acouras CONSULTANCY

The Trustee for Bimioba Investments Trust

37-39 Pavesi Street, West Guildford

Acoustic DA Assessment

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1 Introduction

The following report has been prepared by Acouras Consultancy on behalf of The Trustee for Bimioba Investments Trust to assess the potential for noise impact associated with the proposed residential development 37-39 Pavesi Street, West Guildford comprising of 10 dual occupancy (ie 20 dwellings) and an internal road access.

The proposed residential development is located on Pavesi Road that is surrounded by existing commercial/industrial and residential buildings. Noise from surrounding industrial activity (including trucks) dominates the ambient noise levels. The site location is shown in Figure 1.

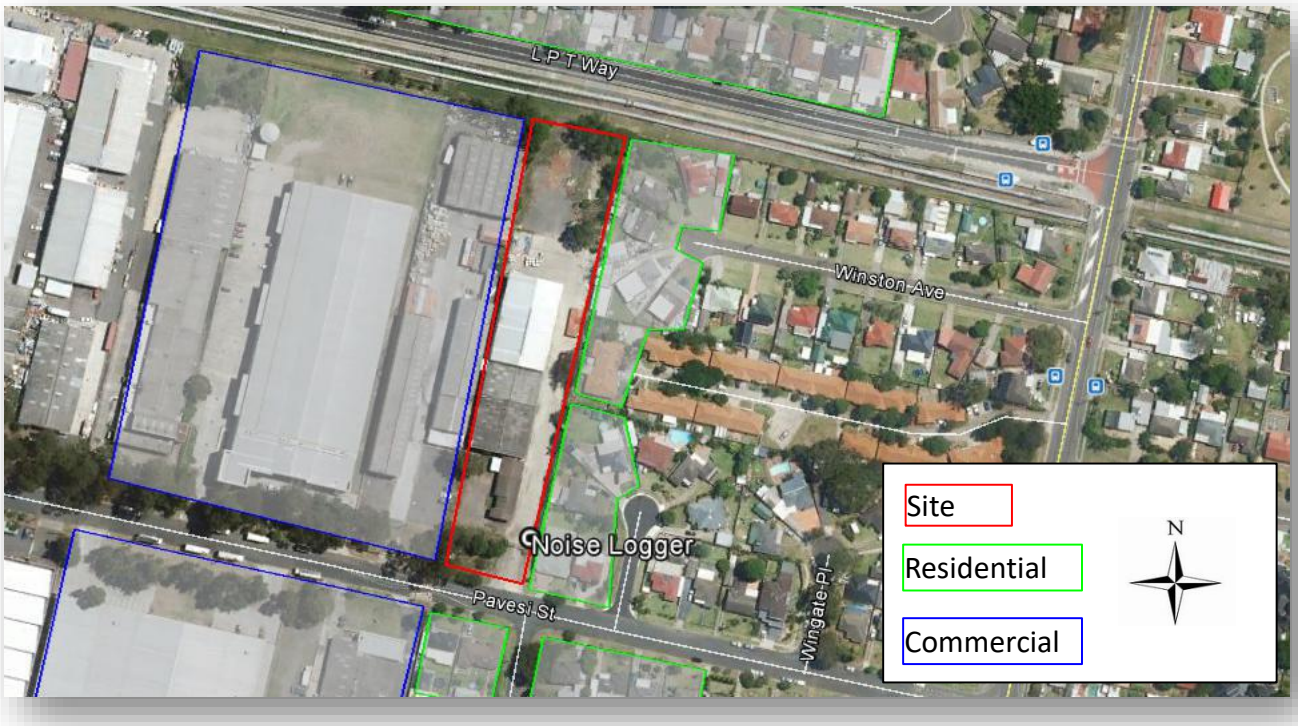


Figure 1 – Site Location, Nearest Residents and Noise Logger Position

2 Noise Criteria

The following standards and guidelines are applicable to this project:

- Holroyd City Council Development Control Plan (DCP) 2013.
- State Environmental Planning Policy (Infrastructure) 2007 Clause 102.
- NCC/BCA Part F5.
- NSW EPA "Noise Guide for Local Government" (NGLG).
- Australian standard AS/NZS 2107-2000: Acoustics – Recommended design sound levels and reverberation times for building interiors.
- Australian standard AS 1055.1-1997: Acoustics – Description and measurement of environmental noise - General procedures.

2.1 Holroyd DCP Acoustic Requirements

Holroyd City DCP 2013 Part B states the following in Condition C11:

C11. Where a property is adjacent to a railway or arterial road, an acoustic report conducted by a suitably qualified acoustic consultant is required to be submitted to Council. The acoustic report shall provide measurements of noise impacts upon proposed dwellings and make specific recommendations for the attenuation of noise to currently recognised levels conductive to reasonable residential amenity. Compliance with the maximum design sound levels recommended by the relevant Australian Standard. Recommended design sound levels and reverberation times for building interiors, as follows:

- *Recreation areas- 40dB(A)*
- *Sleeping areas- 35dB(A)*
- *Other habitable rooms- 40dB(A)*

2.2 Holroyd DCP for Air-Conditioners

For the operation of mechanical equipment and ventilation systems, Condition C15 of Holroyd City DCP 2013 Part B requires that:

C15. Air conditioners, swimming pool pumps and the like are not to exceed 5dba above background noise levels and should not be audible from habitable rooms of neighbouring dwellings. Note: Air conditioners, swimming pool pumps and the like shall comply with the protection of the environment operations act and noise regulation.

During the design stage (Construction Certification) a detailed review of selected noise generating mechanical equipment, such as air-conditioners, condensers, exhaust fans and the like are to be conducted to ensure compliance with the noise limits as specified in Table 3.

2.3 Sound Insulation Requirement (Part F5 NCC/BCA)

For sound transmission and insulation between sole occupancy units (SOU) within the same development, walls and floors to be constructed in accordance with requirements of Part F5 of the Building Code of Australia (BCA). Sound insulation requirements are summarised in Table 1.

Table 1 - NCC Part F5 Requirements (Class 2 or 3)

Building Element	Minimum NCC Part F5 Requirements
Sound Insulation Rating of Walls (Class 2 or 3)	
Walls between separate sole occupancy units.	Rw + Ctr 50 (airborne)
Walls between wet areas (bathrooms, sanitary compartment, laundry or kitchen) and a habitable room (other than kitchen) in adjoining apartments.	Rw + Ctr 50 (airborne) & of discontinuous construction
Walls between sole occupancy unit and stairway, public corridors, public lobby or the like or parts of a different classification.	Rw 50 (airborne)
Walls between a plant room or lift shaft and a sole occupancy unit.	Rw 50 (airborne) & of discontinuous construction
Sound Insulation Rating of Floors (Class 2 or 3)	
Floors between sole occupancy units or between a sole occupancy unit and plant room, lift shaft, stairway, public corridor, public lobby or the like.	Rw + Ctr 50 (airborne) & Ln,w + Cl < 62 (impact)
Apartment Entry Doors (Class 2 or 3)	
A door incorporated in a wall that separates a sole-occupancy unit from a stairway, public corridor, public lobby or the like.	Rw 30 (airborne)
Services (Class 2, 3 or 9c)	
If a storm water pipe, a duct, soil, waste or water supply pipe including a duct or pipe that is located in a wall or floor cavity serves or passes through more than one sole occupancy unit must be separated:	
if the adjacent room is a habitable room (other than a kitchen); or	Rw + Ctr 40
if the room is a kitchen or non-habitable room	Rw + Ctr 25

Construction Deemed to Satisfy

The forms of construction must be installed as follows:

(a) Masonry—Units must be laid with all joints filled solid, including those between the masonry and any adjoining construction.

(b) Concrete slabs—Joints between concrete slabs or panels and any adjoining construction must be filled solid.

(c) Sheeting materials—

(i) if one layer is required on both sides of a wall, it must be fastened to the studs with joints staggered on opposite sides; and

(ii) if two layers are required, the second layer must be fastened over the first layer so that the joints do not coincide with those of the first layer; and

(iii) joints between sheets or between sheets and any adjoining construction must be taped and filled solid.

(d) Timber or steel-framed construction—perimeter framing members must be securely fixed to the adjoining structure and—

(i) bedded in resilient compound; or

(ii) the joints must be caulked so that there are no voids between the framing members and the adjoining structure.

(e) Services—

(i) Services must not be chased into concrete or masonry elements.

(ii) A door or panel required to have a certain Rw + Ctr that provides access to a duct, pipe or other service must—

(A) not open into any habitable room (other than a kitchen); and

(B) be firmly fixed so as to overlap the frame or rebate of the frame by not less than 10 mm, be fitted with a sealing gasket along all edges and be constructed of—

(aa) wood, particleboard or blockboard not less than 33 mm thick; or

(bb) compressed fibre reinforced cement sheeting not less than 9Â mm thick; or

(cc) other suitable material with a mass per unit area not less than 24.4 kg/m^2

(iii) A water supply pipe must—

(A) only be installed in the cavity of discontinuous construction; and

(B) in the case of a pipe that serves only one sole-occupancy unit, not be fixed to the wall leaf on the side adjoining any other sole-occupancy unit and have a clearance not less than 10 mm to the other wall leaf.

(iv) Electrical outlets must be offset from each other—

(A) in masonry walling, not less than 100 mm; and

(B) in timber or steel framed walling, not less than 300 mm.

2.4 Noise Survey and Project Specific Limits

An unattended noise survey was carried out at the site to measure the background and ambient noise levels. Nose monitoring was conducted between Wednesday 12th to Tuesday 18th November 2014. The monitor was positioned at the location shown in Figure 1. Measurements were conducted using the following equipment:

- SVAN 977 Type 1 Real time Analyser/Noise Logger. Serial No. 34892.
- SVAN SV30A Type 1 Sound Level Calibrator. Serial No. 31830.

Noise monitoring was conducted in general accordance with Australian standard AS 1055.1-1997: Acoustics-Description and measurement of environmental noise-General procedures. The noise analyser was calibrated immediately before and after measurements were taken with no discernible differences between these two recorded levels. The sound analyser is Type 1 and complies with Australian standard AS1259.2: 1990.

Table 2 presents a summary of the measured ambient noise level and traffic noise impacting the development.

Table 2 – Measured Ambient and Traffic Noise and Levels, dBA

Location	Period	Average L_{eq}	Highest L_{eq} 1hr
39 Pavesi St	Day (07:00-22:00)	53	62
	Night (22:00-07:00)	49	54

Table 3 presents a summary of the measured background noise level and the allowable intrusive noise limit for this project in accordance with the DCP. For the purpose of the assessment, the background noise level has been determined using the RBL in accordance with the method given in the EPA INP.

Table 3—Noise Survey Summary and Project Limits, dBA

Time Period	Existing Noise Levels		DCP Noise Limits, L_{eq}
	$L_{eq\ (period)}$	$L_{90\ (period)}$	
Day	53	40	45
Evening	53	41	46
Night	49	38	43

During detailed design stage, the design and selection of the mechanical equipment required to service the proposed development will be required to achieve the DCP noise limits as presented in the table above.

During the monitoring period any adverse weather condition have been excluded. The noise logger results are presented in Appendix C.

3 Assessment and Recommendations

3.1 Façade Glazing Requirements

Acoustic glazing for the dual occupancy dwellings are given in Table 4 are required to reduce noise impact on the internal occupants and should result in noise levels within such units in accordance with the Department of Planning Noise Guidelines and AS/NZS 2107:2000.

Table 4 – Schedule of Window and Glazing (R_w)

Level	Façade	Space	Glazing Thickness	Minimum R_w (Glazing+Frame)
All	All	Living & Bedroom	6.38mm laminated	30

All other non-habitable spaces, such as bathrooms and laundries require minimum 6mm monolithic glass (Rw 28).

All Windows/doors should be well sealed (air tight) when closed with good acoustic seals around the top and bottom sliders. Mohair seals are not considered to be acoustic seals.

3.2 Building Façade Construction

To provide sufficient acoustic attention of noise, the general external construction of the proposed building would need to be constructed as detailed in Table 5.

Table 5 – External Façade Construction (R_w)

Building Element	Proposed Construction	Minimum R_w
External Wall	Masonry or cavity brick	45
Roof and ceiling	Concrete with a plasterboard cavity ceiling	45

3.3 Mechanical Services

At the DA stage, the design and selection of mechanical equipment has not been finalised. Following the DA approval of the proposed development, during the Construction Certification Stage a detail assessment of all mechanical plant and equipment will be conducted to ensure compliance with the DCP noise criteria. Typical acoustic measures may include the construction of acoustic barriers, enclosures, attenuators and/or acoustic louvres.

4 Conclusion

An acoustic assessment of the proposed development has been carried out in accordance with the requirements of Holroyd DCP.

An environmental noise survey of the site has been conducted and the noise limiting criteria for mechanical plant/equipment noise emission has been determined based on the DCP requirements. The limits are presented in Table 3.

Construction for glazing, external walls and the roof/ceiling systems have been provided to achieve the internal noise criteria and are detailed in Section 3.1 and Section 3.2 based on the impact of road traffic noise.

Providing the recommendations in this report are implemented, the noise from and to the proposed development is predicted to comply with acoustic requirements of the Holroyd DCP, BCA Part F5 and relevant Australian standards.

Appendix A – Acoustic Terminology

Decibel, dB: A dimensionless unit which denotes the ratio between two quantities that are proportional to power, energy or intensity. One of these quantities is a designated reference by which all other quantities of identical units are divided. The sound pressure level in decibels is equal to 10 times the logarithm (to the base 10) of the ratio between the pressure squared divided by the reference pressure squared. The reference pressure used in acoustics is 20 micro Pascals.

A-WEIGHTING: A measure of sound pressure level designed to reflect the response of the human ear, which does not respond equally to all frequencies. To describe sound in a manner representative of the human ear's response it is necessary to reduce the effects of the low and high frequencies with respect to medium frequencies. The resultant sound level is said to be A-weighted, and the units are in decibels (dBA). The A-weighted sound level is also called the noise level.

Sound Pressure Level, L p (dB), of a sound: 20 times the logarithm to the base 10 of the ratio of the r.m.s. sound pressure to the reference sound pressure of 20 micro Pascals. Sound pressure level is measured using a microphone and a sound level meter, and varies with distance from the source and the environment.

Ambient Noise/Sound: All noise level present in a given environment, usually being a composite of sounds from many sources far and near. Traffic, HVAC, masking sound or even low-level background music can contribute to ambient level of noise or sound.

Percentile Level - L 90 , L 10 , etc: A statistical measurement giving the sound pressure level which is exceeded for the given percentile of an observation period, e.g. L 90 is the level which is exceeded for 90% of a measurement period. L 90 is commonly referred to as the "background" sound level.

Background Noise (L 90): The sum total of all unwanted residual noise generated from all direct and reflected sound sources in a space that can represent an interface to, or interfere with good listening and speech intelligibility.

Rating Background Level – RBL: Method for determining the existing background noise level which involves calculating the tenth percentile from the L A90 measurements. This value gives the Assessment Background Noise Level (ABL). Rating Background Level is the median of the overall ABL.

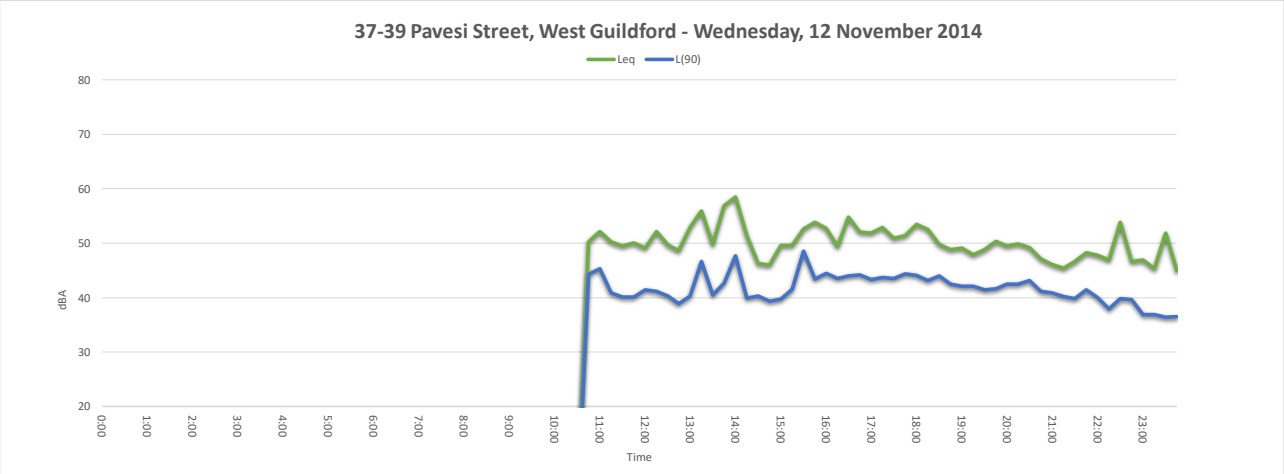
L AEQ,T : Equivalent continuous A-weighted sound pressure level. The value of the A-weighted sound pressure level of a continuous steady sound that, within a measurement time interval T, has the same A-weighted sound energy as the actual time-varying sound.

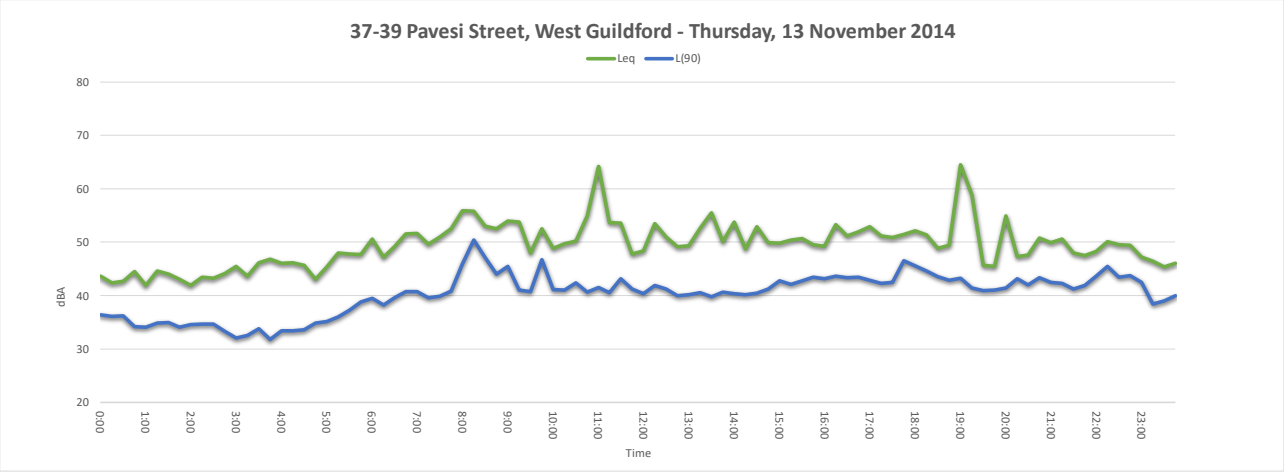
Appendix B – Architectural Drawings

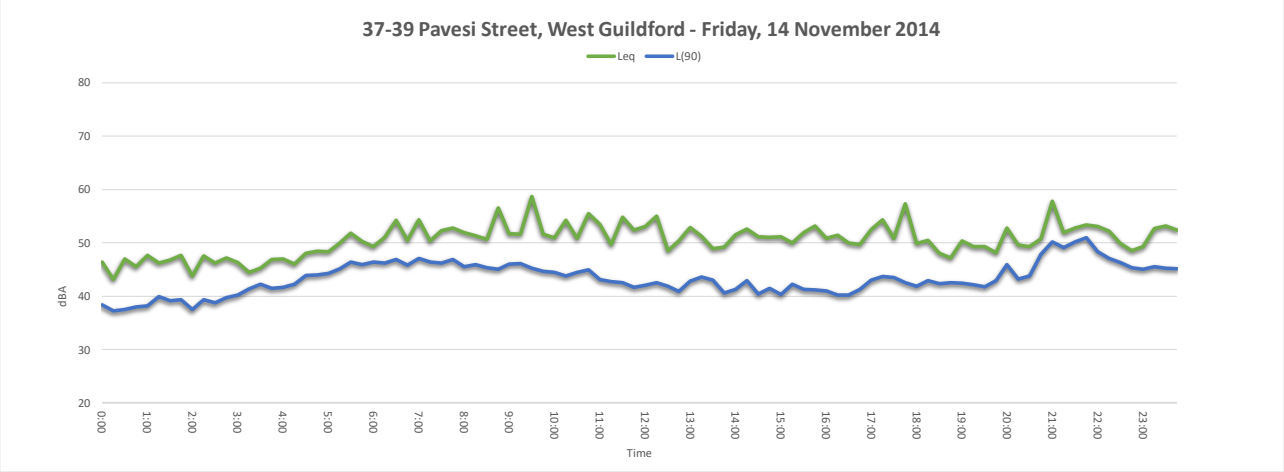
This assessment was based on the following architectural drawings provided by Form Architects.

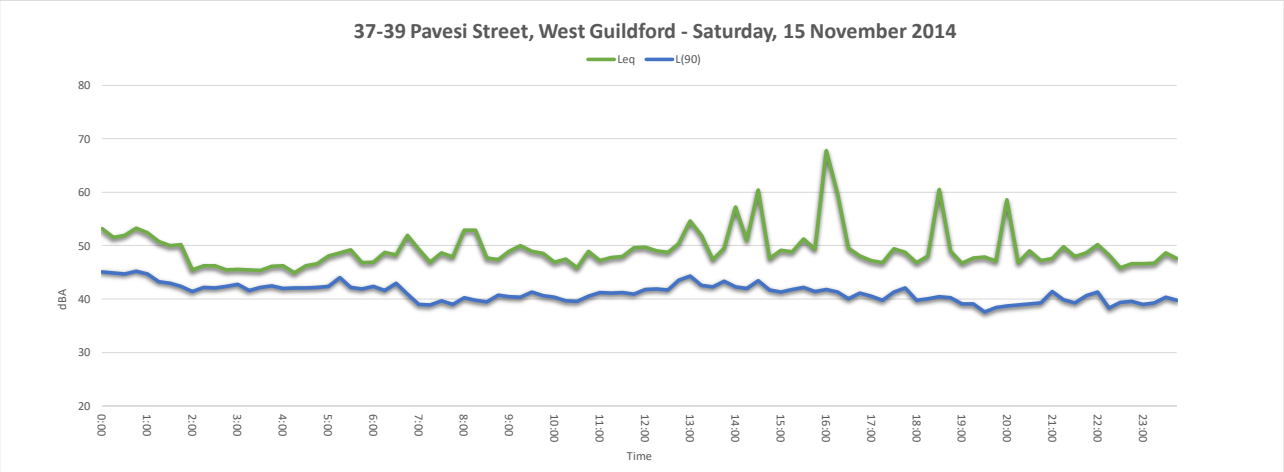
Drawing	Issue	Date	Description
AR10 001	Iteration 14	06/10/2016	Sketch Design

Appendix C – Noise Logger Results





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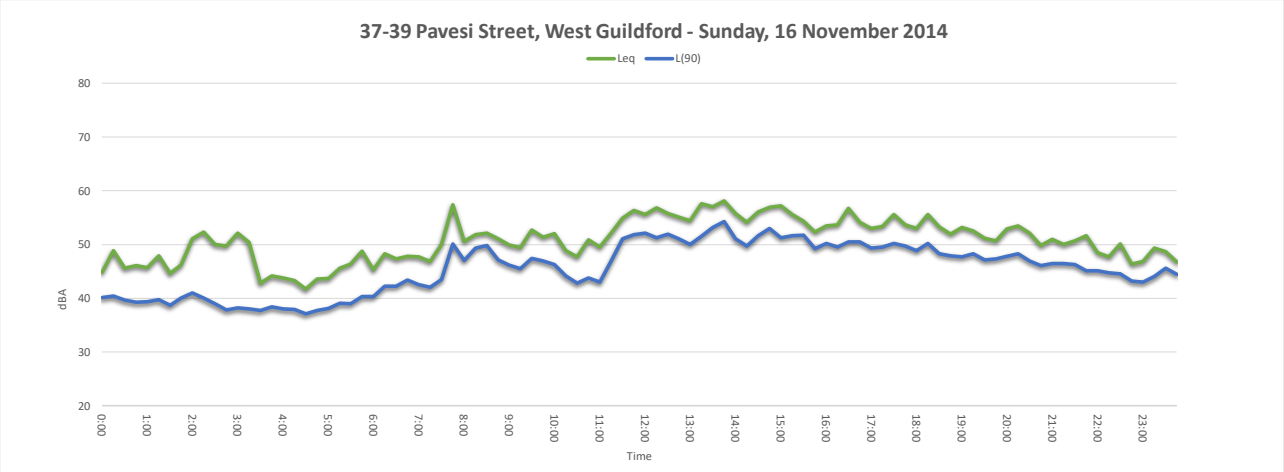
Leq
L(90)
dBA
Time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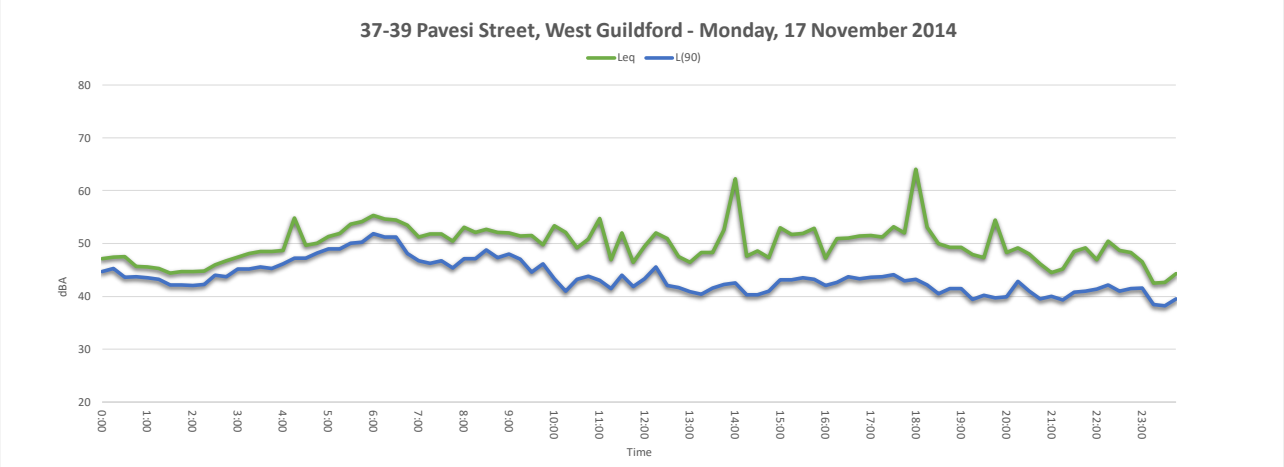
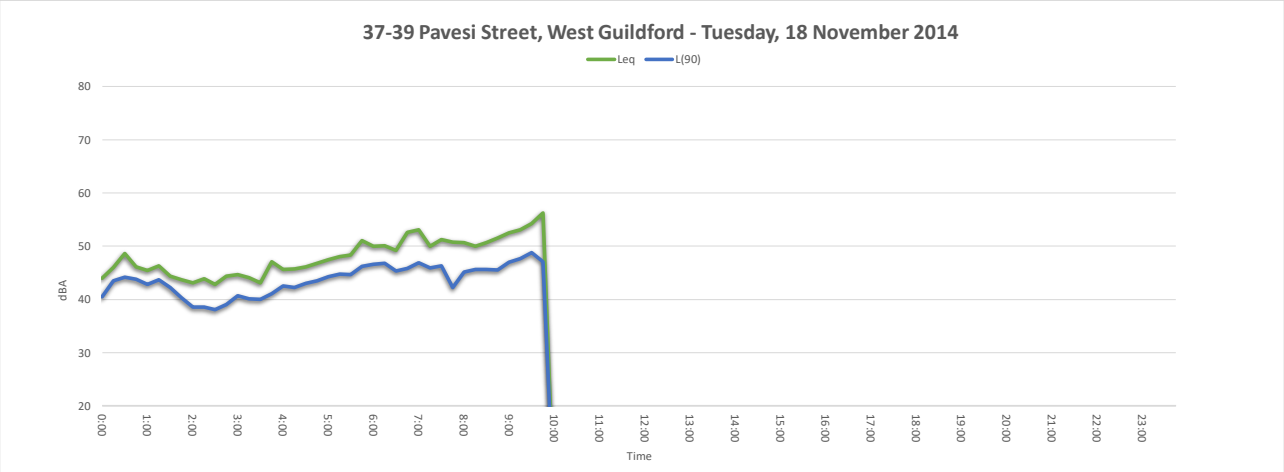
Leq
L(90)
dBA
Time


37-39 Pavesi Street, West Guildford - Monday, 17 November 2014
Leq
L(90)
dBA
Time


37-39 Pavesi Street, West Guildford - Tuesday, 18 November 2014
Leq
L(90)
dBA
80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
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Time