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RAMSGATE BEACH HOTEL - 277 THE GRAND PARADE, RAMSGATE

DA ACOUSTIC ASSESSMENT

6 November 2023

BRONXX

TM657-01F03 DA Acoustic Assessment (r3)

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1 Introduction

Renzo Tonin & Associates (RTA) was engaged to undertake an assessment of potential noise impacts associated with the proposed "Ramsgate Beach Hotel" development (the project) at 277 The Grand Parade, Ramsgate. This report forms part of the support documentation being prepared for a new Development Application (DA).

This assessment addresses:

- External noise impacts (road traffic noise from Grand Parade and Ramsgate Road) on the proposed development and determines building shell acoustic treatments to ensure a suitable level of internal acoustic amenity is provided for future occupants.
- Operational noise emissions associated with the proposed development and the potential impacts on surrounding noise sensitive receivers.

The work documented in this report was carried out in accordance with RTA's Quality Assurance System, which is based on Australian Standard / NZS ISO 9001. A glossary of acoustic terms used in this report is detailed in APPENDIX A.

2 Project Overview and Site Description

The DA seeks consent for the demolition of the existing Coles Ramsgate development on site, to enable the construction of a new mixed-use hotel development. The subject site is located within the Bayside Council local government area (LGA) and is bounded by The Grand Parade to the east, Ramsgate Road to the north, existing commercial properties (203-207, 209, 211 & 213 Ramsgate Road, Ramsgate Beach) to the west and existing residential properties (86-88 Alfred Street, Sans Souci) to the south.

The Grand Parade is a major sub-arterial road, with the section of carriageway adjoining the site comprising of five-lanes and noted as carrying high volumes of traffic. Ramsgate Road is a four-lane sub-arterial road with medium to high volumes of traffic.

It is proposed to construct a new six-storey mixed-use hotel property on site comprising of:

- Two levels of basement carparking
- Ground level anchor retail/supermarket tenancy (approx. 2583.4 m^2) and smaller retail/F&B tenancy (approx. 527.9m^2)
- Level 1 alfresco retail/F&B areas
- Level 2 hotel amenity areas (restaurant, swimming pool, gym, day spa, function space)
- Level 3 to 5 hotel guest rooms

Access to the basement carpark and loading dock is proposed at the north-west corner of the site, via the existing council carpark adjoining Ramsgate Road. The loading dock and proposed ramps (to the basement carpark and loading dock) and completely enclosed. A total of 208 parking spaces is currently provisioned across the two basement levels.

The nearest noise sensitive development to the site is the adjoining residential property to the south, 86-88 Alfred Street, Sans Souci. Multi-storey residential development is also located to the north of the site (across Ramsgate Road, approximately 60m from the site boundary) at 154-162 Ramsgate Road, Ramsgate Beach.

Figure 2-1 illustrates the subject site, surrounds and noise monitoring locations.

Figure 2-1: Locations of project site, surrounding noise sensitive properties and noise surveys (source: Nearmap Limited)

3 Existing Noise Environment

3.1 Methodology

The noise environment of an area varies over time.

- The NSW Environmental Protection Authority's (EPA) *Noise Policy for Industry* (NPfI) [6] outlines standard time periods over which the background and ambient noise levels are to be determined, which is as follows:
  - Day: 07:00 – 18:00 Monday to Saturday and 08:00 – 18:00 Sundays & Public Holidays
  - Evening: 18:00 – 22:00 Monday to Sunday & Public Holidays
  - Night: 22:00 – 07:00 Monday to Saturday and 22:00 – 08:00 Sundays & Public Holidays

  As such, the existing background and ambient noise levels on the site will be summarised in accordance with the NPfI.
- Relevant time periods for the assessment of road traffic noise impacts are provided in NSW Department of Planning and Environment (DPE) publications *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP) [4] and Development Near Rail Corridors and Busy Roads – Interim Guideline (ISEPP[1] Guideline) [3] and are as follows:
  - Day: 7:00 – 22:00 (15-hour period)
  - Night: 22:00 – 7:00 (9-hour period)

Noise survey location considerations included site topography, contributions from environmental noise sources (road traffic, building services plant and equipment etc.) and representative secure locations for the identified surrounding sensitive receivers (see Section 2).

- Given the extent of building services plant noise associated with existing Coles Ramsgate, refrigerated container adjacent to the loading dock, commercial properties at 203 – 213 Ramsgate Road, there was no feasible monitoring location along the western or southern boundaries of the site (including the roof of Ramsgate Coles), to gauge the representative ambient or background noise levels. Additionally, there was no secure location along the northern or eastern boundaries of the site to monitor existing road traffic noise levels from The Grand Parade and Ramsgate Road.
- Hence attended noise surveys were conducted at six representative locations around the site during three different time periods, to gauge the existing ambient and background noise levels. A Type 1 NTi Audio XL2 Audio and Acoustic Analyser was used for the attended noise surveys and was calibrated before and after the measurements using a Bruel & Kjaer Type 4231 calibrator. No significant deviation in calibration was noted.
- Historical noise survey results in the RTA database were also reviewed for long-term unattended noise monitoring conducted at 262 The Grand Parade. Two noise monitors were installed at the property (illustrated as LNM in Figure 2-1) – LNM1 approximately 25m from the kerb @ 4.5m above ground level and LNM2 approximately 55m from the kerb @ 1.5m above ground level (shielded from The

[1] The DPE interim guideline reference the Infrastructure SEPP which was superseded by the Transport and Infrastructure SEPP in April 2022).

Grand Parade by existing property on site). Detailed noise monitoring information attached in APPENDIX B for reference.

3.2 Background/Ambient Noise Levels

The results of the attended noise surveys and historical long-term noise monitoring are summarised in Table 3-1. Period representative background L_{A90} and ambient L_{Aeq} noise levels for the long-term monitoring, were determined in accordance with the procedures of the NPfI.

Table 3-1: Measured background and ambient noise levels

Measurement	Time Period	Representative Noise Levels	
		Background Noise Levels, dB(A)L_{90}	Ambient Noise Levels, dB(A)L_{eq}
ANM1 – The Grand Parade (approx. 4m from the kerb @ 1.5m above ground level) [1]			
9 June 2022 (between 6:30am and 8:00am)	Day (7am-6pm)	61	72
14 June 2022 (between 9:20pm and 11:00pm)	Evening (6pm-10pm)	54	66
	Late Evening (10pm-12am)	45	66
16 June 2022 (between 2:45am and 4:00am)	Night (10pm-7am)	40	65
ANM3 (along southern boundary of site, adjacent to Coles loading dock) and LNM [2]			
LNM2 (1st to 8th November 2013) [3]	Day (7am-6pm)	45	54
	Evening (6pm-10pm)	46	54
	Late Evening (10pm-12am)	42	50
	Night (10pm-7am)	37	49
ANM4 – Ramsgate Road (approx. 25m from the kerb @ 1.5m above ground level) [4]			
9 June 2022 (between 6:30am and 8:00am)	Day (7am-6pm)	56	60
14 June 2022 (between 9:20pm and 11:00pm)	Evening (6pm-10pm)	48	56
	Late Evening (10pm-12am)	43	53
16 June 2022 (between 2:45am and 4:00am)	Night (10pm-7am)	38	49
ANM5 – Alfred Street (between properties 86-88 & 90-92 Alfred Street @ 1.5m above ground level) [5]			
14 June 2022 (between 9:20pm and 11:00pm)	Evening (6pm-10pm)	40	47
	Late Evening (10pm-12am)	37	42

Notes:

1. Noise level measurements at this location are representative of the traffic noise impacts from The Grand Parade on the development site and background noise levels at receivers R1(East), facing The Grand Parade.
2. Noise level measurements at this location are representative of the background noise levels at receivers R1(Middle), screened from The Grand Parade by other apartments in the development and directly adjoining southern façade of proposed development.
3. The attended noise survey measurements during the day and evening periods at location ANM3 were analysed to be similar (within 2dB(A) with the attended measurements being higher) to the noise levels measured by noise monitor LNM2. Hence, adopting a conservative approach, the noise levels measured by LNM2 will be used for this location.
4. Noise level measurements at this location are representative of the background noise levels at R2 (multi-storey residential properties 156-162 Ramsgate Road, Ramsgate Beach).
5. Noise level measurements at this location are representative of the background noise levels at receivers R1(West), facing Alfred Street.

The mixed-use hotel development is proposed to include F&B tenancies and hotel amenity areas (restaurant, function space, pool), which are expected as licensed premises. Noise provisions associated with the operations of licensed premises are governed by Liquor & Gaming NSW (L&GNSW) and presented in Section 5.1.1. Background noise levels summarised in accordance with the L&GNSW criteria (Spectral representation of the), are presented below.

Table 3-2: Spectra background noise levels

Period	Overall dB(A)L_{90}	Octave band centre frequency – Hz, dB(Z)								
		31.5	63	125	250	500	1k	2k	4k	8k
ANM1 – The Grand Parade (approx. 4m from the kerb @ 1.5m above ground level)										
Day (7am-6pm)	61	70	69	63	61	56	56	53	46	36
Evening (6pm-10pm)	54	63	62	54	50	49	52	46	34	22
Late Evening (10pm-12am)	45	57	56	51	44	43	41	34	25	22
ANM3 (along southern boundary of site, adjacent to Coles loading dock) and LNM										
Day (7am-6pm)	45	53	52	43	42	43	40	39	29	21
Evening (6pm-10pm)	46	55	53	45	43	44	42	39	30	24
Late Evening (10pm-12am)	42	51	50	47	38	41	38	32	23	20
ANM4 – Ramsgate Road (approx. 25m from the kerb @ 1.5m above ground level)										
Day (7am-6pm)	56	65	65	60	54	52	53	48	40	27
Evening (6pm-10pm)	48	54	54	52	47	46	44	39	30	25
Late Evening (10pm-12am)	43	52	52	50	45	41	38	32	23	20
ANM5 – Alfred Street (between properties 86-88 & 90-92 Alfred Street @ 1.5m above ground level)										
Evening (6pm-10pm)	40	49	49	49	40	38	34	29	20	19
Late Evening (10pm-12am)	37	46	45	44	38	35	32	26	18	17

Notes:

1. Operating hours of all F&B tenancies and hotel amenities areas will be restricted to before midnight (i.e. no operations between midnight and 7am), hence spectra background noise levels for the overnight period (midnight to 7am) is not included.

3.3 External (Road Traffic) Noise Levels

The results of the attended traffic noise surveys, summarised in accordance with DPE Transport and Infrastructure SEPP and ISEPP Guideline time periods, are presented in Table 3-3.

Table 3-3: Road traffic noise levels

Noise Monitoring	Representative Traffic Noise Levels	
Location	**Day (7am-10pm)**	**Night (10pm-7am)**
ANM1 – The Grand Parade (approx. 4m from kerb @ 1.5m above ground)	72 $L_{Aeq,15hr}$	68 $L_{Aeq,9hr}$
ANM2 – Ramsgate Road (approx. 6m from kerb @ 1.5m above ground)	64 $L_{Aeq,15hr}$	59 $L_{Aeq,9hr}$

4 External Noise Intrusion Assessment

Given the site's proximity to The Grand Parade and Ramsgate Road, sub-arterial carriageways with medium – heavy volumes of traffic, there is potential for impacts on the internal acoustic amenity of future occupants.

The site lies well outside (more than 2000m) the ANEF 20 contour of the current Sydney Airport ANEF 2033 map[2] and thus lies within the "Acceptable" zone for hotel type developments, under the provisions of Australian Standard AS2021:2015 *"Acoustics – Aircraft noise intrusion – Building siting and construction"*.

This section provides a discussion of the relevant acoustic criteria and presents the result of a preliminary noise intrusion assessment.

4.1 Assessment Criteria

4.1.1 Transport and Infrastructure SEPP and ISEPP Guideline

The Transport and Infrastructure SEPP requires an acoustic assessment for developments adjacent to busy roads. Map 16 of the *Traffic volume maps for Infrastructure SEPP* [3] classifies The Grand Parade as a carriageway carrying more than 40,000 Annual Average Daily Traffic (AADT) and hence mandatory for assessment against the noise provisions of the ISEPP.

However, the provisions of both the Transport and Infrastructure SEPP and ISEPP Guideline only apply to residential buildings/accommodation (long term stay), with no guidance provided for retail or hotel areas (including guest rooms i.e. short-term stay) of mixed-use developments.

Therefore, LGA guidelines and Australian Standards are referenced to determine appropriate internal noise criteria.

4.1.2 Rockdale Development Control Plan (DCP) 2011

In reviewing the DCP [1], it is noted that no internal noise criteria requirements are stipulated for mixed-use developments (including guest rooms of hotel type developments).

[2] https://assets.ctfassets.net/v228i5y5k0x4/UFaa5ZMQUKCKmCocmsus4/d6d07ad9d11e960b2fae07bd050f076e/Sydney_Airport_Australian_Noise_Exposure_Forecast_2033.pdf

[3] https://roads-waterways.transport.nsw.gov.au/about/environment/reducing-noise/traffic-volume-maps-for-infrastructure-sepp.html

4.1.3 Australian standards

For occupancies that are not covered in the guidelines and standards presented above, the internal design sound levels from Australian/New Zealand Standard AS/NZS 2107:2016 "*Acoustics - Recommended design sound levels and reverberation times for building interiors*" (AS/NZS 2107:2016) [8] are adopted.

AS/NZS 2107:2016 recommends design criteria for conditions affecting the acoustic environment within building interiors to ensure a healthy, comfortable and productive environment for the occupants and the users. The design sound levels recommended take into account the function of the area(s) and apply to the sound level measured within the space unoccupied but ready for occupancy.

The standard notes that where the traffic noise levels vary over a 24-hour period, an appropriate measurement period should be selected. Criteria relevant to the proposed development are presented in Table 4-1.

Table 4-1: Internal design sound levels

Building type and activity	Satisfactory design sound level ($L_{Aeq,t}$)
Commercial and Retail Areas	
Supermarkets	<55
Café and Restaurants	40 to 50
Hotel Areas	
Function space	40 to 45
Spa/Gym/Yoga Studio	45 to 50
Guest rooms	
Dedicated living areas	40
Bedrooms or combined living/bedroom areas (Night-time)	35

4.2 Recommended Acoustic Treatments (External Noise Intrusion)

Internal noise levels were calculated based on the road traffic noise level incident on the building façades, spectral characteristics of the external noise, building fabric design (area of building element exposed to noise) and internal area (room) sound absorption characteristics.

The following acoustic treatments are required to achieve compliance with the internal noise goals identified in Table 4-1.

4.2.1 Glazed windows and doors

The minimum glazing specification for the proposed development is detailed in Table 4-2. The installation of façade elements in building openings and the design of window mullions, door frames and perimeter seals, must not reduce the sound insulation of the glazing assembly (i.e. glass, frame and seals) below the values nominated in Table 4-2. Key items to note to prevent this include:

- Acoustic seals nominated for all external windows and doors, are required to be fitted with Q-lon type acoustic seals or equivalent rubber bulb acoustic seals. **Mohair of fin type seals are not acceptable for the windows and doors requiring acoustic seals**.
- Perimeter of opening around façade element is acoustically sealed i.e. space between frame (before architraves are installed for windows) and wall structure is sealed with silicone or polyurethane acoustic sealant and foam backing rod.

The glazing specification is indicative only and other constructions that provide the same or better sound transmission loss performance are also acceptable. The window/door supplier/manufacturer shall provide evidence that the glazing system proposed has been tested in a registered laboratory, with results showing compliance with the minimum listed R_W requirements. Also, the glazing installer should certify that the window/doors have been constructed and installed in a manner equivalent to the tested samples.

Table 4-2: Preliminary façade glazing specification

Level	Space		Minimum Acoustic Performance of Glazing Assembly[1]	Indicative Glazing Configuration	Acoustic Seals
Ground level	Anchor Retail/Supermarket Tenancy		R_W 35	10.38mm laminate	Yes
	Retail/F&B tenancy		R_W 35	10.38mm laminate	Yes
	Hotel Lobby		R_W 32	6.38mm laminate	
Level 2	Gym, Spa & Amenities		R_W 32	6.38mm laminate[2]	Yes
	Function Space		R_W 32	6.38mm laminate[2]	Yes
	Restaurant	Eastern façade (Grand Parade)	R_W 35	10.38mm laminate[2]	Yes
		Northern & Southern façades			
		Western façade	R_W 32	6.38mm laminate[2]	Yes
Levels 3 to 5	Deluxe (319, 419 & 519)		R_W 47	6.38mm laminate / 107mm airgap / 10.5mm VLam Hush	Yes
	Access (320, 420 & 520)		R_W 47	6.38mm laminate / 107mm airgap / 10.5mm VLam Hush	Yes
	Single (any)	Eastern façade (Grand Parade)	R_W 41	6.38mm laminate / 107mm airgap / 6mm float/toughened	Yes
	Single (326, 426 & 526)		R_W 45	6.38mm laminate / 107mm airgap / 10mm float/toughened	Yes
	Single (327, 427 & 527)		R_W 37	10.5mm VLAM Hush	Yes
	Single (Room numbers 01, 02, 03, 04, 05, 06, 07, 08, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39 & 40)		R_W 32	6.38mm laminate	Yes
	Single (Room numbers 09, 10, 11, 12, 13,14 & 15)		R_W 35	10.38mm laminate	Yes
	Single (Room numbers 16, 19 & 18)		R_W 37	10.5mm VLAM Hush	Yes

Notes:

1. The minimum acoustic performance corresponds to the cumulative performance of the glazing assembly i.e. glass, frame and seals.
2. Higher acoustic performance may be required to function space façade glazing, to control environmental noise emissions from proposed operations. Please refer to Section 5.3.

NOTES FOR GLAZING CONSTRUCTIONS:

1. The information in this table is provided for consent/approvals process and cost planning and shall not be used for construction unless otherwise approved in writing by the acoustic consultant.
2. The design in this table is preliminary and a comprehensive assessment shall be conducted prior to Construction Certification.
3. Before committing to any form of construction or committing to any builder, advice should be sought from an acoustic consultant to ensure that adequate provisions are made for any variations which may occur as a result of changes to the form of construction where only an "estimate" is available for the sound insulation properties of recommended materials.
4. The glazing supplier shall ensure that installation techniques will not diminish the RW performance of the glazing when installed on site.
5. The above glazing thicknesses should be considered the minimum thicknesses to achieve acoustical ratings. Greater glazing thicknesses may be required for structural loading, wind loading etc.

4.2.2 External walls

All external wall elements are currently proposed to be of masonry construction (in-situ concrete, concrete blockwork or similar). Masonry construction will provide adequate sound insulation (in principle, external wall constructions with a sound isolation rating 15dB higher than the recommended glazing specifications, are sufficient to maintain the acoustic performance of the overall facade system) against site road traffic noise and no further upgrade is required for acoustic purposes. There should not be vents on the internal skin of external walls. All penetrations in the internal skin of external walls should be acoustically sealed (i.e. airtight).

If light-weight external wall systems are proposed during subsequent stages of design, this will need to be reviewed in detail at the Construction Certificate (CC) stage, to determine minimum constructions (additional insulation and/or linings).

4.2.3 Roof and ceiling

The proposed concrete roof is also acoustically acceptable and does not require any additional treatments.

4.2.4 Ventilation requirements

The development will be mechanically ventilated, with no natural ventilation proposed to any occupied areas.

5 Noise Emission Assessment

This section examines noise emissions from the site and their potential impact on nearby development.

Key noise sources associated with the operations of proposed development include:

- Activity noise from licensed premises (level 1 F&B areas and level 2 hotel pool, outdoor terrace & lounge, restaurant & function space).
- Activity noise from non-licensed premises (ground level retail/F&B tenancy, envisaged as a café).
- Building services plant and equipment.
- Activity noise from loading dock operations and waste collection.
- Additional traffic on surrounding public roads generated by the development.

5.1 Assessment Criteria

5.1.1 Licensed premises (Level 1 F&B areas and Level 2 hotel amenity areas)

Noise emissions from licensed premises in NSW, such as restaurants, bars, and clubs, should aim to comply with the standard noise criteria set by the L&GNSW. The L&GNSW, through the Liquor Act 2007, is the regulatory authority that deals with noise pollution issues pertaining to licensed premises. The L&GNSW criteria applies to noise emissions associated with activities from licensed premises i.e. music and patron noise but excludes noise impacts from mechanical plant/equipment. Noise emissions are assessed in terms of the noise limits set out in the L&GNSW's 'Standard Noise Condition' which states as follows:

> *"The LA10* 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 LA10* 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 LA10 can be taken as the average maximum deflection of the noise emission from the licensed premises."*

Based on the noise emissions criteria stated above and the spectra background noise levels presented in Table 3-2, the noise emission goals for the licensed premises in this development are as follows:

Table 5-1: Licensed premises noise emission goals

Receiver	Time Period	Overall	Octave band Centre Frequency – Hz, dB(Z) L10(15 minute)								
		dB(A)	31.5	63	125	250	500	1k	2k	4k	8k
R1(East)	7am to 6pm (61BG + 5 dB)	66	75	74	68	66	61	61	58	51	41
	6pm to 10pm (54BG + 5 dB)	59	68	67	59	55	54	57	51	39	27
	10pm to 12am (45BG + 5 dB)	50	62	61	56	49	48	46	39	30	27
R1(Middle)	7am to 6pm (45BG + 5 dB)	50	58	57	48	47	48	45	44	34	26
	6pm to 10pm (46BG + 5 dB)	51	60	58	50	48	49	47	44	35	29
	10pm to 12am (42BG + 5 dB)	47	56	55	52	43	46	43	37	28	25
R1(West)	6pm to 10pm (40BG + 5 dB)	45	54	54	54	45	43	39	34	25	24
	10pm to 12am (37BG + 5 dB)	42	51	50	49	43	40	37	31	23	22
R2	7am to 6pm (56BG + 5 dB)	61	70	70	65	59	57	58	53	45	32
	6pm to 10pm (48BG + 5 dB)	53	59	59	57	52	51	49	44	35	30
	10pm to 12am (43BG + 5 dB)	48	57	57	55	50	46	43	37	28	25

5.1.2 NSW EPA Noise Policy for Industry (non-licensed premises, building services plant, loading dock and waste collection)

The EPA publication NPfI [6] is the most commonly adopted noise emission guideline to control general operational noise from developments. The NPfI assessment procedure has two components:

- Controlling intrusive noise impacts in the short-term for residential properties, and
- Maintaining noise level amenity (long-term) for residences and other land uses.

In accordance with the NPfI, noise impact should be assessed against the project noise trigger level, which is the lower value of the project intrusiveness noise levels and project amenity noise levels.

5.1.2.1 Intrusiveness noise trigger level

The intrusiveness of a noise source may generally be considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (represented by the $L_{Aeq,15min}$ descriptor) does not exceed the background noise level measured in the absence of the source by more than 5dB(A). The project intrusiveness noise level, which is only applicable to residential receivers, is determined as follows:

$L_{Aeq,15min}$ Intrusiveness noise level = Rating Background Level (RBL) plus 5 dB(A)

Based on the measured background noise levels detailed in Table 3-1 above, the intrusiveness noise trigger levels for surrounding nearest affected residential receivers are presented in Table 5-2.

Table 5-2: Project intrusiveness noise trigger levels

Receivers	Intrusiveness noise level, dB(A)$L_{eq(15min)}$		
	Day (7am to 6pm)	Evening (6pm to 10pm)	Night (10pm to 7am)
R1(East)	61+ 5 = 66	54 + 5 = 59	40 + 5 = 45
R1(Middle) & R1(West)	45+ 5 = 50	46 + 5 = 51 corrected to 50[1]	37 + 5 = 42
R2	56+ 5 = 61	48 + 5 = 53	38 + 5 = 43

Notes:

1. In accordance with the guidance provide in Section 2.3 of the NPfI.

5.1.2.2 Amenity noise trigger level

The project amenity noise levels for different time periods of the day are determined in accordance with Section 2.4 of the NPfI. The NPfI recommends amenity noise levels ($L_{Aeq,period}$) for various receivers including residential, commercial and industrial receivers and sensitive receivers such as schools, hotels, hospitals, churches and parks. These "recommended amenity noise levels" represent the objective for total industrial noise experienced at a receiver location. However, when assessing a single industrial development and its impact on an area, "project amenity noise levels" apply.

To ensure that the total industrial noise level (existing plus new) remain within the recommended amenity noise levels for an area, the project amenity noise level that applies for each new industrial noise source is determined as follows:

$L_{Aeq,period}$ Project amenity noise level = $L_{Aeq,period}$ Recommended amenity noise level – 5dB(A)

However, in developments close to busy roads, the traffic noise levels may be high enough to effectively mask noise from industrial sources. When the existing traffic noise levels exceed the recommended amenity noise level by 10dB, the project amenity noise level may be derived from the traffic L_{Aeq} as follows:

$L_{Aeq,period}$ High traffic project amenity noise level = $L_{Aeq,period}$ (traffic) – 15dB(A)

Furthermore, given that the intrusiveness noise level is based on a 15-minute assessment period and the project amenity noise level is based on day, evening and night assessment periods, the NPfI provides the

following guidance on adjusting the $L_{Aeq,period}$ level to a representative $L_{Aeq,15minute}$ level in order to standardise the time periods.

$$L_{Aeq,15minute} = L_{Aeq,period} + 3dB(A)$$

NPfI recommended amenity noise levels for the project site and surrounding land uses are summarised in Table 5-3.

Table 5-3: Project amenity noise trigger levels

Period	Recommended Amenity Noise Level [1]	Project amenity Noise Level	High Traffic Noise Level	Traffic noise exceed the Recommended Amenity Noise Level by more than 10dB?	High traffic project amenity noise level
	dB(A)$L_{eq(period)}$	dB(A)$L_{eq(period)}$	dB(A)$L_{eq(period)}$		dB(A)$L_{eq(15min)}$
R1(East)					
Day	55	55 – 5 = 50	72	Yes	72 – 15 + 3 = 60
Evening	45	45 – 5 = 40	66	Yes	66 – 15 + 3 = 54
Night	40	40 – 5 = 35	65	Yes	65 – 15 + 3 = 53
R1(Middle) & R1(West)					
Day	55	55 – 5 = 50	54	No	50 + 3 = 53
Evening	45	45 – 5 = 40	50	No	40 + 3 = 43
Night	40	40 – 5 = 35	49	No	35 + 3 = 38
R2					
Day	55	55 – 5 = 50	60	No	50 + 3 = 53
Evening	45	45 – 5 = 40	56	Yes	56 – 15 + 3 = 44
Night	40	40 – 5 = 35	49	No	35 + 3 = 38

Notes:

1. Recommended amenity levels are based on Suburban amenity area.

5.1.2.3 Maximum noise level assessment (sleep disturbance impacts)

Loading dock operations are proposed during the early morning peirod (6am to 7am), hence the potential for sleep disturbance from maximum noise level events during this period must be considered. In accordance with NPfI, a detailed maximum noise level event assessment should be undertaken where the subject development night-time noise levels at a residential location exceed:

- $L_{Aeq,15min}$ 40dB(A) or the prevailing RBL plus 5dB, whichever is the greater, and/or
- L_{AFmax} 52dB(A) or the prevailing RBL plus 15dB, whichever is the greater.

Where there are noise events found to exceed the initial screening level, further analysis is undertaken to identify:

- The likely number of events that might occur during the night assessment period,
- The extent to which the maximum noise level exceeds the rating background noise level.

5.1.2.4 NPfI project noise trigger levels

In accordance with the NPfI, the project noise trigger levels have been determined (lower i.e. more stringent value of the project intrusiveness and amenity noise levels) and are presented in Table 5-4.

Table 5-4: NPfI Project trigger levels (non-licensed premises, building services plant, loading dock and waste collection)

Receiver	Project Specific Noise Limits, dB(A)$L_{eq(15min)}$		
	Day (7am-6pm)	Evening (6pm-10pm)	Night (10pm-7am)
R1(East)	60	54	45
R1(Middle) & R1(West)	50	43	38
R2	53	44	38

The project sleep disturbance assessment levels are presented in Table 5-5.

Table 5-5: Sleep disturbance assessment levels

Receiver	Time Period	Assessment Level, dB(A)$L_{eq(15min)}$	Assessment Level, dB(A)L_{Max}
R2 [1]	Early morning shoulder (6am-7am)	56 + 5 = 61	56 + 15 = 71

Notes:

1. The proposed development will shield receiver R1 from the loading dock operations and operational noise impacts are only expected for receivers R2.

5.1.3 Traffic noise generation

For land use developments with the potential to create additional traffic on surrounding road network, noise impacts associated with the additional traffic is assessed with reference to the EPA publication *Road Noise Policy* (RNP) [5]. Section 2.3.1 of this policy sets out road traffic noise assessment criteria for residential land uses.

As discussed in Section 2, both Ramsgate Road and The Grand Parade fall under the classification of arterial/sub-arterial roads and not local roads, and hence the resulting criteria is as follows.

Table 5-6: RNP noise goals for additional traffic generated by the site

Road Category	Type of Project/Land Use	Assessment Criteria, dB(A)	
		Day (7am to 10pm)	Night (10pm to 7am)
Freeway/arterial/sub-arterial roads	3. Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq,(15\ hour)}$ 60 (external)	$L_{Aeq,(9\ hour)}$ 55 (external)

Further to the above, the RNP states the following for land use developments generating additional traffic:

> *"For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use development, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'no build option'."*

The RNP states that in assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

5.2 Assessment of Noise Emissions

5.2.1 Licensed Premises

Potential licensed premises associated with the subject proposal include:

- Level 1 F&B tenancies – three outdoor F&B outlets are proposed on this level (along northern, southern and eastern façades). Operational noise emissions from these outlets will be subject to tenancy specific development applications, however an assessment in principle is provided to demonstrate that these tenancies are capable of being used for their intended purpose, without excessive noise impacts.
- Level 2 hotel amenity areas – this includes an outdoor pool, lounge and terrace (partially along the eastern frontage), function space with associated terrace (along the northern frontage) and restaurant space with both indoor and outdoor dining areas (along the eastern frontage).

Typical activity noise sources associated with uses above include amplified music and patron speech. To predict noise emissions from the operation of these premises (cumulatively), the following assumptions are adopted:

- Hours of operation for all premises are proposed between 11am to midnight.
- Only low background music is proposed for all outdoor areas (including hotel restaurant and function centre outdoor space). Noise levels of between 60-65 dB(A)L_{10} is typical for outdoor seating areas of restaurant, beer gardens and café. The following spectrum is used for this assessment, based on information in the RTA database:

Table 5-7: Assumed outdoor areas background music spectrum

Source	Overall dB(A)	Octave band Centre Frequency – Hz, dB(Z) L10								
		31.5	63	125	250	500	1k	2k	4k	8k
Sound pressure level (SPL) of background music in outdoor areas (@ 1m from any speaker)	65	68	68	68	60	60	60	58	54	47

- The following patron speech source levels are assumed for outdoor areas:

Table 5-8: Assumed outdoor areas patron speech noise spectrum

Source	Overall dB(A)	Octave band Centre Frequency – Hz, dB(Z) L10								
		31.5	63	125	250	500	1k	2k	4k	8k
Sound power level (SWL) of raised voice per patron in level 1 F&B tenancies and level 2 hotel pool lounge/bar & function space outdoor area[1]	77	62	62	70	70	76	73	68	59	47
Swimming pool (small group i.e. up to 3 kids playing)	85	62	62	68	73	79	81	78	74	70

Source	Overall dB(A)	Octave band Centre Frequency – Hz, dB(Z) L10								
		31.5	63	125	250	500	1k	2k	4k	8k
Sound power level (SWL) of raised voice per patron in level 2 hotel restaurant[3]	75	60	60	68	68	72	71	66	57	45

Notes:

1. Assumed source noise spectrum is representative of raised speech levels from patrons in a crowded F&B tenancy alfresco space (primarily seated), with background music only (i.e., no amplified music).
2. CBD hotel swimming pools are typically not as noisy as resort style pools (i.e beachfront properties or with slides, spa, dedicated kids' pool etc.) and are largely used by adults for relaxation, with informal/private conversations. However, to simulate a worst case, small groups of kids playing in the swimming pool are assumed (a group comprising of up to 3 kids), with an effective SWL of 85 dB(A)L_{10}.
3. Assumed source noise spectrum is representative of patrons speaking with occasional raised speech in a restaurant outdoor seating area, with low background music.

- A maximum SPL of up to 90 dB(A)L_{10} is assumed for the hotel function areas. This is based on an acoustically treated space (i.e. incorporating absorptive surface finishes) and inhouse sound system installed with a noise limiter and graphic equaliser.
- An internal noise level of 80 dB(A)L_{10} SPL is assumed for the level 2 hotel restaurant. This is a conservatively high assumed noise level for a typical hotel restaurant, with background music, absorptive surface finishes and an inhouse sound system with a noise limiter and graphic equaliser.
- The adopted SPL spectrums for the internal areas are as follows:

Table 5-9: Assumed SPL within function space and hotel restaurant

Source	Overall dB(A)	Octave band Centre Frequency – Hz, dB(Z) L10								
		31.5	63	125	250	500	1k	2k	4k	8k
Function space	85	87	89	89	84	88	86	82	75	67
Hotel restaurant	80	66	68	68	69	77	77	73	66	64

- Thick single glazing is assumed for all façade glazing for the function and hotel restaurant areas, with minimum R_W 35 acoustic performance (of the glazing assembly).

Table 5-10: Assumed transmission loss spectra of function area and hotel restaurant façade glazing

Element	Octave band Centre Frequency – Hz,								
	31.5	63	125	250	500	1k	2k	4k	8k
R_W 35 glazing assembly	20	22	25	30	33	32	33	43	53

5.2.1.1 Noise emission predictions up to 10pm

Usage as follows:

- Level 1
  - F&B tenancies along the northern frontage (two seating areas adjacent to the north-east and north-west corners of floorplate) – Total of 200 patrons with 1 in 2 talking at any given time.
  - F&B tenancy along the eastern frontage (north of the stairway proposed adjacent to ground level substation) – Total of 100 patrons with 1 in 2 talking at any given time.

- F&B tenancy with courtyard – Total of 100 patrons with 1 in 2 talking at any given time.
- Noise screens around seating areas as illustrated in Figure 5-1 below.
  - Total height of the noise screen along the northern frontage (illustrated in **blue**) is at least 1.4m above the finished floor level.
  - Total height of noise screen adjacent to the south-west site boundary (illustrated in **red**) is at least 2m above the finished floor level.

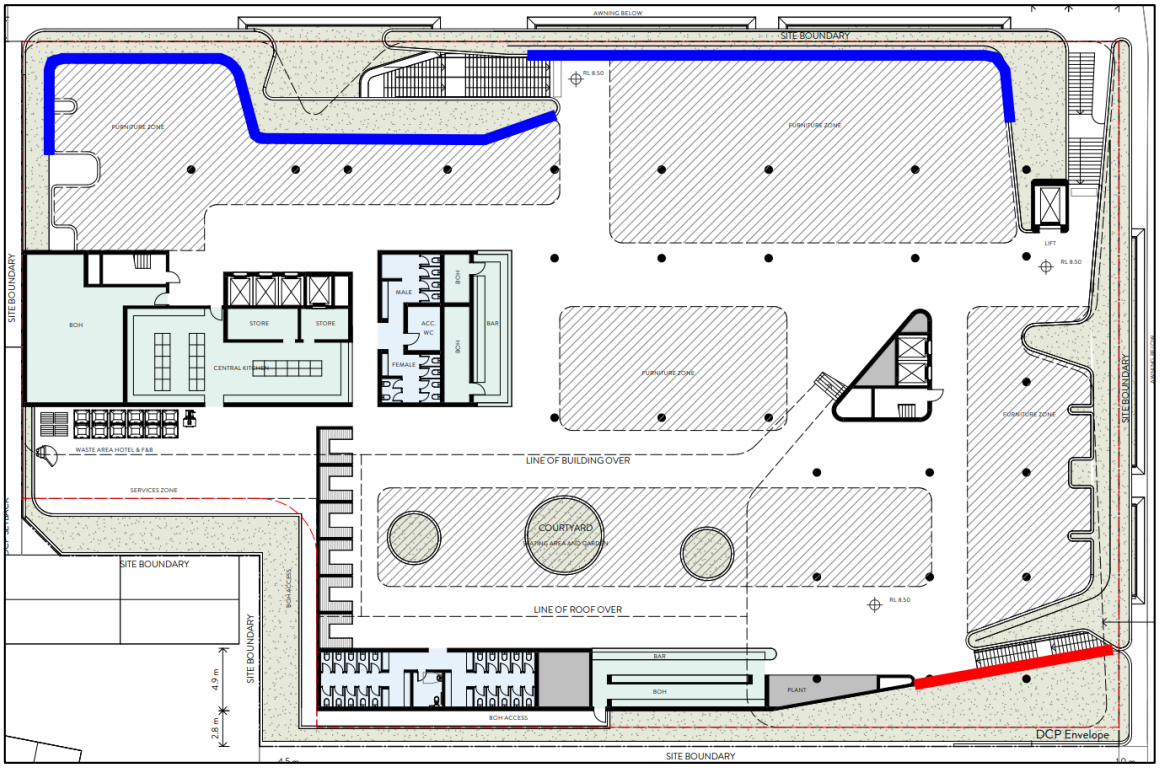


Figure 5-1: Noise screens around level 1 F&B areas

- Level 2
  - Swimming pool and associated terrace areas
    - Up to two small groups of kids playing in the pool at the same time (two groups of up to 3 kids, i.e. total of up to 6 kids).
    - Total of 100 patrons with 1 in 2 talking at any given time.
  - Hotel restaurant outdoor terrace – Total of 75 patrons with 1in 2 talking at any given time.
  - Function space
    - Total of 250 patrons, with maximum of 100 patrons permitted in the outdoor terrace at any given time.
    - Terrace doors are assumed along the northern frontage of the function area. Additionally, doors are generally assumed as being closed at all times during a function, and only open momentarily (approx. 5.5m^2 open area) as patrons move from internal space to outdoor area.
  - Noise screens on this level as illustrated in Figure 5-2 below.

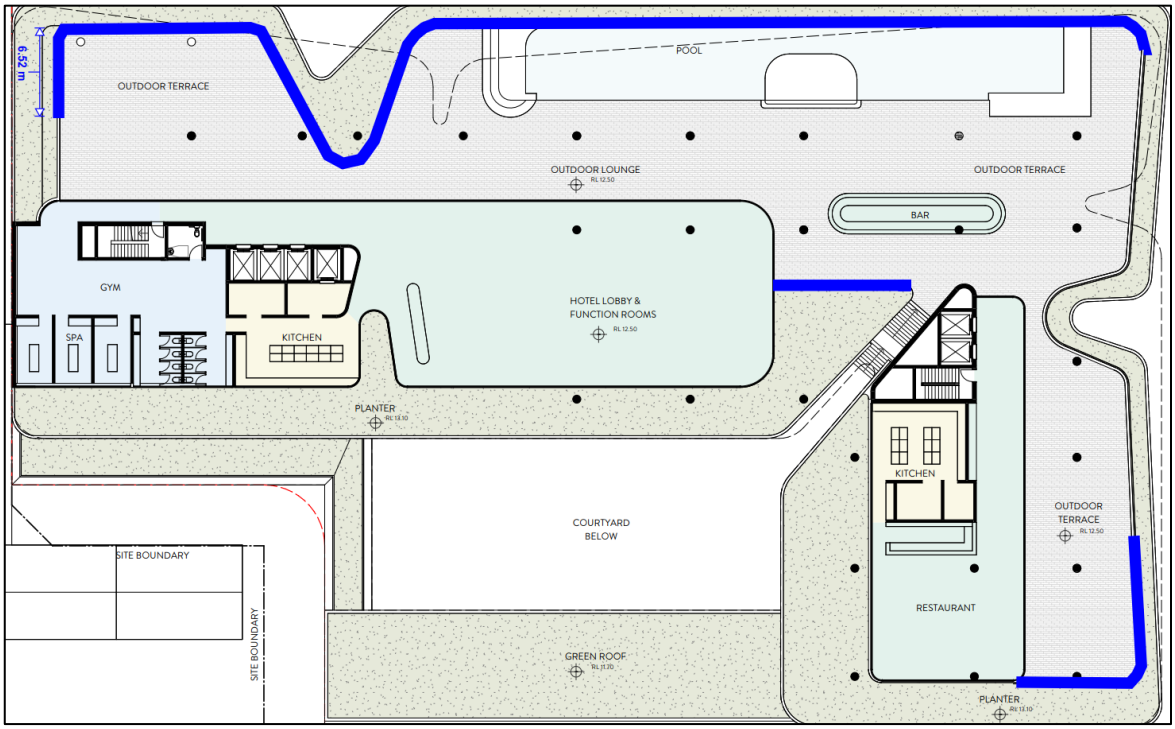


Figure 5-2: Noise screens around level 2 hotel terrace areas

Predicted noise emissions are as follows:

Table 5-11: Operations till 10pm @ R1(East)

Noise Source	Noise Level Emissions to R1 (eastern section of apartments 86-88 Alfred Street) – dBL_{10}									
	31.5	63	125	250	500	1k	2k	4k	8k	A-wt
Contribution 1 (Level 1 Courtyard F&B tenancy)	32	32	40	40	45	43	37	29	16	47
Contribution 2 (Level 1 F&B tenancy along eastern frontage)	36	36	44	44	50	48	42	33	21	51
Contribution 3 (Level 2 Hotel restaurant – indoor area)[1]	33	33	30	26	31	32	27	10	0	35
Contribution 4 (Level 2 Hotel restaurant outdoor terrace)	39	39	47	47	51	51	45	36	24	54
Total Noise Level at Resident - dBL_{10}	***42***	***42***	***50***	***50***	***54***	***53***	***47***	***39***	***26***	***56***
Permissible Noise Level (54BG+5dB)	***68***	***67***	***59***	***55***	***54***	***57***	***51***	***39***	***27***	***59***
Complies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

1. Noise breakout via fixed and closed façade glazing.

Table 5-12: Operations till 10pm @ R1(Middle)

Noise Source	Noise Level Emissions to R1 (middle section of apartments 86-88 Alfred Street) – dBL_{10}									
	31.5	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**A-wt**
Contribution 1 (Level 1 Courtyard F&B tenancy)	32	32	40	40	45	43	37	29	16	47
Contribution 2 (Level 1 F&B tenancy along eastern frontage)	27	27	35	35	40	38	32	23	11	42
Contribution 3 (Level 2 Hotel restaurant – indoor area)[1]	22	22	19	15	20	21	16	0	0	24
Contribution 4 (Level 2 Hotel restaurant outdoor terrace)	27	27	35	35	41	39	33	24	12	42
Total Noise Level at Resident - dBL_{10}	***34***	***34***	***42***	***42***	***48***	***45***	***40***	***31***	***19***	***49***
Permissible Noise Level (50BG+5dB)[2]	***58***	***57***	***48***	***47***	***48***	***45***	***44***	***34***	***26***	***50***
Complies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

1. Noise breakout via fixed and closed façade glazing.
2. Compliance is assessed against day period (7am-6pm) octave band noise goals as the background noise level during this period was marginally lower than the evening period (6pm-10pm), see Table 5-1. Compliance with daytime noise goals will also result in compliance during evening period.

Table 5-13: Operations till 10pm @ R1(West)

Noise Source	Noise Level Emissions to R1 (western section of apartments 86-88 Alfred Street) – dBL_{10}									
	31.5	63	125	250	500	1k	2k	4k	8k	A-wt
Contribution 1 (Level 1 Courtyard F&B tenancy)	27	27	35	35	41	38	33	24	12	42
Contribution 2 (Level 1 Function Space – indoor area)[1]	35	35	33	23	24	23	17	1	0	27
Contribution 3 (Level 1 F&B tenancy along northern frontage, adjacent to north-east corner of floorplate)	20	20	28	28	34	31	26	17	5	35
Total Noise Level at Resident - dBL_{10}	***36***	***36***	***38***	***36***	***42***	***39***	***34***	***25***	***12***	***43***
Permissible Noise Level (40BG+5dB)	***54***	***54***	***54***	***45***	***43***	***39***	***34***	***25***	***24***	***45***
Complies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

1. Noise breakout via fixed and closed façade glazing.

Table 5-14: Operations till 10pm @ R2

Noise Source	Noise Level Emissions to R2 (158-162 Ramsgate Road) – dBL_{10}									
	31.5	63	125	250	500	1k	2k	4k	8k	A-wt
Contribution 1 (Level 1 F&B tenancy along northern frontage)	30	30	38	38	44	42	36	27	15	45
Contribution 2 (Level 2 Swimming Pool and associated terrace areas)	29	29	37	38	43	42	37	31	25	46
Contribution 3 (Level 2 Function Space outdoor terrace)	28	28	36	36	42	39	34	25	13	43
Contribution 4 (Level 2 Function Space – indoor area)[1]	36	36	36	31	36	34	29	22	14	37
Total Noise Level at Resident - dBL_{10}	***38***	***43***	***42***	***48***	***46***	***41***	***33***	***26***	***38***	***50***
Permissible Noise Level (48BG+5dB)	***59***	***59***	***57***	***52***	***51***	***49***	***44***	***35***	***30***	***53***
Complies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

1. Noise breakout vis terrace door momentarily open for patron entry and egress.

5.2.1.2 Noise emission predictions up to 12am

Usage as follows:

- Level 1
  - Noise screens around seating areas as illustrated in Figure 5-1, however a retractable/operable element is required to enable use of the alfresco areas after 10pm. Minimum height of the noise screen (locked in place) is 2.3m above the finished floor level.
  - F&B tenancies along the northern frontage – Total of 200 patrons with 1 in 2 talking at any given time.
  - F&B courtyard tenancy and tenancy along the eastern frontage (combined) – Total of 100 patrons with 1 in 2 talking at any given time.
- Level 2
  - Pool bar and associated terrace areas – closed, not in use.
  - Hotel restaurant – Total of 50 patrons with 1in 2 talking at any given time.
  - Function space
    - Total of 250 patrons, with maximum of 50 patrons permitted in the outdoor terrace at any given time.
    - Terrace doors are assumed along the northern frontage of the function area. Additionally, doors are generally assumed as being closed at all times during a function, and only open momentarily (approx. 5.5m^2 open area) as patrons move from internal space to outdoor area.
  - Noise screens on this level as illustrated in Figure 5-2.

Table 5-15: Operations till 12am @ R1(East)

Noise Source	Noise Level Emissions to R1 (eastern section of apartments 86-88 Alfred Street) – dBL_{10}									
	31.5	63	125	250	500	1k	2k	4k	8k	A-wt
Contribution 1 (Level 1 Courtyard F&B tenancy and tenancy along eastern frontage – combined)	33	33	41	41	47	45	39	30	18	48
Contribution 2 (Level 2 Hotel restaurant – indoor area)[1]	33	33	30	26	31	32	27	10	0	35
Contribution 3 (Level 2 Hotel restaurant outdoor terrace)	23	23	29	27	29	25	17	8	0	29
Total Noise Level at Resident - dBL_{10}	***36***	***36***	***42***	***42***	***47***	***45***	***39***	***30***	***18***	***49***

Noise Source	Noise Level Emissions to R1 (eastern section of apartments 86-88 Alfred Street) – dBL_{10}									
	31.5	63	125	250	500	1k	2k	4k	8k	A-wt
Permissible Noise Level (45BG+5dB)	***62***	***61***	***56***	***49***	***48***	***46***	***39***	***30***	***27***	***50***
Complies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

1. Noise breakout via fixed and closed façade glazing.

Table 5-16: Operations till 12am @ R1(Middle)

Noise Source	Noise Level Emissions to R1 (middle section of apartments 86-88 Alfred Street) – dBL_{10}									
	31.5	63	125	250	500	1k	2k	4k	8k	A-wt
Contribution 1 (Level 1 Courtyard F&B tenancy and tenancy along eastern frontage – combined)	32	32	40	40	45	43	37	28	16	47
Contribution 2 (Level 2 Hotel restaurant – indoor area)[1]	22	22	19	15	20	21	16	0	0	24
Contribution 3 (Level 2 Hotel restaurant outdoor terrace)	21	21	28	25	29	23	15	6	0	28
Total Noise Level at Resident - dBL_{10}	***32***	***32***	***40***	***40***	***46***	***43***	***37***	***28***	***16***	***47***
Permissible Noise Level (42BG+5dB)	***56***	***55***	***52***	***43***	***46***	***43***	***37***	***28***	***25***	***47***
Complies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

1. Noise breakout via fixed and closed façade glazing.

Table 5-17: Operations till 12am @ R1(West)

Noise Source	Noise Level Emissions to R1 (western section of apartments 86-88 Alfred Street) – dBL_{10}									
	31.5	63	125	250	500	1k	2k	4k	8k	A-wt
Contribution 1 (Level 1 Courtyard F&B tenancy and tenancy along eastern frontage – combined)	25	25	33	33	38	36	30	21	9	40
Contribution 2 (Level 2 Function Space – indoor area)[1]	35	35	33	23	24	23	17	1	-17	27

Noise Source	Noise Level Emissions to R1 (western section of apartments 86-88 Alfred Street) – dBL_{10}									
	31.5	63	125	250	500	1k	2k	4k	8k	A-wt
Contribution 3 (Level 1 F&B tenancy along northern frontage, adjacent to north-east corner of floorplate)	18	18	26	26	32	29	24	15	3	33
Total Noise Level at Resident - dBL_{10}	***36***	***36***	***36***	***34***	***39***	***37***	***31***	***22***	***10***	***41***
Permissible Noise Level (37BG+5dB)	***51***	***50***	***49***	***43***	***40***	***37***	***31***	***23***	***22***	***42***
Complies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

1. Noise breakout via fixed and closed façade glazing.

Table 5-18: Operations till 12am @ R2

Noise Source	Noise Level Emissions to R2 (158-162 Ramsgate Road) – dBL_{10}									
	31.5	63	125	250	500	1k	2k	4k	8k	A-wt
Contribution 1 (Level 1 F&B tenancy along northern frontage)	28	28	37	37	42	40	34	25	13	44
Contribution 2 (Level 2 Hotel restaurant outdoor seating)	21	21	29	29	35	32	27	18	5	36
Contribution 3 (Level 2 Function Space outdoor terrace)	25	25	33	33	39	36	31	22	9	40
Contribution 4 (Level 2 Function Space – indoor area)[1]	36	36	36	31	36	34	29	22	14	37
Total Noise Level at Resident - dBL_{10}	***37***	***37***	***40***	***39***	***44***	***42***	***37***	***28***	***18***	***46***
Permissible Noise Level (43BG+5dB)	***57***	***57***	***55***	***50***	***46***	***43***	***37***	***28***	***25***	***48***
Complies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

1. Noise breakout vis terrace door momentarily open for patron entry and egress.

5.2.2 Ground level speciality retail

A café/restaurant type tenancy is proposed for the ground level speciality retail space. This space is expected to have both indoor and outdoor (alfresco) seating areas.

Typical activity noise sources associated with cafés include background music, patron speech and commercial grade coffee machines. Operational noise emissions to the R2 residential receivers are presented below, based on the following assumptions:

- Hours of operation for the café/restaurant is proposed between 7am and 5pm.
- Background music is generally measured between 60-65 dB(A)L_{10} SPL in a café space. Music is only assumed in the internal areas of the space.
- Patron speech is typically noted as 70 dB(A)L_{10} SWL for occasional raised speech in a café space. Total of 150 patrons are assumed in the indoor areas of the space at any given time, with 1 in 2 talking.
- Patron speech is assumed as 75 dB(A)L_{10} SWL for raised conversions in the alfresco dining space. This is not typical for a café but given the high levels of existing traffic noise at site, this is assumed to represent a worst-case. A total of 100 patrons are seated in this space at any given time, with 1 in 2 talking.
- Operations of a commercial grade coffee machine are typically between 70-73 dB(A)L_{10} SPL (measured at 1.5m distance from the machine – RTA database).
- Approximately 20m2 of the northern glazed façade is assume open at all times.

Table 5-19: Predicted noise emissions from ground level café/restaurant

Receiver	Assessment Location	Noise Criteria – dB(A)$L_{eq(15min)}$	Predicted Noise Levels – dB(A)$L_{eq(15min)}$	Comply?
R2 (158-162 Ramsgate Road)	Street Property Boundary	53	50	Yes

5.2.3 Mechanical services plant and equipment

Noise from building services plant and equipment is assessed with reference to the EPA NPfI (Section 5.1.2) and must comply with the noise emission goals presented in Table 5-4.

Details of the mechanical plant and equipment are not typically designed at DA stage. Therefore, the noise impacts from mechanical plant and equipment should be undertaken during the Detailed Design stage of the project. Compliance with EPA requirements will be achievable through typical plant/equipment acoustic treatments (acoustic treatment of plant room ventilation openings, induct acoustic lining, noise screens to equipment casings on roof tops etc).

5.2.4 Loading dock

An enclosed loading dock is proposed on ground level, adjacent to the supermarket tenancy (along western boundary of site). Access to the loading dock is proposed via a separate door adjacent to the access to the basement carparking.

The loudest activity associated with loading dock operations will be from vehicle noise associated with deliveries. We have been advised of the following loading dock operations:

- Deliveries associated with the development will access the loading dock from Ramsgate Road, using the western connection between existing Service Road and Ramsgate.

- A total of 12 deliveries are proposed per day, four associated with the supermarket, four with the hotel and four with the level 1 F&B tenancies.
- 12.5 HRV is the largest vehicle type proposed (associated with the supermarket). Deliveries for the hotel and F&B tenancies are largely expected to include delivery vans and cars.
- A majority of the deliveries are typically expected during the day period (7am to 6pm), with 1 x HRV delivery proposed between 6am to 7am and two deliveries (1 x HRV and 1 x van) proposed between 6pm to 9pm.

Operational noise emissions to the R2 residential receivers are presented below, based on the following assumptions:

- Delivery van arriving/departing assumed as 89 dB(A)SWL. This is typical for a delivery van passby at speeds of between 10-20km/hr.
- 12.5 HRV arriving/departing assumed as 98 dB(A)SWL. This is typical for a Coles or Woolworths heavy rigid delivery truck passby at speeds of between 10-20km/hr.
- Maximum noise level impacts (sleep disturbance) associated with these vehicle types will be from engine starting. Noise impacts from door slams and refrigeration compressor operations have typically been noted as being considerably lower than the Lmax levels associated with engine starting. The following maximum sound power levels are assumed:
  - Delivery van engine starting – 94 dB(A)L_{max}
  - 12.5 HRV engine starting – 102 dB(A)L_{max}
- Vehicle movements:
  - Day (7am-6pm) – 4 movements (2 x van, 2 x HRV) during a15-minute period (two inbound and two outbound or all four inbound/outbound).
  - Evening (6pm-10pm) – 2 HRV movements during a15-minute period associated with HRV (one inbound or one outbound).
  - Early morning shoulder (6am-7am) – 2 HRV movements during a15-minute period associated with HRV (one inbound or one outbound).

Table 5-20: Predicted noise emissions from loading dock operations

Receiver	Time period	Noise Criteria	Predicted Noise Levels	Comply?
R2 (158-162 Ramsgate Road)	Early morning shoulder (6am-7am)	61 dB(A)$L_{eq(15min)}$ 71 dB(A)L_{max}	42 dB(A)$L_{eq(15min)}$ 50 dB(A)L_{max}	Yes
	Day (7am-6pm)	53 dB(A)$L_{eq(15min)}$	44 dB(A)$L_{eq(15min)}$	Yes
	Evening (6pm-10pm)	44 dB(A)$L_{eq(15min)}$	42 dB(A)$L_{eq(15min)}$	Yes

5.2.5 Additional traffic generation

The RNP notes that in assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

In order for traffic noise to increase by more than the permissible 2dB, additional road traffic on the street associated with the proposed development, would need to increase by more than 60 percent. Based on the future peak traffic movements illustrated in Figure 6 of the project traffic assessment report *"Proposed Mixed Use Development – 277 The Grand Parade, Ramsgate Beach – Traffic and Parking Assessment"* [9], peak period (AM or PM) additional traffic generation associated with the development is under 40% (approximately between 36-38%).

Hence, the projected traffic generation associated with the site are not expected to increase the existing traffic noise levels and no adverse impacts are predicted.

5.3 Recommendations

5.3.1 Ground level speciality retail (café/restaurant)

- The maximum capacity must be limited to 150 patrons internally and 100 patrons in the alfresco seating area.
- Retail space to cease operations by 6pm.
- Background music is only recommended for the internal area of the proposed tenancy, limited to 65 dB(A)L_{10} SPL (measured in the centre of the space). Speakers or amplification equipment must be installed at least 1.5m from the northern façade of the tenancy.
- Speakers or amplification equipment are not permitted in the alfresco seating area.
- The proposed glazed partition (including any operable elements) along the northern façade must achieve an acoustic performance of at least R_W 35 (indicatively 10.38mm laminate glass). Maximum of 20m^2 of this glazed façade can remain open during the proposed operating hours (7am to 5pm).

5.3.2 Level 1 F& B areas

Operational noise emissions from these outlets will be subject to tenancy specific development applications, however the following noise control recommendations and management strategies are shall be considered to evaluate cumulative operational noise impacts.

- All tenancies to cease operation by midnight.
- The maximum capacity of each tenancy must be limited as follows:
  - F&B tenancy along northern frontage – 200 patrons at any time.
  - F&B tenancy along eastern frontage
    - 100 patrons till 10pm and combined capacity with courtyard F&B tenancy as detailed below.
  - Courtyard F&B tenancy
    - 100 patrons till 10pm.
    - Combined 100 patrons with F&B tenancy along eastern frontage, 10pm – midnight.

- Noise screens are recommended along the northern edge (illustrated in **blue**) of the F&B tenancy seating areas as illustrated in Figure 5-3 below. The screens shall include a fixed element and an operable element.
  - Minimum 1.4m of the screen (from finished floor level) shall be solid and continuous (masonry, Perspex, glass or a combination of these elements).
  - An operable element is required above this fixed 1.4m element, extending to a total height of 2.3m (above finished floor level). This operable element will need to be extended and locked in place after 10pm (i.e. for operations between 10pm and midnight).
  - The screen shall wrap around the western edge and extend at least past half the length of the proposed seating area on the north-west corner of the floor, i.e. at least 7.5m.
  - The screens along the northern edge shall overlap at the proposed stairway, at least 2m.
- A minimum 2m high noise screen is required along the southern edge (illustrated in **red** in Figure 5-3 below), given proximity to adjoining residences to the south. The screens can be constructed of masonry, Perspex, glass or a combination of these elements (no gaps or holes are permitted in the screens).
- Additionally, noise absorptive lining is recommended to the underside of the soffit above the seating zones, as illustrated in Figure 5-3.
  - **Red** zone – Megasorber® P100 or equivalent (NRC ≥ 1.1) to entire soffit area, evenly distributed.
  - **Yellow** zone – Megasorber® P50 or equivalent (NRC ≥ 1.0) to 50% of soffit area, evenly distributed.

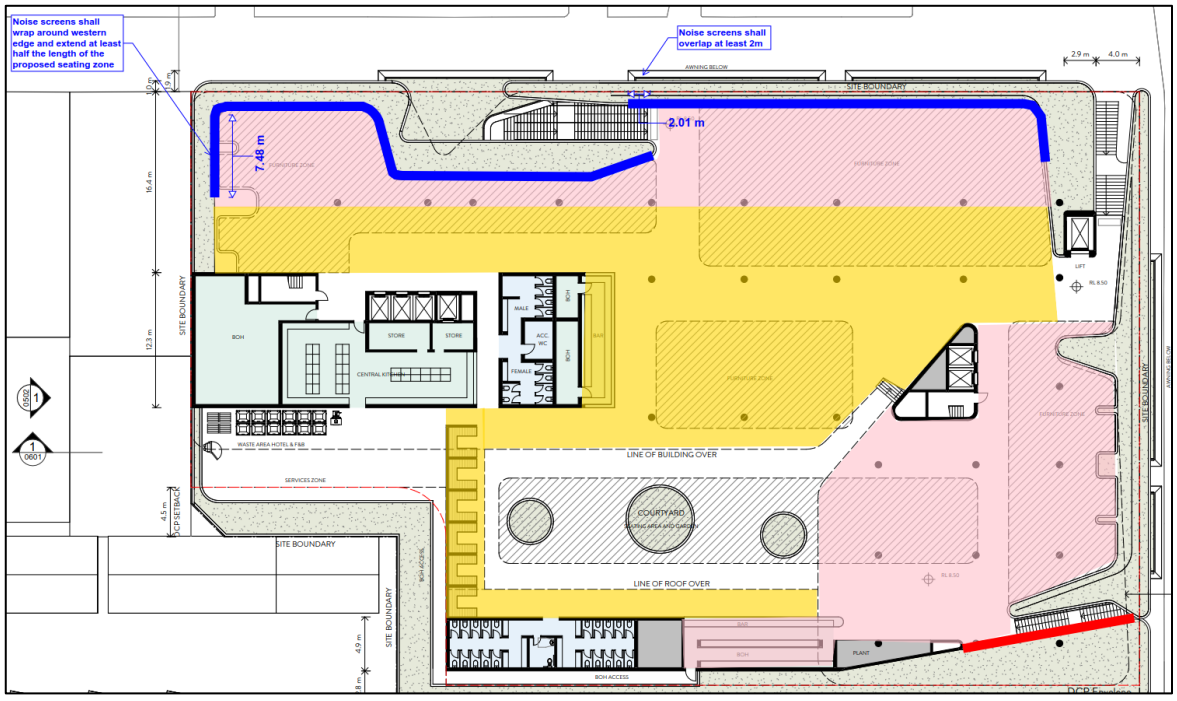


Figure 5-3: Recommended acoustic treatment to level 1 F&B areas

- Only background music permitted for each tenancy, limited to 65 dB(A)L_{10} SPL (measured @ 1m from any speaker). Speakers or amplification equipment must be installed at least 1.5m from the edges.

- Patron entry/egress via the stairway proposed adjacent to the ground floor substation (near the south-east corner of the development) is not recommended after 10pm.

5.3.3 Level 2 hotel amenity areas

- Pool bar and associated terrace areas to cease operations by 10pm.
- Restaurant and function space to cease operations by midnight.
- The maximum capacity of each tenancy must be limited as follows:
  - Pool bar and associated terrace areas – 100 patrons at any time
  - Restaurant
    - 75 patrons till 10pm.
    - 50 patrons between 10pm – midnight but only in the designated zone illustrated in Figure 5-4.
  - Function space – 250 patrons in total, restricted to 100 patrons in the outdoor space till 10pm and 50 patrons in the outdoor space between 10pm and midnight.

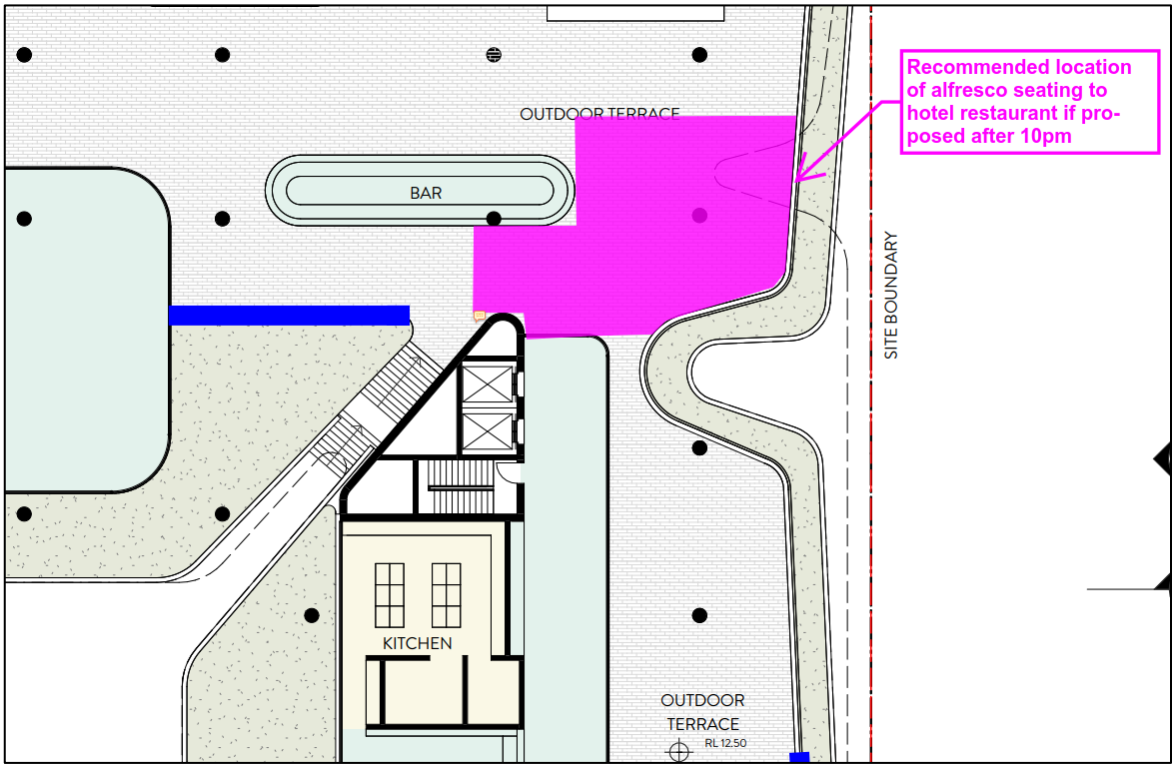
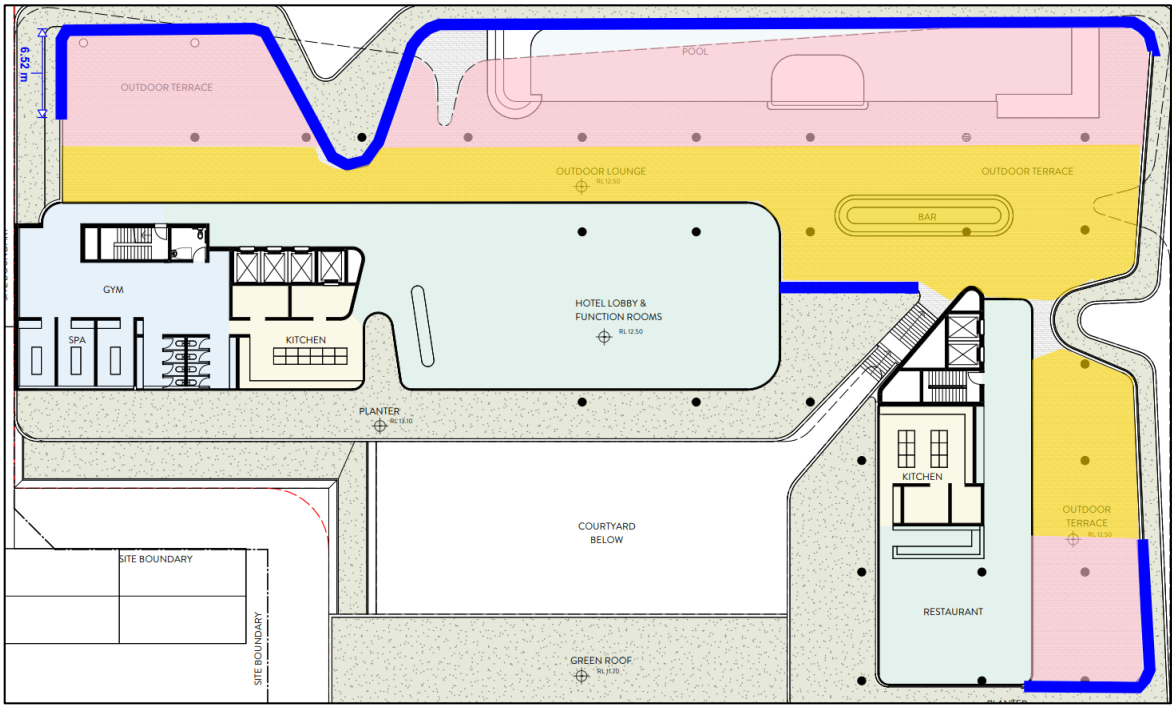


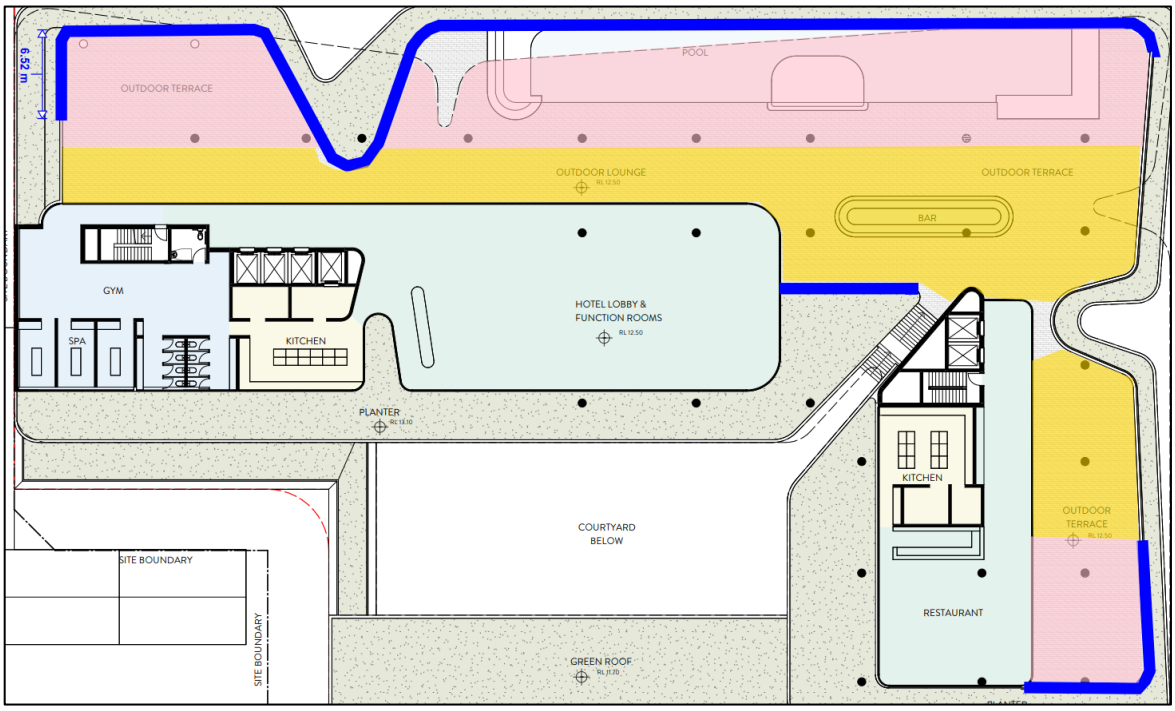
Figure 5-4: Recommended level 2 hotel restaurant alfresco seating area after 10pm

Noise screens, as illustrated in



- Figure 5-5 below. The screens shall be minimum 1.4m high and can be constructed of masonry, Perspex, glass or a combination of these elements. No gaps or holes are permitted in the screens.

Additionally, noise absorptive lining is also recommended to the underside of the soffit, as illustrated in



- Figure 5-5.
  - Red zone – Megasorber® P100 or equivalent (NRC ≥ 1.1) to entire soffit area, evenly distributed.
  - Yellow zone – Megasorber® P50 or equivalent (NRC ≥ 1.0) to 50% of soffit area, evenly distributed.

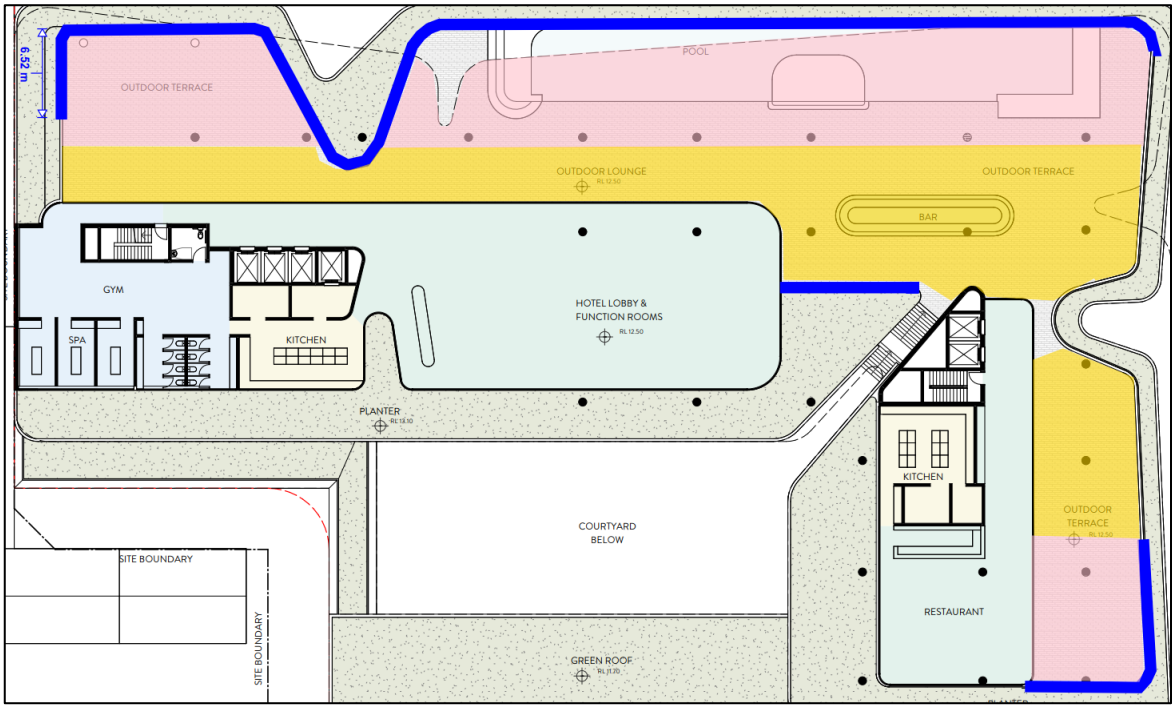


Figure 5-5: Recommended acoustic treatment to level 2 hotel amenity areas

- Only background music is permitted in the hotel amenity areas (pool and associated terrace), limited to 65 dB(A)L_{10} SPL (@1m from any speaker). Speakers or amplification equipment must be installed at least 1.5m from the edges.
- Hotel restaurant
  - Only background music is recommended within the restaurant, limited to 65 dB(A)L_{10} SPL (measured in the centre of the space). Speakers or amplification equipment must be installed at least 1.5m from terrace doors.
  - Only low background music is permitted in the outdoor terrace, limited to 63 dB(A)L_{10} SPL (@1m from any speaker). Speakers or amplification equipment must be installed at least 2m from the southern edge.
  - All façade glazing must achieve an acoustic performance of at least R_W 35 (indicatively 10.38mm laminate glass).
  - Terrace doors shall be installed along the eastern façade, at maximum distance from the southern edge. Doors shall be installed with full perimeter rubber acoustic seals and generally remain closed at all times except for entry and egress.
- Function Space
  - All perimeter glazing for the function space must achieve an acoustic performance of at least R_W 35 (indicatively 10.38mm laminate glass).
  - Access to the outdoor area of the function space must be restricted to the northern façade. Doors shall be installed with full perimeter rubber acoustic seals and generally remain closed at all times except for entry and egress.
  - Noise limiters are recommended for amplification equipment proposed inside this space, limited as follows:

Table 5-21: Octave band noise limits for amplified music in function space

Time Period	Octave Band Noise Limits, dB(Z)									
	31.5	63	125	250	500	1k	2k	4k	8k	Overall dB(A)
If outdoor terrace used after 10pm (i.e. at any time of operation)	85	85	85	77	77	77	75	71	64	82
If outdoor terrace not used after 10pm i.e. (terrace door remain closed at all times)	93	93	93	85	85	85	83	79	72	90

- Only background music is permitted in the outdoor terrace, limited to 65 dB(A)L_{10} SPL (@1m from any speaker). Speakers or amplification equipment must be installed at least 1.5m from the northern and western edges.
- Speakers or amplification equipment proposed to be fixed to Level 2 soffit must be suspended at least 1m from the slab, angled downwards (45° angle to the floor) and mounted using Embelton NRD vibration isolators or equal. Additionally, speakers shall be located at least 1.5m from any operable façade elements.

5.3.4 Loading dock and waste collection

- Early morning shoulder period (6am-7am) loading dock operations must be limited to one (1) truck (12.5 HRV) delivery.
- Evening period (6pm-10pm) loading dock operations must be limited to two (2) deliveries (1 x 12.5 HRV and 1 x van or 2 vans).
- Vehicles are not recommended to be left idling once inside the loading dock, with engine turned off as soon as practicable.
- Alternative to beeper warning alarms must be considered for all heavy vehicles accessing the loading dock (e.g. broadband alarms, variable level alarms).
- Waste collection is only permitted after 7am and before 6pm.

6 Conclusion

Renzo Tonin & Associates has completed an acoustic assessment of the proposed mixed-use hotel development "Ramsgate Beach Hotel" at 277 The Grand Parade, Ramsgate.

This assessment has considered environmental noise impacts (road traffic noise from The Grand Parade and Ramsgate Road) to the proposed occupied areas of the development and external noise emissions from the operations of the development (activity noise and noise from building services plant/equipment). The proposed Level 1 F&B outlets will be subject to tenancy specific development applications, however an assessment in principle (cumulative impacts) was provided to demonstrate that these tenancies are capable of being used for their intended purpose.

- Impacts from existing environmental noise sources (road traffic) surrounding the site have been assessed in Section 4. Recommendations to the building shell constructions to address these impacts are detailed in Section 4.2.
- Operational noise impacts associated with the proposed development have assessed in Section 5.
  - Relevant noise emission criteria for key noise sources associated with the project are detailed in Section 5.1.
  - A preliminary assessment of operational noise impacts was undertaken (Section 5.2), with recommendations and management strategies required to control these impacts detailed in Section 5.3.

As such, the proposed development is suitable at the site from an acoustic viewpoint.

References

[1]. Bayside Council. (2011). Rockdale Development Control Plan 2011, Sydney.

[2]. Craft Architecture. (2022). *Ramsgate Beach Hotel – 277 The Grand Parade, Ramsgate* DA Drawings *(revision 9 dated 13 July 2022),* Sydney.

[3]. Department of Planning and Environment. (2008). *Development Near Rail Corridors and busy Roads – Interim Guideline*. Sydney

[4]. Department of Planning and Environment. (2021b). State Environmental Planning Policy (Transport and Infrastructure) 2021. NSW Government.

[5]. Environment Protection Authority. (2011). *Road Noise Policy*, Sydney.

[6]. Environment Protection Authority. (2017). *Noise Policy for Industry*, Sydney.

[7]. Office of Liquor Gaming & Racing. (2009). *Sound advice – Reducing the risk of noise disturbance (October 2009)*, NSW Government.

[8]. Standards Australia. (2016). '*Acoustics – Recommended design sound levels and reverberation times for building interiors'* (AS/NZS 2107:2016), Standards Australia.

[9]. Transport and Traffic Planning Associated. (2022). *Proposed Mixed Use Development 277 The Grand Parade, Ramsgate Beach – Traffic and Parking Assessment (Revision B)*, Sydney

APPENDIX A Glossary of terminology

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

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 L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of common sounds in our daytime environment: threshold of hearing — 0 dB — The faintest sound we can hear 10 dB — Human breathing almost silent — 20 dB 30 dB — Quiet bedroom or in a quiet national park location generally quiet — 40 dB — Library 50 dB — Typical office space or ambience in the city at night moderately loud — 60 dB — CBD mall at lunch time 70 dB — The sound of a car passing on the street loud — 80 dB — Loud music played at home 90 dB — The sound of a truck passing on the street very loud — 100 dB — Indoor rock band concert 110 dB — Operating a chainsaw or jackhammer extremely loud — 120 dB — Jet plane take-off at 100m away threshold of pain — 130 dB 140 dB — Military jet take-off at 25m away
dB(A)	A-weighted decibels. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in 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.
L_{Max}	The maximum 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.

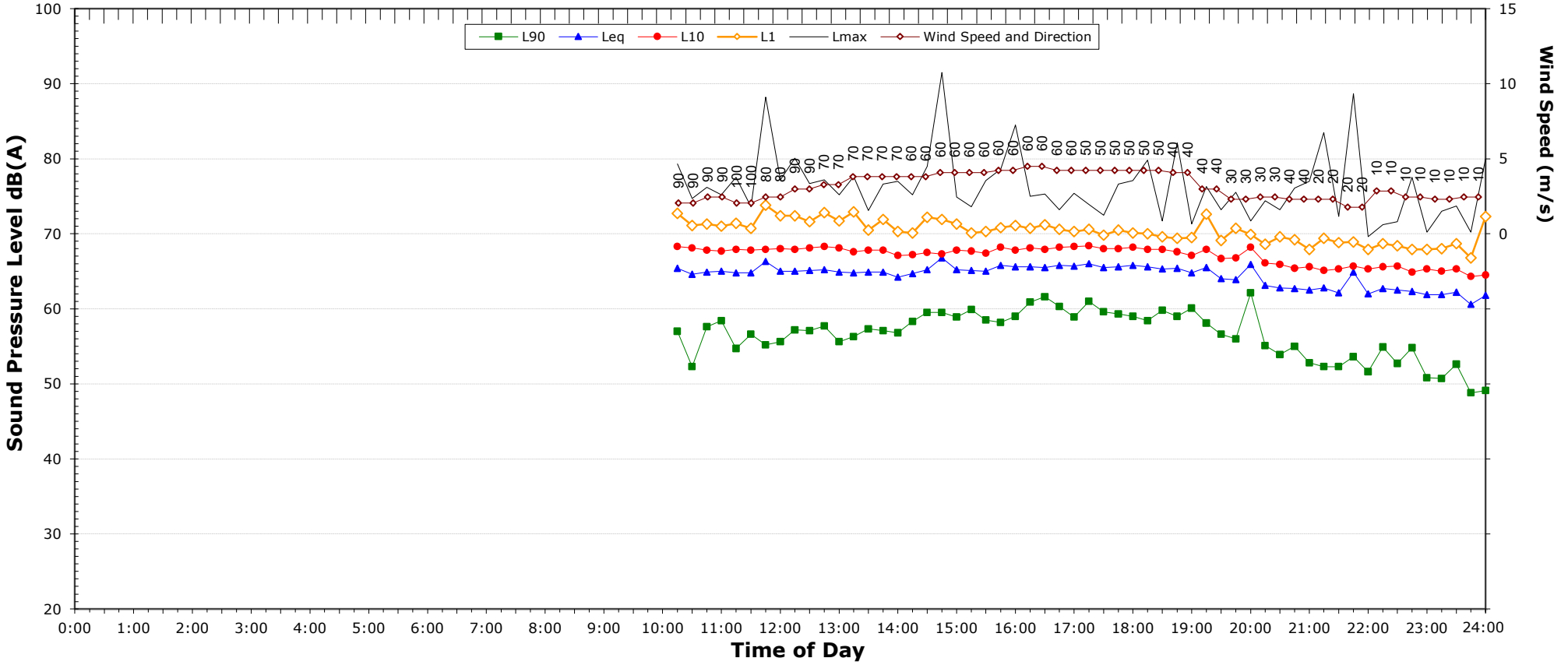
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L_{Aeq} or L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time, which would produce the same energy as a fluctuating sound level. When A-weighted, this is written as the L_{Aeq}.
Rw	Weighted Sound Reduction Index A measure of the sound insulation performance of a building element. It is measured in very controlled conditions in a laboratory. The term supersedes the value STC which was used in older versions of the Building Code of Australa. Rw is measured and calculated using the procedure in ISO 717-1. The related field measurement is the DnT,w. The higher the value the better the acoustic performance of the building element.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
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 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 of 1 pico watt.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone referenced to 20 mico Pascal.
Transmission Loss	The sound level difference between one room or area and another, usually of sound transmitted through an intervening partition or wall. Also the vibration level difference between one point and another. For example, if the sound level on one side of a wall is 100dB and 65dB on the other side, it is said that the transmission loss of the wall is 35dB. If the transmission loss is normalised or standardised, it then becomes the Rw or Raw or DnT,w.

APPENDIX B Historic Noise Monitoring Results

EXISTING AMBIENT NOISE LEVELS

L1 - 262 The Grand Parade, Ramsgate, NSW (Front)

Friday, 1 November 2013



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	-	52.3	38.8
Leq	-	64.2	60.6

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)

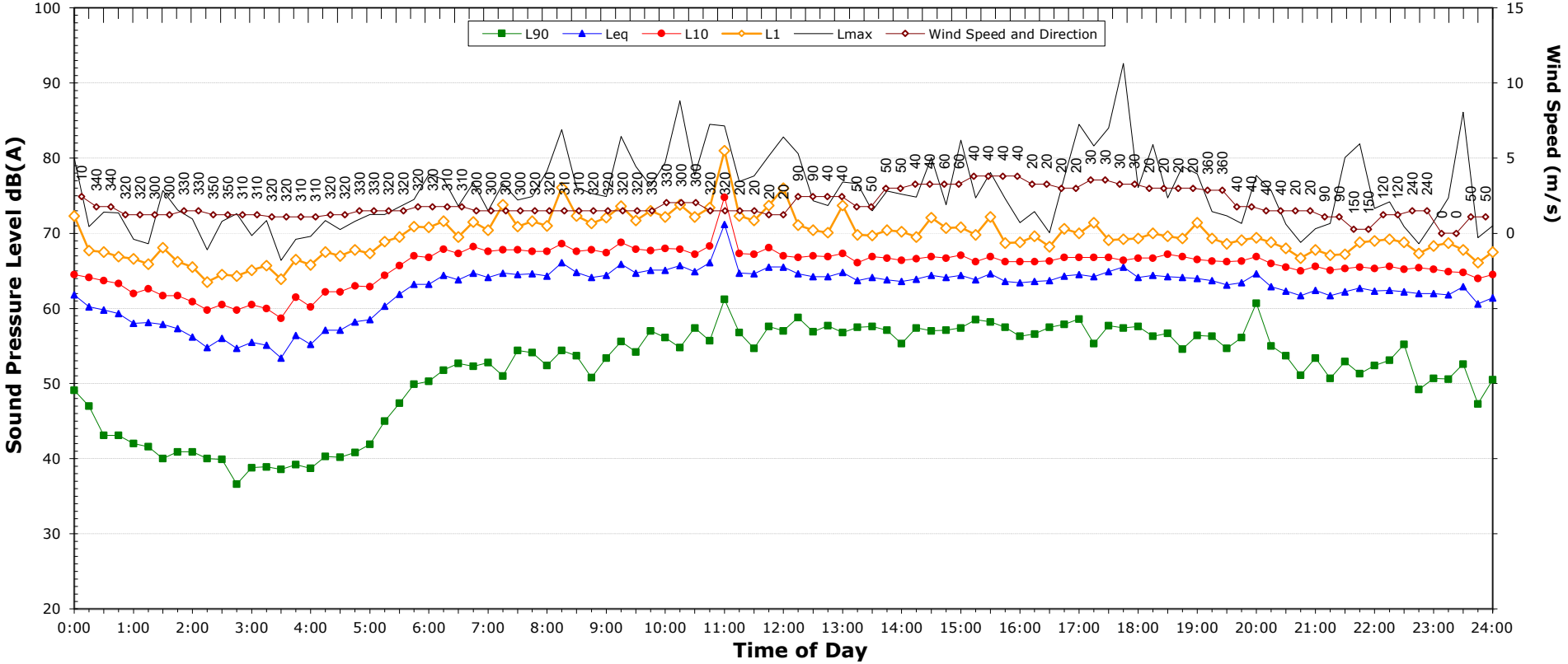
NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	67.5	63.1
$L_{eq\ 1hr}$ upper 10 percentile	68.2	66.8
$L_{eq\ 1hr}$ lower 10 percentile	65.4	57.7

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	71.7	to	80.0
Lmax - Leq (Range)	15.1	to	18.3

EXISTING AMBIENT NOISE LEVELS

L1 - 262 The Grand Parade, Ramsgate, NSW (Front)

Saturday, 2 November 2013



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	53.7	51.1	39.6
Leq	64.9	63.2	59.7

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)

NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	67.0	62.2
$L_{eq\ 1hr}$ upper 10 percentile	69.2	64.7
$L_{eq\ 1hr}$ lower 10 percentile	64.8	58.9

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	74.9	to	86.1
Lmax - Leq (Range)	16.2	to	25.5

Data File: 2013-11-01_SLM_000_123_Rpt_Report.txt

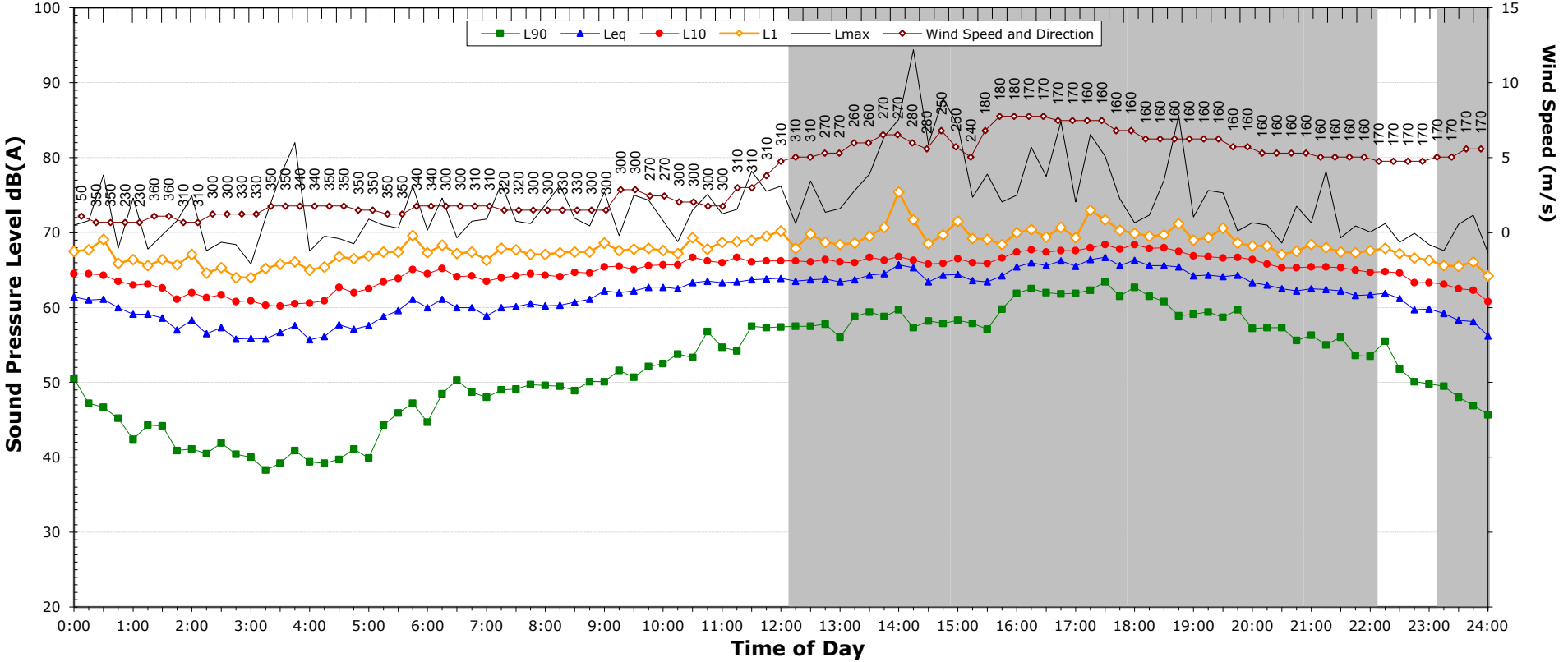
TG502-01 (rev 0) Location L1 - Front Logger

Template QTE-05B (rev 104) Sydney Logger Graphs

EXISTING AMBIENT NOISE LEVELS

L1 - 262 The Grand Parade, Ramsgate, NSW (Front)

Sunday, 3 November 2013



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

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)

NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	64.8	62.2
$L_{eq\ 1hr}$ upper 10 percentile	66.2	65.6
$L_{eq\ 1hr}$ lower 10 percentile	62.7	56.1

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	73.0	to	79.2
Lmax - Leq (Range)	18.8	to	20.3

Data File: 2013-11-01_SLM_000_123_Rpt_Report.txt

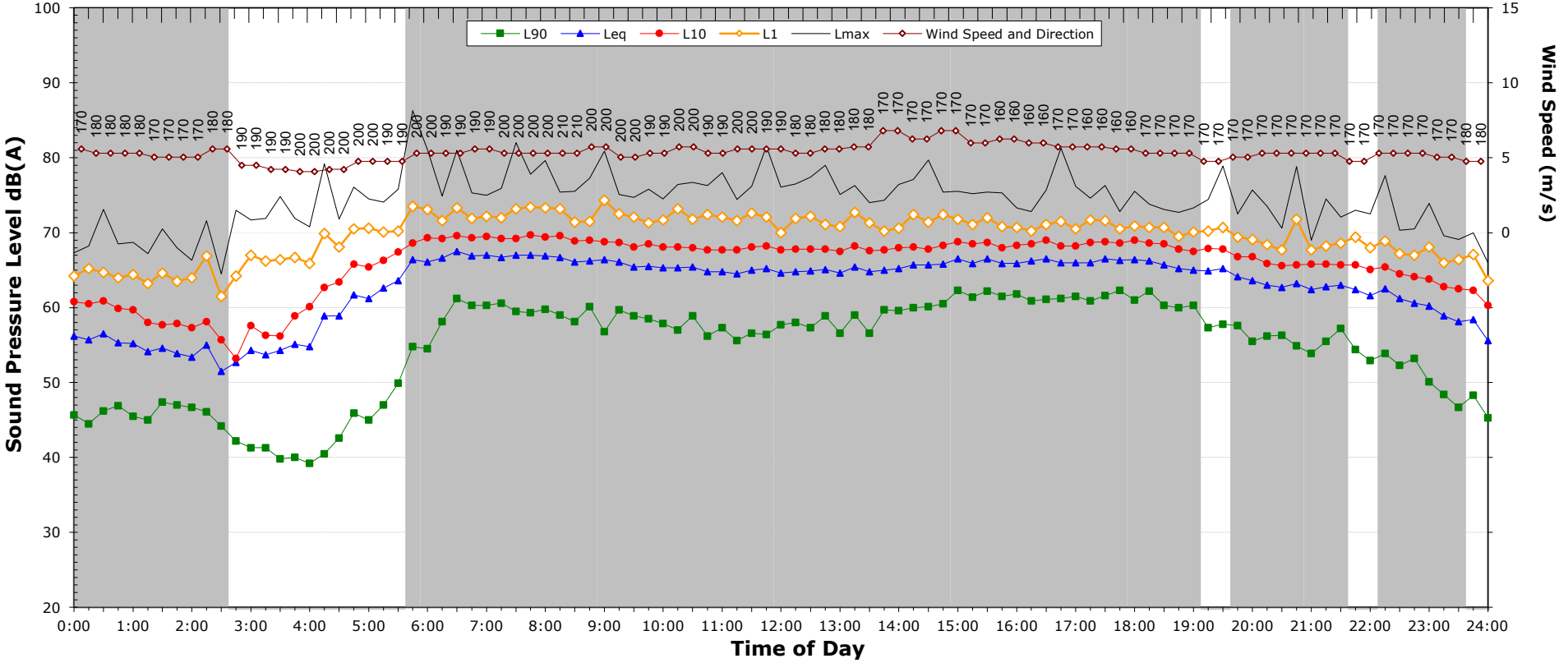
TG502-01 (rev 0) Location L1 - Front Logger

Template QTE-05B (rev 104) Sydney Logger Graphs

EXISTING AMBIENT NOISE LEVELS

L1 - 262 The Grand Parade, Ramsgate, NSW (Front)

Monday, 4 November 2013



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

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)

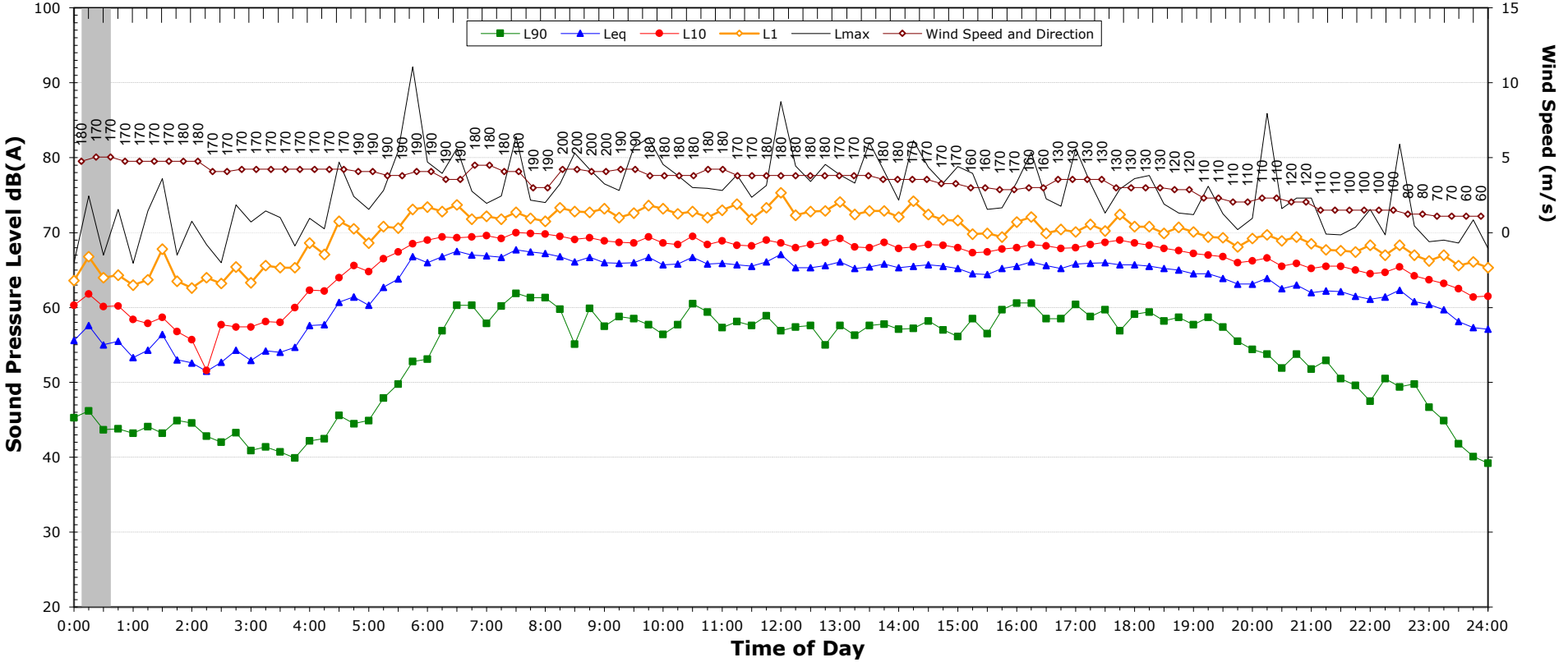
NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	66.3	64.3
$L_{eq\ 1hr}$ upper 10 percentile	67.6	69.6
$L_{eq\ 1hr}$ lower 10 percentile	64.5	55.5

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	72.9	to	92.1
Lmax - Leq (Range)	17.5	to	27.0

EXISTING AMBIENT NOISE LEVELS

L1 - 262 The Grand Parade, Ramsgate, NSW (Front)

Tuesday, 5 November 2013



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	56.4	49.6	37.8
Leq	65.9	63.5	61.6

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)

NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	67.9	64.1
$L_{eq\ 1hr}$ upper 10 percentile	69.4	69.8
$L_{eq\ 1hr}$ lower 10 percentile	64.9	55.8

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	73.5	to	84.2
Lmax - Leq (Range)	17.5	to	22.1

Data File: 2013-11-01_SLM_000_123_Rpt_Report.txt

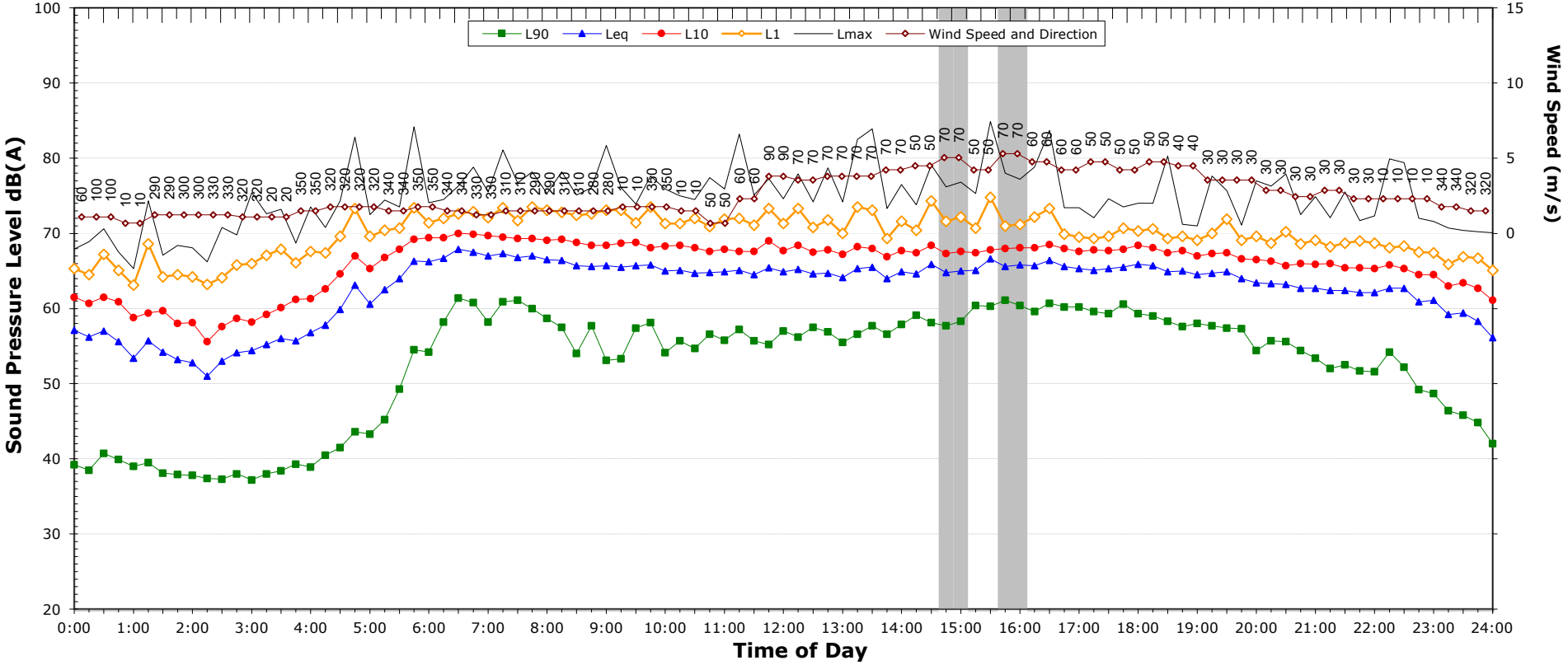
TG502-01 (rev 0) Location L1 - Front Logger

Template QTE-05B (rev 104) Sydney Logger Graphs

EXISTING AMBIENT NOISE LEVELS

L1 - 262 The Grand Parade, Ramsgate, NSW (Front)

Wednesday, 6 November 2013



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	54.4	51.7	40.1
Leq	65.5	63.8	61.3

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

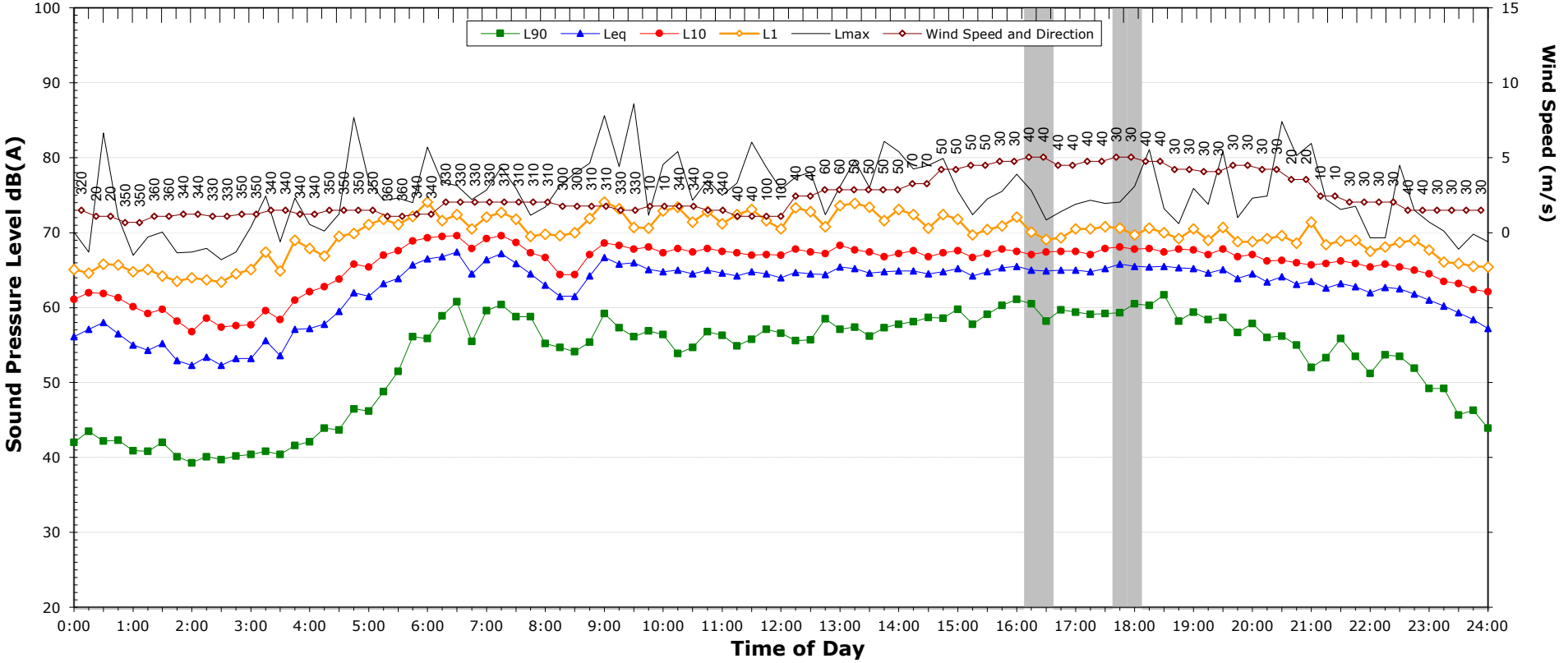
NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	67.6	63.8
$L_{eq\ 1hr}$ upper 10 percentile	68.9	68.9
$L_{eq\ 1hr}$ lower 10 percentile	65.1	55.5

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	70.1	to	85.4
Lmax - Leq (Range)	16.3	to	26.5

EXISTING AMBIENT NOISE LEVELS

L1 - 262 The Grand Parade, Ramsgate, NSW (Front)

Thursday, 7 November 2013



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	54.8	52.0	-
Leq	64.9	64.1	-

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)

NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	67.2	60.7
$L_{eq\ 1hr}$ upper 10 percentile	67.9	64.5
$L_{eq\ 1hr}$ lower 10 percentile	65.6	55.8

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	69.5	to	79.0
Lmax - Leq (Range)	16.2	to	17.9

Data File: 2013-11-01_SLM_000_123_Rpt_Report.txt

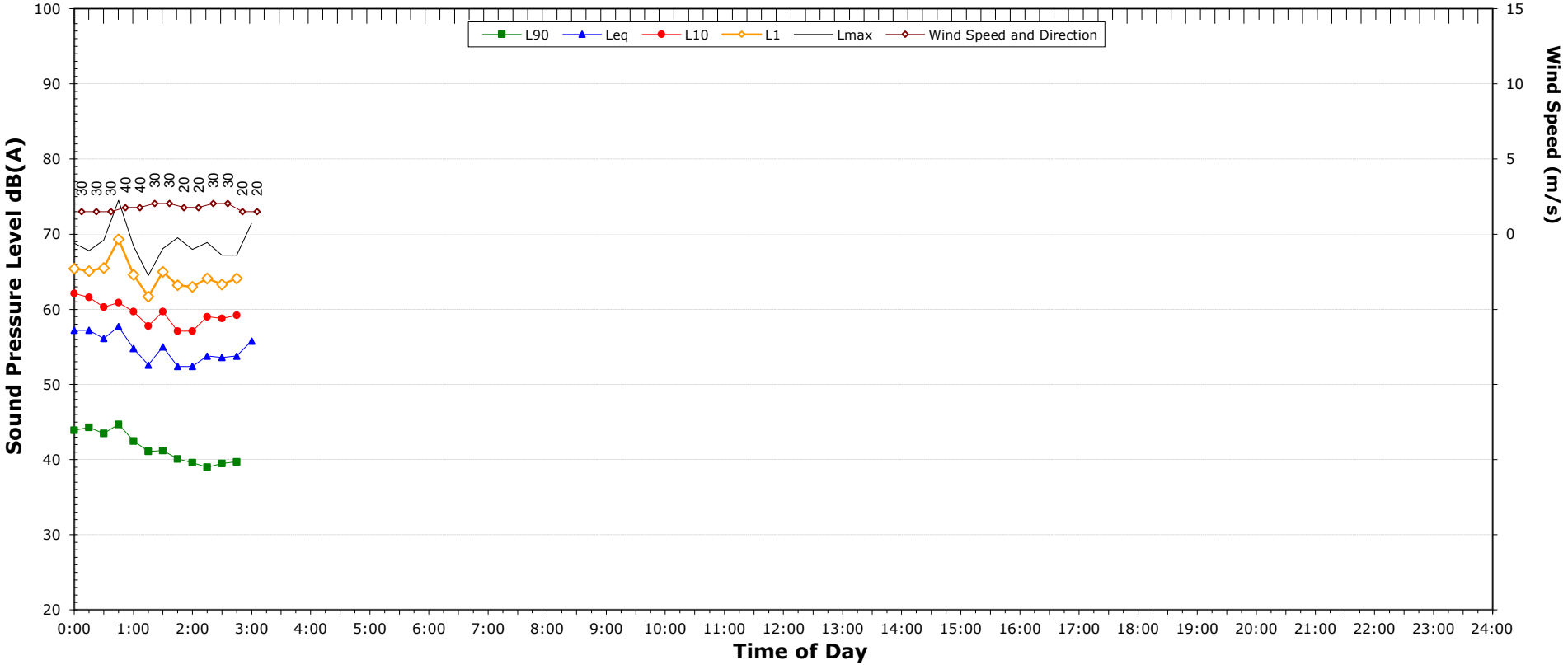
TG502-01 (rev 0) Location L1 - Front Logger

Template QTE-05B (rev 104) Sydney Logger Graphs

EXISTING AMBIENT NOISE LEVELS

L1 - 262 The Grand Parade, Ramsgate, NSW (Front)

Friday, 8 November 2013



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

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)

NSW Road Noise Policy (1m from facade)	(see note 3)	
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	-	-
$L_{eq\ 1hr}$ upper 10 percentile	-	-
$L_{eq\ 1hr}$ lower 10 percentile	-	-

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	-	to	-
Lmax - Leq (Range)	-	to	-

Data File: 2013-11-01_SLM_000_123_Rpt_Report.txt

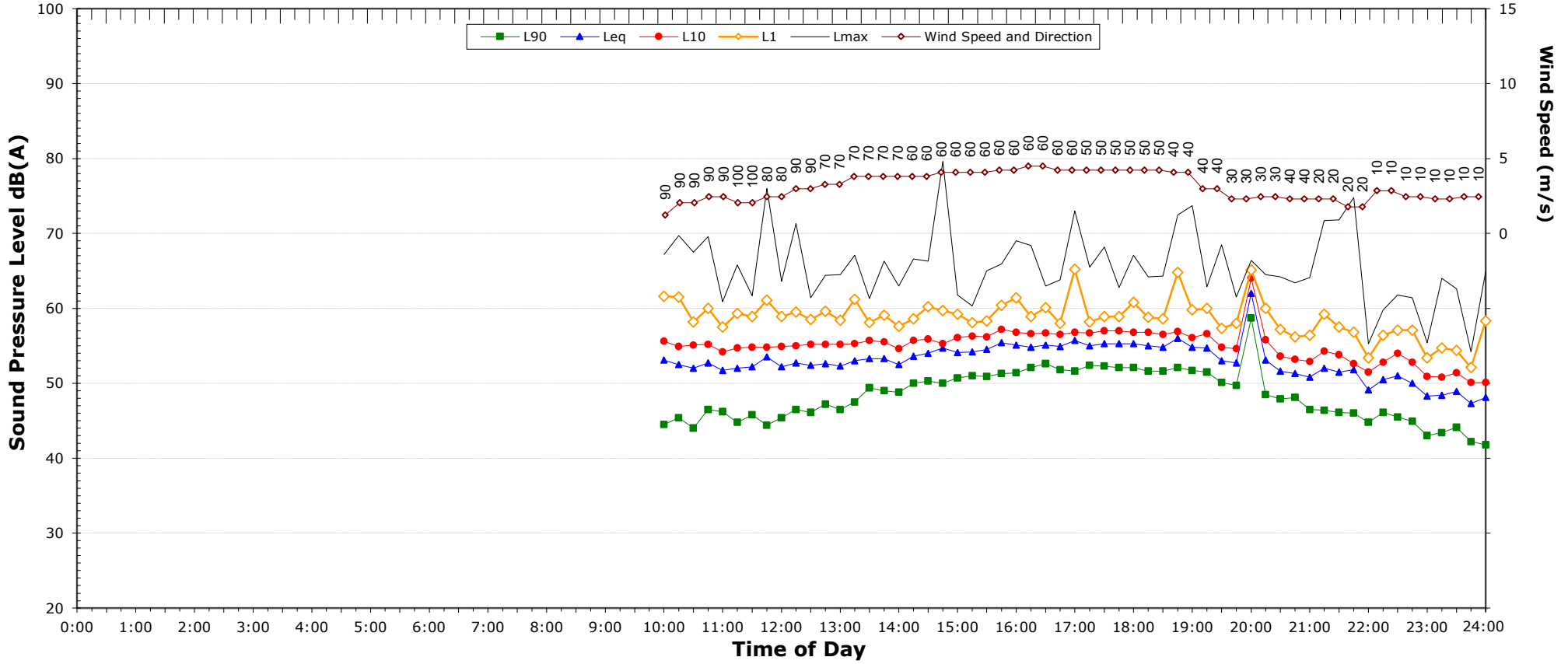
TG502-01 (rev 0) Location L1 - Front Logger

Template QTE-05B (rev 104) Sydney Logger Graphs

EXISTING AMBIENT NOISE LEVELS

L2 - 262 The Grand Parade Ramsgate, NSW (Rear)

Friday, 1 November 2013



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	-	46.0	35.0
Leq	-	54.7	48.1

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)

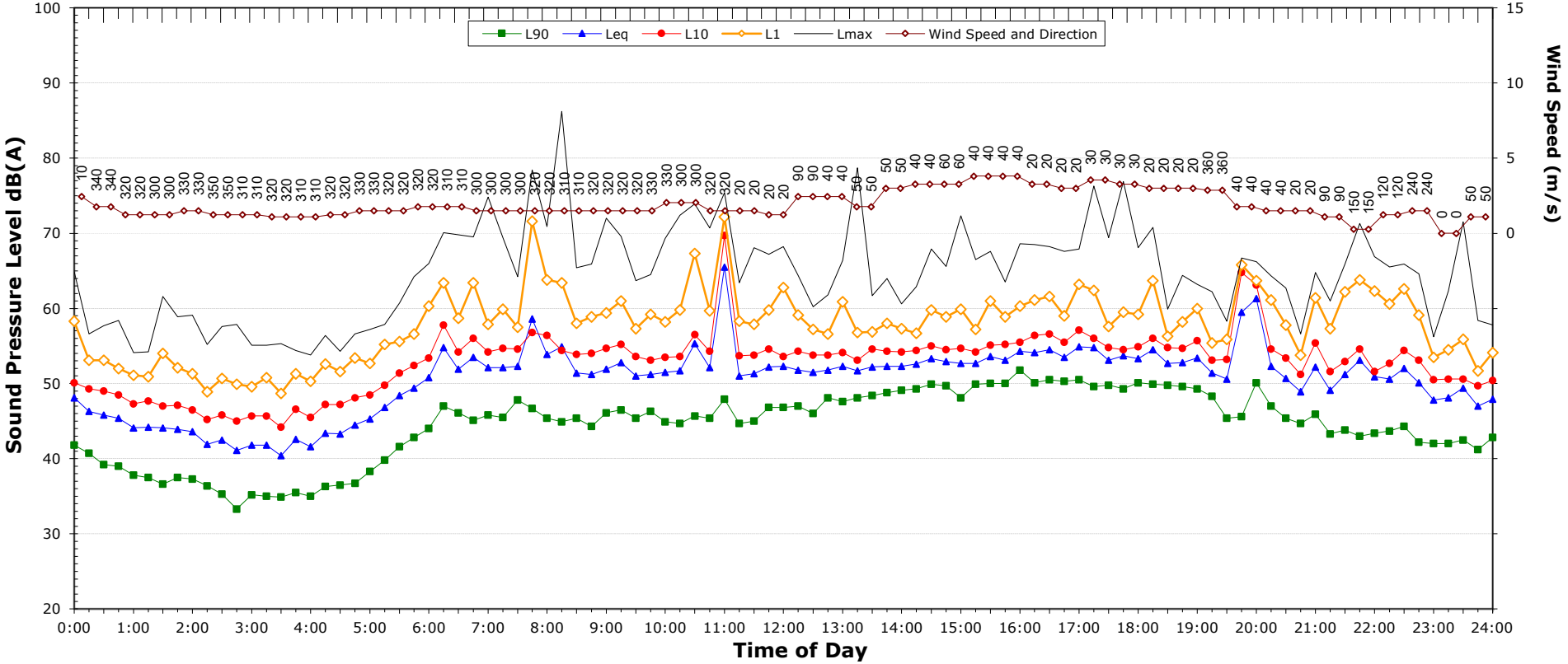
NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	56.6	50.6
$L_{eq\ 1hr}$ upper 10 percentile	59.5	55.7
$L_{eq\ 1hr}$ lower 10 percentile	53.9	44.2

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	66.0	to	74.8
Lmax - Leq (Range)	16.0	to	21.6

EXISTING AMBIENT NOISE LEVELS

L2 - 262 The Grand Parade Ramsgate, NSW (Rear)

Saturday, 2 November 2013



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	44.9	43.3	37.2
Leq	54.5	54.4	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 Lmax values are shown only where Lmax > 65dB(A) and where Lmax-Leq ≥ 15dB(A)

NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	57.0	50.1
$L_{eq\ 1hr}$ upper 10 percentile	61.7	52.9
$L_{eq\ 1hr}$ lower 10 percentile	53.8	45.9

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	65.9	to	71.5
Lmax - Leq (Range)	15.5	to	23.3

Data File: 2013-11-01_SLM_000_123_Rpt_Report.txt

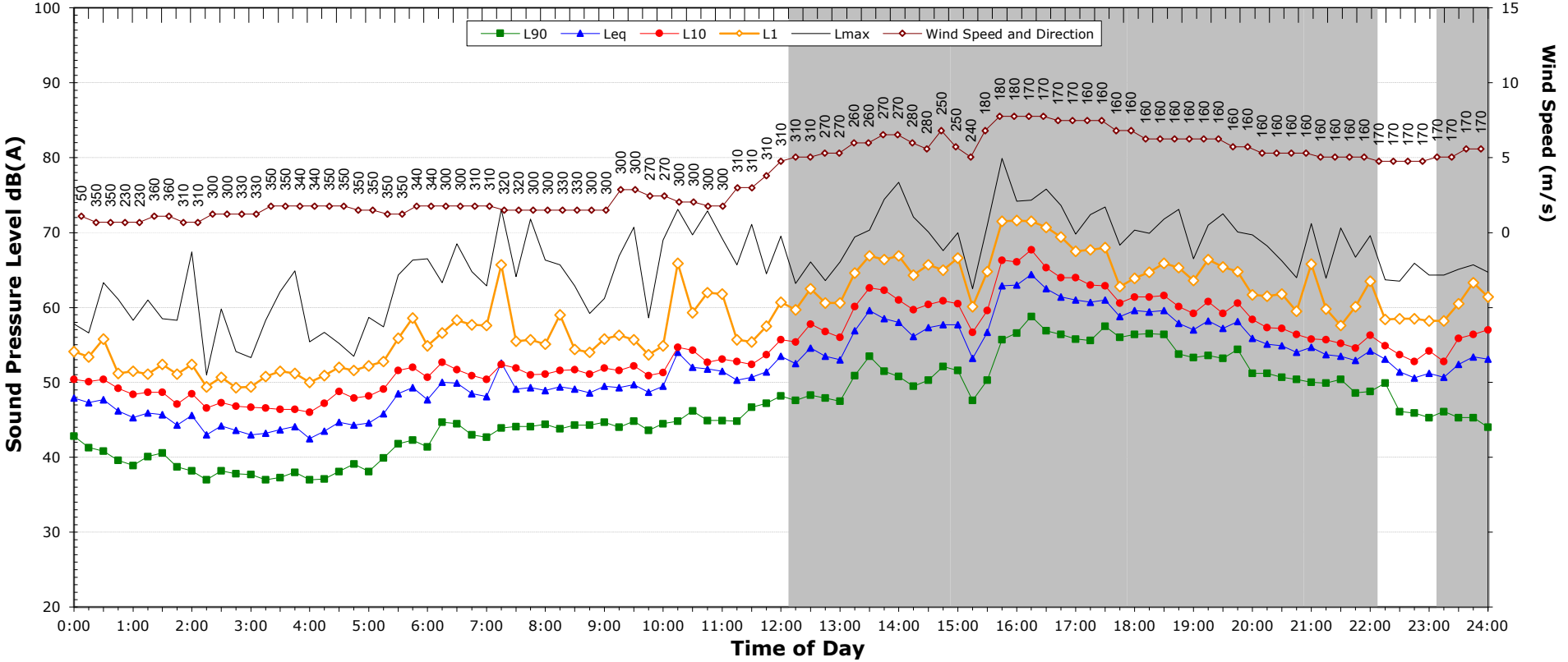
TG502-01 (rev 0) Location L2 - Rear Logger

Template QTE-05B (rev 104) Sydney Logger Graphs

EXISTING AMBIENT NOISE LEVELS

L2 - 262 The Grand Parade Ramsgate, NSW (Rear)

Sunday, 3 November 2013



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

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)

NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	53.3	52.7
$L_{eq\ 1hr}$ upper 10 percentile	54.9	55.0
$L_{eq\ 1hr}$ lower 10 percentile	51.7	49.9

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	68.5	to	68.5
Lmax - Leq (Range)	19.6	to	19.6

Data File: 2013-11-01_SLM_000_123_Rpt_Report.txt

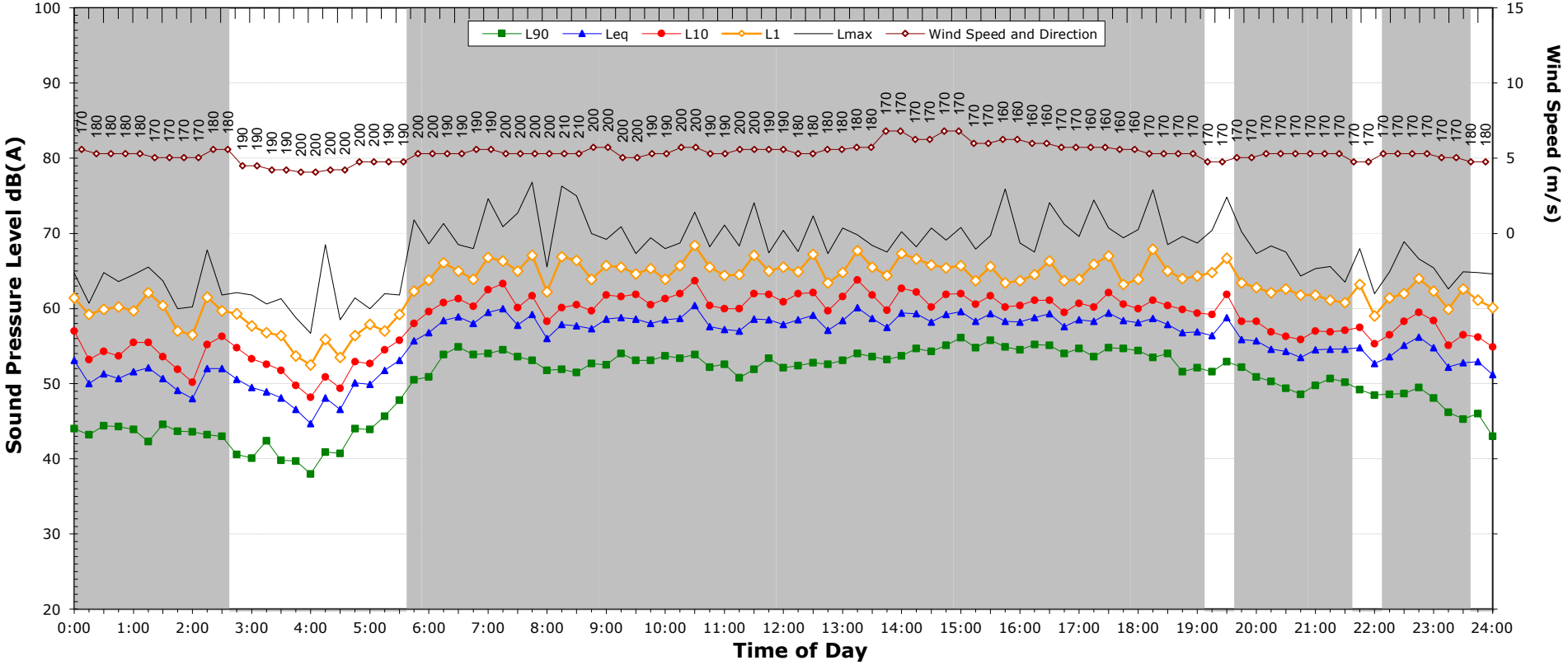
TG502-01 (rev 0) Location L2 - Rear Logger

Template QTE-05B (rev 104) Sydney Logger Graphs

EXISTING AMBIENT NOISE LEVELS

L2 - 262 The Grand Parade Ramsgate, NSW (Rear)

Monday, 4 November 2013



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

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)

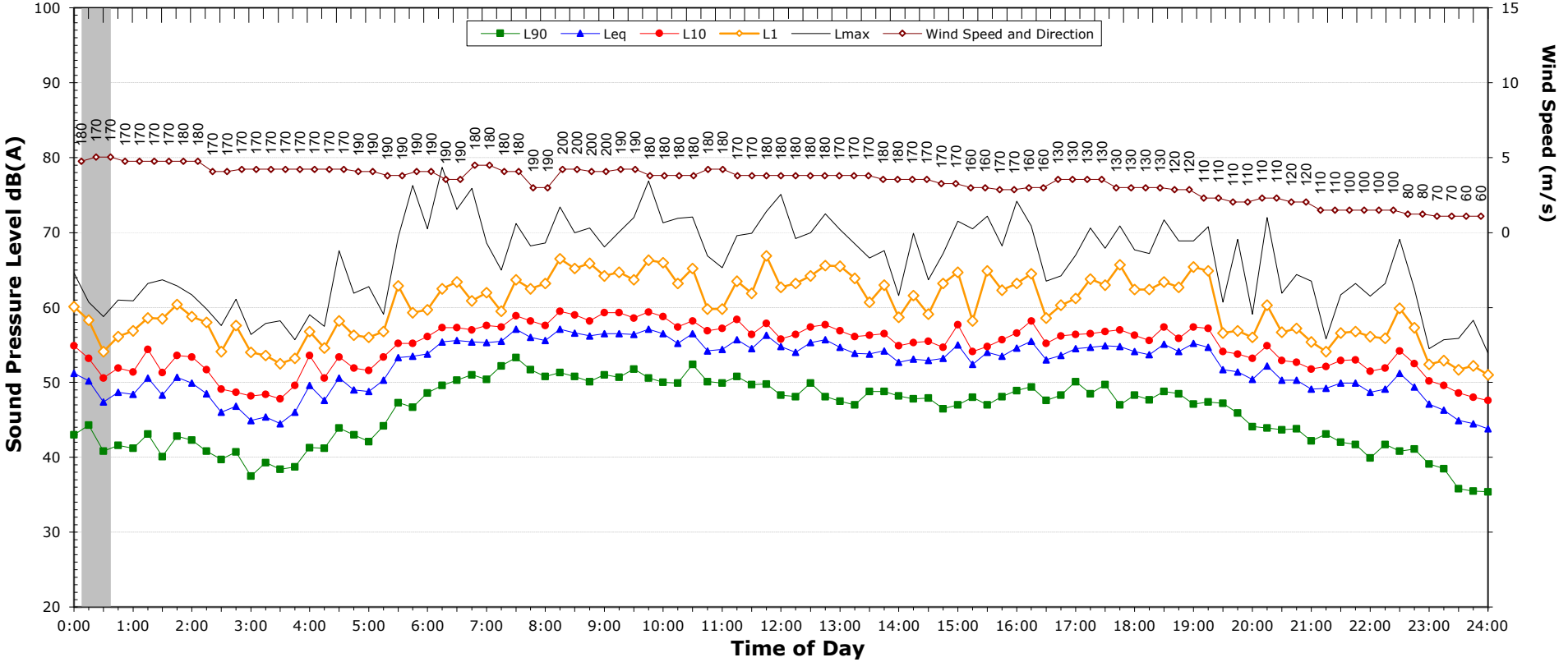
NSW Road Noise Policy (1m from facade)	(see note 3)	
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	58.7	53.8
$L_{eq\ 1hr}$ upper 10 percentile	60.3	57.9
$L_{eq\ 1hr}$ lower 10 percentile	56.4	49.3

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	67.6	to	78.7
Lmax - Leq (Range)	18.5	to	23.4

EXISTING AMBIENT NOISE LEVELS

L2 - 262 The Grand Parade Ramsgate, NSW (Rear)

Tuesday, 5 November 2013



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	47.0	41.7	33.5
Leq	55.1	52.2	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)

NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	57.0	51.2
$L_{eq\ 1hr}$ upper 10 percentile	59.1	57.0
$L_{eq\ 1hr}$ lower 10 percentile	52.6	42.8

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	69.1	to	73.1
Lmax - Leq (Range)	15.6	to	22.6

Data File: 2013-11-01_SLM_000_123_Rpt_Report.txt

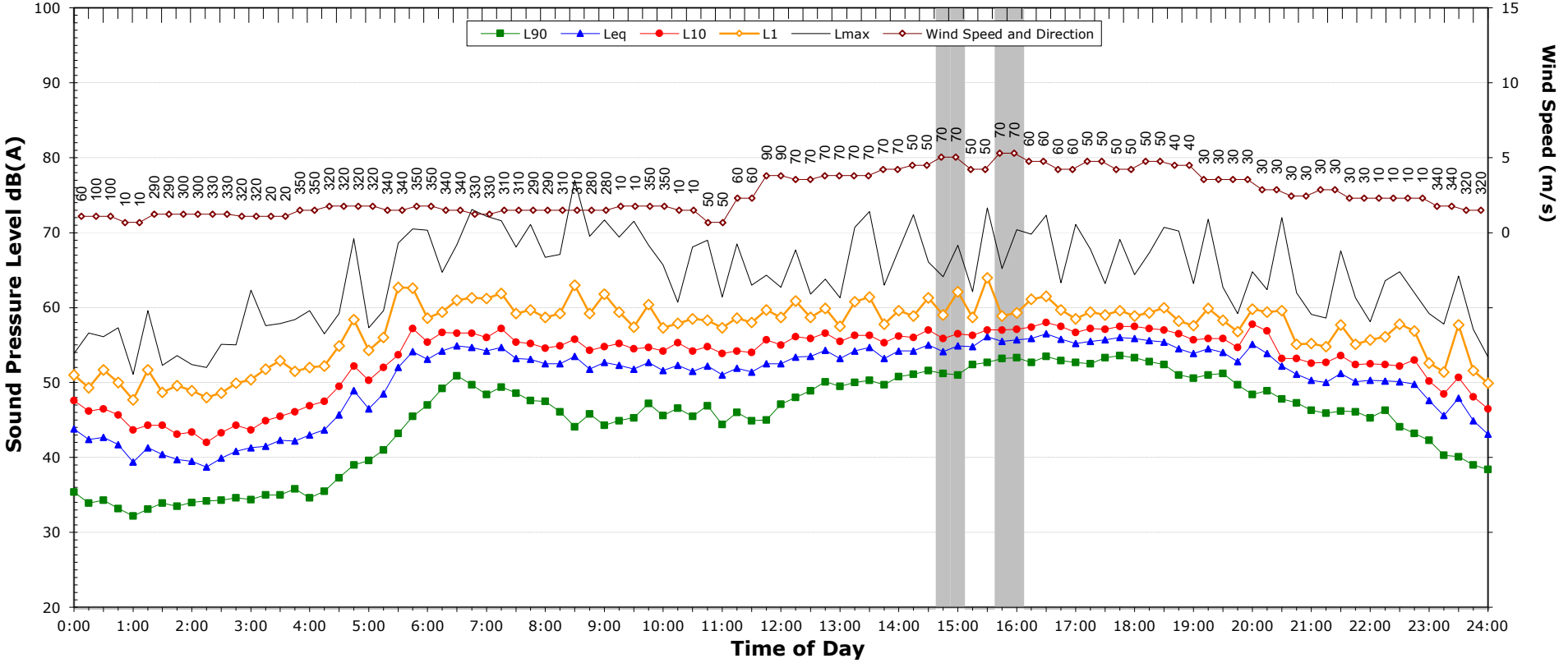
TG502-01 (rev 0) Location L2 - Rear Logger

Template QTE-05B (rev 104) Sydney Logger Graphs

EXISTING AMBIENT NOISE LEVELS

L2 - 262 The Grand Parade Ramsgate, NSW (Rear)

Wednesday, 6 November 2013



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	44.9	45.9	37.1
Leq	53.9	53.2	48.9

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)

NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	56.2	51.4
$L_{eq\ 1hr}$ upper 10 percentile	58.3	56.9
$L_{eq\ 1hr}$ lower 10 percentile	53.7	44.1

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	68.5	to	78.4
Lmax - Leq (Range)	15.3	to	24.3

Data File: 2013-11-01_SLM_000_123_Rpt_Report.txt

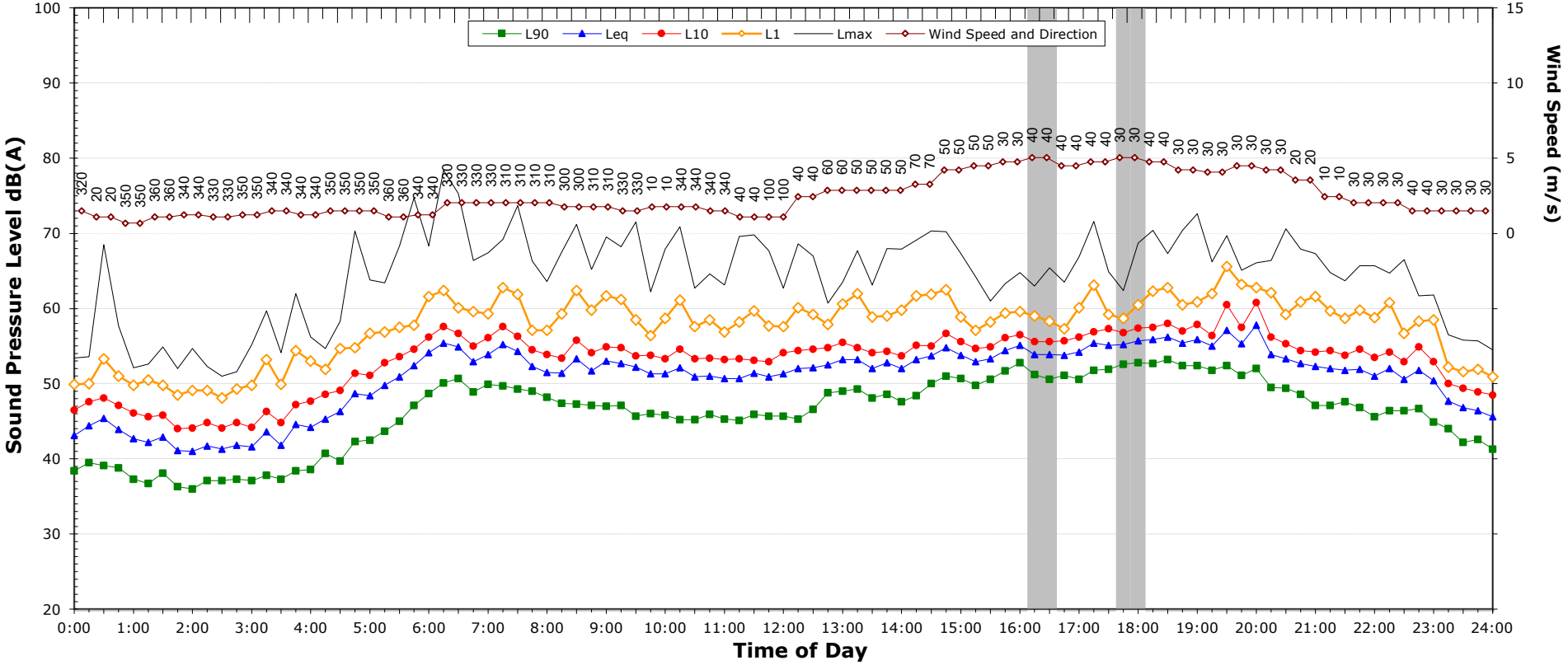
TG502-01 (rev 0) Location L2 - Rear Logger

Template QTE-05B (rev 104) Sydney Logger Graphs

EXISTING AMBIENT NOISE LEVELS

L2 - 262 The Grand Parade Ramsgate, NSW (Rear)

Thursday, 7 November 2013



NSW Industrial Noise Policy (Free Field)			
Descriptor	Day	Evening	Night[2]
	7am-6pm	6pm-10pm	10pm-7am
L_{90}	45.3	46.8	36.5
Leq	52.9	54.7	49.4

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)

NSW Road Noise Policy (1m from facade)		(see note 3)
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	56.0	51.9
$L_{eq\ 1hr}$ upper 10 percentile	58.7	57.3
$L_{eq\ 1hr}$ lower 10 percentile	53.6	44.0

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	65.6	to	74.4
Lmax - Leq (Range)	15.2	to	21.4

Data File: 2013-11-01_SLM_000_123_Rpt_Report.txt

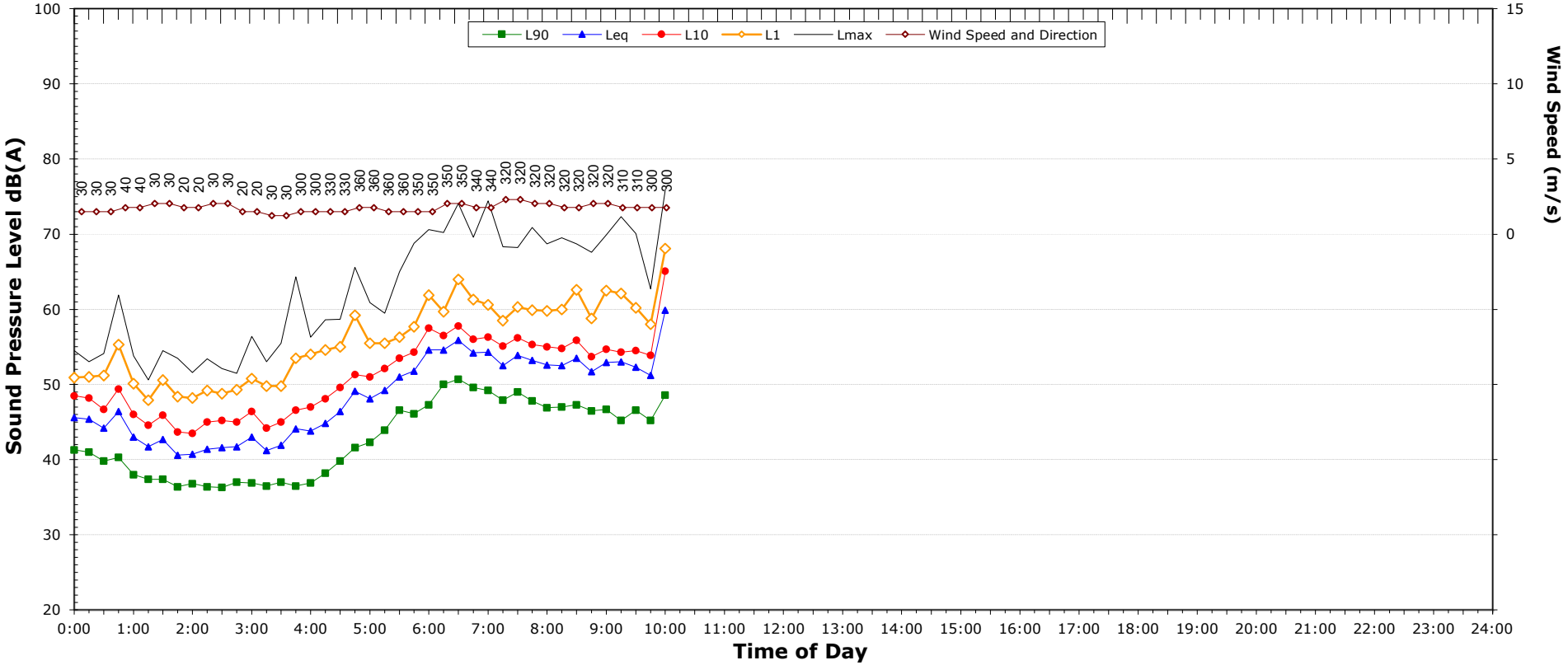
TG502-01 (rev 0) Location L2 - Rear Logger

Template QTE-05B (rev 104) Sydney Logger Graphs

EXISTING AMBIENT NOISE LEVELS

L2 - 262 The Grand Parade Ramsgate, NSW (Rear)

Friday, 8 November 2013



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

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)

NSW Road Noise Policy (1m from facade)	(see note 3)	
Descriptor	Day	Night[2]
	7am-10pm	10pm-7am
$L_{eq\ 15\ hr}$ and $L_{eq\ 9\ hr}$	56.5	-
$L_{eq\ 1hr}$ upper 10 percentile	58.2	-
$L_{eq\ 1hr}$ lower 10 percentile	55.2	-

Night Time Maximum Noise Levels			(see note 4)
Lmax (Range)	-	to	-
Lmax - Leq (Range)	-	to	-

Data File: 2013-11-01_SLM_000_123_Rpt_Report.txt

TG502-01 (rev 0) Location L2 - Rear Logger

Template QTE-05B (rev 104) Sydney Logger Graphs