

Commercial 1 (Unit 27)

+612 9587 9702

DELIVERING SOUND ADVICE

637-645 Forest Road

office@koikasacoustics.com

Bexley NSW 2207

www.koikasacoustics.com

ABN: 12 058 524 771

ACOUSTICAL REPORT

PROPOSED INSTALLATION OF OUTDOOR SPEAKERS

AT AN EXISTING MOSQUE

67 WANGEE ROAD, LAKEMBA NSW

Date: 9th October 2024

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Prepared by	Tony Basa Acoustic Consultant Member of the Australian Acoustical Society - MAAS		
Approved by	Nick Koikas Director Member of the Australian Acoustical Society - MAAS 		
			
Client	Lebanese Muslim Association C/- Rockeman Town Planning Attention: Rhonda Jamleoui Email: rhonda@rockeman.com		

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ACOUSTICAL REPORT
PROPOSED OUTDOOR SPEAKER INSTALLATION AT EXISTING MOSQUE
67 WANGEE ROAD, LAKEMBA NSW

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1.0 INTRODUCTION

Koikas Acoustics Pty Ltd was commissioned by Rockeman Town Planning to conduct a noise impact assessment for the use of a proposed outdoor speaker to be installed at Lakemba Mosque, 67 Wangee Road, Lakemba.

For this DA, the acoustical impact of the proposed must be assessed in terms of standard planning guidelines issued by the Canturbury-Bankstown Council in their Development Control Plan (DCP), the Environmental Protection Agency's Noise Policy for Industry 2017 and other standard planning guidelines related to common sources of noise.

As per the Council guidelines and other standard planning instruments, Koikas Acoustics has determined the following acoustical components require an assessment:

- The noise impact of the proposed speaker system on surrounding properties.

This report presents the results and findings of an acoustical assessment of the subject proposal. In-principle acoustic treatments and noise control measures detailed within this report are deemed necessary for the development to comply with the nominated acoustical planning levels/project noise objectives.



2.0 THE SITE

The proposed outdoor speaker system will be installed on the existing minaret of Lakemba Mosque located at 67 Wangee Road, Lakemba.

The subject site is situated in a primarily suburban residential area classified as R4 'High density Residential' as per the NSW planning portal 2024. To the north of the subject site is the Lebanese Muslim Association's Head office classified as IN2 'Light industrial'. The surrounding properties to the East are predominantly single dwelling houses classified as R4' High Density Residential'. Properties to the South and West are predominantly multi-dwelling apartments also classified as R4' High Density Residential. A proposed high school has been approved for the adjacent lots south of the mosque (DA-625/2011/A). While this site has not been built yet this report will apply the relevant noise criteria to these lots.

The subject site and surrounding properties are identified in the aerial photograph in **Figure 1**.



Figure 1. Aerial photo of the subject site and surrounding area – Image from SixMaps

Prevailing ambient noise conditions on-site and in the local area are generally the result of typical environmental noise such as traffic noise from Wangee Rd and localised domestic noise sources.

3.0 UNATTENDED AMBIENT NOISE SURVEY

An unattended noise logging survey was conducted in the rear yard of 20 Boorea Avenue, Lakemba between 8 February and 14 February 2024.

The measurement microphone was set at a height of 1.5 metres above the ground and was within 3.5 meters of a sound-reflective surface other than the ground. This means that reflected sound may have influenced the measured ambient noise level. The sound reflective surface was not directly incident to the predominant sound sources and as we are trying to establish the free-field noise environment of the area, a -1.5 dB correction is applied as guided by AS1055-2018.

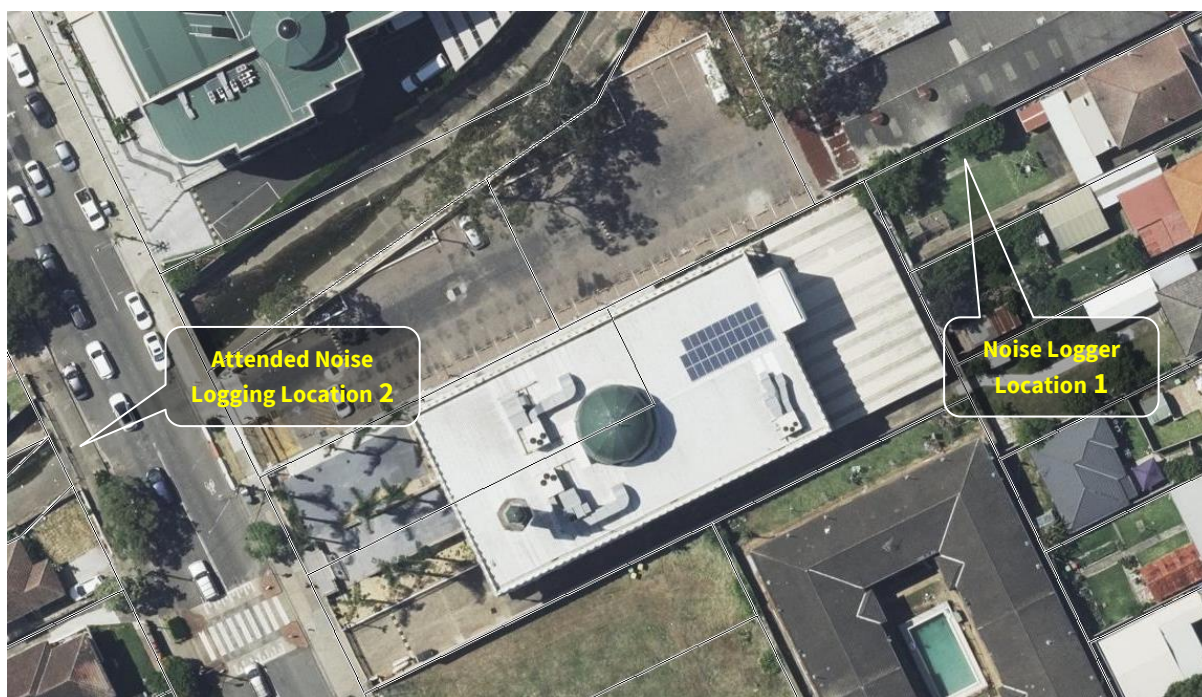


Figure 2. Noise logging location – Image from SixMaps

A Type 1 Svantek 949 noise logger was used for the unattended noise survey. The instrument was set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response. Noise levels were saved on the quarter-hour within the logger memory.

A NATA-calibrated and certified Larson Davis CAL200 precision acoustic calibrator was used to field calibrate the sound level meter before and after the noise survey. System drift observed for this sound level meter was within the ± 0.5 dB tolerance.

Weather records were obtained from a weather station located approximately 10 m above the

ground at 60 Glenfarne Street Bexley. The distance from this weather station is 6.5 km to the subject site. See **Appendix A** for details.

Data obtained from the weather station was used to ascertain if inclement weather could have increased noise during the noise survey. Where these periods showed an increase in ambient and ambient background levels, the noise data was removed as per the recommendations of the NSW EPA Noise Policy for Industry. Where the meteorological data showed that the wind speed was greater than 5 m/s or that there was precipitation but the noise level trends showed no noticeable increase in the ambient and ambient background noise levels, the noise data was retained.

A summary of the noise survey data is presented below.

Table 1. Summary of noise logger results [dB] Logger Location 1							
Day		Assessment background level			L_{Aeq} ambient noise level		
		Day	Evening	Night	Day	Evening	Night
Thursday	8 Feb 2024	39	40	39	47	50	53
Friday	9 Feb 2024	38	40	42	47	57	49
Saturday	10 Feb 2024	39	40	39	50	54	54
Sunday	11 Feb 2024	34	38	36	52	58	53
Monday	12 Feb 2024	37	40	39	50	59	57
Tuesday	13 Feb 2024	36	39	39	51	64	59
Wednesday	14 Feb 2024	37	42	43	50	57	55
Rating Background Level [RBL]		37	40	39			
Log average ambient noise level					50	59	55
Notes	1. The NSW EPA Noise Policy for Industry (NPfi) refers to: Daytime: 7 am – 6 pm Monday to Saturday and 8 am to 6 pm Sunday and public holidays. Evening: 6 pm – 10 pm Monday to Sunday Night: 10 pm – 7 am Monday to Saturday and 10 pm to 8 am Sunday and public holidays.						

Daily logger graphs are attached in **Appendix B**.

An attended noise survey was conducted simultaneously with the unattended survey for a representative period related to the subject proposal.

Noise level measurements were taken with a NATA-calibrated Type 1 NTi XL2 sound level meter. The instrument was set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response.



Sound level measurements were taken for durations deemed sufficient to represent the underlying ambient and background noise environment without the influence of extraneous noise or noise from the subject's development.

The attended noise survey was conducted to the west of the mosque at 84 Wangee Road, Lakemba to establish noise-ambient noise levels at the surrounding residents (See **Figure 2**)

The sound level meter microphone was placed 1.5 metres above the natural ground in 'free-field' conditions, ie. ≥ 3.5 metres from any reflective façade.

Table 2. Summary of noise logger results [dB] Attended noise survey			
Location	Period, T ¹	Rating background level ² L _{A90}	Ambient noise level ² L _{Aeq}
84 Wangee Rd, Lakemba	Day	45	59
	Evening	48	67
	Night	47	63
Notes	- The NSW EPA Noise Policy for Industry (NPfi) refers to: Daytime: 7 am – 6 pm Monday to Saturday and 8 am to 6 pm Sunday and public holidays. Evening: 6 pm – 10 pm Monday to Sunday Night: 10 pm - 7 am Monday to Saturday and 10 pm to 8 am Sunday and public holidays. - Period levels have been calculated from the attended logger and unattended logger differences.		



4.0 ACOUSTIC CRITERIA

4.1 EPA NOISE POLICY FOR INDUSTRY

Noise emission design targets have been referenced from the *NSW Environmental Protection Authority (EPA) Noise Policy for Industry (NPfI)*.

The NPfI is designed to assess environmental noise impacts associated with scheduled activities prescribed within the Protection of the *Environment Operations Act 1997*, Schedule 1. It is also used as a reference tool for establishing suitable planning levels for noise generated by mechanical plant and equipment and noise emission from commercial operations.

For residential receivers, the guideline applies limits on the short-term intrusive nature of a noise or noise-generating development (project intrusive noise level), as well as applying an upper limit on cumulative industrial noise emissions from all surrounding development/industry (project amenity noise level).

The most stringent of the project intrusive noise level and project amenity noise level are applied as the **project noise trigger level (PNTL)**. To determine which of the intrusive and amenity noise criteria is more stringent, the underlying noise metrics must be the same.

As the intrusive noise level is defined in terms of an $L_{Aeq, 15 \text{ minutes}}$ and the amenity noise level is defined in terms of an $L_{Aeq, \text{Period}}$, a +3 dB correction is applied to the project amenity noise level to equate the $L_{Aeq, \text{Period}}$ to $L_{Aeq, 15 \text{ minutes}}$.

Non-residential receivers are assessed to project amenity noise levels relevant to the applicable receiver category (industrial/commercial).

Where noise is measured or predicted below the project noise trigger level, the noise outcome is deemed acceptable. Above the project noise trigger level, management responses such as applying reasonable and feasible noise mitigation measures are to be recommended, along with assessing any residual noise impacts once noise mitigation has been considered.

The policy is designed in such a way that the assessing authority would consider the project noise trigger levels, reasonable and feasible mitigation measures, and any residual noise impacts when



deciding on acceptable noise outcomes.

The site-specific project noise trigger levels need only be considered for the hours under which the noise or activity occurs, which is limited to daytime hours.

The PNTL for the various types of receivers surrounding the subject site are as follows:

- Residential (see table 3 below)
- Commercial = 60 dB $L_{Aeq, 8 \text{ Hours}}$
- School Classroom (internal) = 30 dB $L_{Aeq, 1 \text{ Hour}}$

Commercial and School classroom PNTL are calculated from the recommended amenity noise levels (found in table 2.2 of the Npfl 2017) – 5dB

Table 3. NPfl planning levels – L _{Aeq, 15 minutes} [dB]								
Period,T	Intrusive		Amenity					Project noise trigger level
(Note 1)	RBL	RBL + 5	Area classification	Recommended amenity noise level	High traffic area	² Project amenity noise level	+3dB correction	
East of the Mosque Boorea Avenue, Lakemba								
Day	37	42	Suburban	55	No	50	53	42
Evening	40	45	Suburban	45	No	40	43	43
Night	39	44	Suburban	40	No	35	38	38
West of the Mosque Wangee Road, Lakemba								
Day	45	50	Suburban	55	No	50	47	47
Evening	48	53	Suburban	45	No	40	43	43
Night	47	52	Suburban	40	No	35	38	38
Notes:	1. EPA defines the following periods: Day: 7 am to 6 pm Mon to Sat and 8 am to 6 pm Sun and public holidays, Evening: 6 pm to 10 pm Mon to Sun, Night: 10 pm to 7 am Mon to Sat and 10 pm to 8 am Sun and public holidays. 2. Project noise amenity level = recommended noise amenity level – 5 dB, except where specific circumstances are met, such as high traffic.							

Provisions in the EPA Npfl Factsheet C table C3 allow a 15 dB exceedance of the $L_{Aeq, 15\text{-minute}}$ equivalent noise criterion for a single noise event between 1.5 and 6 minutes. Adjusting for the sound exposure of the event over the assessment period (15 minutes) a 6 dB correction would apply. This allowable exceedance is only applied to receivers with $L_{Aeq, 15\text{-minute}}$ metrics, in this case, the



residential receivers. All other receiver types will have only a time adjustment correction for the call to prayer event. Table 4 below details the corrected PNTL for all affected receiver types.

Table 4. NPfI Corrected for noise duration – L_{Aeq} [dB]					
Period, T	Noise duration (min)	PNTL	Allowable exceedance (dB)	Time correction (dB)	Corrected PNTL⁴
East of the Mosque Boorea Avenue, Lakemba (Residential)					
Day (L_{Aeq} , 15 min)	4	42	15	-6 ¹	63
West of the Mosque Wangee Road, Lakemba (Residential)					
Day (L_{Aeq} , 15 min)	4	47	15	-6 ¹	68
North of the Mosque Wangee Road, Lakemba (Commercial)					
When in use (L_{Aeq} , 8 hrs)	4	60	NA	-21 ²	81
South of the Mosque Wangee Road, Lakemba (School Classroom External)⁵					
When in use (L_{Aeq} , 1 hr)	4	50 ⁵	NA	-12 ³	62
Notes: 1. Time correction for residential receivers calculated as $10\log\left(\frac{4}{15}\right) = -5.7$ 2. Time correction for commercial receivers calculated as $10\log\left(\frac{4}{480}\right) = -20.8$ 3. Time correction for school playground receivers calculated as $10\log\left(\frac{4}{60}\right) = -11.7$ 4. Correct PNTL calculated as $PNTL + Allowable\ Exceedance + Time\ Correction$ 5. The external classroom PNTL is derived from the recommended amenity noise level for classrooms-internal found in table 2.2 of the Npfi – 5dB + an assumed building facade reduction of 20 dB					

4.2 OFFENSIVE NOISE (POEO ACT 1997 DEFINITION)

In the definitions of the *Protection of the Environment Operations Act 1997*, ‘offensive noise’ means noise:

- (a) *that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:*
 - (i) *is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or*
 - (ii) *interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or*
- (b) *that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations.*



5.0 NOISE MODEL

5.1 CADNA-A

Assessing the impact of the proposed speaker installation on the surrounding area is based on predictive modelling conducted using CadnaA.

The program predicts noise levels to receiver points and provides a graphical representation of noise level contours for a defined area of interest. The input parameters to this model include the source sound power levels, ground contours, ground absorption/reflections, and the presence of any acoustic shielding objects. For this project building heights for the dwellings surrounding the subject site have been derived from Google Earth elevation measurements. The building height for the subject site has been derived from architectural plans created by Nemco Design (job 22273 dated 31.05.2023)

Noise propagation calculations are determined under *ISO 9613 Acoustics – Attenuation of sound during propagation outdoors*. The sound propagation algorithms adopted in the ISO standard result in the calculation of a downwind sound pressure level which constitutes an assessment of noise-enhancing weather conditions.

5.2 NOISE SOURCES

Noise source data for this project have been calculated from a recording of the Azan Madina (Call to Prayer) by Muhammad Marwan Qassas. The recording is a single male voice singing a simple melody with a long and dense reverb effect. The spectrum was derived by performing an FFT on the recorded .WAV file. See **Figure 3** below.

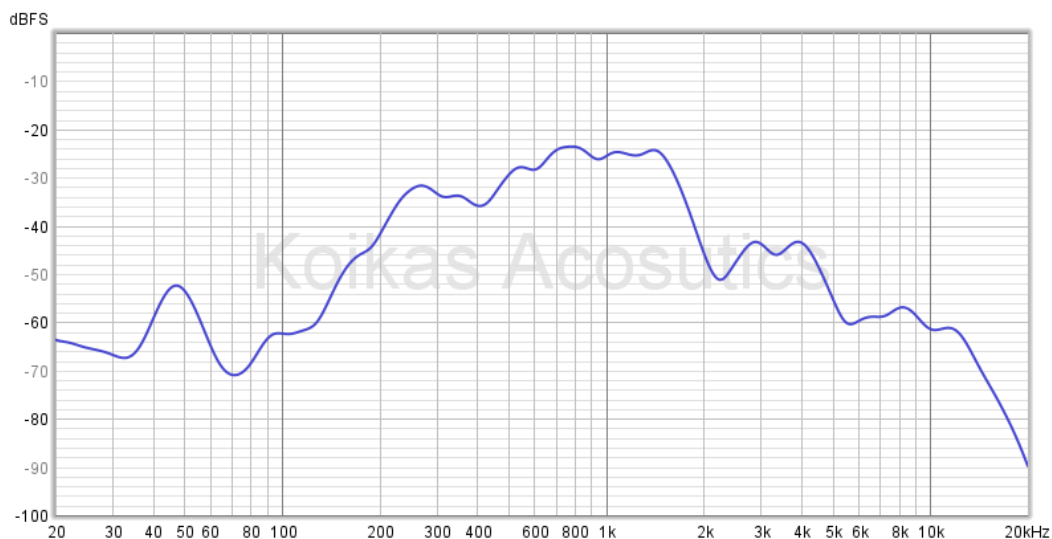


Figure 3. 1/1 octave smoothed FFT of Azan Madina – Screen capture from REW

The resulting spectrum was calculated by normalising 1/3 octave levels relative to 1KHz then converting the 1/3 octave results to 1/1 octave to use in CadnaA. Table 5 below details this spectrum.

Table 5. Noise source spectrum (dB)									
Noise Source	1/1 octave band centre frequency [Hz]								
	31.5	63	125	250	500	1000	2000	4000	8000
Call to Prayer	-32.3	-27.5	-22.3	-4.3	0.5	5.6	-2.8	-15.4	-28.5

5.3 NOISE SCENARIOS

To determine the maximum number of speakers that can be installed and their maximum operating levels the mosque and the surrounding premises have been modelled in CadnaA. The two scenarios considered are summarised below in Table 6.

Table 6. Noise Model scenarios				
Scenario No.	Number of Speakers	Speaker Volume at 1 m [dBA]		
1	2	North Speaker:	93	
		West Speaker:	93	
2	4	South Speaker:	83	
		East Speaker:	90	
		North Speaker:	92	
		West Speaker:	92	

Detailed noise maps of each scenario are attached as **Appendix C**

Notes:

- Speakers have been modelled to be 20.5 meters above the natural ground, and installed to the existing minaret of the mosque at approximately 30 cm from the façade.
- Speakers have been modelled as omnidirectional point sources.

5.4 ASSESSMENT LOCATIONS

Noise levels are assessed at the most affected point on or within the boundary of neighbouring receivers and above the floor level of the relevant upper stories of the surrounding receivers.

The map in **Figure 4** details which criteria apply to the receivers in that area and is further qualified in Table 7.



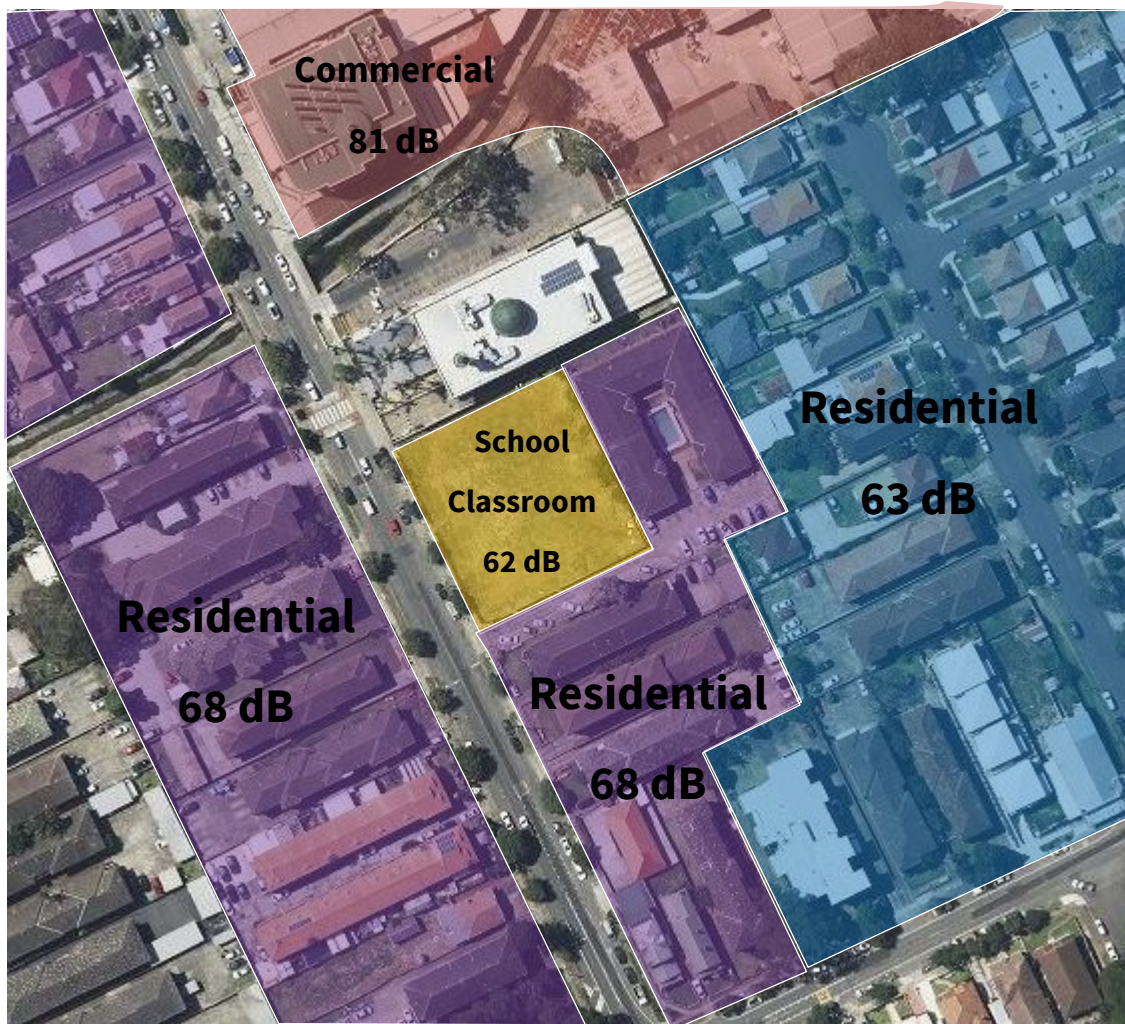


Figure 4. Acoustic criteria map – base map from six maps

ID	Receiver type	Assessment Criteria
Blue	Residential	63
Purple	Residential	68
Yellow	School Classroom	62
Red	Commercial	81

The most affected receivers have been identified and each assessment location is shown in **Figure 5** below and further qualified in Table 8. It should be noted that all receiver assessment locations are approximately 1 meter from a modelled façade or at the most affected point within the property boundary at the heights specified in Table 8.

Table 8. Assessment locations

ID	Receiver type and address	Assessment location	Location Criteria (dB)
R1	Residential/20 Boorea Ave	Rear yard (1.5 meters above natural ground)	63
R2	Residential/18 Boorea Ave	Rear yard (1.5 meters above natural ground)	63
R3	Residential/16 Boorea Ave	Rear yard (1.5 meters above natural ground)	63
R4	Residential/14 Boorea Ave	Rear yard (1.5 meters above natural ground)	63
R5	Residential/12 Boorea Ave	Rear yard (1.5 meters above natural ground)	63
R6	Residential/10 Boorea Ave	Rear yard (1.5 meters above natural ground)	63
R7	Residential/8 Boorea Ave	Rear yard (1.5 meters above natural ground)	63
R8	Residential/ 53 Wangee Rd	Northern Façade First floor (4.5 m above natural ground)	68
R9	Residential/55 Wangee Rd	N-W Façade Second floor (7.5 m above natural ground)	68
R10	Residential/74-76 Wangee Rd	Eastern Façade Second floor (7.5 m above natural ground)	68
R11	Residential/78-80 Wangee Rd	Eastern Façade Second floor (7.5 m above natural ground)	68
R12	Residential/ 82 Wangee Rd	Eastern Façade First floor (4.5 meters above natural ground)	68
R13	Residential/ 84 Wangee Rd	Eastern Façade (1.5 meters above natural ground)	68
R14	Residential/ 86 Wangee Rd	Eastern Façade (1.5 meters above natural ground)	68
R15	Residential/ 88 Wangee Rd	Eastern Façade (1.5 meters above natural ground)	68
R16	Residential/ 90 Wangee Rd	Eastern Façade (1.5 meters above natural ground)	68
R17	Residential/ 92 Wangee Rd	Eastern Façade (1.5 meters above natural ground)	68
R18	Residential/ 94 Wangee Rd	Eastern Façade (1.5 meters above natural ground)	68
R19	Commercial/71-75 Wangee Rd	Southern Façade Second floor (7.5 m above natural ground)	81
R20	School / 63 Wangee Rd	Northern boundary (1.5 meters above natural ground)	62

**Figure 5.** Assessment locations – CadnaA

The lot where receiver R20 is located has been approved for the development of a high school. As such the criteria for this receiver location has been derived from the NPfI amenity level table 2.2.

The criteria is specified as an internal ambient level, Koikas Acoustics has converted this to an external level by assuming that the proposed building envelope will achieve a sound reduction of 20dB. It is also assumed that there will be classrooms along the northern façade of the proposed school building.

As there currently is no building on this lot Koikas Acoustics believes the most reasonable assessment location for this receiver should be on the edge of the northern boundary, 1.5m above the natural ground.

5.5 CALCULATED RECEIVER LEVELS

The following noise levels were calculated for each of the assessment locations as per Table 9:

Table 9. Calculated receiver noise levels - L_{Aeq} [dB]			
Receivers	Scenario 1 2 speakers N & W facade	Scenario 2 4 Speakers N, E, S, & W facade	Criteria
R1	49	50	63
R2	57	59	63
R3	57	59	63
R4	58	59	63
R5	54	55	63
R6	58	58	63
R7	59	60	63
R8	58	59	68
R9	67	67	68
R10	60	61	68
R11	62	62	68
R12	62	62	68
R13	62	61	68
R14	63	63	68
R15	60	59	68
R16	59	59	68
R17	63	63	68
R18	62	62	68
R19	65	65	81
R20	57	60	62



The calculated noise levels in all scenarios will comply with the corrected PNTL established in section 4.1 of this report.

It should be noted that all calculations are based on the spectrum of Sheikh Muhammad Marwan Qassas performing the Azan Madina. Another recording or live performance of the Azan Madina with a different tonal balance may produce results that do not achieve compliance at the specified levels in Table 7.

5.6 OFFENSIVE NOISE CHECKLIST (EPA NOISE GUIDE FOR LOCAL GOVERNMENT, 2013)

The *EPA Noise Guide for Local Government (NGLG)* provides a checklist that is used to assist with establishing if a particular noise is 'offensive'. The checklist is summarised below:

- Is the noise loud in an absolute sense? Is it loud relative to other noise in the area?
- Yes. The call to prayer is intended to be loud so the community can hear it above the ambient levels of the area. However, the event is short.
- Does the noise include characteristics that make it particularly irritating?
- This is subjective and difficult to answer. The call to prayer is musical and is not impulsive or intermittent. 1/3 octave assessment of the call to prayer does find the spectrum to have tonal characteristics (assessed to ISO1996-2-2007, Annex D)
- Does the noise occur at times when people expect to enjoy peace & quiet?
- No, this call to prayer occurs around 12:30 pm and 1:00 pm which is during the middle of the day on the busiest day of the week.
- Is the noise atypical for the area?
- No, the call to prayer is not a feature of the current ambient environment. However, it is an event associated with the mosque activities and therefore be expected for the area.
- Does the noise occur often?
- No. The call to prayer will only occur once a week for approximately 4 minutes.
- Are several people affected by the noise?
- This is subjective. Some people may welcome this call to prayer, others may not. The call to prayer is intended to be heard throughout the community.



6.0 RECOMMENDATIONS

Based on the calculated noise levels detailed in section 5 of this report, the following noise control recommendations apply for the proposed speaker installation.

- Speakers should be installed approximately 20.5 meters above the natural ground to the minaret.
- If 2 speakers are to be used they should be installed to the north and east facades of the minaret and calibrated to produce a sound pressure level of no more than 93 dBA when measured 1 m from the speaker for the north and east facing speakers.
- If 4 speakers are to be used they should be installed at 90° to each other, evenly spaced around the perimeter of the minaret to achieve the most even coverage and have a sound pressure level of no more than 92 dBA for the north-facing speaker, 90 dBA for the east-facing speaker, 83 dBA for the south-facing speaker and 92 dBA for the west-facing speaker.
- Speaker sound pressure levels should be measured at a distance of 1 meter from the speaker cabinet and the intended call to prayer audio should be used as the calibration source.



7.0 CONCLUSION

Koikas Acoustics was requested to conduct an acoustical assessment and prepare a report for the proposed installation of speakers on the minaret of Lakemba Mosque located at 67 Wangee Road, Lakemba. The acoustical report is to accompany a development application to be submitted to the Canterbury-Bankstown Council.

The assessment considers potential noise impacts on surrounding residents such that acceptable acoustic amenity is maintained.

Acoustic planning levels have been referenced from current EPA acoustic planning guidelines and requirements.

The included recommendations are based on designs prepared by Nemco Designs and on-site noise surveys conducted by Koikas Acoustics.

The conclusions reached in this acoustical report should assist the Council in making their determination of the proposal.

Of the assessed components of noise, Koikas Acoustics has concluded the following:

Installation of a 2 or 4-speaker system will comply with EPA noise policy criteria so long as the recommendations in section 6 of this report are adhered to.

The noise generated by the use of the speaker system will not be considered offensive under the definition of Offensive Noise in the *POEO ACT 1997*.

In our professional opinion, there is sufficient scope within the proposed speaker installation to achieve the applied acoustic planning guidelines.



APPENDIX A

APPENDIX A

APPENDIX A

Subject Site:
20 Boorea Avenue,
Lakemba

**Koikas Acoustics
Weather Station:**
60 Glenfarne Street,
Bexley

Measure distance

Click on the map to add to your path

Total distance: 6.48 km (4.03 mi)

**A
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P
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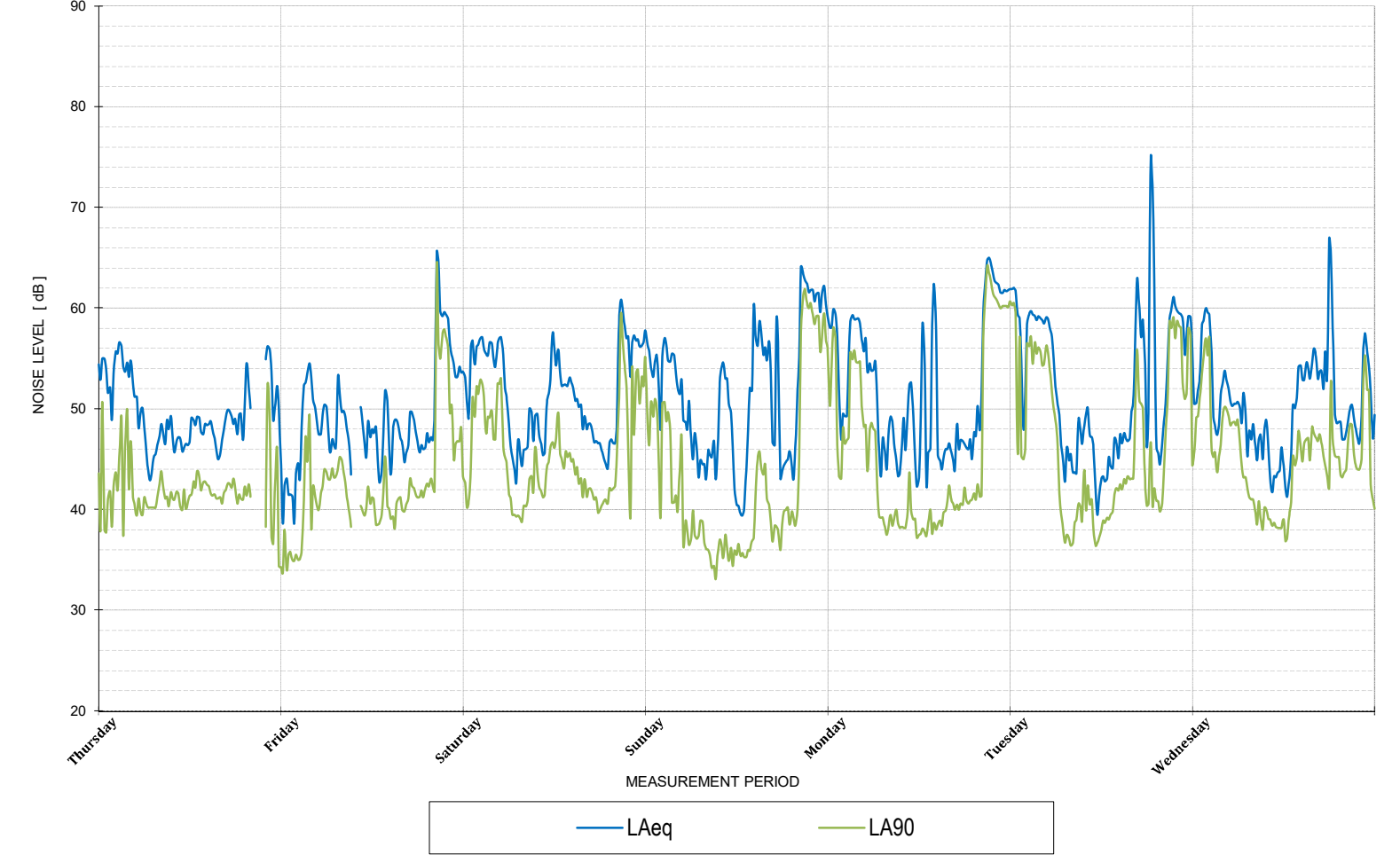
B**

WEEKLY SUMMARY

LOGGER LOCATION: 20 Boorea Ave, Lakemba

PERIOD: 8th to the 14th February 2024

SVAN 949 UNATTENDED NOISE SURVEY WEEKLY SUMMARY



Sundays and Public Holidays the hours change to 0800
Svan 949 6027

SUMMARY OF AMBIENT LEVELS

	LA90 Daytime	LA90 Evening	LA90 Night-time
Day 1	40	41	40
Day 2	39	41	43
Day 3	40	41	40
Day 4	35	39	37
Day 5	38	41	40
Day 6	37	40	40
Day 7	38	43	44
RBL	38	41	40

	LAeq Daytime	LAeq Evening	LAeq Night-time
Day 1	48	51	54
Day 2	48	58	50
Day 3	51	55	55
Day 4	53	59	54
Day 5	51	60	58
Day 6	52	65	60
Day 7	51	58	56
Average	51	60	56

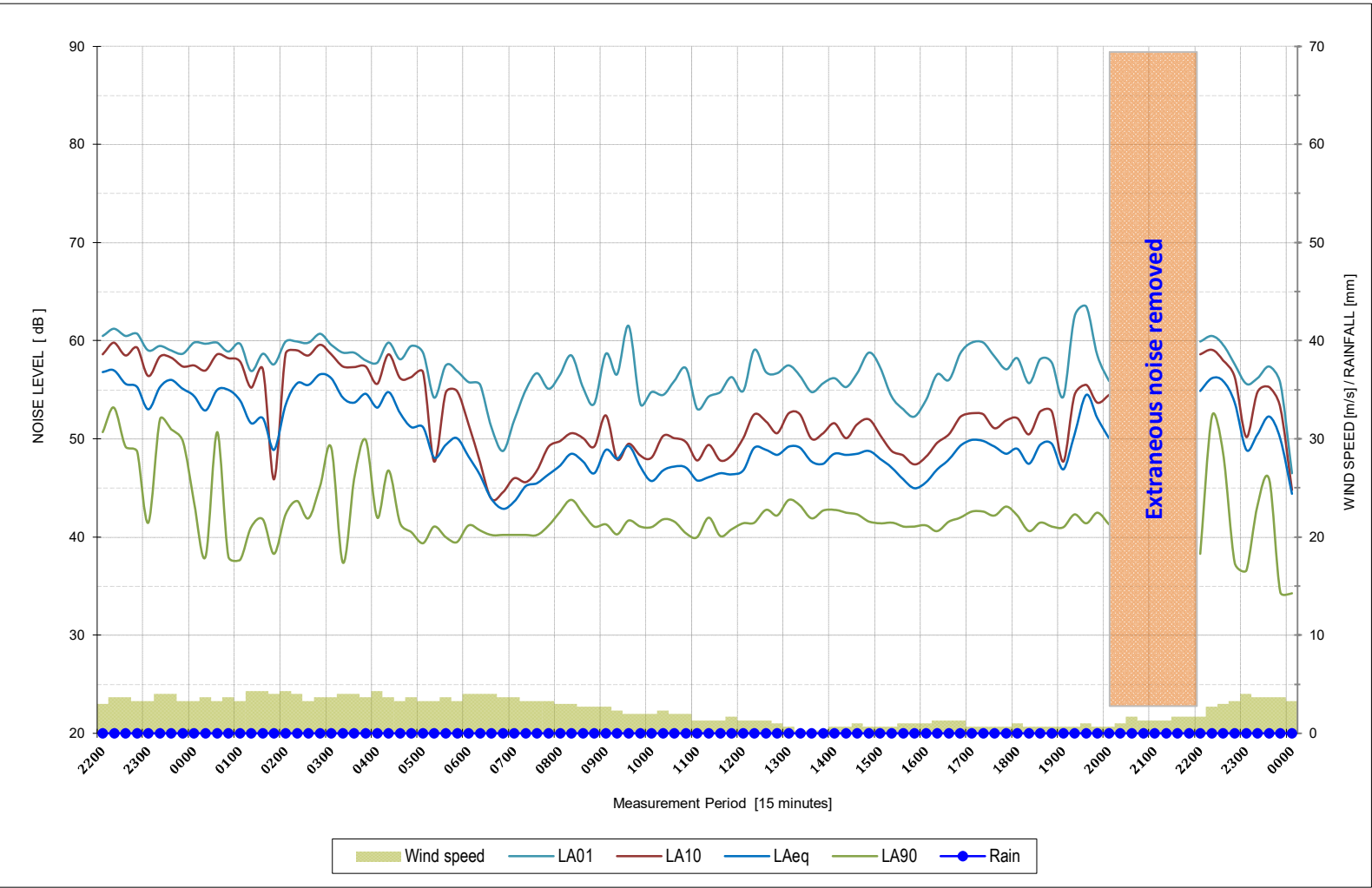
SUMMARY OF TRAFFIC LEVELS

LAeq 15 hrs	0700-2200	55	dB
LAeq 9 hrs	2200-0700	56	dB
Max LAeq 1 hr	0700-2200	58	dB
Max LAeq 1 hr	2200-0700	57	dB

DAY 1

LOGGER LOCATION: 20 Boorea Ave, Lakemba

DATE: Thursday, 8 February 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1600	40	dB
LA90 Evening	1800-2200	41	dB
LA90 Night-time	0600-0700	40	dB
LAeq Daytime	0700-1800	48	dB
LAeq Evening	1800-2200	51	dB
LAeq Night-time	2200-0700	54	dB

TRAFFIC & MISC. NOISE METRICS

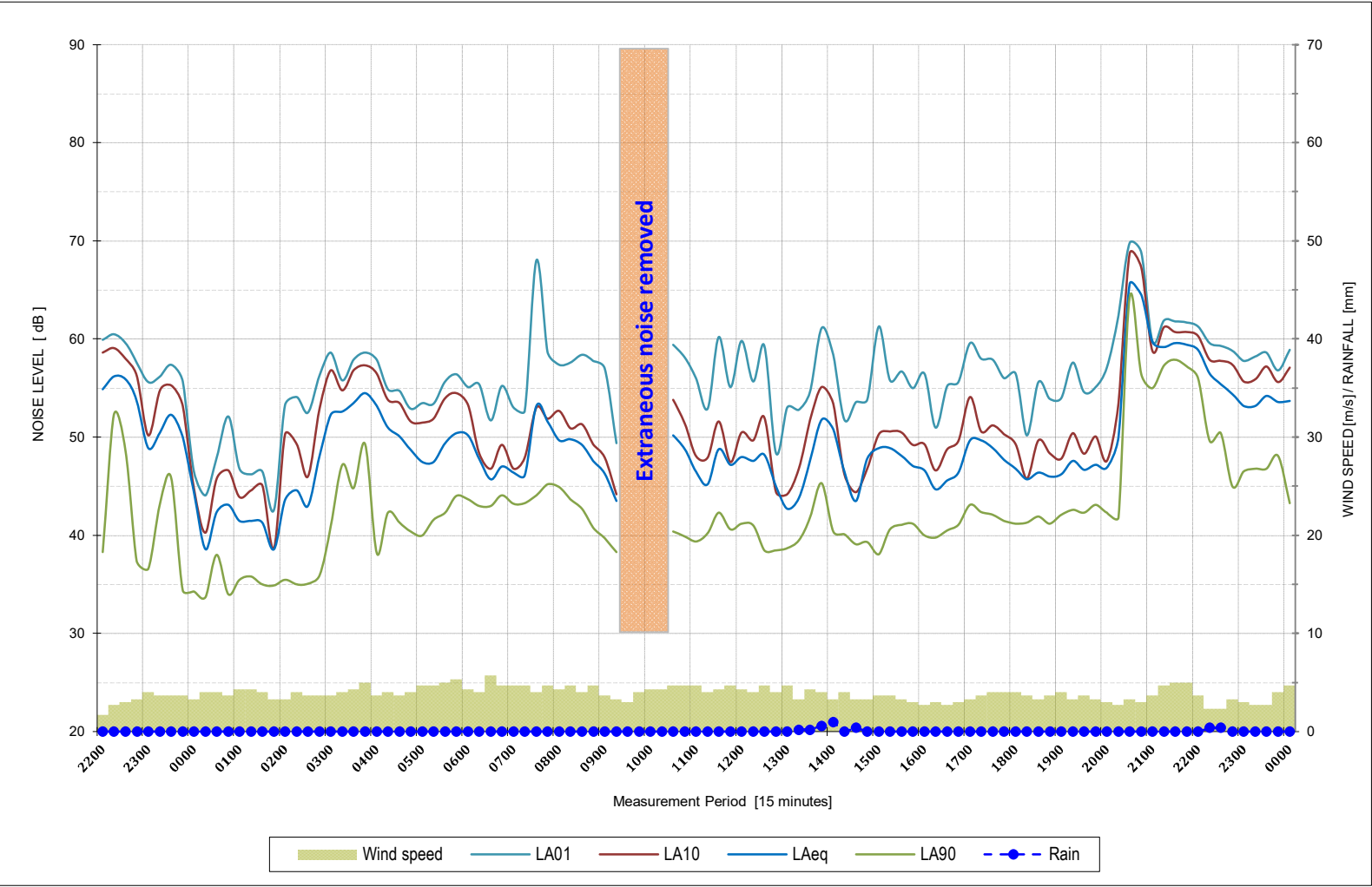
LAeq 15 hours	0700-2200	48	dB
LAeq 9 hours	2200-0700	54	dB
Max LAeq 1 hour	0700-2200	49	dB
Max LAeq 1 hour	2200-0700	55	dB

Maximum noise events as defined in the Environmental Noise Management Manual [$L_{Amax} - L_{Aeq} \geq 15$]	4
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DAY 2

LOGGER LOCATION: 20 Boorea Ave, Lakemba

DATE: Friday, 9 February 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1600	39	dB
LA90 Evening	1800-2200	41	dB
LA90 Night-time	0600-0700	43	dB
LAeq Daytime	0700-1800	48	dB
LAeq Evening	1800-2200	58	dB
LAeq Night-time	2200-0700	50	dB

TRAFFIC & MISC. NOISE METRICS

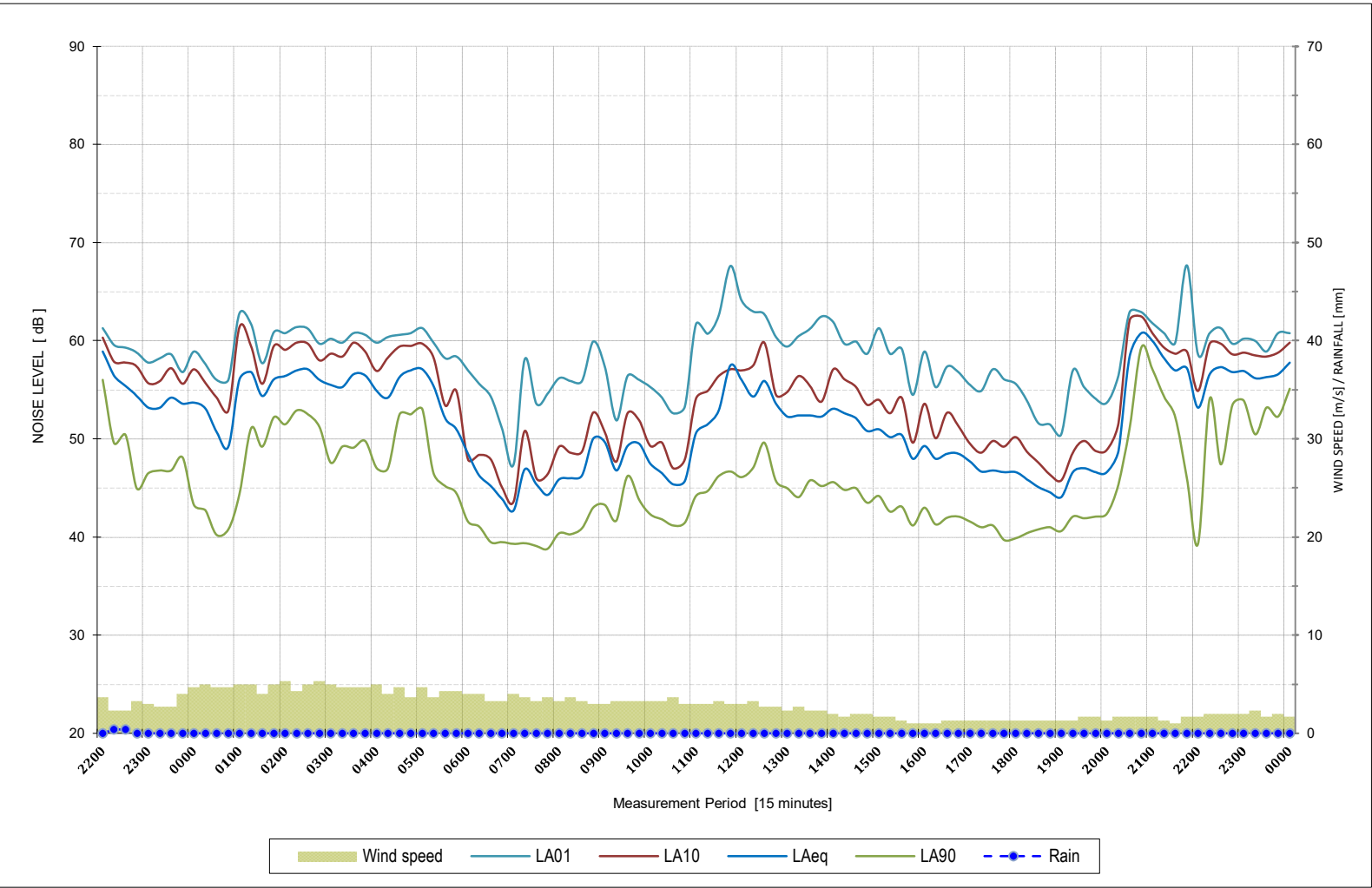
LAeq 15 hours	0700-2200	54	dB
LAeq 9 hours	2200-0700	50	dB
Max LAeq 1 hour	0700-2200	58	dB
Max LAeq 1 hour	2200-0700	53	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	8
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DAY 3

LOGGER LOCATION: 20 Boorea Ave, Lakemba

DATE: Saturday, 10 February 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	40	dB
LA90 Evening	1800-2200	41	dB
LA90 Night-time	0600-0700	40	dB
LAeq Daytime	0700-1800	51	dB
LAeq Evening	1800-2200	55	dB
LAeq Night-time	2200-0700	55	dB

TRAFFIC & MISC. NOISE METRICS

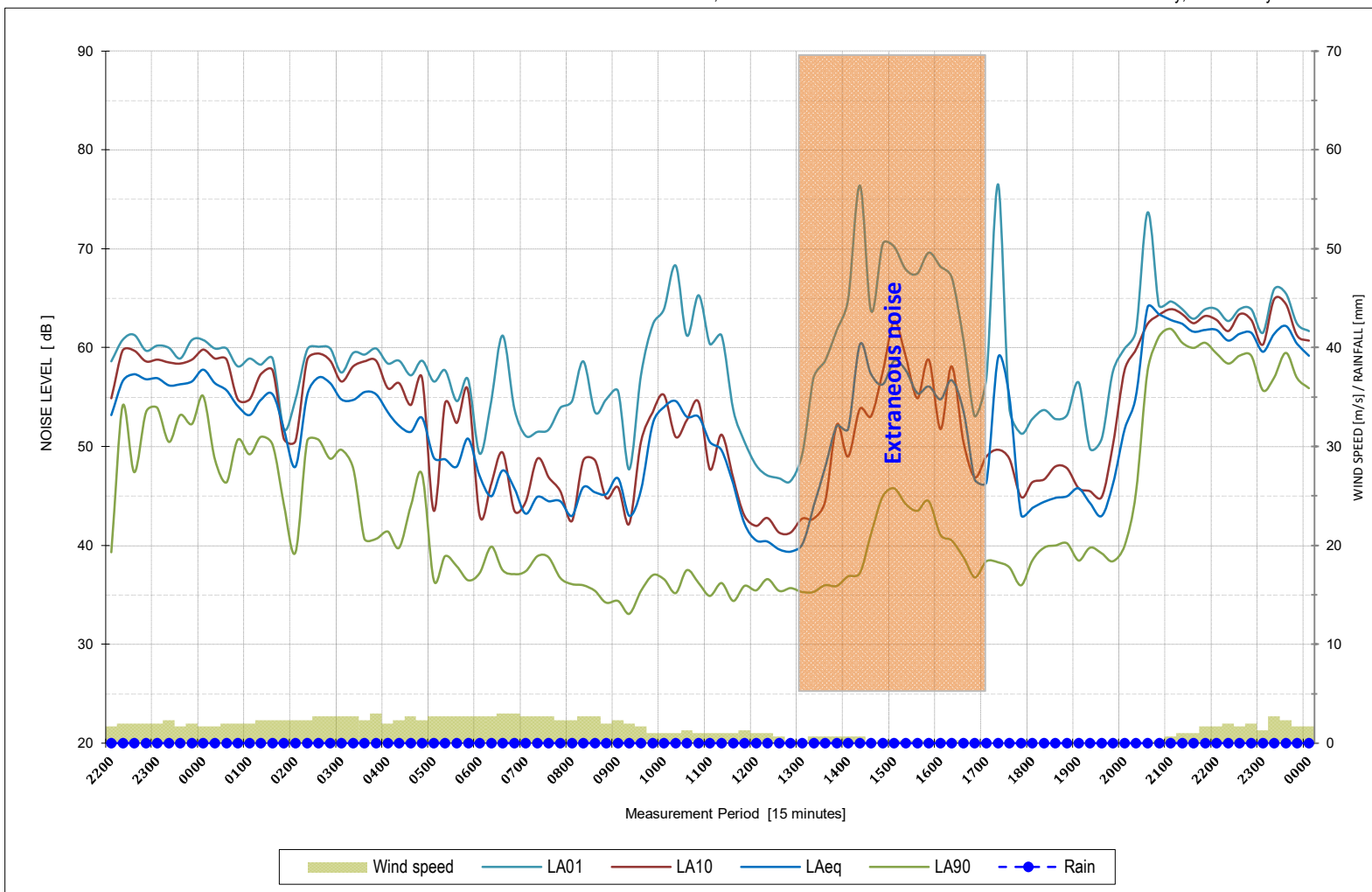
LAeq 15 hours	0700-2200	52	dB
LAeq 9 hours	2200-0700	55	dB
Max LAeq 1 hour	0700-2200	56	dB
Max LAeq 1 hour	2200-0700	56	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	3
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DAY 4

LOGGER LOCATION: 20 Boorea Ave, Lakemba

DATE: Sunday, 11 February 2024

**AMBIENT NOISE METRICS**

Descriptor	Period	Level	Units
LA90 Daytime	0800-1800	35	dB
LA90 Evening	1800-2200	39	dB
LA90 Night-time	0600-0800	37	dB
LAeq Daytime	0800-1800	53	dB
LAeq Evening	1800-2200	59	dB
LAeq Night-time	2200-0800	54	dB

TRAFFIC & MISC. NOISE METRICS

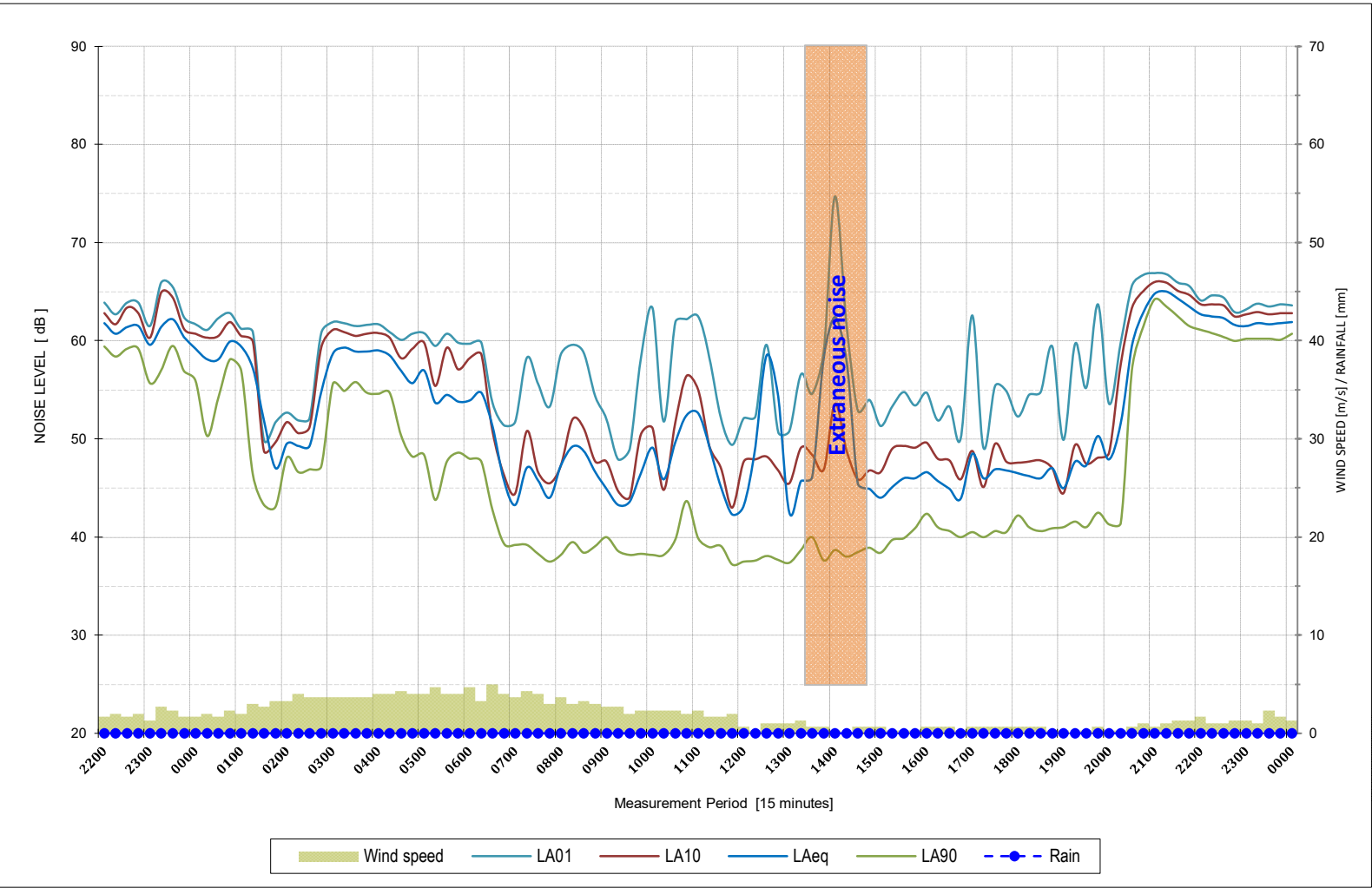
LAeq 15 hours	0700-2200	55	dB
LAeq 9 hours	2200-0700	54	dB
Max LAeq 1 hour	0700-2200	59	dB
Max LAeq 1 hour	2200-0700	57	dB

Maximum noise events as defined in the Environmental Noise Management Manual [$L_{Amax} - L_{Aeq} \geq 15$]	5
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DAY 5

LOGGER LOCATION: 20 Boorea Ave, Lakemba

DATE: Monday, 12 February 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	38	dB
LA90 Evening	1800-2200	41	dB
LA90 Night-time	0600-0700	40	dB
LAeq Daytime	0700-1800	51	dB
LAeq Evening	1800-2200	60	dB
LAeq Night-time	2200-0700	58	dB

TRAFFIC & MISC. NOISE METRICS

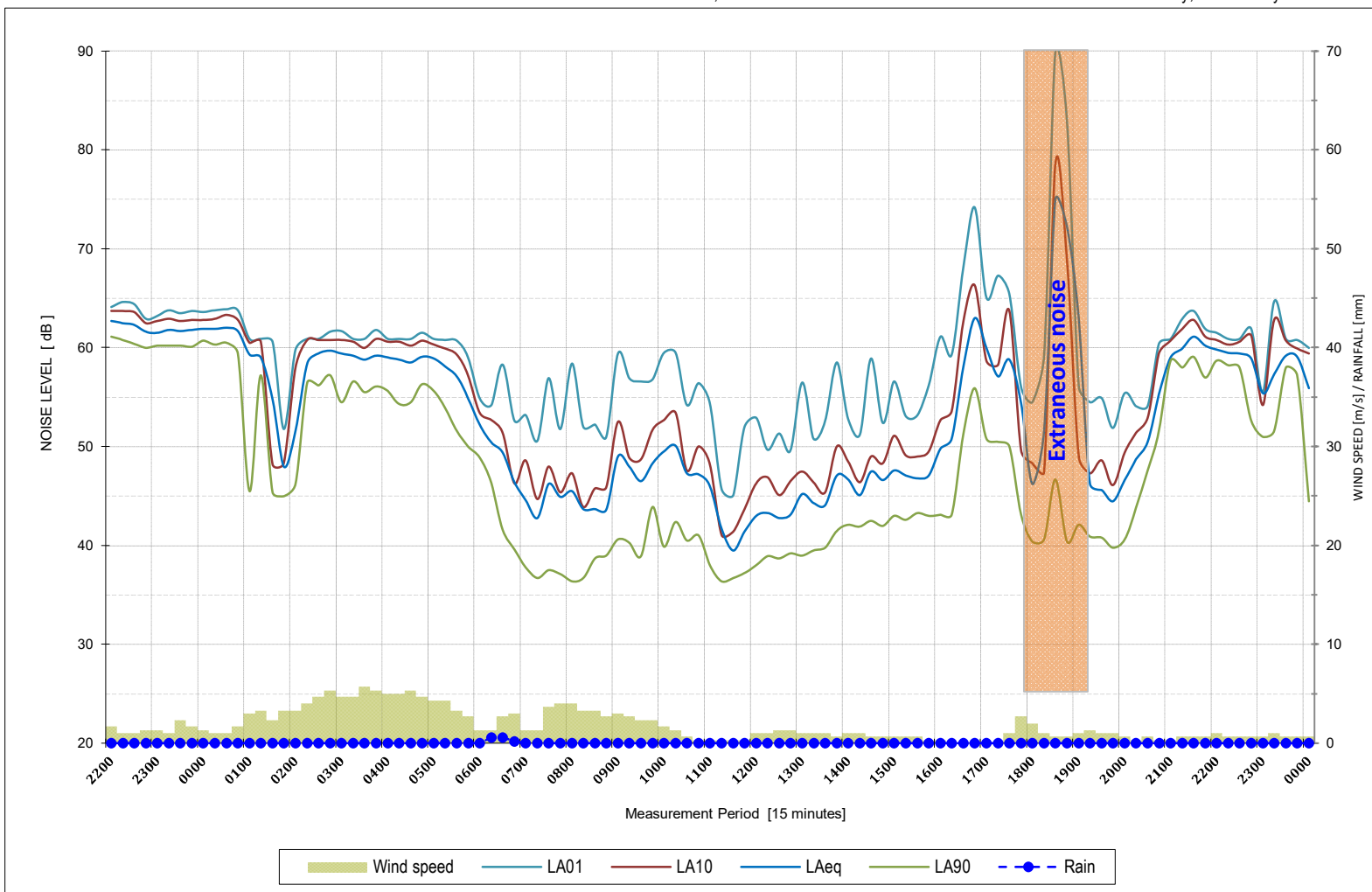
LAeq 15 hours	0700-2200	55	dB
LAeq 9 hours	2200-0700	58	dB
Max LAeq 1 hour	0700-2200	59	dB
Max LAeq 1 hour	2200-0700	61	dB

Maximum noise events as defined in the Environmental Noise Management Manual [$L_{Amax} - L_{Aeq} \geq 15$]	3
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DAY 6

LOGGER LOCATION: 20 Boorea Ave, Lakemba

DATE: Tuesday, 13 February 2024

**AMBIENT NOISE METRICS**

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	37	dB
LA90 Evening	1800-2200	40	dB
LA90 Night-time	0600-0700	40	dB
LAeq Daytime	0700-1800	52	dB
LAeq Evening	1800-2200	65	dB
LAeq Night-time	2200-0700	60	dB

TRAFFIC & MISC. NOISE METRICS

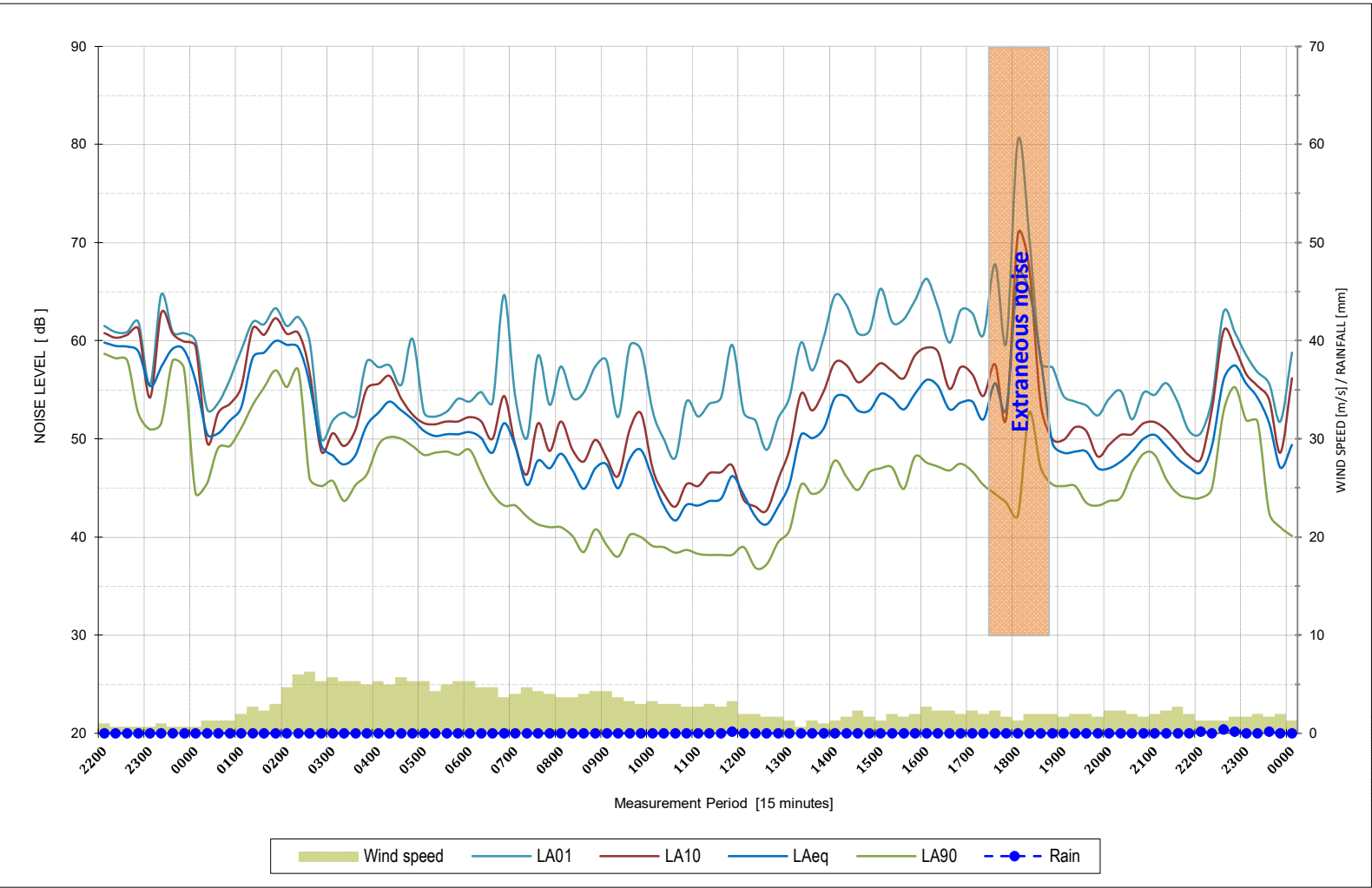
LAeq 15 hours	0700-2200	60	dB
LAeq 9 hours	2200-0700	60	dB
Max LAeq 1 hour	0700-2200	60	dB
Max LAeq 1 hour	2200-0700	62	dB

Maximum noise events as defined in the Environmental Noise Management Manual [$L_{Amax} - L_{Aeq} \geq 15$]	2
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DAY 7

LOGGER LOCATION: 20 Boorea Ave, Lakemba

DATE: Wednesday, 14 February 2024



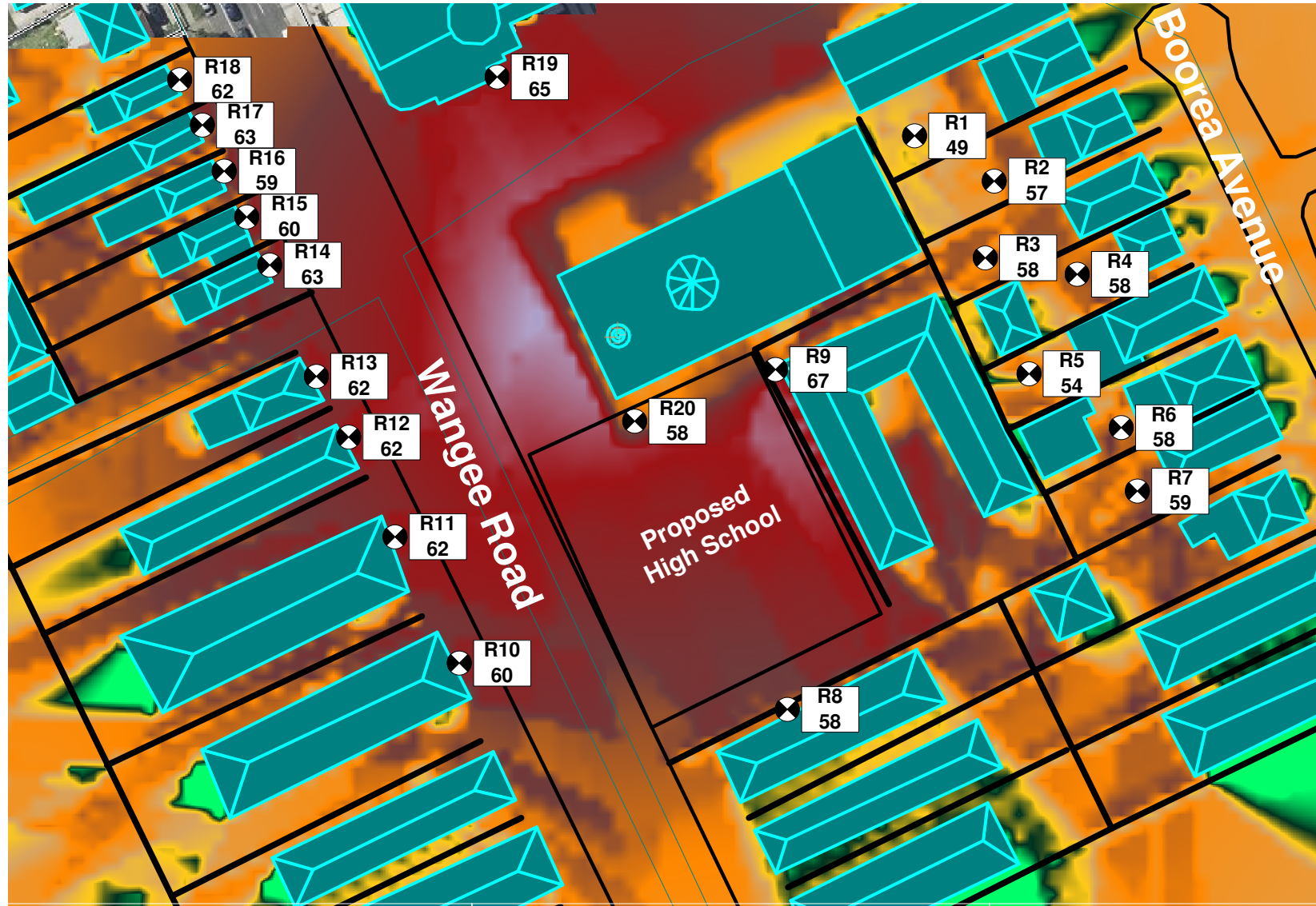
AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	38	dB
LA90 Evening	1800-2200	43	dB
LA90 Night-time	0600-0700	44	dB
LAeq Daytime	0700-1800	51	dB
LAeq Evening	1800-2200	58	dB
LAeq Night-time	2200-0700	56	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	54	dB
LAeq 9 hours	2200-0700	56	dB
Max LAeq 1 hour	0700-2200	55	dB
Max LAeq 1 hour	2200-0700	59	dB

Maximum noise events as defined in the Environmental Noise Management Manual [$L_{Amax} - L_{Aeq} \geq 15$]	5
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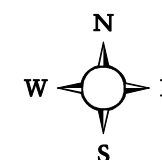
** NOISE SOURCES **

- ~ 2 Speakers at 18 meters above the natural ground
- North and East facing speaker are 93dBA at 1 meter
- Loudest receiver R9 67 dBA
- Noise contours are 1.5 meters above the natural ground

PRINT DATE: 27/02/2024
VERSION: S1

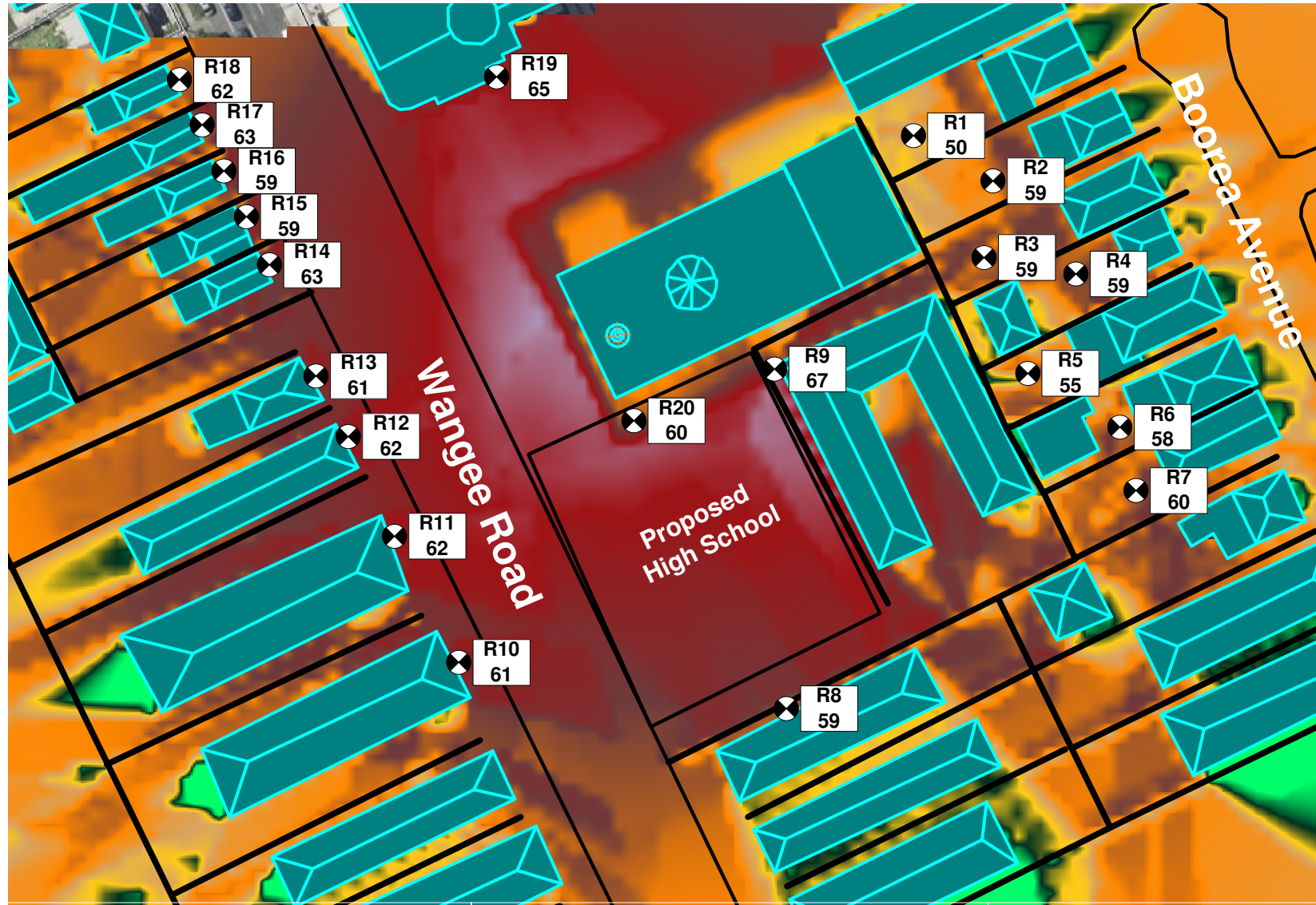
- + Point Source
- Building
- Barrier
- Contour Line
- Receiver
- Calculation Area

- > 40.0 dBA
- > 45.0 dBA
- > 50.0 dBA
- > 55.0 dBA
- > 60.0 dBA
- > 65.0 dBA
- > 70.0 dBA
- > 75.0 dBA
- > 80.0 dBA
- > 85.0 dBA



koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 6120 [Scenario 1]
CLIENT: Lebanese Muslim Association
SITE ADDRESS: 67 Wangee Road, Lakemba
ASSESSED TO: Noise Policy for Industry
Project Trigger Noise Level
LIMITING CRITERIA: 63 dBA (Residential) 68 dBA (Residential)
81 dBA (Commercial) 62 dBA (School)



** NOISE SOURCES **

~ 4 Speakers at 20.5 meters above the natural ground

- North facing speaker is 92dBA at 1 meter
- West facing speaker is 92dBA at 1 meter
- East facing speaker is 90dBA at 1 meter
- South facing speaker is 83dBA at 1 meter

- Loudest receiver R9 67 dBA

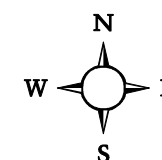
- Noise contours are 1.5 meters above the natural ground

PRINT DATE: 09/10/2024

VERSION: S2

- + Point Source
- Building
- Barrier
- Contour Line
- Receiver
- Calculation Area

- > 40.0 dB
- > 45.0 dB
- > 50.0 dB
- > 55.0 dB
- > 60.0 dB
- > 65.0 dB
- > 70.0 dB
- > 75.0 dB
- > 80.0 dB
- > 85.0 dB



koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 6120 [Scenario 2]
CLIENT: Lebanese Muslim Association
SITE ADDRESS: 67 Wangee Road, Lakemba
ASSESSED TO: Noise Policy for Industry
Project Trigger Noise Level
LIMITING CRITERIA: 63 dBA (Residential) 68 dBA (Residential)
81 dBA (Commercial) 62 dBA (School)