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Assessment of Road Traffic Noise
149 Hansworth Street, Mulgrave

Report Number 640.11107-R1

30 June 2015

Tony Pong
149 Hansworth Street
Email: tpong@mail.com
MULGRAVE VIC 3170

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Assessment of Road Traffic Noise 149 Hansworth Street, Mulgrave

PREPARED BY:

SLR Consulting Australia Pty Ltd
ABN 29 001 584 612
Suite 6, 131 Bulleen Road
Balwyn North VIC 3104 Australia

T: +61 3 9249 9400 F: +61 3 9249 9499
melbourne@slrconsulting.com www.slrconsulting.com

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
640.11107-R1	Revision 0	30 June 2015	Ima Fricker	Jim Antonopoulos	Jim Antonopoulos

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1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR) was retained by Pong Constructions Pty Ltd to provide an acoustic report to satisfy VicRoads requirements for the proposed residential development at No. 149 Hansworth Street, Mulgrave.

2 SITE DESCRIPTION

2.1 Site Layout

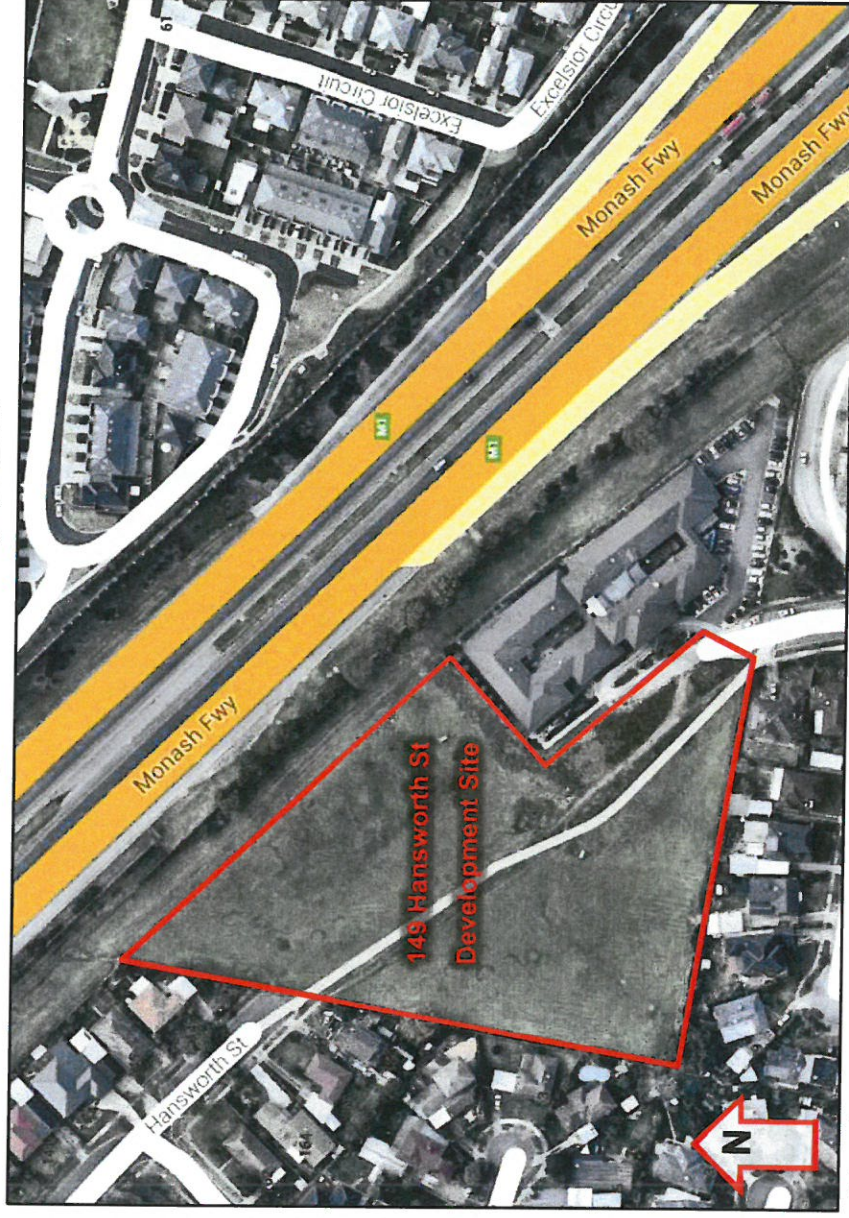
The subject site sits on a currently vacant parcel of land located along Hansworth Street approximately 30 m south of the Monash Freeway. The site sits on a slight incline with increasing elevation ranging from 84 Above Ground Level (AGL) at the northern end of the site to 92 m AGL at the southeast edge.

A two-storey aged facility is located adjacent the Freeway near the southern end of the site and one and two storey residential dwellings to the west adjacent Hansworth St.

There is an existing noise barrier which is approximately 2.8 to 3 m high which separates the site from the adjacent Monash Freeway. The residential area to the north is separated from the Freeway by a slightly higher 4 m high noise barrier located slightly closer to the Freeway.

Figure 1 shows an aerial photograph of the site and surrounding area in which the Monash Freeway and adjacent residential area can be seen.

Figure 1 149 Hansworth Street, Mulgrave – Aerial Photograph of Site



Note: Image courtesy of Nearmaps ©, aerial photograph taken 26 May 2015

Figure 2 shows a photograph taken from the northern corner of the site looking southeast along the noise barrier towards the aged care facility. **Figure 3** shows a photograph taken from the centre of the site looking north towards the existing noise barrier.

Figure 2 Photograph taken from north corner of Site looking southeast



Figure 3 Photograph taken from Centre of site looking north towards Noise Barrier



2.2 Proposed Development

The proposed development consists of residential usage including:

- Three residential apartment towers ranging from six to ten storeys in height to be located along the northern end of the site adjacent the Monash Freeway.
- A total of 18 two storey town houses located along the southern and western ends of the site.

The ground floor layout of the proposed development is shown in **Figure 4** below. Full details of the proposed development are provided in Yellow Woods Architects Town Planning Drawings TP00 through TP30, dated 4 September 2014.

Figure 4 Ground Floor Layout of Proposed Development



3 NOISE CRITERIA

3.1 VicRoads Traffic Noise Requirements

It is understood that no specific acoustic related conditions have been provided by Council or VicRoads for the proposed development other than the general request for a noise assessment. We would expect as a minimum, compliance with the VicRoads document entitled "Requirements of Developers – Noise Sensitive Uses", dated March 2004 would be required.

The VicRoads document aims to minimise road traffic noise impacts and ensure that the occupants of developments remain protected into the future after the developer has finished the project.

The VicRoads document normally requires the developer to attenuate noise from the Freeway (measured at a distance 1 m from the most exposed ground floor habitable room window) to a level of noise no greater than 63 dBA¹ L10², 18h³. Where noise levels exceed 63 dBA L10, 18h and it is practical to erect a noise barrier to protect a large number of buildings in a sub-division then the developer should attenuate traffic noise from the Freeway to a level of 63 dBA or less.

It is noted that this condition does not address internal amenity requirements; consequently, first floor habitable rooms which are not shielded by traffic noise barriers can be exposed to high levels of road traffic noise. As such, we would normally recommend façade treatments (i.e. glazing upgrades) are still considered for affected habitable rooms closest the Freeway.

Given the height of the proposed apartment buildings adjacent the Freeway an upgraded noise barrier will be ineffective to most of the dwellings.

It is understood that the block originally had a permit for 40 townhouses in 2006 with agreement provided by VicRoads such that no changes would be required to the existing noise barrier. Assuming this agreement is still in place, the VicRoads requirements are:

"Where the developer decides, in consultation with VicRoads and Council, that it is not desirable to erect high noise barriers then the following conditions should apply...:

11. *The noise sensitive buildings adjacent to the Freeway must be designed and constructed to meet the desirable acoustic standards set out in AS 2107-2000 "Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors..."*

13. *The developer must provide a fence that visually screens the traffic from the view at the lowest habitable level of the development. This screen would be expected to screen out vehicles up to 3.5 metres high"*

Consequently, the development can be designed to meet the internal noise goals for all habitable rooms.

1 dBA: Decibels recorded on a sound level meter which has had its frequency response modified electronically to an international standard to quantify the human response of sounds of differing loudness and character.

2 L10: The value of a range of values exceeded for 10% of the observation period, i.e. the level exceeded for 6 minutes of every 60 minutes of observation.

3 L10, 18h: The arithmetic average of hourly L10 intervals for the 18 hr period between 6 am until midnight.

3.2 Australian New Zealand Standards AS / NZS 2107:2000

Guidance for setting internal design criteria to residences is provided in Australian New Zealand Standard AS / NZS 2107:2000 'Acoustics-Recommended design sound levels and reverberation times for building interiors' (AS / NZS 2107). The standard provides recommended design sound levels for a range of building and occupancy types based on the surrounding environment.

The recommended design sound levels suggested in AS / NZS 2107 for residences near busy roads are shown in **Table 1**.

Table 1 AS 2107 Design Sound Levels for Houses and Apartments near Major Roads

Type of activity	Recommended design sound level, Leq ⁴ , dBA	
	Satisfactory	Maximum
Work and Living areas	35	45
Sleeping areas	30	40

The recommended design noise levels for apartments in this development are provided below based on the higher end of the ranges provided above and incorporating a 3 dBA margin for traffic growth:

Living areas: **42 dBA, Leq, 15h⁵**

Bedrooms: **37 dBA, Leq, 9h⁶**

4 SITE NOISE TESTING

To quantify potential road traffic noise impacts to the proposed development, SLR visited the site on Monday 1 June 2015.

Unattended noise monitoring equipment was deployed near the existing noise barrier at two locations to determine noise levels to the development site. The two locations are summarised below:

- **Location A:** Located at the noise barrier approximately 55 m southeast of the western property boundary. The microphone for the noise logger was fixed to an extendable mast which was deployed at a height 3.8 m above natural ground level (AGL), approximately 0.8 m above the top of the noise barrier.
- **Location B:** Located 70 m southeast of the west property boundary atop the slight embankment 6.3 m southwest of the noise barrier. The microphone was located at an elevated height of 6.5 m AGL.

The microphones of both noise loggers were elevated such that they were fully exposed to the Monash Freeway. The noise monitoring equipment used consisted of an Acoustic Research Laboratories (ARL) Ngara noise logger (Serial No.: 87801E) and an ARL EL-316 noise logger (Serial No.: 16-306-040) which were both calibration checked before and after the monitoring period using a Brüel & Kjær Type 4231 calibrator (Serial No.: 3002675).

⁴ Leq: The equivalent continuous noise level. It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

⁵ Leq, 15h: The day time equivalent continuous noise level, defined as the period from 7 am until 10 pm.

⁶ Leq, 9h: The night time equivalent continuous noise, defined as the period between 10 pm and 7 am the following morning.

All noise monitoring and calibration equipment contains current National Australian Testing Authority (NATA) calibration certificates which can be made available on request.

The noise monitoring equipment was collected on Friday 14 June to allow for a total of ten (10) full days of noise monitoring results. A site plan showing both noise monitoring locations relative to the Freeway alignment and proposed development is provided in **Figure 5**.

Photographs of the noise monitoring equipment deployed at each location are also provided in **Figure 6** and **Figure 7** on the following page.

Figure 5 Noise Monitoring Locations



Figure 6 Photograph from Centre of Site looking east towards Noise Monitoring Equipment



Figure 7 Noise Monitoring Equipment



Location A: View looking north towards monitoring equipment



Location B: View looking southeast along traffic noise barrier towards monitoring equipment

5 MEASUREMENT RESULTS

The overall L_{10,18hr}, 'day' Leq, 15hr (from 7:00 am to 10:00 pm) and 'night' Leq, 9hr (from 10:00 pm to 7:00 am) results are provided in **Table 2** for both measurement locations.

Table 2 Noise Monitoring Results, dBA

Day	Location A (at noise barrier, 3.8 m AGL)			Location B (6.3 m inside site, 6.5 m AGL)		
	Day	Day	Night	Day	Day	Night
	L _{10,18hr}	Leq, 15hr,	Leq, 9hr	L _{10,18hr}	Leq, 15hr,	Leq, 9hr
Mon, 01-06-2015			74.2			74.1
Tue, 02-06-2015	79.8	78.2	74.1	79.1	77.9	73.9
Wed, 03-06-2015	78.9	77.2	73.2	78.4	77.1	73.3
Thu, 04-06-2015	79.5	77.8	76.2	79.3	78.0	76.2
Fri, 05-06-2015	79.7	78.2	71.8	79.2	78.1	71.9
Sat, 06-06-2015	78.1	76.5	70.1	77.6	76.6	70.3
Sun, 07-06-2015	77.3	75.6	70.3	76.8	75.7	70.3
Mon, 08-06-2015	77.2	75.7	75.7	76.7	75.6	75.7
Tue, 09-06-2015	79.9	78.1	75.5	79.4	78.1	75.6
Wed, 10-06-2015	79.6	78.0	73.5	79.0	77.9	73.4
Thu, 11-06-2015	78.8	77.1	73.3	78.2	76.8	73.4
Average (free field)*	79.2	77.5	74.2	78.7	77.5	74.2

Note *: In accordance with VicRoads measurement guidelines weekend periods (when traffic is variable and can be much lower) were excluded along with periods of heavy rain or strong winds.

Detailed graphical data for the entire monitoring period is provided in **Appendix A**.

Weather conditions over the monitoring period were predominantly calm and dry with slight to moderate northerly winds and brief periods of heavy rain on the 1, 4 and 9 June 2015. Periods where the measured noise level was affected by weather were excluded from the data set in general accordance with VicRoads requirements.

A 15 minute attended noise measurement was also taken at Location A (i.e. 3.8 m AGL, approximately 0.8 m above the top of the noise barrier) before the equipment was collected between 11:30 am and 11:45 am on Friday the 12 June. The octave band spectra for the main acoustic parameters are presented in **Table 3**.

Table 3 Monash Freeway Attended Noise Measurement Results

Parameter	Octave Band Centre Frequency (Hz)				Overall Noise Level, dBA			
	63	125	250	500		1k	2k	4k
L _{max}	85	85	82	83	78	69	65	85
L ₁₀	80	78	76	79	78	68	59	81
Leq	77	75	73	76	76	66	56	79
L ₉₀	70	68	68	72	73	63	51	76

The measurement results were clearly dominated by high levels of road traffic noise from the Monash Freeway which included a large proportion of trucks and heavy vehicles. As the section of the Freeway is relatively straight with predominantly smooth flowing traffic there were no noticeable periods where trucks were required to use their engine brakes.

Noise logging results for the critical night period show that the average nightly noise levels (i.e. from 10:00 pm to 7:00 am) ranged from 70 to 76 dBA, Leq.

Peak noise levels during the night period typically occur between 5:00 am and 6:00 am (weekdays) when traffic on the Freeway is starting to build up towards morning peak hour. For this period the noise levels were generally between 77 dBA and 80 dBA, Leq. It is noted that during the weekend the measured noise levels for the equivalent period were significantly lower (typically between 70 and 72 dBA, Leq).

Noise monitoring results for the following three hours (i.e. from 6:00 am to 9:00 am weekdays) indicate that noise levels can drop quite significantly as traffic on the Freeway banks up.

6 NOISE MODELLING

To determine road traffic noise levels at the proposed development site a predictive noise model was prepared using the SoundPLAN (version 7.3) computer noise modelling package. It is noted that instead of using the Calculation of Road Traffic Noise (CoRTN) algorithm to predict noise from the Freeway, the ISO9613 algorithm has been used as it allows for the following parameters which are not fully implemented in CoRTN:

- Multiple reflections off buildings & barriers;
- Full spectral data;
- Slightly enhanced propagation conditions.

The model used the ISO 9613 algorithm to predict the level of noise from road traffic to the façades of the proposed residential towers closest to the Monash Freeway.

The model incorporates:

- Noise data based on the measured spectrum of road traffic noise (modelled as a distributed area source 1 m above ground);
- Elevation data (high resolution 0.2 m survey data for the site was available, whereas for the Freeway alignment and surrounding area 1 m elevation data from VicMAP was used);
- Shielding provided by the adjacent noise barriers, nearby existing buildings, and proposed dwellings associated with the development;
- Reflections off surrounding buildings and the 7.4 to 7.8 m high precast concrete noise barrier to the Mirvac Waverley Park development on the opposite (northern) side of the Freeway;
- Proposed Apartment Buildings and Receptor Locations positioned at the façade of habitable room windows (as based on drawings TP21 through TP30), and;
- Atmospheric and ground absorption (soft absorptive ground was input for grassy areas such as the existing site and embankments adjacent the Freeway; whereas for road surfaces and built up / paved land such as the adjacent residential area and proposed development site ground was conservatively modelled as hard);

Figure 8 on the following page shows a 3D view of the noise model for the proposed apartment buildings adjacent the Monash Freeway.

To calibrate the noise model the existing situation (i.e. no development) was run with the road traffic sound power level adjusted to meet the noise levels presented in **Table 4** at the reference measurement locations.

Table 4 Measured Noise Levels used for Calibration of Noise Model / Design Calculations

Condition	Location A	Location B
Bedrooms (average noise level from 10:00 pm to 7:00 am), Leq, 9h	74 dBA	74 dBA
Living Rooms / Habitable Rooms (daytime average from 7:00 am to 10:00 pm), Leq, 15h	78 dBA	78 dBA

Figure 9 shows the noise contours at 6.5 m, AGL across the existing site calibrated to the measured day time noise level of 78 dBA, Leq, 15h. The full noise contour plot showing noise across the site calibrated to the maximum measured night time noise level is shown in **Appendix B**.

Figure 8 3D Isometric Drawing of Noise Model showing Proposed Apartment Building

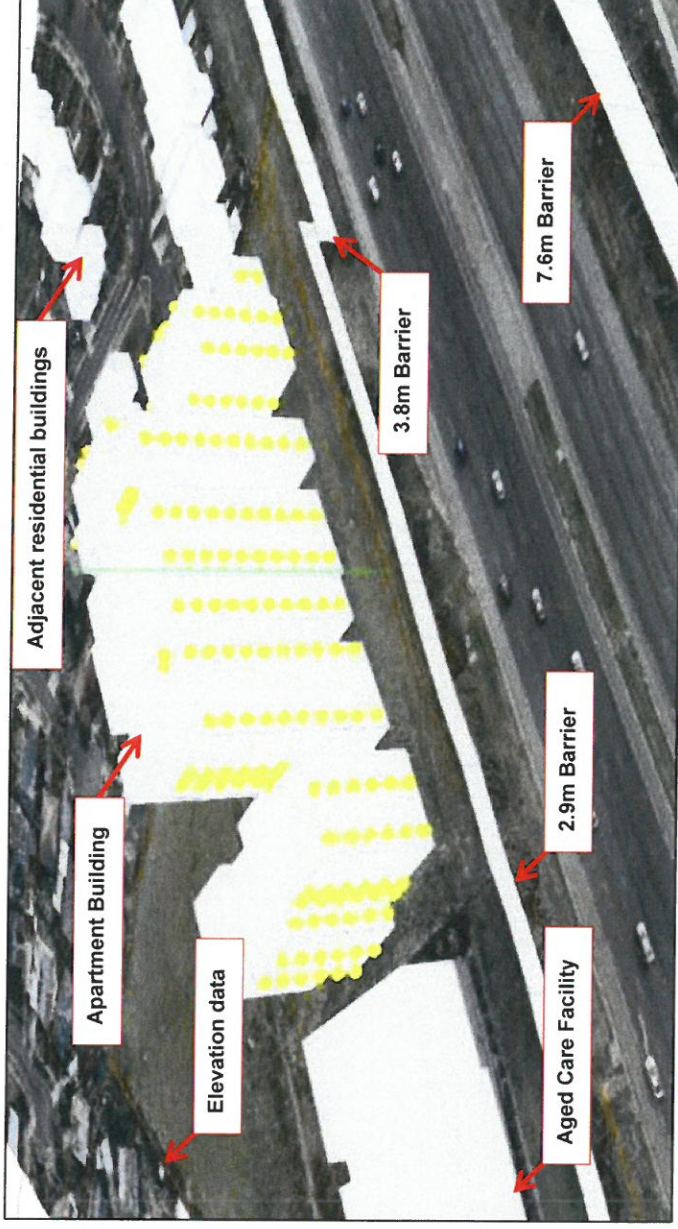
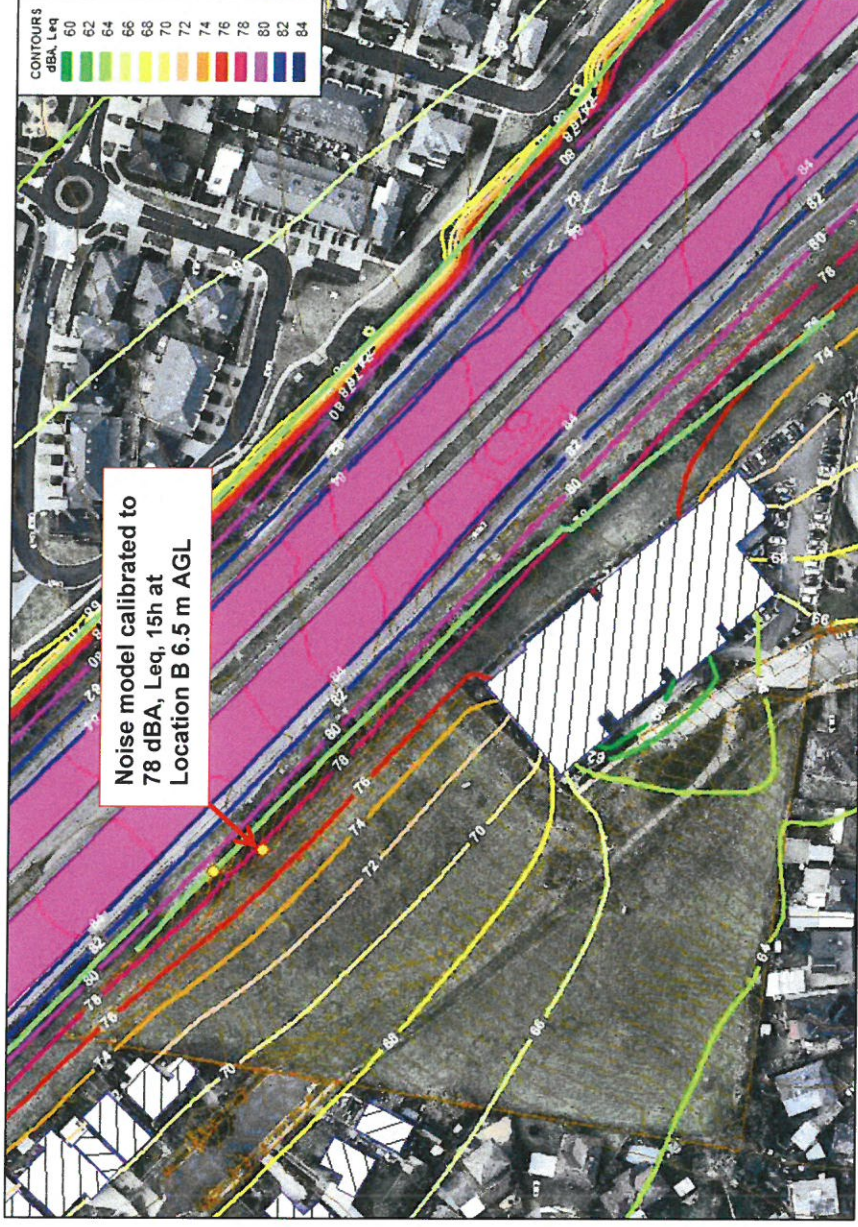


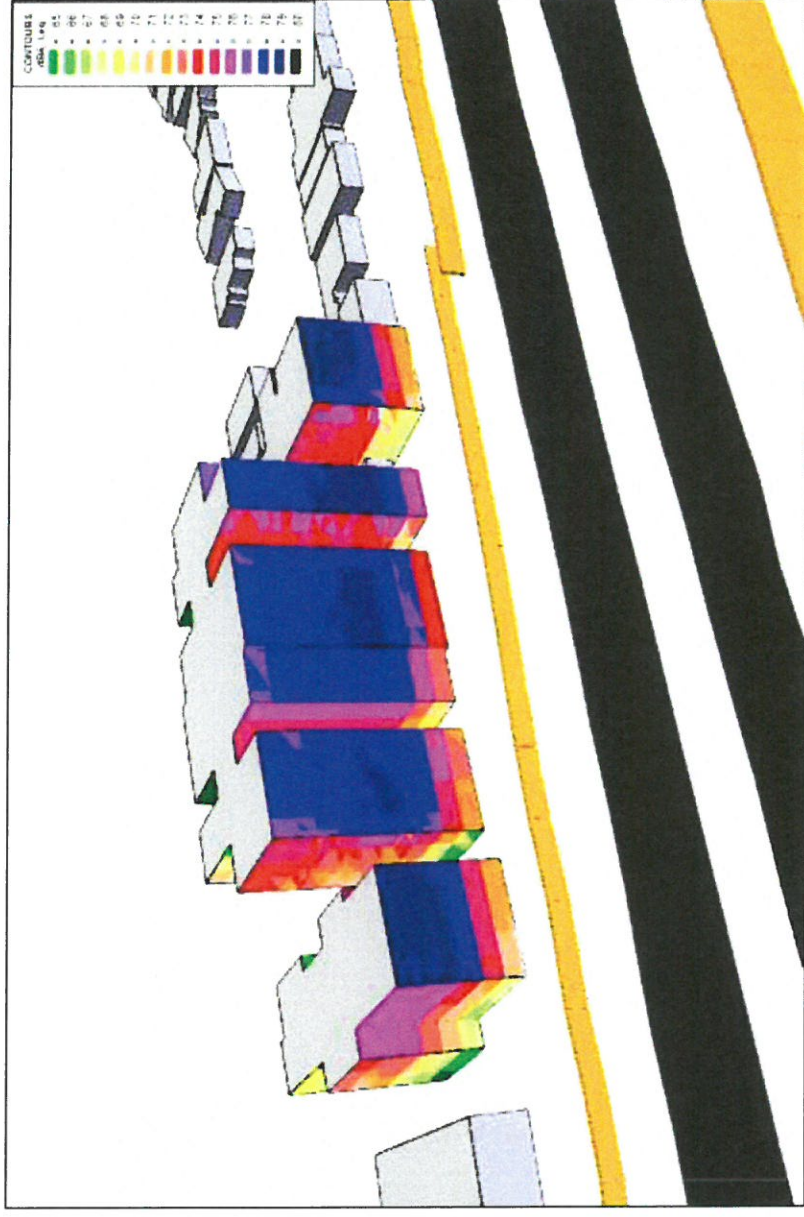
Figure 9 Noise Contour Plot (6.5 m, AGL) of Existing Site Calibrated to Daytime Measured Noise Levels



The proposed apartment towers were input to the calibrated noise model to determine the distribution of noise across the various façade elements. **Figure 10** shows the façade reflected noise levels to the apartments facing the Monash Freeway for the day period (refer to **Appendix C**).

In accordance with the measurement results presented in **Table 4**, the night time average noise levels are respectively 4 dBA lower.

Figure 10 Day-time Noise Level (dBA, Leq, 15h, façade reflected) at Proposed Apartments



From the noise levels presented in **Figure 10** it can be seen that the most exposed façades to the three apartment towers are those typically located on levels 2 through 10 overlooking the Freeway. For these apartments the external noise levels during the day period range from 77 to 79 dBA, Leq (reflected) with average night time noise levels 4 dBA quieter (i.e. 73 to 75 dBA, Leq (reflected)).

The noise levels to apartments on the sides of the towers were typically 3 to 6 dBA quieter due to the partial shielding provided by the edge of the building.

7 ROAD TRAFFIC NOISE THROUGH GLAZING

In most buildings the main acoustical weakness is the glazing. Standard masonry construction typically provides well above 46 dBA noise reduction compared to typical glass which provides a noise reduction in the range of 25 to 30 dBA. As such, it is the glazing that requires specific attention in regard to noise intrusion.

Internal road traffic noise levels have been calculated to the proposed apartments taking into consideration the following factors:

- The predicted external noise level from the 3D computer noise model.
- The sound spectrum of the external noise source.
- Area and orientation of the glass.
- The sound insulation performance rating of the proposed glass across the entire sound spectrum.
- The size and amount of absorption within the room.

8 RECOMMENDATIONS

Recommendations for façade upgrades to control traffic noise are provided in the marked up drawings labelled **A1** through **A8** (attached).

Facades that are not subject to, or likely to be subject to appreciable noise do not have glazing types specified. However we suggest that, as a minimum, 6.38 mm thick laminated glass is used throughout.

Full descriptions of upgrades are provided in **Table 5**. The full description includes recommendations for façade and ventilation treatments to ensure that the performance of the glazing is not compromised by these elements.

The advice provided in this report is for achieving the standards identified in **Section 3.2**. Where a higher level of acoustic amenity is required by the developer, the glazing should be upgraded from that proposed in this report. Glazing can also be upgraded to minimise the number of glazing types used on the project, noting that Type A is the highest acoustic rating and Type D the lowest.

For reference, noise levels were also predicted to the townhouses located to the rear of the apartments along the south and west boundaries of the site. Whilst the townhouses are two storeys in height, they are particularly well shielded by the apartment buildings to the northeast. Consequently, the predicted maximum noise levels during the night period were found to typically range from 60 to 64 dBA, Leq at the most exposed façades on the first floor. To suitably attenuate road traffic noise to these dwellings it is recommended that minor upgrades to the glazing be considered for the bedrooms and living areas in accordance with Type D (refer to **Table 5**).

Table 5 Glazing and Façade Definitions

Type	Short Description	Full Description	Glazing rating	
			Rw	Rw+Ctr
A	10.38 lam/50/6 IGU	<ul style="list-style-type: none"> Acoustic double glazing consisting of: <ul style="list-style-type: none"> 10.38 mm laminated glass; minimum 50 mm airgap; and 6 mm glass. <p>It is noted that the only supplier available to provide this system as a fully sealed Insulated Glazed Unit (IGU) is G. James. Where an alternative system is used, the acoustic double glazed system is to comprise:</p> <ul style="list-style-type: none"> 10.38 mm laminated glass; minimum 75 mm airgap, and; 6 mm glass. <p>This may need to be in the format of a jockey sash or secondary slider system.</p> <ul style="list-style-type: none"> No sliding windows or doors (except for secondary window). Acoustic seals to all doors and openable windows. Frames not to degrade performance of windows. For lightweight facade walls: <ul style="list-style-type: none"> Minimum 9 mm compressed cement sheet externally 100 mm thick, minimum 14 kg/m³ fibrous insulation to wall cavity Steel studs or timber studs with furring channels 2 x 13 mm fire rated plasterboard internally OR alternative construction with an Rw rating of not less than 52 dB. 	40	38
B	10.38 lam/12/6	<ul style="list-style-type: none"> Double thermal glazing consisting of 10.38 mm laminated glass, 12 mm airgap, and 6 mm glass. No sliding doors or windows to bedrooms. Sliding doors to living rooms acceptable provided two sets of seals are installed to each side of the sliding door frame. Vertical seals to include one set of Q-Lon compressible seals and one set of fin and fur seals. Combined fin and fur seals acceptable for horizontal sides of frame. Eg. G. James Series 445. Hinged windows to be fitted with two sets of compressible seals Frames not to degrade performance of doors or windows. For lightweight facade walls: <ul style="list-style-type: none"> Minimum 7 mm compressed cement sheet externally or 9 mm cement sheet 100 mm thick, minimum 14 kg/m³ fibrous insulation to wall cavity Steel studs or timber studs with furring channels 2 x 13 mm fire rated plasterboard internally OR alternative construction with an Rw rating of not less than 49 dB. 	39	34

Type	Short Description	Full Description	Glazing rating	
			Rw	Rw+Ctr
C	10.38 lam	<ul style="list-style-type: none"> 10.38 mm thick laminated glass OR thermal double glazed unit comprising 6.38 mm laminated glass, 12 mm air cavity and 6 mm float glass. No sliding doors or windows to bedrooms Sliding doors acceptable to living rooms As a minimum, two sets of seals to be installed to each side of sliding door frame. Vertical seals to include one set of Q-Lon compressible seals and one set of fin and fur seals. Combined fin and fur seals acceptable for horizontal sides of frame. Eg. G. James Series 445. Hinged windows to be fitted with two sets of compressible seals Frames not to degrade performance of windows or doors. <p>AND</p> <ul style="list-style-type: none"> For lightweight facade walls: <ul style="list-style-type: none"> Minimum 7 mm cement sheet externally 100 mm thick, minimum 14 kg/m³ fibrous insulation to wall cavity Steel studs or timber studs with furring channels 1 x 13 mm fire rated plasterboard internally (or 2 x 10 mm standard core plasterboard) <p>OR alternative construction with an Rw rating of not less than 45 dB.</p>	34	32
	OR 6.38 lam/12/6.38 lam		<ul style="list-style-type: none"> 32 (sliding doors only) 29 (sliding doors only) 	
D	6.38 lam OR 6/12/6	<ul style="list-style-type: none"> 6.38 mm thick laminated glass OR thermal double glazed unit comprising 6 mm laminated glass, 12 mm air cavity and 6 mm float glass. Acoustic seals to all doors and openable windows. No sliding doors or windows to bedrooms. Sliding doors acceptable to living rooms. As a minimum, combined fin and brush seals to be installed on all sliding doors. Frames not to degrade performance of windows or doors. For lightweight facade walls: <ul style="list-style-type: none"> Minimum 7 mm cement sheet externally 100 mm thick, minimum 14 kg/m³ fibrous insulation to wall cavity Steel studs or timber studs with furring channels 1 x 13 mm fire rated plasterboard internally (or 2 x 10 mm standard core plasterboard) <p>OR alternative construction with an Rw rating of not less than 45 dB.</p>	32	30
			<ul style="list-style-type: none"> 30 (sliding doors only) 28 (sliding doors only) 	

GLAZING NOTES:

Window frames are not to degrade the performance of windows. Frames of Glazing Types **A** to **C** are to be not less than 2.5 mm thick aluminium unless tests conducted in a NATA certified laboratory are provided demonstrating that the recommended acoustic ratings can be achieved with alternative products.

Sliding doors for apartments should be designed such that there is no degradation in the sound isolation (Both R_w and $R_w + C_{tr}$) due to perimeter sealing. To comply, the doors should either:

- Have been tested in a NATA certified acoustical laboratory, and the results of the tests provided to Pong Construction prior to ordering of materials for manufacture, or
- Have been designed, or the design checked, by an acoustical consultant being employed by an Acoustical Consultant Company who is a Member or eligible for Membership of the AAAC.

If alternative glazing is offered, it will need to be demonstrated that the sound isolation at all 1/3 octave frequency bands is not less than for the nominated glazing.

The above recommendations are the minimum requirement for acoustics, and all glazing is also to conform to the relevant Codes.

VENTILATION TREATMENTS:

Ventilation openings to the north, east and south facades of apartments must include acoustically lined ducts so as not to compromise the integrity of the glazing design. Typically, this would comprise:

- 600 to 900 mm long internally lined acoustic duct for make-up air intakes.
- 600 to 900 mm long internally lined acoustic duct for kitchen and toilet exhausts (or use of acoustic flexible duct).

The above ventilation treatments will need to be reviewed in detail during the detailed design of the building, once the mechanical ventilation layouts are available.

9 SUMMARY

An acoustic planning report addressing road traffic noise impacts to the site has been prepared for the proposed development at 149 Hansworth Street, Mulgrave.

Noise monitoring has been undertaken to identify existing road traffic noise associated with the adjacent Monash Freeway and calibrate a 3D computer noise model which allows the accurate prediction of noise to the development site.

The predicted noise levels were then used to determine appropriate glazing and façade construction details required to limit road traffic noise ingress to habitable rooms within the development, and satisfy the design noise levels provided in AS / NZS 2107.

The results indicate significant glazing and façade upgrades will be required to apartments overlooking the Freeway; whereas for the two storey townhouses located along the south and west boundaries of the site, minimal glazing upgrades are required.

Noise Monitoring Results 149 Hansworth St, Mulgrave



Results of Noise Monitoring

Client: Pong Constructions Pty Ltd
 Job Number: 640.11107
 Location: 149 Hansworth Street, Mulgrave
 Microphone position: Acoustic Wall, 3.8m high
 Initial calibration: 94 dBA Final calibration: 94 dBA

Hour	Mon, 01-06-2015	Tue, 02-06-2015	Wed, 03-06-2015	Thu, 04-06-2015	Fri, 05-06-2015	Sat, 06-06-2015	Sun, 07-06-2015
00:00 to 01:00	L10 76.4	L10 77.6	L10 75.0	L10 71.3	L10 78.6	L10 75.4	L10 74.6
01:00 to 02:00	L90 79.6	L90 74.4	L90 80.4	L90 77.1	L90 82.3*	L90 78.6	L90 78.2
02:00 to 03:00	L10 80.1	L10 77.9	L10 76.4	L10 81.9	L10 78.8	L10 78.1	L10 77.7
03:00 to 04:00	L90 80.1	L90 77.9	L90 76.4	L90 81.9	L90 78.8	L90 78.1	L90 77.7
04:00 to 05:00	L10 81.8	L10 76.6	L10 80.1	L10 77.8	L10 80.7*	L10 78.7	L10 78.5
05:00 to 06:00	L90 81.4	L90 76.3	L90 79.3	L90 77.6	L90 82.3*	L90 78.3	L90 78.5
06:00 to 07:00	L10 81.8	L10 76.6	L10 80.1	L10 77.8	L10 80.7*	L10 78.7	L10 78.5
07:00 to 08:00	L90 80.8	L90 75.6	L90 78.7	L90 74.0	L90 82.4*	L90 78.6	L90 78.4
08:00 to 09:00	L10 80.1	L10 77.9	L10 76.4	L10 81.9	L10 78.8	L10 78.1	L10 77.7
09:00 to 10:00	L90 80.1	L90 77.9	L90 76.4	L90 81.9	L90 78.8	L90 78.1	L90 77.7
10:00 to 11:00	L10 79.5	L10 72.1	L10 80.9	L10 76.3	L10 79.0	L10 77.3	L10 77.0
11:00 to 12:00	L90 81.9	L90 76.6	L90 79.8	L90 81.1	L90 78.9	L90 77.6	L90 78.6
12:00 to 13:00	L10 82.3	L10 77.1	L10 80.2	L10 78.4	L10 80.4	L10 79.4	L10 78.4
13:00 to 14:00	L90 82.1	L90 76.7	L90 80.0	L90 74.6	L90 77.9	L90 74.1	L90 77.0
14:00 to 15:00	L10 81.8	L10 76.6	L10 80.1	L10 77.8	L10 80.7*	L10 78.7	L10 78.5
15:00 to 16:00	L90 81.4	L90 76.3	L90 79.3	L90 77.6	L90 82.3*	L90 78.3	L90 78.5
16:00 to 17:00	L10 80.8	L10 75.6	L10 78.7	L10 74.0	L10 82.4*	L10 78.6	L10 78.4
17:00 to 18:00	L90 79.6	L90 74.4	L90 80.4	L90 75.7	L90 78.5	L90 74.1	L90 78.2
18:00 to 19:00	L10 80.1	L10 77.9	L10 76.4	L10 81.9	L10 78.8	L10 78.1	L10 77.7
19:00 to 20:00	L90 79.5	L90 76.8	L90 78.7	L90 75.9	L90 79.5	L90 77.3	L90 77.0
20:00 to 21:00	L10 78.8	L10 75.7	L10 78.2	L10 74.4	L10 78.7	L10 76.4	L10 76.4
21:00 to 22:00	L90 78.3	L90 67.8	L90 76.9	L90 80.9	L90 77.2	L90 66.9	L90 67.6
22:00 to 23:00	L10 77.7	L10 74.1	L10 73.6	L10 73.0	L10 77.0	L10 67.0	L10 75.5
23:00 to 24:00	L90 76.4	L90 61.7	L90 72.5	L90 61.3	L90 78.6	L90 65.0	L90 63.2

Wind @1500h, km/h	22 km/h SW	4 km/h SW	4 km/h WSW	13 km/h WNW	7 km/h NNW	13 km/h NE	20 km/h N
L10 (15h), ar. av. 6-24h	79.8	78.9	79.5	79.7	78.1	77.3	77.3
L90 (15h), log av. 7-22h	78.2	77.2	77.8	78.2	76.5	76.5	75.6
L90 (9h), log av. 22-7h	74.1	73.2	76.2	71.8	70.1	70.3	70.3
L90 (24h), log av. 0-24h	77.1	76.3	76.5	77.5	75.2	74.2	74.2
L90 Day	74.6	73.9	72.1	75.3	73.7	72.1	72.1
L90 Evening	69.8	69.4	75.5	71.0	69.3	69.4	69.4
L90 Night	60.8	60.4	65.6	60.6	59.0	60.6	60.6
Wind @0900h, km/h	2 km/h ENE	2 km/h NNW	7 km/h N	11 km/h NNE	9 km/h N	7 km/h N	19 km/h NNE
Wind @1500h, km/h	4 km/h SW	4 km/h WSW	13 km/h WNW	7 km/h NNW	13 km/h NE	20 km/h N	

Note *: Weather data sourced from the closest Bureau of Meteorology Weather station at Scoresby. Periods of strong rains of heavy winds was excluded.



Results of Noise Monitoring

Client: Pong Constructions Pty Ltd
 Job Number: 640.11107 Location: 149 Hansworth Street, Mulgrave
 Microphone position: Acoustic Wall, 3.8m high
 Initial calibration: 94 dBA Final calibration: 94 dBA

Hour	Sound Pressure Level, dB(A)														
	Mon, 08-06-2015			Tue, 09-06-2015			Wed, 10-06-2015			Thu, 11-06-2015			Fri, 12-06-2015		
	L ₁₀	L ₉₀	L _{eq}	L ₁₀	L ₉₀	L _{eq}	L ₁₀	L ₉₀	L _{eq}	L ₁₀	L ₉₀	L _{eq}	L ₁₀	L ₉₀	L _{eq}
00:00 to 01:00	73.4	61.4	70.0	72.7	55.5	68.5	68.5	76.2	59.9	72.0	74.2	55.4	70.0	74.3	57.2
01:00 to 02:00	72.1	57.8	68.1	72.6	54.0	68.4	70.9	75.9	57.5	71.5	73.4	50.5	69.1	73.2	54.2
02:00 to 03:00	71.2	56.1	67.2	75.4	54.2	67.2	70.9	75.3	55.9	71.0	72.7	51.4	68.3	73.2	51.3
03:00 to 04:00	72.2	56.0	67.9	77.3	57.6	73.0	77.3	73.0	58.0	73.0	74.9	54.5	70.6	74.7	53.3
04:00 to 05:00	73.5	59.4	69.6	80.1	67.4	76.6	80.2	65.9	76.4	77.4	61.4	73.6	73.6	77.4	60.4
05:00 to 06:00	74.4	60.5	70.7	82.3	75.3	79.9	82.7	75.7	80.4	80.5	72.7	77.9	80.3	72.0	77.6
06:00 to 07:00	75.5	64.5	72.2	82.3	79.0	80.8	80.2	71.6	77.6	79.1	70.4	76.3	78.6	71.4	76.4
07:00 to 08:00	76.0	66.0	73.1	80.9	72.6	78.0	80.7	71.5	77.6	76.6	67.2	73.8	76.7	67.2	73.7
08:00 to 09:00	76.5	67.6	73.7	79.1	72.3	76.8	78.9	71.0	76.5	76.9	67.7	74.0	79.1	69.8	76.1
09:00 to 10:00	77.5	70.6	75.1	82.5	78.4	80.8	82.2	77.1	80.2	80.3	75.5	78.3	80.2	75.5	78.2
10:00 to 11:00	78.3	72.6	76.2	82.2	77.6	80.3	82.1	77.3	80.2	80.7	75.6	78.7	80.4	75.2	78.3
11:00 to 12:00	78.7	73.8	76.7	81.7	76.4	79.6	81.6	76.4	79.5	80.9	75.4	78.6	80.5	75.3	78.3
12:00 to 13:00	78.7	74.0	76.9	81.1	75.5	78.9	81.2	75.4	78.9	80.7	74.8	78.3	80.6	74.9	78.4
13:00 to 14:00	78.8	74.2	77.0	80.4	74.6	78.1	80.6	74.6	78.3	80.5	74.7	78.3	80.5	74.7	78.3
14:00 to 15:00	78.7	74.0	76.9	80.6	74.9	78.3	80.7	75.1	78.5	80.4	74.5	78.1	80.4	74.5	78.1
15:00 to 16:00	78.5	73.8	76.7	80.1	74.8	77.9	80.2	74.7	78.0	79.8	74.8	77.8	79.8	74.2	77.6
16:00 to 17:00	78.2	73.6	76.4	79.4	74.3	77.4	79.8	74.8	77.8	79.3	74.4	77.3	77.3	74.4	77.3
17:00 to 18:00	78.2	73.5	76.3	79.8	75.6	78.1	79.5	74.9	77.7	79.0	74.4	77.1	77.1	74.4	77.1
18:00 to 19:00	77.7	71.7	75.5	79.5	73.3	77.2	79.2	73.0	76.9	78.6	72.6	76.4	76.4	72.6	76.4
19:00 to 20:00	77.2	69.5	74.6	78.3	70.0	75.5	78.4	69.9	75.6	78.1	72.6	75.5	69.9	75.5	75.5
20:00 to 21:00	76.6	67.8	73.8	77.7	68.3	74.7	77.6	68.1	74.7	77.6	74.6	68.0	69.9	74.6	74.6
21:00 to 22:00	76.0	65.9	72.9	78.0	68.0	74.8	77.2	66.6	74.0	77.3	74.3	67.5	74.3	74.3	74.3
22:00 to 23:00	75.0	63.3	71.5	77.7	65.7	74.2	76.8	64.4	73.3	76.4	72.9	65.1	72.9	76.4	72.9
23:00 to 24:00	74.0	59.8	69.9	76.7	62.8	72.9	75.5	60.7	71.7	75.5	61.3	71.7	75.5	71.7	71.7
L ₁₀ ^(18h) ar av	77.2		79.9			79.6			78.8						
L _{eq} ^(15h) , log av	75.7		78.1			78.0			77.1						
L _{eq} ^(9h) , log av	75.7		75.5			73.5			73.3						
L _{eq} ^(24h) , log av	74.3		77.4			77.2			76.0						73.0
L90 Day	72.2		75.2			74.8			73.5						
L90 Evening	68.7		69.9			69.4			69.5						
L90 Night	62.9		63.7			60.2			60.7						
Wind @ 0900h, km/h															
Wind @ 1500h, km/h															



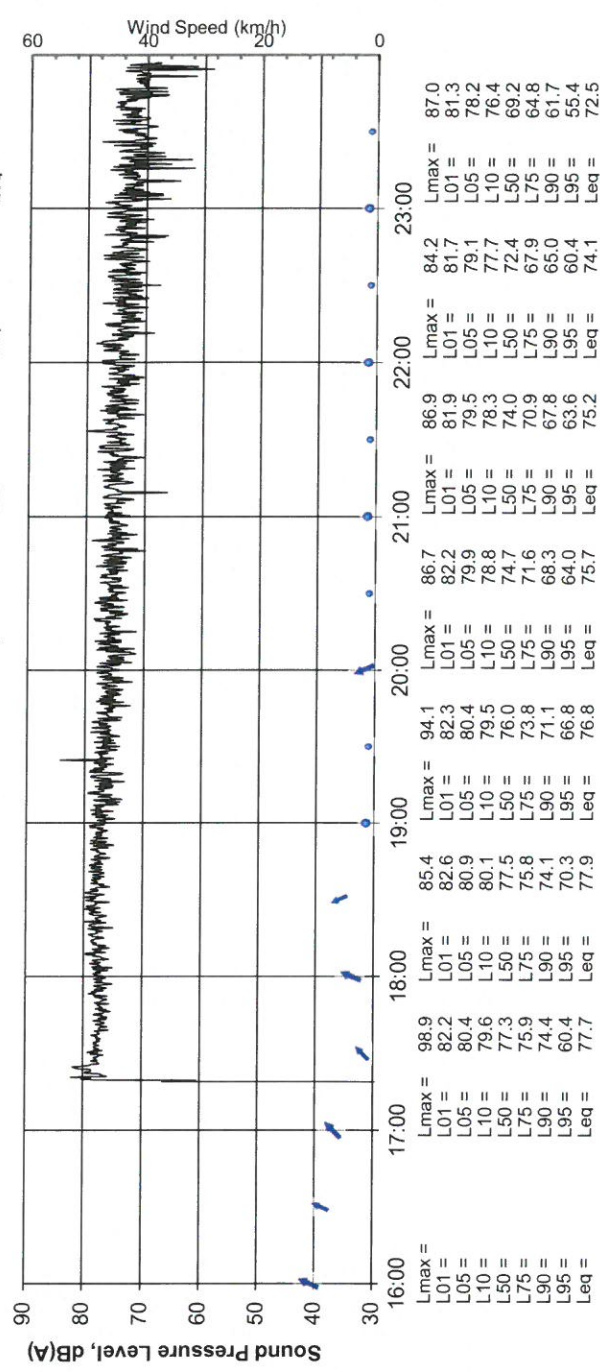
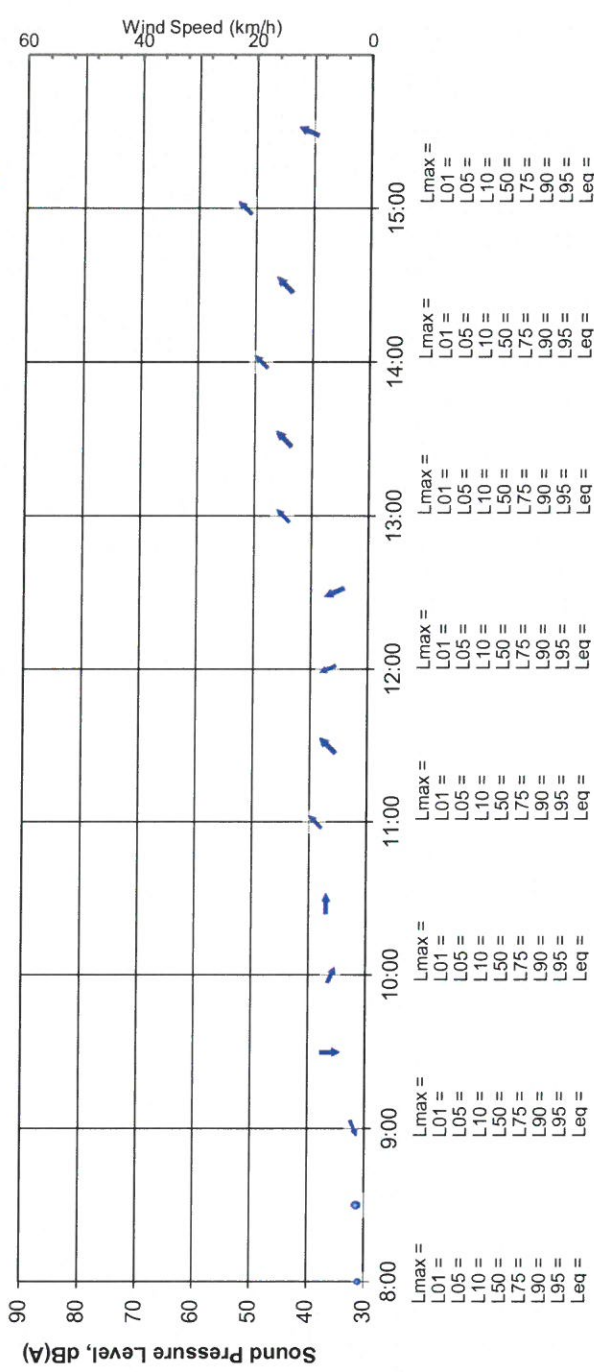
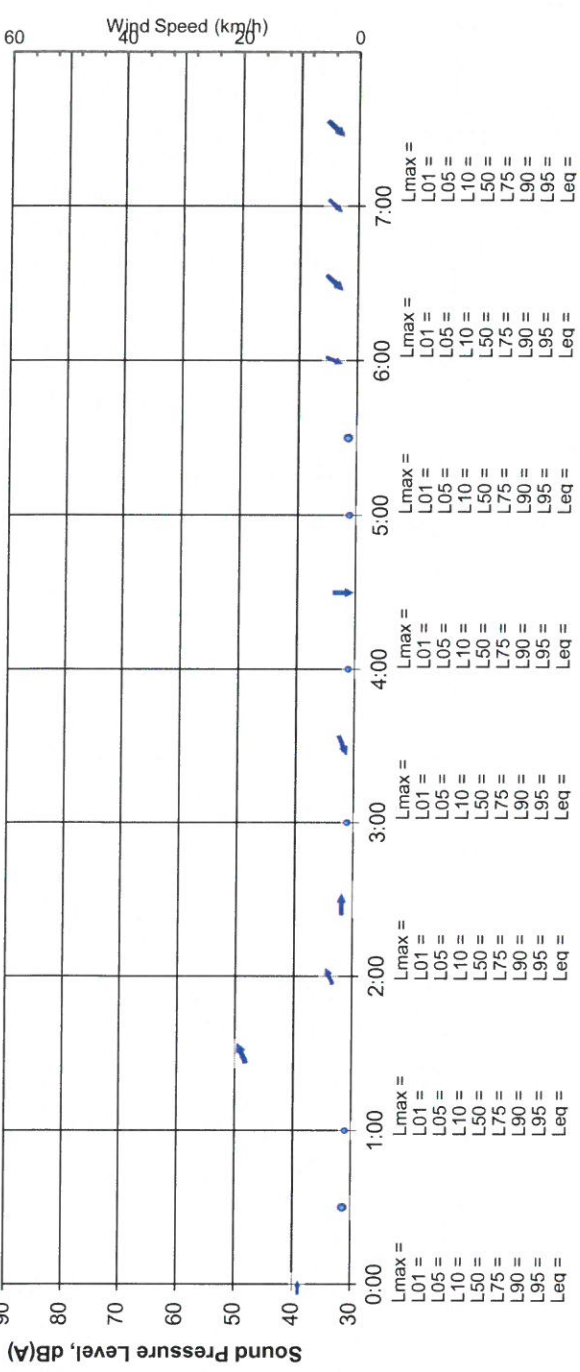
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Monday
01 Jun 2015

Microphone position: Acoustic Wall, 3.8m high





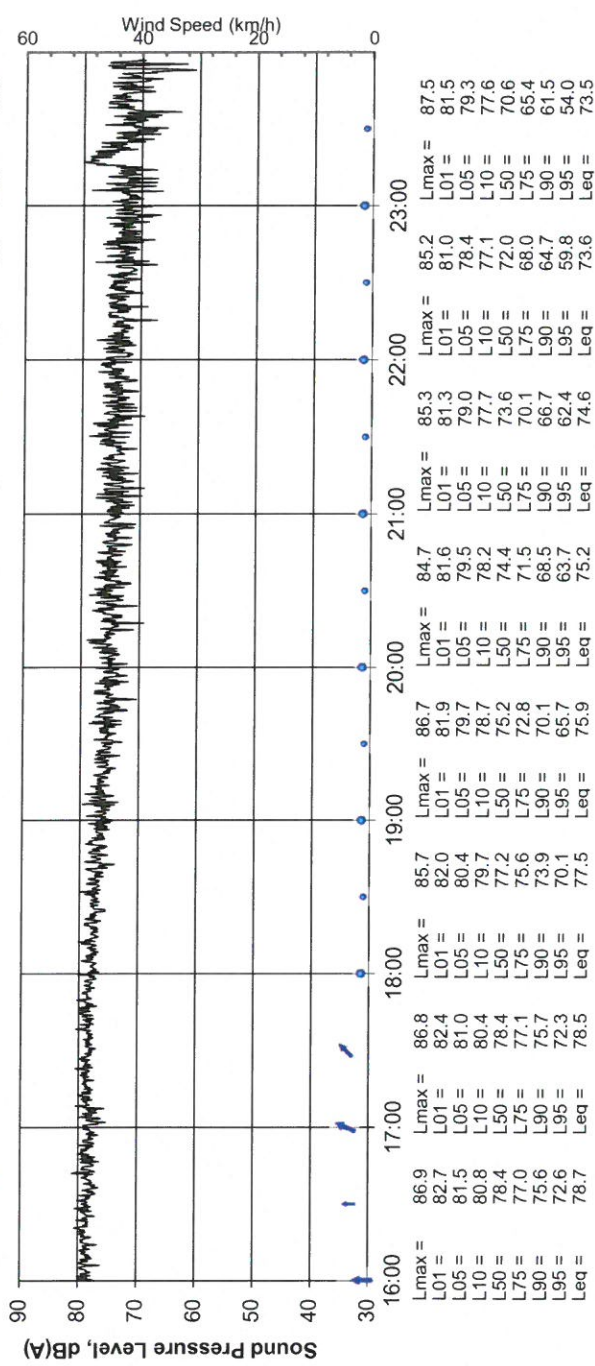
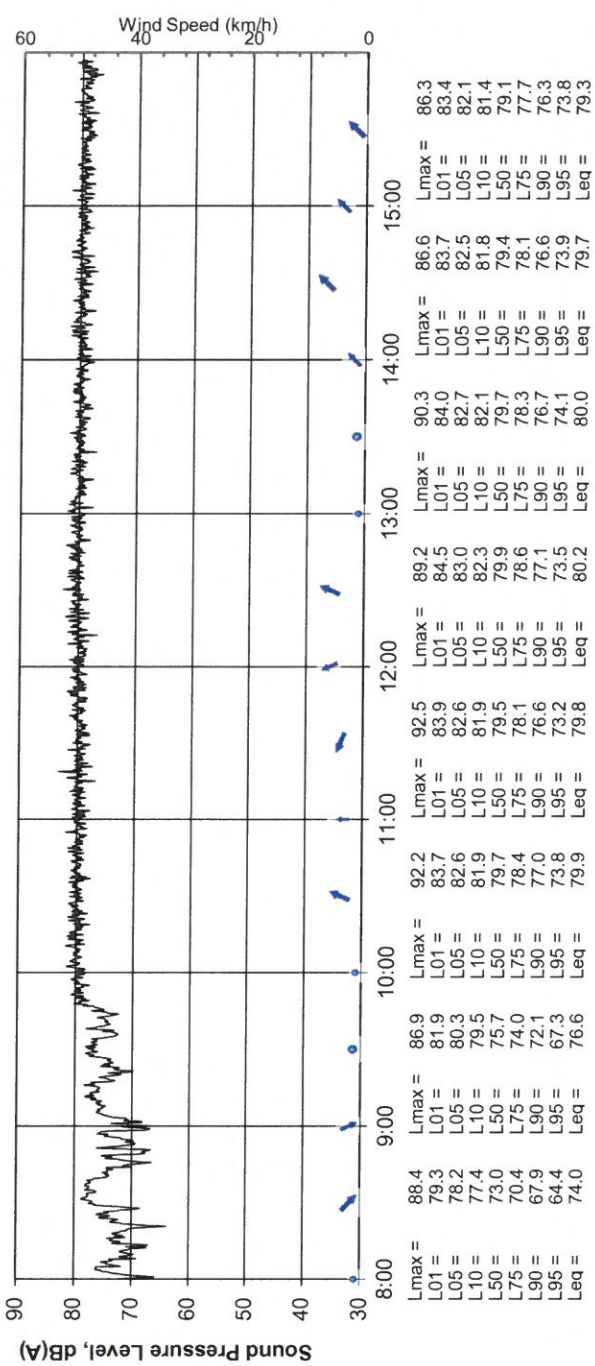
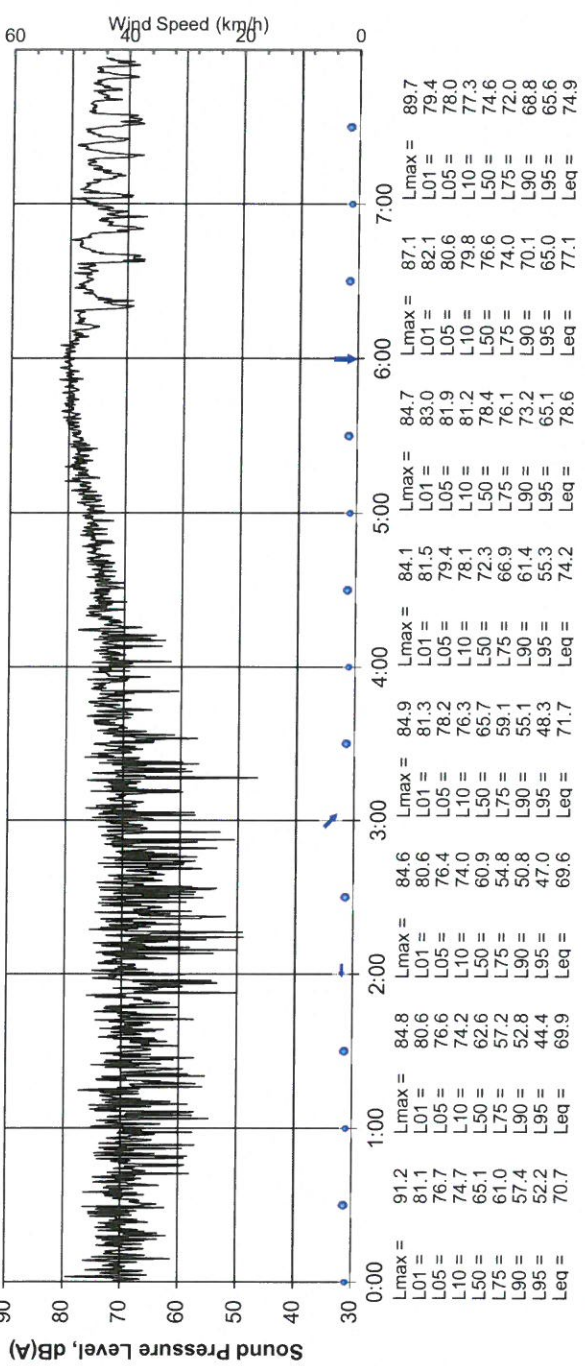
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Date: Tuesday
02 Jun 2015

Location: 149 Hansworth Street, Mulgrave

Microphone position: Acoustic Wall, 3.8m high





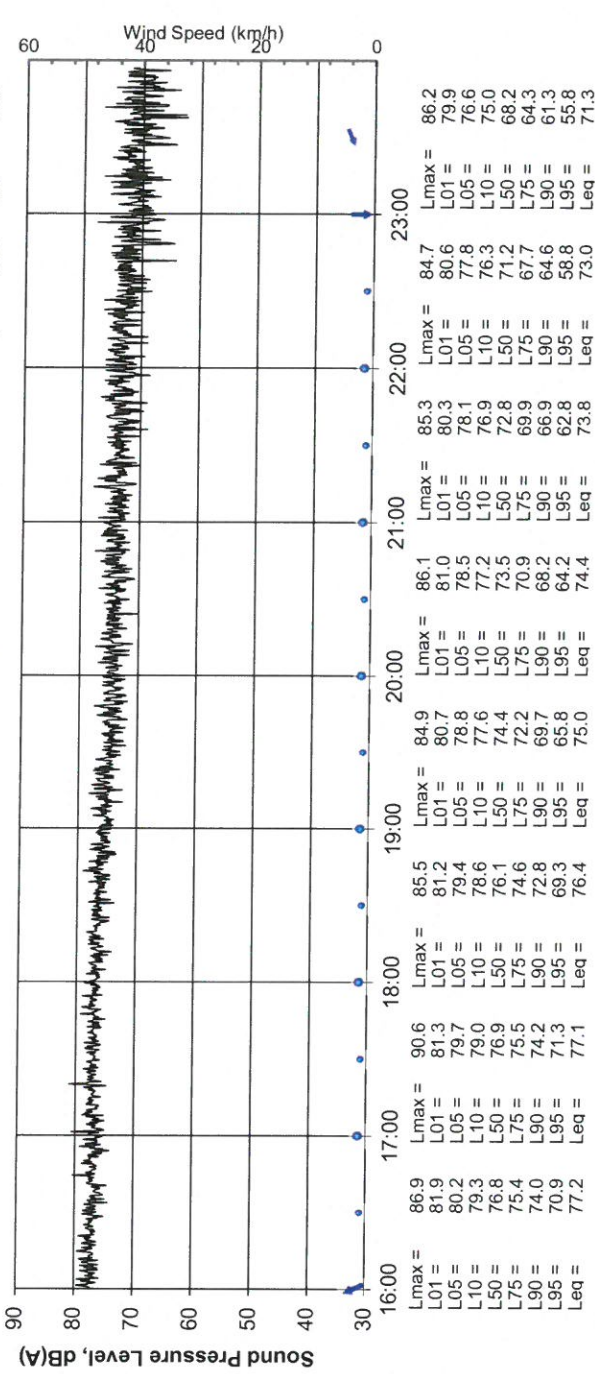
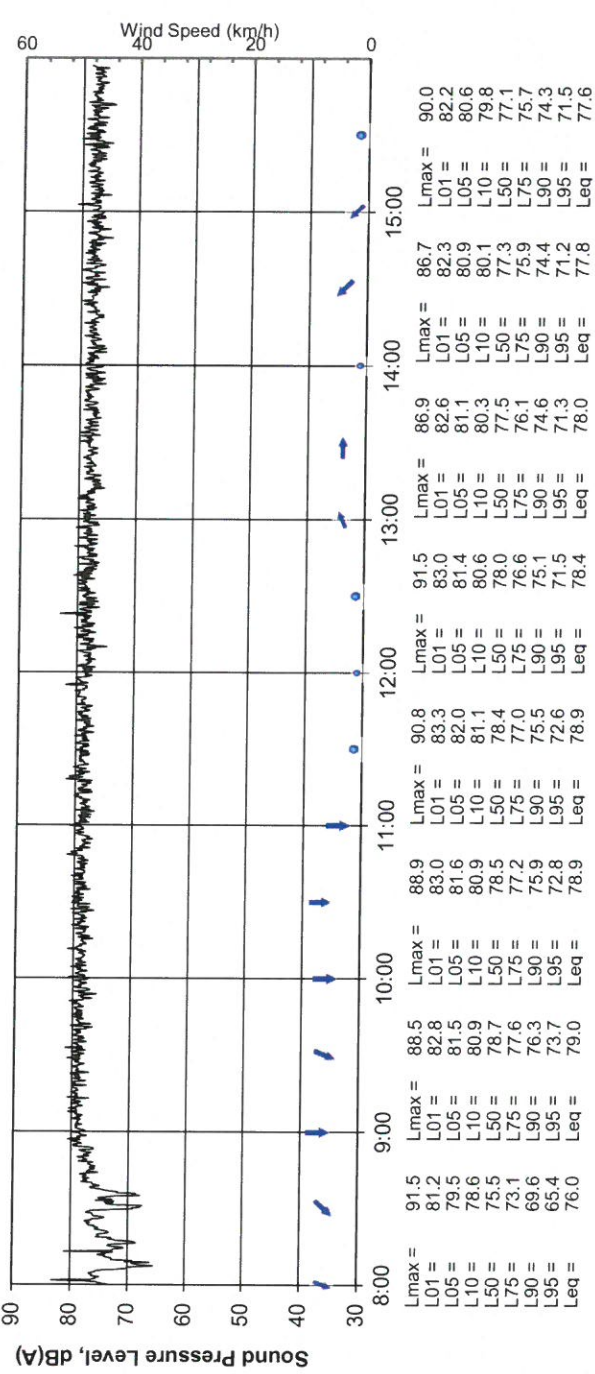
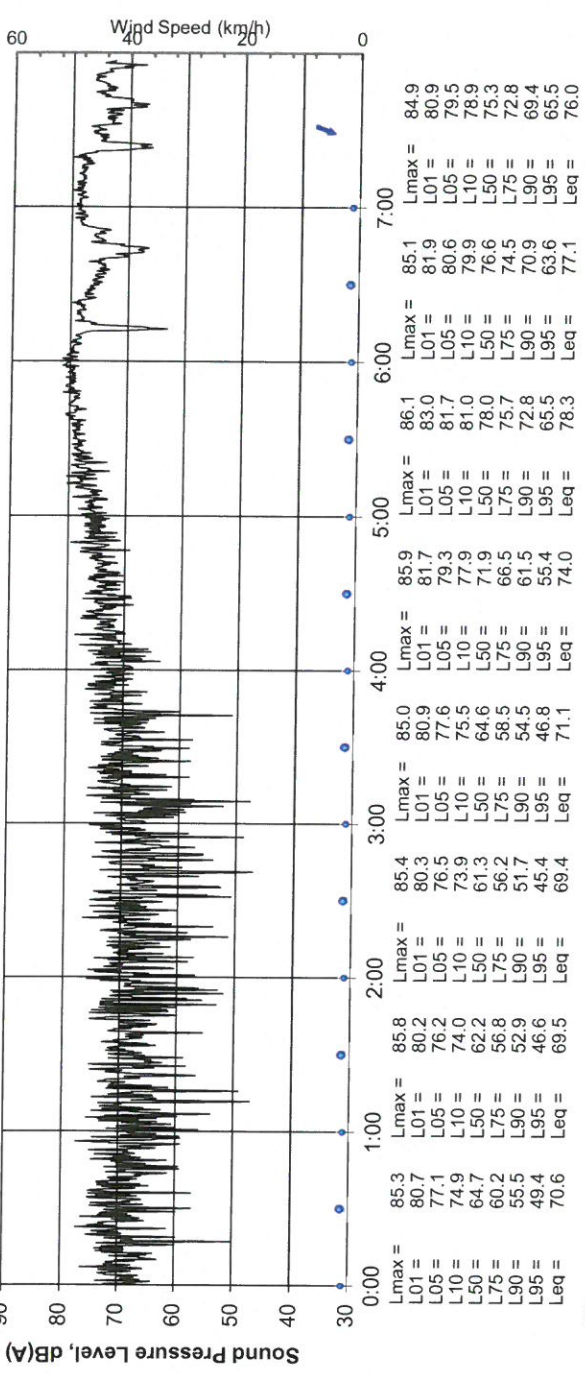
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Wednesday
03 Jun 2015

Microphone position: Acoustic Wall, 3.8m high





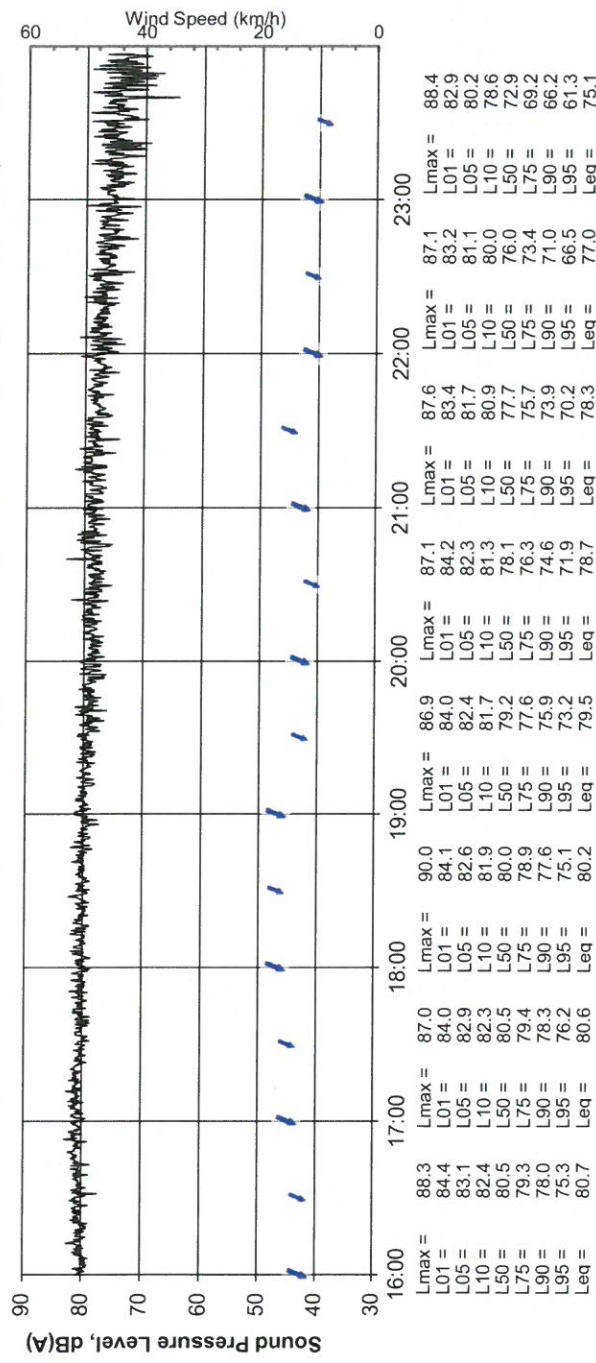
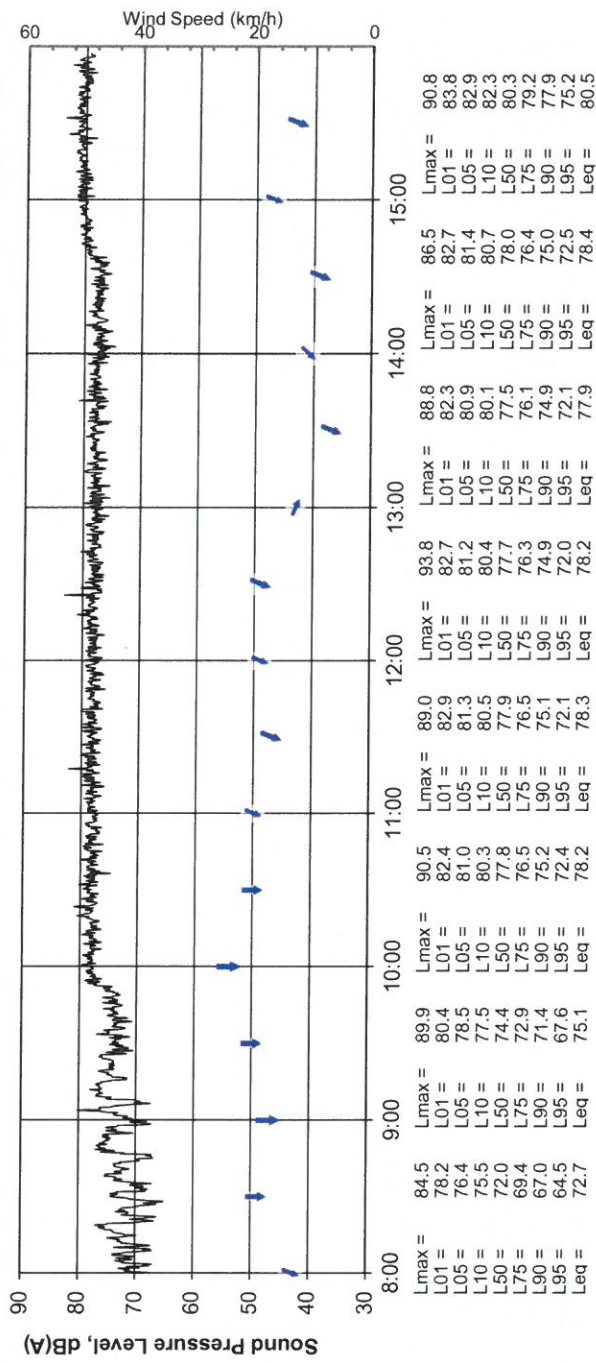
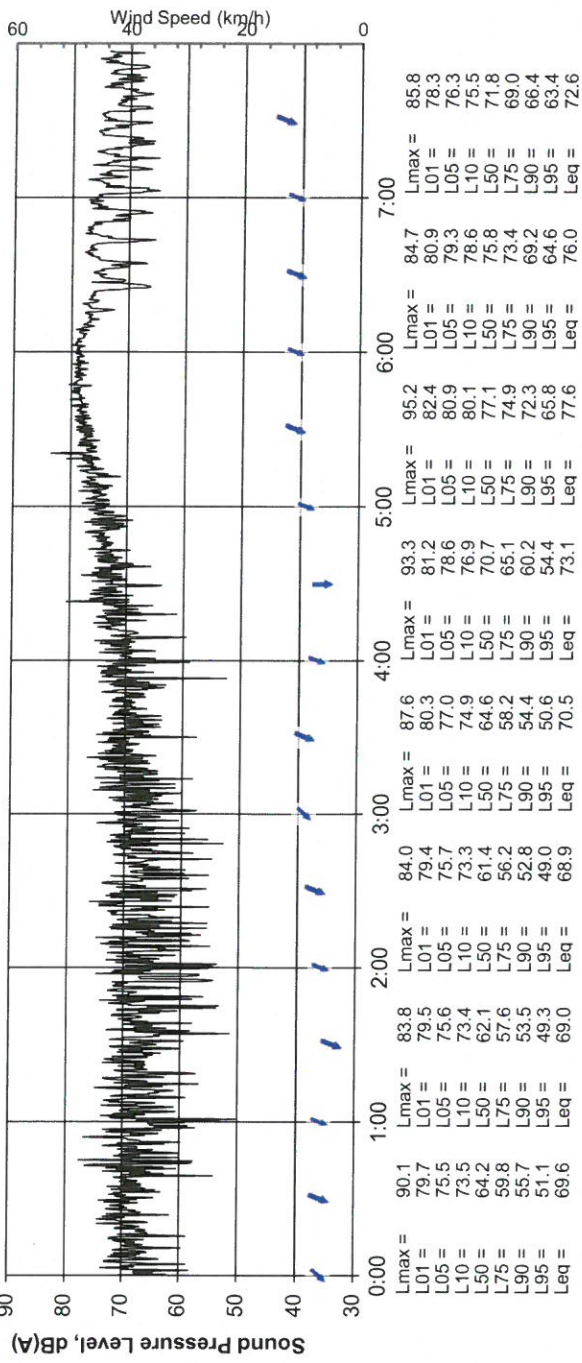
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Thursday
04 Jun 2015

Microphone position: Acoustic Wall, 3.8m high





Results of Noise Monitoring

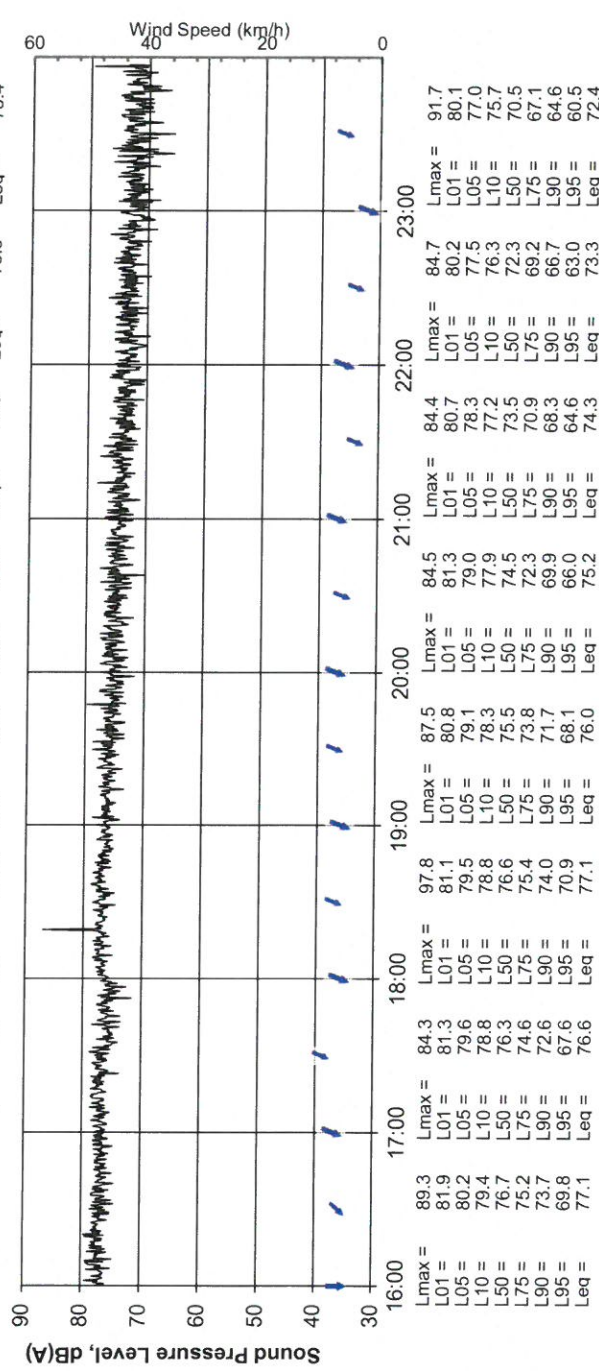
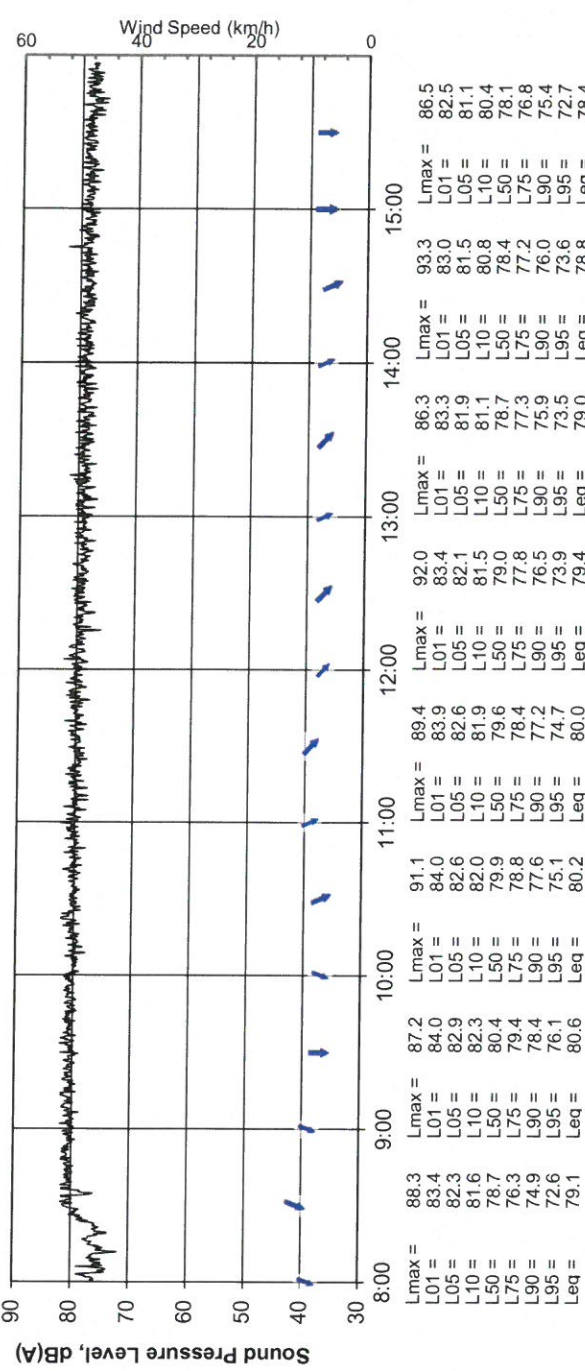
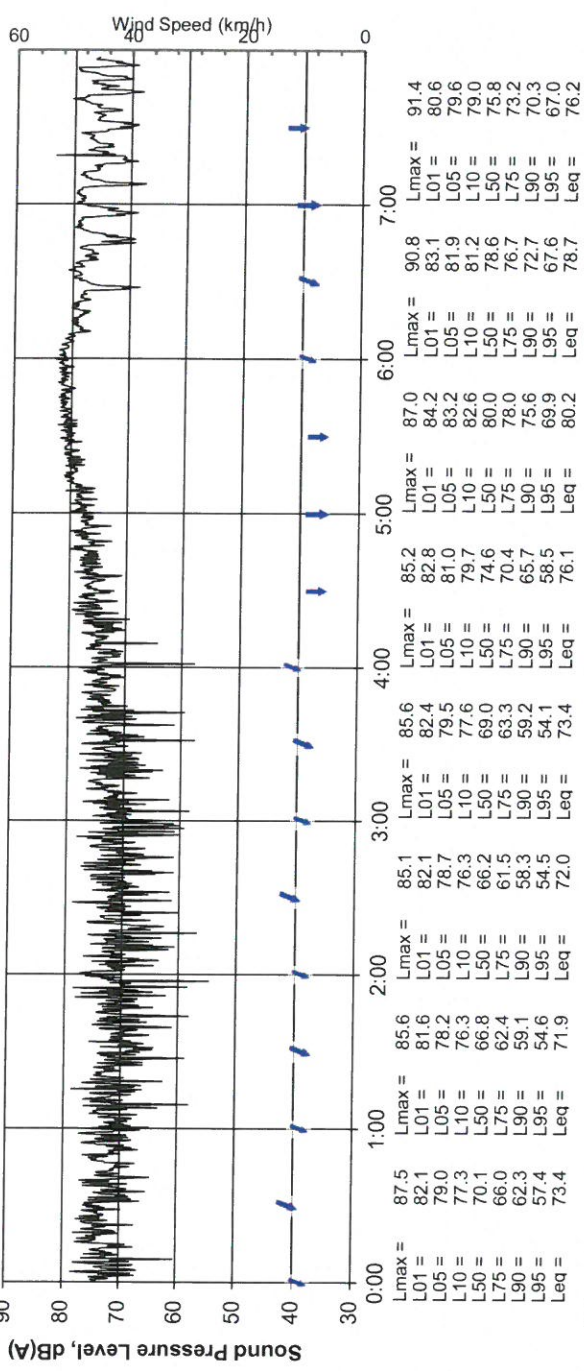
Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Friday

05 Jun 2015

Microphone position: Acoustic Wall, 3.8m high





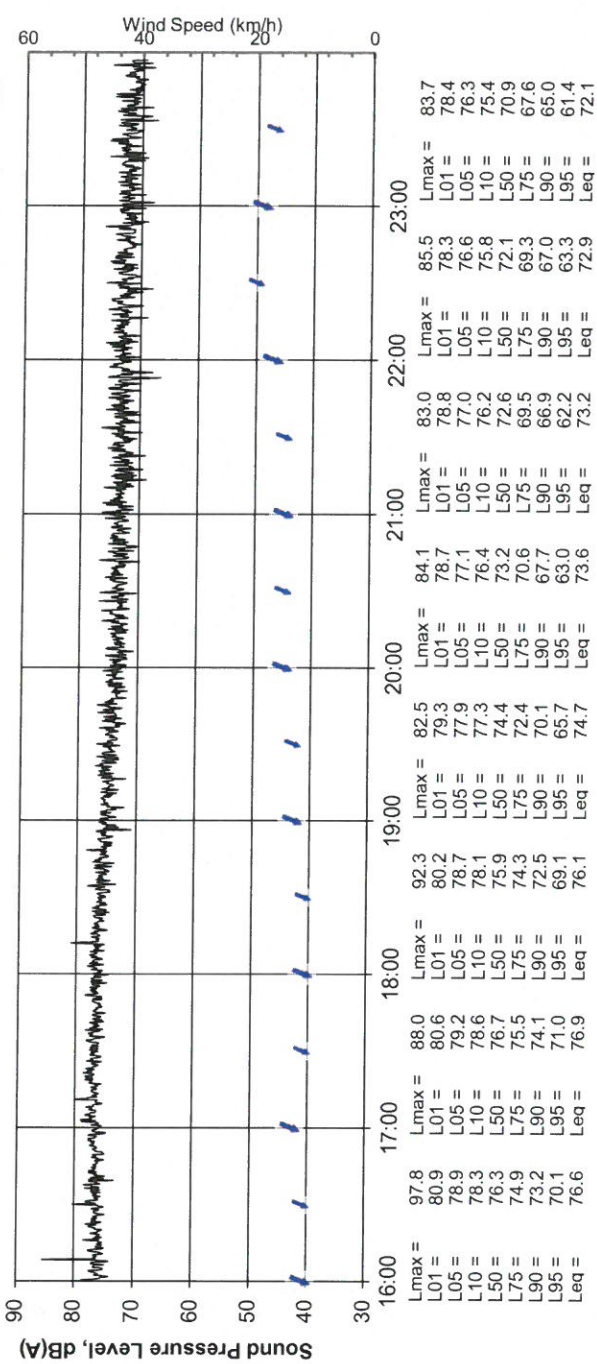
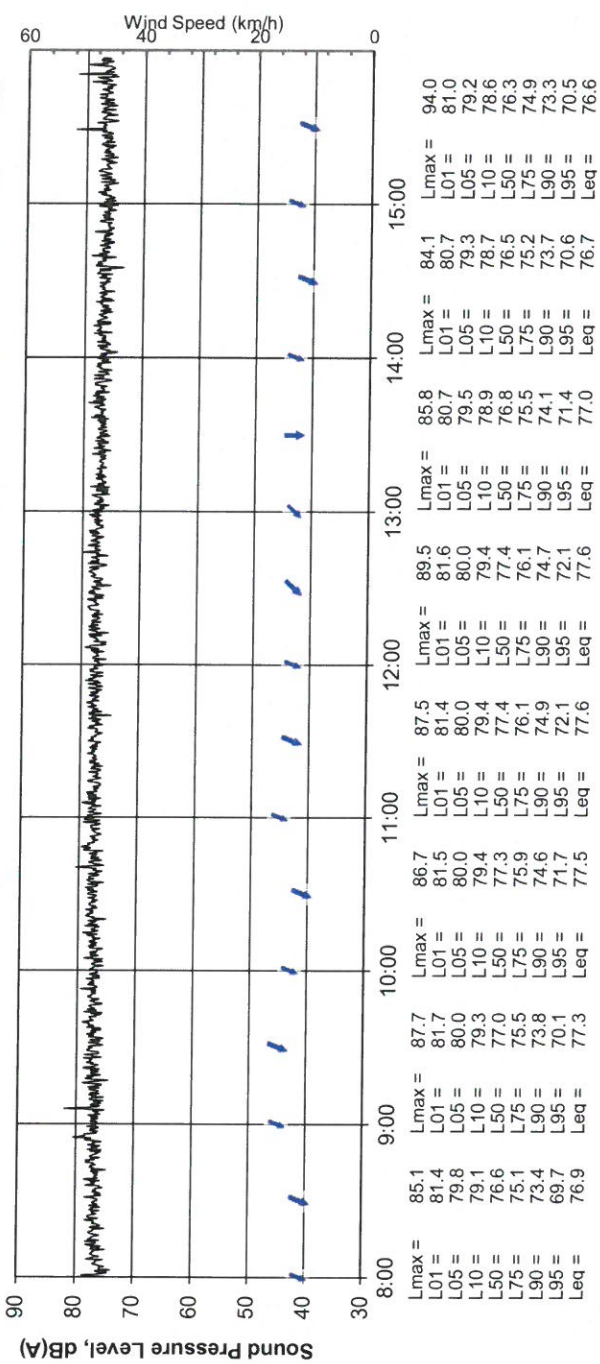
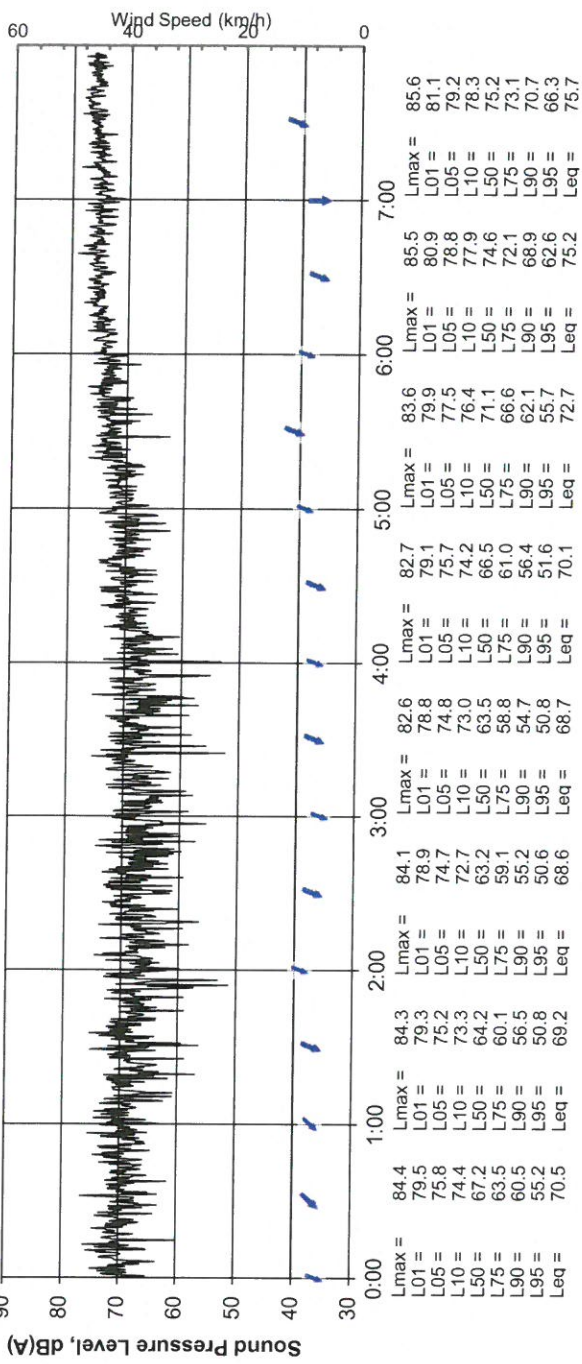
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Saturday
06 Jun 2015

Microphone position: Acoustic Wall, 3.8m high





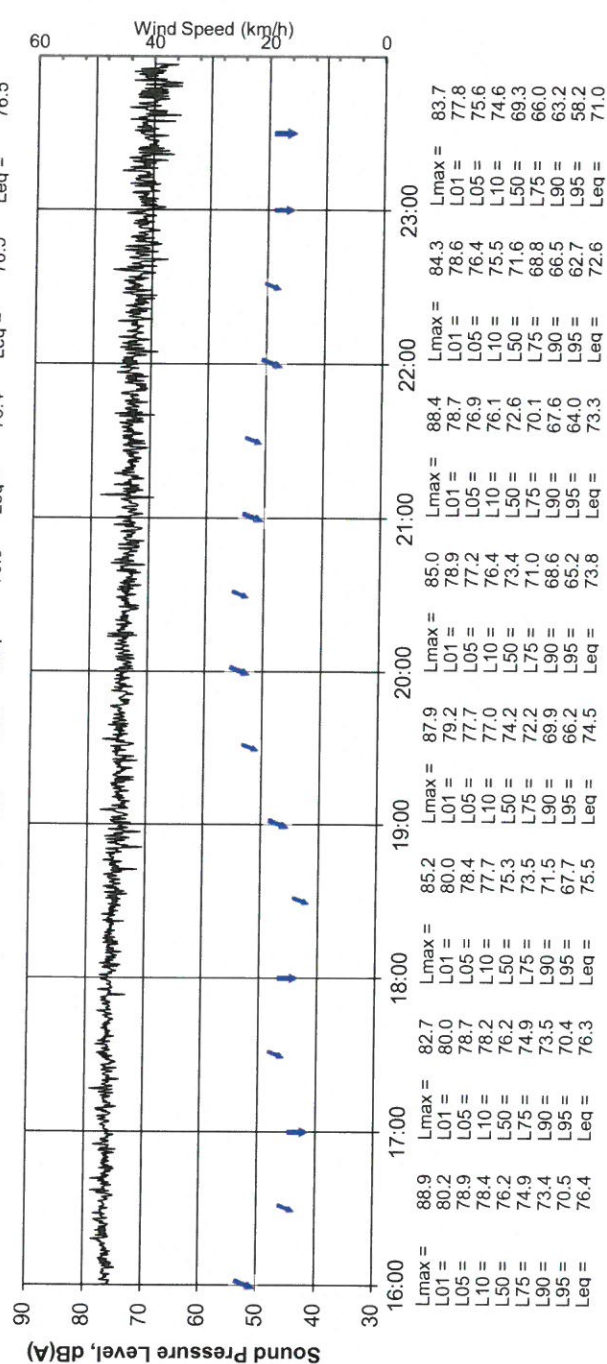
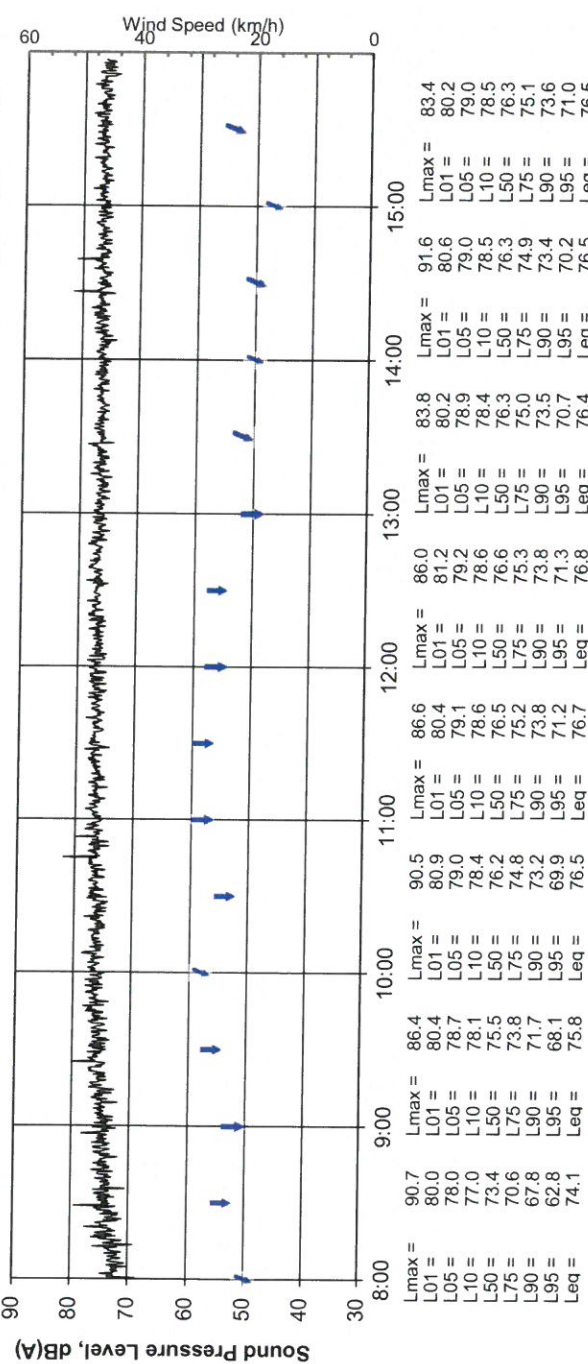
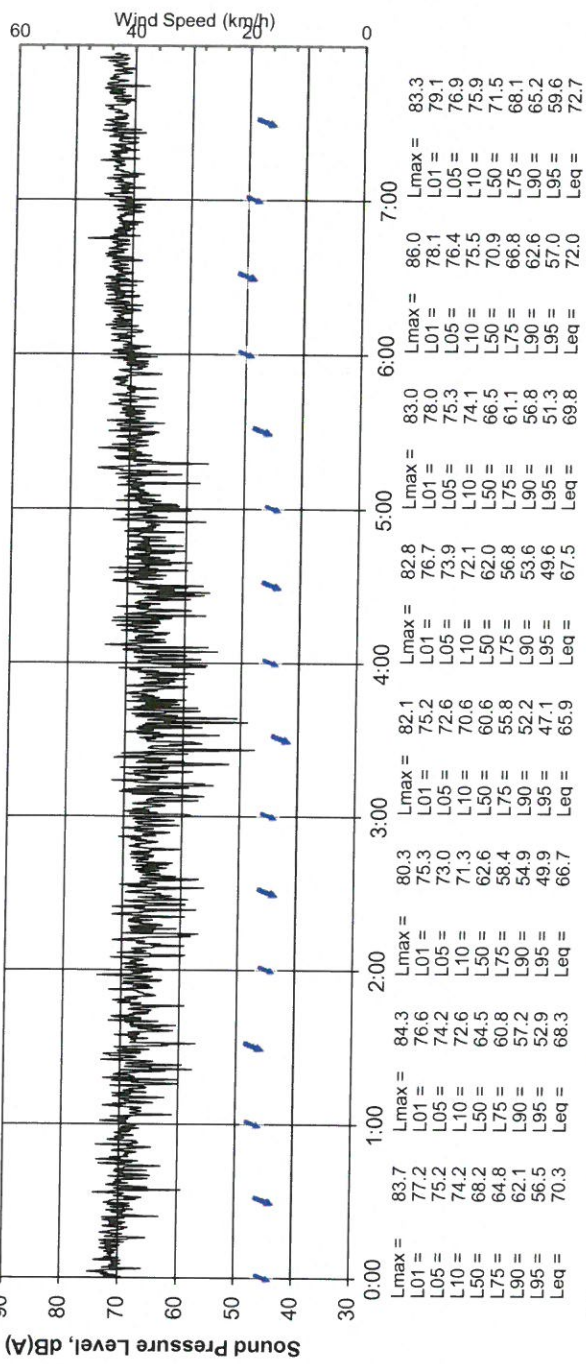
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Sunday
07 Jun 2015

Microphone position: Acoustic Wall, 3.8m high





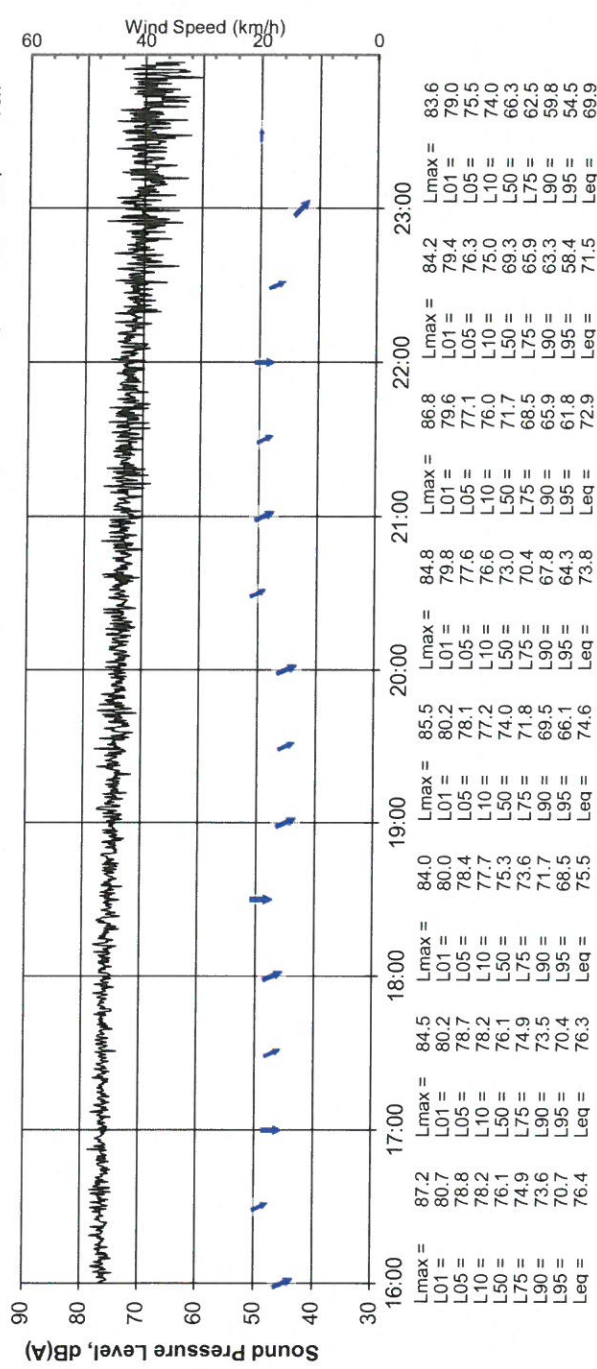
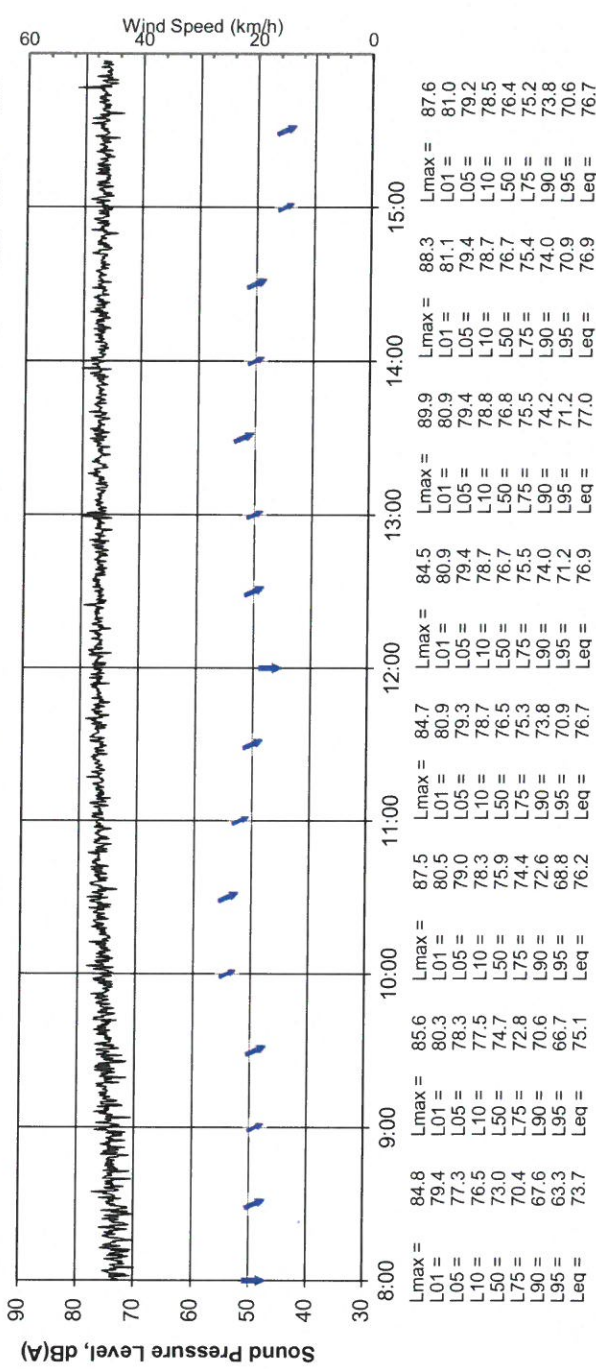
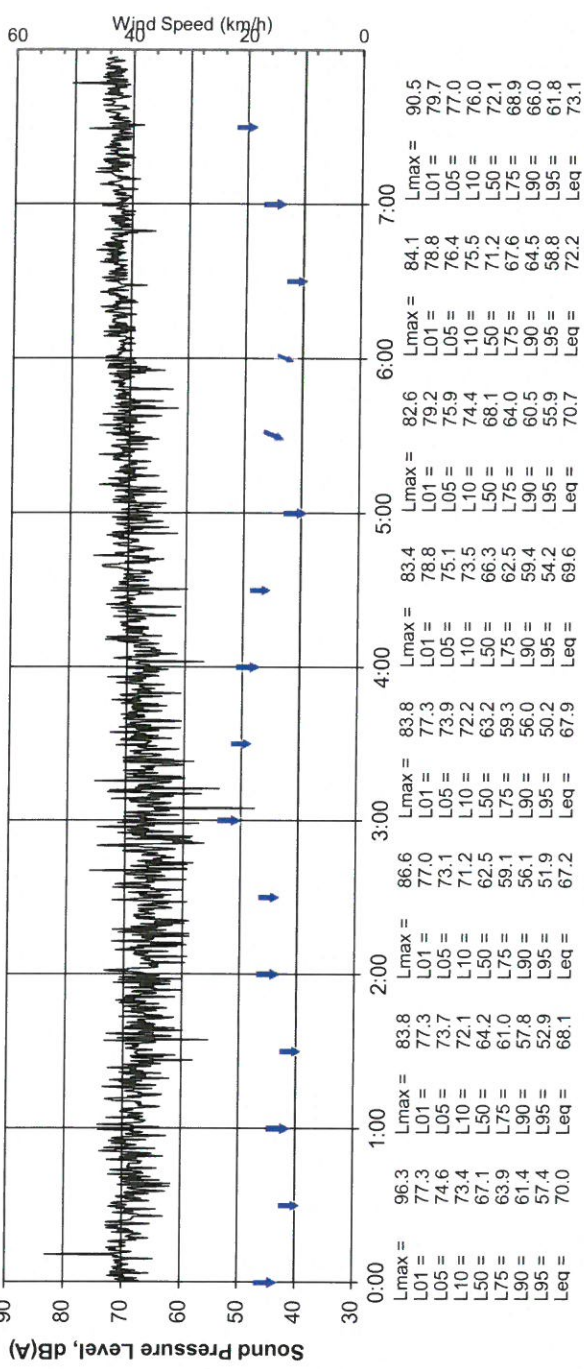
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Monday
08 Jun 2015

Microphone position: Acoustic Wall, 3.8m high





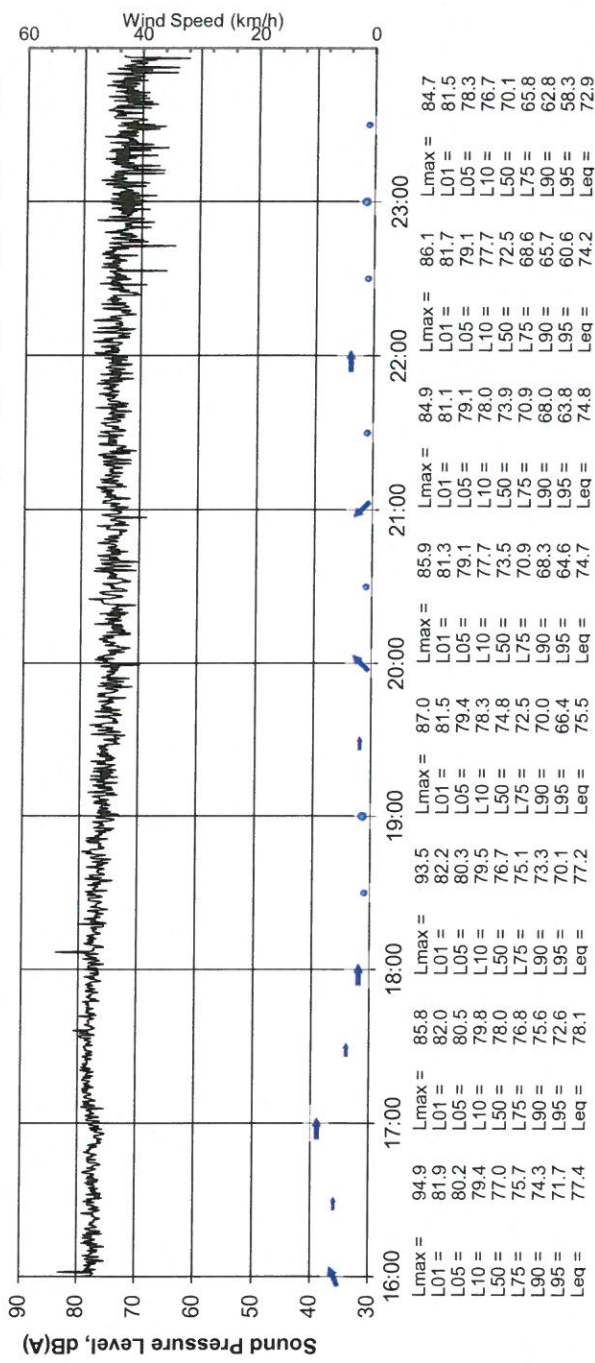
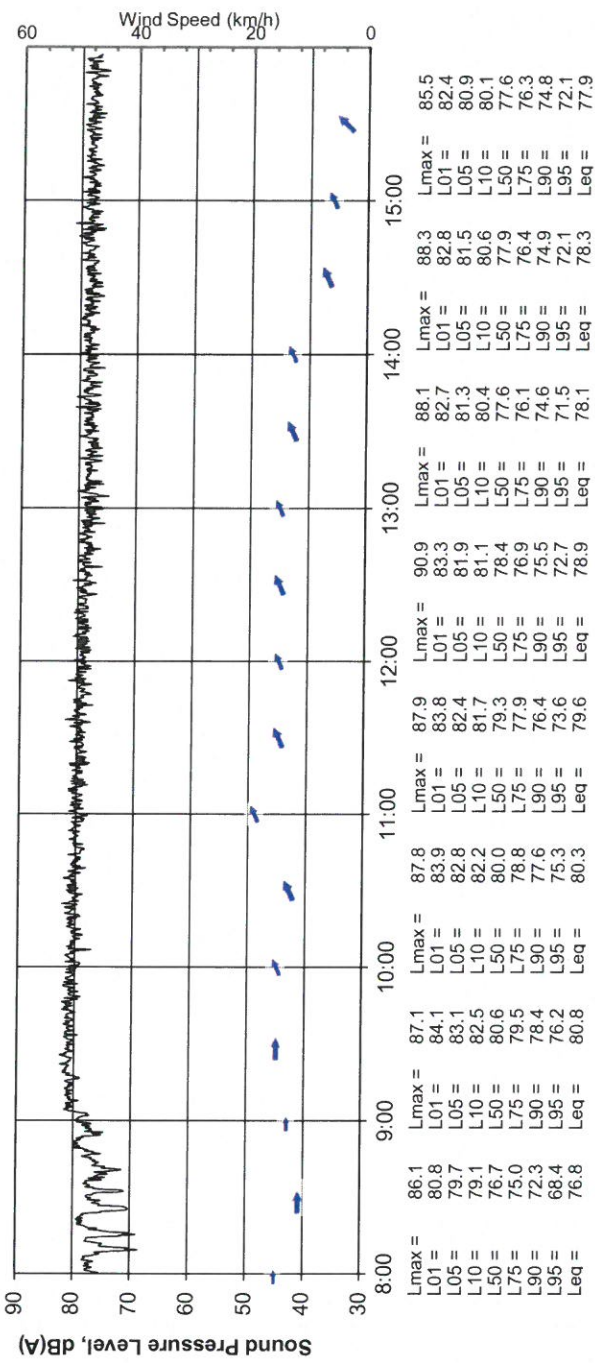
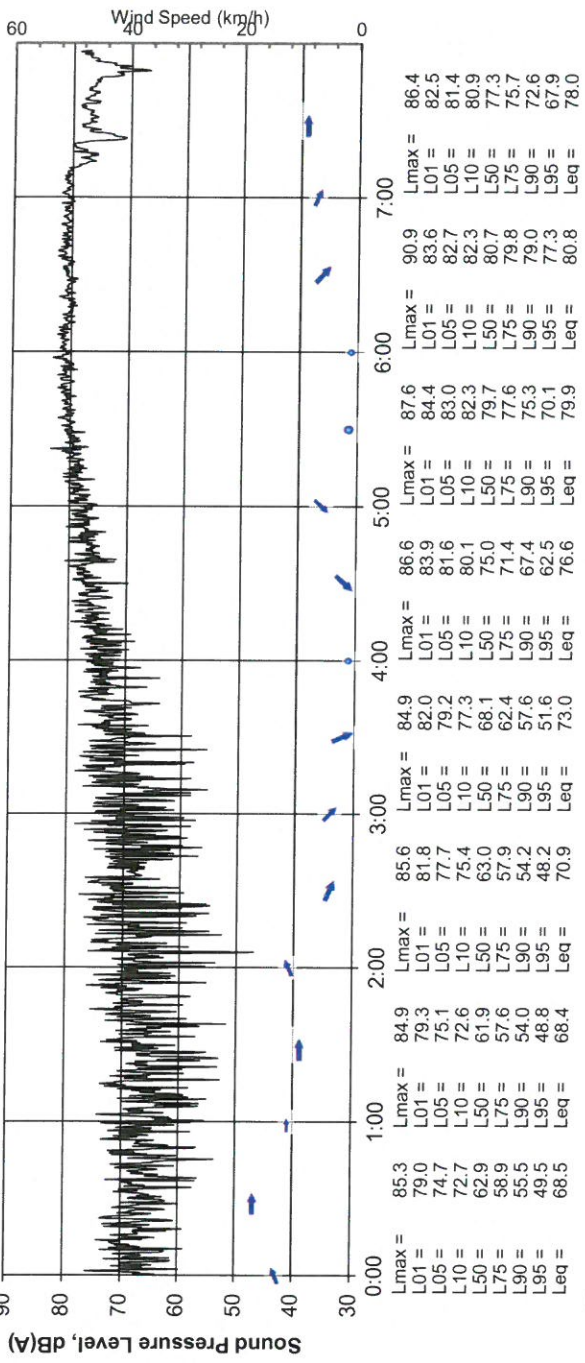
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Tuesday
09 Jun 2015

Microphone position: Acoustic Wall, 3.8m high





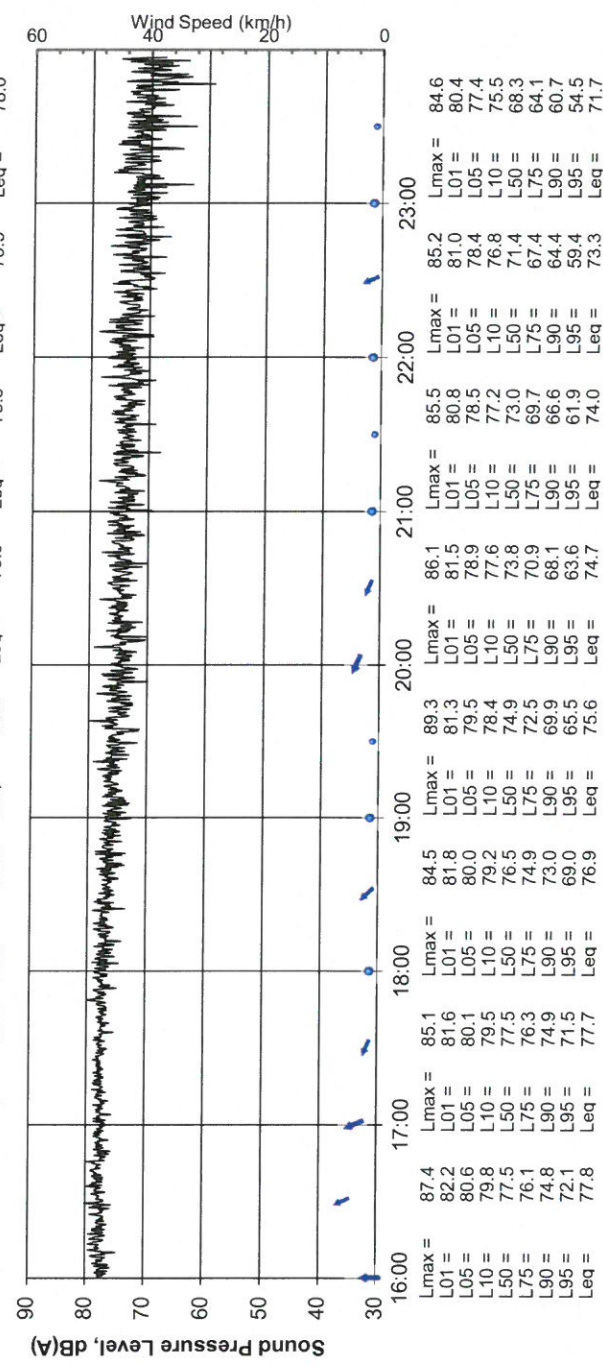
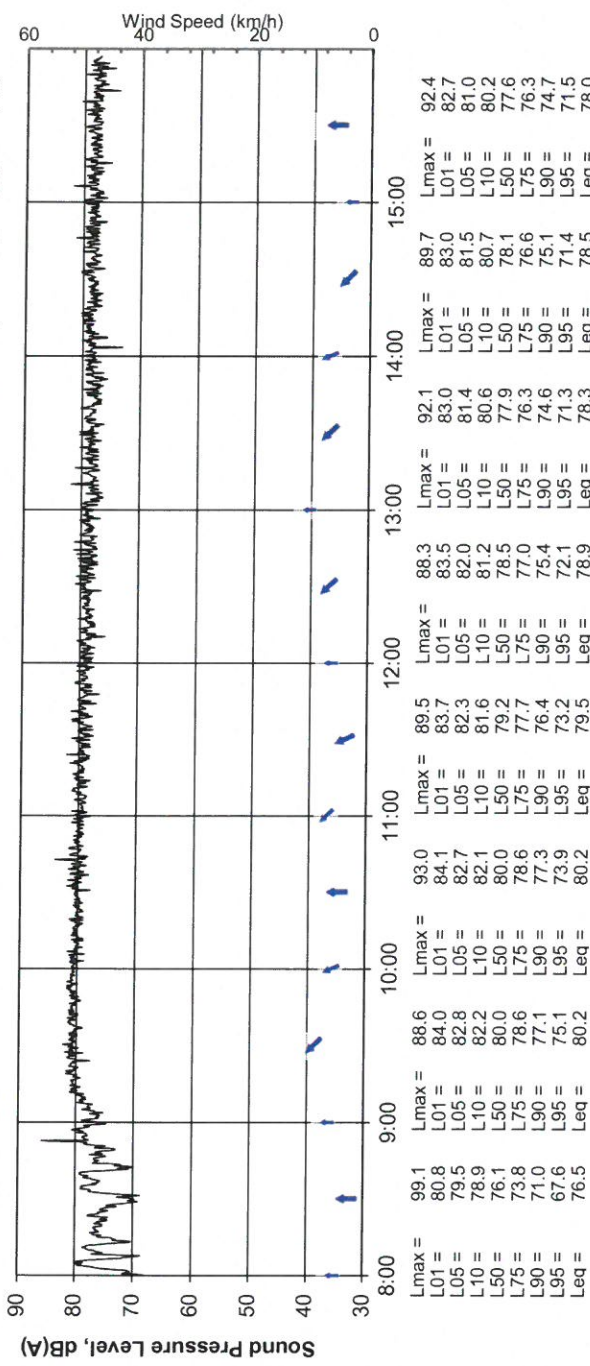
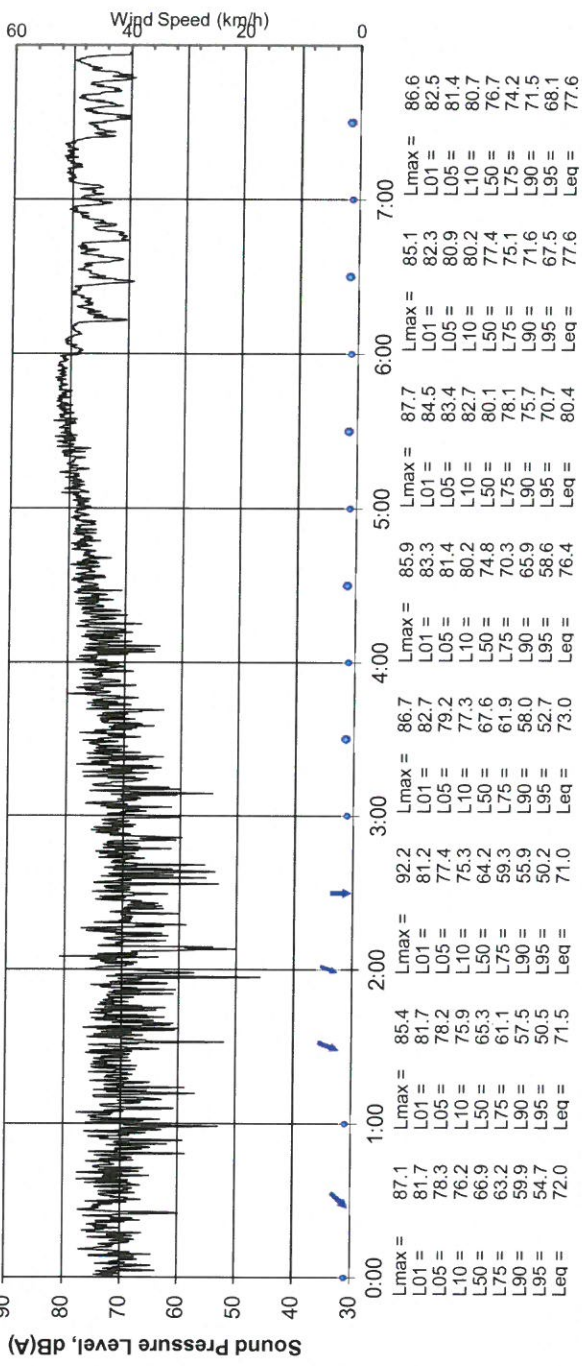
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Wednesday
10 Jun 2015

Microphone position: Acoustic Wall, 3.8m high





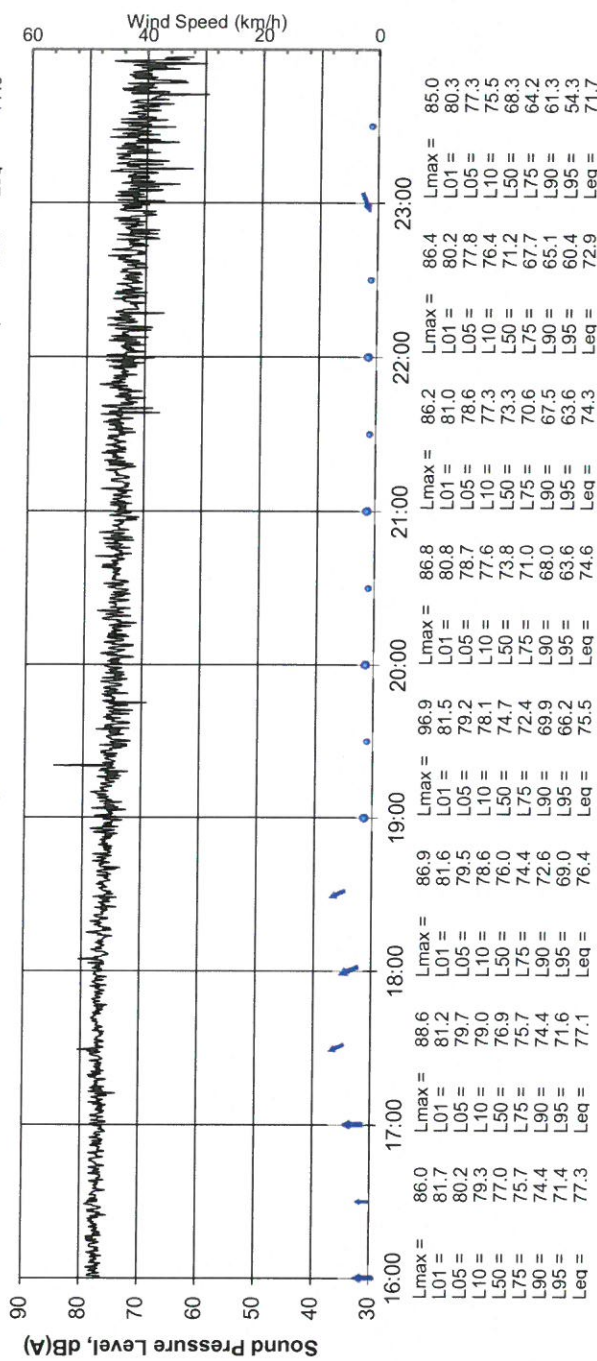
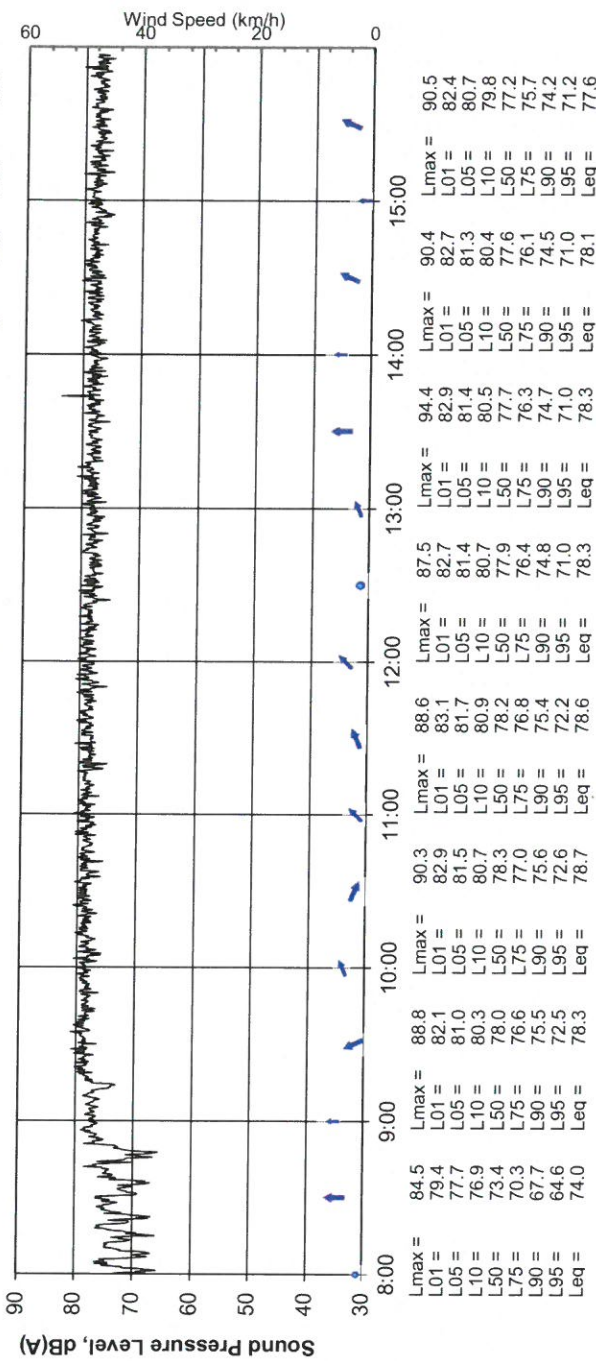
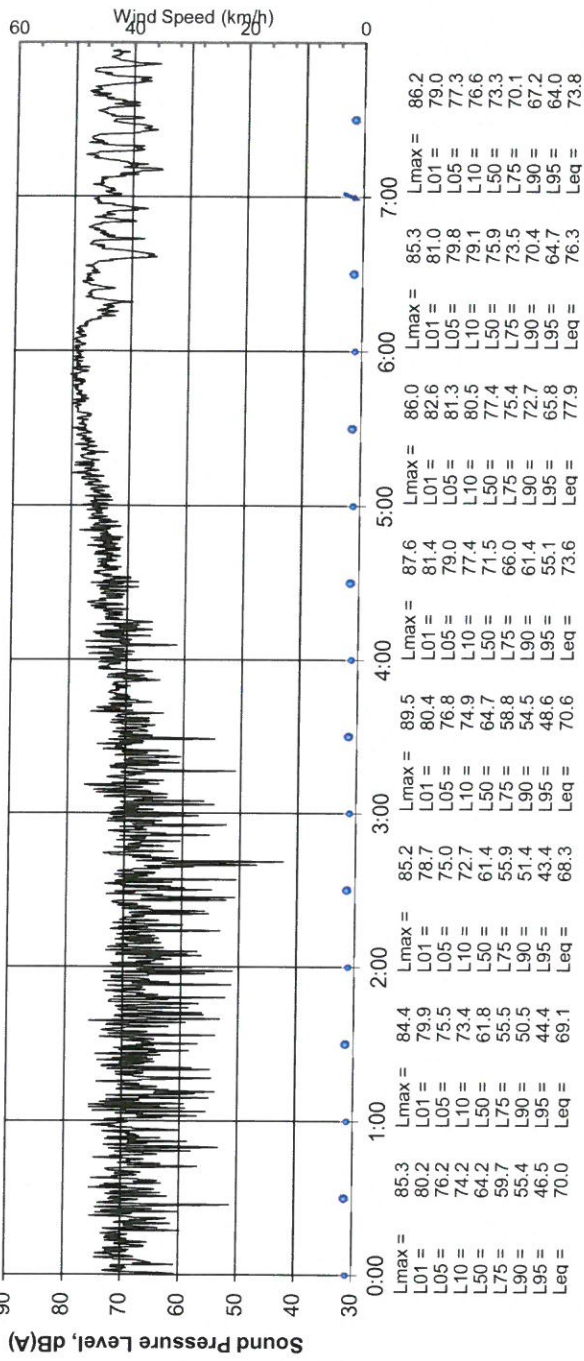
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Thursday
11 Jun 2015

Microphone position: Acoustic Wall, 3.8m high





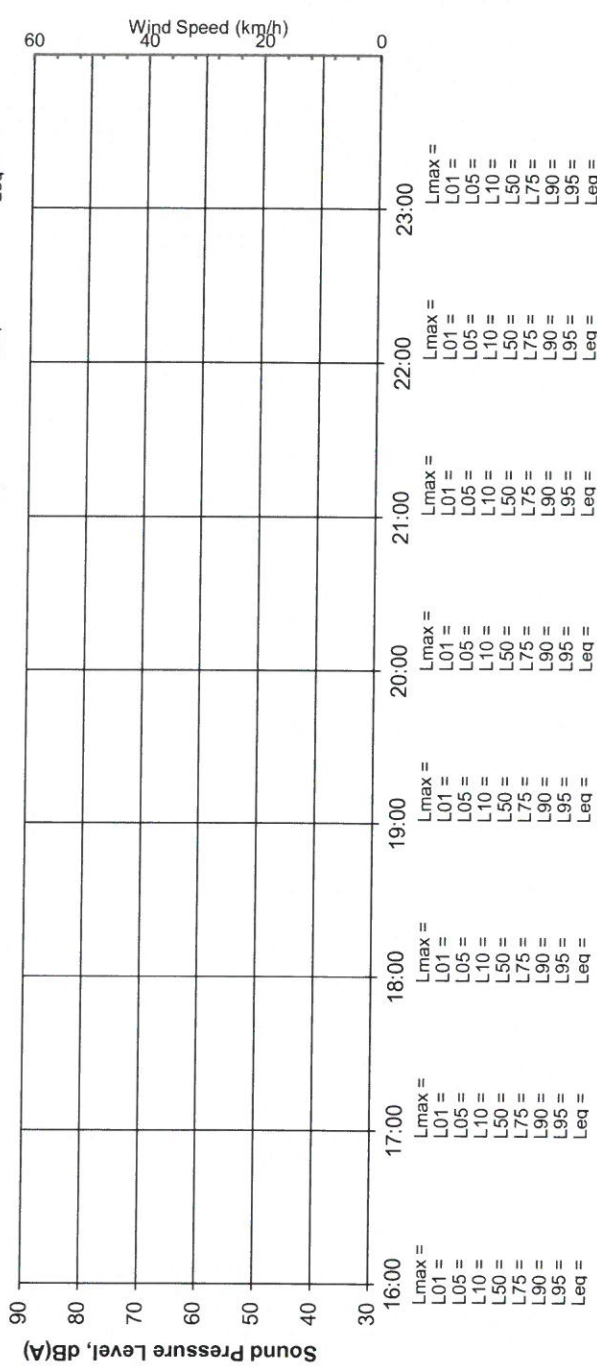
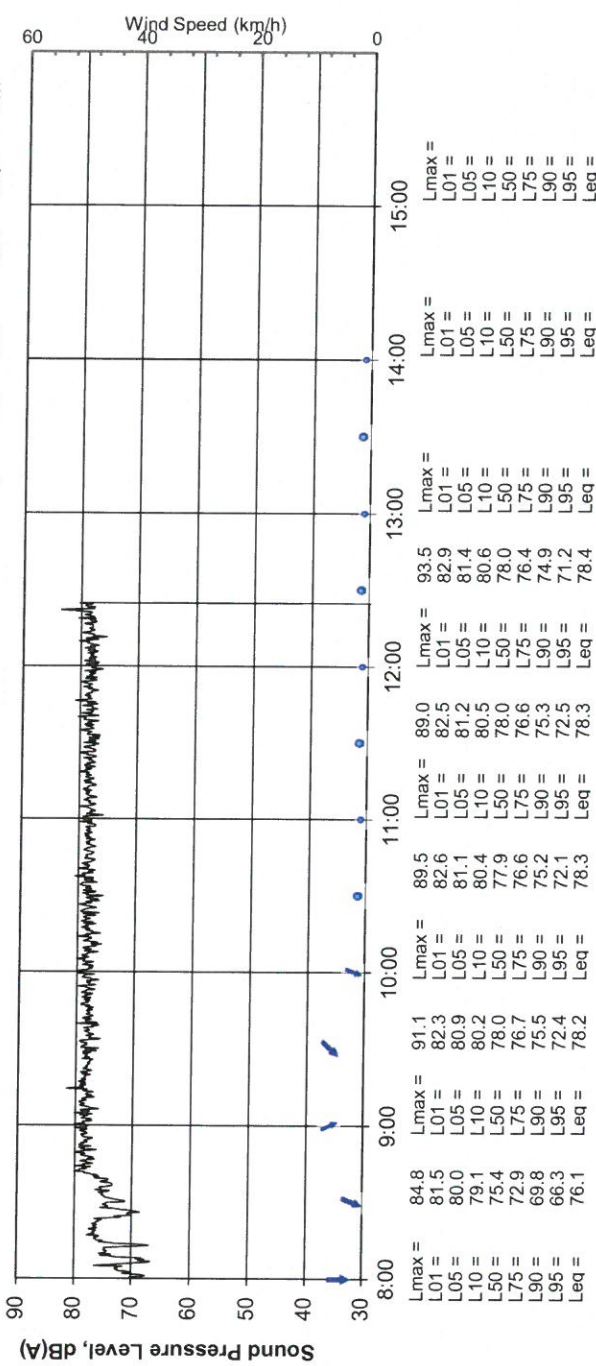
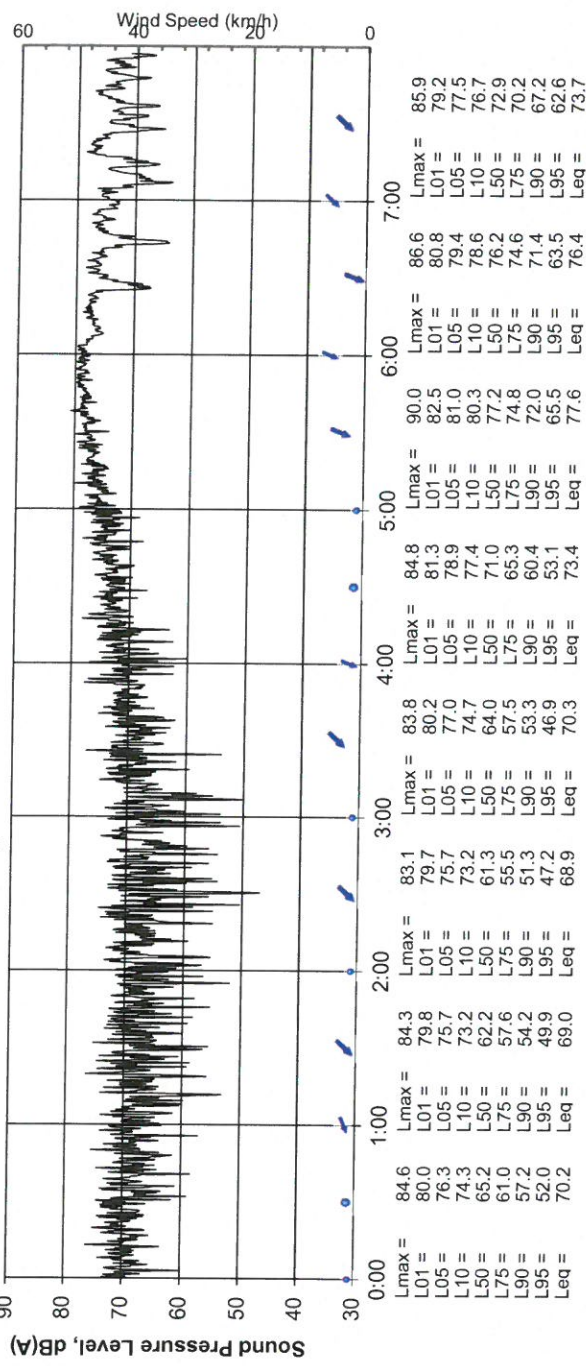
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Friday
12 Jun 2015

Microphone position: Acoustic Wall, 3.8m high





Results of Noise Monitoring

Client: Pong Constructions Pty Ltd
 Job Number: 640.11107 Location: 149 Hansworth Street, Mulgrave
 Microphone position: 6.3m from existing fence, 6.5m high
 Initial calibration: 94 dBA Final calibration: 94 dBA

Hour	Mon, 01-06-2015	Tue, 02-06-2015	Wed, 03-06-2015	Thu, 04-06-2015	Fri, 05-06-2015	Sat, 06-06-2015	Sun, 07-06-2015
00:00 to 01:00	L10	L10	L10	L10	L10	L10	L90
01:00 to 02:00	74.0	60.9	74.3	59.1	73.0	73.5	70.7
02:00 to 03:00	73.6	53.7	73.1	54.8	73.0	55.6	68.5
03:00 to 04:00	75.4	58.2	74.7	57.9	74.4	57.1	67.0
04:00 to 05:00	77.3	65.0	73.9	65.1	73.0	68.4	66.0
05:00 to 06:00	80.5	74.1	80.2	73.5	78.1	72.9	69.7
06:00 to 07:00	79.5	71.5	79.4	72.6	77.1	78.5	71.9
07:00 to 08:00	77.4	71.2	75.4	71.6	73.7	72.8	72.7
08:00 to 09:00	77.4	70.2	74.6	71.9	76.5	79.4	74.0
09:00 to 10:00	79.1	72.8	76.7	78.9	77.5	80.5	75.8
10:00 to 11:00	81.1	77.1	79.5	76.1	79.7	79.9	73.9
11:00 to 12:00	81.0	76.7	79.3	75.7	78.2	79.0	76.6
12:00 to 13:00	81.5	77.3	79.9	78.0	79.7	78.9	78.3
13:00 to 14:00	81.3	77.0	79.6	74.9	80.3	78.4	76.6
14:00 to 15:00	81.1	77.0	79.5	77.5	80.1	78.6	76.6
15:00 to 16:00	80.6	76.7	79.0	74.8	79.6	78.1	74.1
16:00 to 17:00	79.3	74.2	79.9	78.3	78.5	76.8	74.3
17:00 to 18:00	78.7	75.1	77.3	78.2	78.2	74.1	76.5
18:00 to 19:00	79.4	74.8	77.6	79.0	78.4	74.8	76.4
19:00 to 20:00	78.7	72.5	76.6	77.9	78.0	74.8	75.6
20:00 to 21:00	77.9	70.2	75.4	77.3	79.0	73.7	74.7
21:00 to 22:00	77.5	70.1	75.0	77.0	76.7	73.4	73.3
22:00 to 23:00	76.9	67.6	74.0	67.4	73.3	69.0	68.3
23:00 to 24:00	75.6	64.6	72.4	64.5	71.6	67.4	71.1

Wind @1500h, km/h	22 km/h SW	4 km/h SW	4 km/h WSW	13 km/h WNW	7 km/h NNW	13 km/h NE	19 km/h NNE
L10(15h), log av	79.1	78.4	79.3	79.2	77.6	76.8	75.7
L _{eq} (15h), log av	77.9	77.1	78.0	78.1	76.6	75.3	74.3
L _{eq} (9h), log av	74.1	73.9	76.2	77.3	71.9	70.3	70.3
L _{eq} (24h), log av		76.8	76.1	76.7	74.5	72.9	74.3
L90 Day	75.2	74.6	73.2	75.8	74.5	72.9	72.9
L90 Evening	71.9	71.4	76.6	72.4	70.8	70.8	70.8
L90 Night	63.6	63.4	67.8	63.4	61.6	62.2	62.2
Wind @0900h, km/h	2 km/h ENE	2 km/h NNW	7 km/h N	11 km/h NNE	9 km/h N	7 km/h N	19 km/h NNE
Wind @1500h, km/h	22 km/h SW	4 km/h SW	4 km/h WSW	13 km/h WNW	7 km/h NNW	13 km/h NE	19 km/h NNE

Note *: Weather data sourced from the closest Bureau of Meteorology Weather station at Scoresby. Periods of strong rains or heavy winds was excluded.



Results of Noise Monitoring

Client: Pong Constructions Pty Ltd
 Job Number: 640.11107
 Location: 149 Hansworth Street, Mulgrave
 Microphone position: 6.3m from existing fence, 6.5m
 Initial calibration: 94 dBA Final calibration: 94 dBA

Hour	Sound Pressure Level, dB(A)											
	Mon, 08-06-2015		Tue, 09-06-2015		Wed, 10-06-2015		Thu, 11-06-2015		Fri, 12-06-2015			
	L ₁₀	L ₉₀	L ₁₀	L ₉₀	L ₁₀	L ₉₀	L ₁₀	L ₉₀	L ₁₀	L ₉₀	L ₁₀	L ₉₀
00:00 to 01:00	72.6	63.1	70.2	58.0	68.3	56.7	62.4	59.1	73.5	69.8	73.6	61.1
01:00 to 02:00	71.7	60.0	68.5	56.7	68.8	56.7	70.2	68.8	72.7	69.1	73.6	61.1
02:00 to 03:00	70.9	58.0	67.5	55.7	70.9	54.1	72.8	68.1	71.0	68.8	72.9	57.6
03:00 to 04:00	71.7	58.0	68.0	58.8	73.0	58.1	74.1	68.1	72.9	68.1	74.0	57.2
04:00 to 05:00	72.4	60.2	69.1	69.3	76.4	64.9	76.7	68.1	76.3	73.3	73.2	70.2
05:00 to 06:00	73.8	61.3	70.5	81.9	79.8	80.4	77.7	79.9	80.4	73.4	79.7	73.2
06:00 to 07:00	74.9	66.2	72.3	82.1	81.0	80.3	78.2	78.9	80.3	73.7	77.4	70.2
07:00 to 08:00	75.5	67.8	73.1	80.9	78.7	80.8	78.4	76.9	79.0	74.7	76.7	74.6
08:00 to 09:00	75.9	69.4	73.7	79.3	77.6	79.0	77.2	76.8	77.2	74.6	74.6	76.4
09:00 to 10:00	77.2	71.7	75.3	82.0	80.6	81.7	79.7	80.1	80.1	74.6	78.8	78.5
10:00 to 11:00	77.8	73.3	76.1	81.7	80.2	81.5	77.4	79.7	80.0	78.2	78.5	78.3
11:00 to 12:00	78.1	74.2	76.6	76.8	79.5	76.8	79.4	79.8	79.8	75.7	79.9	78.3
12:00 to 13:00	78.3	74.5	76.9	80.0	80.5	81.0	78.7	75.0	80.0	78.2	78.1	78.1
13:00 to 14:00	78.4	74.7	76.9	80.0	78.1	79.9	79.6	77.8	79.6	75.7	77.8	77.8
14:00 to 15:00	78.2	74.5	76.8	79.9	80.1	75.6	78.3	74.9	78.3	75.7	77.6	77.6
15:00 to 16:00	78.0	74.2	76.6	79.4	77.8	79.6	78.0	79.0	78.0	74.7	77.6	77.6
16:00 to 17:00	77.7	74.1	76.3	78.9	77.3	75.2	77.7	74.6	77.7	74.6	77.0	77.0
17:00 to 18:00	77.7	74.0	74.0	78.9	79.3	75.2	77.7	78.5	79.3	74.6	77.0	77.0
18:00 to 19:00	77.3	72.7	72.7	79.0	77.3	75.3	76.7	74.7	75.5	73.5	76.4	76.4
19:00 to 20:00	76.7	70.9	74.6	77.8	75.5	71.5	71.5	77.6	75.5	71.6	75.6	75.6
20:00 to 21:00	76.0	69.4	73.8	77.2	70.1	74.7	70.0	70.2	74.5	70.2	74.6	74.6
21:00 to 22:00	75.2	67.4	72.7	77.3	70.0	76.4	73.9	69.9	73.9	70.2	74.4	74.4
22:00 to 23:00	74.2	65.1	71.5	77.2	68.2	76.1	73.2	67.7	73.2	70.2	74.4	74.4
23:00 to 24:00	73.1	61.7	69.9	76.1	65.5	72.9	71.6	64.5	71.6	70.2	74.4	74.4
L ₁₀ ^(18h) , ar av	76.7	79.4	79.0	78.2	79.0	78.2	78.2	78.2	78.2	78.2	78.2	78.2
L _{eq} (15h), log av	75.6	78.1	77.9	78.1	77.9	77.9	77.9	76.8	77.9	76.8	76.8	76.8
L _{eq} (9h), log av	75.7	75.6	75.6	75.6	75.6	75.6	73.4	73.4	73.4	73.4	73.4	73.4
L _{eq} (24h), log av	74.2	77.4	77.2	77.4	77.2	77.2	75.8	75.8	75.8	75.8	75.8	75.8
L90 Day	72.9	76.0	75.6	76.0	75.6	75.6	74.1	74.1	74.1	74.1	74.1	74.1
L90 Evening	70.1	71.4	71.1	71.4	71.1	71.1	71.3	71.3	71.3	71.3	71.3	71.3
L90 Night	64.5	66.1	63.0	63.0	63.0	63.0	63.5	63.5	63.5	63.5	63.5	63.5
Wind @ 0900h, km/h	11 km/h N	6 km/h NW	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM
Wind @ 1500h, km/h	20 km/h NNW	15 km/h WSW	7 km/h SE	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM	0 km/h CALM



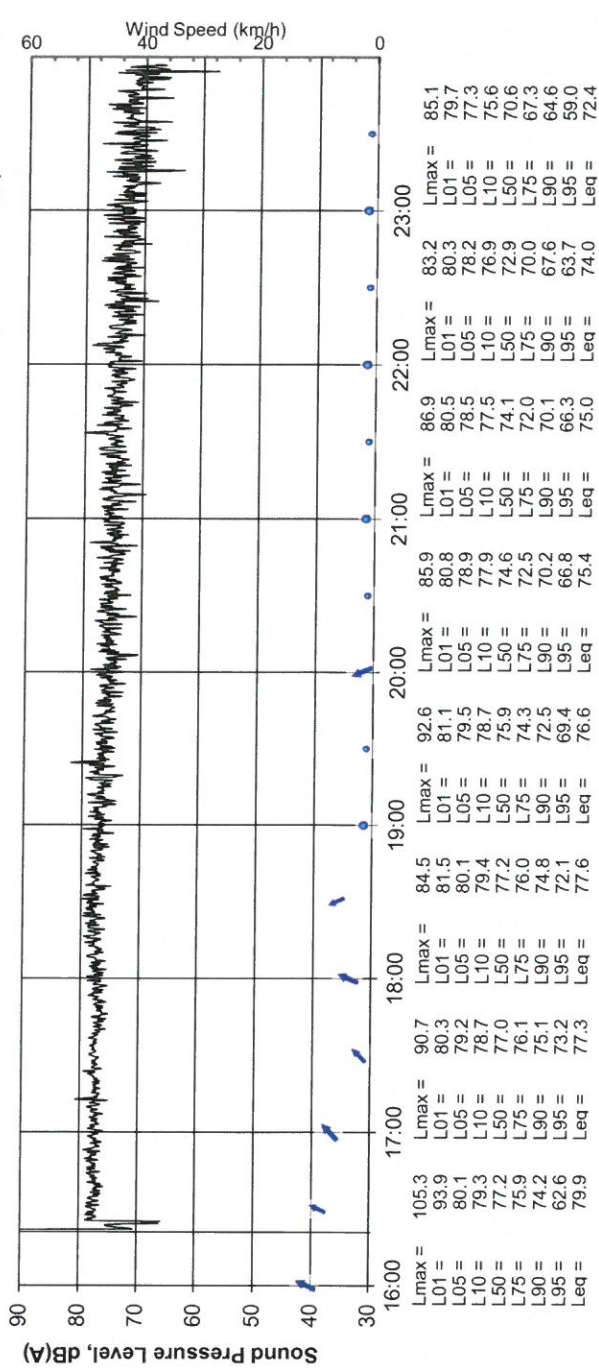
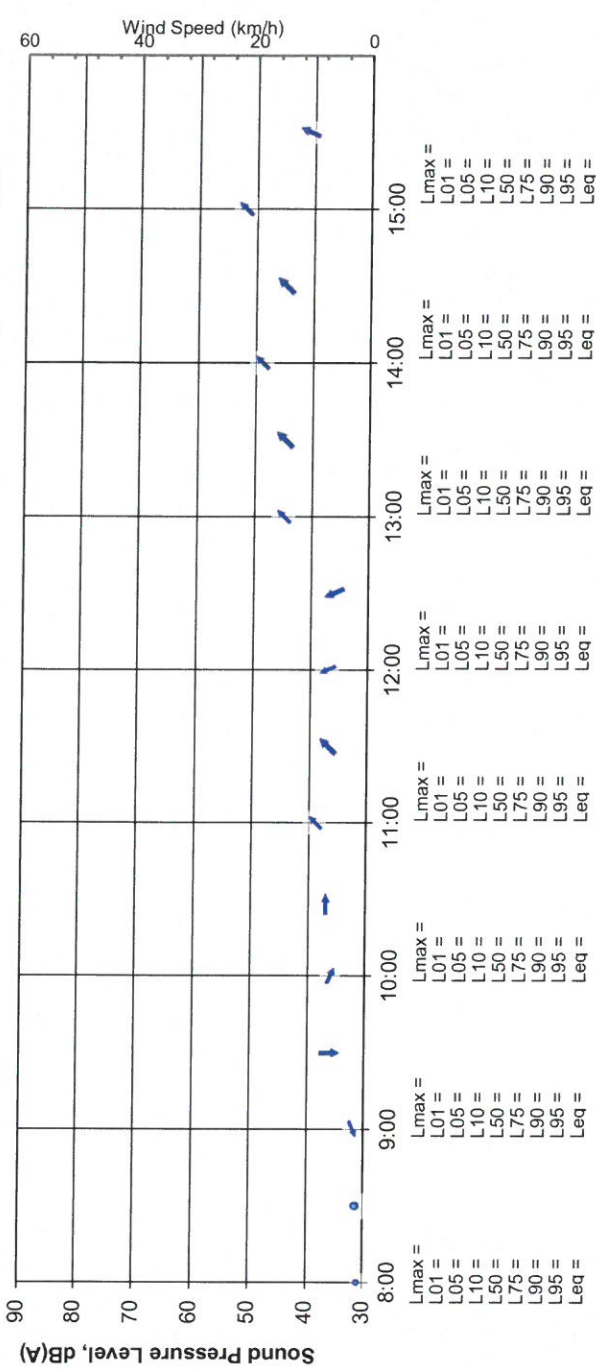
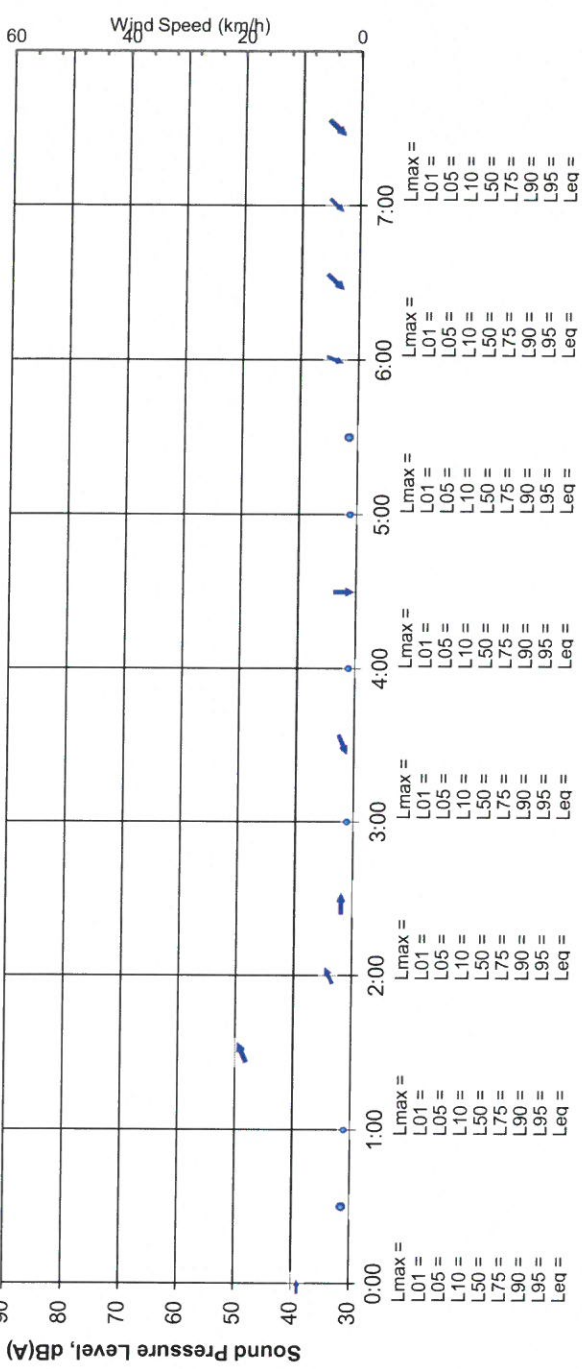
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Monday
01 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high





Results of Noise Monitoring

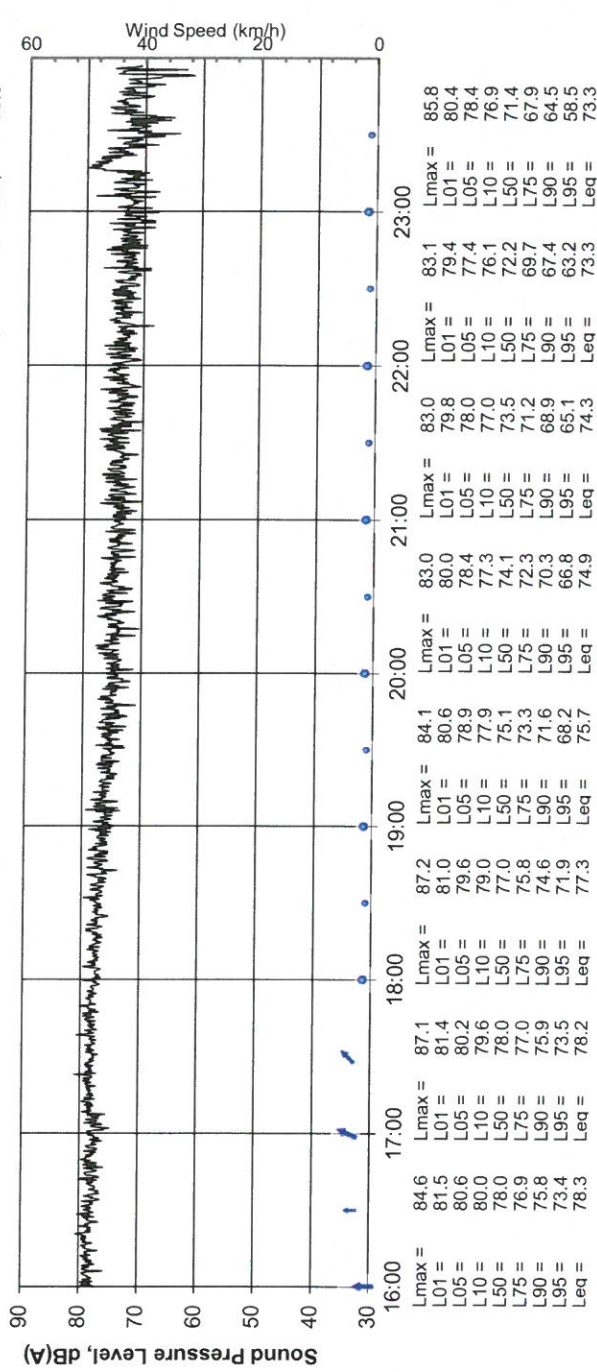
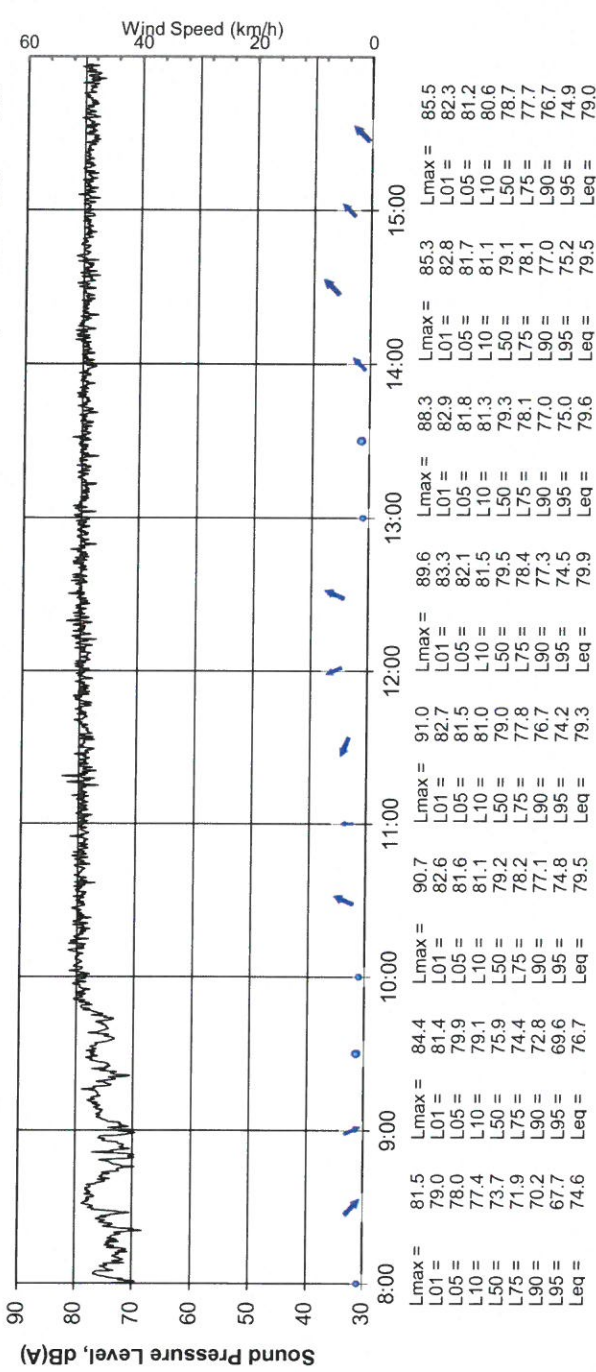
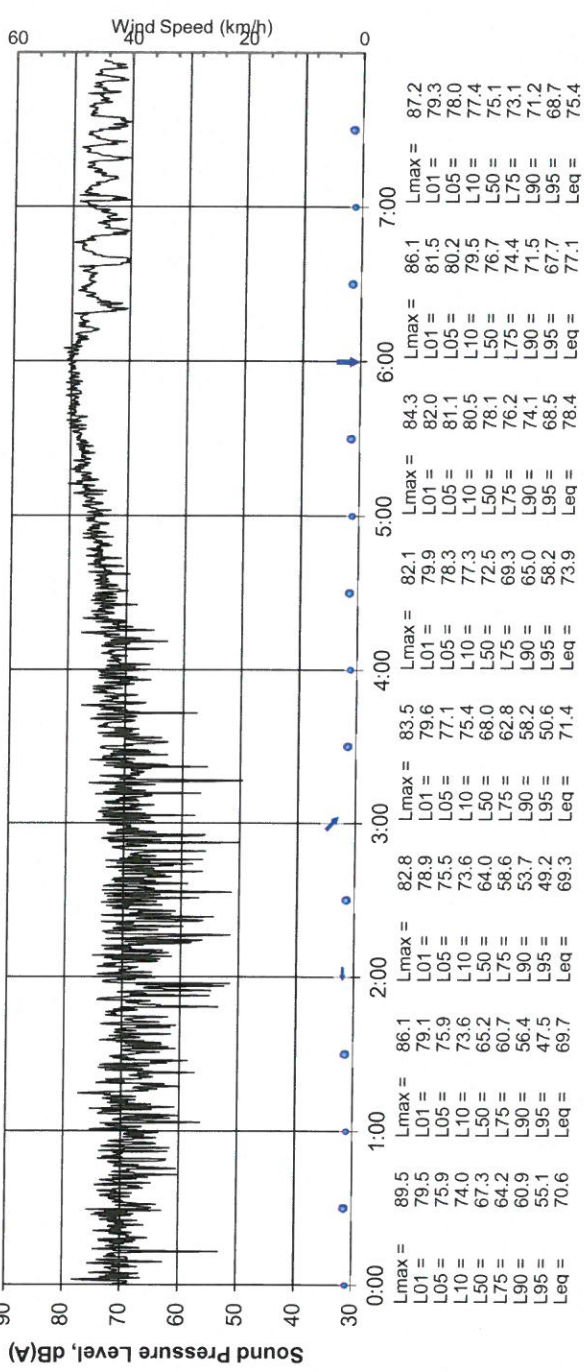
Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Tuesday

02 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high





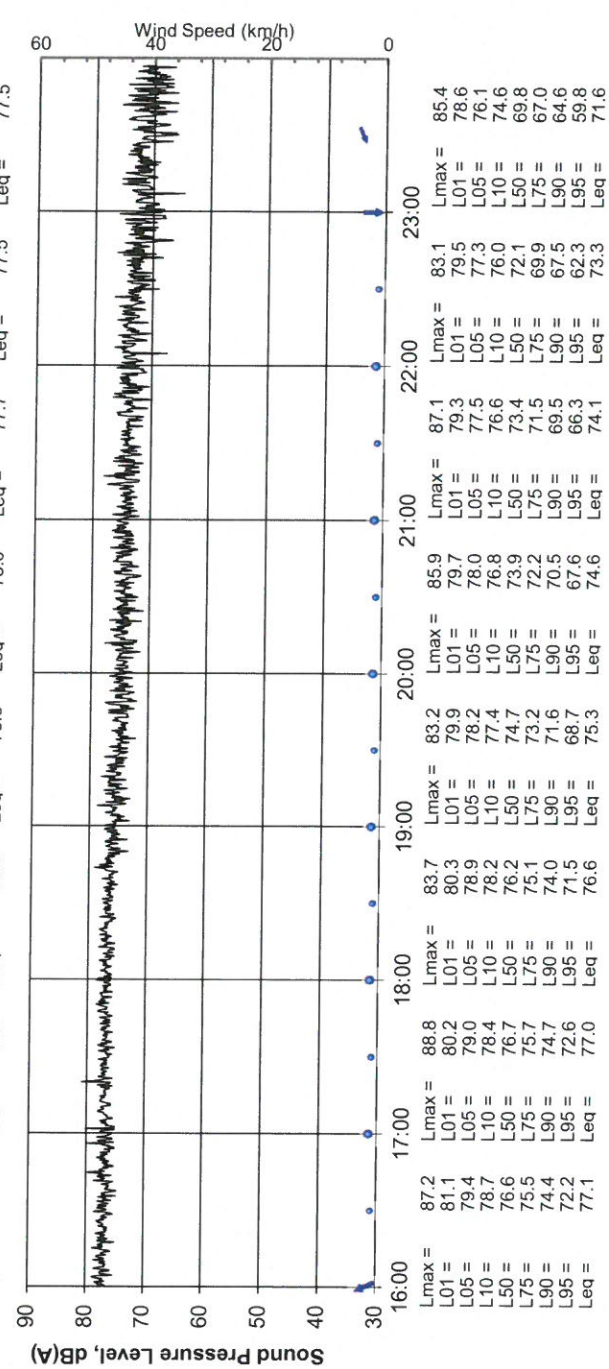
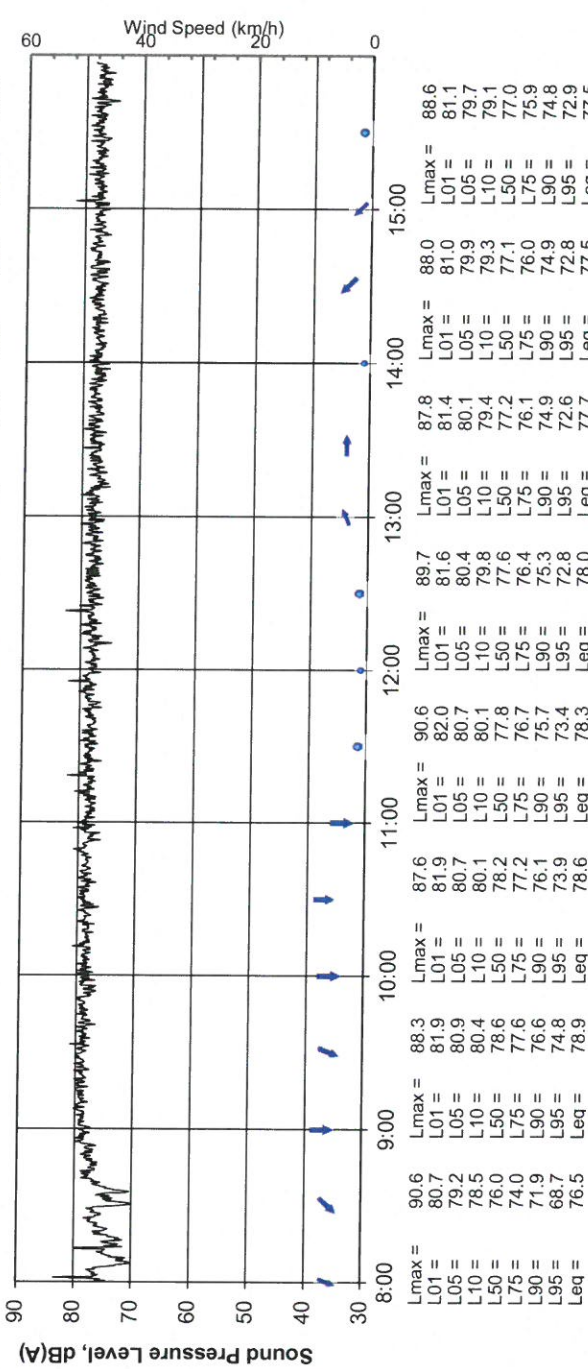
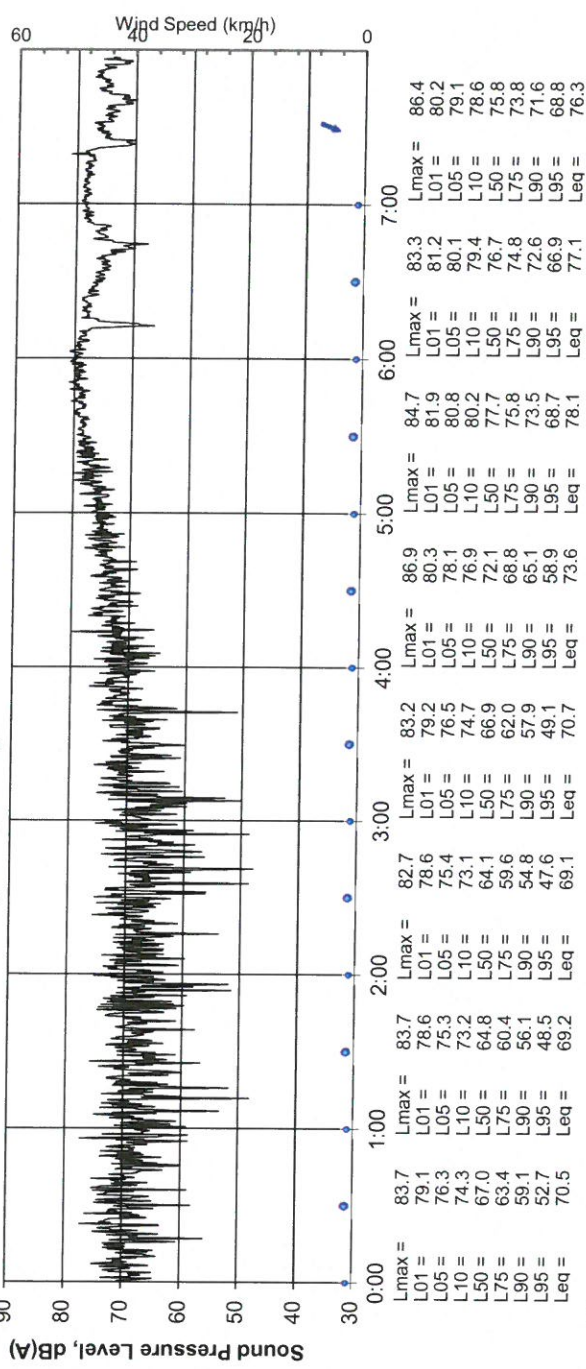
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Wednesday
03 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high





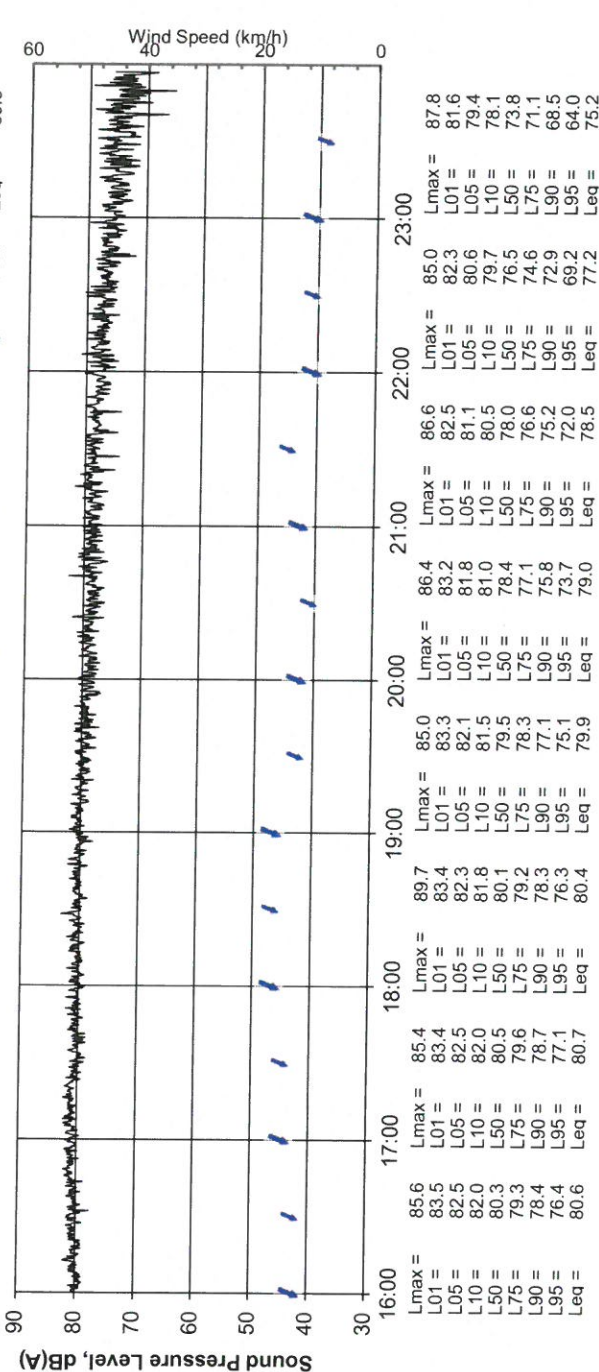
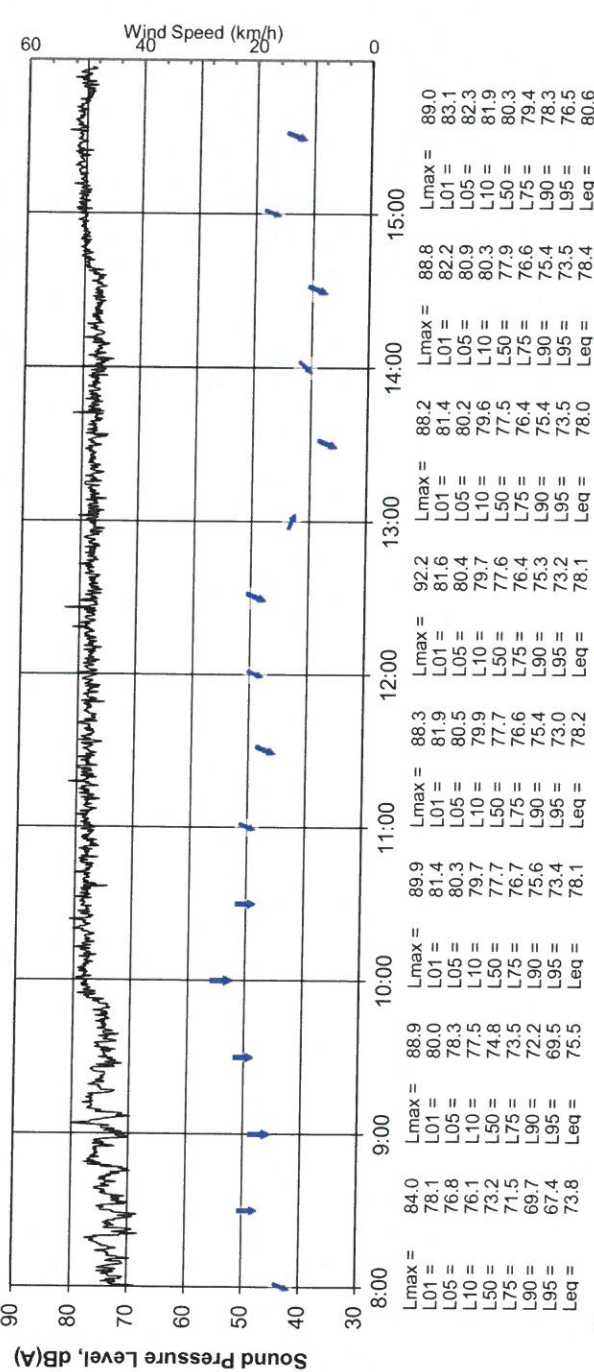
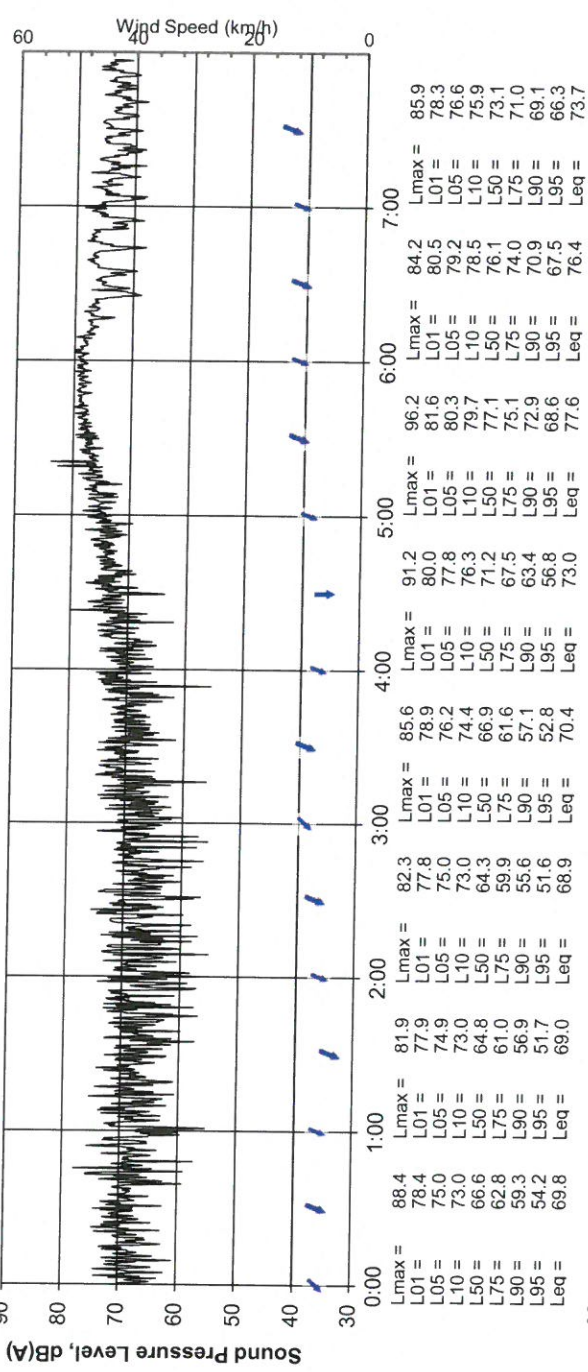
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Thursday
04 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high



Graph based on Leq at 20s intervals.

Hourly percentiles based on Lp at 0.125s intervals.



Results of Noise Monitoring

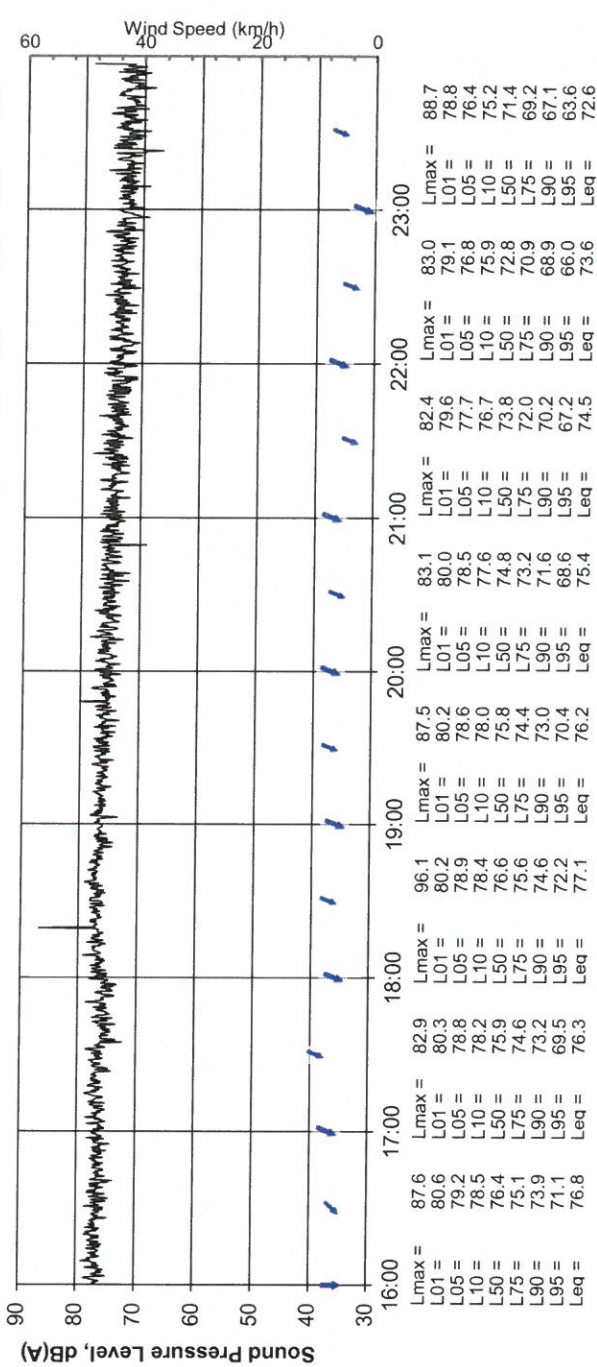
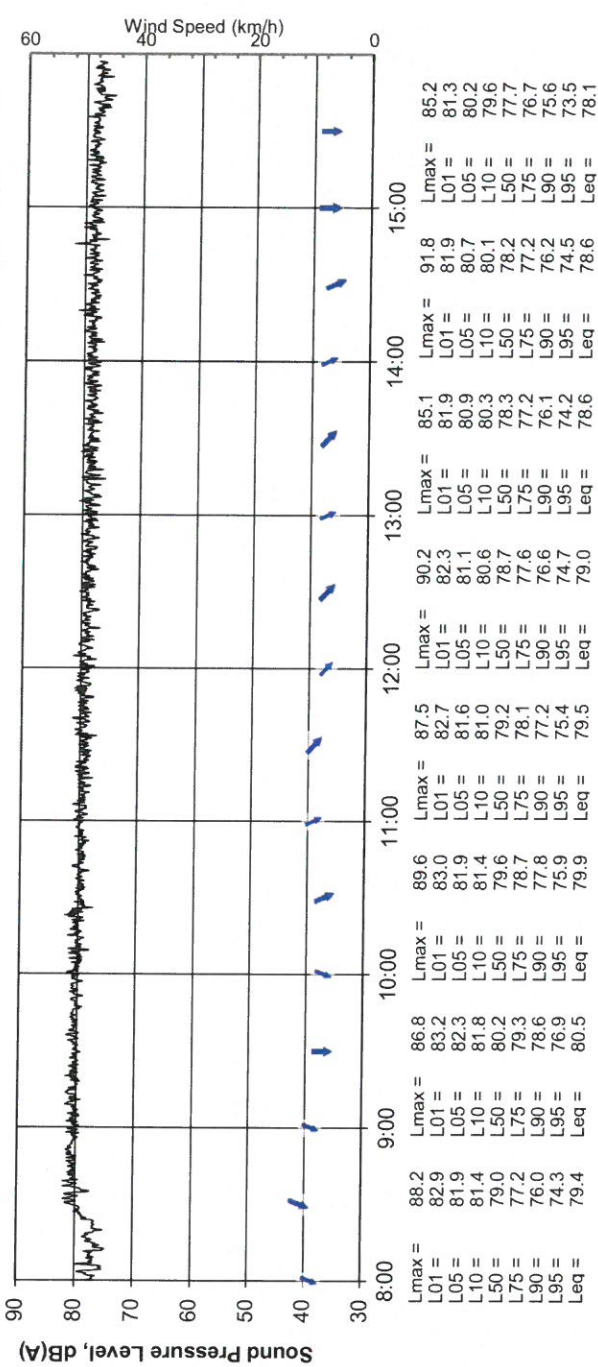
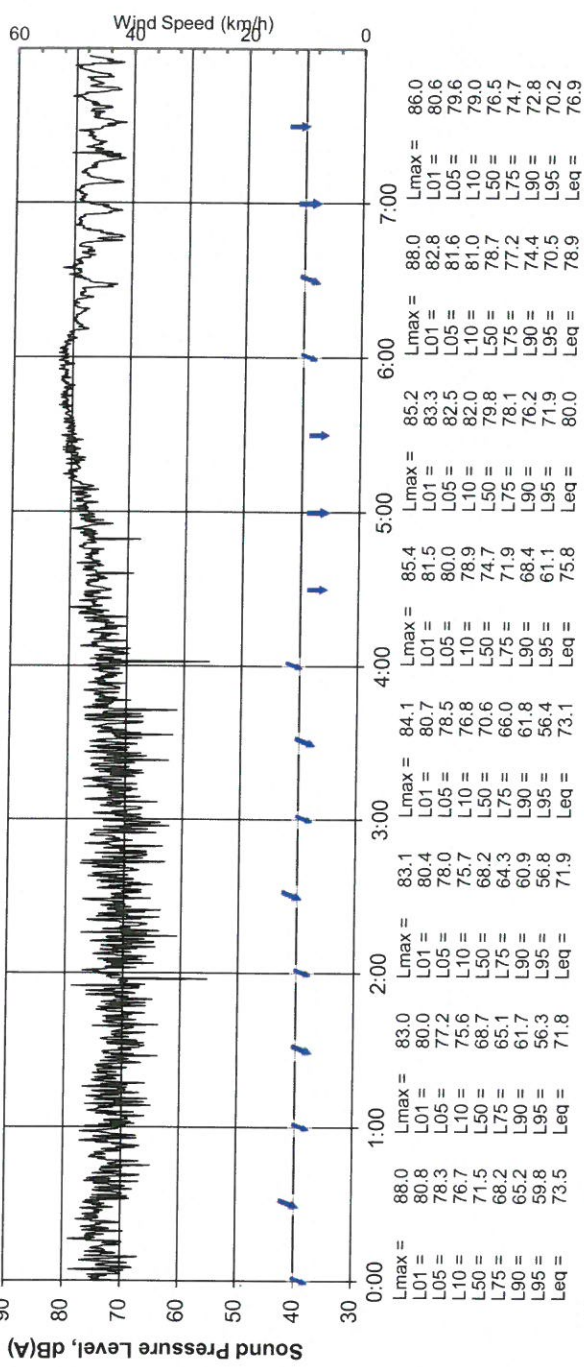
Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Friday

05 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high





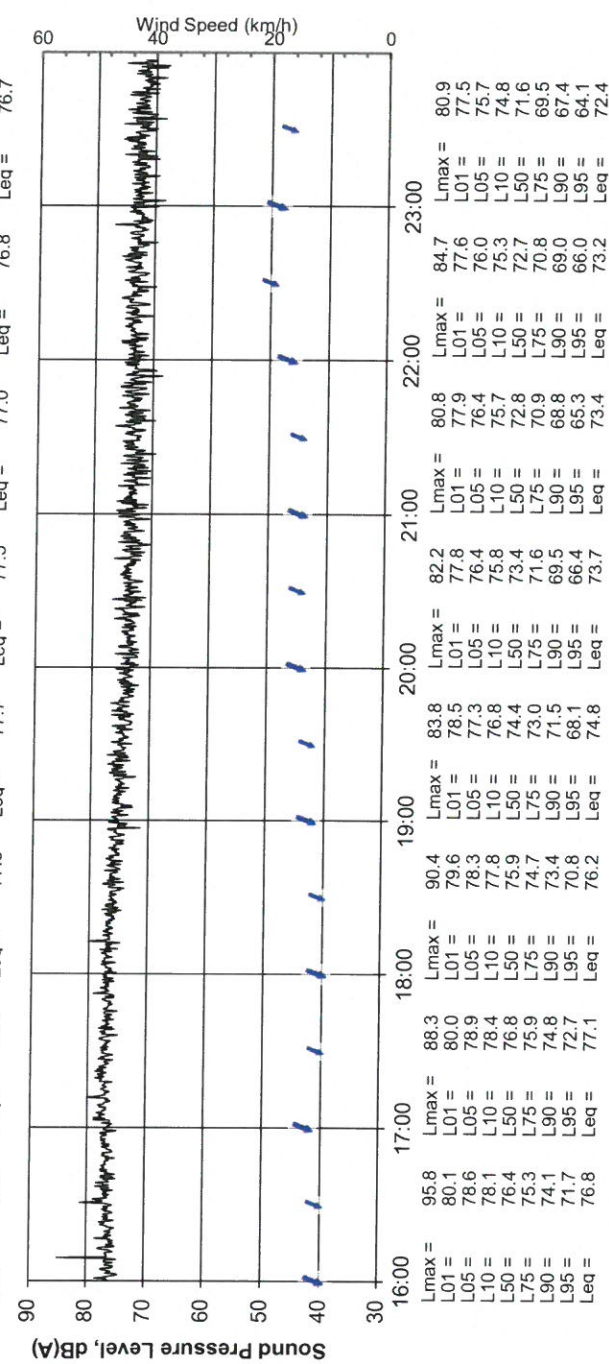
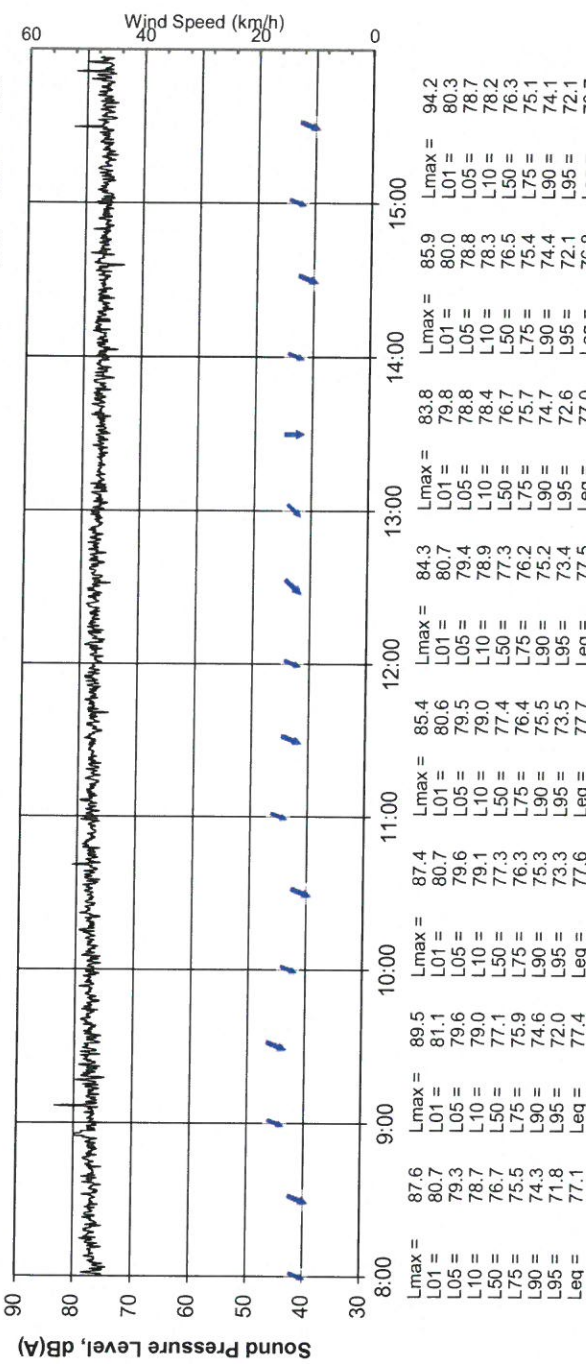
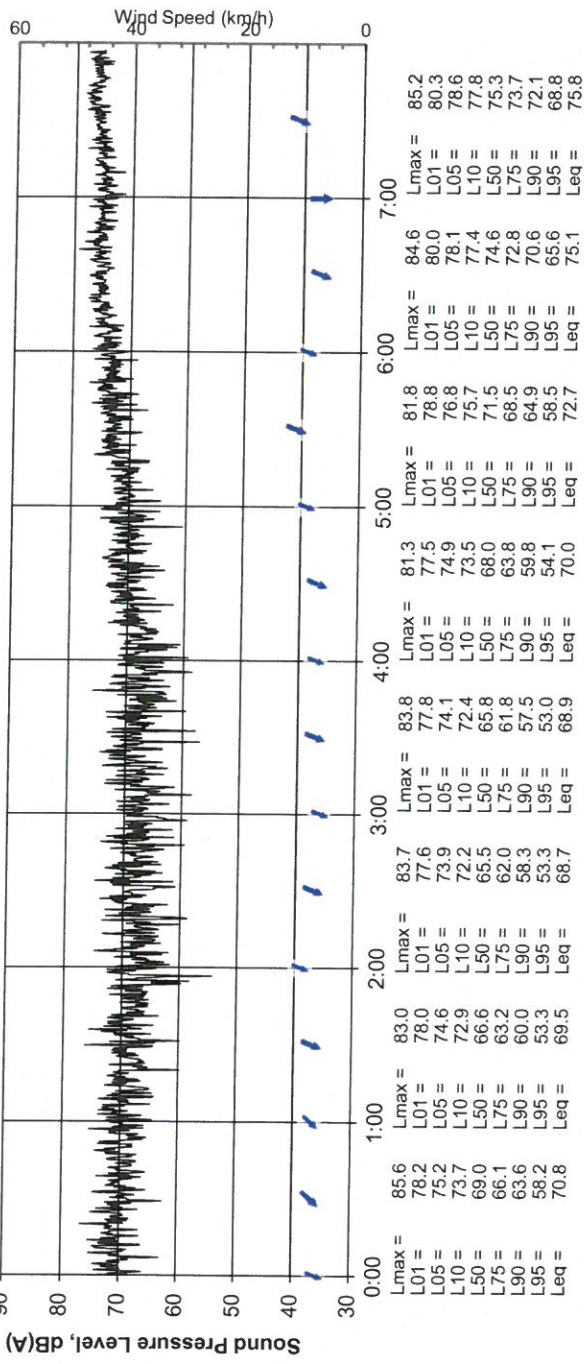
Results of Noise Monitoring

Client: Pona Constructions Pty Ltd

Location: 149 Hansworth Street, Mulgrave

Date: Saturday
06 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high





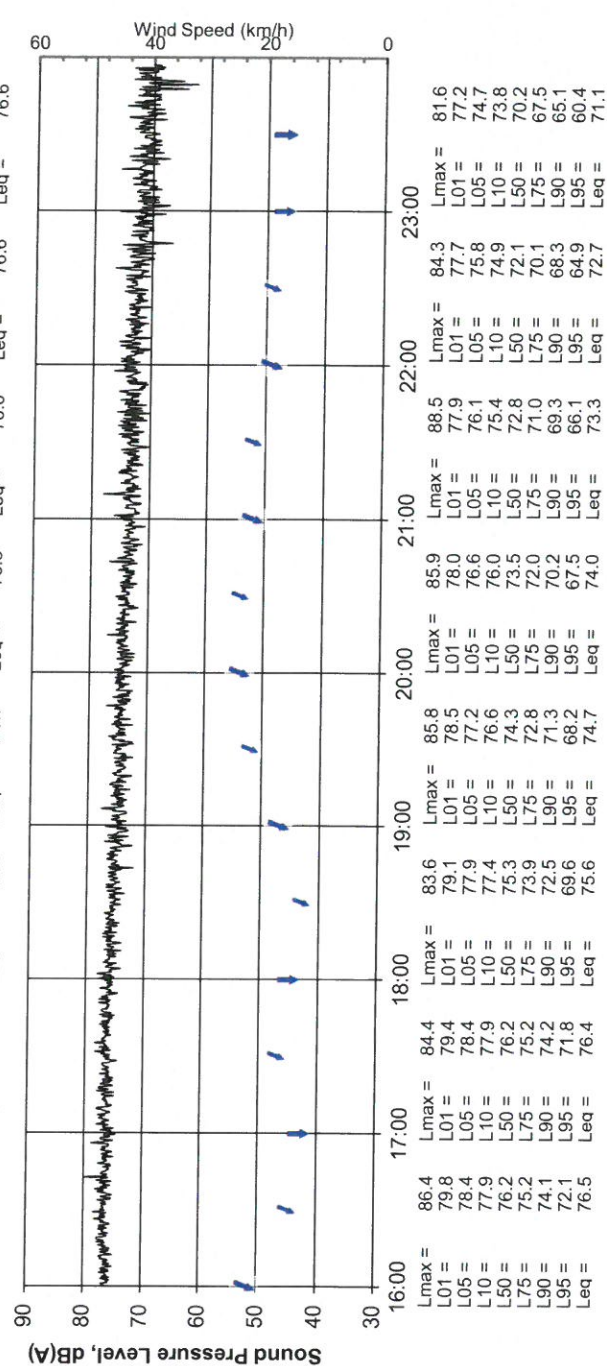
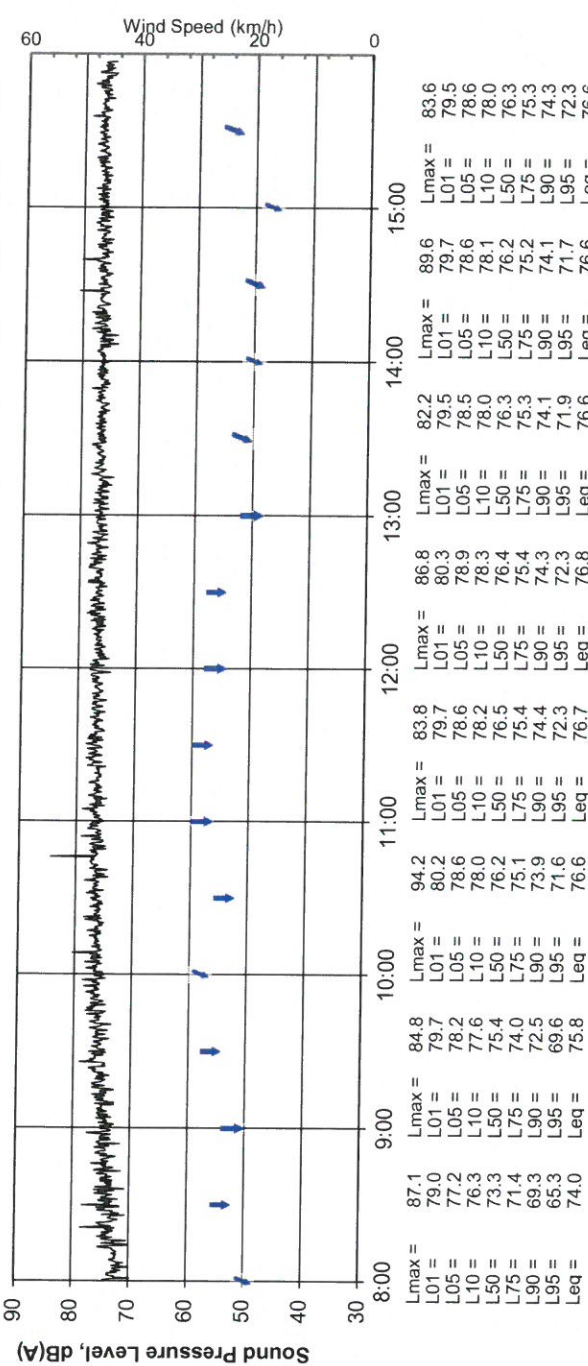
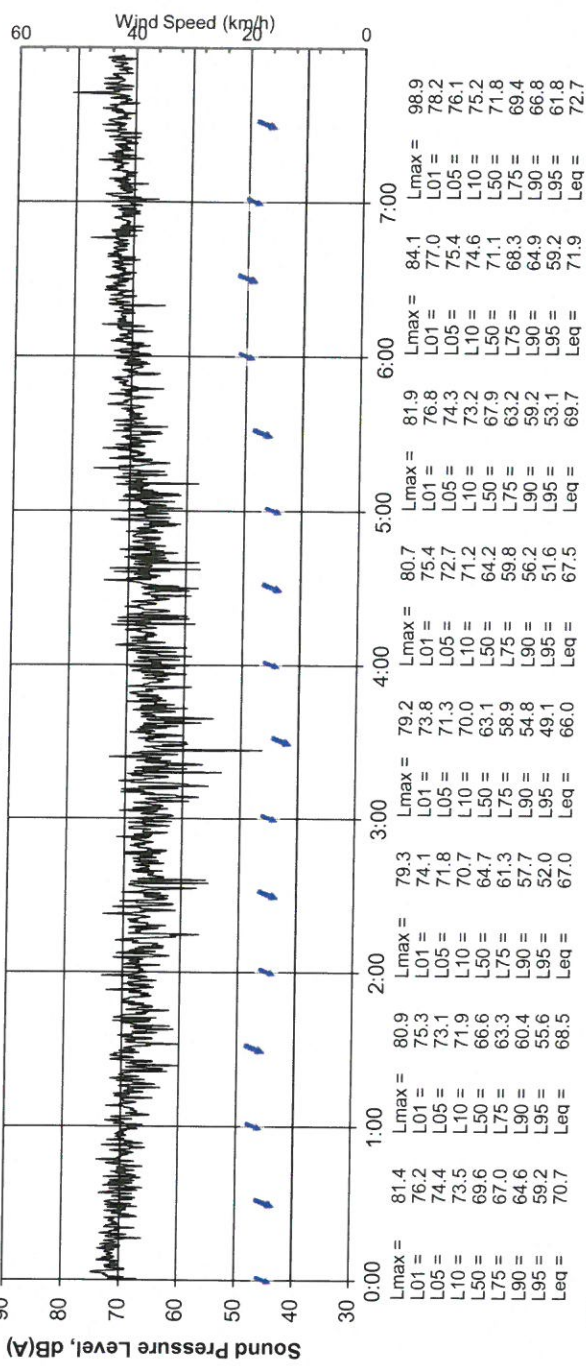
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Sunday
07 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high





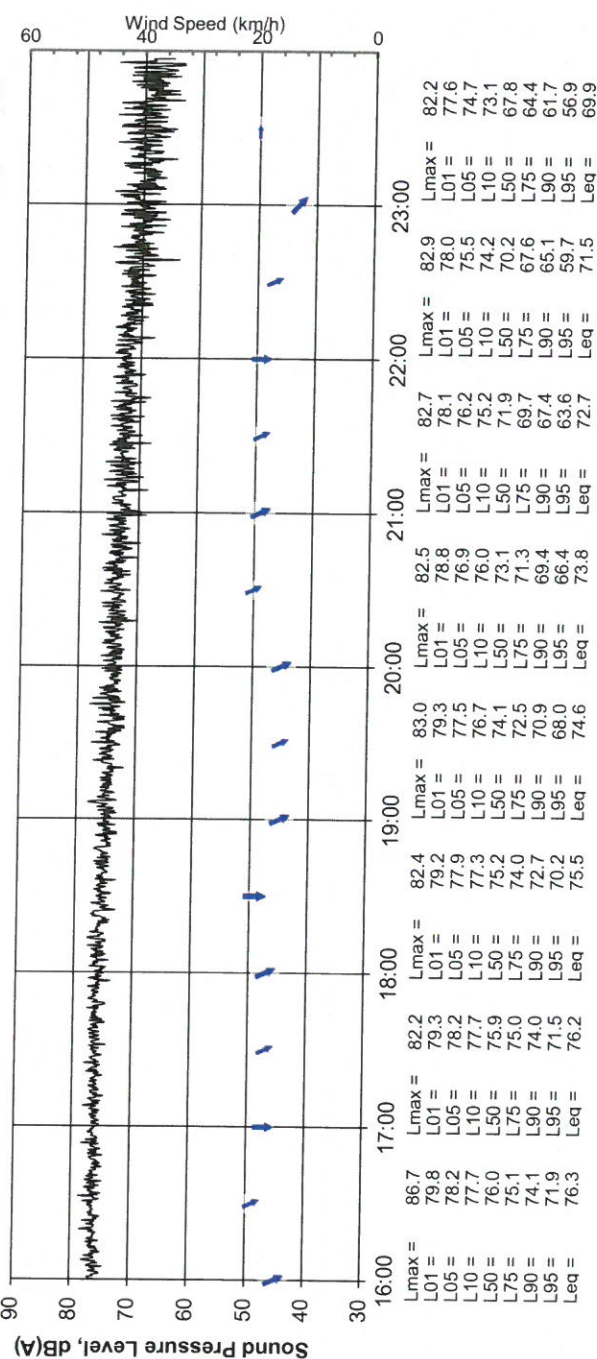
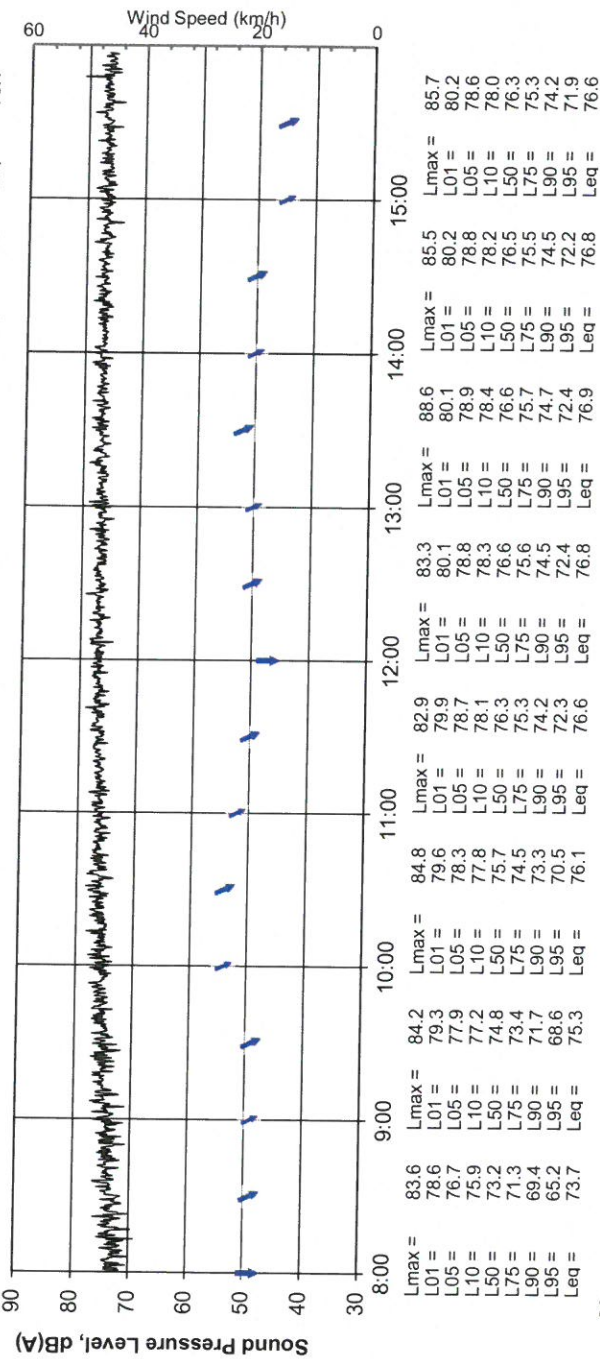
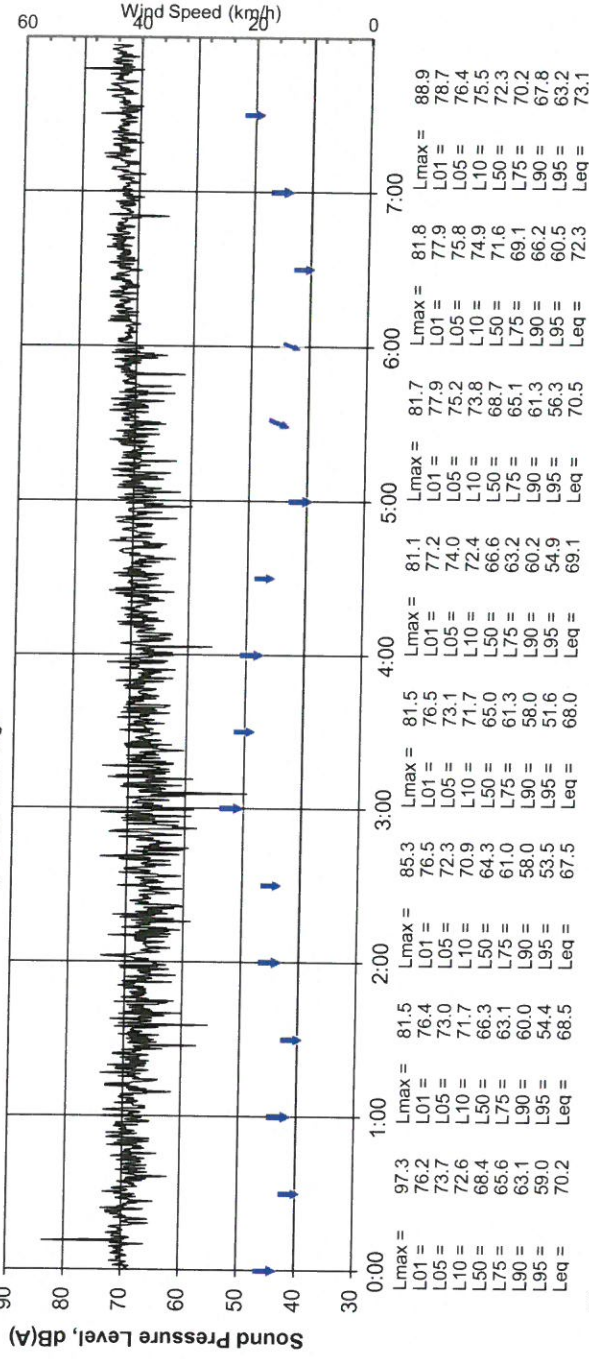
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Monday
08 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high





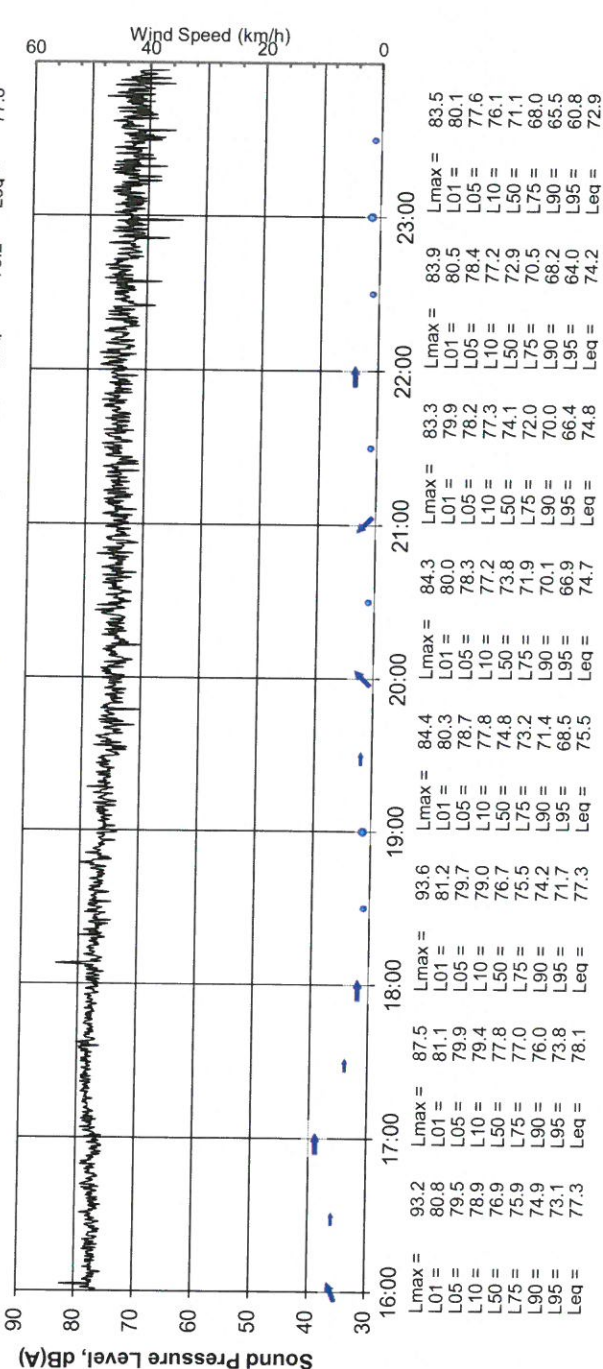
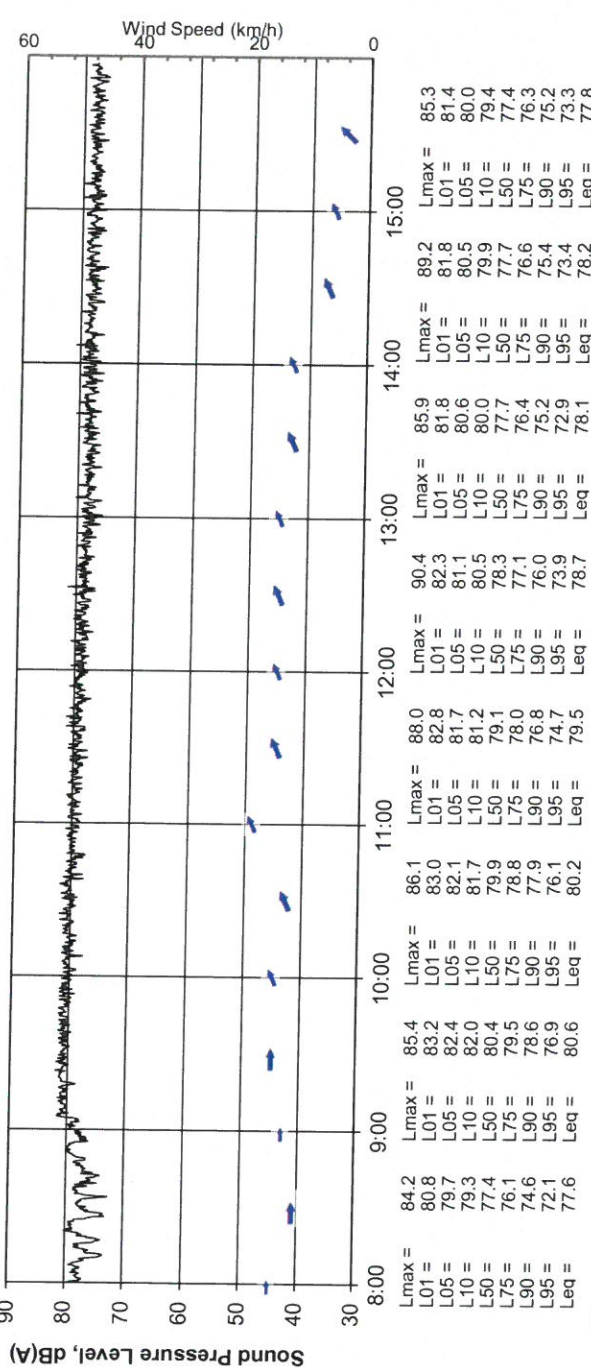
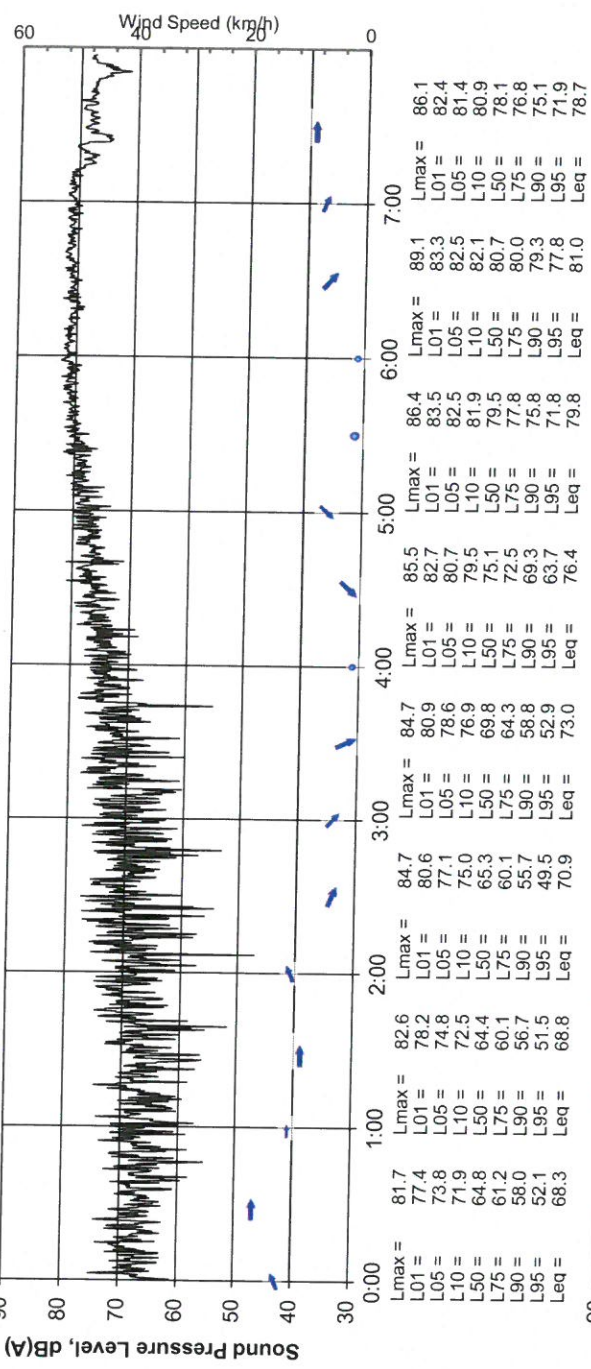
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Tuesday
09 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high





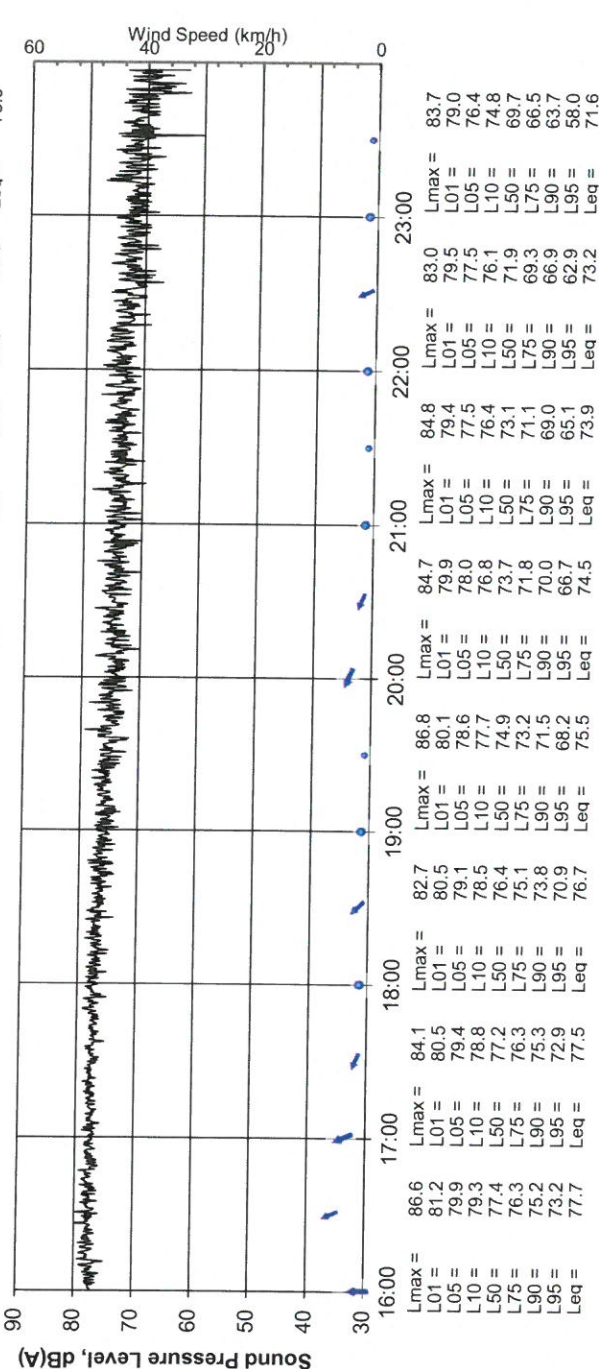
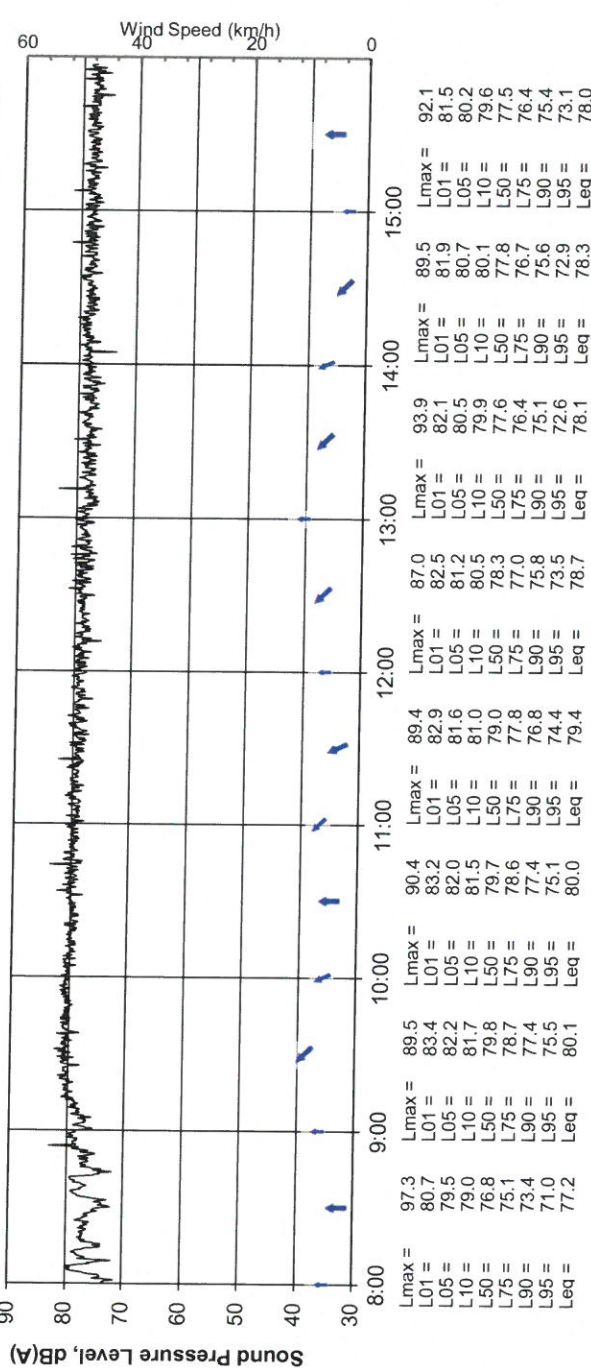
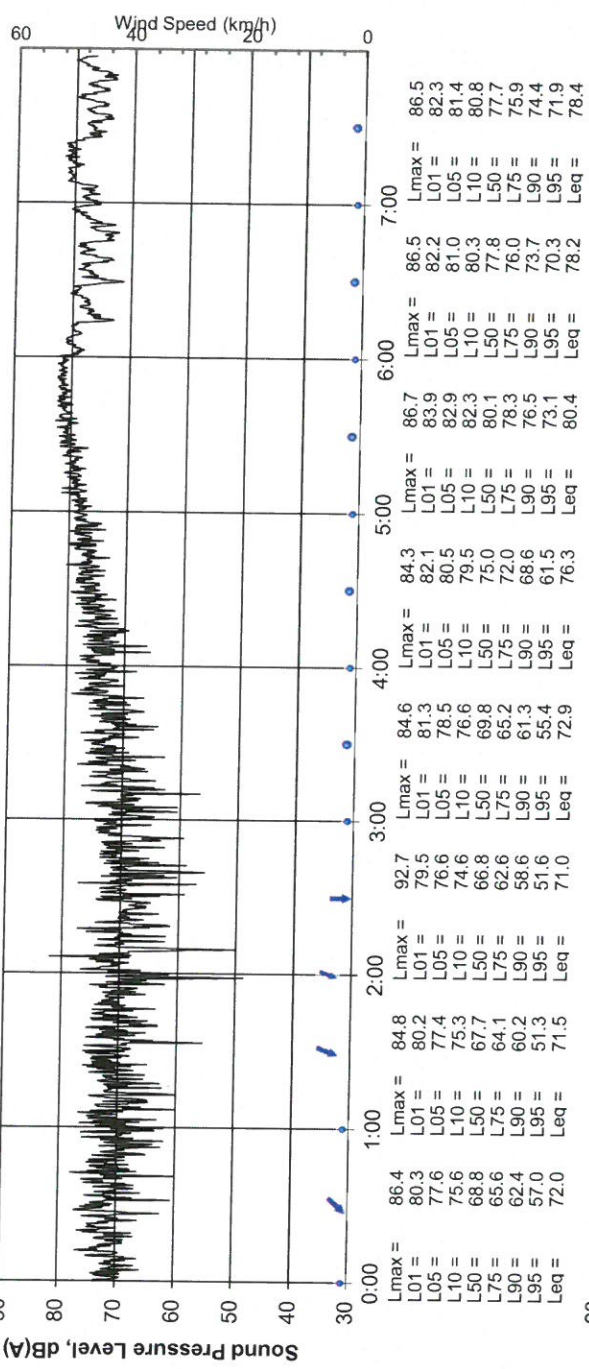
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Wednesday
10 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high





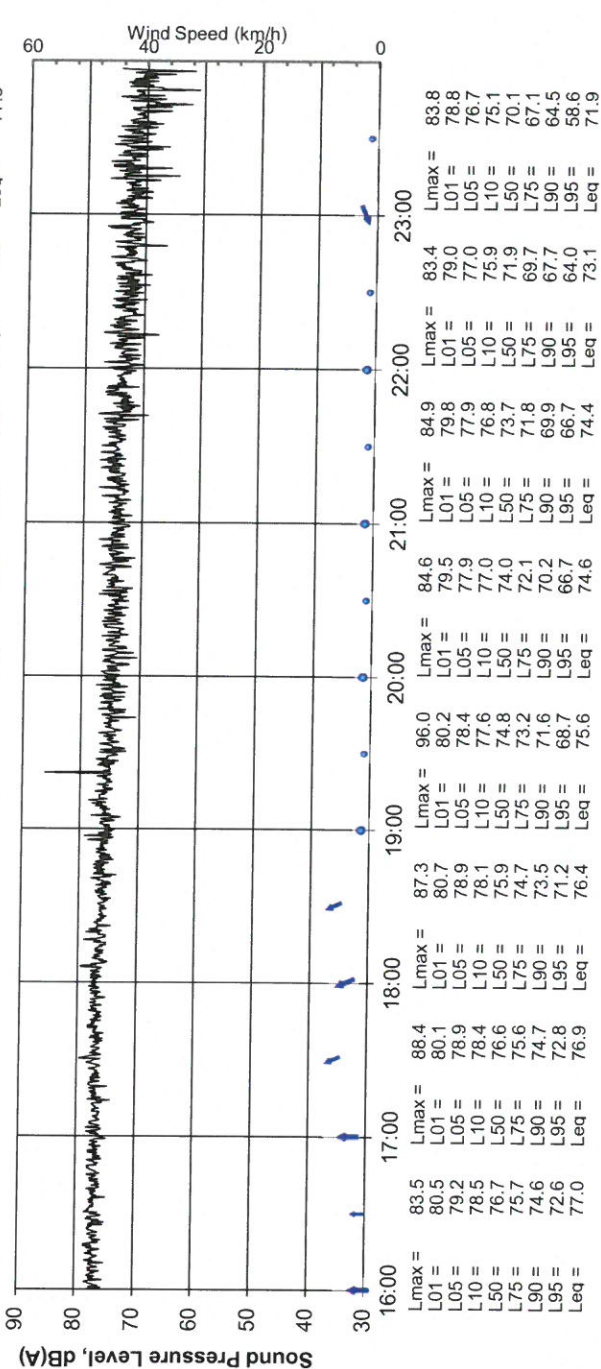
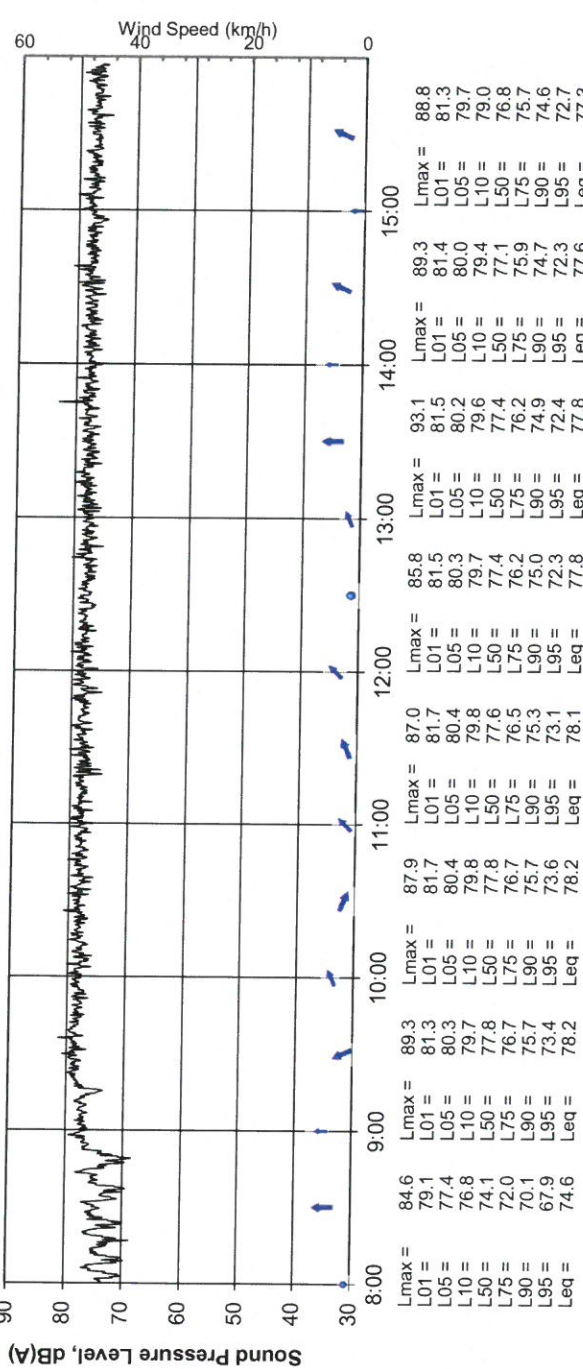
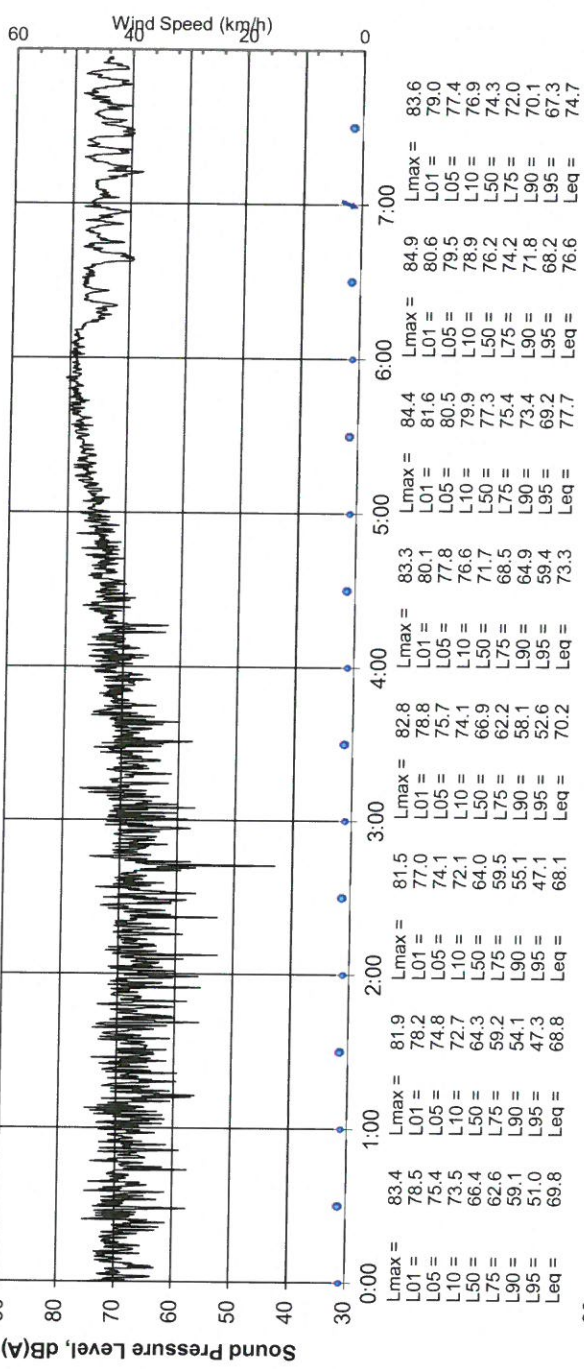
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

Location 149 Hansworth Street, Mulgrave

Date: Thursday
11 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high





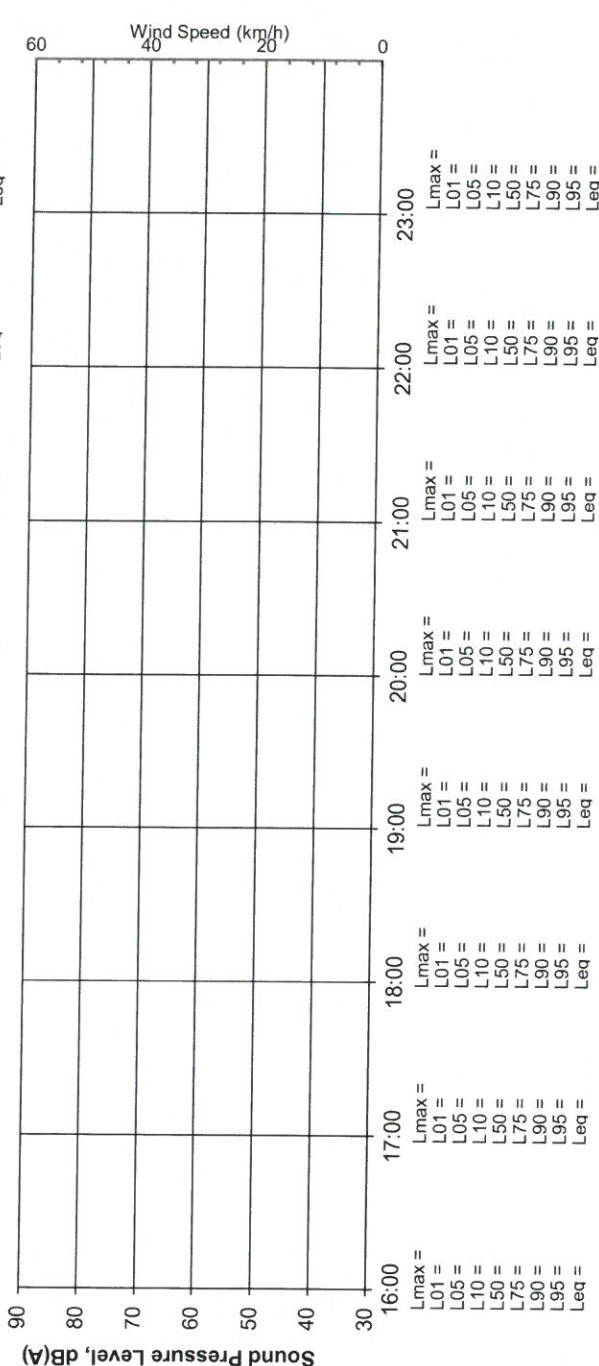
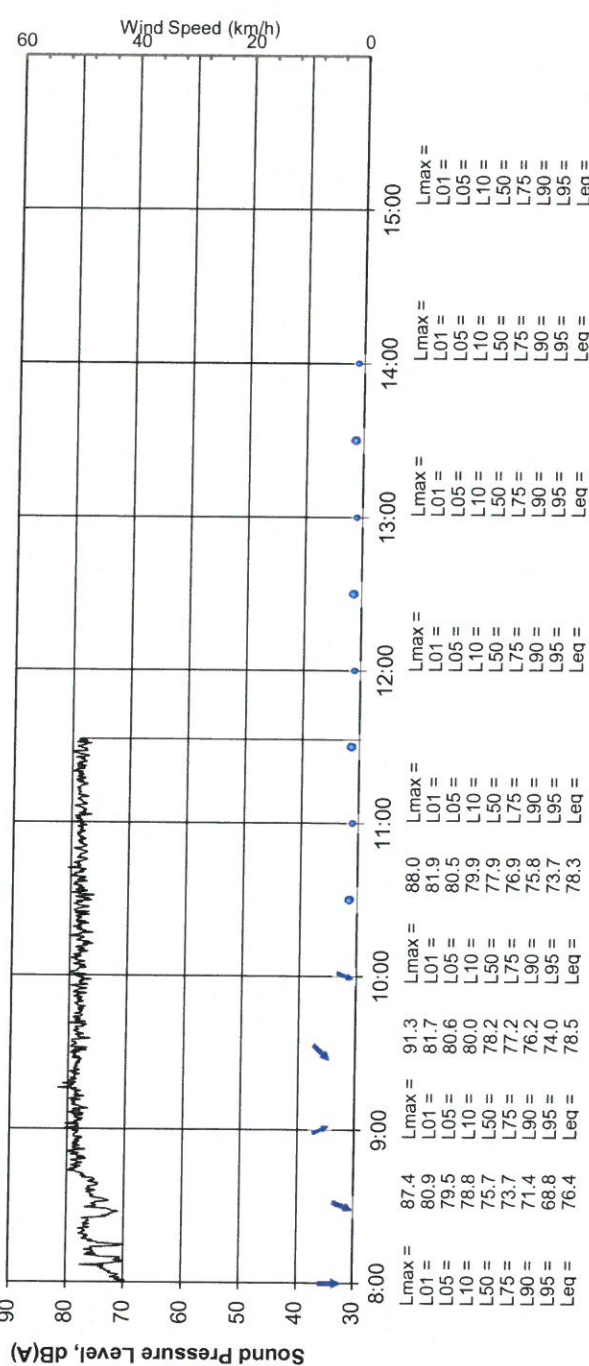
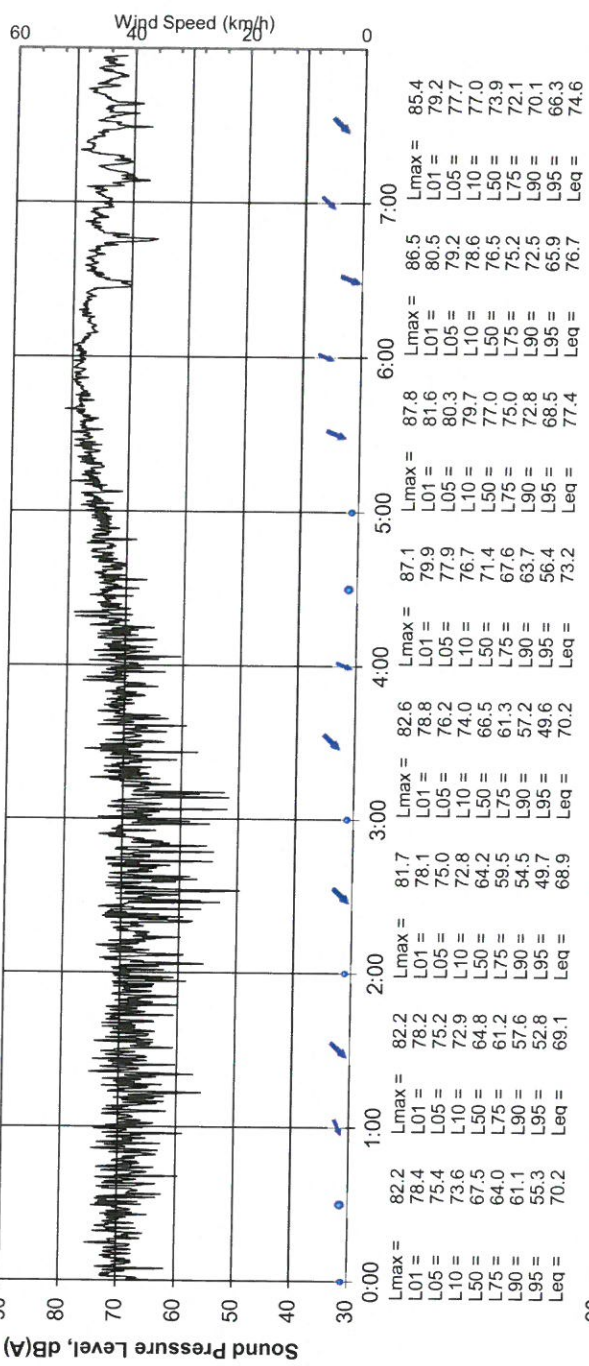
Results of Noise Monitoring

Client: Pong Constructions Pty Ltd

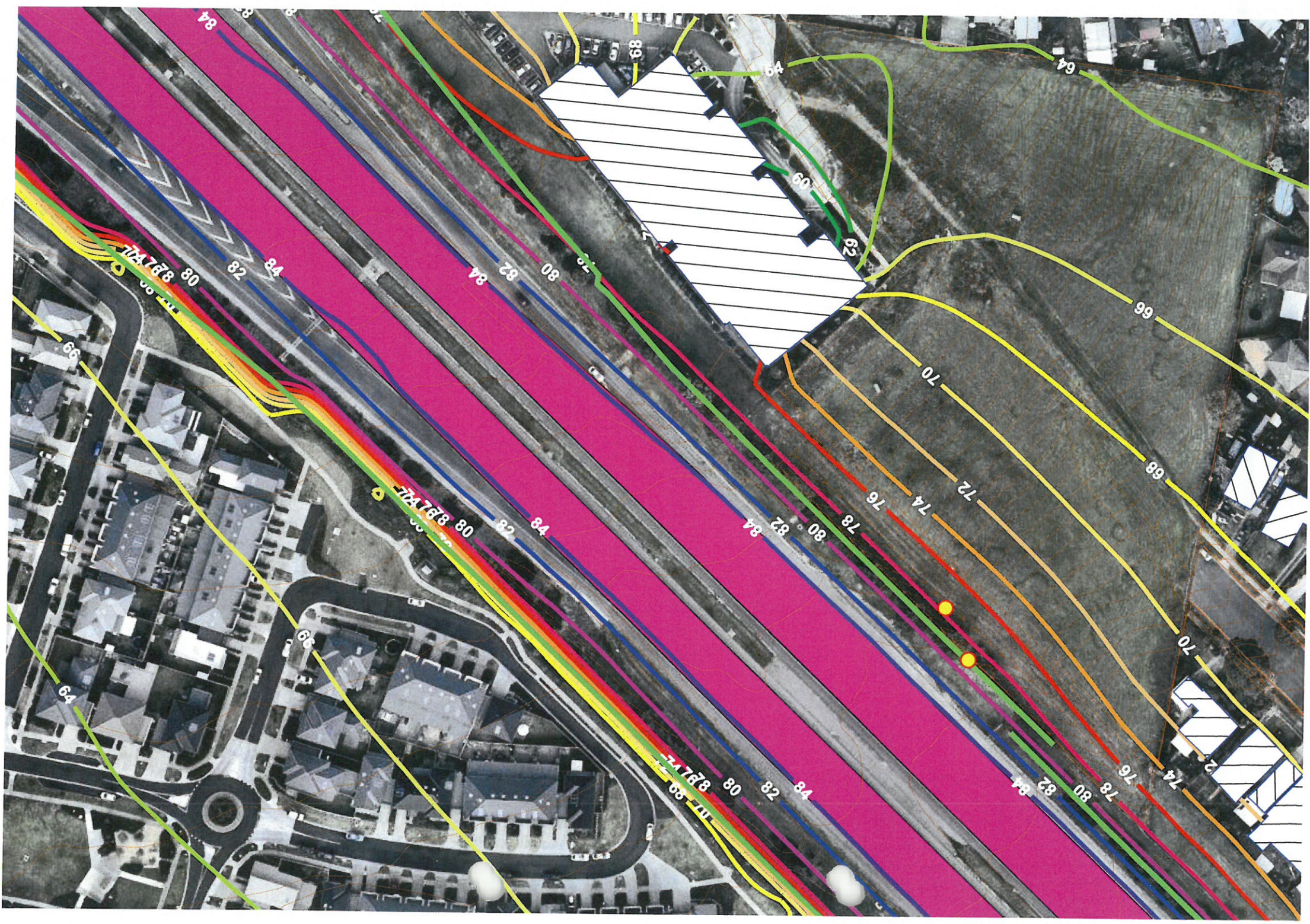
Location 149 Hansworth Street, Mulgrave

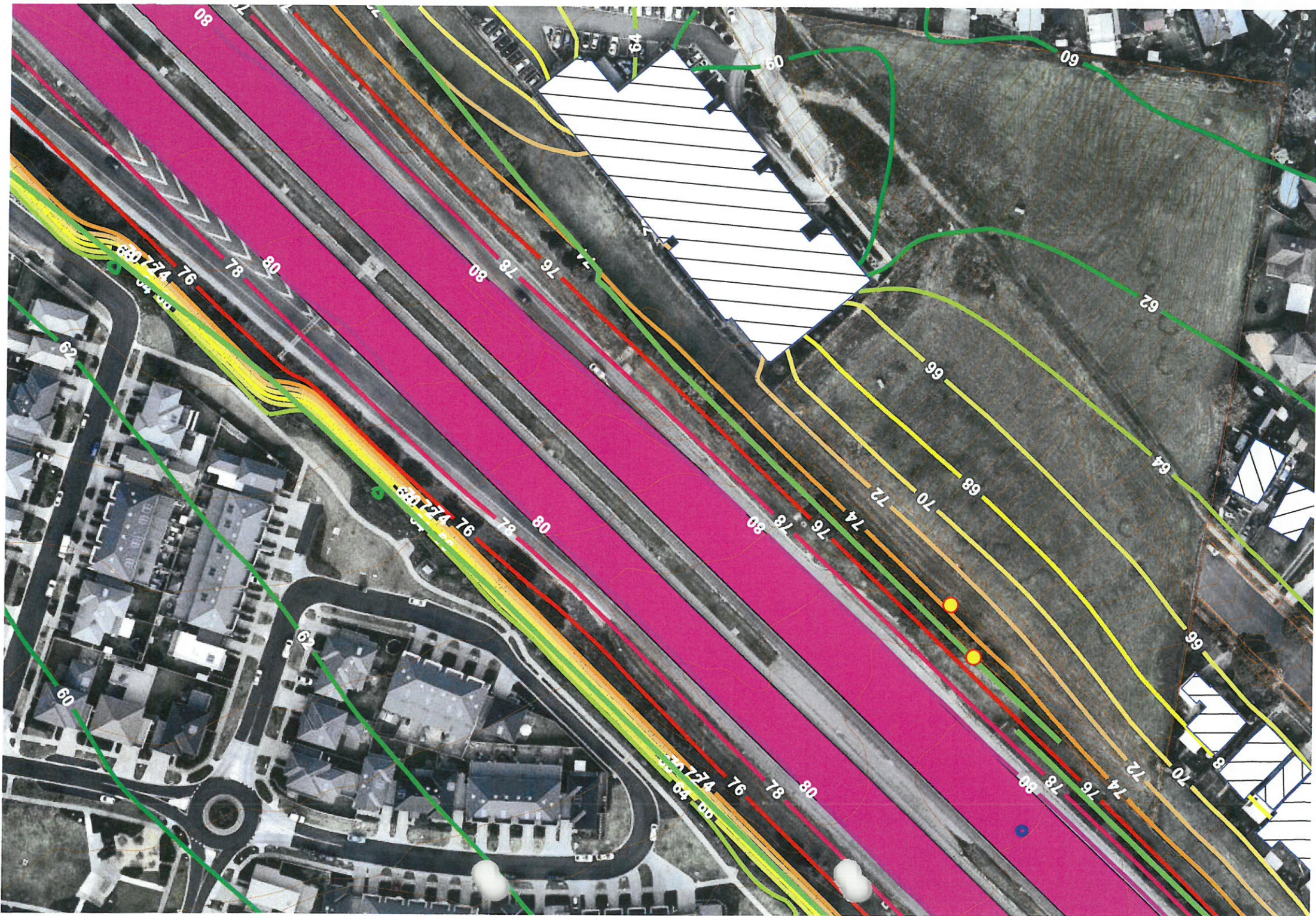
Date: Friday
12 Jun 2015

Microphone position: 6.3m from existing fence, 6.5m high



Noise Model Showing Noise Levels across Existing Site (6.5 m AGL)





Noise Model Showing Distribution of Noise across Apartment Façade

