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STOCKLAND WETHERILL PARK

OPERATIONAL NOISE ASSESSMENT

TF010-01F03 (REV 1) OPERATIONAL NOISE ASSESSMENT

15 NOVEMBER 2010

Prepared for:

Stockland Developments Pty Ltd

Attention: MS JULIA CAIN

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CONTENTS

List of Tables

1 INTRODUCTION

Renzo Tonin & Associates were engaged to conduct an environmental noise assessment for the operation of the proposed expansion of the existing Stockland Shopping Centre located on Polding Street, Wetherill Park. More specifically, this report quantifies the noise impact from the operation of the proposed expansion and assesses the potential impact on neighbouring premises close to the site.

Noise emissions from the site are assessed in accordance with the requirements set out in the NSW Department of Environment, Climate Change and Water's (DECCW) 'Industrial Noise Policy' (INP), while traffic noise on public roads as a result of the site generated traffic is assessed against the DECCW's 'Environmental Criteria for Road Traffic Noise' (ECRTN).

This report is to form part of the Development Application to be submitted to Fairfield City Council

The work documented in this report was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001.

2 PROJECT DESCRIPTION

2.1 Background

The existing Stockland Wetherill Park shopping centre is to be expanded to include additional specialty shops, a supermarket, a mini major retailer and basement, ground and roof top car parking areas.

This report forms part of the Development Application (DA) that is to be submitted to the Fairfield City Council. In accordance with Council guidelines, operational noise from the proposed redeveloped site is assessed against the DECCW's INP and ECRTN.

2.2 Site Description

The site is located in Wetherill Park and is bound by Restwell Road to the south, the Liverpool-Parramatta Transitway to the west, Polding Street to the north and Prairiewood High School to the east. Residential properties are located within the vicinity of the site to the west (across the Transitway), to the north (across Polding Street) and to the east (sharing a common boundary). Existing commercial premises, including a cinema, library and childcare centre are located within the site.

The nearest and potentially worst affected sensitive receivers were identified during a site inspection. These sensitive receivers are as follows:

- **Receiver R1 – 13 Housman Street, Wetherill Park**
  Residential property approximately 50m north of the site and across Polding Street. Noise environment representative of residences along Housman Street and/or adjacent to Polding Street
- **Receiver R2 – 40 Belair Place, Wetherill Park**
  Residential property adjoining the site to the east and sharing a common boundary. Noise environment representative of residences east of the site.
- **Receiver R3 – Prairiewood High School**
  High school adjoining the site to the east and sharing a common boundary.

Figure 1 is a locality map showing the site, its surrounding area and receiver locations.

2.3 Hours of Operation

The proposed redeveloped areas of the shopping centre are anticipated to operate under the same general operating hours of the existing shopping centre.

- 9.00am to 5.30pm, Monday to Wednesday and Fridays

- 9.00am to 9.00pm on Thursdays
- 9.00am to 5.00pm on Saturdays
- 10.00am to 4.00pm on Sundays

2.4 Noise Issues

Potential noise emissions from the development impacting upon nearby residential and commercial premises include:

- Continuous noise from mechanical plant;
- Intermittent noise from the loading dock;
- General carpark noise from the proposed multi-storey car park;
- Traffic noise on public roads due to additional traffic generated by the development; and
- Noise emission from the proposed gymnasium.

2.5 Proposed Gymnasium

With respect to the proposed gymnasium, details of the fit-out are not yet available at this stage of the development. Since windows are likely to be fixed and due to the separation distance to residences, noise emissions from the operation of the gymnasium are not expected to cause adverse impacts. However, we recommend that a detailed assessment of noise emission from the gymnasium be undertaken when fit-out details and operating hours are known. Where noise emission may be found to exceed criteria, noise reduction can be readily achieved through appropriate design of the internal fit-out. Therefore, no further assessment of noise emission form the gymnasium will be undertaken further from herein.

3 EXISTING ACOUSTIC ENVIRONMENT

Background noise varies over the course of any 24 hour period, typically from a minimum at 3am in the morning to a maximum during morning and afternoon traffic peak hours. Therefore, the NSW INP requires that the level of background and ambient noise be assessed separately for the daytime, evening and night-time periods. The INP defines these periods as follows:

- **Day** is defined as 7:00am to 6:00pm, Monday to Saturday and 8:00am to 6:00pm Sundays & Public Holidays.
- **Evening** is defined as 6:00pm to 10:00pm, Monday to Sunday & Public Holidays.
- **Night** is defined as 10:00pm to 7:00am, Monday to Saturday and 10:00pm to 8:00am Sundays & Public Holidays.

Traffic noise levels are assessed separately for daytime and night time periods, defined by the ECRTN as follows:

- **Day** is defined as 7:00am to 10:00pm;
- **Night** is defined as 10:00pm to 7:00am.

3.1 Noise Monitoring Locations

Noise measurements are to be taken at the nearest or potentially most affected residential locations. In this case the nearest and potentially most affected locations were:

- **Location M1 – 9 Housman Street, Wetherill Park**
  Noise monitor located in the front yard and positioned in the free field (ie. away from any buildings). The noise environment was dominated by traffic noise from Polding Street and natural sounds (eg. birds and insects). Noise levels at this location were considered representative of Receiver R1.
- **Location M2 – 40 Belair Place, Wetherill Park**
  Noise monitor located in the rear yard and positioned in the free field (ie. away from any buildings). The noise environment was dominated by natural sounds (eg. birds and insects) and distant traffic noise from Polding Street and the shopping centre car park areas. Noise levels at this location were considered representative of Receivers R2 and R3.

To quantify the existing ambient noise environment, long-term unattended noise monitoring was conducted at the above locations over ten (10) days, between Friday 15th and Monday 25th October 2010.

Figure 1 shows the long term monitoring locations.

Appendix A of this report presents a description of acoustic terms. Appendix B details the noise monitoring methodology. The graphical recorded output from long term noise monitoring is included in Appendix C to this report. The graphs in Appendix C were analysed to determine a single assessment background level (ABL) for each day, evening and night period, and the RBL for each period is taken as the median of the ABL's in accordance with the NSW DEC's 'Industrial Noise Policy'.

3.2 Existing Background & Ambient Noise Levels

Existing background and ambient noise levels are presented in Table 3.1 below.

The noise monitoring was conducted outdoors in the open (ie away from building facades) at the locations presented. Operational noise from the proposed redevelopment should be assessed away from the facade at the potentially most affected residential boundaries and therefore the representative noise levels listed in Table 3.1 are directly applicable.

Table 3.1 – Measured Existing Background (L_{90}) & Ambient (L_{eq}) Noise Levels, dB(A)

Noise Monitoring Locations	L_{90} Background Noise Levels			L_{eq} Ambient Noise Levels		
	Day	Evening	Night	Day	Evening	Night
Location M1 – 9 Housman Street	47	46	40	59	58	54
Location M2 – 40 Belair Place	45	46	39	55	55	51

Notes:
1. *Day is defined as 7:00am to 6:00pm, Monday to Saturday; 8:00am to 6:00pm Sundays & Public Holidays.*
2. *Evening is defined as 6:00pm to 10:00pm, Monday to Sunday & Public Holidays.*
3. *Night is defined as 10:00pm to 7:00am, Monday to Saturday; 10:00pm to 8:00am Sundays & Public Holidays.*

The noise monitor located at Location M1 was also exposed to traffic noise from Polding Street and the measured traffic noise level results are shown below. It is noted that Polding Street is classified as a collector road. Road traffic noise from the site should be measured at 1m from the building facade most exposed to traffic noise. Therefore the representative noise levels listed in Table 3.2 have been corrected to allow for façade reflections [ie. + 2.5dB(A)].

Table 3.2 – Measured Existing Road Traffic (L_{eq}) Noise Levels

Noise Monitoring Location	Road Traffic Noise Source	Distance From Road	$L_{Aeq,1hr}$ Traffic Noise Levels, dB(A)			
			Day Upper Level	Day Lower Level	Night Upper Level	Night Lower Level
Location M1 – 9 Housman St	Polding St	29m	63	60	61	51

Notes:
1. *$L_{Aeq,1hr}$ noise levels applicable for collector roads*
2. *Noise levels have been corrected for façade reflections; ie. + 2.5dB(A)*

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Title: Figure 1 : Site, Surrounds, Receivers & Monitoring Locations

Date : 05/11/10

Scale: NTS

Project: TF010-01 Stockland Wetherill Park

Ref : TF010-01P02 (rev 0)

4 OPERATIONAL NOISE CRITERIA

All noise emissions as a result of the site operations, including mechanical plant, loading dock and carpark activities are assessed in accordance with the DECCW's 'Industrial Noise Policy' (INP). The assessment procedure in terms of the INP has two components:

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

4.1 Intrusiveness Criteria

According to the INP, the intrusiveness of a mechanical noise source may generally be considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (represented by the L_{Aeq} descriptor), measured over a 15-minute period, does not exceed the background noise level measured in the absence of the source by more than 5dB(A). It is noted that this is applicable to residential properties only.

Therefore, the intrusiveness criterion for residential noise receptors as summarised in the INP is as follows:

$L_{Aeq,\ 15\ minute} \leq$ Rating Background Level (L_{A90}) + 5 dB(A)

The intrusiveness criteria for the potentially most affected residential receivers are presented below.

Table 4.1 – Intrusiveness Noise Criteria, dB(A)

Receiver	Intrusiveness Criteria, $L_{Aeq,15min}$		
	Day	Evening	Night
Receiver R1 – 13 Housman Street	47 + 5 = **52**	46 + 5 = **51**	40 + 5 = **45**
Receiver R2 – 40 Belair Place	45 + 5 = **50**	46 + 5 = **51**	39 + 5 = **44**

Based on the operating hours of the proposed new areas of the shopping centre, the day and evening periods would be applicable for the noise assessment and therefore will be assessed against from herein.

4.2 Amenity Criteria

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.1 of the NSW INP, the applicable parts of which are reproduced below.

Nearby critical receivers consists of residential properties situated in a suburban area and a high school with classrooms and playground areas. Based on the nature of these receivers, the following amenity criteria (L_{Aeq}) will be applied.

Table 4.2 – Amenity Noise Criteria, dB(A)

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level	
			Acceptable	Maximum
Residence[1]	Rural	Day	55	60
		Evening	45	50
		Night	40	45
School classroom - internal	All	Noisiest 1-hour period when in use	35	40
Active recreation area (eg. school playground)	All	When in use	55	60

Notes: 1. Residential locations have been categorised as 'Suburban'. Given that the existing noise environment is not influenced by existing industry, the Amenity Criteria have not been modified in accordance with Table 4.1, NSW INP.

As a general rule, masonry / brick type building structures would typically provide a 15dB(A) reduction from external noise levels to internal noise levels. Therefore, the equivalent external amenity noise criterion for school classrooms would be **60dB(A)**.

4.3 Summary

In assessing noise impact, both criteria components must be taken into account to form the project specific noise levels (PSNLs) for the each receiver location.

The applicable PSNLs (including intrusive and amenity criteria) are presented in the table below.

Table 4.3 – INP Project Specific Noise Levels, dB(A)

Receiver		Intrusiveness Criteria $L_{Aeq,15min}$		Amenity Criteria $L_{Aeq,period}$	
		Day	Evening	Day	Evening
Receiver R1 – 13 Housman Street		52	51	55	45
Receiver R2 – 40 Belair Place		50	51		
Receiver R3 – Prairiewood HS[2]	Classroom	N/A		50[1]	N/A
	Playground	N/A		55	N/A

Notes: 1. Equivalent external noise level
2. School only operates during the day period

From the above table it can be seen that the night period for Receiver R1 is the most stringent for both the intrusiveness and amenity criteria, while for Receiver R2 the day and night periods for the intrusiveness and amenity criteria, respectively, are the most stringent.

Therefore, the most stringent periods will be assessed against from herein for each receiver location and each INP assessment criteria.

5 NOISE SOURCES

5.1 Mechanical Plant

Mechanical plant will be located in various areas of the proposed new shopping centre expansion. The main sources of noise that may impact nearby receivers include:

- Carpark exhaust fans
- Kitchen exhaust fans
- Toilet exhaust fans
- Supply air intake fans
- Cooling towers

Exact make and model numbers of the proposed mechanical plant are unknown at this stage of the project. However, typical source noise levels for the above types of mechanical plant have been obtained from measurements from past projects and/or data held in our library files and are presented in the table below.

Table 5.1 – Sound Power Levels of Mechanical Plant & Equipment

Mechanical Plant Item	Sound Power Level, dB(A) re. 1pW
Carpark Exhaust Fan	96
Kitchen Exhaust Fan	89
Toilet Exhaust Fan	79
Supply Air Intake Fans	88
Cooling Towers	87

Notes: 1. Based on data from post projects and/or held in our library files

It is noted that above noise levels are assumptions only and more detailed analysis should be undertaken once selection of the mechanical plant have been finalised during the detailed design stage of the project.

5.2 Loading Dock

Renzo Tonin & Associates have measured loading dock noise during past projects. Typical loading dock activities commonly causing noise include:

1. Reversing alarms on trucks when backing into the loading dock area
2. Truck engines starting & doors closing
3. Operation of refrigeration equipment mounted on refrigerated vehicles
4. Trolleys and palettes being moved
5. People talking

6. PA system
7. Electric cardboard compactor
8. Compressed air.

Table 5.2 below summarises typical L_{Aeq} sound power levels of various loading dock activities.

Table 5.2 – Typical Sound Power Levels of Loading Dock Activities

Main Activities (refer to activity list above)	Sound Power Level, dB(A) re. 1pW
4, 8	< 78
2, 4	88
3, 4	89
3, 4	< 78
2, 7	84
1, 2, 4	91
4, 7	86
1, 2, 6	89
1, 2, 4, 5, 6	< 78
Mean	**87**

It is anticipated that the loading dock may be used at any time during the proposed operating hours. Furthermore, based on architectural drawings issued by Stockland, the loading dock will be located on the northern side of the site with separate access via Polding Street.

For noise modelling purposes it is assumed that as a worst case scenario, up to two trucks will utilise the loading dock area in a 15 minute period.

5.3 Carpark Activities

Noise generated by carpark activities which may contribute to the overall L_{Aeq} noise level emission from the site includes vehicle doors closing, vehicle engines starting, vehicles accelerating and vehicles moving. To assess the carpark noise, the L_{Aeq} noise level at the nearest affected receivers was determined based on the number of vehicle activities expected to occur during that operation of the new carpark areas. Sound Exposure Level (SEL) measurements from our database and library files were used for the purpose of this assessment.

The sound power levels generated by car park activities on site, as used in the predictive noise modelling for this project, are presented in Table 5.3 below.

Table 5.3 – Sound Power Levels for Car Park Activities

Activity	Sound Power Level, dB(A) re 1pW	
	SEL	L1
Vehicle door closing	84	100
Vehicle engine starting	90	100
Vehicle accelerating	93	95
Vehicle moving (10-30km/h)	84	85

Based on the traffic assessment report prepared by Colston Budd Hunt & Kafes Pty Ltd (ref. 7931/1, dated November 2010) and for noise modelling purposes, it has been assumed that up to **700** vehicle movements will occur in a one hour period as a result of the proposed new areas. Furthermore, it has also been assumed that all the car parking spaces in the new multi-storey car park and the new car park located on the north western side of the site will be filled up in a one hour period.

6 NOISE ASSESSMENT

Noise emissions were determined by modelling the noise sources, receiver locations, topographical features of the intervening area and existing building structures using the Cadna-A Version 4.0.135 computer program. The program calculates the contribution of each noise source at each specified receptor point and allows for the prediction of the total noise from a site.

The noise prediction models takes into account:

- Location of noise sources and receiver locations;
- Height of sources and receivers;
- Separation distances between sources and receivers; and
- Attenuation from existing structures (natural and purpose built).

The following noise predictions have been based on architectural drawings prepared by Stockland (drawing no. DA003-A to DA008-A; DA202-A to DA204-A; and DA301-A to DA303-A) and source noise levels presented in Section 5 above.

Furthermore, the following assumptions have also been used in the noise predictions:

- Loading dock activity occurring for up to 15 minutes when a delivery vehicle uses the loading dock area;
- Up to two trucks using the loading dock area in a 15 minute period;
- Delivery trucks will enter and exit the site via the dedicated driveway on Polding Street;
- Cars will enter and exit the site via the existing carpark driveways off Polding Street and Restwell Road;
- Up to 700 additional car movements in the car park area per hour;
- All car parking spaces in the new multi-storey car park and the new car park on the north western side of the site will be filled up in a one hour period; and
- Mechanical plant servicing the proposed new areas of the shopping centre are anticipated to operate concurrently during the typical operating hours of the shopping centre, as presented in Section 2.3.

Table 6.1 below presents the predicted noise levels at the nearest affected receivers due to the operation of the proposed new areas of Stockland Wetherill Park.

Table 6.1 – Predicted Noise Levels at Sensitive Receivers, dB(A)

Noise Source	Intrusiveness Assessment	Amenity Assessment	
Receiver R1 – 13 Housman Street			
INP Noise Criteria	*51*	*45*	
Mechanical Plant	35	35	
Loading Dock	39	39	
Carpark	39	39	
Cumulative (all sources)	43	43	
Complies?	Yes	Yes	
Receiver R2 – 40 Belair Place			
INP Noise Criteria	*50*	*45*	
Mechanical Plant	35	35	
Loading Dock	34	34	
Carpark	35	35	
Cumulative (all sources)	39	39	
Complies?	Yes	Yes	
Receiver R1 – Prairiewood High School			
INP Noise Criteria	*N/A[3]*	*50[1]*	*55[2]*
Mechanical Plant		42	
Loading Dock		<10	
Carpark		41	
Cumulative (all sources)		45	
Complies?		Yes	

Notes: 1. *Equivalent external noise level for school classrooms*
2. *Noise criteria for school playground*
3. *Intrusiveness assessment only applicable to residential receivers*

Predicted noise levels presented in the above table indicate that operational noise of the proposed new areas of Stockland Wetherill Park during the typical operating hours of the shopping centre (Section 2.3) will comply with the applicable noise criteria.

7 RECOMMENDATIONS

The following recommendations provide in-principle noise control solutions to maintain noise compliance to the nearest affected receiver locations. This information is presented for the purpose of Council approvals process and cost planning and shall not be used for construction unless otherwise approved in writing by the acoustic consultant.

The advice provided here is in respect of acoustics only. Supplementary professional advice may need to be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

As the type of mechanical plant items are not yet finalised at this early stage of the design process, the noise emissions calculated and presented in Section 6 are based on assumptions and data obtained from previous projects and held in our library files. Therefore, all mechanical plant, once selected, shall have their noise specifications and their proposed locations checked prior to their installation on site, to ensure that they shall not either singularly or in total emit noise levels which exceed the noise limits specified in Section 4 above.

If noise emissions from these plant items are calculated to be in excess of the set criteria at the affected receivers during the detailed design stage, then further appropriate acoustic treatment shall be implemented to ensure compliance with the relevant noise criteria. In general, noise controls for mechanical plant are standard and commercially available, and can be readily added to silence any potentially noisy plant. Such noise control treatment may include any of the following:

- procurement of 'quiet' plant;
- installation of commercially available silencers over noisy fans;
- installation of acoustic screens and barriers between plant and sensitive neighbouring premises;
- installation of partially-enclosed or fully-enclosed acoustic enclosures over plant; and

8 ROAD TRAFFIC NOISE ASSESSMENT

8.1 Road Traffic Noise Criteria

The L_{eq} noise level or the "equivalent continuous noise level" correlates best with the human perception of annoyance associated with traffic noise. The NSW *Environmental Criteria for Road Traffic Noise* (ECRTN) uses the $L_{Aeq(15hr)}$, $L_{Aeq(9hr)}$ and $L_{Aeq(1hr)}$ to assess traffic noise impact. The ECRTN is used to assess the potential traffic noise impact from the site onto residential receivers only. Therefore, given that residences within the vicinity of the site are generally impacted by traffic noise along Polding Street, noise due additional traffic from the proposed new areas of Stockland Wetherill Park travelling along Polding Street will be assessed from herein.

Table 1 in the ECRTN, 'Road Traffic Noise Criteria for Proposed Road or Residential Land Use Developments', divides land use developments into different categories and lists the respective noise criteria for each case.

Polding Street is categorised as a 'collector' road. The applicable criteria for the day and night periods are summarised in Table 8.1 below.

Table 8.1 – Applicable Road Traffic Noise Criteria, dB(A)

Type of Development	Day (7am-10pm)	Night (10pm-7am)	Where Criteria are Already Exceeded
8. Land use developments with potential to create additional traffic on collector road	$L_{Aeq(1hr)}$ 60	$L_{Aeq(1hr)}$ 55	Where feasible, existing noise levels should be mitigated to meet the noise criteria. In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB

Given that the typical operating hours of the proposed new areas of Stockland Wetherill Park will coincide with the typical operating hours of the existing shopping centre, as detailed in Section 2.3, only the day period will be applicable for the assessment of traffic noise.

8.2 Predicted Road Traffic Noise

Based on Section 3.20 of the traffic report prepared by Colston Budd Hunt & Kafes Pty Ltd (ref. 7931/1, dated November 2010), up to 165 additional vehicles per hour (two way) are expected to occur along Polding Street as a result of the operation of the proposed new areas of Stockland Wetherill Park.

The existing traffic noise levels and the traffic noise levels due to the operation of the proposed new areas of the shopping centre at Receiver R1, which represents residential receivers impacted by traffic noise along Polding Street, are presented in Table 8.2 below for the day period.

Table 8.2 – Traffic Noise Levels at Receiver R1, dB(A)

Period	Existing Traffic Noise Level	Traffic Noise as a Result of Proposed New Areas	Cumulative Traffic Noise Level
Day	60[1]	55	61

Notes: 1. *Existing traffic noise levels based on lower levels during the day period as presented in Table 3.2. This is considered to be conservative*

2. *Only day period assessed, coinciding with the typical operating hours of the proposed new areas of the shopping centre*

Based on the assumed additional traffic movements to and from the shopping centre as a result of the new proposed areas, it was predicted that traffic noise levels at Receiver R1 during the day period would increase overall traffic noise levels by 1 dB(A). However, a 1dB(A) increase is considered to be insignificant and inconsequential. Furthermore, traffic noise levels are not predicted to increase by more than 2dB(A) over the existing traffic noise levels, as stipulated in the ECRTN.

Therefore, traffic noise along Polding Street as a result of the traffic movements associated with the operation of the proposed new areas of the shopping centre will comply with the relevant traffic noise criteria.

9 CONCLUSION

Renzo Tonin & Associates have completed an assessment of the environmental noise impact from the operation of the proposed expansion of the existing Stockland Shopping Centre located on Polding Street, Wetherill Park. Noise impact from the proposed new areas of the shopping centre upon the potentially most affected noise sensitive locations, has been quantified and compared to the noise guidelines set by the NSW Department of Environmental, Climate Change and Water and Fairfield City Council for operation and road traffic noise.

Operational noise emissions from the site are expected to comply with the relevant noise criteria based on mechanical plant data assumed for the proposed new areas and a traffic assessment report prepared by Colston Budd Hunt & Kafes Pty Ltd. In-principal noise control measures have been recommended and should be considered once detailed information is obtained during the detailed design stage of the project.

Road traffic noise along Polding Street impacting residences as a result of traffic movements associated with the operation of the proposed new areas of the shopping centre was also determined to comply with the applicable ECRTN criteria.

APPENDIX A - GLOSSARY OF ACOUSTIC TERMS

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Adverse Weather — Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).

Ambient Noise — The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.

Assessment Period — The period in a day over which assessments are made.

Assessment Point — A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.

Background Noise — Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the $\mathbf{L_{90}}$ noise level (see below).

Decibel [dB] — The units that sound is measured in. The following are examples of the decibel readings of every day sounds:

0dB	The faintest sound we can hear
30dB	A quiet library or in a quiet location in the country
45dB	Typical office space. Ambience in the city at night
60dB	Martin Place at lunch time
70dB	The sound of a car passing on the street
80dB	Loud music played at home

	90dB The sound of a truck passing on the street
	100dB The sound of a rock band
	115dB Limit of sound permitted in industry
	120dB Deafening
dB(A):	A-weighted decibels The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_{max}	The maximum sound pressure level measured over a given period.
L_{min}	The minimum sound pressure level measured over a given period.
L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L_{90} noise level expressed in units of dB(A).

L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound Absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound Level Meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound Pressure Level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound Power Level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.

APPENDIX B - NOISE MONITORING METHODOLOGY

B.1 Noise Monitoring Equipment

All long term noise monitoring was conducted using RTA Technology noise loggers. The noise monitoring equipment used here complies with Australian Standard 1259.2-1990 "Acoustics - Sound Level Meters" and is designated as a Type 2 instrument suitable for field use.

A noise monitor consists of a sound level meter and a computer housed in a weather resistant enclosure. Ambient noise levels were recorded at a rate of 10 samples per second. Every 15 minutes, the data is processed statistically and stored in memory. The equipment was calibrated prior and subsequent to the measurement period using a Bruel & Kjaer Type 4230 calibrator. No significant drift in calibration was observed.

For short-term monitoring, a CEL593 precision sound level meter was used. This instrument complies with Australian Standard 1259.2-1990 "Acoustics - Sound Level Meters – Part 2: Integrating - averaging" and is designated as Type 1 instrument having an accuracy suitable for field and laboratory use.

The sound level analyser was calibrated prior and subsequent to the measurements using a Bruel & Kjaer Type 4231 calibrator. No significant drift in calibration was observed.

B.2 Meteorology during Monitoring

Measurements affected by extraneous noise, wind (greater than 5m/s) or rain were excluded from the recorded data in accordance with the INP. The Bureau of Meteorology provided meteorological data, which is considered representative of the site, for the duration of the noise monitoring period.

B.3 Noise vs Time Graphs

Noise almost always varies with time. Noise environments can be described using various descriptors to show how a noise ranges about a level. In this report, noise values measured or referred to include the L_{10}, L_{90}, and L_{eq} levels. The statistical descriptors L_{10} and L_{90} measure the noise level exceeded for 10% and 90% of the sample measurement time. The L_{eq} level is the equivalent continuous noise level or the level averaged on an equal energy basis. Measurement sample periods are usually ten to fifteen minutes. The Noise -vs- Time graphs representing measured noise levels at the noise monitoring locations in Appendix C illustrate these concepts.

Noise levels are commonly measured in units of A-weighted decibels or dB(A). The "A-weighting" refers to a standardised amplitude versus frequency curve used to "weight" sound measurements to represent the response of the human ear. The human ear is less sensitive to low pitch sound than it is to high pitch sound. Overall A-weighted measurements quantify sound with a single number to represent how people subjectively hear different frequencies at different levels.

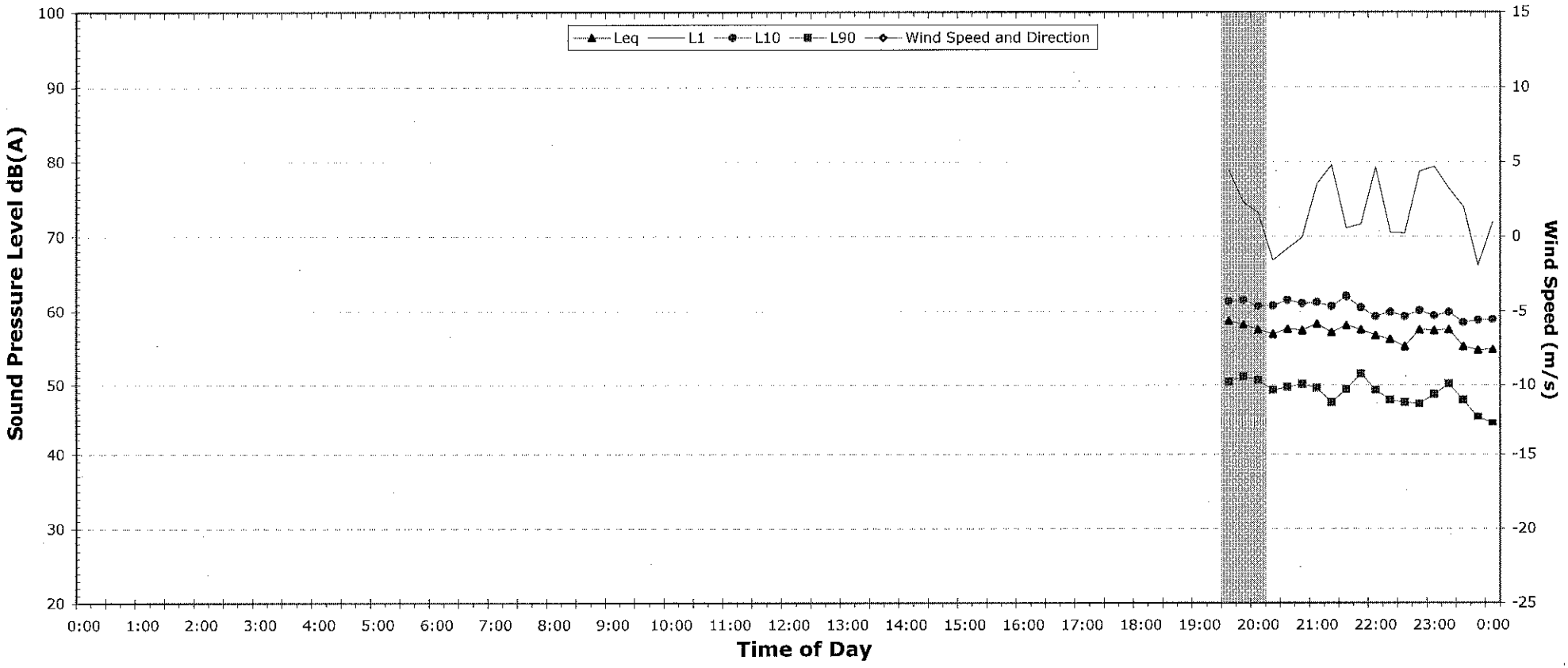
Background noise is the term used to describe the noise measured in the absence of the noise under investigation. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample time period. This is represented as the $\mathbf{L_{90}}$ noise level.

APPENDIX C - NOISE MONITORING RESULTS

EXISTING AMBIENT NOISE LEVELS

Frontyard of 9 Houseman St

Friday, 15 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	-	47.6	41.3
Leq (see note 3)	-	57.5	54.2

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L01 (rev 0) 9 Housman St.xls

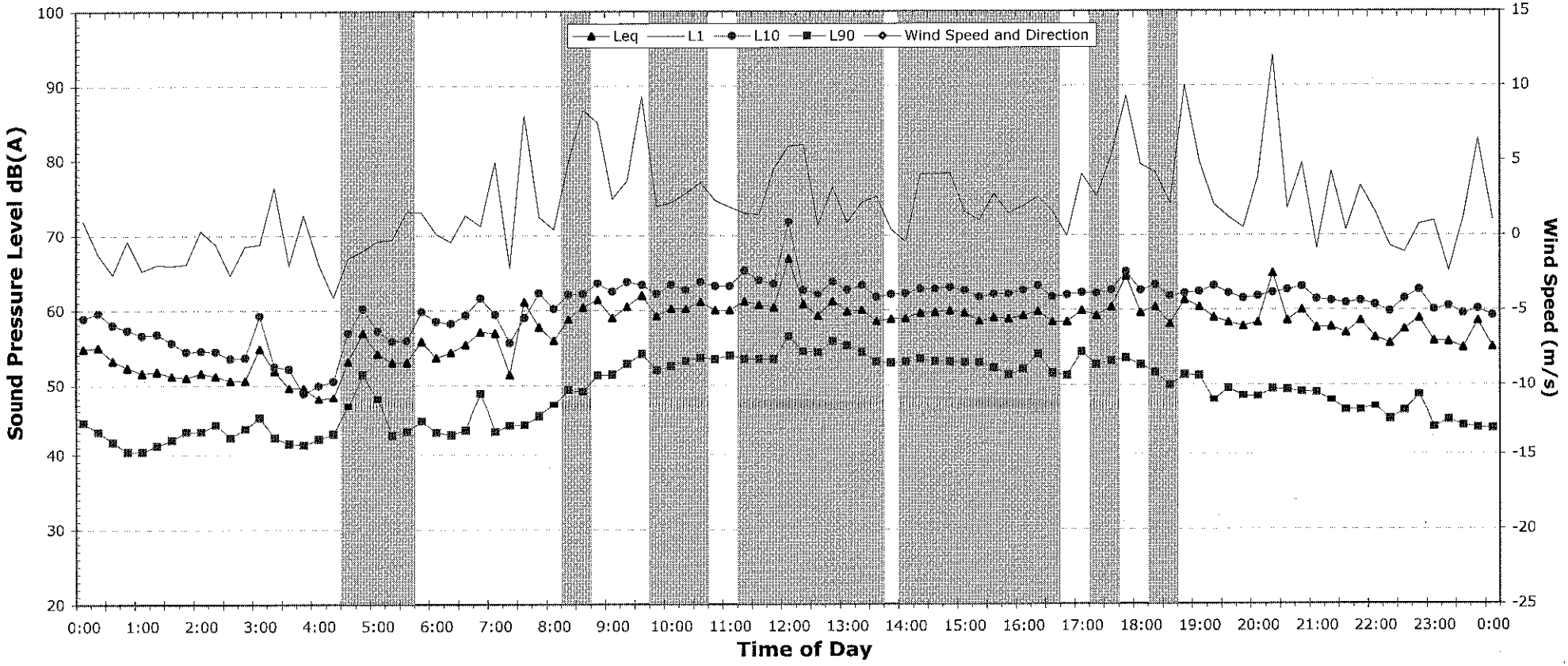
Template QTT-01 (rev 60) Logger Graphs

TF010-01L01 (rev 1) 9 Housman St.xls

EXISTING AMBIENT NOISE LEVELS

Frontyard of 9 Houseman St

Saturday, 16 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night*
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	44.1	46.1	40.3
Leq (see note 3)	60.1	59.6	53.6

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L01 (rev 0) 9 Housman St.xls

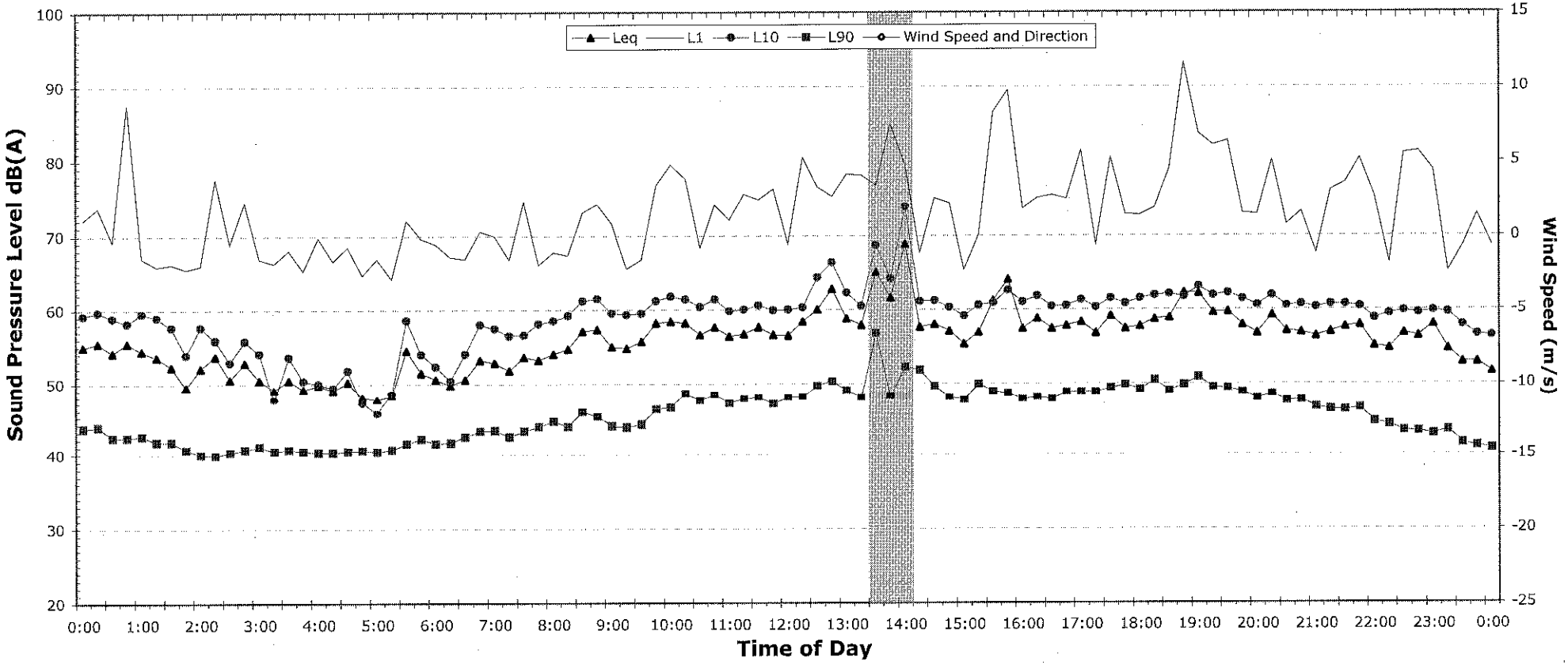
TF010-01L01 (rev 1) 9 Housman St.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Frontyard of 9 Houseman St

Sunday, 17 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	43.7	46.0	38.6
Leq (see note 3)	58.0	58.8	54.4

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L01 (rev 0) 9 Housman St.xls

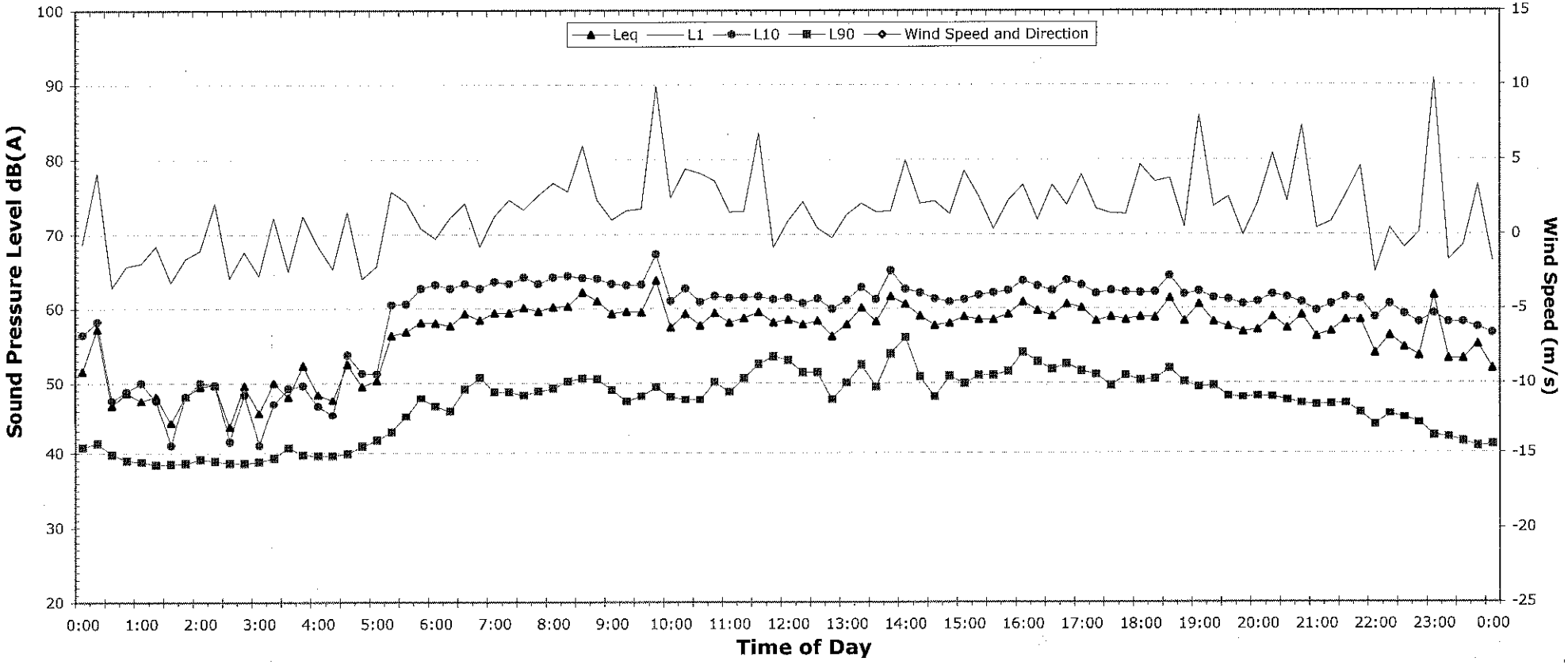
TF010-01L01 (rev 1) 9 Housman St.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Frontyard of 9 Houseman St

Monday, 18 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night*
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	48.0	45.7	39.7
Leq (see note 3)	59.5	58.3	55.1

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L01 (rev 0) 9 Housman St.xls

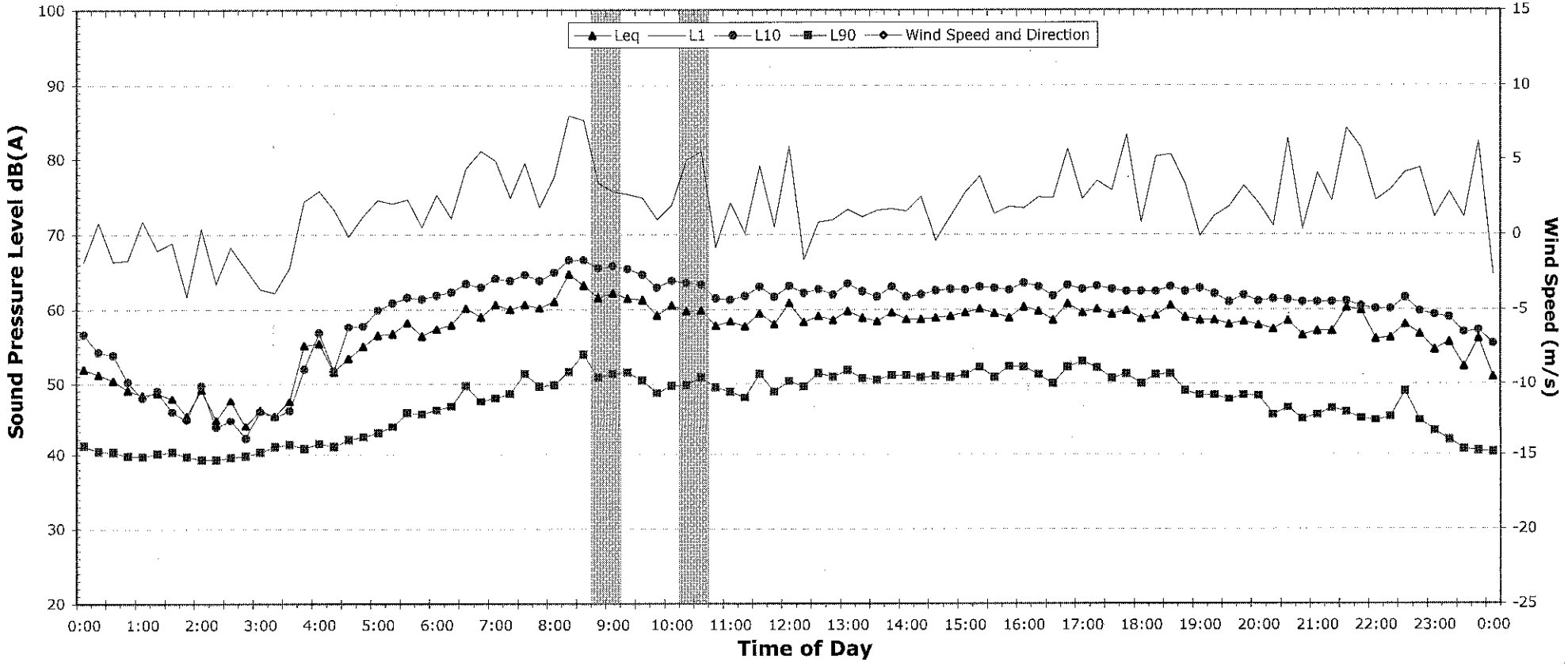
TF010-01L01 (rev 1) 9 Housman St.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Frontyard of 9 Houseman St

Tuesday, 19 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night*
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	48.9	44.9	39.9
Leq (see note 3)	60.0	58.5	55.4

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L01 (rev 0) 9 Housman St.xls

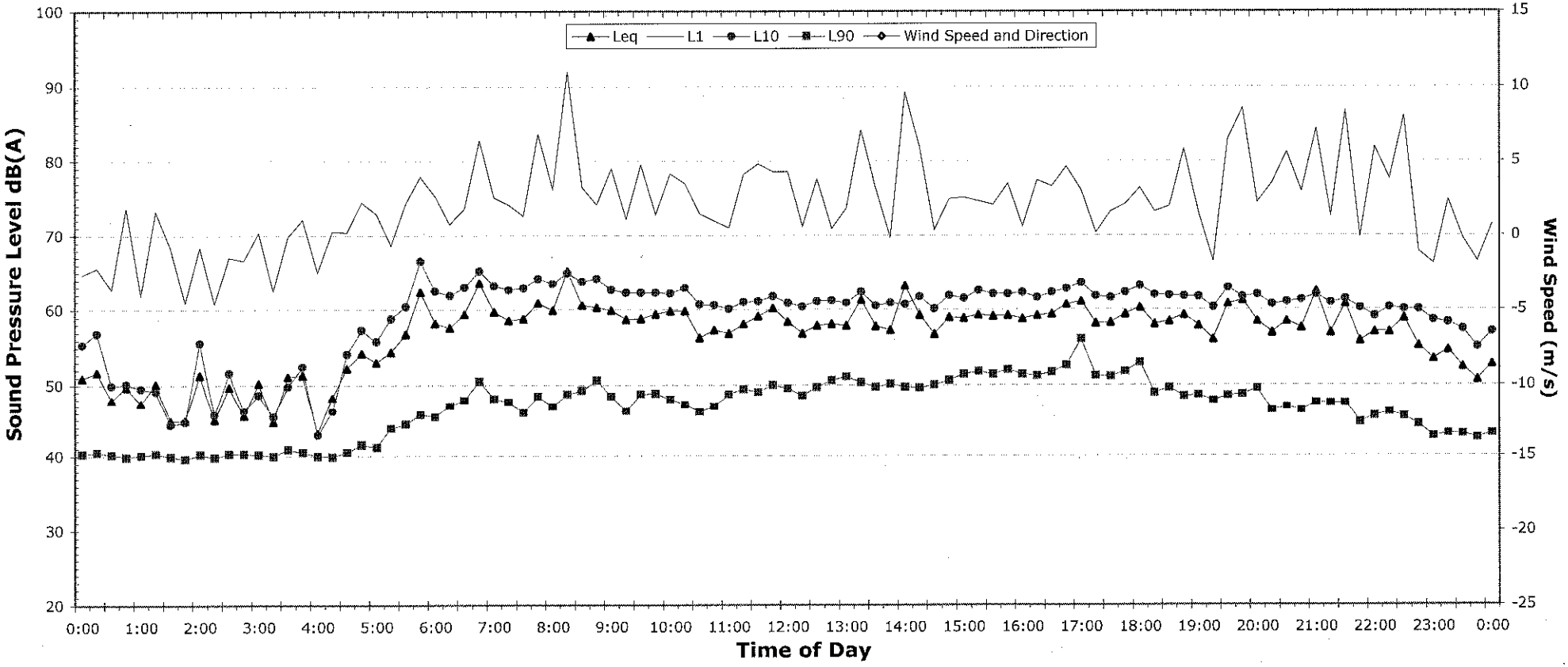
TF010-01L01 (rev 1) 9 Housman St.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Frontyard of 9 Houseman St

Wednesday, 20 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	46.9	45.5	40.8
Leq (see note 3)	59.6	59.0	53.9

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

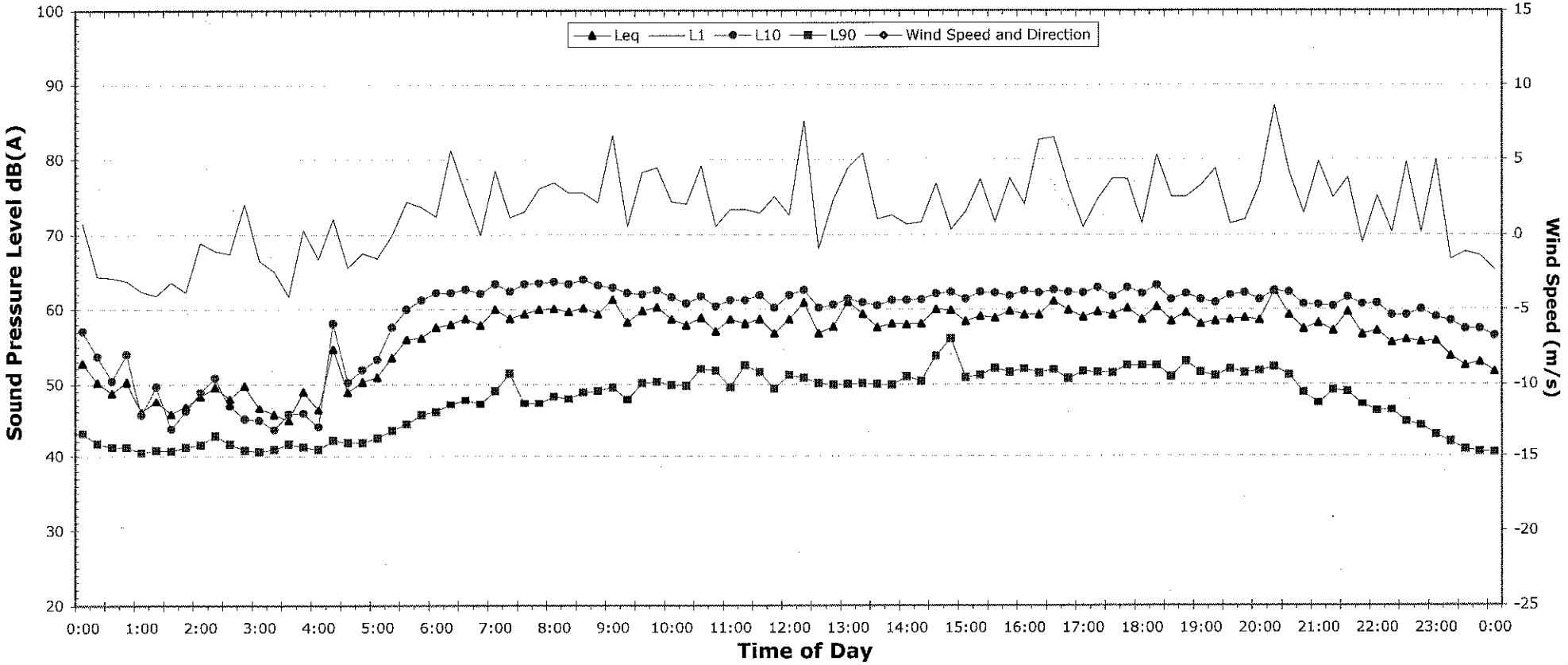
Data File: TF010-01L01 (rev 0) 9 Housman St.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Frontyard of 9 Houseman St

Thursday, 21 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	48.3	47.1	40.4
Leq (see note 3)	59.3	59.0	55.0

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L01 (rev 0) 9 Housman St.xls

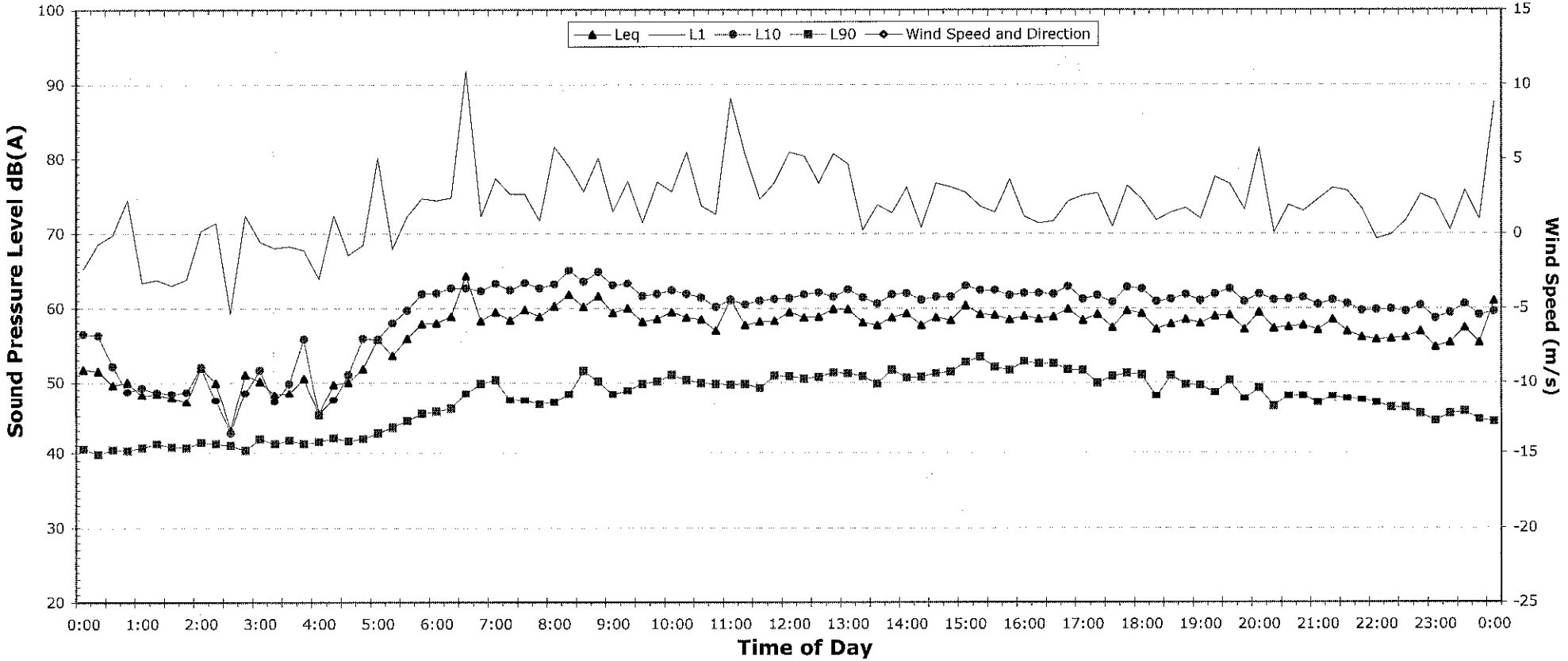
TF010-01L01 (rev 1) 9 Housman St.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Frontyard of 9 Houseman St

Friday, 22 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	48.2	46.8	41.5
Leq (see note 3)	59.2	57.8	54.2

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L01 (rev 0) 9 Housman St.xls

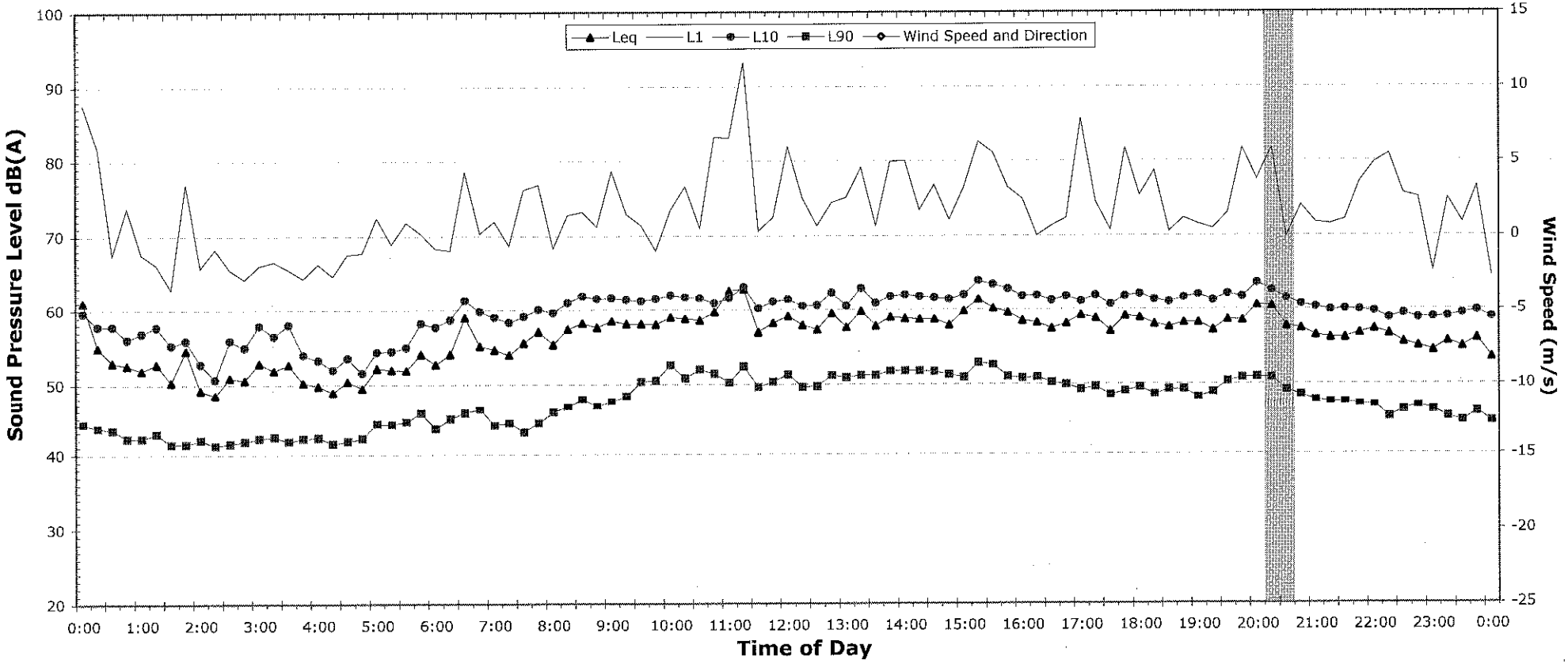
TF010-01L01 (rev 1) 9 Housman St.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Frontyard of 9 Houseman St

Saturday, 23 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day -	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	46.6	46.9	41.7
Leq (see note 3)	58.8	57.8	53.1

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L01 (rev 0) 9 Housman St.xls

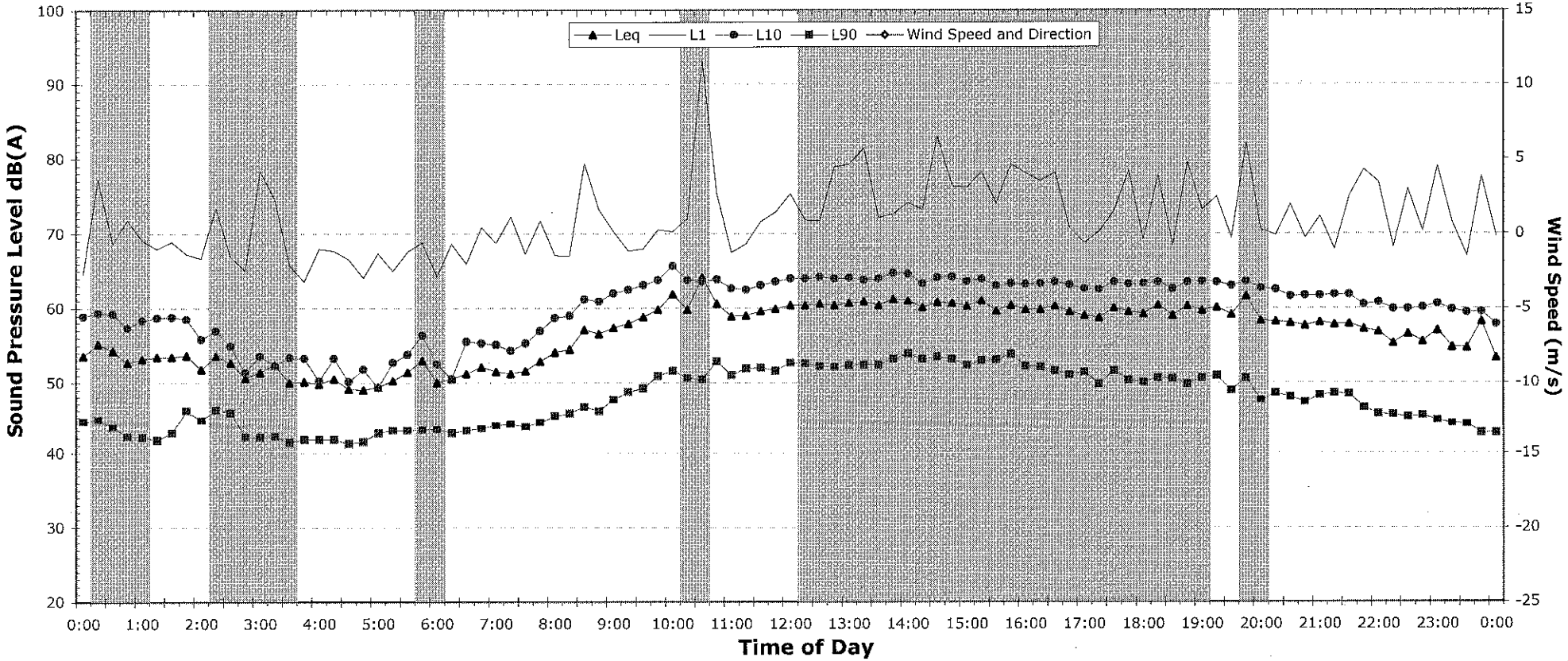
TF010-01L01 (rev 1) 9 Housman St.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Frontyard of 9 Houseman St

Sunday, 24 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	44.0	46.0	40.4
Leq (see note 3)	58.3	58.2	54.6

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L01 (rev 0) 9 Housman St.xls

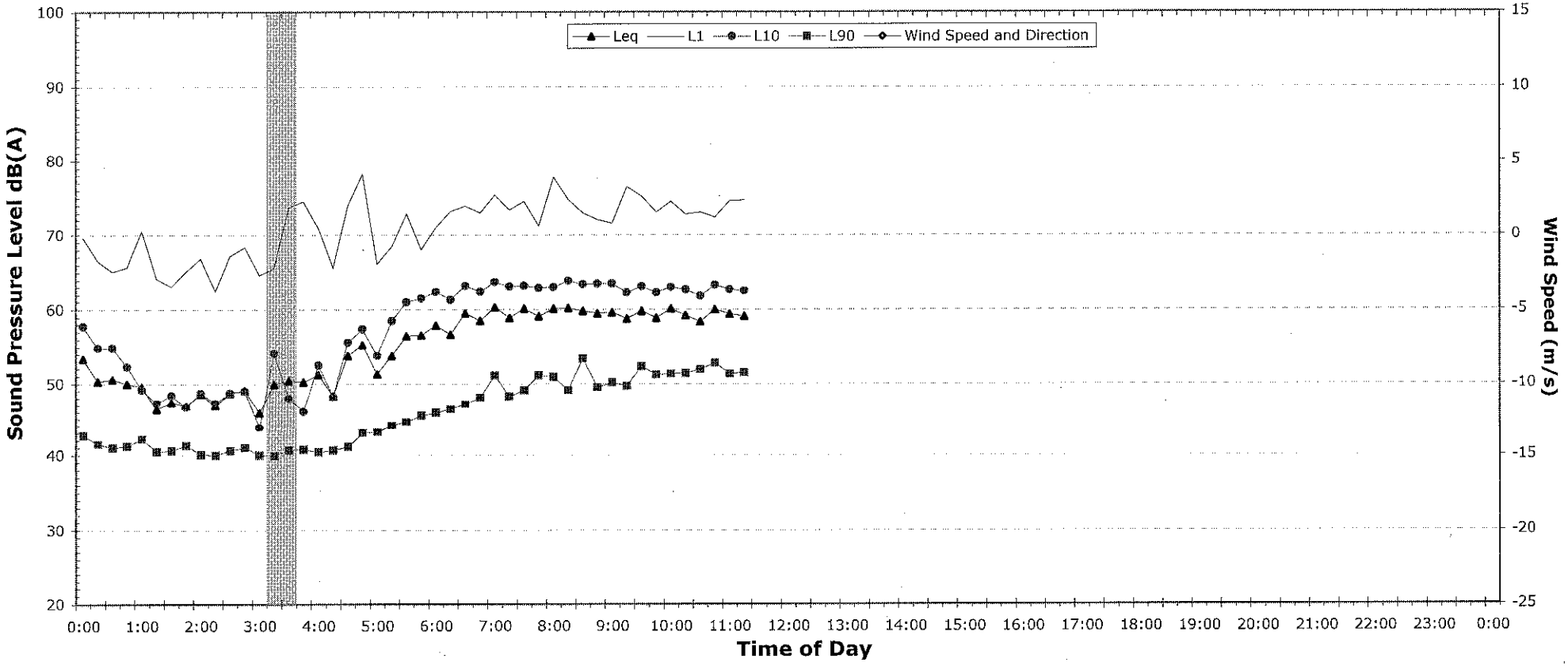
TF010-01L01 (rev 1) 9 Housman St.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Frontyard of 9 Houseman St

Monday, 25 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night*
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	49.1	-	-
Leq (see note 3)	59.5	-	-

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L01 (rev 0) 9 Housman St.xls

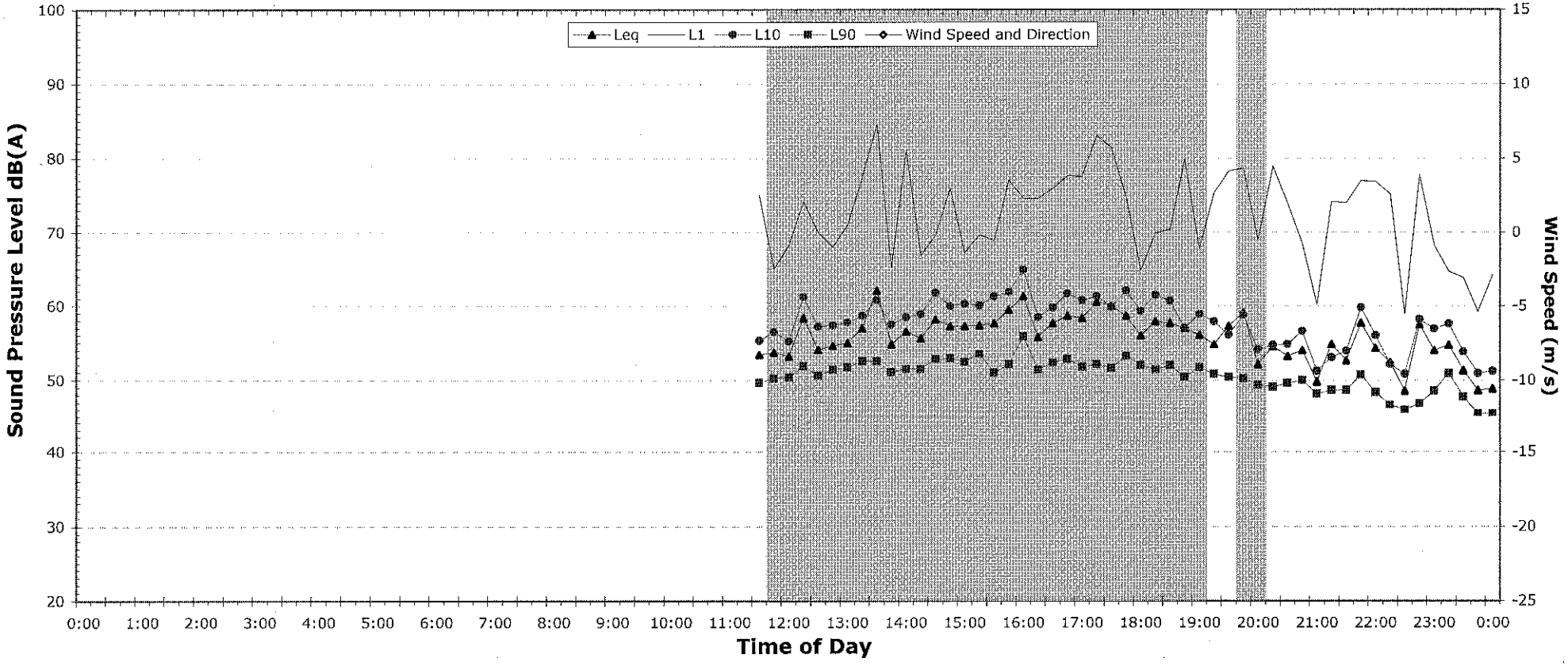
TF010-01L01 (rev 1) 9 Housman St.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Rear Yard 40 Belair Pl

Friday, 15 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	49.7	48.3	41.6
Leq (see note 3)	53.4	54.8	51.2

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L02 (rev 0) 40 Belair Pl.xls

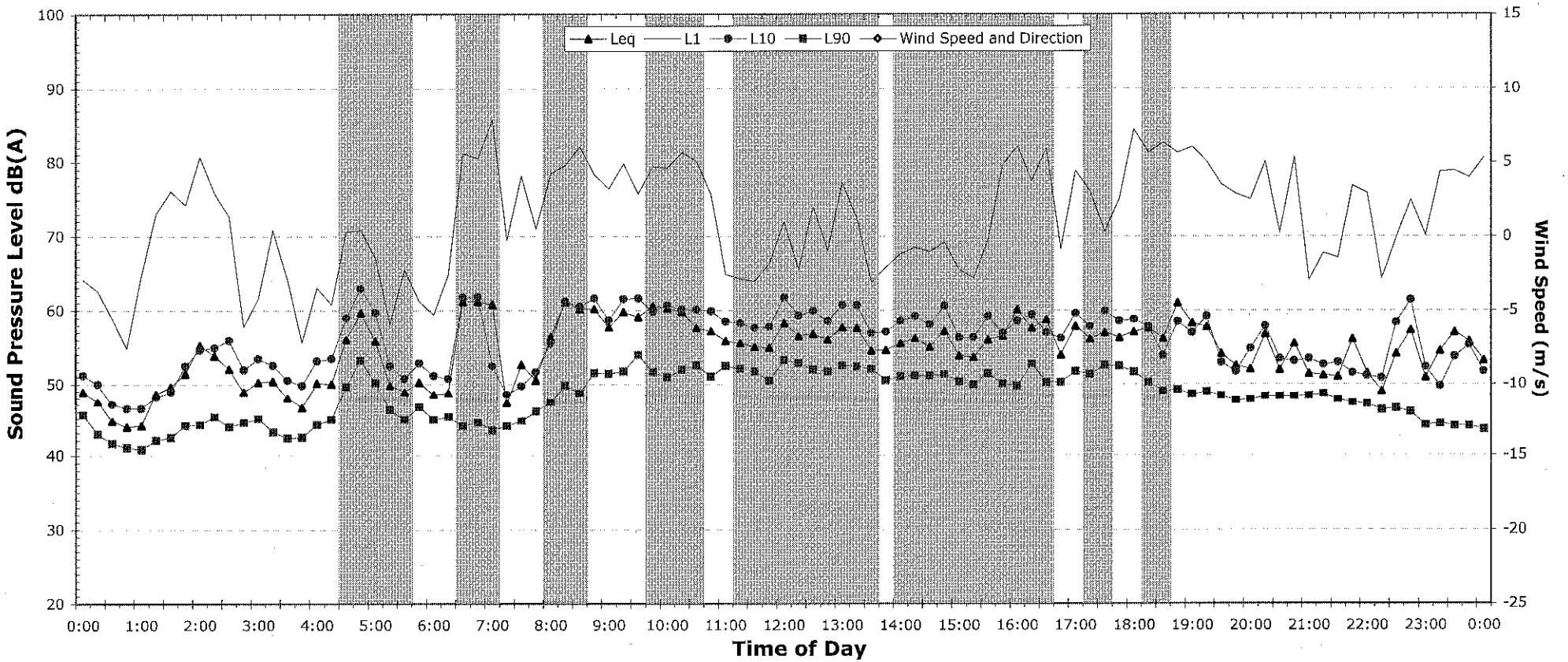
TF010-01L02 (rev 1) 40 Belair Pl.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Rear Yard 40 Belair Pl

Saturday, 16 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	44.6	47.2	40.6
Leq (see note 3)	56.8	55.6	49.9

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

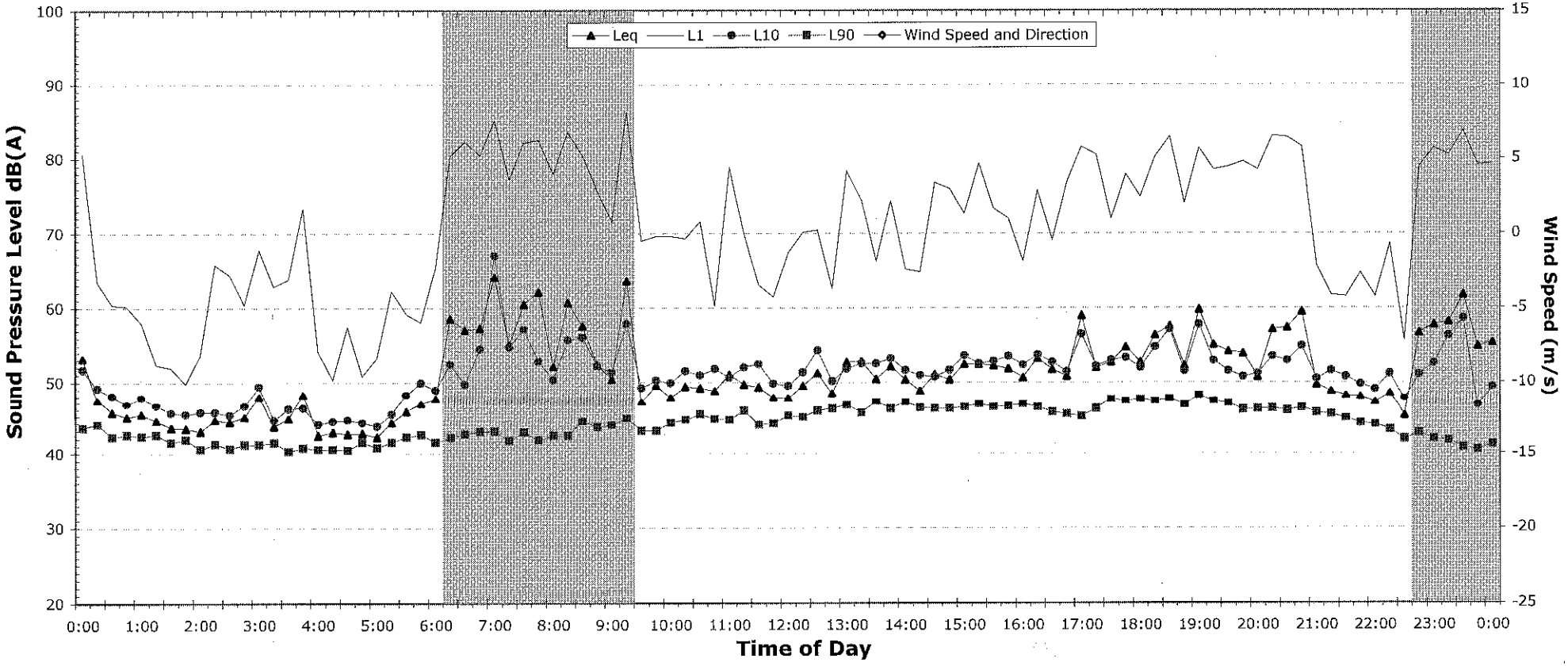
Data File: TF010-01L02 (rev 0) 40 Belair Pl.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Rear Yard 40 Belair Pl

Sunday, 17 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	44.0	44.0	38.7
Leq (see note 3)	51.6	55.3	52.2

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

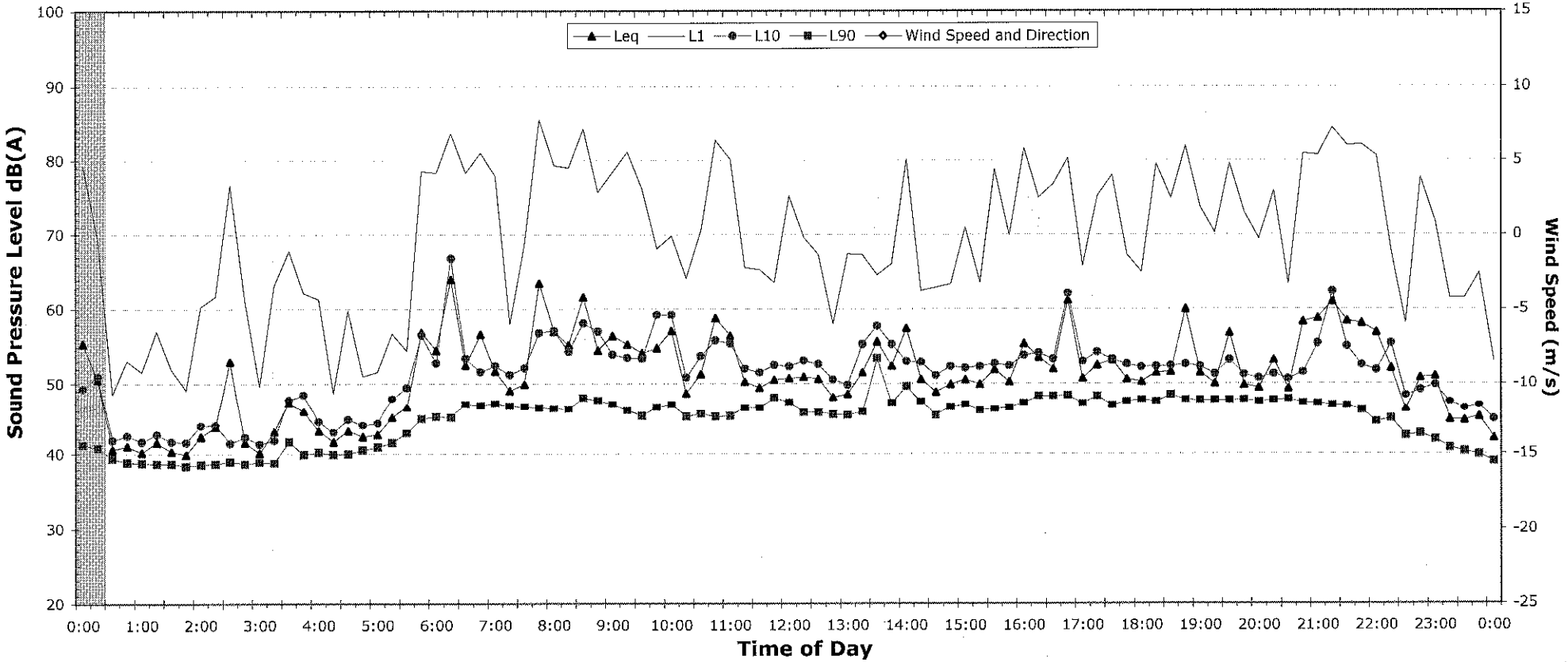
Data File: TF010-01L02 (rev 0) 40 Belair Pl.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Rear Yard 40 Belair Pl

Monday, 18 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night*
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	45.3	46.0	37.5
Leq (see note 3)	55.0	56.4	48.7

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

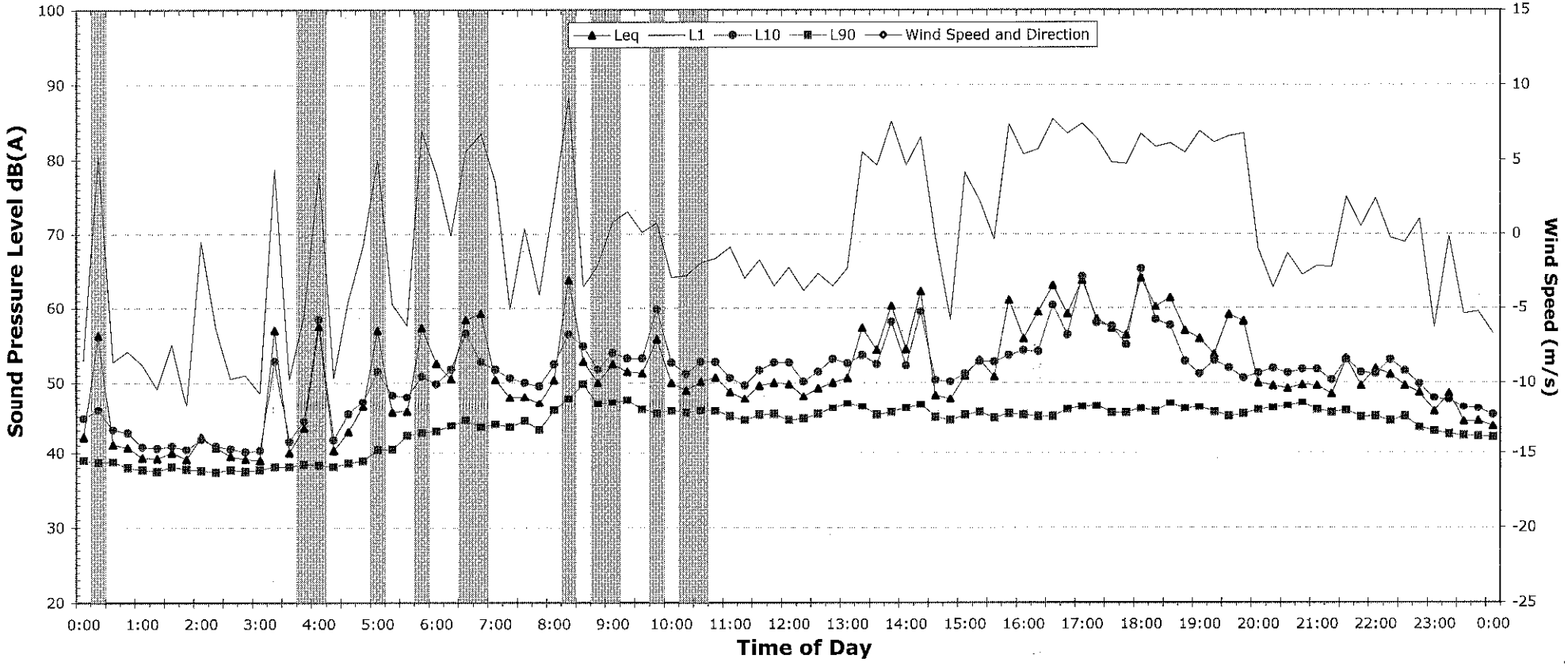
Data File: TF010-01L02 (rev 0) 40 Belair Pl.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Rear Yard 40 Belair Pl

Tuesday, 19 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	44.5	45.0	41.9
Leq (see note 3)	56.8	55.8	50.8

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

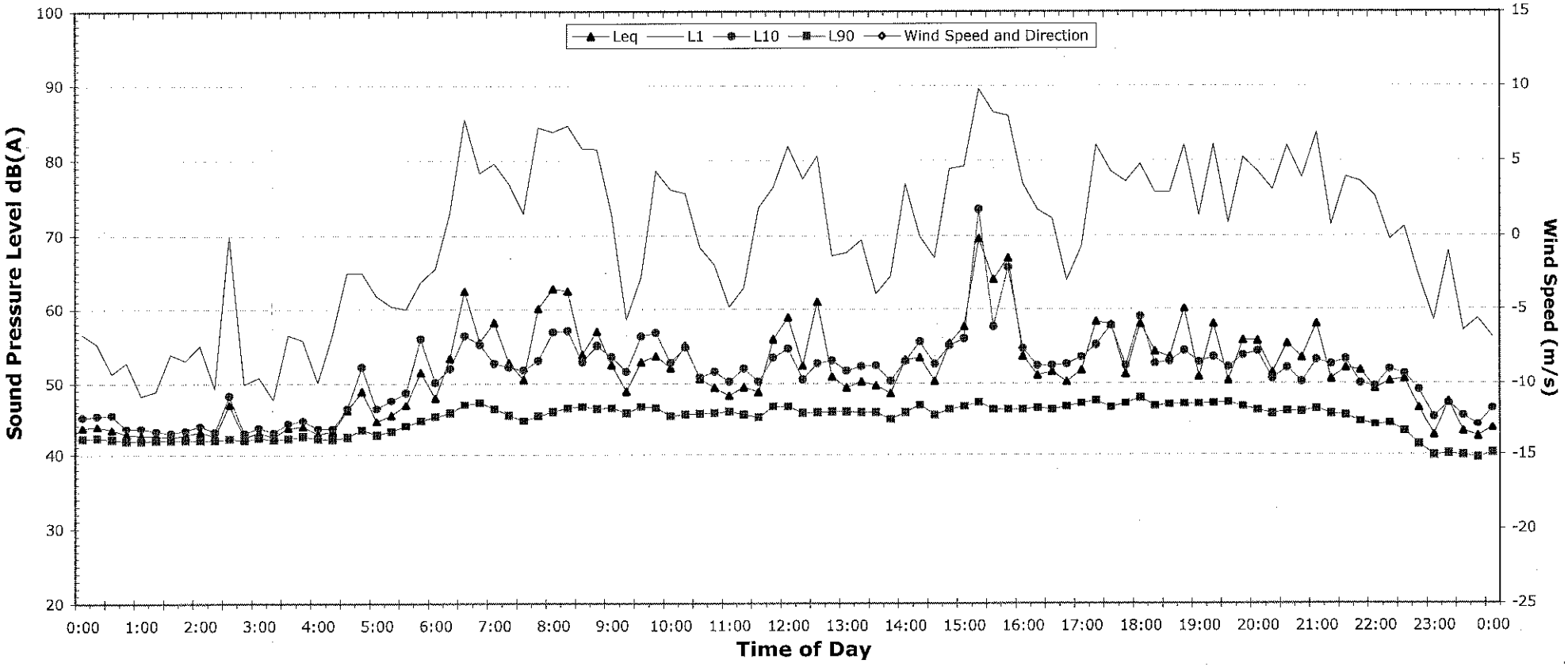
Data File: TF010-01L02 (rev 0) 40 Belair Pl.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Rear Yard 40 Belair Pl

Wednesday, 20 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[4]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	45.4	44.6	38.2
Leq (see note 3)	58.5	54.9	49.6

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

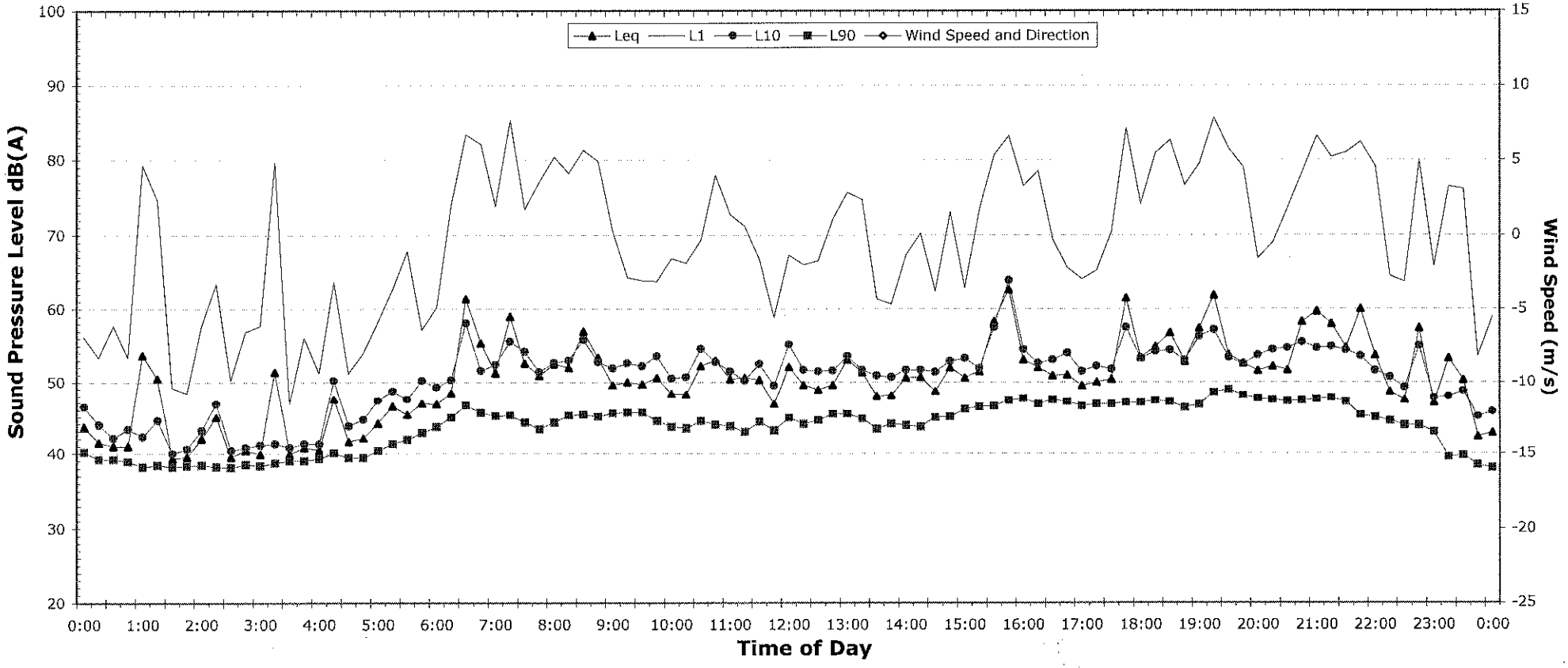
Data File: TF010-01L02 (rev 0) 40 Belair Pl.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Rear Yard 40 Belair Pl

Thursday, 21 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night*
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	43.4	45.2	37.2
Leq (see note 3)	53.6	56.8	49.5

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

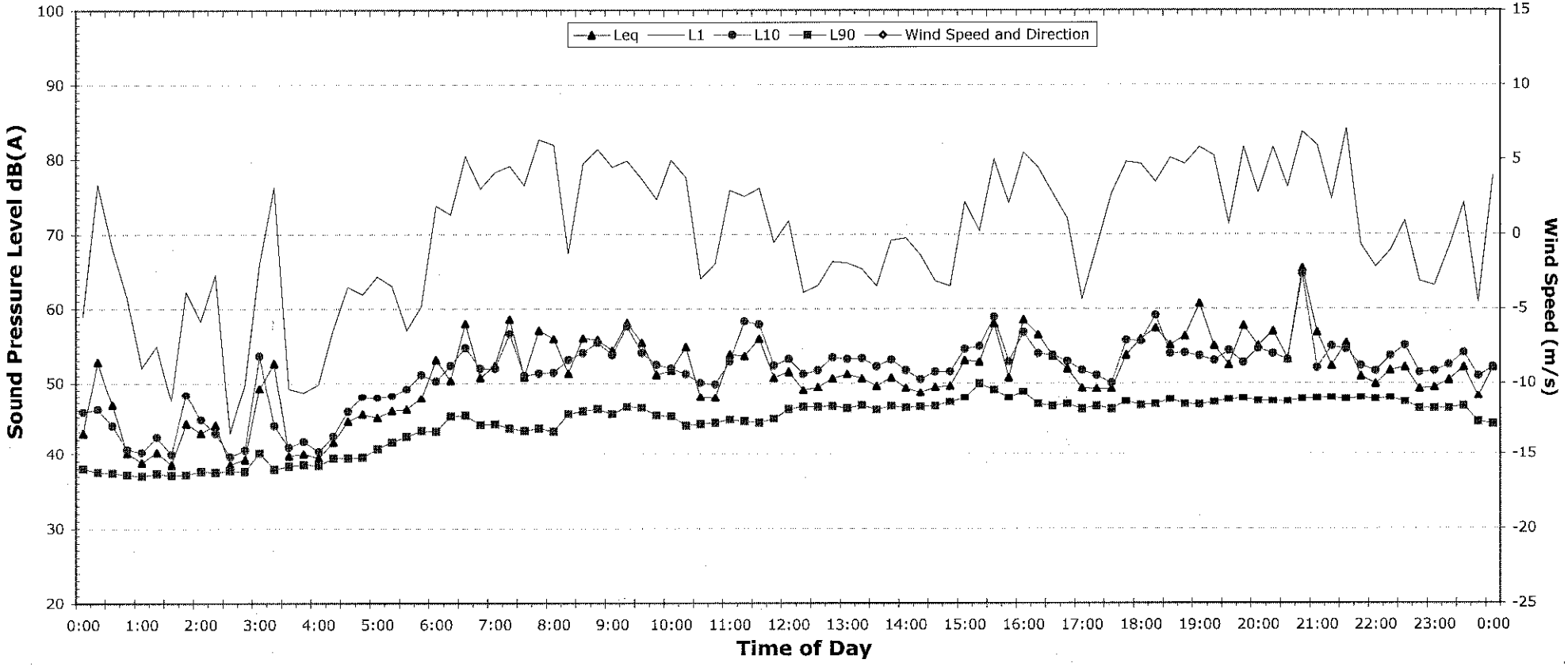
Data File: TF010-01L02 (rev 0) 40 Belair Pl.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Rear Yard 40 Belair Pl

Friday, 22 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night*
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	43.8	46.8	39.1
Leq (see note 3)	53.7	57.6	50.8

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

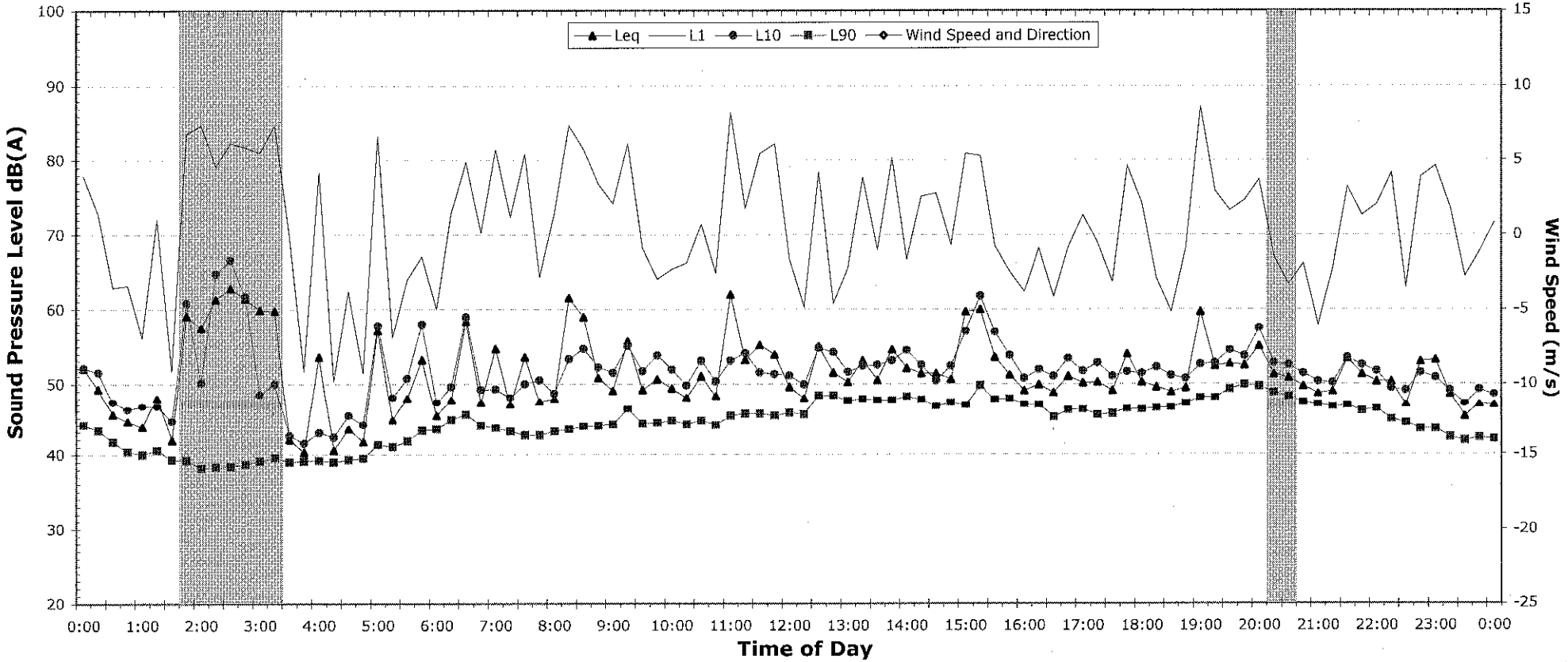
Data File: TF010-01L02 (rev 0) 40 Belair Pl.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Rear Yard 40 Belair Pl

Saturday, 23 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	43.4	46.3	37.6
Leq (see note 3)	54.1	52.9	49.6

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

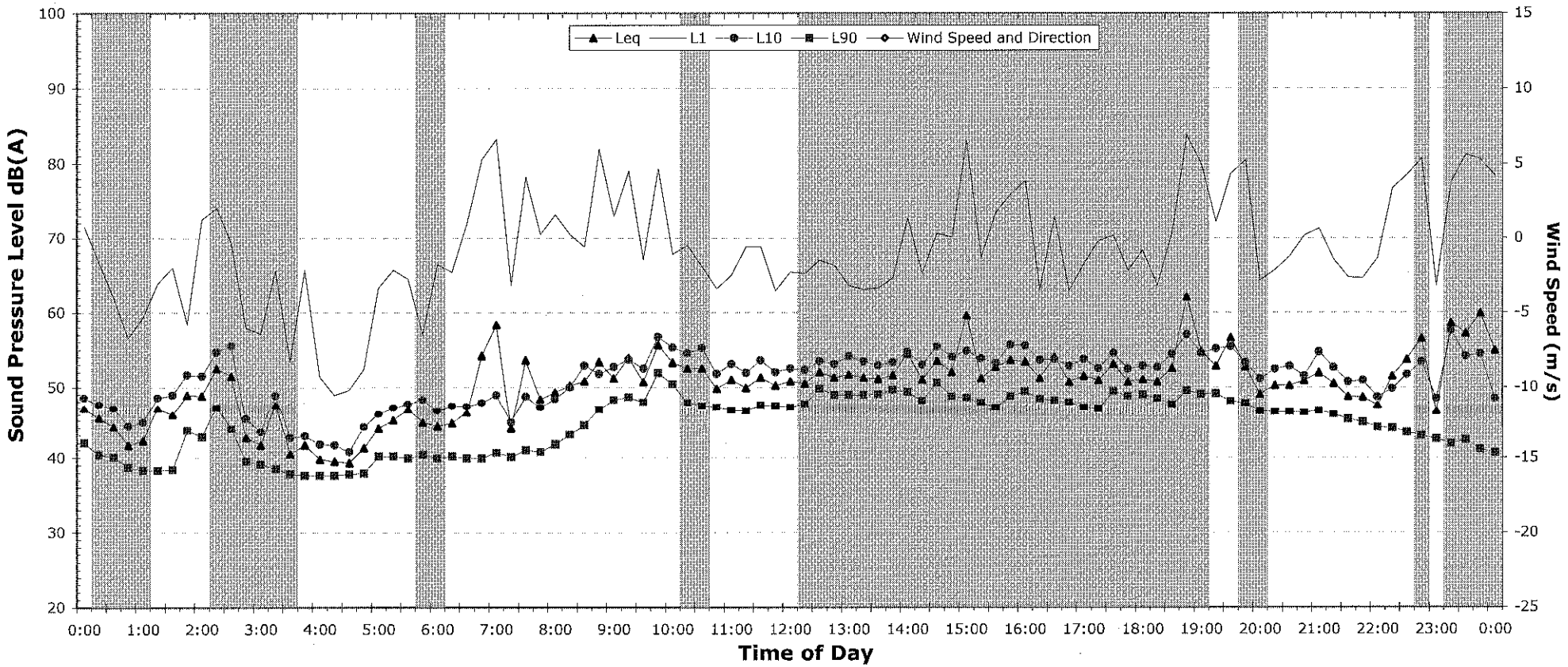
Data File: TF010-01L02 (rev 0) 40 Belair Pl.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Rear Yard 40 Belair Pl

Sunday, 24 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	40.8	44.5	38.3
Leq (see note 3)	51.6	51.6	52.6

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

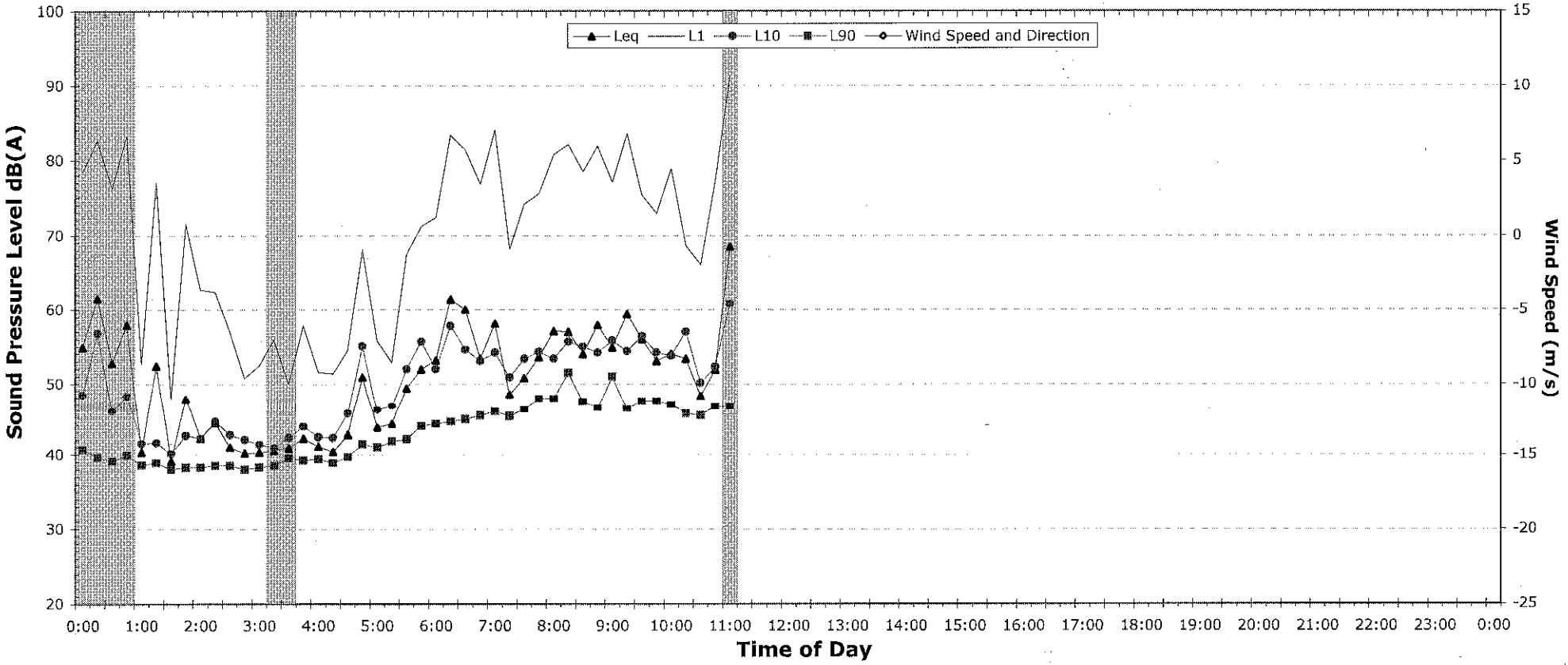
Data File: TF010-01L02 (rev 0) 40 Belair Pl.xls

Template QTT-01 (rev 60) Logger Graphs

EXISTING AMBIENT NOISE LEVELS

Rear Yard 40 Belair Pl

Monday, 25 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	45.3	-	-
Leq (see note 3)	55.0	-	-

NOTES:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.

2. "Night" relates to period from 10pm on this graph to 7am on the following graph.

3. Graphed data measured in free-field; tabulated results facade corrected

4. Night time Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

Data File: TF010-01L02 (rev 0) 40 Belair Pl.xls

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RENZO TONIN & ASSOCIATES
Inspired to achieve

Consultants in Acoustics, Vibration & Structural Dynamics
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Doc Ref: TF010-01F04 (rev 0) Response to Council Comments.doc

Date: 30 March 2011

To: Stockland Developments Pty Ltd

Attn: MS JULIA CAIN Email: julia.cain@stockland.com.au

From: Michael Chung

RE: STOCKLAND WETHERILL PARK – RESPONSE TO COUNCIL COMMENTS

A review of comments and objections issued by Fairfield City Council in a letter dated 9 March 2011 for the Development Application (ref. DA 1253.1/2010) submitted for the proposed redevelopment of the Stockland shopping centre in Wetherill Park has been undertaken by Renzo Tonin & Associates.

Following the review of the letter, it was noted that only one issue pertaining to noise was raised in the 'Objections' section of the letter. Item 23 (e) of the letter states the following:

> *"23. (e) The increase in cars and shoppers will create an adverse noise impact to surrounding residents."*

Based on this objection, we refer to Section 8 of the Operational Noise Assessment report prepared by Renzo Tonin & Associates (ref. TF010-01F03 (rev 1), dated 15 November 2010), where noise from additional traffic on the public road network within the vicinity of the shopping centre as a result of the redevelopment was addressed and assessed against.

Furthermore, Section 5.3 of the report addressed noise from carpark activities during the operation of the redeveloped shopping centre.

Therefore, the objection relating to the concern of noise from the increase in cars has been addressed in the Renzo Tonin & Associates report.

For the concern of noise from shoppers, it is not possible to quantify the number of shoppers proposed to shop at the redeveloped shopping centre. Nevertheless, only a minority of shoppers will be walking to and from the shopping centre and therefore, there would be insignificant noise impacts to nearby residences.

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