APPLICANT'S NOISE IMPACT ASSESSMENT

(Revision 2)

COURT DETAILS	
Court	Land and Environment Court of New South Wales
Class	1
Case number	2020/62268
TITLE OF PROCEEDINGS	
Applicant	**VINCENZO CAGNONI**
Respondent	**PARRAMATTA CITY COUNCIL**
FILING DETAILS	
Filed for	**Vincenzo Cagnoni,** applicant
Legal representative	Paul Nicholas Vergotis, McCabes Lawyers
Contact name and telephone	Paul Vergotis 0418 162 346, 9265 3207
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ATTACHMENT

1 Noise Impact Assessment prepared by Rodney Stevens Acoustics dated 6 September 2021

RODNEY STEVENS ACOUSTICS
Acoustic Consultants

REPORT 180178R1

Revision 2

Noise Impact Assessment
Proposed Boarding House
61 Fennell Street, North Parramatta NSW

PREPARED FOR:
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6 September 2021

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Noise Impact Assessment

Proposed Boarding House

61 Fennell Street, North Parramatta NSW

PREPARED BY:

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
180178R1	Revision 0	17 September 2018	Dani Awad	Desmond Raymond	Rodney Stevens
180178R1	Revision 1	24 September 2019	Dani Awad	Desmond Raymond	Rodney Stevens
180178R1	Revision 2	6 September 2021	Desmond Raymond	Rodney Stevens	Rodney Stevens

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INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (here forth referred to as RSA), has been engaged by WARINGA PTY LTD, GLEXIBAN NOMINEES PTY LTD, F CAGNONI, E M A CAGNONI and MJ CAGNONI to conduct a noise impact assessment for Development Application (DA) lodgment of the proposed boarding house at 61 Fennel Street, North Parramatta.

This report will address traffic noise impact from Fennell Street and Brickfield Street on the amenity of the proposed boarding house in addition to any mechanical plant, carpark and outdoor communal area noise caused by the site on nearby sensitive receivers.

This assessment is to form part of the supporting documentation for the DA submission to Parramatta City Council.

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

1 PROPOSED DEVELOPMENT

1.1 Site Location

The proposed residential development site is located at 61 Fennel Street, North Parramatta. It is bounded by residential premises to the north, east and south and west. The location of the proposed site and surrounding area is presented in Figure 1-1.

Figure 1-1 Site Location

Aerial image courtesy of Near Map © 2018

1.2 Proposed Development

The proposal consists of the construction of a three-story boarding house comprising of 19 boarding rooms split between the ground, first and second floor. The site will have an outdoor communal area and 2 basement levels. The architectural plans of the proposed residential development are presented in Appendix C.

2 EXISTING ACOUSTIC ENVIRONMENT

2.1 Unattended Noise Monitoring

In order to characterize the existing acoustical environment of the area, RSA carried out unattended noise monitoring between Thursday 24 May and Thursday 31 May 2018 at the logging location shown in Figure 1-1. 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 RION NL-42 environmental noise loggers (serial numbers 572559 and 572542) fitted with a microphone windshield. Calibration of the loggers 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.

2.2 Ambient Noise Level Results

In order to assess the acoustical implications of the proposed development on the levels of noise received at the neighboring residential and commercial premises, the measured data was processed according to the NSW Environment Protection Authority (EPA) and Noise Policy for Industry (NPfI) assessment time periods. Table 2-1 details the RBL (background) and L_{Aeq} noise levels recorded during the daytime, evening and nighttime periods.

Table 2-1 Measured Ambient Noise Levels

Noise Level – dB(A) re 20 µPa					
Day		Evening		Night	
RBL [1]	L_{Aeq} [2]	RBL [1]	L_{Aeq} [2]	RBL [1]	L_{Aeq} [2]
37	51	37	50	32	45

Note 1: 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

Note 2: The L_{Aeq} 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.

3 NOISE CRITERIA

3.1 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.

3.1.1 Parramatta City Council Requirements

Parramatta City Council has specific requirements for traffic noise intrusion into residential spaces. These requirements are detailed in the Parramatta City 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*

3.1.2 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 3-1.

Table 3-1 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 3.1.2 and in Table 3-1 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.

3.2 Operational Noise Project Trigger Noise Levels

Responsibility for the control of noise emissions in New South Wales is vested in Local Government and the EPA. The EPA oversees the Noise Policy for Industry (NPfI) October 2017 which provides a framework and process for deriving project trigger noise level. The NPfI project noise levels 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.

3.2.1 Intrusiveness Noise Levels

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

3.2.2 Amenity Noise Levels

The amenity noise level 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 noise levels 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 project trigger noise level 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 project trigger noise level.

3.2.3 Area Classification

The NPfI characterises the "Suburban" noise environment as an area with an acoustical environment that:

- has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry.
- This area often has the following characteristic: - evening ambient noise levels defined by the natural environment and human activity

The area surrounding the proposed development falls under the "Suburban" area classification.

3.2.4 Project Specific Trigger Noise Levels

Having defined the area type, the processed results of the unattended noise monitoring have been used to determine project specific project trigger noise level. The intrusive and amenity project trigger noise level for nearby residential premises are presented in Table 3-2. These project trigger noise levels are nominated for the purpose of assessing potential noise impacts from the proposed development.

For each assessment period, the lower (i.e. the more stringent) of the amenity or intrusive criteria are adopted. These are shown in bold text in Table 3-2.

Table 3-2 Project Specific Trigger Noise Levels (NPfI)

Receiver	Time of Day	ANL [1] $L_{Aeq(15min)}$	Measured		Project specific Noise Levels	
			RBL [2] $L_{A90(15min)}$	L_{Aeq} Noise Level)	Intrusive $L_{Aeq(15min)}$	Amenity [3] $L_{Aeq(15min)}$
Residential	Day	55	37	51	**42**	55
	Evening	45	37	50	**42**	45
	Night	40	32	45	**37**	40

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

4 NOISE IMPACT ASSESSMENT

4.1 Road Traffic Noise

4.1.1 Road Traffic Noise Intrusion Assessment

In order to ascertain the existing noise levels from the surrounding area, the measured noise logger data was processed in accordance to the NSW Road Noise Policy assessment time periods. Table 4-1 details the traffic noise levels.

Table 4-1 Measured Traffic Noise Levels

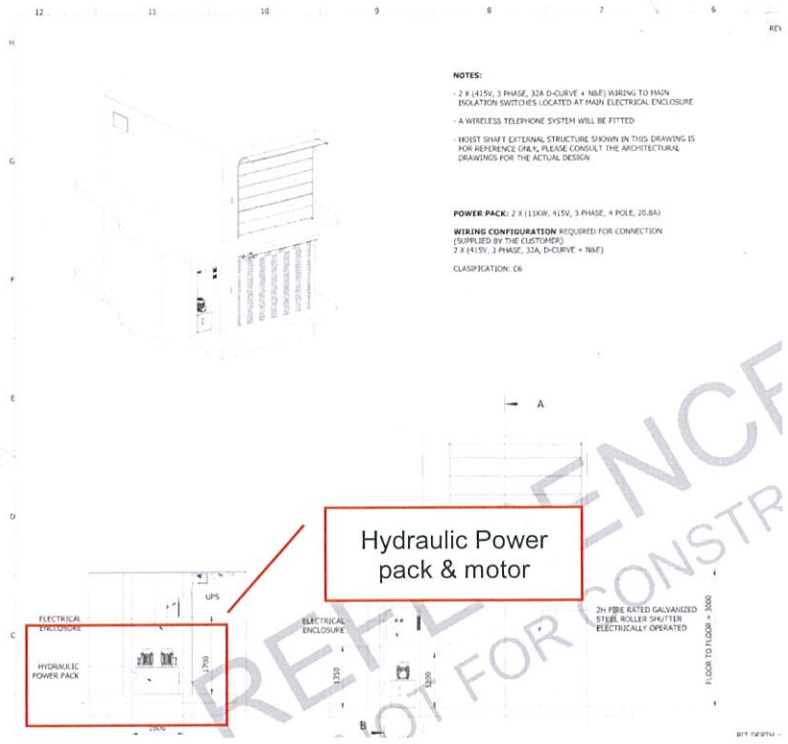
Logger Location	Noise Level – dB(A) re 20 µPa	
	$L_{Aeq\ (15hour)}$ 07:00 – 22:00	$L_{Aeq\ (9hour)}$ 22:00 to 07:00
61 Fennell Street	57	50

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

4.2 Car Hoist Noise Assessment

A car hoist is proposed for the development. The purpose of the car hoist is to transport vehicles from the ground floor to the carpark in the basement levels. A *Southwell SCH-6030* model car hoist has been proposed for the development. The design for the car hoist is presented in the figure below.

Figure 4-1 Car Hoist Design



As per the manufacturer's design, the hydraulic power pack and motor is located on the lower levels with the platform located on the ground level. The manufacturer have supplied a Sound Power Level Lw 66 dBA for normal operation and Sound Power Level Lw 68 dBA for Over Relief Valve. Assuming this sound power level and the location of the motor, the noise impact at the surrounding residential receivers would be inaudible.

5 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 traffic 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 treatments are based on the following floor finishes:

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

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

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

5.1 Glazing

The R_w rating required for each window will 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 acoustic requirements.

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.

It is possible that structural demands for wind loading or fire rating or the like 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.

5.1.1 Rw Requirements for Glazing

The glazing will be required to achieve a rating of R_w 22. This Rw rating is generally achieved with a standard aluminium frame, seals and 4mm monolithic glass panes. The glazing for the indoor communal room should be required to achieve a rating of R_w 28. This Rw rating is generally achieved with a standard aluminium frame, seals and 6mm monolithic glass panes No further acoustic requirements are needed at present.

5.2 Mechanical Ventilation

The windows of the development can be opened for natural ventilation, where mechanical ventilation is desired, 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*.

6 OPERATIONAL NOISE ASSESSMENT

6.1 Mechanical Plant Noise Assessment

Finalised architectural layouts and specific mechanical plant selections have not been supplied at this stage. It is anticipated that the building will be serviced by typical mechanical ventilation/air conditioning and heating equipment.

It is likely that the criteria set out by Parramatta City Council and other regulatory standards will be met through the use of conventional noise control methods (e.g. selection of equipment on the basis of quiet operation and, where necessary, providing enclosures, localised barriers, silencers and lined ductwork).

An appropriately qualified acoustic consultant should review the mechanical plant associated with the development at the detailed design stage when final plant selections have been made and full mechanical plant assessment must then be carried out.

6.2 Typical Vocal Levels

Calculations of the amount of noise transmitted to these receivers from the proposed boarding house have been based on voice levels as referenced in the Handbook of Acoustical Measurements and Noise Control by Cyril M. Harris. This handbook provides voice spectrums for males and females as well as different vocal efforts. The spectrum is given in Table 6-1.

The spectra have been scaled based upon the overall number of patrons expected to be in the outdoor areas at any given time

Table 6-1 Speech Spectrums - Handbook of Acoustical Measurements and Noise Control.

Type	Noise Level (dB) at Octave Band Centre Frequency (Hz)							Overall dB(A)
	125	250	500	1 k	2 k	4 k	8 k	
Male (Raised)	49	55	58	51	47	43	37	58
Female (Raised)	37	51	54	49	44	43	38	55

6.3 Tenant Sound Power Levels

Based on a maximum assumed number of 12 tenants in the outdoor area (assuming that 23 people will live in the development, that being 22 tenants and 1 manager), the following worst-case operational scenarios have also been assumed for our assessment:

- An assumed total of 12 people in the outdoor area. Therefore, with 50 percent of the patrons talking, the worst-case scenario will be 6 tenants talking at any one time in the outdoor area.

Table 6-2 Sound Power Levels of People talking with Normal Voice - Lw – dB(A)

Scenario	Resultant Sound Power Level per Octave Band (dB)							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
6 Tenants with Normal Vocal in the Outdoor Area	-	67	73	76	69	65	61	55

6.4 Noise Emissions Calculation

Calculations of the noise levels from the operation of the proposed boarding house have been carried out using the data in tables 6-1 and 6-2. We have used the worst-case scenario where all noise is active at the same time. Calculations consider factors such as distance, shielding from buildings and barriers.

The following figure presents the proposed development and all sensitive receivers

Figure 6-1 Sensitive Receiver Location

6.5 Predicted Noise Levels

Predictive resultant noise levels have been calculated for residents using the communal area and car movements within the site. Noise emissions at the nearest residential receivers are presented in the table below. The predicted noise calculations consider the following:

- Heights of receivers are assumed to be 1.5 meters above ground level.
- A 1.6m balustrade on the northern façade of the outdoor communal area. (Please see Appendix E)
- A 1.8m solid boundary fence on the eastern southern and western facades.
- Up to 12 people will be in the outdoor communal area at a time (day and evening time only).
- The maximum capacity of the basement carpark is 10 we have assumed an operational scenario where 5 cars leave the parking area at the same time.

Table 6-3 Predicted Noise Levels at sensitive receivers.

Receiver	Period	Calculated Noise Level L_{Aeq} – dB(A)	Criteria	Compliance
R1	Day	35	42	Yes
	Evening	35	42	Yes
	Night	35	37	Yes
R2	Day	34	42	Yes
	Evening	34	42	Yes
	Night	34	37	Yes
R3	Day	<30	42	Yes
	Evening	<30	42	Yes
	Night	<30	37	Yes
R4	Day	42	42	Yes
	Evening	42	42	Yes
	Night	42	37	No

It is likely that most tenants will use the common room, however, all tenants must be instructed to minimise noise while using the outdoor areas to minimise unnecessary intrusion. We note that our calculations assumed that the outdoor common areas will only be used by the tenants.

6.6 Outdoor Communal Area Mitigation Recommendations

To ensure the future amenity of nearby sensitive receivers most notably the residential development to the west, the following recommendations should be put in place:

- A 1.6m balustrade on the western façade of the outdoor communal area. (Please see Appendix E).
- No music is to be played in the outdoor communal area.
- No tenants are allowed to use the outdoor area from 10pm - 7am.

7 CONCLUSION

Rodney Stevens Acoustics has conducted a noise impact assessment of the proposed boarding house development located at 61 Fennell Street, North Parramatta. The review has assessed the noise intrusion of the site and compared it with the noise criteria required by in Parramatta City Council and other relevant standards including the EPA's Noise Policy for Industry.

A noise survey has been carried out and the processed data has been used to determine traffic noise from the surrounding area to the project site. 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: -

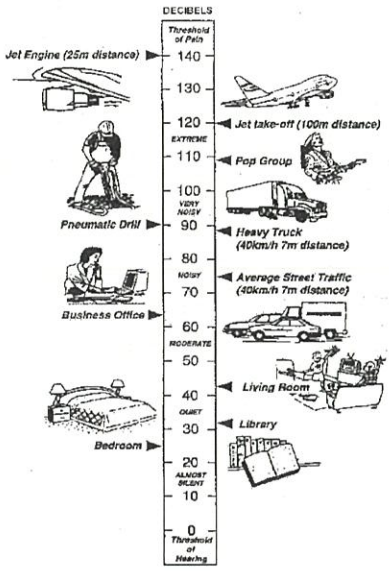
Rodney Stevens

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 10th 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)*.

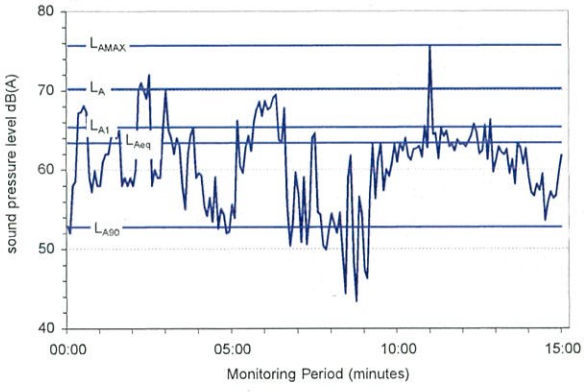
Sound Pressure Level (SPL)

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:



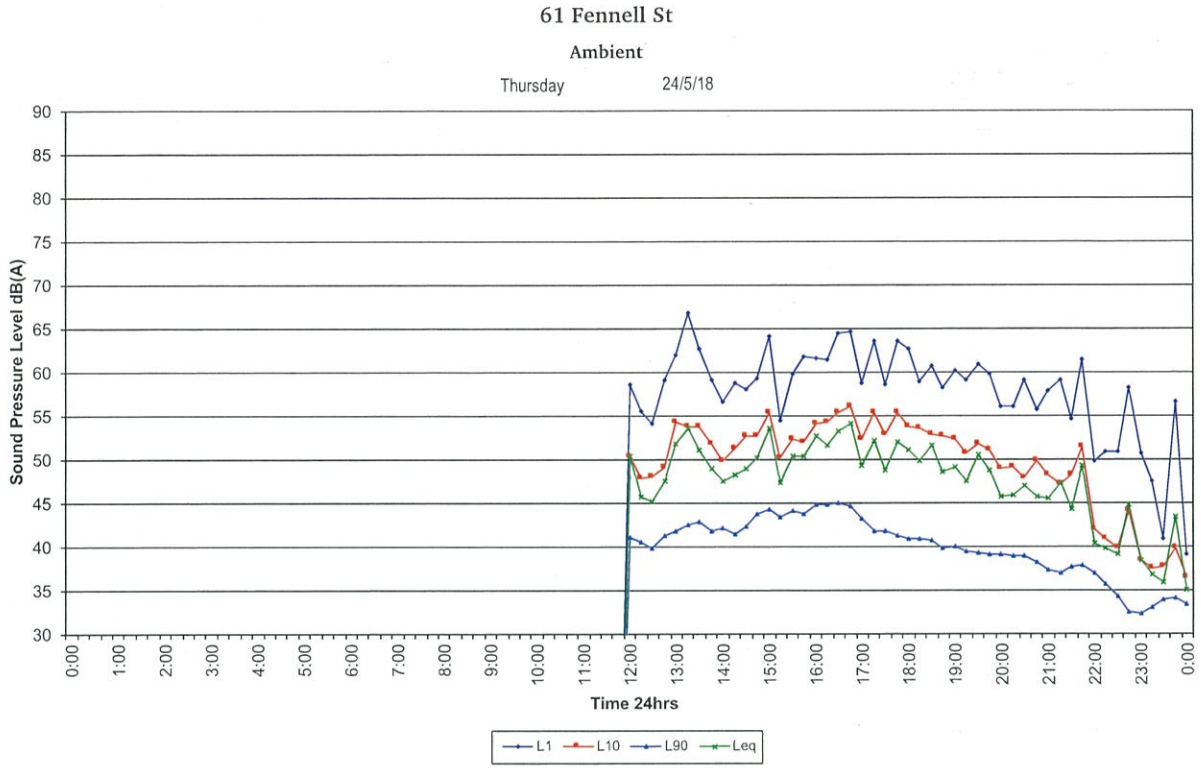
Key descriptors:

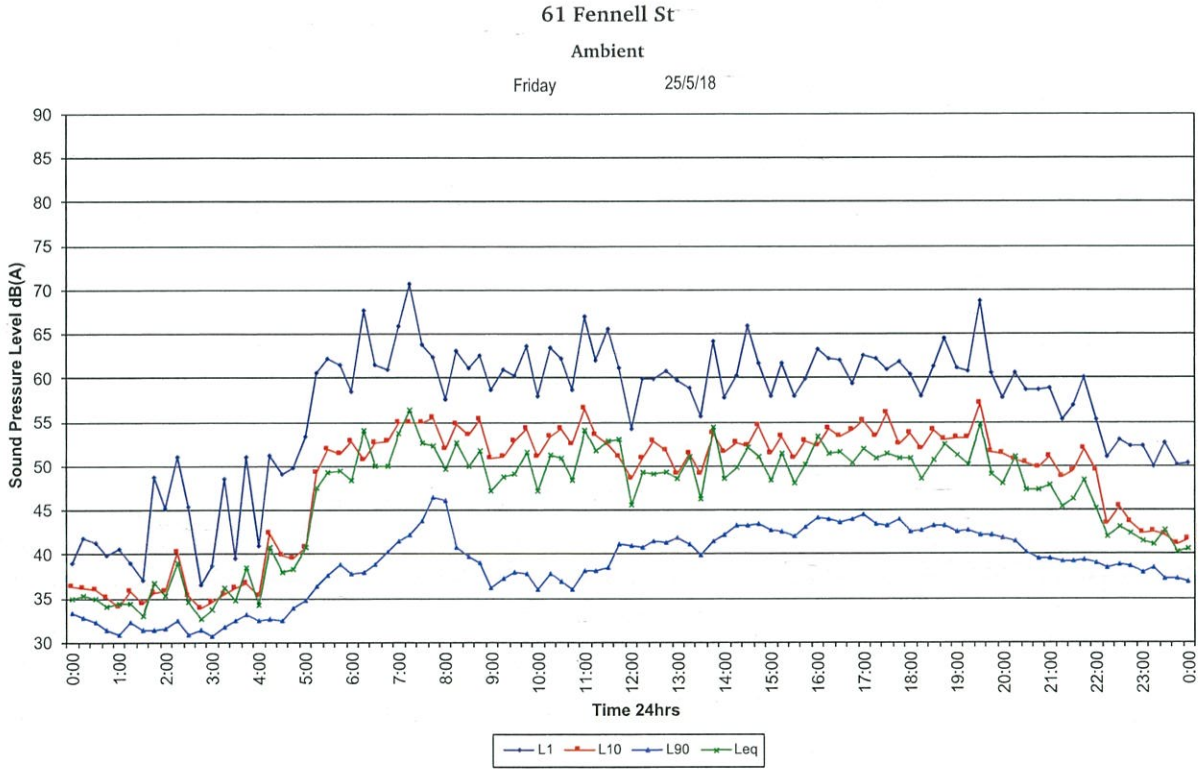
L_{Amax} Maximum recorded noise level.

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

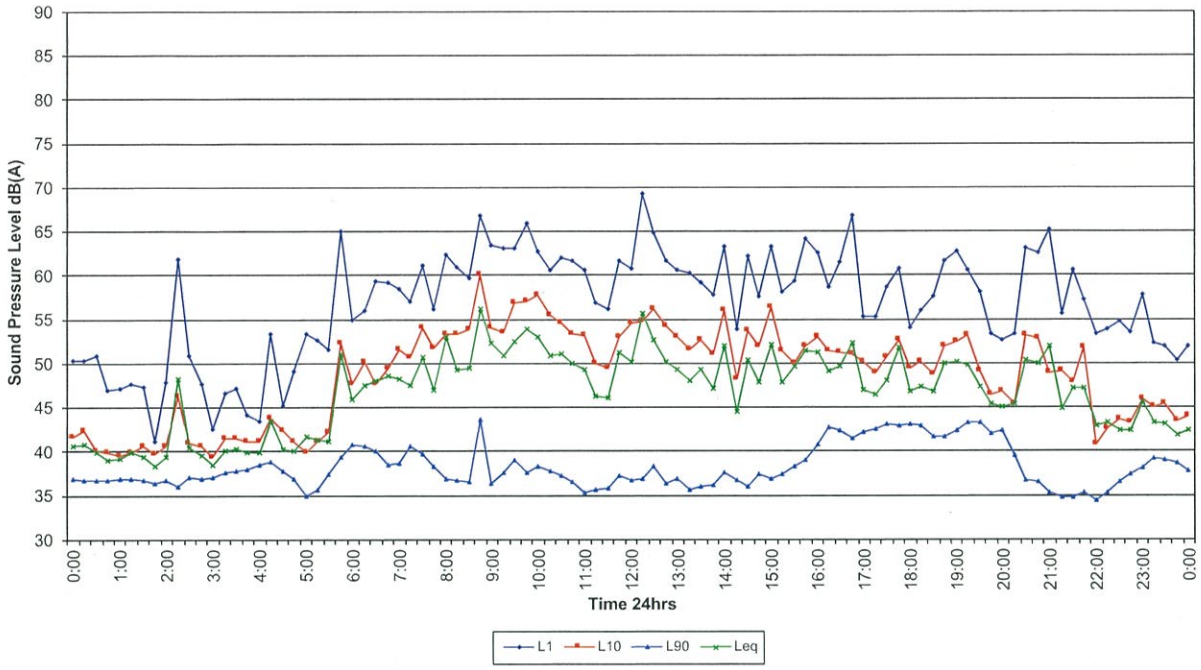




61 Fennell St

Ambient

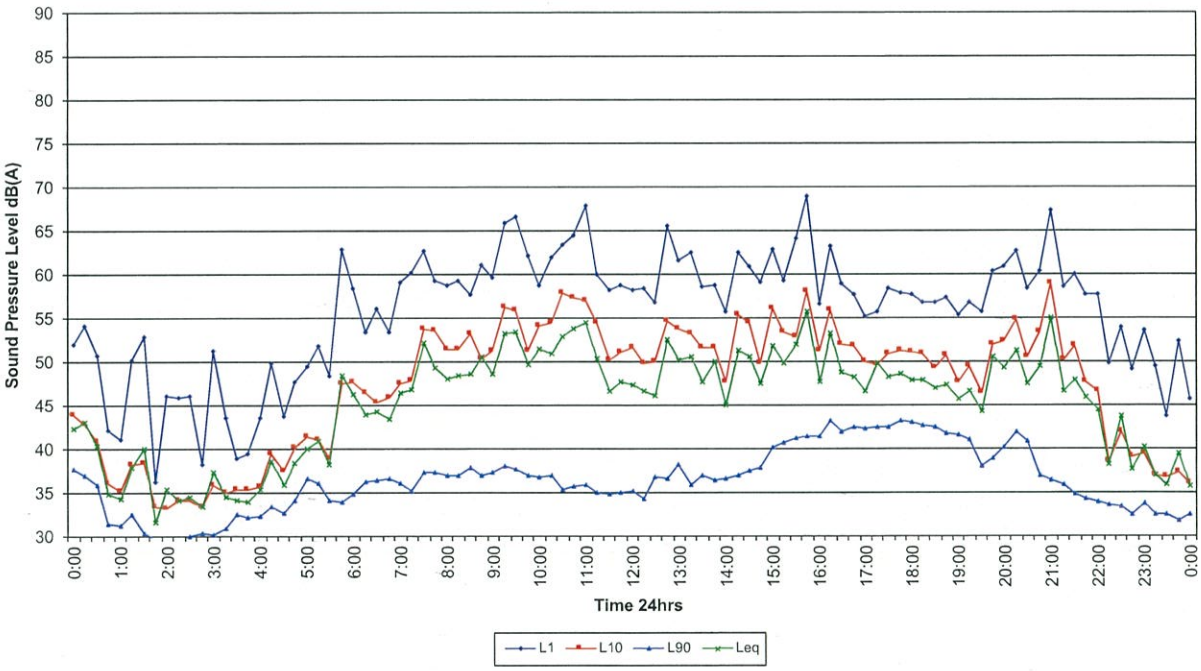
Saturday 26/5/18



61 Fennell St

Ambient

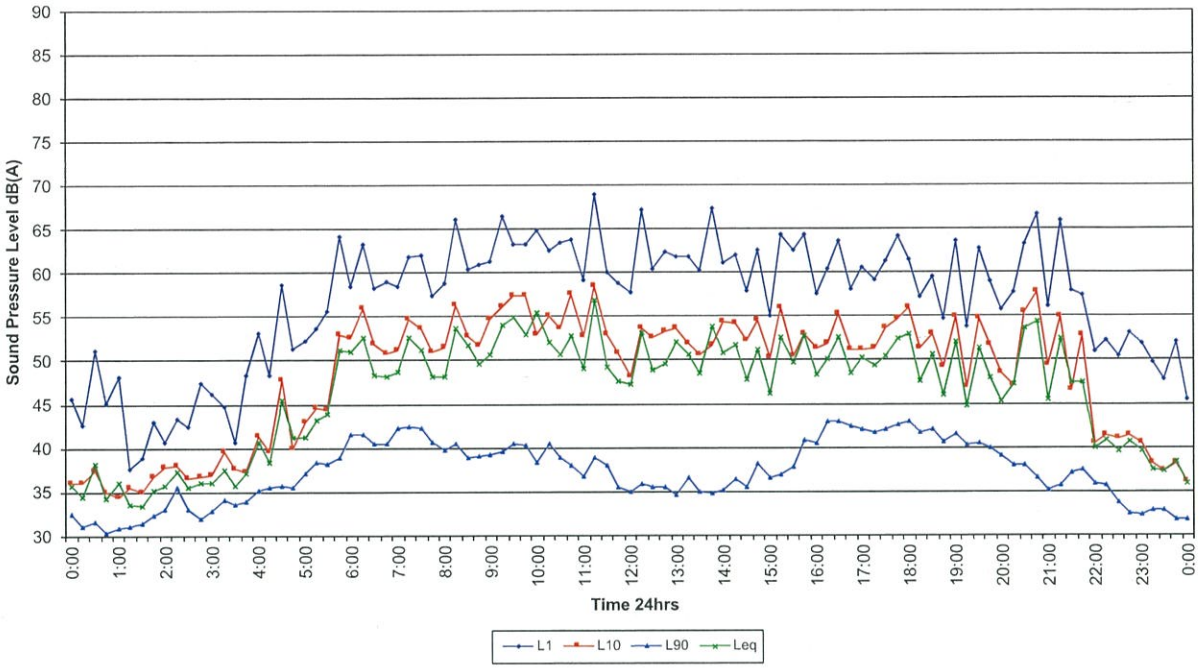
Sunday 27/5/18



61 Fennell St

Ambient

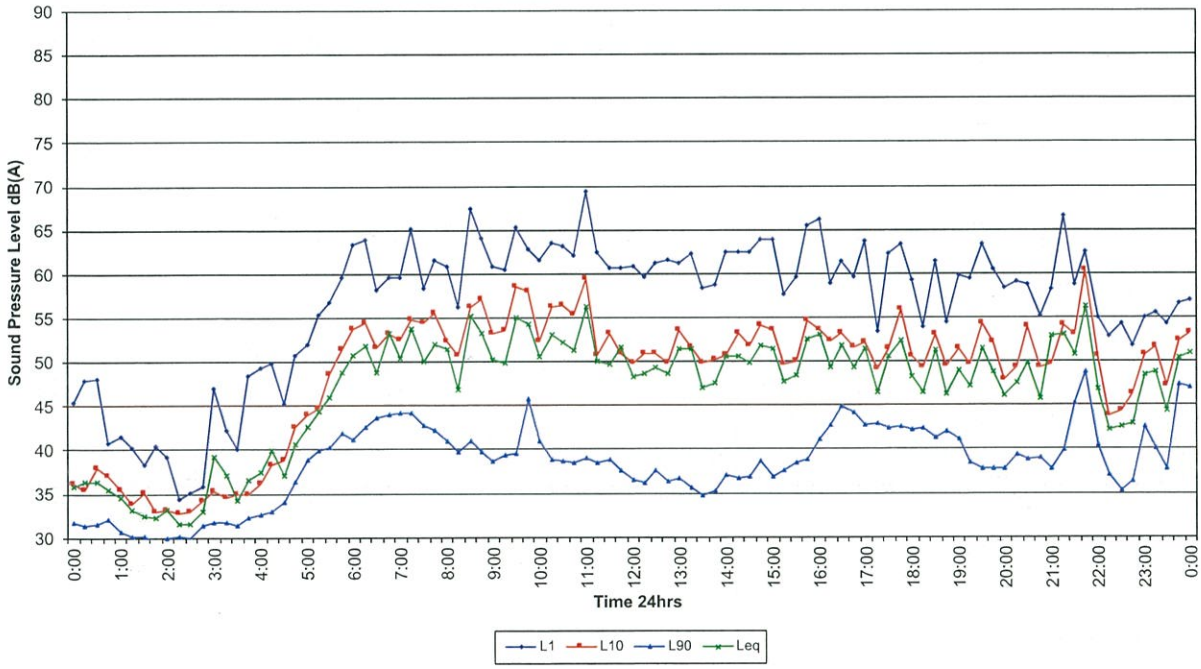
Monday 28/5/18



61 Fennell St

Ambient

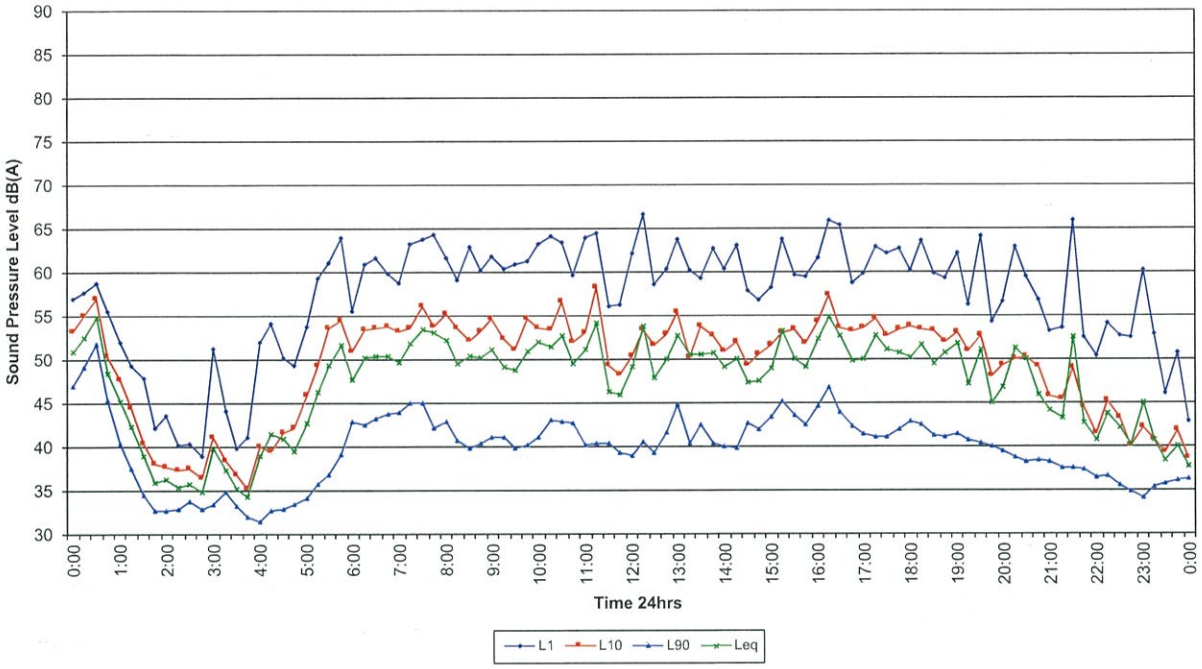
Tuesday 29/5/18



61 Fennell St

Ambient

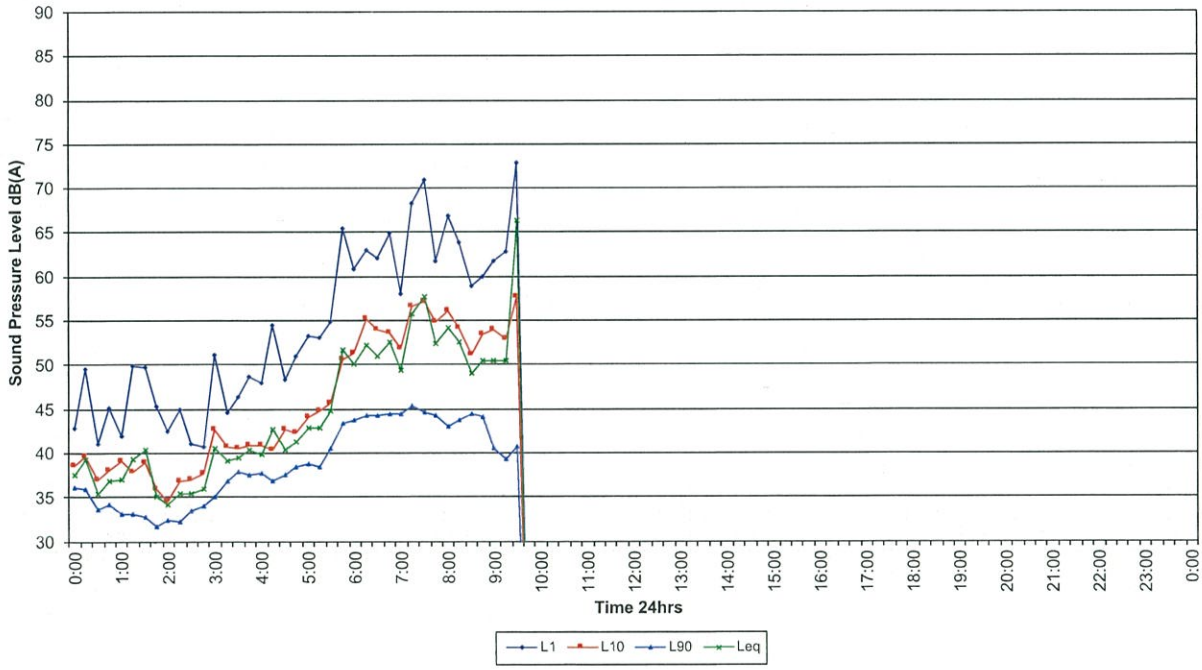
Wednesday 30/5/18

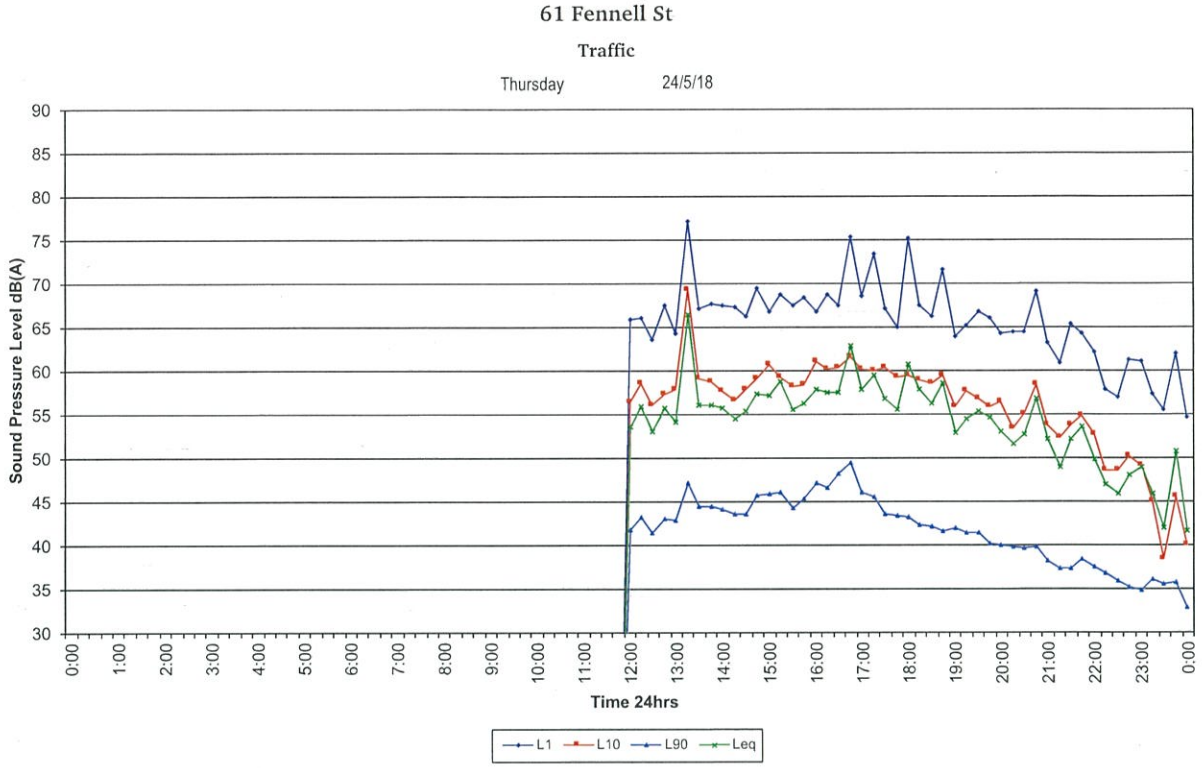


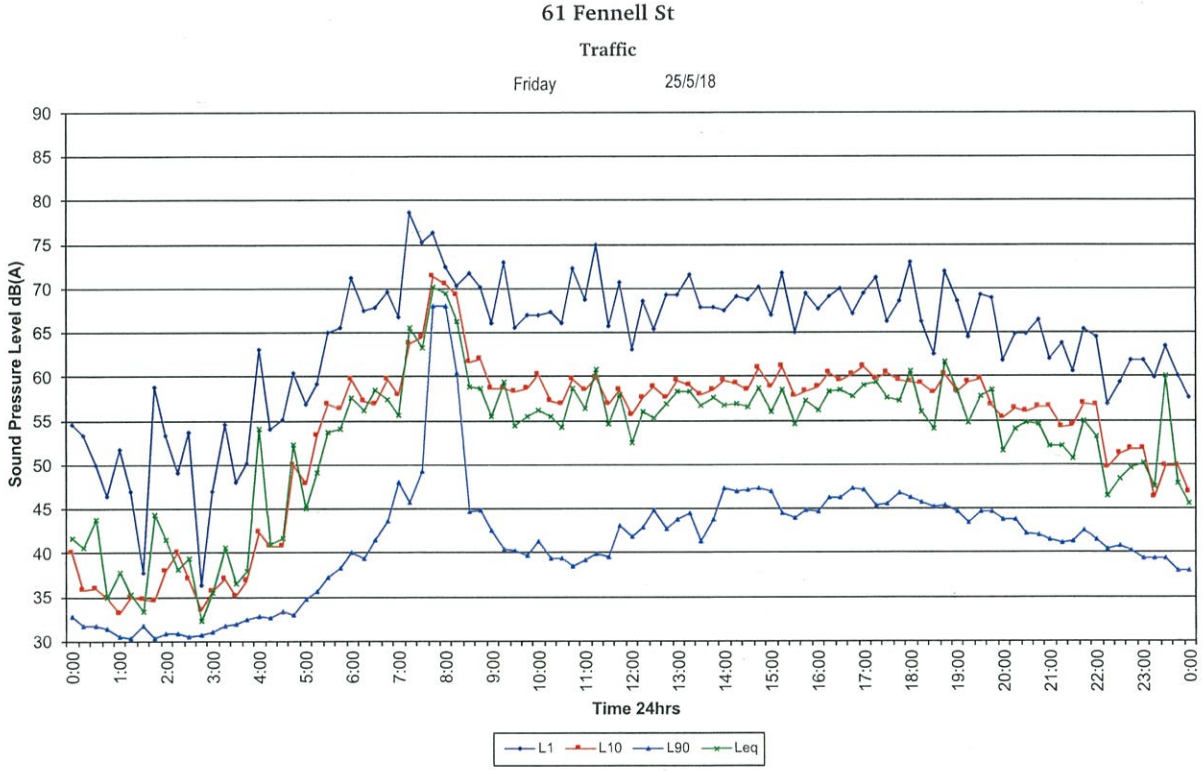
61 Fennell St

Ambient

Thursday 31/5/18



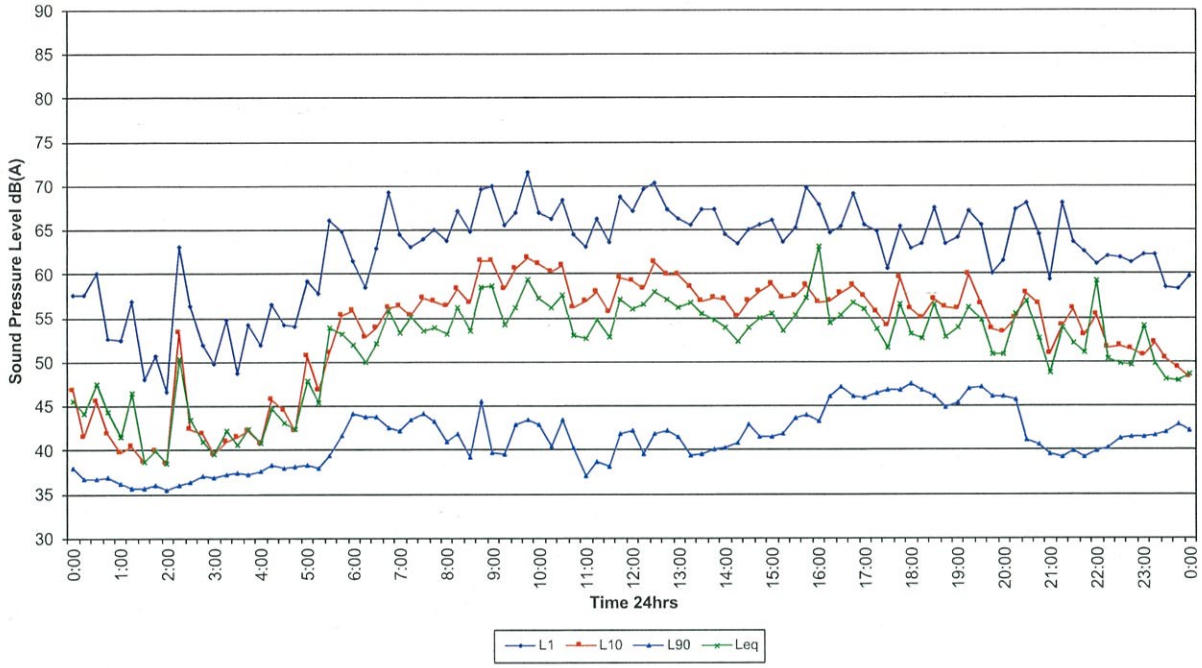

61 Fennell St
Traffic
Thursday 24/5/18
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
35
30
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time 24hrs
L1 L10 L90 Leq


61 Fennell St
Traffic
Friday 25/5/18
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
35
30
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time 24hrs
L1 L10 L90 Leq

61 Fennell St

Traffic

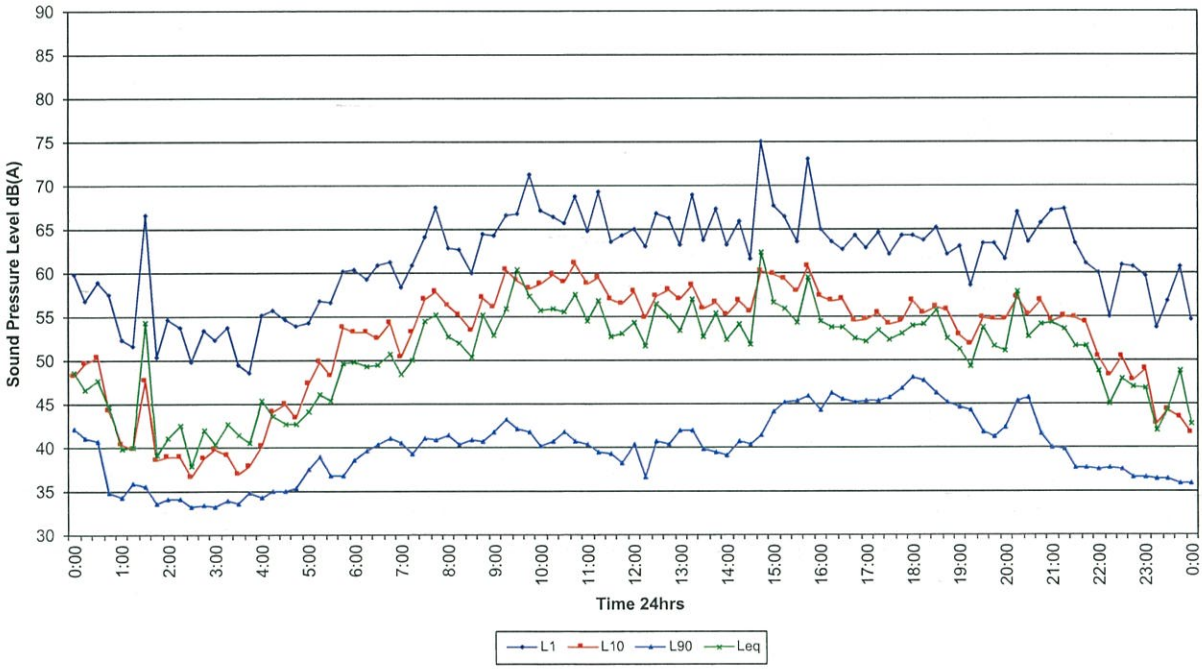
Saturday 26/5/18



61 Fennell St

Traffic

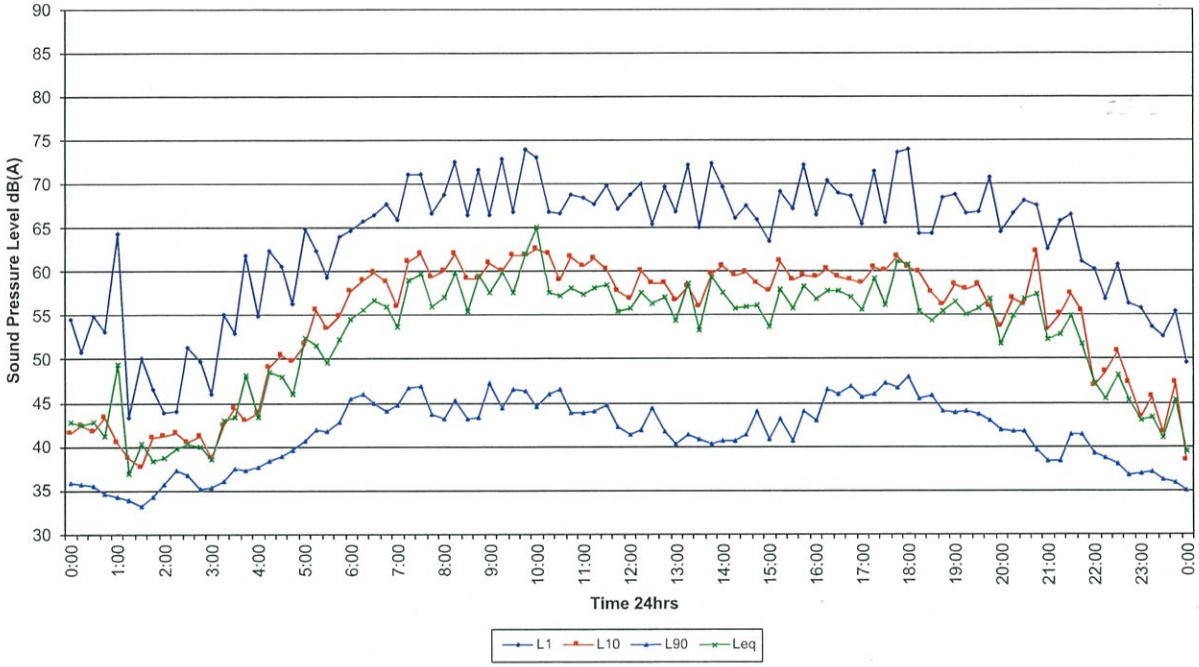
Sunday 27/5/18



61 Fennell St

Traffic

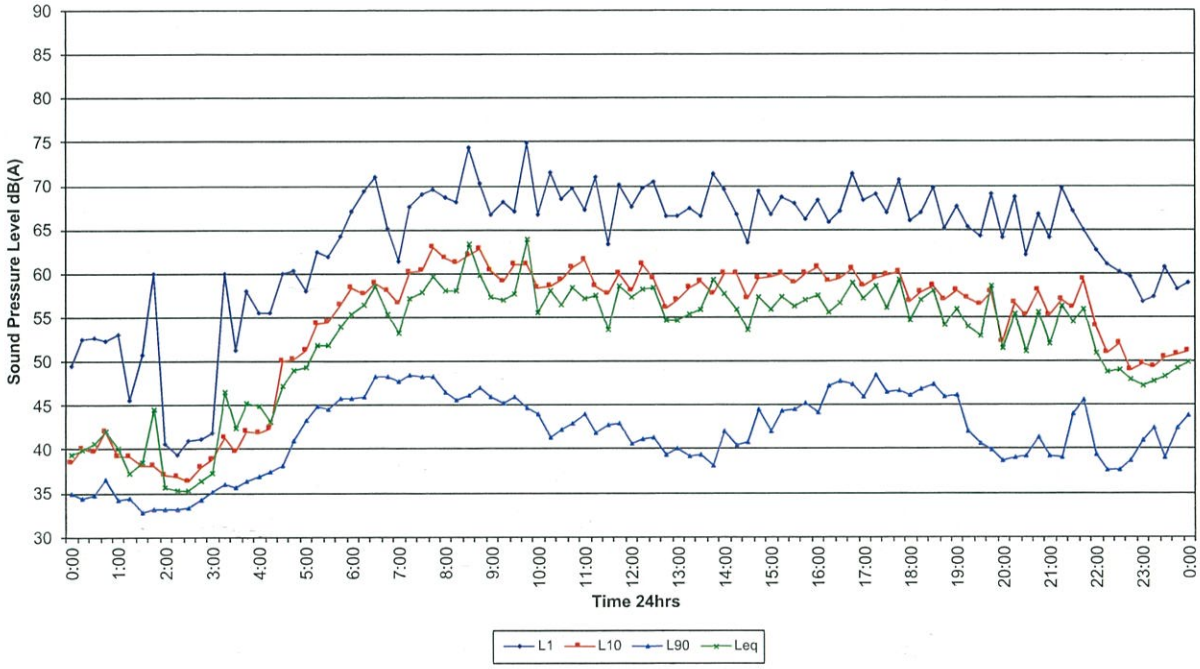
Monday 28/5/18

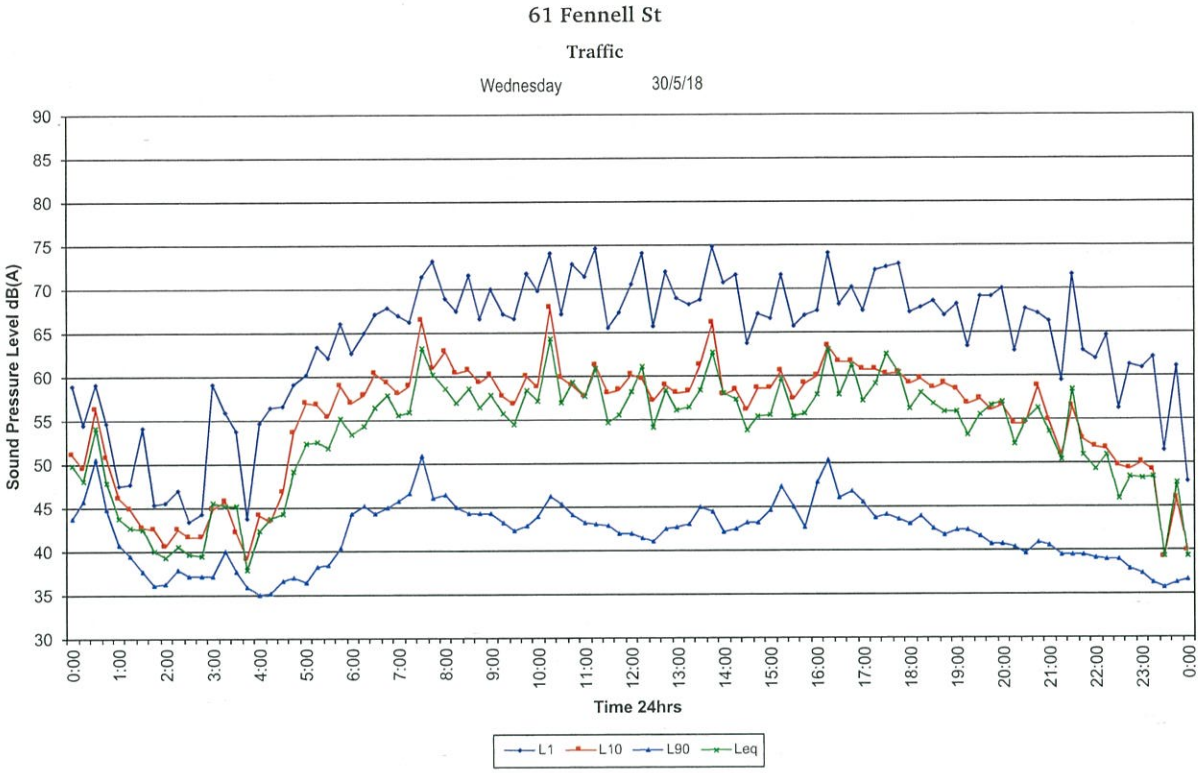


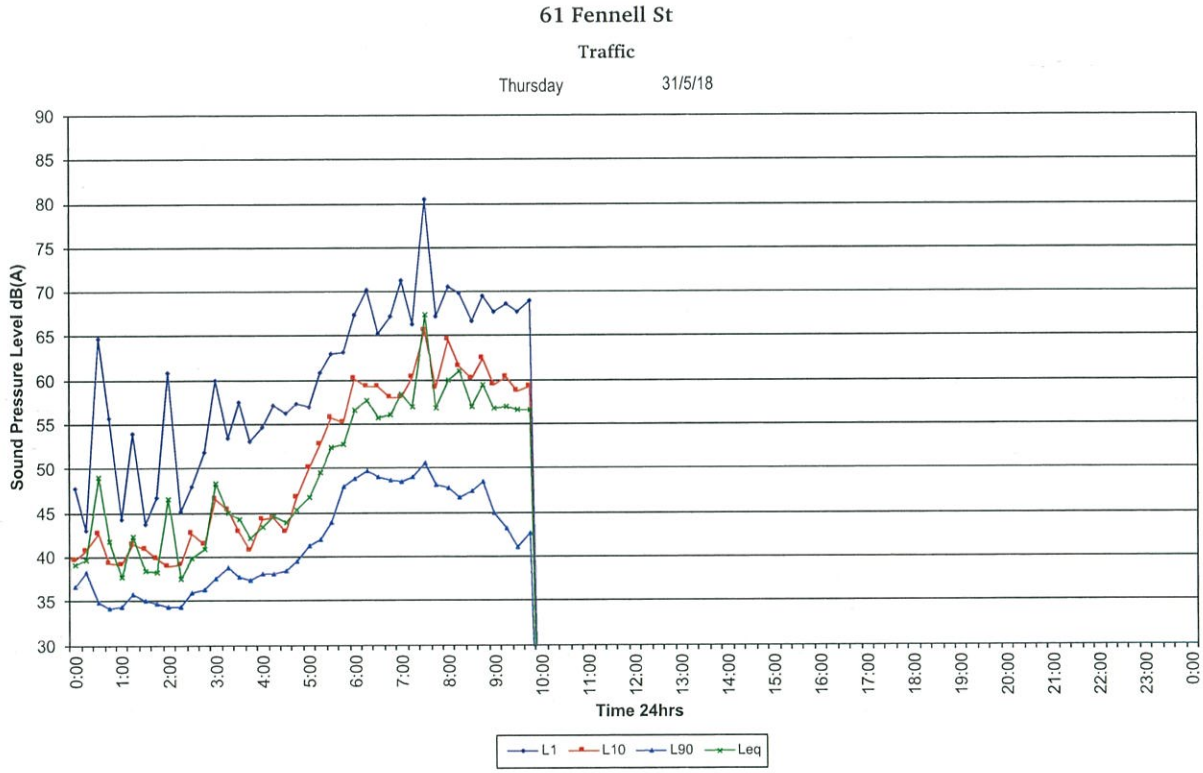
61 Fennell St

Traffic

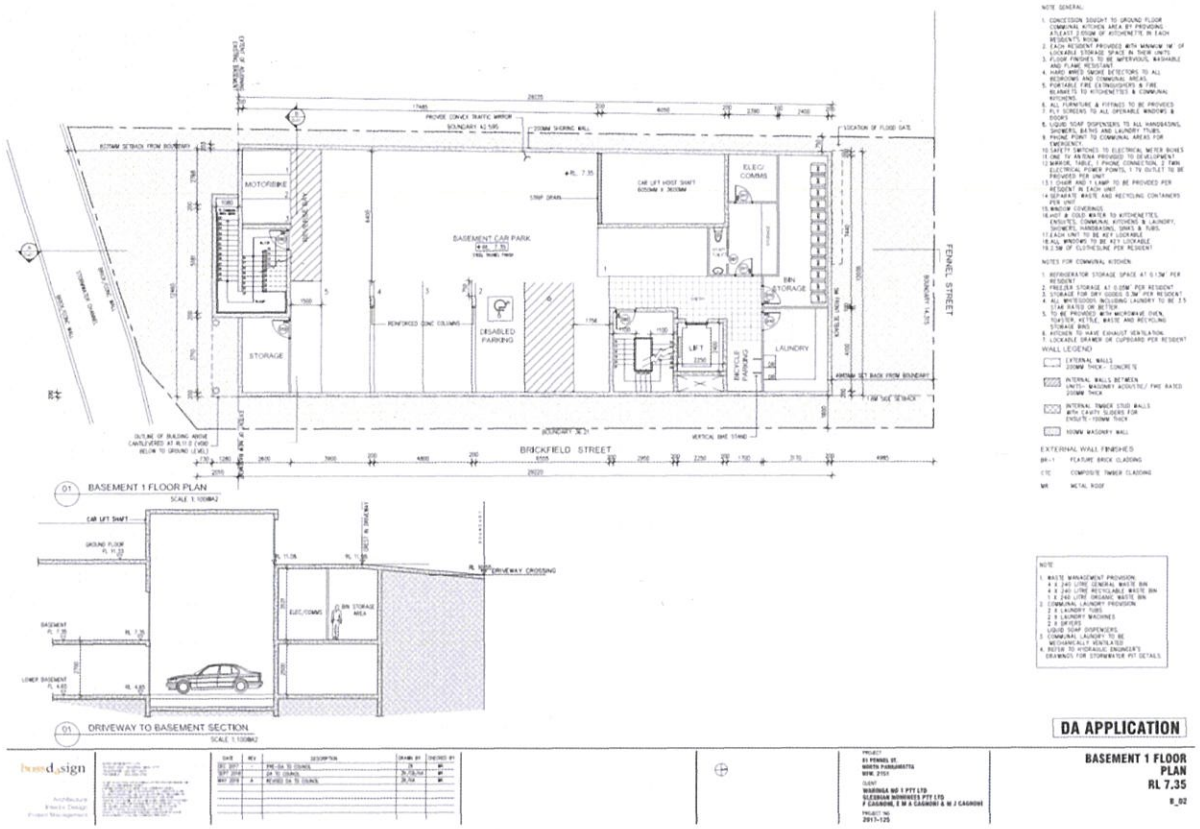
Tuesday 29/5/18

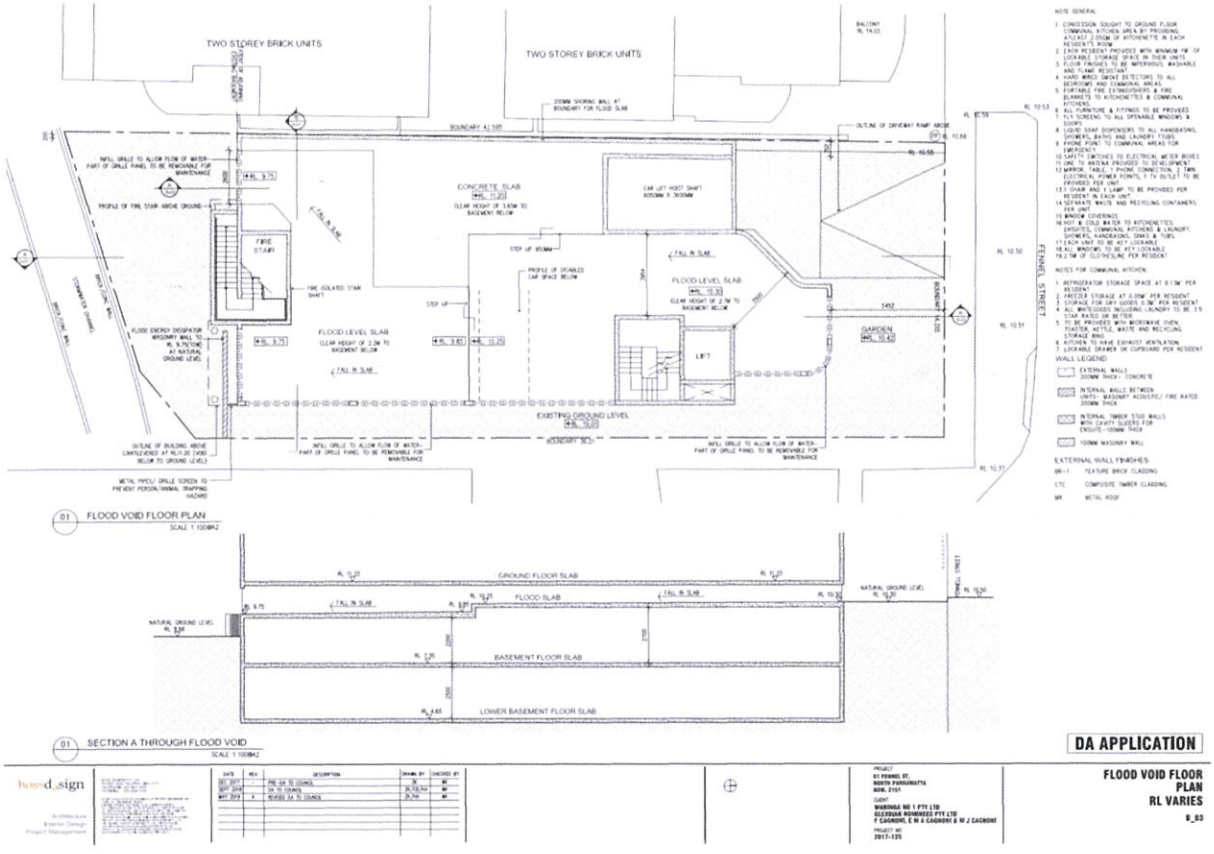


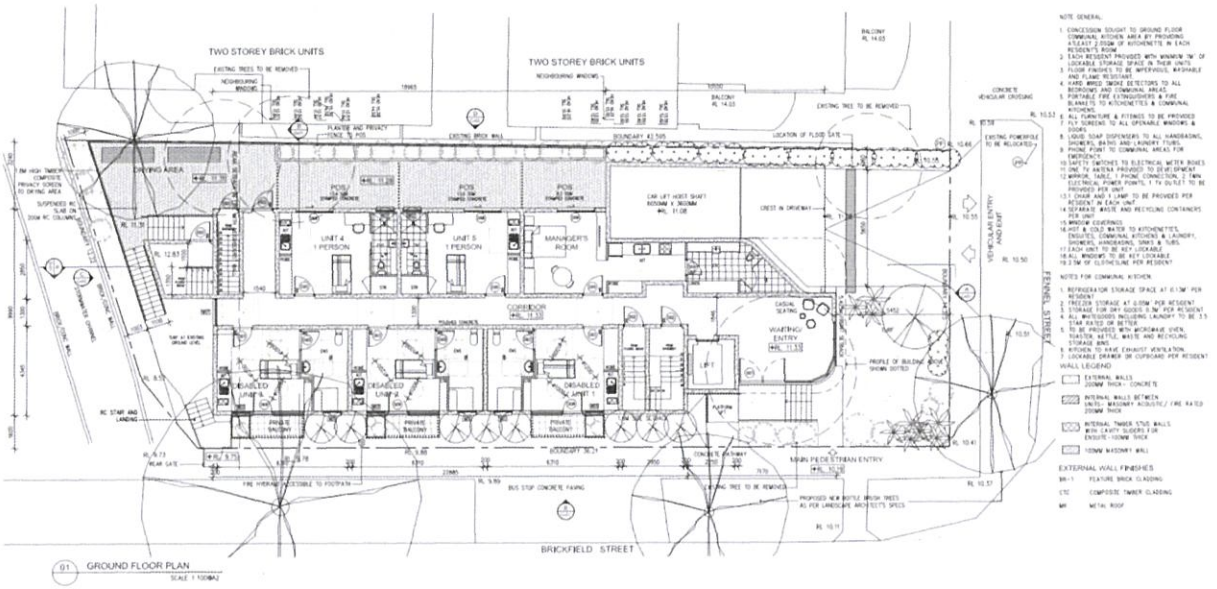

61 Fennell St
Traffic
Wednesday 30/5/18
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
35
30
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time 24hrs
L1 L10 L90 Leq


61 Fennell St
Traffic
Thursday 31/5/18
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
35
30
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 0:00
Time 24hrs
L1 L10 L90 Leq

Appendix C Architectural Plans



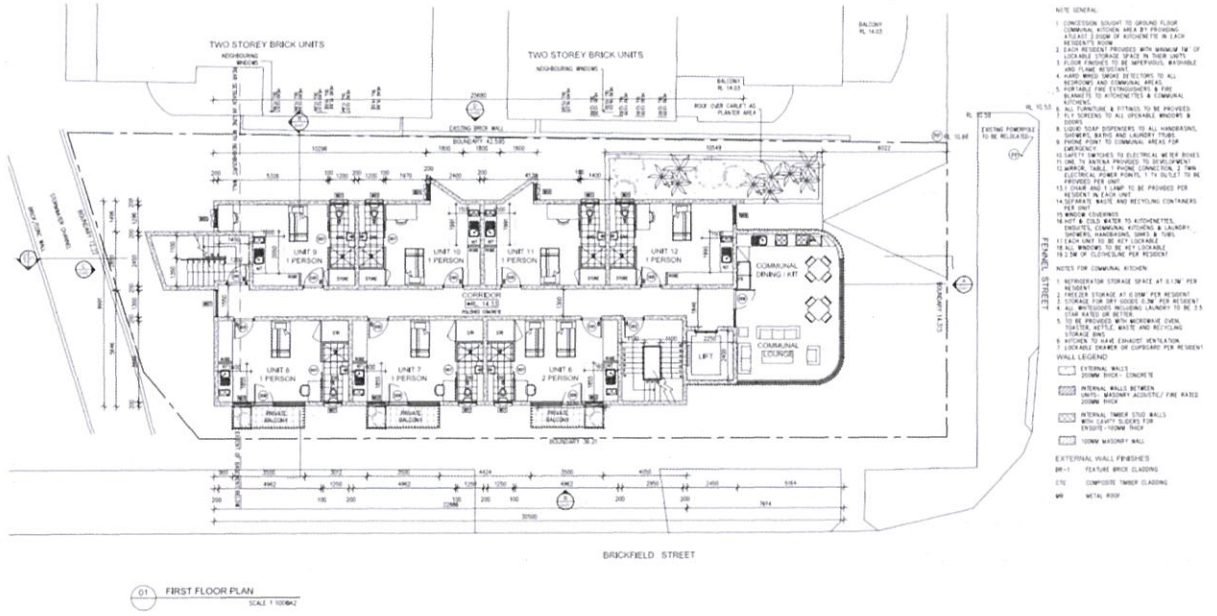




DA APPLICATION

bossdesign

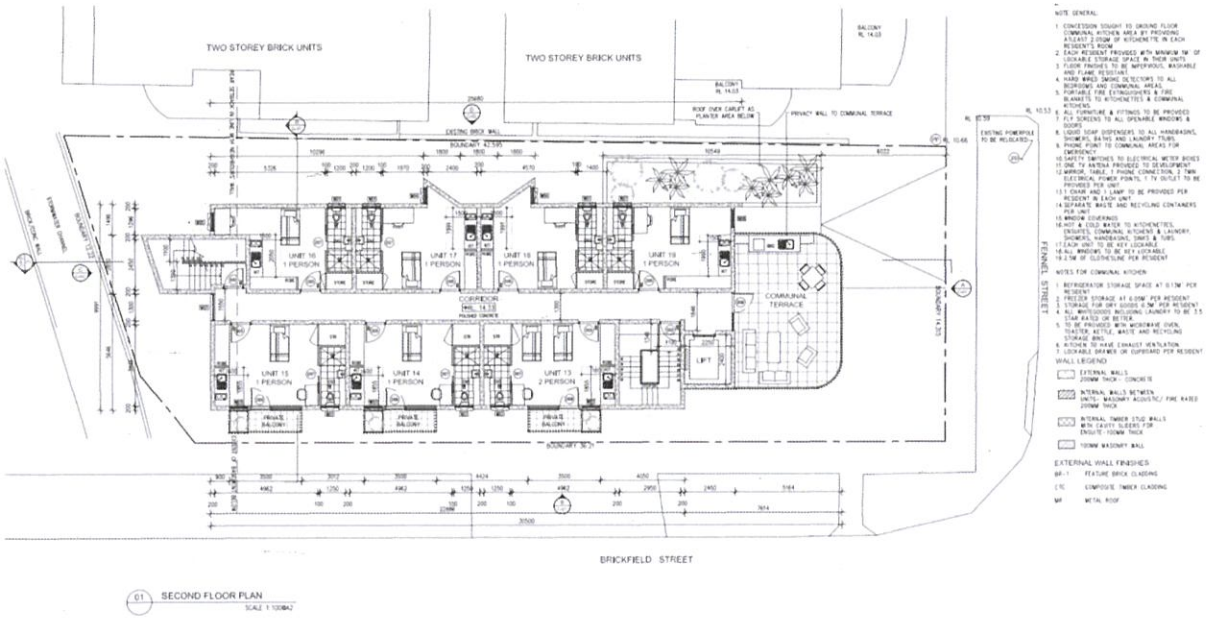
GROUND FLOOR PLAN
RL 11.33
8_04



DA APPLICATION

bossdesign

FIRST FLOOR PLAN
RL 14.33
8_05



01 SECOND FLOOR PLAN
SCALE 1:100@A2

DA APPLICATION

bossd_sign

DATE	REV	DESCRIPTION	DRAWN BY	CHECKED BY
SEP 2017	-	RFI TO COUNCIL	JS	MC
SEP 2018	-	TO COUNCIL	JS/DS/SW	MC
MAY 2019	A	REVISED TO COUNCIL	JS/SW	MC

PROJECT
61 FENNELL ST.
NORTH PARRAMATTA
NSW. 2151

CLIENT
WAIRINGA NO 1 PTY LTD
GLENDAIR HOMEMADES PTY LTD
F CAGNONE, S M A CAGNONE & M J CAGNONE

PROJECT NO
2017-125

SECOND FLOOR PLAN
RL 17.33
B_06

Appendix D 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 C17321

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 :	00572559
Microphone Serial Number :	170395
Pre-amplifier Serial Number :	72897

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	21.4°C	**Ambient Temperature :**	21.5°C
Relative Humidity :	42.9%	**Relative Humidity :**	42.3%
Barometric Pressure :	99.19kPa	**Barometric Pressure :**	99.15kPa

Calibration Technician : Lucky Jaiswal
Calibration Date : 04/07/2017
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

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.

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Appendix E Communal Area Balustrade

In addition to the timber louvered privacy screen, a 1.6m high solid balustrade must be implemented on the western boundary of the communal terrace and is required to provide adequate noise attenuation, the construction material of the barrier must have a surface density of 10-15 kg/m' and be free from holes and gaps. Some suitable materials include:

- 12 mm thick Perspex, polycarbonate or Danpalon
- 6 mm toughened laminated safety glass
- Any other approved material which meets the above surface density specification

A typical material used in childcare centres is Perspex, which is a polycarbonate material. The use of the 12 mm thick Perspex or 6 mm glass for this purpose which has a surface mass of 11 kg/m' will meet the mass requirements detailed above and be suitable for use as it is transparent and will not unduly restrict light or vision.

All barriers must be free of gaps and penetrations and it is particularly important to ensure that the gap at the bottom of the barrier is minimised as far as practicable. The base of the barriers should be well sealed at the junction where the barrier meets the floor, but still be designed to allow proper water drainage. See below for barrier layout: