

ST JOHNS PARK BOWLING CLUB DA ACOUSTIC ASSESSMENT FOR MASTERPLAN

TF109-01F02 (REV 2) DA ACOUSTIC ASSESSMENT REPORT.DOC

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Prepared for:

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Surry Hills NSW 2010

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DOCUMENT CONTROL

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CONTENTS

1	INTRODUCTION	5
2	PROJECT DESCRIPTION	6
2.1	Proposed Development	6
2.2	Noise Issues	6
2.3	Hours of Operation	7
2.4	Assessment Methodology	7
2.5	Reference Material	7
3	ASSESSMENT LOCATIONS	9
4	EXISTING ACOUSTIC ENVIRONMENT	10
4.1	Long-Term Unattended Noise Monitoring	10
5	OLGR NOISE ASSESSMENT	12
5.1	Office of Liquor, Gaming and Racing Criteria	12
5.2	Noise Sources	13
5.3	Prediction Methodology	14
5.4	Noise Predictions for Full Project Completion	15
6	DECCW INP NOISE ASSESSMENT	18
6.1	NSW DECCW Industrial Noise Policy	18
6.2	Mechanical Plant & Equipment Schedule	18
6.3	Noise Prediction Results & Assessment	19
7	SLEEP DISTURBANCE ASSESSMENT	21
7.1	Sleep Disturbance Criteria	21
7.2	Noise Sources	22
7.3	Noise Predictions	22
8	ROAD TRAFFIC NOISE ASSESSMENT	24
8.1	Road Traffic Noise Criteria	24
9	RECOMMENDATIONS	25
9.1	External Patron Noise Emission	25
9.2	Function Room	26
10	RISK ASSESSMENT	27
11	CONCLUSION	28
	APPENDIX A - GLOSSARY OF ACOUSTIC TERMS	29
	APPENDIX B - SITE AND MEASUREMENT LOCATIONS	32
	APPENDIX C - NOISE MONITORING METHODOLOGY	33
	C.1 Noise Monitoring Equipment	33

C.2 Meteorology during Monitoring	33
C.3 Noise vs Time Graphs	33
APPENDIX D - LONG-TERM NOISE MONITORING RESULTS	34

List of Tables

Table 1 – Long-Term Noise Monitoring Results	11
Table 2 – OLGR Noise Goals	13
Table 3 – OLGR Source Noise Levels	14
Table 4 – Predicted Noise Levels at Assessment Locations	15
Table 5 – DECCW’s Industrial Noise Criteria, dB(A)	18
Table 6 – Mechanical Services Plant & Equipment Sound Power Level	19
Table 7 – Mechanical Services Noise Predictions	19
Table 8 – External Sleep Disturbance Criteria	22
Table 9 – Sound Power Levels – Male Shouting, dB(A) re 1pW	22
Table 10 – Predicted Male Shouting Noise Levels at Assessment Locations	22

1 INTRODUCTION

Renzo Tonin & Associates was engaged to conduct an environmental noise impact assessment of operational noise for the full masterplan scope of the St Johns Park Bowling Club (SJPBC) Development in the Fairfield City Council area. SJPBC is located on 93 Edensor Road, St Johns Park, and situated just outside the Bonnyrigg Town Centre site.

This report forms a part of the Development Application for the proposal. It addresses the acoustic impact upon nearby receiver locations only and not to other areas within the site.

The report quantifies the noise impact from activities associated with the development and assesses potential noise impact on nearby residential receivers in accordance with the noise requirements of the Office of Liquor Gaming and Racing (OLGR) and other relevant standard noise policy/guideline from NSW Department of Environment, Climate Change and Water (DECCW) and NSW Environmental Criteria for Road Traffic Noise (ECRTN).

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 Proposed Development

The proposed development consists of refurbishment, renewal and expansion to the existing club facility and immediate surrounds. The proposed project will be separated into various stages of development which will be carried out over a 3-5 year period, with only one DA to be submitted for approval. The extent of works is as follows:

- Remodelling within existing building including new Sports Lounge and Terrace, Main Bar, TAB, Indoor and Outdoor Lounge, Indoor and Outdoor Bistro, Kitchen and Servery, and refurbished toilets,
- New Outdoor Gaming Terrace extension,
- New Outdoor Alfresco Lounge and Bar,
- Refurbishment to existing indoor and outdoor gaming lounge,
- Entry and Restaurant,
- Facade upgrade to Entry side,
- Function Level re-modelling,
- Function Terrace,
- Administration refurbishment, and
- Facade upgrade to remaining sides.

The areas of development with potential to have acoustic impacts upon nearest affected receiver/s are identified as:

- Area 1 – Upgrade and minor expansion to outdoor area to create alfresco lounge/bar,
- Area 2 – Indentation into the existing building to create outdoor dining/lounge areas,
- Area 3 – Extension to building to create outdoor gaming areas and noodle bar,
- Area 4 – Removal of the existing air cooled chiller and installation of two new water cooled chillers, and
- Area 5 – Level 1 Function Terrace.

2.2 Noise Issues

From the proposed works above, four major types of noise source are identified:

1. Outdoor and indoor dining/lounge areas which will be dominated by patrons and background music at low noise level;
2. Outdoor and indoor gaming area which will be dominated by patrons and gaming machine music;
3. Function Rooms on the 1st Floor which include patrons on the proposed terrace and activities from internal spaces, and
4. Existing and proposed mechanical services associated with the whole development.

2.3 Hours of Operation

There is no change under this application to the existing trading hours of 9:00am to 3:00am, Monday to Friday, and 9:00am to 6:00am on Saturdays, Sundays and Public Holidays.

2.4 Assessment Methodology

In order to assess the potential noise impact from the subject proposal the following methodology was used;

- Identify nearest most potentially affected receiver locations to the subject site;
- Determine existing background noise levels at the nearest most potentially affected receiver locations;
- Use ambient noise and background levels to establish noise goals in accordance with the standard noise criteria issued by the OLGR, NSW DECCW and NSW ECRTN;
- Using predictive noise modelling, determine the extent of noise impact from the proposed usage on nearby residential premises;
- Identify where noise emission from the site may exceed the relevant criteria; and
- Where noise emission from the site may exceed the relevant criteria provide recommendations to reduce noise impacts from the site.

2.5 Reference Material

The following documentation and drawings have been referenced for this report:

- Architectural drawings prepared by Cullinan Ivanov Partnership (received on 17th December 2010);

File Name	Date	Drawing No	Issue	Drawing Title
SJPBC MASTERPLAN DA - Preliminary 2.pdf	01.11.10	A000	-	Cover Sheet
	01.11.10	A100	-	Site and Location Plan
	01.11.10	A101	A	Level 0 – Existing and Demolition Plan
	01.11.10	A102	A	Level 1 – Existing and Demolition Plan
	01.11.10	A103	A	Level 2 – Existing and Demolition Plan
	01.11.10	A104	-	Level R – Existing and Demolition Plan
	01.11.10	A105	A	Level 0 – Proposed Plan
	01.11.10	A106	A	Level 1 – Proposed Plan
	01.11.10	A107	A	Level 2 – Proposed Plan
	01.11.10	A109	-	Level R – Proposed Plan
	01.11.10	A110	A	Proposed Plans – Chiller
	01.11.10	A201	-	Proposed Elevations
	01.11.10	A202	-	Proposed Elevations
	01.11.10	A203	A	Proposed Elevations – Chiller
	01.11.10	A204	-	Proposed Elevations – Greens Keeper Shed

File Name	Date	Drawing No	Issue	Drawing Title
	01.11.10	A301	–	Proposed Sections

- Plan of Detail and Levels over “St Johns Park Bowling Club Limited”, Lot 1 DP 862060, Lot 1 DP 869668, Lot 389 DP 752060 & Lot 446 DP 824288 prepared by Summit Geomatic dated 19th November 2007 [ref: External Survey.pdf];
- Environmental Noise Impact of the Proposed Outdoor Gaming Area at St Johns Park Bowling Club prepared by Day Design Pty Ltd issued on 14th May 2008 [ref: SJPBC Day Design.pdf].

3 ASSESSMENT LOCATIONS

The nearest most potentially affected receiver locations were identified as:

- Location A1 136-138 Edensor Road, Bonnyrigg – A two-storey mixed-use development with commercial/retail on ground floor and residential on Level 1. It is located approximately 52m to the south of the outdoor lounges on the opposite side of Edensor Road.
- Location A2 40-42 Gumdale Avenue, St Johns Park – Two-storey residential dwellings located approximately 88m to the north of the proposed western outdoor gaming on the opposite side of Clear Paddock Creek.
- Location A3 2 Herston Road, St Johns Park – A single-storey residential dwelling located approximately 208m to the north-east of the proposed eastern outdoor gaming on the opposite side of Clear Paddock Creek.

The assessment locations are identified as 'A1', 'A2' and 'A3' in Appendix B.

4 EXISTING ACOUSTIC ENVIRONMENT

Noise impacts at the residential premises are assessed against noise goals established from the existing noise environment of the area without the subject premise in operation. Appendix B of the NSW DECCW's Industrial Noise Policy (INP) presents two methods of determining the background noise levels of an area being '*B1 – Long-term background noise method*' and '*B2 – Short-term background noise method*'. For the subject assessment, a long-term noise monitoring was undertaken to establish the existing acoustic environment. Additional long-term noise monitoring results of the area stored in our acoustic database have been utilised.

4.1 Long-Term Unattended Noise Monitoring

Noise measurements are to be taken at the nearest or potentially most affected premises with respect to the subject development. In this case, the nearest and potentially most affected premises to the north were residential dwellings at 40-42 Gumdale Avenue and 2 Herston Road, St Johns Park. However, these premises were affected by the existing mechanical services plant, which will be replaced as a part of the masterplan scope. Therefore, another monitoring location, which is considered representative of the background and ambient noise levels of the area was selected. In addition, a separate long-term noise monitoring conducted at a nearby premise to the south of the subject development, which was stored in our acoustic database, was utilised.

- Location L1 73 Buranda Crescent, St Johns Park – Front Yard.

Noise monitor was positioned in the free field and shielded from the SJPBC. The noise monitoring location was exposed to noise from distant traffic. The noise monitoring was undertaken between Friday 22nd October and Monday 1st November 2010.

- Location L2 132 Edensor Road, Bonnyrigg – Front Porch.

Noise monitor was positioned at the top of the stairway leading to the entry door with line of sight to the SJPBC. The noise monitoring location was exposed to noise from the intersection of Edensor Road and Bonnyrigg Avenue. The noise monitoring was undertaken between Tuesday 28th September and Monday 11th October 2010.

Appendix B shows the long term monitoring location marked as L1. Appendix C of this report details the long term noise monitoring methodology and the graphical recorded output from the noise monitoring is included in Appendix D.

The graphs in Appendix D were analysed to determine a single assessment background level (ABL) for each day, evening and night period in each 24 hour period of noise monitoring, and based on the median of the individual ABLs, an overall single Rating Background Level (RBL) for the day, evening and night period is determined over the entire monitoring period in accordance with the INP. A summary of results is presented in Table 1 below. Additional assessment periods, relevant to the proposed hours of operation have also been included.

Table 1 – Long-Term Noise Monitoring Results

Descriptor	Period	Overall dB(A)	Octave Band Centre Frequency – Hz (dBZ)								
			31.5	63	125	250	500	1k	2k	4k	8k
Location L1 – 73 Buranda Crescent											
L ₉₀ Background Noise Levels	Day	39	50	49	44	36	34	32	28	23	17
	Evening	41	49	49	45	38	35	35	33	24	18
	Night	34	45	44	40	33	30	27	22	16	12
	9:00am – 6:00pm	39	50	49	44	37	35	32	28	23	19
	10:00pm – Midnight	38	47	47	44	37	33	32	27	22	18
	Midnight – 6:00am	34	45	44	40	33	30	27	22	16	12
L _{eq} Ambient Noise Levels	Day	55	62	60	58	54	52	49	47	46	42
	Evening	53	58	60	57	53	49	47	47	41	37
	Night	47	55	55	53	47	43	40	41	38	31
Location L2 – 132 Edensor Road											
L ₉₀ Background Noise Levels	Day	57	61	62	57	53	51	52	50	43	32
	Evening	54	59	59	55	51	49	50	48	41	29
	Night	40	49	50	46	40	38	34	29	23	13
	9:00am – 6:00pm	58	63	63	58	54	52	53	51	44	33
	10:00pm – Midnight	47	53	52	49	46	45	42	38	32	21
	Midnight – 6:00am	40	49	50	46	40	37	34	29	22	13
L _{eq} Ambient Noise Levels	Day	66	68	74	70	64	60	61	59	53	46
	Evening	65	66	72	70	63	59	61	58	51	44
	Night	61	61	68	64	58	55	58	55	49	42

Notes: Day is defined as 7:00am to 6:00pm, Monday to Saturday; 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; 10:00pm to 8:00am Sundays & Public Holidays.
9:00am – 6:00pm, 10:00pm – Midnight and Midnight – 6:00am have been included as the assessment periods for OLGR's 'Standard Noise Condition'.

5 OLGR NOISE ASSESSMENT

The St Johns Park Bowling Club project encompasses a 3-5-year masterplan with several construction stages. Each construction stage addresses a specific area of the development as follows;

- Stage 1A – Bar/ Bistro/ Lounge
- Stage 1B – Extended Outdoor Gaming
- Stage 1C – Alfresco Bar and Lounge
- Stage 2A – Gaming Lounge
- Stage 3A – Entry and Restaurant
- Stage 3B – Facade Upgrade to Entry Side
- Stage 4A – Function Level Re-Modelling
- Stage 4B – Function Terrace
- Stage 4C – Administration Refurbishment
- Stage 4D – Facade Upgrade to Remaining Sides

The assessment of patron and music noise emission from within SJPBC focuses on the cumulative impact of completed works.

5.1 Office of Liquor, Gaming and Racing Criteria

Noise emissions from within licensed premises in NSW, such as restaurants, bars and clubs, should aim to comply with the standard noise criteria set by the NSW OLGR. The OLGR criteria applies to all noise emission associated with activities from the licensed area of the premises, including music and patron noise.

The OLGR, through the Liquor Act 2007, is the regulatory authority that deals with noise pollution issues pertaining to licensed premises. The OLGR recommends the use of their standard noise criteria when assessing noise impact from licensed premises and when determining the occurrence of noise nuisance and annoyance. Noise emissions are assessed in terms of the noise limits set out in the OLGR's 'Standard Noise Condition' which states as follows:

"The L_{A10}^ noise level emitted from the licensed premises shall not exceed the background noise level in an Octave Band Centre Frequency (31.5Hz – 8kHz inclusive) by more than 5dB between 7:00am and 12:00 midnight at the boundary of any affected residence.*

The L_{A10}^ noise level emitted from the licensed premises shall not exceed the background noise level in an Octave Band Centre Frequency (31.5Hz – 8kHz inclusive) between 12:00 midnight and 7:00am at the boundary of any affected residence.*

Notwithstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00 midnight and 7:00am.

Interior noise levels which still exceed safe hearing levels are in no way supported or condoned by the Liquor Administration Board.

This is a minimum standard. In some instances the Board may specify a time earlier than midnight in respect of the above condition.

**For the purposes of this condition, the L_{A10} can be taken as the average maximum deflection of the noise emission from the licensed premises."*

The octave band criteria for the OLGR assessment are set out in Table 2 below and have been established from the long-term noise monitoring results set out in Section 4.

Table 2 – OLGR Noise Goals

Assessment Period	Octave Band Centre Frequency - Hz (dBZ)								
	31.5	63	125	250	500	1k	2k	4k	8k
Location A1 – 136-138 Edensor Road									
9am – 6pm	68	68	63	59	57	58	56	49	38
6pm – 10pm	64	64	60	56	54	55	53	46	34
10pm – 12am	58	57	54	51	50	47	43	37	26
12am – 6am (external)	49	50	46	40	37	34	29	22	13
12am – 6am (external – inaudibility)*	48 [^]	40	36	30	27	24	19	12	7 [^]
Locations A2 & A3 – 40-42 Gumdale Avenue and 2 Herston Road									
9am – 6pm	55	54	49	42	40	37	33	28	24
6pm – 10pm	54	54	50	43	40	40	38	29	23
10pm – 12am	52	52	49	42	38	37	32	27	23
12am – 6am (external)	48 [^]	44	40	33	30	27	22	16	12
12am – 6am (external – inaudibility)*	48 [^]	34	30	23	20	17	12	6	7 [^]

Notes: *Assumed that if inaudibility is achieved externally the internal inaudibility criterion will also be achieved.

[^] Threshold of hearing in accordance with AS3657.1, taken as the lowest third octave level for the respective octave band.

We note that for the determination of inaudibility Renzo Tonin and Associates consider a design criterion of 10dB below the background noise level in each octave band for intermittent noise sources.

5.2 Noise Sources

The source noise levels used for our assessment are presented in Table 3 below.

Table 3 – OLGR Source Noise Levels

Noise Source	Overall dB(A)	Octave Band Centre Frequency - Hz (dBZ)								
		31.5	63	125	250	500	1k	2k	4k	8k
Outdoor Patrons with Music (L_w per person)	85	–	79	78	77	82	81	77	70	56
Outdoor Patrons with No Music (L_w per person)	79	–	67	67	72	78	75	70	62	51
Male Raised Voice (L_w per person)	73	–	–	62	67	72	66	62	57	51
Café/ Restaurant External Seating (L_w per person)	70	–	–	–	62	66	66	64	59	50
Live Lounge Band (L_{10} @ 5m)	95	75	86	94	96	92	89	86	82	78
Internal Patrons - Low Background Music (L_p)*	84	70	72	72	73	81	81	77	70	58

Note: * Spatial L_p considered occurring at each facade element for the purpose of external noise predictions.

5.3 Prediction Methodology

The 3D noise model has been based upon architectural drawings prepared by Cullinan Ivanov Partnership, as set out in Section 2.6. Noise predictions were carried out in accordance with ISO9613 as implemented by SoundPLAN Version 6.2 computer modelling program.

The following outdoor patron numbers were as specified or calculated based on the information provided by the architect;

- Beer Garden/ Outdoor Lounge 325 Patrons with Background Music
- Cafe Deck 62 External Seating Patrons
- Lounge Deck 102 Outdoor Patrons No Music
- Sports Terrace 35 Patrons No Music
- Eastern Outdoor Gaming 165 Patrons No Music (33 patrons raised voice)
- Noodle Bar 45 External Seating Patrons
- Western Outdoor Gaming 70 Patrons No Music (14 patrons raised voice)
- Functions Terrace 250 Patrons No Music

The following indoor patron areas were modelled as;

- Dining, Lounge and Sports Lounge – Approximately 180 patrons and no/ low level music. All doors open leading to the outdoor area.
- Pre-Function – A function room with approximately 45 patrons and no/ low level music. All doors open leading to the outdoor area.
- Function Rooms – A single combined function room with live entertainment band. When entertainment is provided internally, only a single door opening is allowed for ingress and egress from the terrace and shall remain closed at other times.

With regard to the outdoor gaming area, as agreed with the architect, the followings have been assumed;

- Interaction between gaming machine players within a gaming room is very minimal.
- Occasionally some players will play on one or more machines as a group of two to three people with interaction, however on the whole most gamers play machines individually and with very little interaction with other players.
- Interaction and talking in a gaming room without a lounge or gathering area would occur between 20% of the total population estimated to be on the gaming floor at any one time.
- In addition, there would be no more than 15 patrons communing in the area over and above the projected machine in use data.

Based on the above assumption, we have calculated on the basis of 14 patrons talking at one time on the western outdoor gaming (55 machines in use + 15 additional patrons = 70 patrons, 20% talking), and 33 patrons talking at one time on the eastern outdoor gaming (150 machines in use + 15 additional patrons = 165 patrons, 20% talking). Note that the outcomes of this report are dependant on these assumptions.

For the predictions of the function rooms, we have assumed the following constructions;

- Walls – Masonry (Cavity Wall) with standard plasterboard lining or cement render on both sides;
- Operable Doors / Windows – 10.38mm thick laminated glass with acoustic seals;
- Roof/Ceiling – 0.48mm thick metal decking sheet with one layer of standard plasterboard ceiling and insulation in the cavity.

5.4 Noise Predictions for Full Project Completion

Table 4 below sets out the prediction results for the major contributors of noise from the completed proposal at each assessment of the most sensitive locations identified.

Table 4 – Predicted Noise Levels at Assessment Locations

Description	Octave Band Centre Frequency - Hz								
	31.5	63	125	250	500	1k	2k	4k	8k
Location A1 – 136-138 Edensor Road									
Beer Garden/ Outdoor Lounge	–	52	50	49	53	51	46	36	15
Cafe Deck	–	–	–	27	32	31	28	20	3
Lounge Deck	–	33	31	35	40	36	31	21	2
Sports Terrace	–	23	23	28	33	30	25	14	–
Eastern Outdoor Gaming	–	–	–	–	3	–	–	–	–
Noodle Bar	–	–	–	–	3	2	–	–	–
Western Outdoor Gaming	–	–	11	15	19	13	8	1	–
Functions Terrace	–	39	39	44	51	48	43	35	17
Dining	34	36	32	34	42	41	37	28	10
Lounge	32	34	30	31	38	37	32	23	4

Description		Octave Band Centre Frequency - Hz								
		31.5	63	125	250	500	1k	2k	4k	8k
	Sports Lounge	29	31	28	29	36	35	30	21	-
	Pre-Function	-	33	35	30	21	13	8	14	3
	Functions	25	40	50	50	44	41	38	32	20
	TOTAL	37	53	53	53	56	54	49	40	23
OLGR Standard Noise Criteria	9am – 6pm	68	68	63	59	57	58	56	49	38
	6pm – 10pm	64	64	60	56	54	55	53	46	34
	10pm – 12am	58	57	54	51	50	47	43	37	26
	12am - 6am	49	50	46	40	37	34	29	22	13
	External (L ₉₀ +0dB)									
	12am - 6am	48^	40	36	30	27	24	19	12	7^
	Inaudibility –(L ₉₀ -10dB) *									
Location A2 – 40-42 Gumdale Avenue										
	Beer Garden/ Outdoor Lounge	-	38	35	31	35	36	30	17	-
	Cafe Deck	-	-	-	5	6	3	-	-	-
	Lounge Deck	-	17	13	15	18	13	7	-	-
	Sports Terrace	-	11	8	10	14	11	5	-	-
	Eastern Outdoor Gaming	-	-	16	20	24	17	10	-	-
	Noodle Bar	-	-	-	24	22	17	7	-	-
	Western Outdoor Gaming	-	-	18	21	26	19	12	2	-
	Functions Terrace	-	26	23	25	28	22	13	-	-
	Dining	17	15	9	7	12	12	7	-	-
	Lounge	20	18	12	10	15	15	10	-	-
	Sports Lounge	22	21	12	10	17	18	13	2	-
	Pre-Function	-	30	31	24	14	5	-	-	-
	Functions	14	24	39	38	27	18	10	1	-
	TOTAL	25	39	41	39	38	37	31	19	0
OLGR Standard Noise Criteria	9am – 6pm	55	54	49	42	40	37	33	28	24
	6pm – 10pm	54	54	50	43	40	40	38	29	23
	10pm – 12am	52	52	49	42	38	37	32	27	23
	12am - 6am	48^	44	40	33	30	27	22	16	12
	External (L ₉₀ +0dB)									
	12am - 6am	48^	34	30	23	20	17	12	6	7^
	Inaudibility –(L ₉₀ -10dB) *									
Location A3 – 2 Herston Road										
	Beer Garden/ Outdoor Lounge	-	48	38	32	34	41	38	24	-
	Cafe Deck	-	-	-	7	9	10	7	-	-
	Lounge Deck	-	20	18	20	24	20	10	-	-
	Sports Terrace	-	28	20	20	24	28	24	10	-
	Eastern Outdoor Gaming	-	-	10	11	13	12	6	-	-
	Noodle Bar	-	-	13	15	19	14	2	-	-
	Western Outdoor Gaming	-	-	14	15	19	17	10	-	-
	Functions Terrace	-	26	24	26	29	29	22	7	-

Description		Octave Band Centre Frequency - Hz								
		31.5	63	125	250	500	1k	2k	4k	8k
	Dining	21	22	14	15	21	21	15	-	-
	Lounge	24	26	19	16	20	18	16	-	-
	Sports Lounge	30	33	24	20	26	33	31	18	-
	Pre-Function	-	25	27	19	6	5	-	-	-
	Functions	16	29	37	34	24	20	11	-	-
	TOTAL	32	48	41	37	37	42	39	25	-
OLGR Standard Noise Criteria	9am – 6pm	55	54	49	42	40	37	33	28	24
	6pm – 10pm	54	54	50	43	40	40	38	29	23
	10pm – 12am	52	52	49	42	38	37	32	27	23
	12am - 6am	48 ^	44	40	33	30	27	22	16	12
	External (L90+0dB)									
	12am - 6am	48 ^	34	30	23	20	17	12	6	7 ^
	Inaudibility –(L90-10dB) *									

The predicted noise levels at Location A1 set out in Table 4 indicate that the proposed development can comply with the OLGR criteria up to 10pm; however non-compliances were revealed between 10pm and midnight as a result of patron noise emission from the combination of the Beer Garden/ Outdoor Lounge, the Functions Terrace and indoor spaces.

The predicted noise levels at Location A2 show that the proposed development can comply with the OLGR criteria up to midnight.

The predicted noise levels at Location A3 reveal exceedances of the OLGR criteria at the 1kHz and 2kHz octave band centre frequencies between 9am and midnight as a result of patron noise emission from the Beer Garden/ Outdoor Lounge. With regard to the day and evening period, only marginal exceedance of the noise criteria was predicted. As the long-term measurement location was in a more shielded location than that of the assessment location, it is considered that impacts during the day and evening period will be negligible.

Recommendations for the control and management of noise emission from patron noise have been provided in Section 9.

6 DECCW INP NOISE ASSESSMENT

6.1 NSW DECCW Industrial Noise Policy

Noise emission from vehicle movements, loading dock activities and mechanical plant are assessed in accordance with the DECCW's Industrial Noise Policy (INP). As advised by the architect, the proposed development does not substantially increase useable area; hence no traffic study has been undertaken. Based on the information, we assume that the vehicle movements and loading dock activities in relation to SJPBC will be as existing and therefore no acoustic assessment has been conducted. The DECCW INP noise criteria have been established for the specific assessment of mechanical services plant and equipment.

The assessment procedure of the INP has two components:

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

In accordance with the INP, noise impact should be assessed in terms of both intrusiveness and amenity. Table 5 sets out the intrusiveness and amenity criteria applicable at the nearest most potentially affected residential receiver locations.

The most potentially affected receiver locations with respect to the proposed mechanical services plant and equipment from SJPBC are located in Gumdale Avenue and Herston Road. The measured noise levels from our long-term noise survey (see Section 4.1) have been used for the assessment.

Table 5 – DECCW's Industrial Noise Criteria, dB(A)

Assessment Location	Intrusiveness Criteria			Amenity Criteria*		
	L _{Aeq,15min}			L _{Aeq,period}		
	Day	Evening	Night	Day	Evening	Night
A2 & A3	44	46	39	55	45	40

Note: * All residential locations have been categorised as 'Urban'.

6.2 Mechanical Plant & Equipment Schedule

Two chillers are to be located inside a proposed Chiller Plant Room situated next to the northern boundary right beside the existing multi-storey carpark. An intake opening of 2.4m by 2.0m is proposed at the southern end of the Chiller room and a discharge opening of 2.4m by 0.7m is proposed at the northern end of the Chiller room. In addition, four cooling towers are to be located on a steel platform above the Chiller Plant Room, with 4.5m solid walls surrounding the platform.

For the predictions of the Chiller room, we have assumed the following constructions;

- Walls – Masonry (190mm Block Wall) with aluminium panel cladding on the outside;
- Doors – 43mm thick solid core timber door;
- Roof/Ceiling – 0.48mm thick metal decking sheet with one layer of standard plasterboard ceiling and insulation in the cavity.

For our review of the proposed design, we have referred to the hand sketch Floor and Roof Plans [ref: 2010-10-28 revised chiller plant floor plan.pdf & 2010-10-28 revised chiller plant roof plan.pdf] and sound level data provided by Engineered Environments on the 10th January 2011, in addition to the architectural drawings provided by Cullinan Ivanov Partnership set out in Section 2.5.

The sound power level data for the units with its corresponding model number were utilised for the noise assessment and are presented in Table 6 below.

Table 6 – Mechanical Services Plant & Equipment Sound Power Level

Model No.		Overall dB(A)	Octave Band Centre Frequency - Hz (dB)								
			31.5	63	125	250	500	1k	2k	4k	8k
2 x Carrier 23XRV3637NRVAA9		81.5	65.9	64.4	70.8	83.1	76.8	74.8	73.5	66.9	58.0
4 x Ebrara Shinwa SDC-U175ASD	PWL 1	81.0	–	54.0	64.0	72.0	75.0	78.5	71.5	65.5	59.0
	PWL 2	79.5	–	53.0	65.5	71.0	75.5	74.0	69.5	60.0	56.0

6.3 Noise Prediction Results & Assessment

The noise level predictions take into account the potential reflections from the surrounding walls on Level 1 Chiller, the acoustic shielding from the proposed walls and the loss due to the distance. The calculation of noise assumes only one unit of the chillers can operate at 100% (Chiller to be set 50% load max if both chillers operate at the same time) and the cooling towers are operating at standard operation maximum power.

Table 7 – Mechanical Services Noise Predictions

Description			Overall dB(A)
Location A2 – 40-42 Gumdale Avenue			
Chiller Room			18
Cooling Towers			24
TOTAL			25
<i>INP Noise Criteria</i>	<i>Intrusiveness</i>	<i>Day</i>	44
		<i>Evening</i>	46
		<i>Night</i>	39
	<i>Amenity</i>	<i>Day</i>	55

Description			Overall dB(A)
<i>Evening</i>			45
<i>Night</i>			40
Location A3 – 2 Herston Road			
Chiller Room			12
Cooling Towers			17
TOTAL			18
<i>INP Noise Criteria</i>	<i>Intrusiveness</i>	<i>Day</i>	44
		<i>Evening</i>	46
		<i>Night</i>	39
	<i>Amenity</i>	<i>Day</i>	55
		<i>Evening</i>	45
		<i>Night</i>	40

Table 7 above shows noise emission from the proposed chillers and cooling towers can comply with the DECCW INP noise criteria. The predicted noise levels readily comply with the INP noise criteria.

7 SLEEP DISTURBANCE ASSESSMENT

7.1 Sleep Disturbance Criteria

The DECCW has issued the following policy statement with respect to sleep disturbance:

"Peak noise level events, such as reversing beepers, noise from heavy items being dropped or other high noise level events, have the potential to cause sleep disturbance. The potential for high noise level events at night and effects on sleep should be addressed in noise assessments for both the construction and operational phases of a development. The INP does not specifically address sleep disturbance from high noise level events.

DEC reviewed research on sleep disturbance in the NSW Environmental Criteria for Road Traffic Noise (ECRTN) (EPA, 1999). This review concluded that the range of results is sufficiently diverse that it was not reasonable to issue new noise criteria for sleep disturbance.

From the research, DEC recognised that current sleep disturbance criterion of an LA1, (1 minute) not exceeding the LA90, (15 minute) by more than 15 dB(A) is not ideal. Nevertheless, as there is insufficient evidence to determine what should replace it, DEC will continue to use it as a guide to identify the likelihood of sleep disturbance. This means that where the criterion is met, sleep disturbance is not likely, but where it is not met, a more detailed analysis is required.

The detailed analysis should cover the maximum noise level or LA1, (1 minute), that is, the extent to which the maximum noise level exceeds the background level and the number of times this happens during the night-time period. Some guidance on possible impact is contained in the review of research results in the appendices to the ECRTN. Other factors that may be important in assessing the extent of impacts on sleep include:

- how often high noise events will occur*
- time of day (normally between 10pm and 7am)*
- whether there are times of day when there is a clear change in the noise environment (such as during early morning shoulder periods).*

The LA1, (1 minute) descriptor is meant to represent a maximum noise level measured under 'fast' time response. DEC will accept analysis based on either LA1, (1 minute) or LA, (Max)."

The policy states that a sleep disturbance criterion of $L_{A1(1min)} \leq L_{A90(15min)} + 15dB(A)$, should be used as a first step 'guide' as it is 'not ideal' and 'where it is not met, a more detailed analysis is required'. That detailed analysis includes a reference to the research material contained in the NSW ECRTN in the assessment of the subject proposal.

In 1999, the NSW ECRTN contains an Appendix B that summarises the findings of world-wide research undertaken on sleep disturbance from noise up until the time when this publication was produced. It summarises all of the research with the following statement:

“Considering all of the foregoing information the following conclusions can be drawn:

- *Maximum internal noise levels below 50-55dB(A) are unlikely to cause awakening reactions.*
- *One or two noise events per night, with maximum internal noise levels of 65-70dB(A), are not likely to affect health and wellbeing significantly.”*

Table 8 – External Sleep Disturbance Criteria

Assessment Location	L _{Max} Criteria
A1, A2 & A3	L _{Max} ≤ 55dB(A)

7.2 Noise Sources

Sleep disturbance would most potentially be caused by a single event of a patron shouting while in the outdoor areas, where there is a limited degree of acoustic shielding (compared with internal activities) and due to the relatively high L₁ noise levels that can be generated. A reference sound power level of a male shouting was used for the purpose of this assessment and is presented in Table 9 below.

Table 9 – Sound Power Levels – Male Shouting, dB(A) re 1pW

Activity	Sound Power Level, dB(A) re 1pW
	L ₁
Male Shouting*	96

Note: * Source reference – Handbook of Acoustical Measurements and Noise Control, Third Edition, Cyril M. Harris

7.3 Noise Predictions

Table 10 below sets out the prediction results for a sound power level of 96dB(A) occurring in each outdoor area and assessed to the receiver locations identified in Section 3 of this report.

Table 10 – Predicted Male Shouting Noise Levels at Assessment Locations

Description	Predicted L _{1-1minute} noise level [dB(A)]
Location A1 – 136-138 Edensor Road	
Beer Garden/ Outdoor Lounge	39
Cafe Deck	42
Lounge Deck	35
Sports Terrace	34
Eastern Outdoor Gaming	13
Noodle Bar	14

Description	Predicted L _{1-1minute} noise level [dB(A)]
Western Outdoor Gaming	25
Functions Terrace	43
Sleep Disturbance Criteria	55
Location A2 – 40-42 Gumdale Avenue	
Beer Garden/ Outdoor Lounge	22
Cafe Deck	14
Lounge Deck	12
Sports Terrace	14
Eastern Outdoor Gaming	35
Noodle Bar	38
Western Outdoor Gaming	33
Functions Terrace	18
Sleep Disturbance Criteria	55
Location A3 – 2 Herston Road	
Beer Garden/ Outdoor Lounge	27
Cafe Deck	20
Lounge Deck	19
Sports Terrace	30
Eastern Outdoor Gaming	27
Noodle Bar	32
Western Outdoor Gaming	28
Functions Terrace	22
Sleep Disturbance Criteria	55

The predicted noise levels reveal that a single event of a male shouting in any of the outdoor areas during the night time period comply with the sleep disturbance criteria.

8 ROAD TRAFFIC NOISE ASSESSMENT

8.1 Road Traffic Noise Criteria

Noise impact from the potential increase in traffic on the surrounding road network is assessed against the *NSW Environmental Criteria for Road Traffic Noise* (ECRTN, Environment Protection Authority 1999). However, as discussed briefly in Section 6.1, the proposed development does not substantially increasing useable area; hence no traffic study is undertaken. Based on the information, we assume that the vehicle movements in relation to SJPBC will be as existing and no assessment has been conducted.

9 RECOMMENDATIONS

Recommendations below are in-principle noise control solutions to reduce noise impacts to residential receivers. 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 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.

9.1 External Patron Noise Emission

With regard to the 10pm to 12 midnight period, exceedance of the noise criteria was the result of noise emission from the Beer Garden and Function Terrace areas. Noise from the beer garden can be controlled through either limiting patron capacity or limiting the background music noise levels. With respect to the Functions Terrace, the predictions assumed 1.5m² per person over the 300m² floor area, resulting in 250 people on the functions terrace. However, the capacity of the combined function room (Functions 1, 2, 3 and 4) is 340 people. Therefore, the noise impacts from the area can be reduced by assuming only half of the total attendees will occupy the functions terrace at one time, i.e. 170 people. Appropriate measures to ensure the number of patrons to the areas are limited is recommended, either through management measures or reducing the physical areas of the space.

The noise level predictions set out in Table 4 indicate that the operation of individual outdoor area will exceed the after midnight inaudibility criteria for at least one of the assessment locations. Whilst it is accepted that the Function Terrace and Beer garden will be closed at midnight it is desired that the outdoor gaming and noodle bar remain operating after midnight along with use of the Sports Terrace and Lounge Deck for smokers only.

It is expected that noise from the outdoor gaming areas will be minimal during the after midnight period if patron occupancy is low, however may vary intermittently. Due to the lower patron numbers when compared with terrace areas, the audibility of noise is likely to be the result of individual patrons rather than general crowd noise. Noise emission is therefore dependant upon management of any excessive noise from individual patrons, which can be more readily addressed in gaming areas. As noise level predictions have been based on the combining of sound power from multiple patrons, individual noise contributions will be lower. On this basis, provided that areas are appropriately staffed and patron noise monitored, noise emission from the outdoor gaming areas could comply with the Office of Liquor Gaming and Racing requirements. The use of electronic noise monitoring equipment could also be investigated for management purposes.

With regard to use of the Sports Terrace and Lounge Deck for smokers only, with reference to the sound power levels of raised male voices, we confirm that up to 10 patrons could readily occupy the Sports Terrace and Lounge Deck after midnight and comply with the OLGR criteria. Noise breakout from internal areas should be controlled by having all but one door used for ingress and egress and ensuring that the door is a button activated auto slider.

With regard to the design of the external areas, it is recommended that acoustically absorptive finishes be incorporated into the design, in particular the ceiling areas. Specification of appropriate finishes should be addressed during the detailed design phase.

9.2 Function Room

While entertainment is provided inside the Function Rooms, only single door shall be allowed for egress/ ingress of patrons between the Functions Terrace and the Function Rooms.

The building envelope of the Function rooms will require detailed acoustic assessment and review during the design development stages to ensure that the integrity of the building envelope is not affected once the detail of services and fitting are incorporated into the overall design.

Risk management is an integral part of good management practice. AS/NZS 4360-1999 "Risk Management" has become part of our company's culture and as a consequence it permeates all aspects of the company's work and is actively promoted to our clients.

The risk management process can be applied to any situation where an undesired or unexpected outcome could be significant or where opportunities are identified. Our clients need to know about possible outcomes and the steps that can be taken to control any adverse impact.

There is an opportunity in the design process for the client to actively participate in risk management by providing input into risk reduction strategy. For example, the client may need to know that some aspects of risk reduction could involve passing those risks on to other entities in a better position to treat those risks. Some aspects of risk reduction may involve additional cost or time consequences. On the other hand, there may also be opportunities to avoid or avert risk at no cost to the client by rescheduling processes so that key information becomes available at a critical time.

When the client is properly informed, this supports better decision making by contributing a greater insight into risks and their impacts. It is recommended that the client seek to understand the potential risk during the detailed design phase of the development.

11 CONCLUSION

Renzo Tonin & Associates has completed an assessment of potential noise impacts from the proposed St Johns Park Bowling Club Masterplan.

Noise impact from the proposed development on the most potentially affected noise sensitive receiver locations has been quantified and compared to the noise guidelines set by the Office of Liquor Gaming and Racing and NSW DECCW. Our assessment considered the major noise sources with potential to impact nearby sensitive receivers to be patrons, music entertainment and mechanical services equipment.

The findings of our assessment were;

- Noise emission from internal areas can be readily satisfied through appropriate specification of the building envelope construction.
- Physical noise control and management measures have been recommended for the control of noise emission from internal and external areas.
- Outdoor areas are not to be used after midnight with the exception of the outdoor gaming areas and noodle bar along with the Sports Terrace and Lounge Deck for smoking only (limited patronage).
- No acoustic treatment is required for the specified chillers and cooling towers to be located in the Chiller Plant Room.

APPENDIX A - GLOSSARY OF ACOUSTIC TERMS

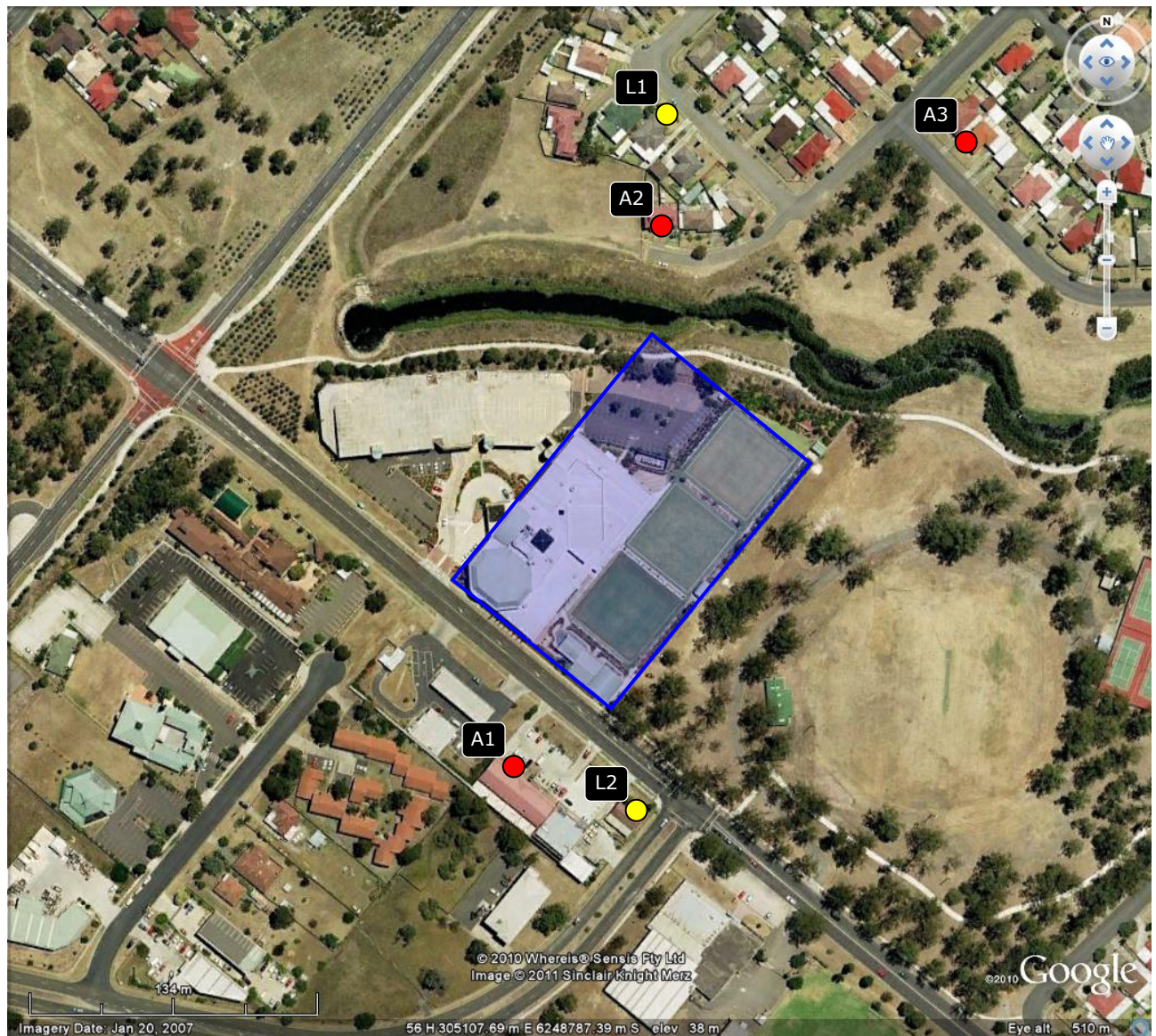
The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

<i>Adverse Weather</i>	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).																				
<i>Ambient Noise</i>	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.																				
<i>Assessment Period</i>	The period in a day over which assessments are made.																				
<i>Assessment Point</i>	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.																				
<i>Background Noise</i>	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 L_{90} noise level (see below).																				
<i>Decibel [dB]</i>	<p>The units that sound is measured in. The following are examples of the decibel readings of every day sounds:</p> <table><tr><td>0dB</td><td>The faintest sound we can hear</td></tr><tr><td>30dB</td><td>A quiet library or in a quiet location in the country</td></tr><tr><td>45dB</td><td>Typical office space. Ambience in the city at night</td></tr><tr><td>60dB</td><td>Martin Place at lunch time</td></tr><tr><td>70dB</td><td>The sound of a car passing on the street</td></tr><tr><td>80dB</td><td>Loud music played at home</td></tr><tr><td>90dB</td><td>The sound of a truck passing on the street</td></tr><tr><td>100dB</td><td>The sound of a rock band</td></tr><tr><td>115dB</td><td>Limit of sound permitted in industry</td></tr><tr><td>120dB</td><td>Deafening</td></tr></table>	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
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115dB	Limit of sound permitted in industry																				
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<i>dB(A)</i>	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.
<i>Frequency</i>	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.
<i>Impulsive noise</i>	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.
<i>Intermittent noise</i>	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.
<i>L_{max}</i>	The maximum sound pressure level measured over a given period.
<i>L_{min}</i>	The minimum sound pressure level measured over a given period.
<i>L₁</i>	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
<i>L₁₀</i>	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
<i>L₉₀</i>	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).
<i>L_{eq}</i>	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
<i>Reflection</i>	Sound wave changed in direction of propagation due to a solid object obscuring its path.
<i>SEL</i>	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 L _{eq} sound levels over any period of time and can be used for predicting noise at various locations.

<i>Sound</i>	A fluctuation of air pressure which is propagated as a wave through air.
<i>Sound Absorption</i>	The ability of a material to absorb sound energy through its conversion into thermal energy.
<i>Sound Level Meter</i>	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
<i>Sound Pressure Level</i>	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
<i>Sound Power Level</i>	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
<i>Tonal noise</i>	Containing a prominent frequency and characterised by a definite pitch.

APPENDIX B - SITE AND MEASUREMENT LOCATIONS



- - Long-Term Monitoring Location
- - Short Term Measurement Locations
- - Assessment Locations
- Site Location

APPENDIX C - NOISE MONITORING METHODOLOGY

C.1 Noise Monitoring Equipment

Long term noise monitoring was conducted using a RTA Technology 04 noise logger. The noise monitoring equipment used here complies with AS IEC 61672.1 2004 "Electroacoustics - Sound Level Meters" and is designated as a Type 1 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.

C.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 (BOM) provided meteorological data, which is considered representative of the site, for the duration of the noise monitoring period. The data was modified to allow for the height difference between the BOM weather station, where wind speed and direction is recorded at a height of 10m above ground level, and the microphone location, which is at 1.5m above ground level. The correction factor applied to the data was taken from *Australian Standard AS1170.2 1989 Section 4.2.5.1*.

C.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 location in Appendix D 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 L_{90} noise level.

APPENDIX D - LONG-TERM NOISE MONITORING RESULTS

Front Yard of 73 Buranda Crescent, St Johns Park

BACKGROUND & AMBIENT NOISE MONITORING RESULTS NSW DECCW's 'INDUSTRIAL NOISE POLICY', 2000

Day	L _{A90} Background Noise Levels ⁵			L _{Aeq} Ambient Noise Levels		
	Day	Evening	Night	Day	Evening	Night
Friday-22-October-2010	-	40	36	-	56	48
Saturday-23-October-2010	38	38	-	53	56	-
Sunday-24-October-2010	-	-	34	-	-	46
Monday-25-October-2010	42	41	34	53	51	47
Tuesday-26-October-2010	38	45	33	53	55	48
Wednesday-27-October-2010	39	43	31	53	52	50
Thursday-28-October-2010	40	41	34	52	50	46
Friday-29-October-2010	37	42	36	55	50	45
Saturday-30-October-2010	39	43	34	53	53	47
Sunday-31-October-2010	39	41	34	61	52	49
Monday-01-November-2010	-	-	-	-	-	-
Representative Level	39	41	34	55	53	47

Notes:

- Day is taken to be 7:00am to 6:00pm
- Evening is taken to be 6:00pm to 10:00pm.
- Night is taken to be the remaining periods.
- Partial day's monitoring
- Assessment Background Level (ABL)
- Rating Background Level (RBL) for L90 and logarithmic average for Leq

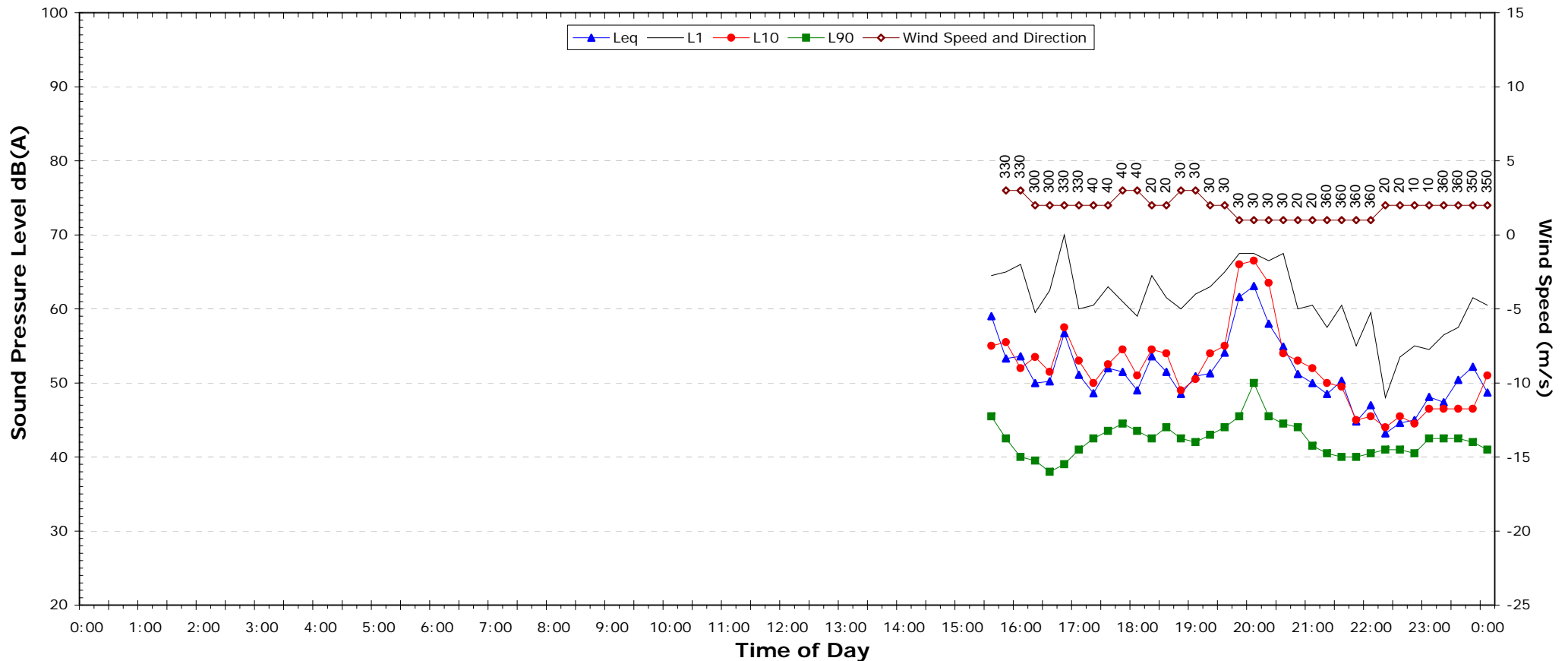
TRAFFIC NOISE MONITORING RESULTS NSW DECCW 'ENVIRONMENTAL CRITERIA FOR ROAD TRAFFIC NOISE', 1999

Day	L _{Aeq} Noise Levels			L _{Aeq 1hr} Noise Levels		
	Day	Night	Day - Up	Day - Low	Night - Up	Night - Low
Friday-22-October-2010	57	50	62	51	57	41
Saturday-23-October-2010	57	49	61	51	55	42
Sunday-24-October-2010	54	48	59	51	54	39
Monday-25-October-2010	55	50	58	50	58	38
Tuesday-26-October-2010	56	50	60	53	57	39
Wednesday-27-October-2010	55	52	57	52	59	36
Thursday-28-October-2010	54	48	57	51	54	39
Friday-29-October-2010	57	47	63	49	53	40
Saturday-30-October-2010	55	49	57	52	54	40
Sunday-31-October-2010	62	51	70	51	58	39
Monday-01-November-2010	53	-	55	50	-	-
Representative Weekday	56	50	60	51	57	39
Representative Weekend	58	50	65	51	55	40
Representative Week	57	50	63	51	56	40

EXISTING AMBIENT NOISE LEVELS

Front Yard of 73 Buranda Crescent, St Johns Park

Friday, 22 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	-	40.0	35.5
Leq (see note 3)	-	55.6	47.6

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 L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

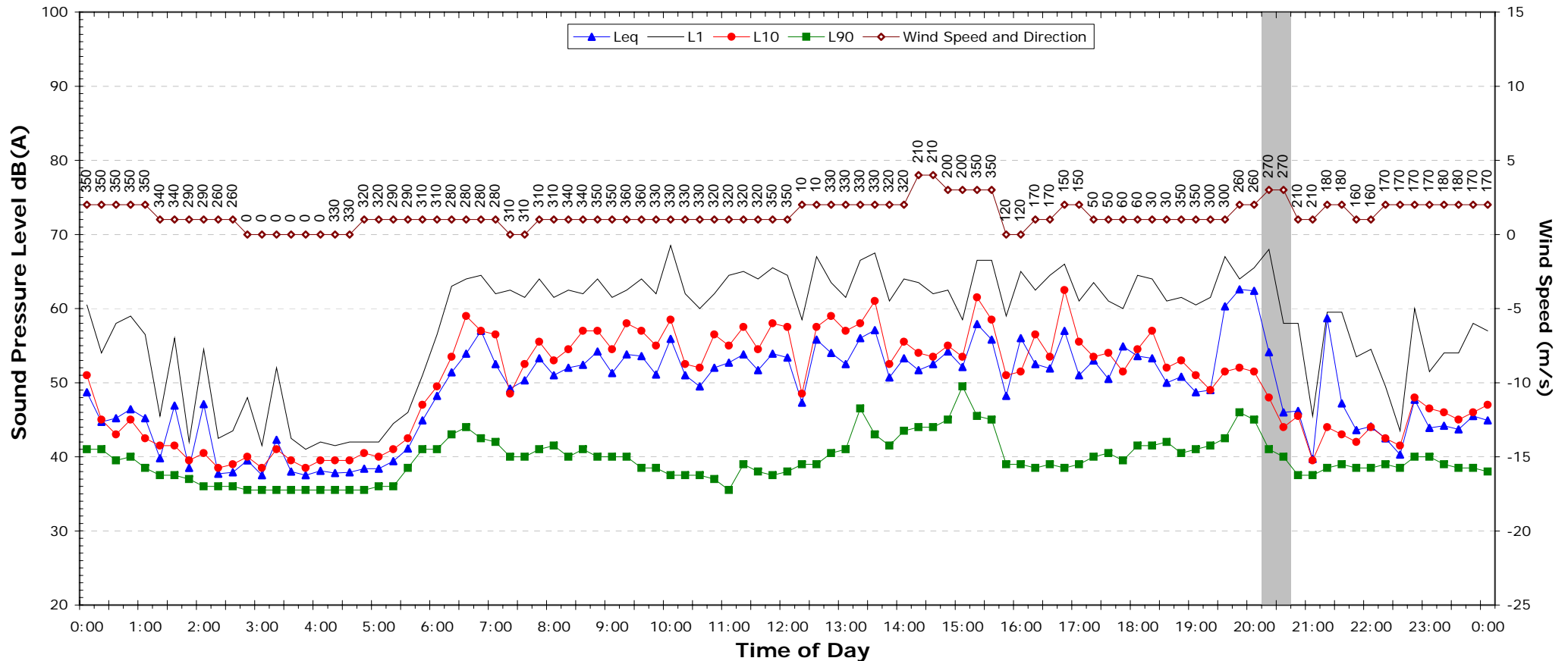
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	57.4	50.1
L _{eq} 1hr upper 10 percentile	62.4	56.7
L _{eq} 1hr lower 10 percentile	50.6	40.6

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

EXISTING AMBIENT NOISE LEVELS

Front Yard of 73 Buranda Crescent, St Johns Park

Saturday, 23 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	37.5	37.5	-
Leq (see note 3)	53.5	56.4	-

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 L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

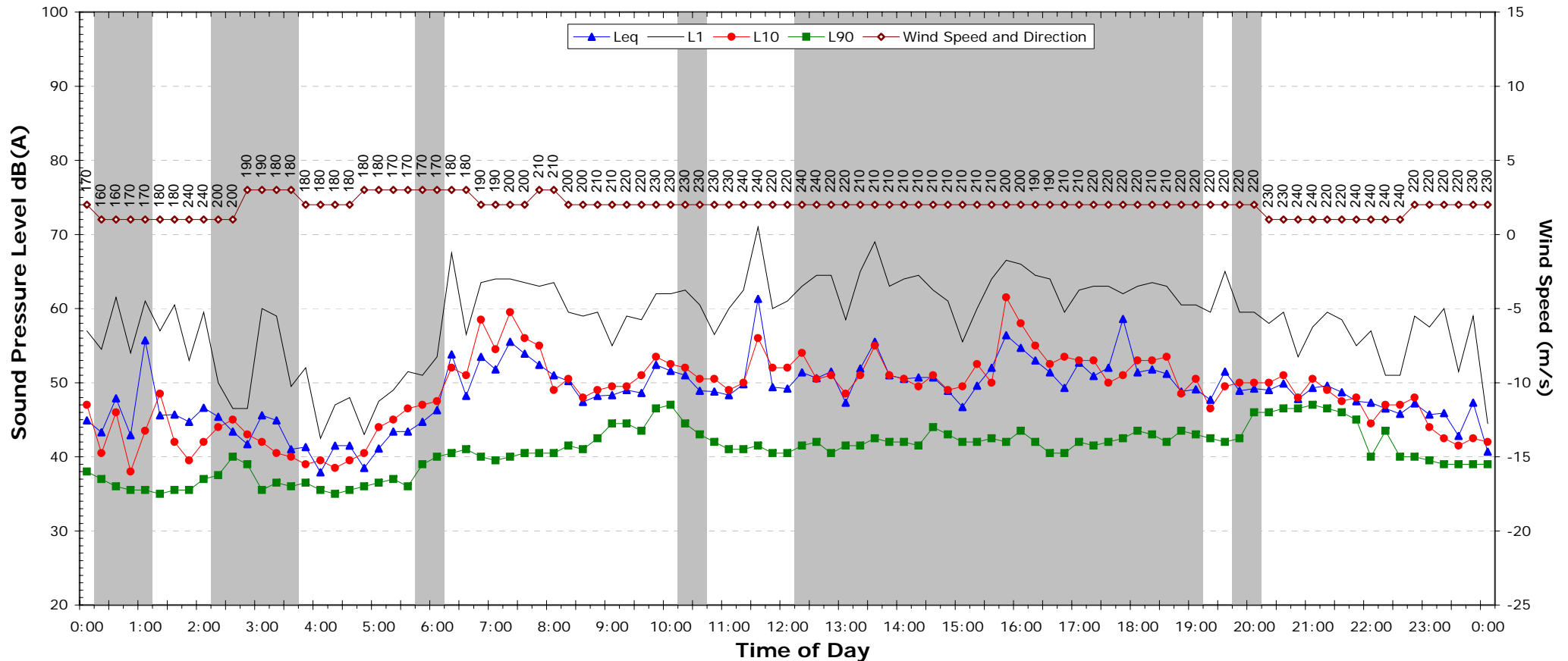
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	56.9	49.4
L _{eq} 1hr upper 10 percentile	61.4	54.8
L _{eq} 1hr lower 10 percentile	51.3	42.4

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	67.5	to	67.5
L _{max} - Leq (Range)	15.2	to	15.5

EXISTING AMBIENT NOISE LEVELS

Front Yard of 73 Buranda Crescent, St Johns Park

Sunday, 24 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	-	-	34.0
Leq (see note 3)	-	-	45.9

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 L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

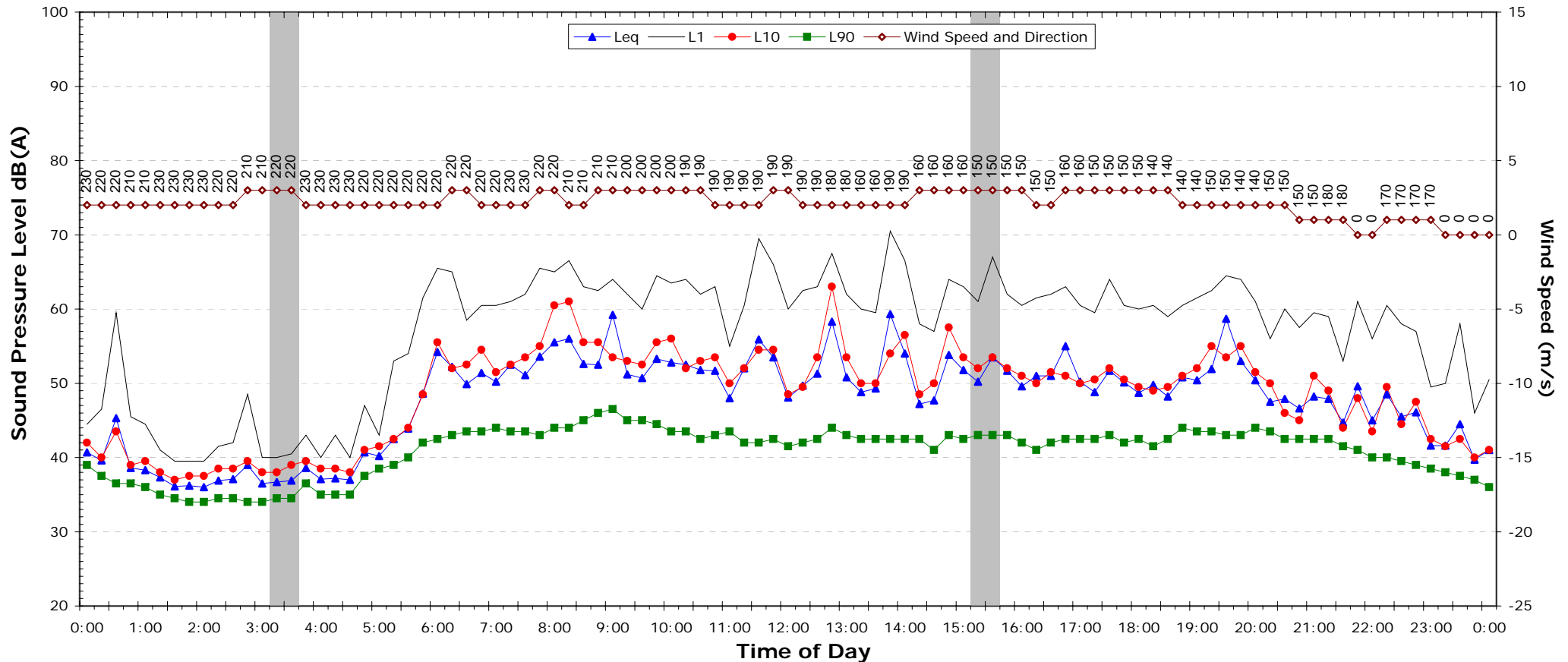
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	54.3	48.4
L _{eq} 1hr upper 10 percentile	58.6	53.5
L _{eq} 1hr lower 10 percentile	50.9	38.9

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	65.5	to	65.5
L _{max} - Leq (Range)	15.1	to	18.0

EXISTING AMBIENT NOISE LEVELS

Front Yard of 73 Buranda Crescent, St Johns Park

Monday, 25 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	42.0	41.0	33.5
Leq (see note 3)	53.1	51.1	47.4

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 L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

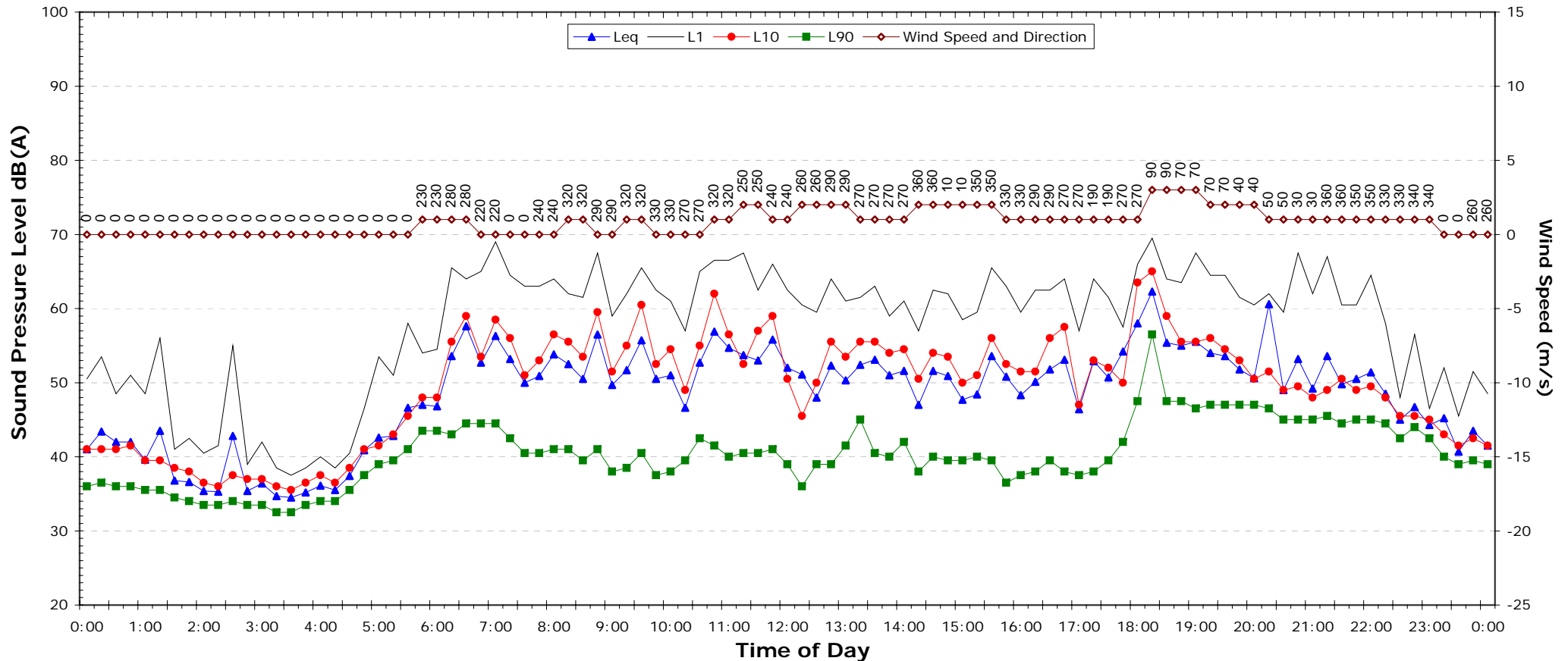
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	55.1	49.9
L _{eq} 1hr upper 10 percentile	58.0	58.0
L _{eq} 1hr lower 10 percentile	49.9	37.7

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	15.9	to	16.6

EXISTING AMBIENT NOISE LEVELS

Front Yard of 73 Buranda Crescent, St Johns Park

Tuesday, 26 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	37.5	45.0	33.0
Leq (see note 3)	52.6	55.4	47.8

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 L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

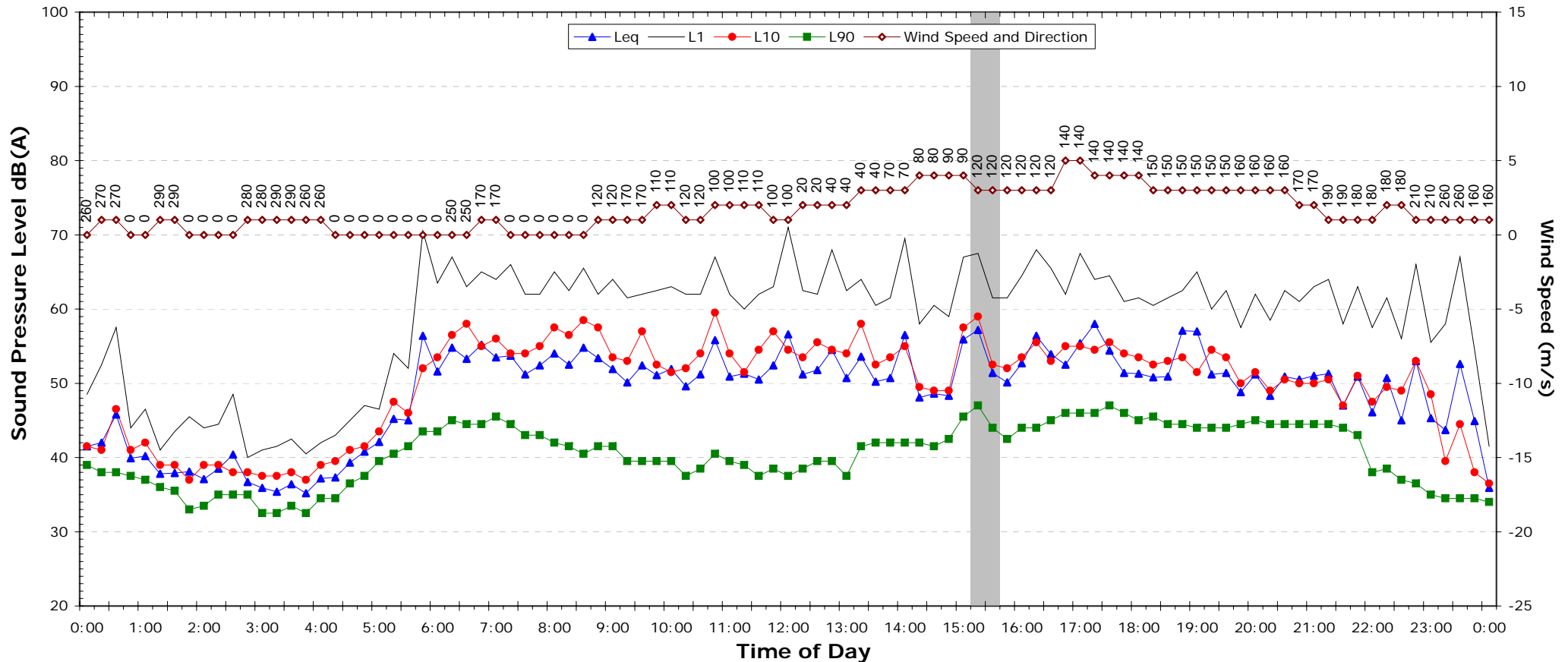
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	56.0	50.3
L _{eq} 1hr upper 10 percentile	59.7	56.8
L _{eq} 1hr lower 10 percentile	52.7	38.6

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	70.5	to	70.5
L _{max} - Leq (Range)	18.4	to	18.4

EXISTING AMBIENT NOISE LEVELS

Front Yard of 73 Buranda Crescent, St Johns Park

Wednesday, 27 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	38.5	43.0	31.0
Leq (see note 3)	53.1	52.0	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 L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

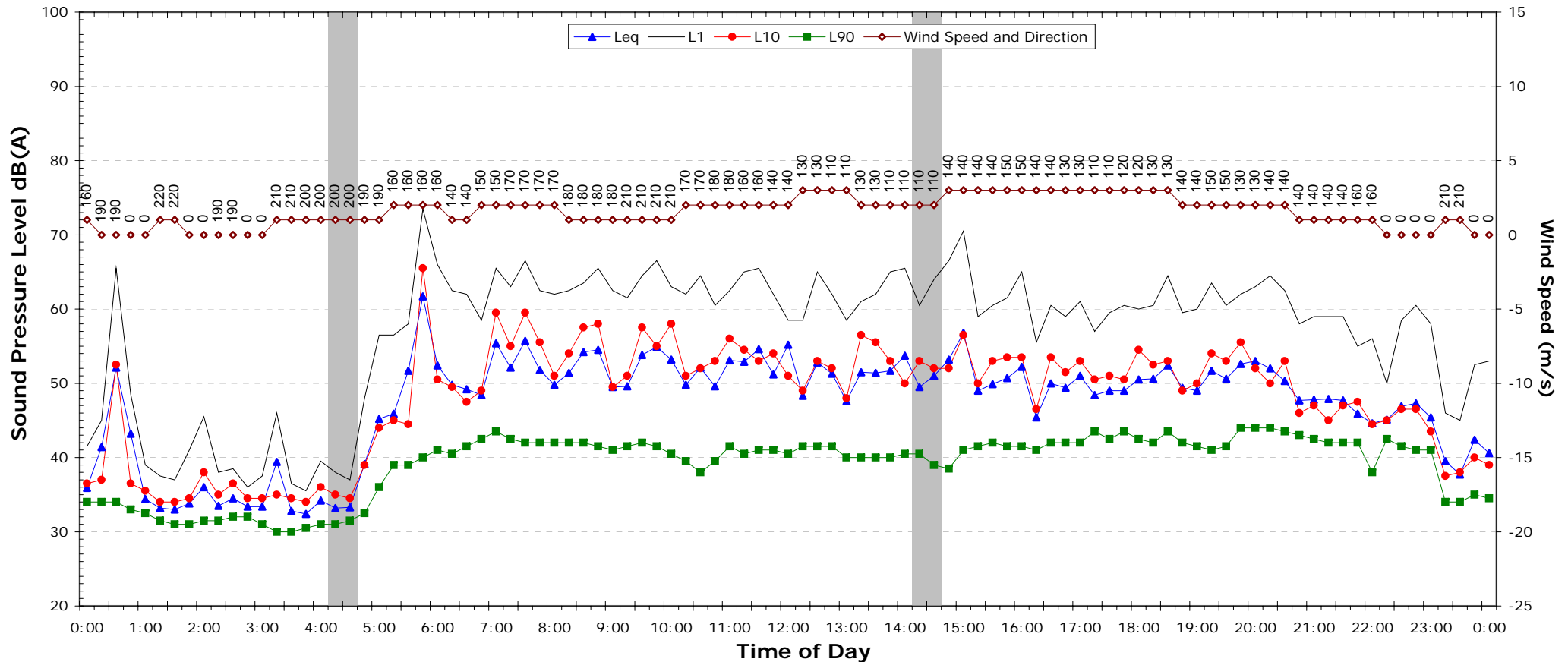
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	55.3	52.4
L _{eq} 1hr upper 10 percentile	57.4	59.1
L _{eq} 1hr lower 10 percentile	52.4	36.2

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	65.5	to	73.5
L _{max} - Leq (Range)	16.2	to	19.2

EXISTING AMBIENT NOISE LEVELS

Front Yard of 73 Buranda Crescent, St Johns Park

Thursday, 28 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	40.0	41.0	33.5
Leq (see note 3)	52.1	50.2	45.6

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 L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

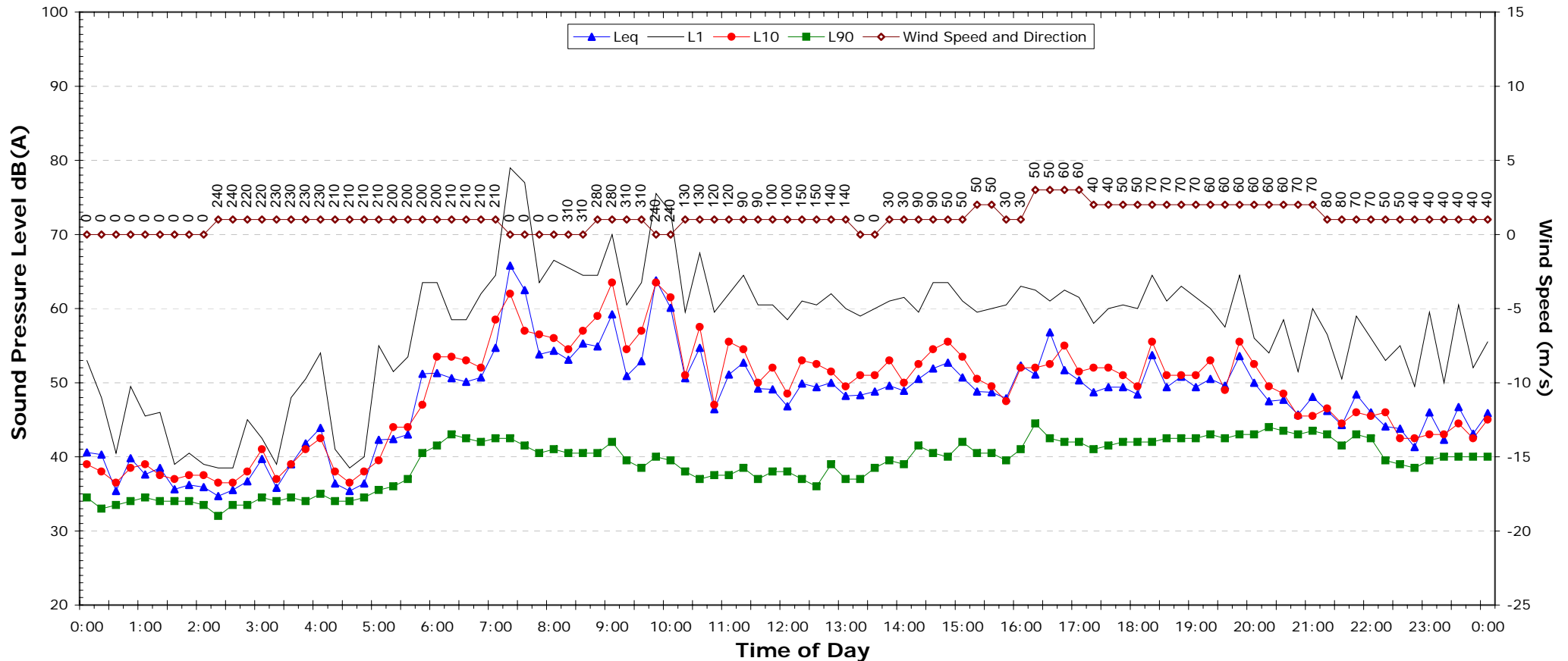
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	54.2	48.1
L _{eq} 1hr upper 10 percentile	57.1	54.5
L _{eq} 1hr lower 10 percentile	50.7	39.2

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	16.4	to	16.4

EXISTING AMBIENT NOISE LEVELS

Front Yard of 73 Buranda Crescent, St Johns Park

Friday, 29 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	37.0	42.0	35.5
Leq (see note 3)	55.4	49.6	44.8

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 L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

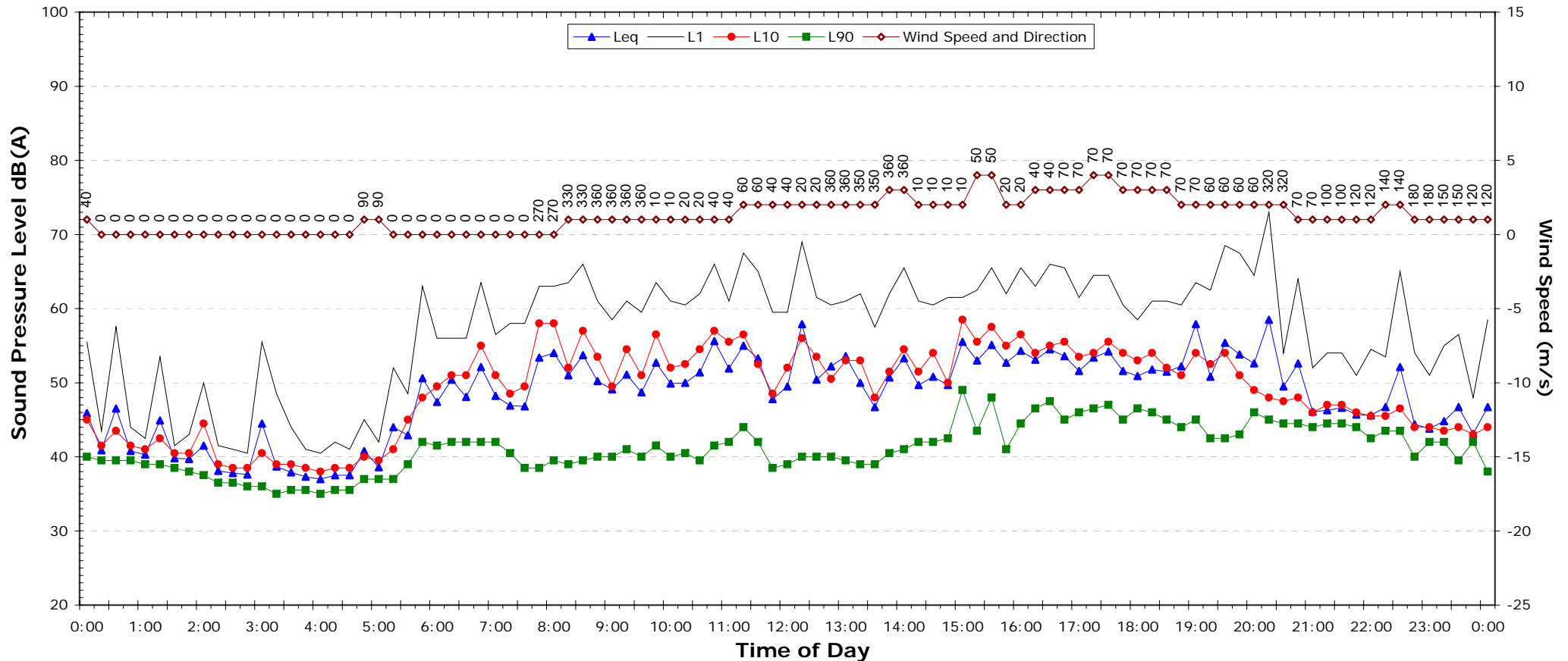
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	57.0	47.3
L _{eq} 1hr upper 10 percentile	63.4	52.5
L _{eq} 1hr lower 10 percentile	49.4	40.3

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	15.4	to	15.7

EXISTING AMBIENT NOISE LEVELS

Front Yard of 73 Buranda Crescent, St Johns Park

Saturday, 30 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	39.0	42.5	34.0
Leq (see note 3)	52.5	52.9	46.5

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 L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

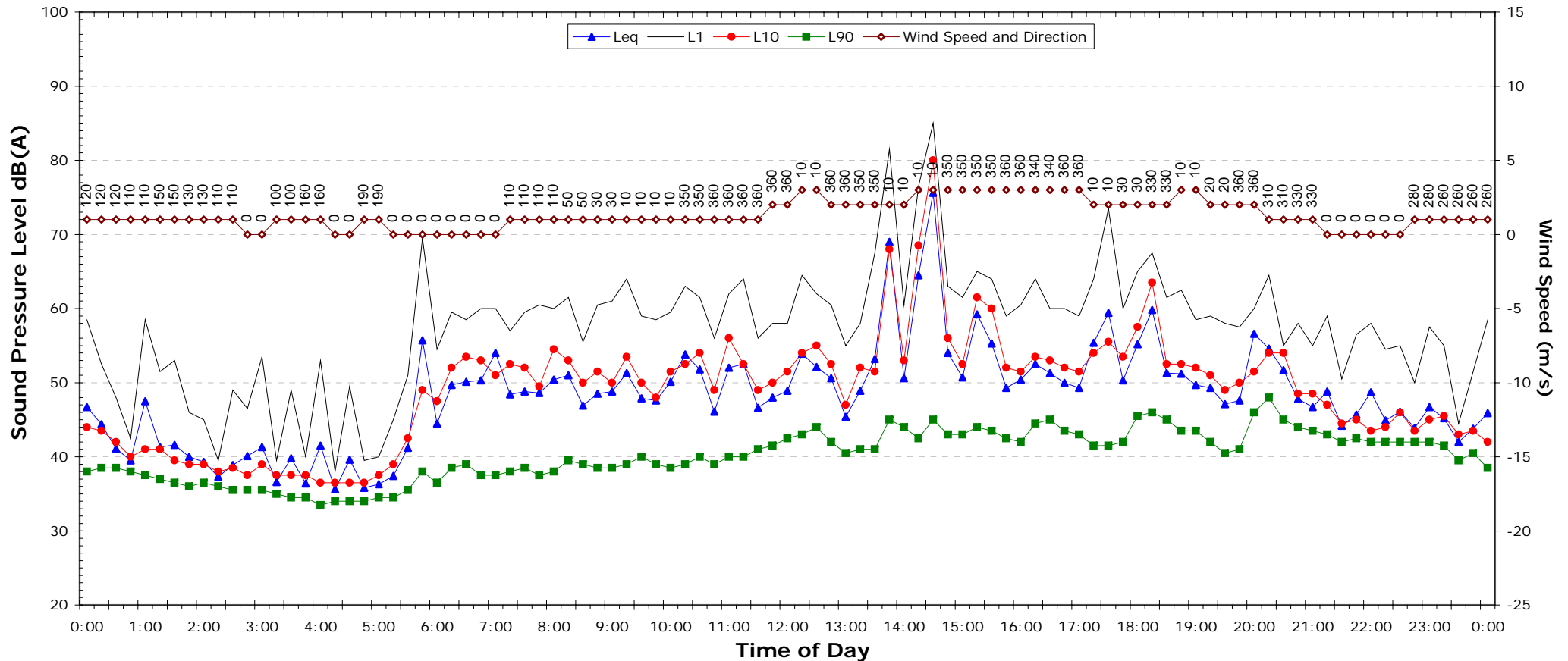
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	55.1	49.0
L _{eq} 1hr upper 10 percentile	56.9	53.9
L _{eq} 1hr lower 10 percentile	51.5	39.7

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	65.0	to	69.5
L _{max} - Leq (Range)	16.9	to	19.3

EXISTING AMBIENT NOISE LEVELS

Front Yard of 73 Buranda Crescent, St Johns Park

Sunday, 31 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	38.5	41.0	34.0
Leq (see note 3)	60.9	52.3	48.5

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 L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max} - Leq ≥ 15dB(A)

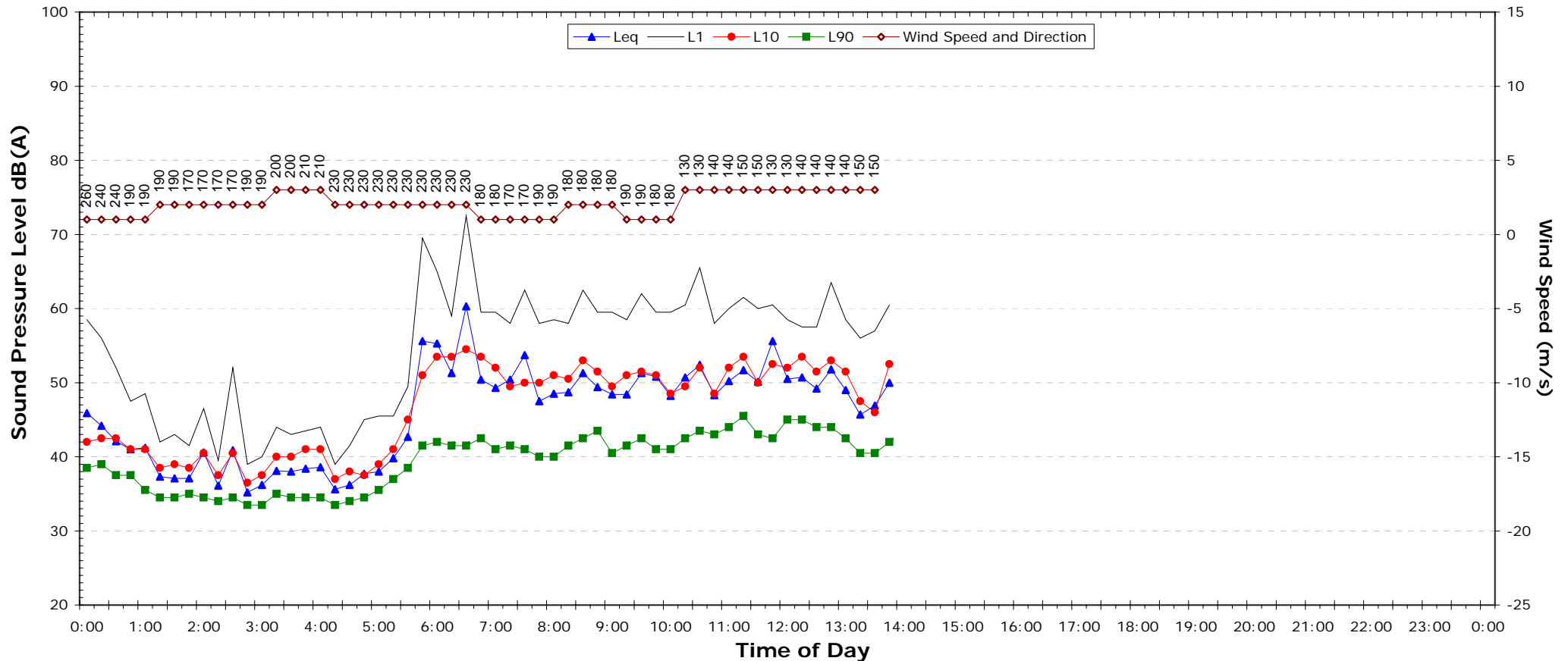
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	62.2	51.0
L _{eq} 1hr upper 10 percentile	70.3	57.9
L _{eq} 1hr lower 10 percentile	50.8	39.5

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	69.5	to	72.5
L _{max} - Leq (Range)	16.9	to	17.1

EXISTING AMBIENT NOISE LEVELS

Front Yard of 73 Buranda Crescent, St Johns Park

Monday, 1 November 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	-	-	-
Leq (see note 3)	-	-	-

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 L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	53.0	-
L _{eq} 1hr upper 10 percentile	55.1	-
L _{eq} 1hr lower 10 percentile	50.4	-

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

Front Yard of 132 Edensor Road

BACKGROUND & AMBIENT NOISE MONITORING RESULTS NSW DECCW's 'INDUSTRIAL NOISE POLICY', 2000

Day	L _{A90} Background Noise Levels ⁵			L _{Aeq} Ambient Noise Levels		
	Day	Evening	Night	Day	Evening	Night
Tuesday-28-September-2010	-	54	37	-	65	61
Wednesday-29-September-2010	57	-	37	66	-	61
Thursday-30-September-2010	56	56	43	65	66	62
Friday-01-October-2010	57	55	41	66	65	60
Saturday-02-October-2010	-	-	-	-	-	-
Sunday-03-October-2010	-	-	-	-	-	-
Monday-04-October-2010	55	53	-	65	63	-
Tuesday-05-October-2010	56	53	38	65	64	62
Wednesday-06-October-2010	57	53	40	66	64	61
Thursday-07-October-2010	58	52	39	66	65	62
Friday-08-October-2010	57	55	40	66	65	61
Saturday-09-October-2010	57	55	-	66	64	-
Sunday-10-October-2010	57	52	40	66	64	62
Monday-11-October-2010	58	-	-	66	-	-
Representative Level	57	54	40	66	65	61

Notes:

- Day is taken to be 7:00am to 6:00pm
- Evening is taken to be 6:00pm to 10:00pm.
- Night is taken to be the remaining periods.
- Partial day's monitoring
- Assessment Background Level (ABL)
- Rating Background Level (RBL) for L90 and logarithmic average for Leq

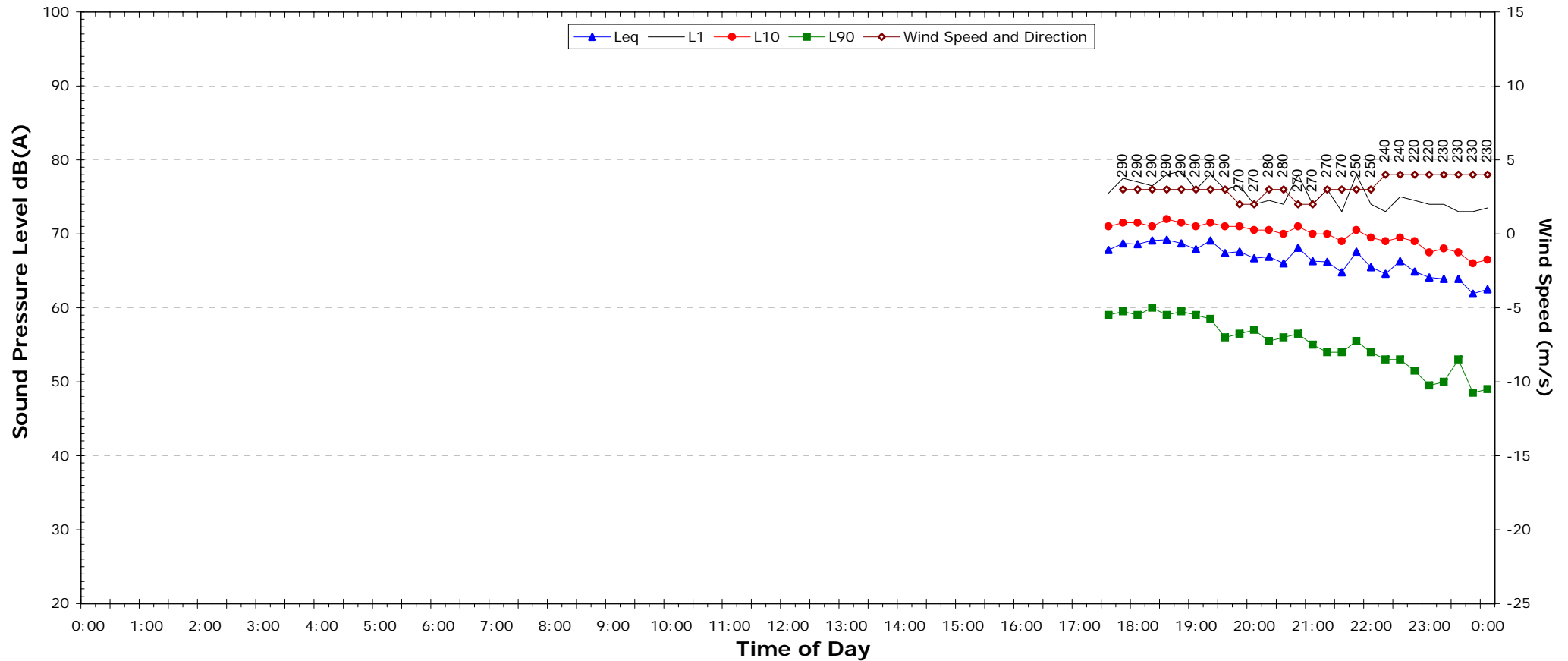
TRAFFIC NOISE MONITORING RESULTS NSW DECCW 'ENVIRONMENTAL CRITERIA FOR ROAD TRAFFIC NOISE', 1999

Day	L _{Aeq} Noise Levels		L _{Aeq} 1hr Noise Levels			
	Day	Night	Day - Up	Day - Low	Night - Up	Night - Low
Tuesday-28-September-2010	68	63	69	66	68	56
Wednesday-29-September-2010	68	64	69	67	69	56
Thursday-30-September-2010	68	64	69	67	69	58
Friday-01-October-2010	68	63	69	67	65	59
Saturday-02-October-2010	68	64	70	65	68	61
Sunday-03-October-2010	68	63	69	66	65	61
Monday-04-October-2010	67	64	69	65	68	58
Tuesday-05-October-2010	67	64	68	67	68	58
Wednesday-06-October-2010	68	64	70	65	69	58
Thursday-07-October-2010	68	64	69	66	68	55
Friday-08-October-2010	68	64	69	67	66	60
Saturday-09-October-2010	68	64	70	66	66	61
Sunday-10-October-2010	68	65	69	66	69	58
Monday-11-October-2010	69	-	71	67	-	-
Representative Weekday	68	64	69	66	68	58
Representative Weekend	68	64	70	66	67	60
Representative Week	68	64	69	66	68	59

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Tuesday, 28 September 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	-	54.0	37.0
Leq (see note 3)	-	65.0	60.8

NOTES:

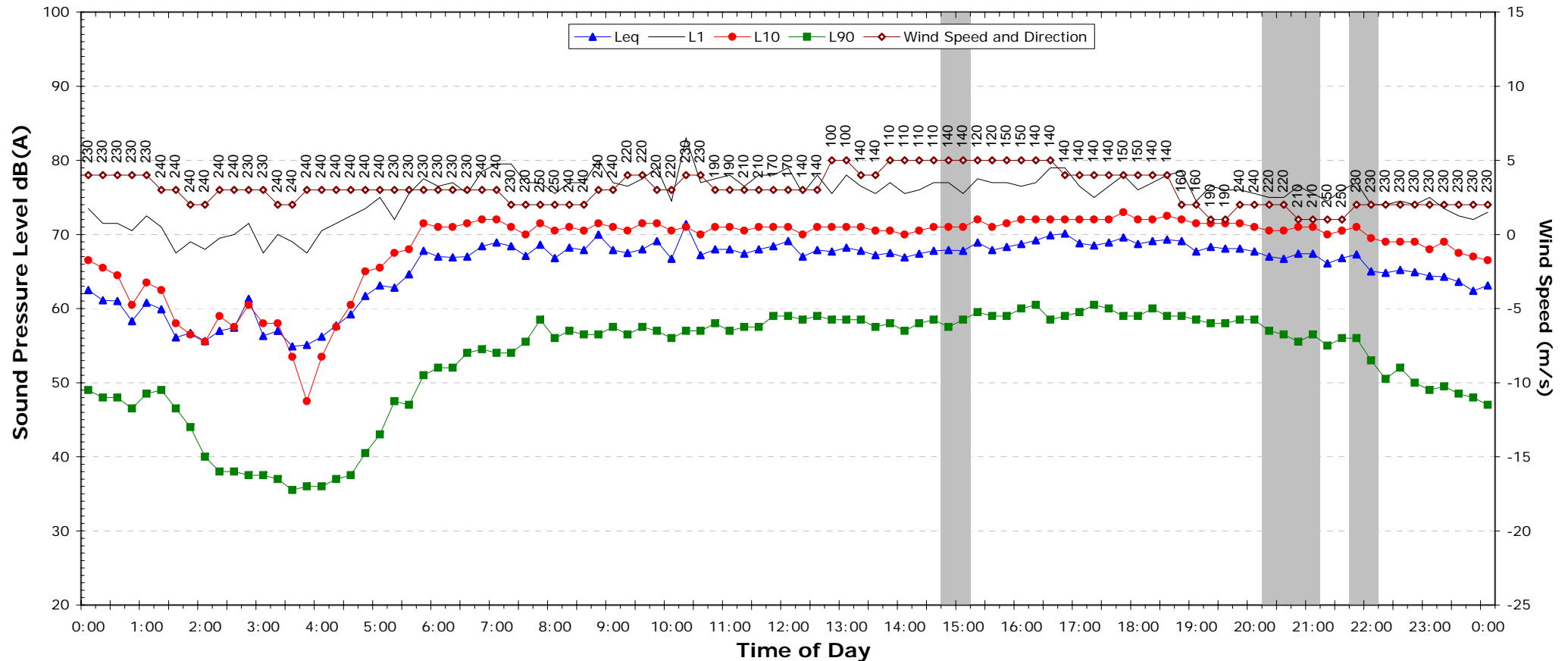
1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Night" relates to period from 10pm on this graph to 7am on the following graph.
3. Graphed data measured 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

NSW ECRTN Policy (1m from facade)			(see note3)
Descriptor	Day	Night ²	
	7am-10pm	10pm-7am	
L _{eq} 15 hr and L _{eq} 9 hr	67.7	63.3	
L _{eq} 1hr upper 10 percentile	68.8	67.9	
L _{eq} 1hr lower 10 percentile	66.2	55.9	
Night Time Maximum Noise Levels			(see note 4)
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Wednesday, 29 September 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	56.5	-	37.0
Leq (see note 3)	65.9	-	61.5

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

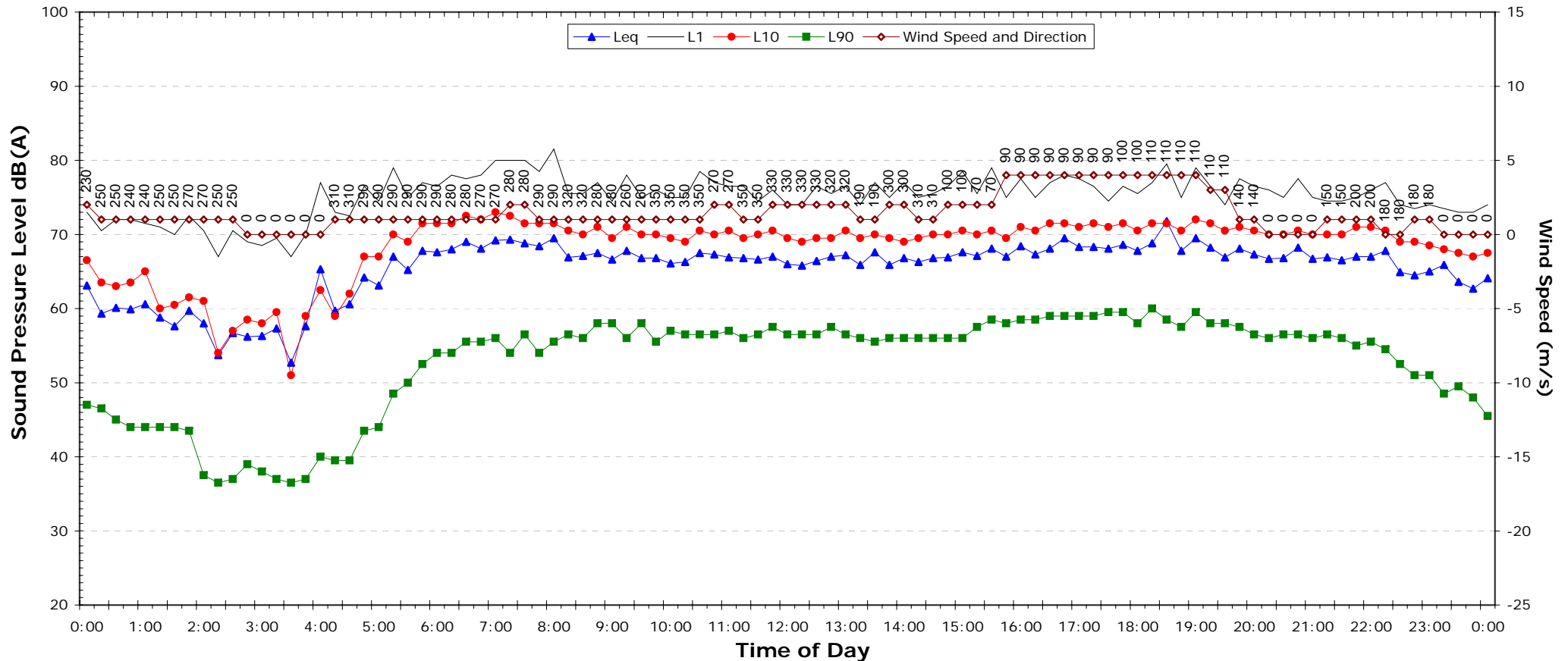
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	68.3	64.0
L _{eq} 1hr upper 10 percentile	69.3	68.6
L _{eq} 1hr lower 10 percentile	66.8	55.9

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	77.0	to	77.0
L _{max} - Leq (Range)	16.3	to	16.3

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Thursday, 30 September 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	55.5	55.5	43.0
Leq (see note 3)	64.9	65.5	61.5

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

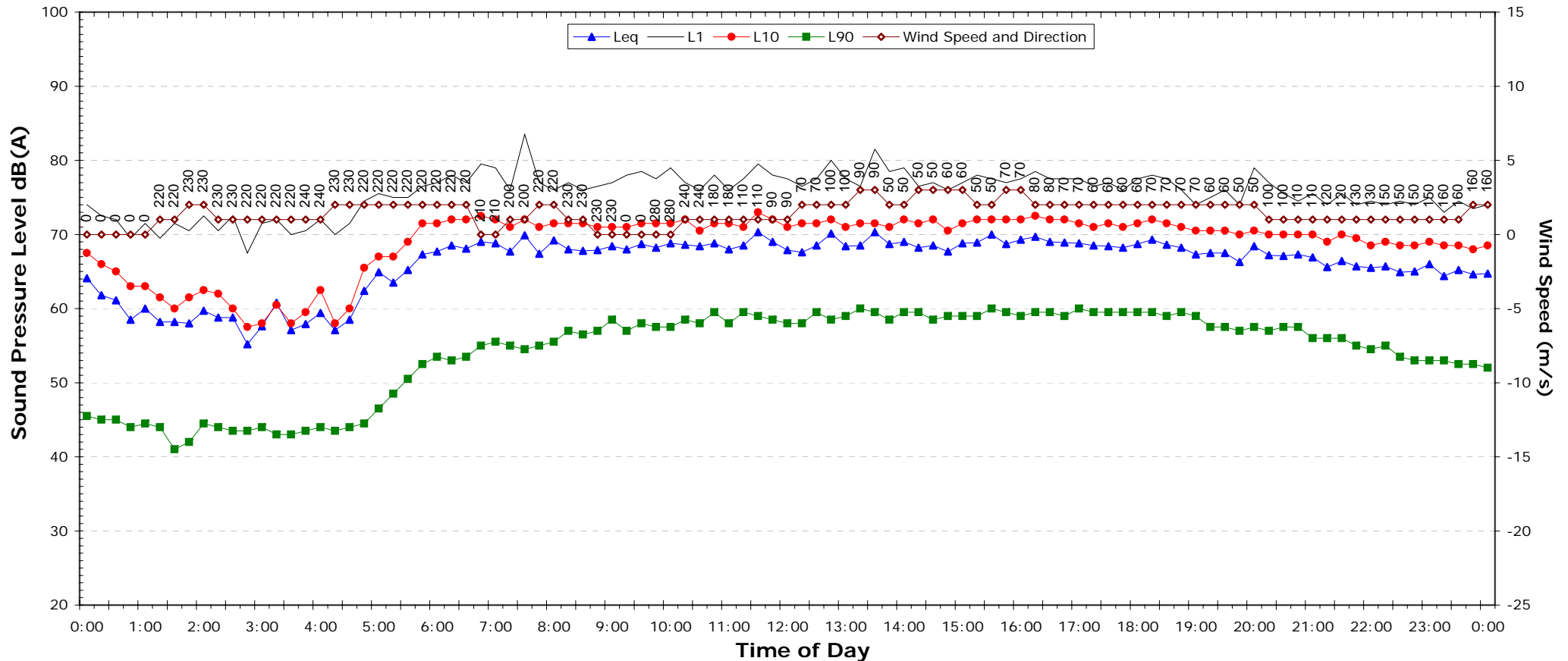
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	67.6	64.0
L _{eq} 1hr upper 10 percentile	69.4	68.6
L _{eq} 1hr lower 10 percentile	66.6	57.8

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Friday, 1 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	56.5	55.0	41.0
Leq (see note 3)	66.2	64.8	60.4

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

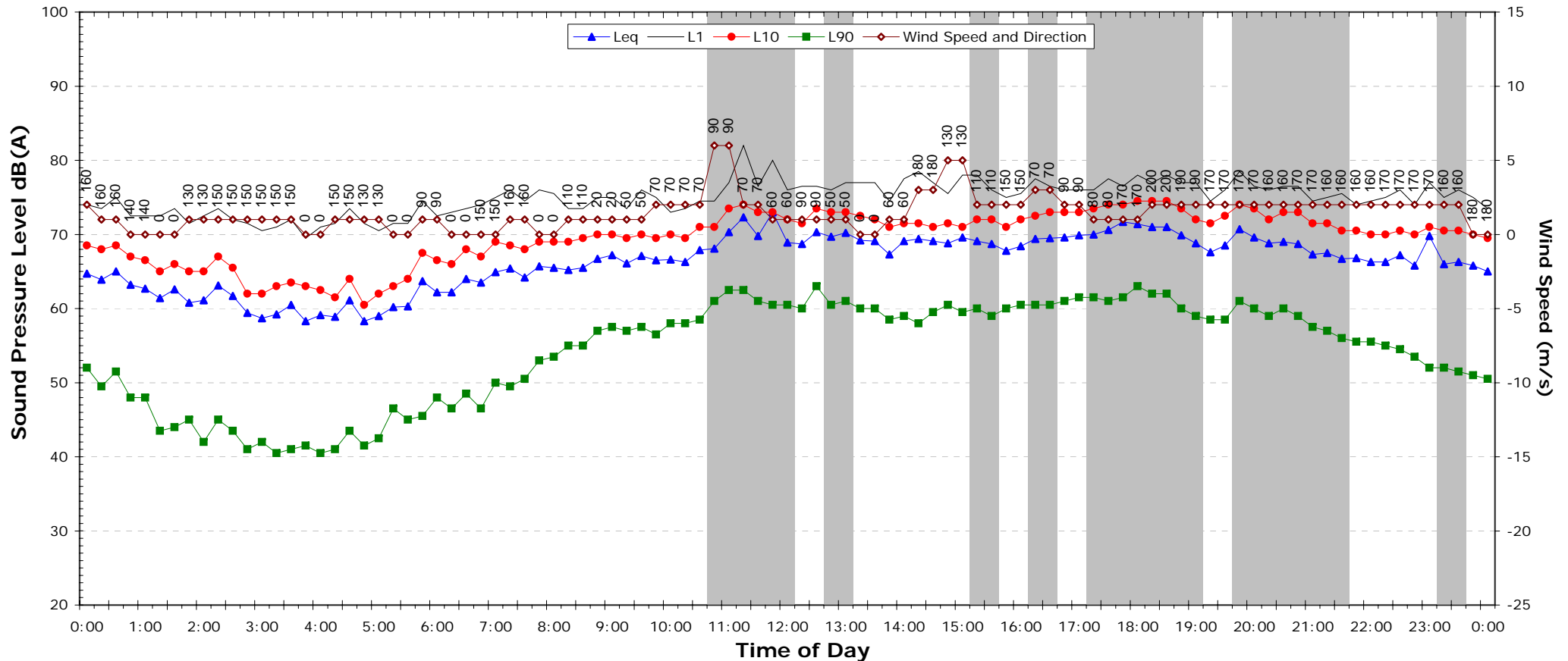
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	68.4	62.9
L _{eq} 1hr upper 10 percentile	69.2	65.4
L _{eq} 1hr lower 10 percentile	66.5	59.3

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Saturday, 2 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	-	-	-
Leq (see note 3)	-	-	-

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

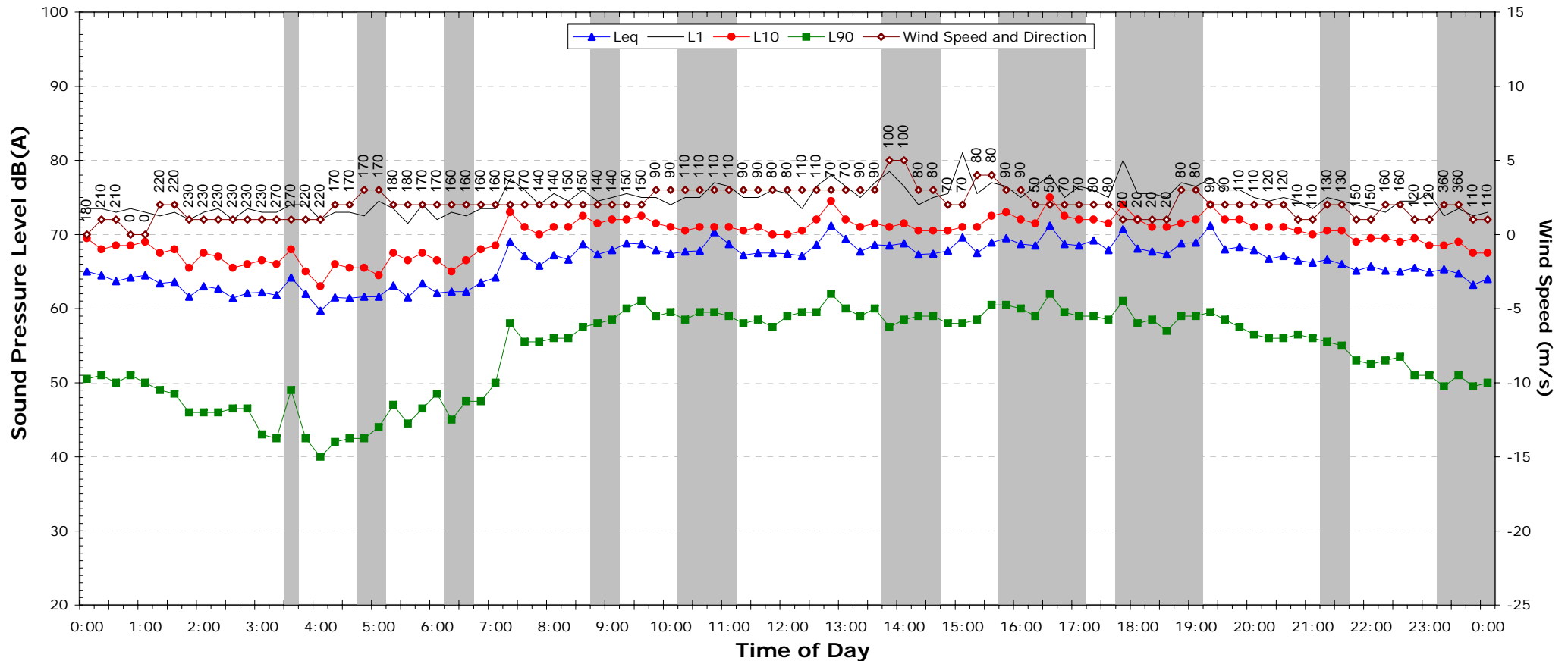
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	67.8	64.1
L _{eq} 1hr upper 10 percentile	69.7	67.6
L _{eq} 1hr lower 10 percentile	65.3	61.3

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Sunday, 3 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	-	-	-
Leq (see note 3)	-	-	-

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

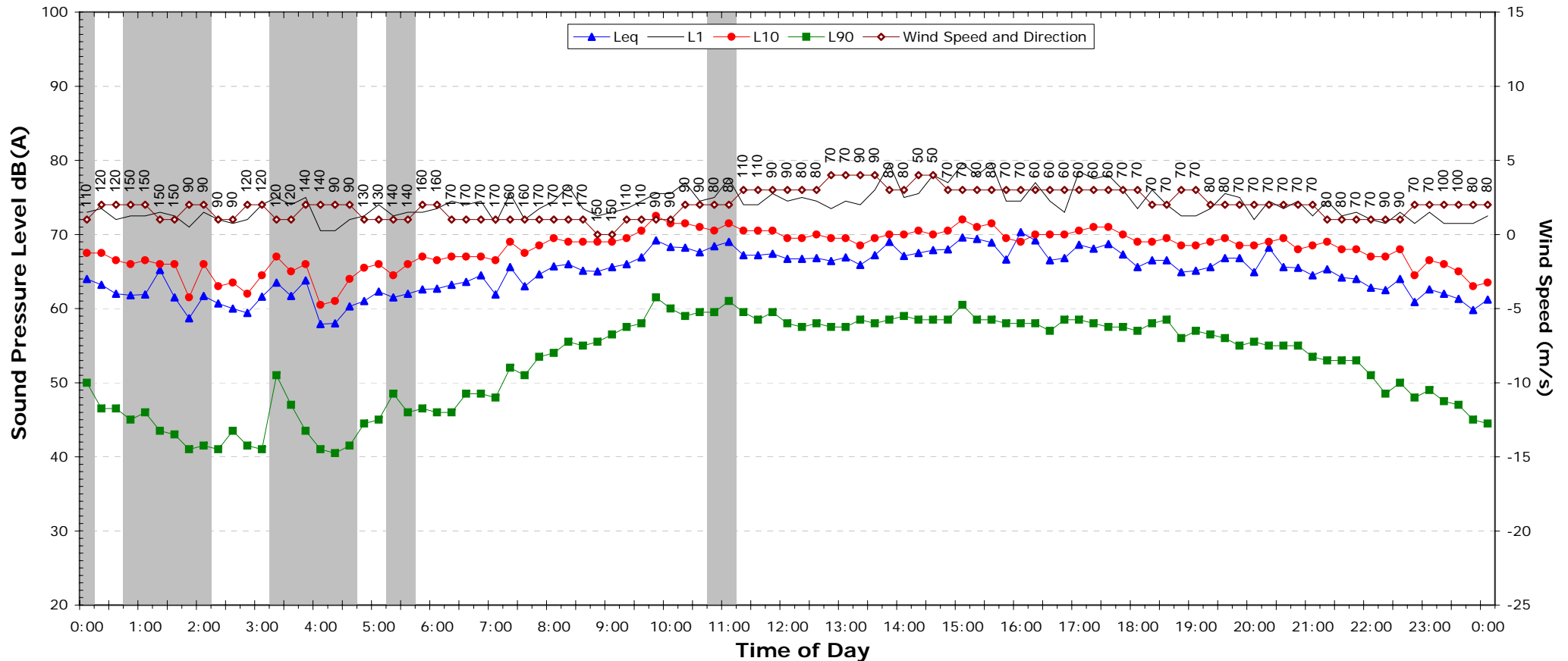
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	68.1	63.1
L _{eq} 1hr upper 10 percentile	69.3	65.1
L _{eq} 1hr lower 10 percentile	65.7	60.5

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Monday, 4 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	55.0	53.0	-
Leq (see note 3)	64.9	63.1	-

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

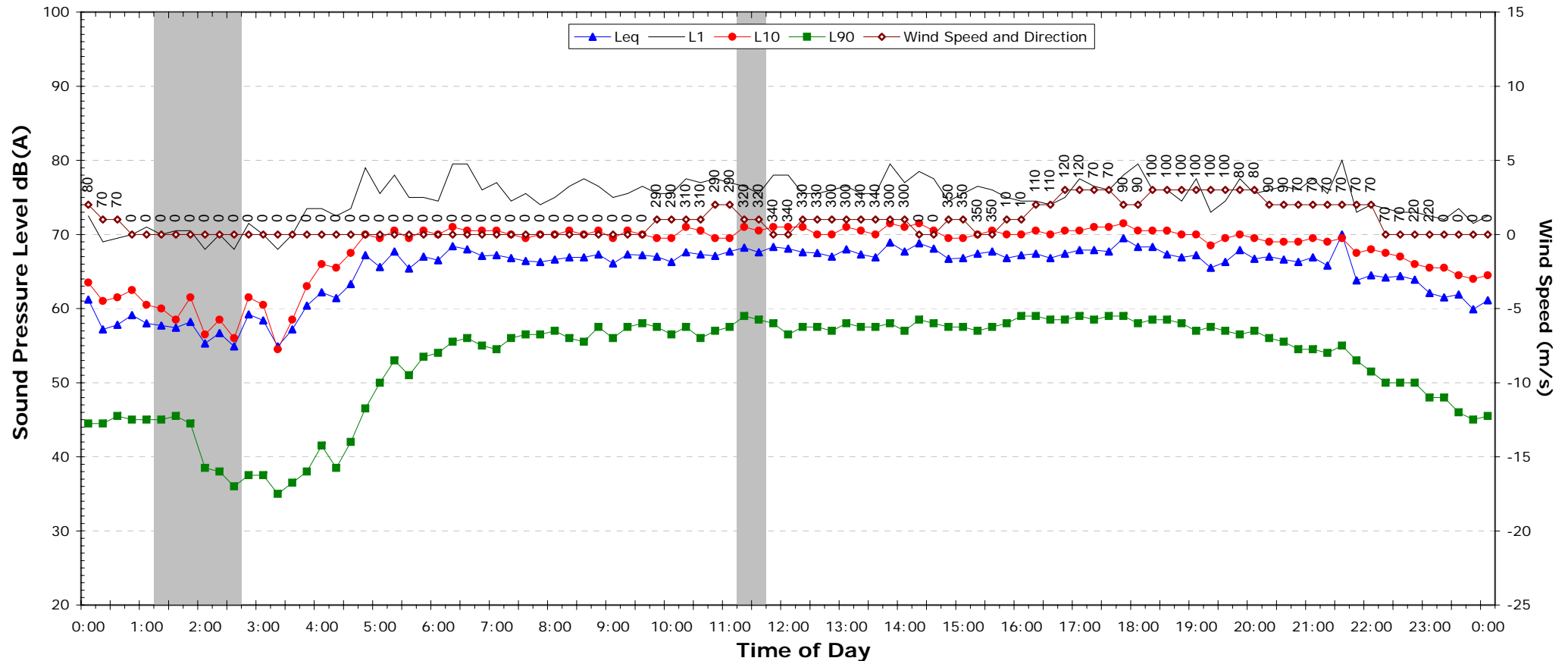
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	67.0	64.0
L _{eq} 1hr upper 10 percentile	68.7	67.7
L _{eq} 1hr lower 10 percentile	64.5	58.1

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Tuesday, 5 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	56.0	53.0	37.5
Leq (see note 3)	65.0	64.4	62.0

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

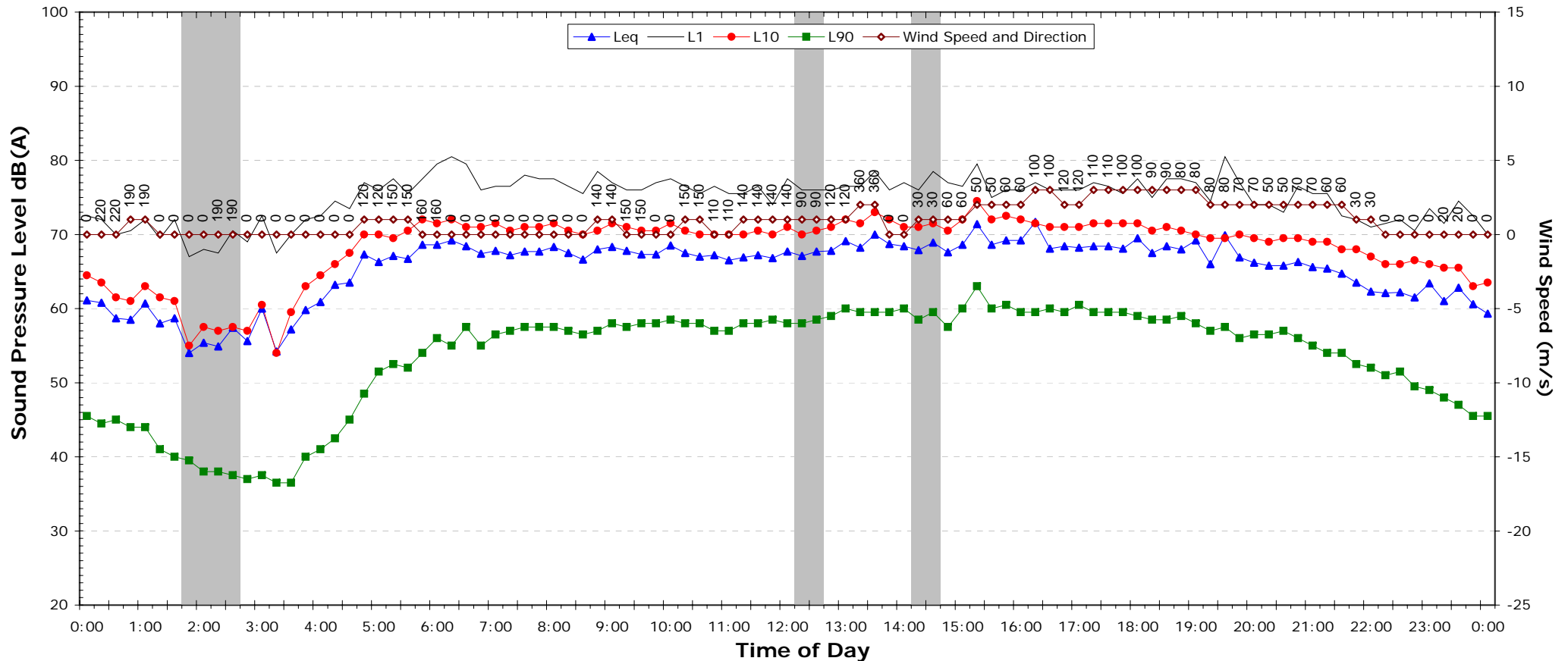
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	67.3	64.5
L _{eq} 1hr upper 10 percentile	68.3	68.3
L _{eq} 1hr lower 10 percentile	66.6	58.3

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Wednesday, 6 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	57.0	52.5	40.0
Leq (see note 3)	65.8	64.3	61.4

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max} - Leq ≥ 15dB(A)

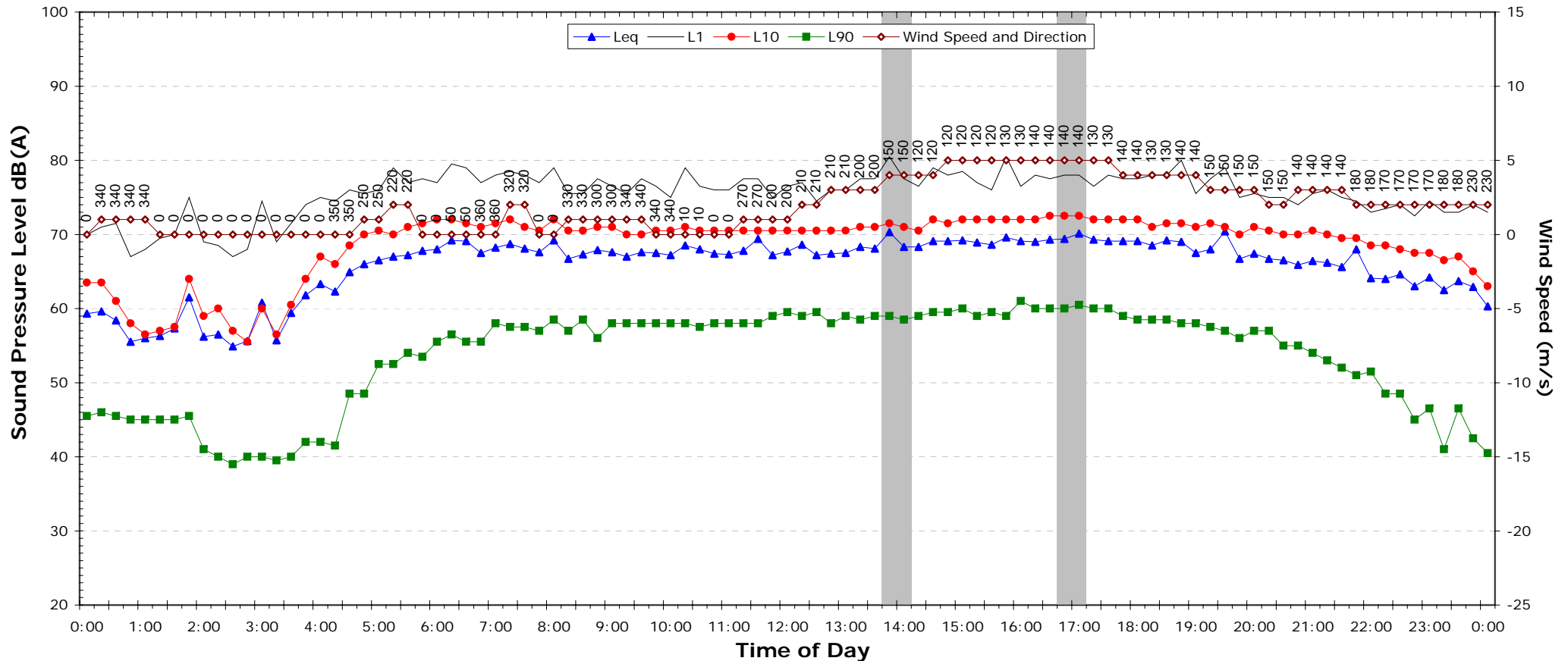
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	67.9	63.9
L _{eq} 1hr upper 10 percentile	69.6	68.6
L _{eq} 1hr lower 10 percentile	65.1	57.6

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	74.5	to	75.0
L _{max} - Leq (Range)	16.6	to	16.9

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Thursday, 7 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	57.5	51.5	38.5
Leq (see note 3)	65.8	65.0	61.7

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max} - Leq ≥ 15dB(A)

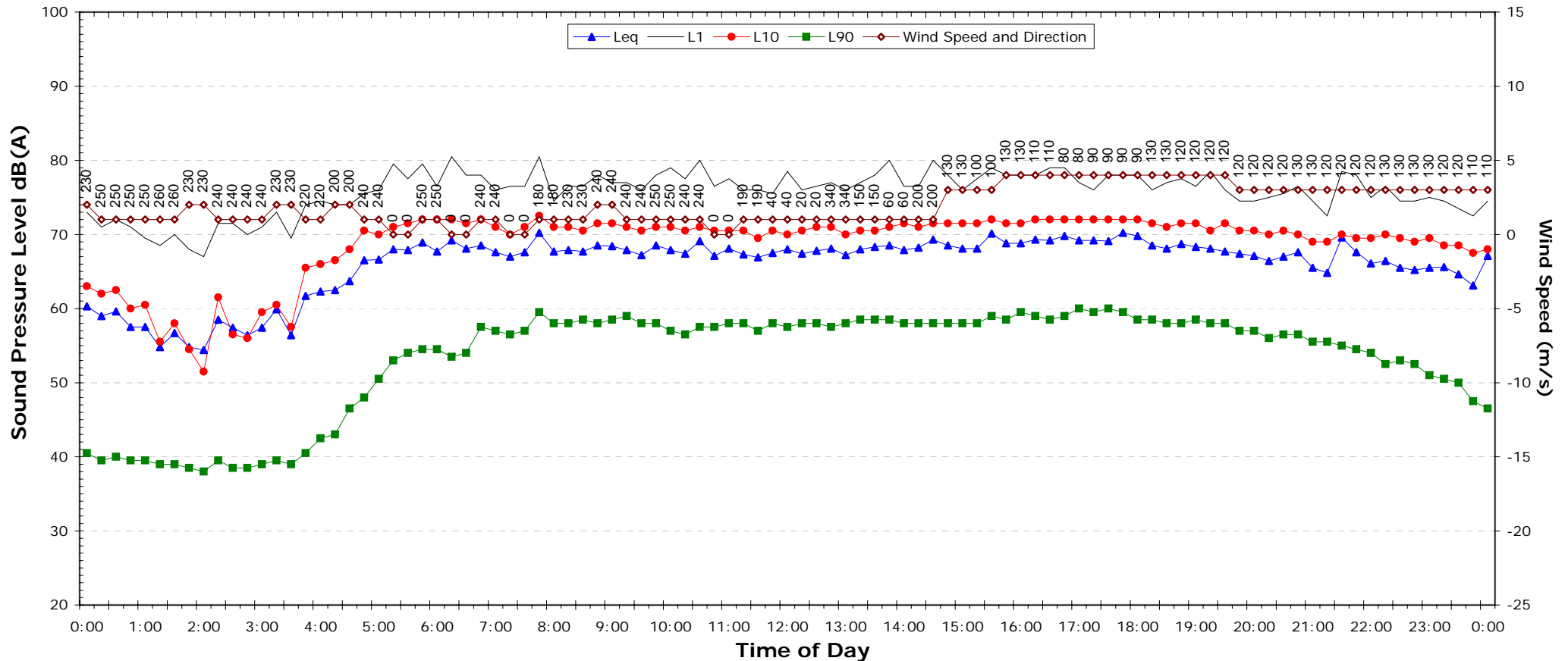
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	68.1	64.2
L _{eq} 1hr upper 10 percentile	69.2	68.4
L _{eq} 1hr lower 10 percentile	66.3	55.3

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Friday, 8 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	57.0	54.5	40.0
Leq (see note 3)	65.9	65.1	61.1

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

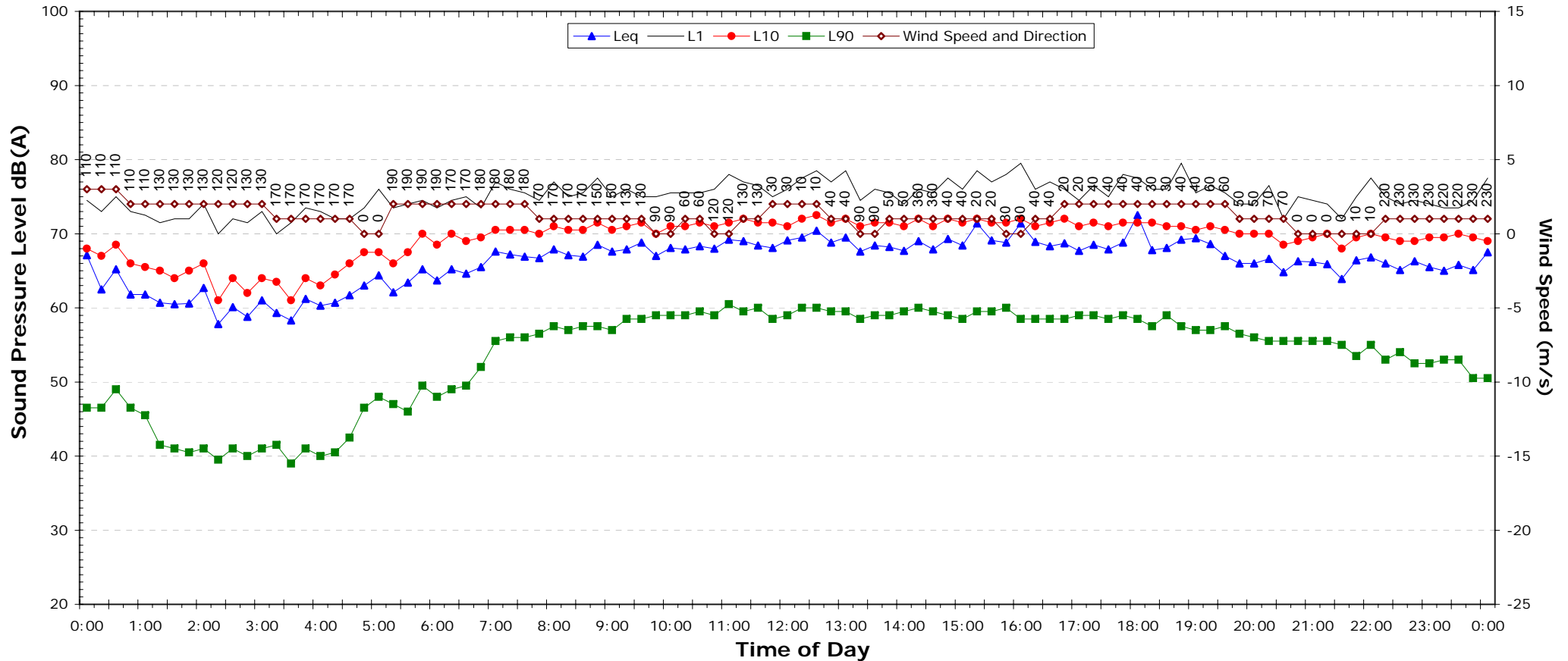
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	68.2	63.6
L _{eq} 1hr upper 10 percentile	69.5	65.9
L _{eq} 1hr lower 10 percentile	67.1	59.6

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Saturday, 9 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	57.0	55.0	-
Leq (see note 3)	66.2	63.8	-

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

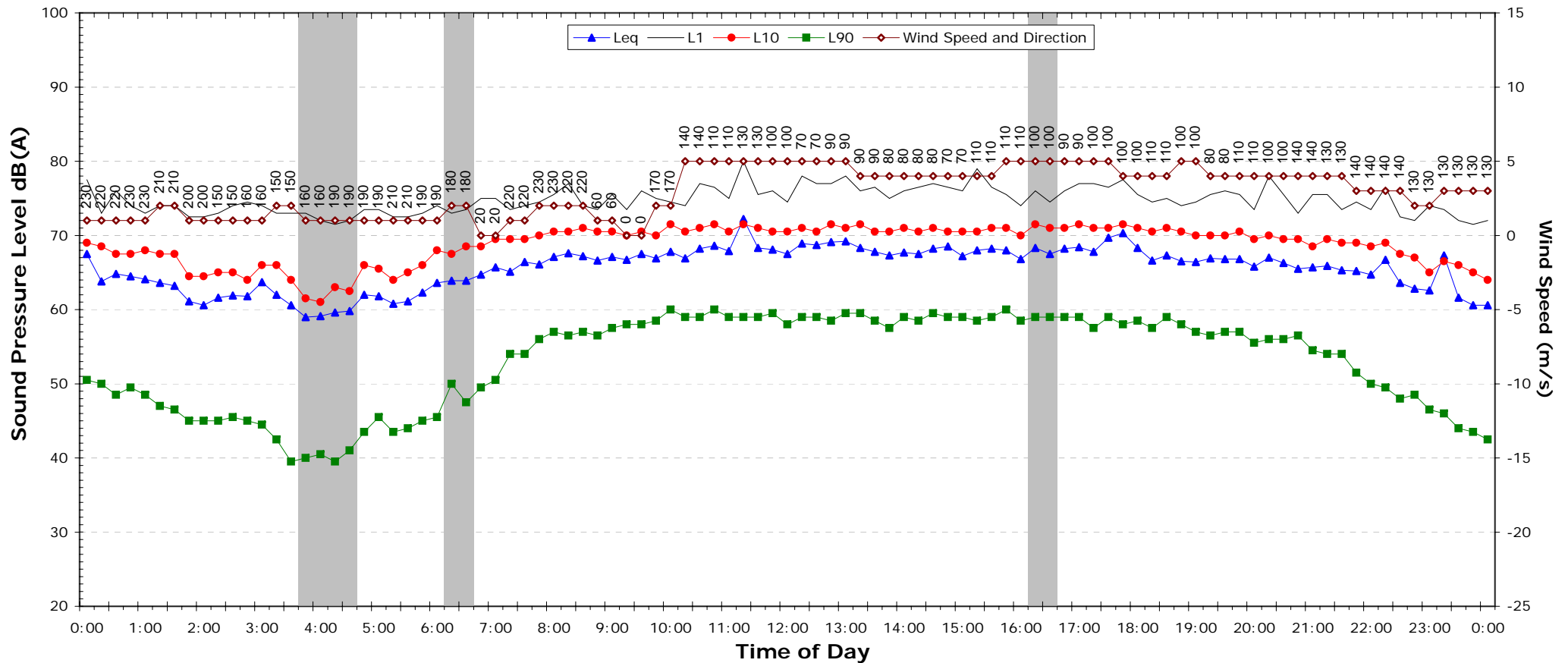
NSW ECRTN Policy (1m from facade)			(see note3)
Descriptor	Day	Night ²	
	7am-10pm	10pm-7am	
L _{eq} 15 hr and L _{eq} 9 hr	68.3	63.9	
L _{eq} 1hr upper 10 percentile	70.1	66.0	
L _{eq} 1hr lower 10 percentile	66.0	61.4	

Night Time Maximum Noise Levels				(see note 4)
L _{max} (Range)	-	to	-	
L _{max} - Leq (Range)	-	to	-	

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Sunday, 10 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	56.5	51.5	39.5
Leq (see note 3)	65.6	63.7	62.4

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

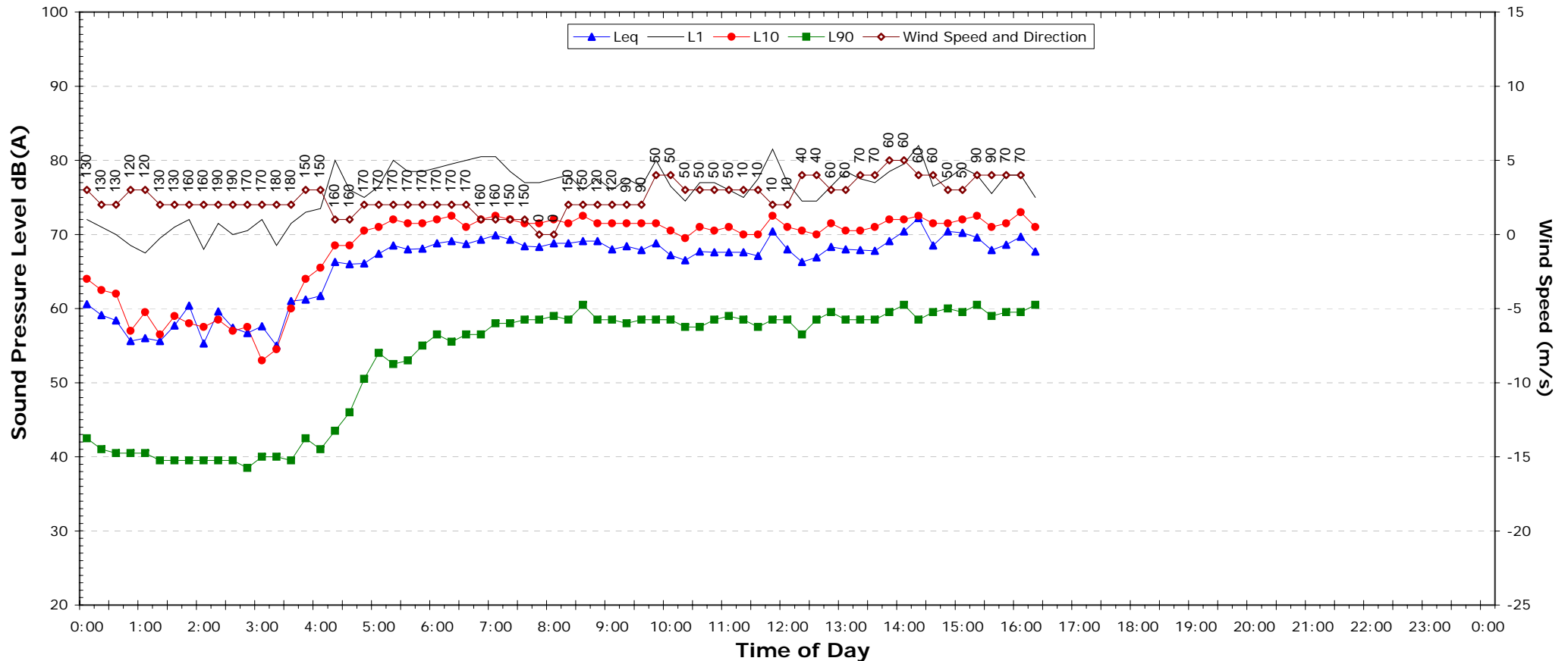
NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	67.6	64.9
L _{eq} 1hr upper 10 percentile	69.3	69.3
L _{eq} 1hr lower 10 percentile	65.8	57.5

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-

EXISTING AMBIENT NOISE LEVELS

Front Yard of 132 Edensor Road

Monday, 11 October 2010



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
L ₉₀	57.5	-	-
Leq (see note 3)	66.2	-	-

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 1m from facade; tabulated results free-field corrected
4. Night time L_{max} values are shown only where L_{max} > 65dB(A) and where L_{max}-Leq ≥ 15dB(A)

NSW ECRTN Policy (1m from facade) (see note3)		
Descriptor	Day	Night ²
	7am-10pm	10pm-7am
L _{eq} 15 hr and L _{eq} 9 hr	68.7	-
L _{eq} 1hr upper 10 percentile	70.5	-
L _{eq} 1hr lower 10 percentile	67.4	-

Night Time Maximum Noise Levels (see note 4)			
L _{max} (Range)	-	to	-
L _{max} - Leq (Range)	-	to	-