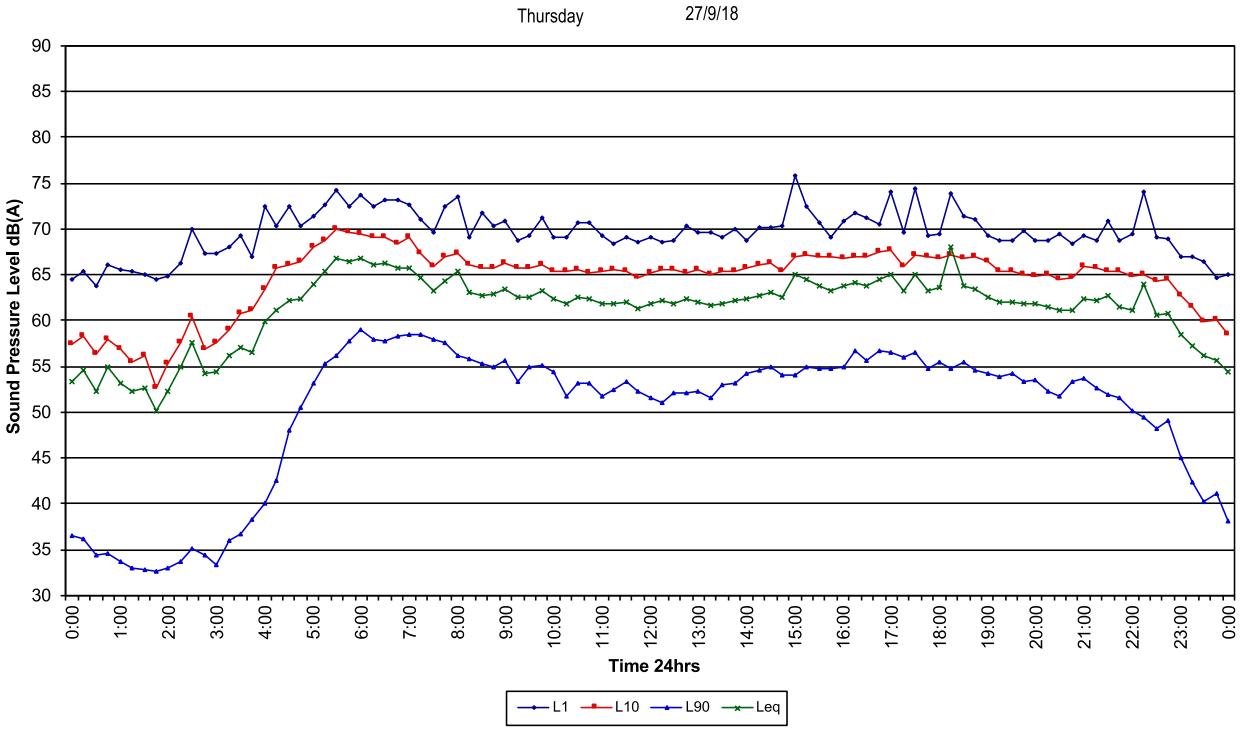

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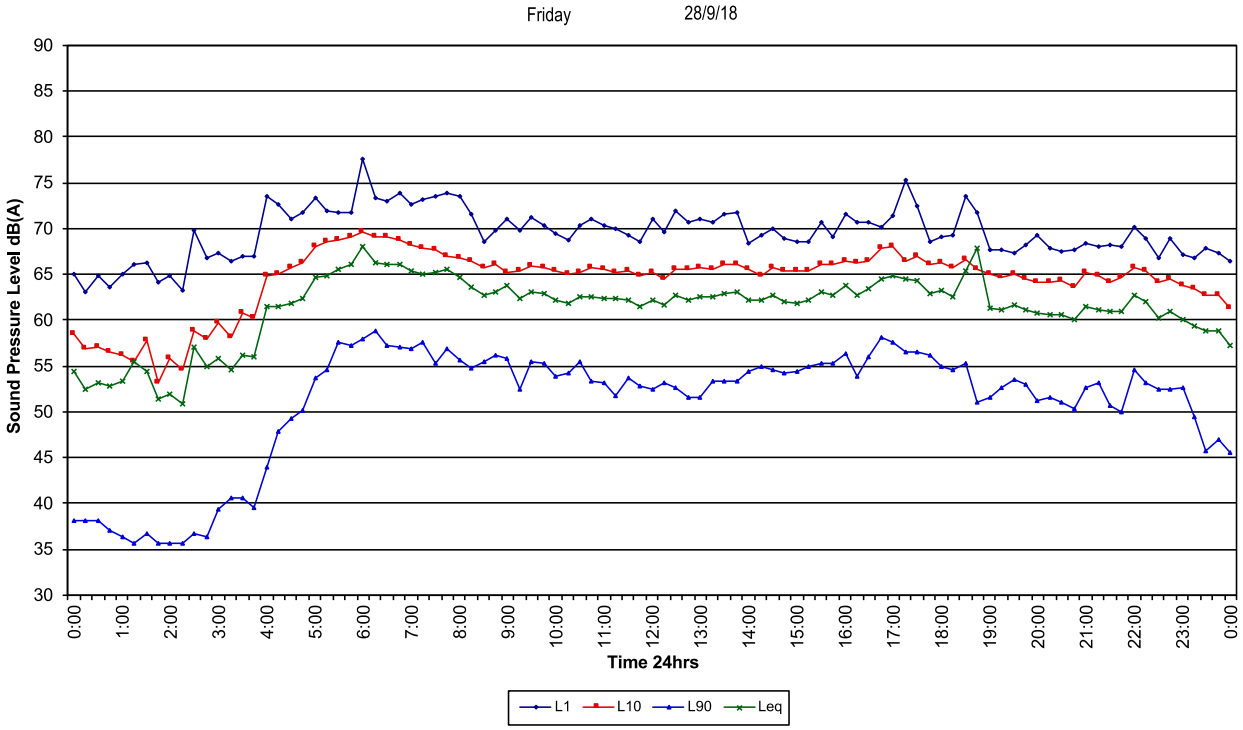

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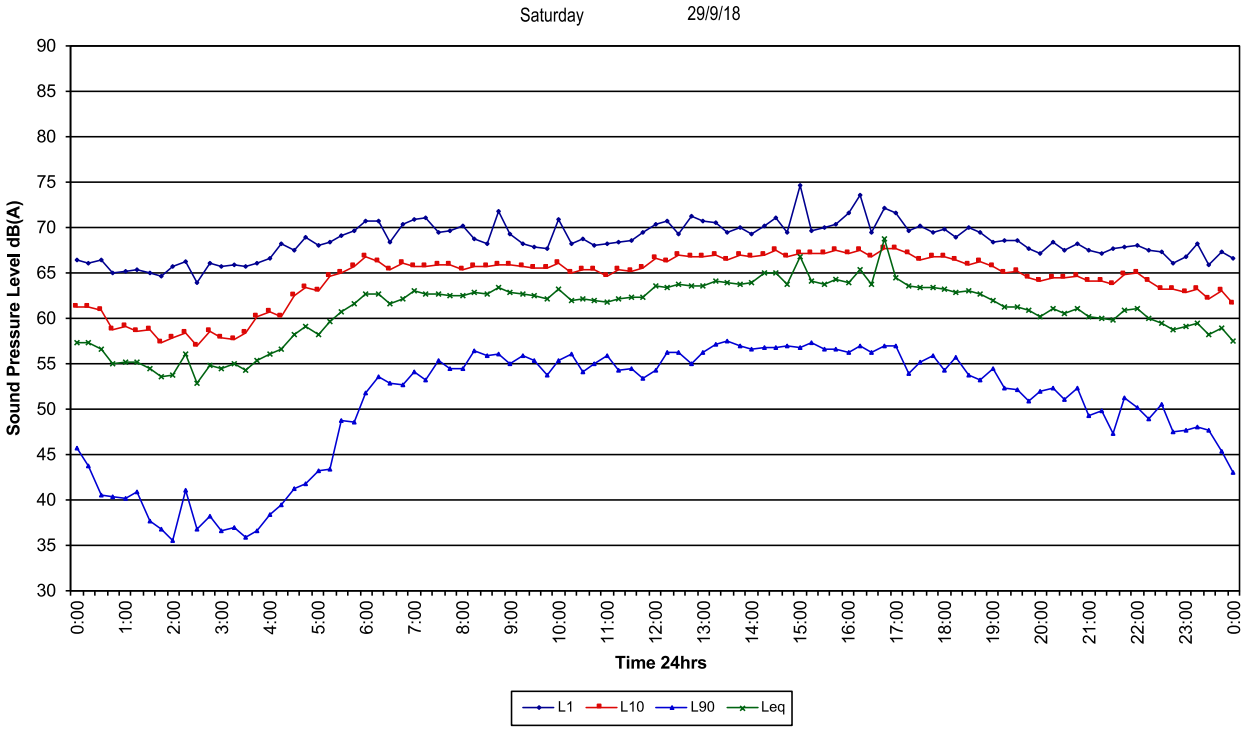

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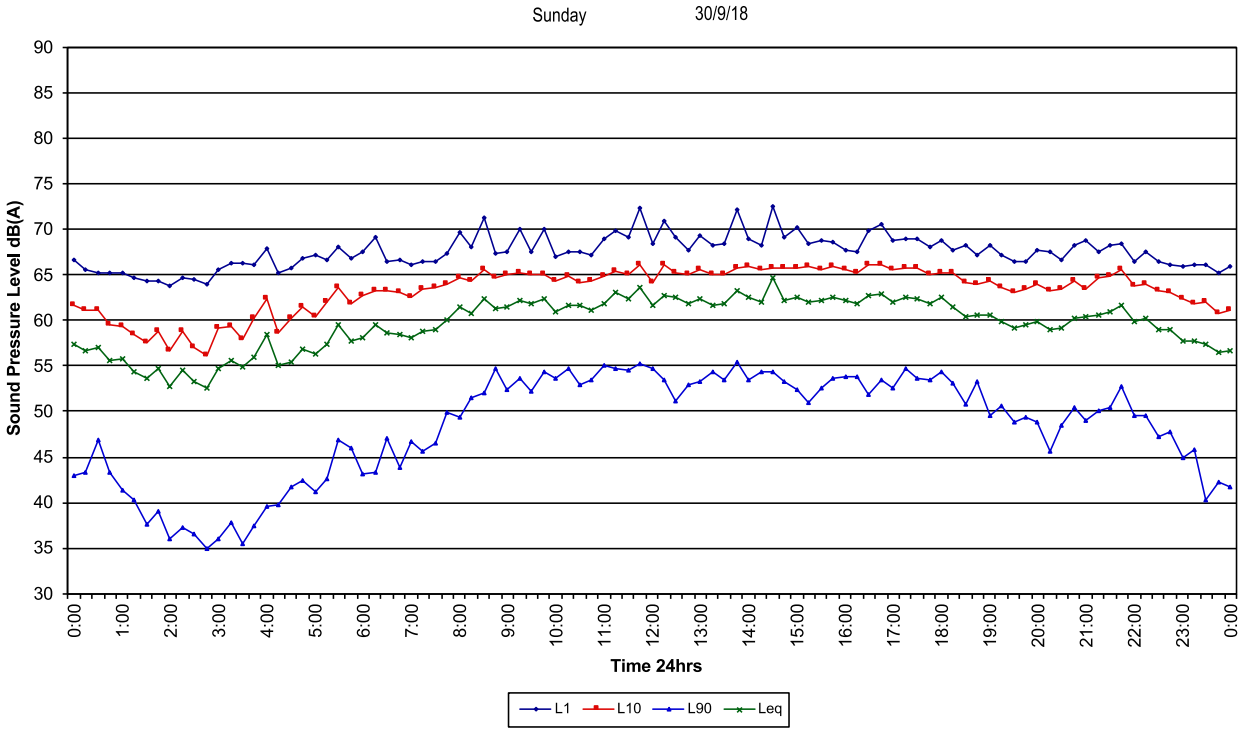

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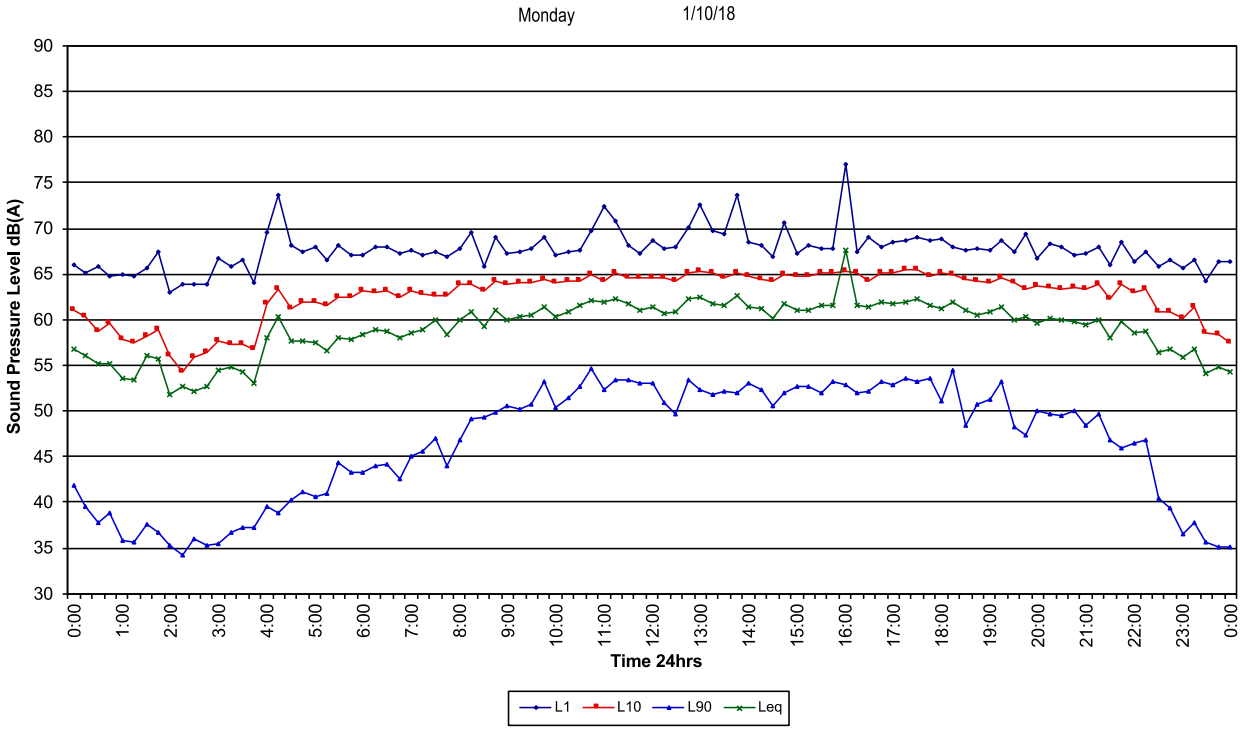

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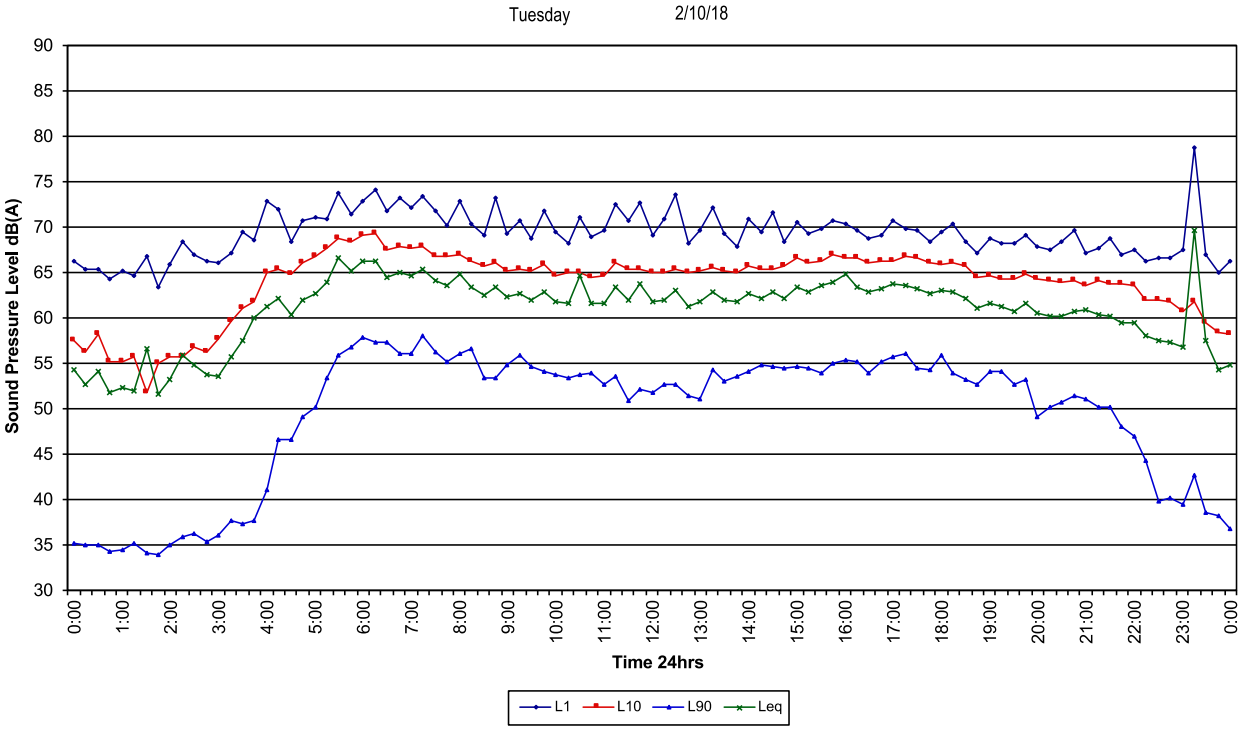
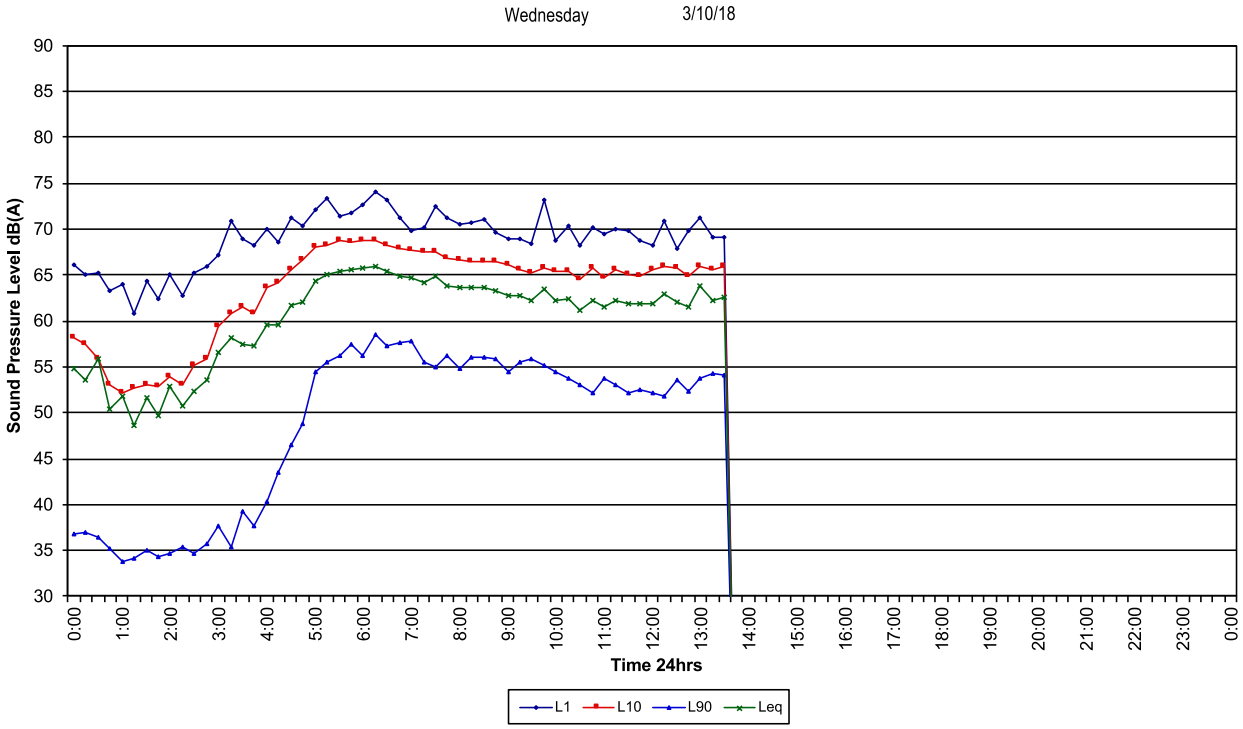


824 Forest Rd, Peakhurst



Appendix C 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 C17323

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 : 00572542
Microphone Serial Number : 170370
Pre-amplifier Serial Number : 72880

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	23.4°C	**Ambient Temperature :**	23.3°C
Relative Humidity :	37.2%	**Relative Humidity :**	37.8%
Barometric Pressure :	99.65kPa	**Barometric Pressure :**	99.52kPa

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.

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Sound Level Meter

IEC 61672-3.2013

Calibration Certificate

Calibration Number C17335

Client Details Rodney Stevens Acoustics Pty Ltd
1 Majura Close
ST IVES NSW 2075

Equipment Tested/ Model Number : Rion NL-42EX
Instrument Serial Number : 00133013
Microphone Serial Number : 162572
Pre-amplifier Serial Number : 46604

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	23°C	**Ambient Temperature :**	23°C
Relative Humidity :	38.8%	**Relative Humidity :**	37.7%
Barometric Pressure :	98.93kPa	**Barometric Pressure :**	98.94kPa

Calibration Technician : Lucky Jaiswal
Calibration Date : 04/07/2017
Secondary Check: Sandra Minto
Report Issue Date : 05/07/2017

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.

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Appendix D Architectural plans