koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

Commercial 1 (Unit 27)
637-645 Forest Road
Bexley NSW 2207

+612 9587 9702
office@koikasacoustics.com
www.koikasacoustics.com

DELIVERING SOUND ADVICE

ABN: 12 058 524 771

ACOUSTICAL REPORT

PROPOSED CHILD CARE CENTER

41-63 RYANS ROAD, GILLIESTON HEIGHTS NSW

Date: 14 February 2025

File Reference: 6451R20241125hw41-63RyansRoadGilliestonHeights_DA

DOCUMENT CONTROL

Project title	Acoustical Report Proposed Child Care Centre 41-63 Ryans Road, Gilleston Heights		
Project number	6451		
Document reference	6451R20241125hw41-63RyansRoadGilliestonHeights_DA		
Document path	G:\Shared drives\KA Acoustics 2024\REPORT\CCC\6451 (hw) 41-63 Ryans Road, Gillieston Heights\6451R20241125hw41-63RyansRoadGilliestonHeights_DA.docx		
Date	**Author**	**Review**	**Notes**
14/02/2025	HW	JT	Report available for issue
Approved by	James Tsevrementzis Managing Consultant (Acoustics)		Member of the Australian Acoustical Society - MAAS
Client	EXP Gillieston Heights Pty Ltd Attention: Stuart Quirk Email: stuart@expcapital.com.au		

ACOUSTICAL REPORT

PROPOSED CHILD CARE CENTER

41-63 RYANS ROAD, GILLIESTON HEIGHTS NSW

CONTENTS

TABLE OF APPENDICES

1.0 INTRODUCTION

Koikas Acoustics Pty Ltd was commissioned to conduct a noise impact assessment of the proposed development at 41-63 Ryans Road, Gillieston Heights seeking approval for the construction of a childcare centre.

This report primarily presents an assessment of noise egress from the proposed childcare centre. The site is not located next to a main road, or rail corridor, under a flight path or adjacent to industrial premises. This concludes that external noise impacts on the proposed childcare centre are not anticipated.

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

- Noise emissions from children occupying indoor and outdoor areas.
- Vehicle drop-off and pick-up.
- Mechanical plant and operational noise emission from the proposed development to neighbouring dwellings (indicative assessment at DA stage).
- Noise associated with increased traffic on the local road network as a result of the proposed development.
- Potential sleep disturbance from staff and parents arriving before 7 am.

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 PROPOSED DEVELOPMENT

The proposed childcare centre is located at 76 – 81 Ryans Road, Gillieston Heights and consists of:

- At-grade parking with (21) twenty-one parking spaces including (1) one accessible parking space.
- Five (5) Indoor play areas divided by age group, cot room, kitchen, laundry, staff room, offices, and amenities on the ground floor level.
- Outdoor play areas are located at the site's southern boundary on the ground floor level.

Being a corner block, the site has street frontages to Kiah Road, Ryans Road and Golden Bell Circuit. Access to the car park is via Golden Bell Circuit.

This acoustic report and any associated recommendations are based solely on the architectural design and drawings prepared by Shaddock Architects (Project No. 1302, dated 03/02/2025). Any changes to the design may impact the findings of this report and associated noise control recommendations.

Figure 1. Proposed childcare centre per architectural drawings

2.1 OCCUPANCY LEVELS

The proposed centre can accommodate a total of 96 children. The breakdown per age bracket is:

- 36 children aged 0-2 years,
- 40 children aged 2-3 years, and
- 20 children aged 3-5 years.

2.2 OPERATING HOURS

The proposed hours of operation of the child care centre are between 6:30 am and 6:30 pm, Monday to Friday.

Staff arrival is expected to be between 6:00 am and 6:15 am, consideration of potential sleep disturbance impacts on neighbours requires assessment.

3.0 NOISE SURVEYS

3.1 ATTENDED ENVIRONMENTAL NOISE MONITORING

Ambient and ambient background noise levels are generally taken to determine the noise profile of the subject area. Due to safety concerns, Koikas Acoustics was unable to locate a noise logger on-site. As such, attended noise surveys were conducted for representative periods related to the subject development.

Noise level measurements were taken with two NATA-calibrated Type 1 NTi XL2 sound level meters. The instruments were 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.

Noise surveys were conducted in areas surrounding the proposed development such that the ambient noise levels could be quantified (See **Figure 2):**

- 41 – 63 Ryans Road, Gillieston Heights Site Location 1
- 32 Kiah Road, Gilliestone Heights Site Location 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.

A summary of the noise survey results is provided in Table 1.

Table 1. Summary of measured environmental noise levels [dB]

Location	Date	Measurement period	EPA assessment period	L_{A90}	L_{Aeq}
Attended 1	19.11.2024	12:30 pm to 13:30 pm	Daytime	45	53
Noise Logger 1	19.11.2024	12:30 pm to 13:30 pm	Daytime	44	56
Attended 2	19.11.2024	13:15 pm to 13:45 pm	Daytime	44	48
Noise Logger 2	19.11.2024	13:15 pm to 13:45 pm	Daytime	46	51

3.2 UNATTENDED AMBIENT NOISE SURVEY

An unattended noise logging survey was conducted in two locations at 41 – 63 Ryans Road between 19 November to 27 November 2024. The measurement microphones were set at a height of 1.5 metres above the ground and were clear of any sound-reflective surfaces (excl. the ground) by at least 3.5 metres. This satisfies the requirements for a free-field measurement under AS1055-2018 and Fact Sheet B of the NSW EPA Noise Policy for Industry.

Figure 2. Noise logging location – Image from SixMaps

Two type 1 NSRT noise sentries were used for this noise survey. The instruments were 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 meters before and after the noise survey. No system drift was observed for

this sound level meter.

A review of the weather records from the Bureau of Meteorology shows that adverse weather conditions did not influence the noise environment during the measurement period. Observable short-duration extraneous noise events were removed from the survey data.

A summary of the noise survey data is presented below.

Table 2. Summary of noise logger results [dB] – Eastern Boundary

Location	Period, T [1]	Ambient noise level L_{Aeq}	Rating background level L_{A90}	Traffic noise level[2] $L_{Aeq, Period}$
41 – 63 Ryans Road, Gillieston Heights	Day	55	37	55
	Evening	52	38	
	Night	47	36	47

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.
2. The **EPA/RMS/NSW DoP** refers to:
   Daytime: 7 am – 10 pm seven days per week.
   Night: 10 pm - 7 am seven days per week

Table 3. Summary of noise logger results [dB] – South Western Boundary

Location	Period, T [1]	Ambient noise level L_{Aeq}	Rating background level L_{A90}	Traffic noise level[2] $L_{Aeq, Period}$
41 – 63 Ryans Road, Gillieston Heights	Day	51	37	50
	Evening	50	41	
	Night	48	38	48

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.
2. The **EPA/RMS/NSW DoP** refers to:
   Daytime: 7 am – 10 pm seven days per week.
   Night: 10 pm - 7 am seven days per week

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

4.0 NOISE ASSESSMENT GUIDELINES

4.1 MAITLAND CITY COUNCIL DCP 2011 GUIDELINES

Maitland City Council DCP has no specific noise-related guidelines for the development of childcare centres. The DCP defers to the criteria set out within SEPP (Educational Establishments and Child Care Facilities) 2017 and the Child Care Planning Guideline 2017 (CCPG).

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.

4.3 SEPP (EDUCATIONAL ESTABLISHMENTS AND CHILD CARE FACILITIES) 2017

The State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017 outlines assessment requirements for educational establishments and childcare facilities across NSW. The policy does not present any specific noise limits to apply to the development but rather requires that the regulatory authority appropriately consider the compatibility of the development in the context of the surrounding area. The regulatory authority must also consider applicable provisions of the *Child Care Planning Guideline*.

4.4 CHILD CARE PLANNING GUIDELINE 2017 (CCPG)

The CCPG includes provisions under items C23, C24, C25, and C26 that concern acoustic amenity impacts on neighbours and noise pollution impacts on the development itself. In summary, these provisions require:

- **C23** - An acoustic fence along the property boundary.
- **C23** - Ensure that mechanical plant and equipment are suitably screened to reduce noise.
  C24 - An acoustic report is provided with an application that establishes an appropriate background noise level for times the outdoor play area will be in use, identifies an

appropriate target noise level (noise criteria) for childcare centre noise emission, and recommends appropriate heights for any acoustic fences.

C25 and 26 - That the design and location of the building are suitable to minimise the impact of external noise on the development and that an acoustic report is provided that appropriately considers the impact of external noise from industry, aircraft, rail corridors, busy roads, or any other source of substantial external noise.

4.5 AAA AAAC CHILDCARE CENTRE NOISE ASSESSMENT GUIDELINES SEPTEMBER 2020 V 3.0

In the absence of prescriptive noise criteria in the DCP, SEPPTI, and CCPG, Koikas Acoustics considers it appropriate to refer to the acoustic criteria published in the AAAC childcare centre noise assessment guidelines. This document is widely used in the industry and is commonly referenced in matters heard at the NSWLEC as a standard planning tool concerning assessment procedures and relevant noise criteria.

This document discusses the findings of our assessment concerning:

- Noise emission from outdoor play areas,
- Noise emissions from indoor play areas, mechanical plant and drop-off/pick-up areas,
- Sleep disturbance impacts, and
- External noise intrusion.

The AAAC guidelines do not, however, present noise objectives for an assessment of vehicle noise attributed to additional cars on local roads. The NSW Environment Protection Authority (EPA) Road Noise Policy (RNP) is referenced for specific noise objectives related to on-road vehicular noise emissions. This policy is discussed in **Section 4.6** of this report.

4.5.1 Outdoor play areas

Noise criteria related to the outdoor play areas are derived in one of three ways under the AAAC guidelines:

1. If the existing background noise level is less than 40 dB(A), then a base criterion of $L_{Aeq,\ 15\ minutes}$ 45 dB applies, irrespective of the duration of outdoor play.

2. If the existing background noise level is 40 dB(A) or above, and the outdoor play area is used for **more than a total of 4 hours** (2 hours in the morning and 2 hours in the afternoon), then a criterion of background + 5 dB applies.
3. If the existing background noise level (RBL) is 40 dB(A) or above, and the outdoor play area is limited in its use to **not more than a total of 4 hours** (2 hours in the morning and 2 hours in the afternoon), then a noise criterion of background +10 dB applies.

As per the AAAC V3.0 Guidelines state that, "*the noise logger should be located to measure the background noise environment at a location most representative of the most affected sensitive receiver locations."* Further, the Guidelines state "*This measured representative noise environment should be used to establish relevant criteria for all sensitive receivers*." Koikas Acoustics understand that the above means that sound measurements are taken at a location representative of the background noise of a number of receiver locations. This means that there could be more than one representative receiver location on a development site because the ambient background noise at the rear of a property, where background noise levels are typically lower on account of the shielding of a row of dwellings, is not representative of the most noise affected sensitive receivers adjacent and opposite the front end of the development site where background noise levels may be louder on account of an unimpeded view of passing traffic.

The most affected sensitive receiver locations are assessed at the most affected point on or within the residential boundary:

- at 1.5 metres above the ground,
- on a balcony or outside a window at 1.5 metres above the relevant floor level.

4.5.2 Indoor play area, mechanical plant, pick-up and drop-off

The noise that is generated by indoor activities, mechanical plant & equipment, and site pick-up/drop-off zones must not exceed the RBL by more than 5 dB when assessed at the most noise-affected point within any residential property. Childcare centre noise is assessed as the $L_{Aeq,\ 15\text{-}minutes}$.

4.5.3 Sleep disturbance (AAAC)

Activity on-site before 7 am or during the night hours, such as staff arrivals, cleaning etc must be assessed for potential sleep disturbance impacts to nearby residential receptors. The sleep disturbance assessment criterion adopted by the AAAC is for a L_{Amax} (the maximum hold sound pressure level) not exceeding the background noise level by more than 15 dB outside the window of the nearest habitable space.

4.5.4 Commercial receptors and other sensitive receivers

No commercial receptors surround the subject site meaning this component of the guideline has no relevance in this case.

4.5.5 Noise intrusion from external sources

Ryans Road is not an arterial/busy road meaning an assessment of traffic noise is not required under the AAAC guidelines, nor is it required under the SEPPTI as previously noted.

4.5.6 Indoor play area, mechanical plant, pick-up and drop-off

The noise that is generated by indoor activities, mechanical plant & equipment, and site pick-up/drop-off zones must not exceed the RBL by more than 5 dB when assessed at the most noise-affected point within any residential property. Childcare centre noise is assessed as the $L_{Aeq,\ 15\text{-}minutes}$.

4.5.7 Commercial receptors and other sensitive receivers

Noise emitted from a childcare centre must not result in an $L_{Aeq,\ 15\text{-}minutes}$ noise level that exceeds 65 dB on or within any property boundary for a commercial receptor or any other noise-sensitive receiver such as a school, hospital, place of worship or park (active and passive). For sensitive receivers (excluding commercial premises), the cumulative noise from the childcare centre when assessed internally and with windows/doors open shall not exceed $L_{Aeq,\ 15\text{-}minutes}$ 45 dB.

4.5.8 Noise intrusion from external sources

The recommended assessment criteria for noise intrusion to a childcare centre from external sources such as road, rail, aircraft, and/or industry are:

- $L_{Aeq,\ 1\text{-}hour}$ 55 dB from road, rail, or industry at any location within the outdoor play area during the hours the centre is operating.
- $L_{Aeq,\ 1\text{-}hour}$ 40 dB (activity areas) or 35 dB (sleeping areas) from road, rail, or industry at any location within the indoor activity or sleeping areas (windows/doors closed) during the hours the centre is operating.
- $L_{A,Slow,max}$ noise level from aircraft at any location within the indoor activity or sleeping areas during the hours the centre is operating shall not exceed 50 dB per guidelines provided in *Australian Standard 2021-2015 Aircraft noise intrusion building siting and construction*. Furthermore, Table 2.1 of AS2021-2015 (Note 4) states that for building sites within ANEF zones that are classified as 'unacceptable', outdoor noise levels should also be considered.

The Botany Bay DCP 213 provides a process by which to consider the impact of aircraft noise on outdoor environments, by taking the following into account:

- Whether or not there is an existing residential dwelling on-site;
- What the application of the Standard applies to;
- Does the dwelling have access to a rear yard within the property, which is currently available for outdoor recreational use by residents of the dwelling; and
- Does the outdoor environment, given the curfew and current operating patterns, such that in daylight hours there will be sufficient opportunity to resort to the private open space without the presence of aircraft noise?

4.6 EPA ROAD NOISE POLICY

Traffic generating developments such as childcare centres will introduce additional vehicles onto the local road network. The noise that is associated with these additional vehicles forms part of the acoustical assessment of the proposed development.

The document entitles “NSW Road Noise Policy” has replaced the “Environmental Criteria for Road Traffic Noise” (ECRTN) fir assessment procedures and criteria for traffic noise and effective from 1st of July 2011.

The EPA RNP recommends that traffic noise levels should not exceed $L_{Aeq,1\text{-}hour}$ 55 dB during daytime hours (7 am to 10 pm) at an assessment location of (one) 1 metre from the façade of an affected residential building and at a height of 1.5 metres above the ground. Outside of daytime hours, the objective becomes $L_{Aeq,1\text{-}hour}$ 50 dB.

An extract of Table 3 and Table 6 of NSW Road Noise Policy from Environmental Climate Change & Water (ECCW) is provided below:

Table 3 Road traffic noise assessment criteria for residential land uses

Road category	Type of project/land use	Assessment criteria – dB(A)	
		Day (7 a.m.–10 p.m.)	Night (10 p.m.–7 a.m.)
Freeway/ arterial/ sub-arterial roads	1. Existing residences affected by noise from **new** freeway/arterial/sub-arterial road corridors	$L_{Aeq, (15\ hour)}$ 55 (external)	$L_{Aeq, (9\ hour)}$ 50 (external)
	2. Existing residences affected by noise from **redevelopment** of existing 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)
Local roads	4. Existing residences affected by noise from **new** local road corridors 5. Existing residences affected by noise from **redevelopment** of existing local roads 6. Existing residences affected by **additional traffic** on existing local roads generated by land use developments	$L_{Aeq, (1\ hour)}$ 55 (external)	$L_{Aeq, (1\ hour)}$ 50 (external)

Note: Land use developers must meet internal noise goals in the Infrastructure SEPP (Department of Planning NSW 2007) for sensitive developments near busy roads (see **Appendix C10**).

Figure 3. Table 3 of NSW Road Noise Policy from Environmental Climate Change & Water (ECCW)

In this case, type 2 of the above for local roads will be applicable.

Furthermore, Section 3.4 of NSW Road Noise Policy states the following:

3.4 Applying the assessment and relative increase criteria

The process for applying the criteria involves firstly defining a study area. This helps ensure that noise is assessed and any necessary mitigation applied at those locations most affected. The *UK Design Manual for Roads and Bridges* (United Kingdom Highways Agency 2008) adopts a distance of 600 metres from a project as being adequate for this purpose.

Where existing traffic noise levels are above the noise assessment criteria, the primary objective is to reduce these through feasible and reasonable measures to meet the assessment criteria. A secondary objective is to protect against excessive decreases in amenity as the result of a project by applying the relative increase criteria.

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.

Section 3.4.1 provides a step-by-step procedure for applying the noise criteria to each type of project and development covered by the RNP.

Figure 4. Table 6 of NSW Road Noise Policy from Environmental Climate Change & Water (ECCW)

Where the existing traffic noise levels are above the NSW Road Noise Policy (ECCW) assessment criteria, the increase in traffic noise levels due to the proposed development is not to exceed **2 dB**.

4.7 CONSOLIDATION OF CRITERIA

To comply with relevant planning guidelines, childcare centres require a plan of management and noise mitigation measures to satisfy the noise criteria summarised below.

Table 4. Summary of criteria – Ryans Road

Noise component	Document	Noise Metric	Criteria
Outdoor/indoor play areas	Council DCP	$L_{Aeq,\ 15\ minutes}$	(45)
Mechanical plant & car park noise levels	Council DCP	$L_{Aeq,\ 15\ minutes}$	RBL + 5 dB (42)
Indoor play areas, mechanical plant & carpark noise levels	AAAC	$L_{Aeq,\ 15\ minutes}$	RBL + 5 dB (42)
Sleep disturbance	AAAC	L_{Amax}	RBL + 15 dB (52)
Cumulative CCC noise to neighbouring commercial premises: schools, hospitals, places of worship and parks (active and passive)	AAAC	$L_{Aeq,\ 15\ minutes}$	(65)
Cumulative CCC noise to sensitive uses/receivers	AAAC	$L_{Aeq,\ 15\ minutes}$	RBL + 5 dB (42)
On-road vehicle noise	NSW RNP	$L_{Aeq,\ 1\ hour}$	55 (7 am to 10 pm) [1] 50 (10 pm to 7 am) [1]

Notes:

1. In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB to maintain acceptable acoustic amenities for residential neighbours.

5.0 CHILD CARE CENTRE NOISE ASSESSMENT

5.1 CADNA-A

Assessing noise emitted by the building's mechanical plant & equipment 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.

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 sources associated with the childcare centre that must be assessed, include:

- Children occupying the outdoor play area
- Noise breakout from the children in the indoor play area
- Noise from vehicles during morning drop-off and afternoon pick-up
- Mechanical plant noise such as air conditioner condenser units and kitchen exhaust fans
- On-road noise from vehicles arriving and departing during morning and afternoon drop-off/pick-up
- Sleep disturbance from staff arrival before 7 am.

It is noted that system selections for the mechanical plant and equipment are not generally available at the application stage. This noise is more appropriately assessed during the detailed design stage. This report presents the noise limits applied to the equipment only.

Noise levels of children playing are referenced from the AAAC guidelines that present effective sound power levels and associated noise spectra from groups of 10 children in age groups of 0-2 years, 2-3 years, and 3-5 years. Outdoor play noise levels are directly calculated from these sound

levels. Indoor play noise levels considered these sound levels as well as room effect. The room effect presumes that the internal reverberation time within each playroom does not exceed 0.7 seconds.

Vehicle noise includes that attributed to cars traversing the carpark. Database noise levels from measurements conducted by Koikas Acoustics of vehicles travelling at 10kmph have been used in the assessment. The traffic report issued by Transport and Traffic Planning Associates (Reference: 24262, dated February 2025) advises peak AM traffic generated is 31 vehicle trips or 7.75 vehicle trips per 15 minutes. This assessment conservatively allows for up to 8 vehicles to enter and leave the carpark area in a 15-minute period.

On-road vehicle nouse is predicted via the road nouse module in CadnaA on the presumption of up to 31 cars arriving and departing during the peak traffic hour. The traffic report states that the AM peak traffic count is 190 vehicles.

5.3 DESIGN SCENARIOS

The proposed child care centre has been assessed in terms of its impact on neighbouring properties from noise attributed to:

- Children in outdoor play areas
- Children in indoor play areas
- Drop-off and pick-up (parking) zones
- Mechanical plant and equipment
- On-road vehicle noise
- Potential sleep disturbance from staff arriving before 7 am

To fully assess the impact from and to the child care centre, several assessment scenarios are required. These are summarised below for clarity:

1. Noise emission from the outdoor play area
2. Noise from indoor play areas, parking zones, and mechanical plant and equipment
3. On-road vehicle noise
4. Sleep disturbance – Early morning staff arrival

5.4 ASSESSMENT OF OUTDOOR PLAY AREA NOISE – SCENARIO 1

5.4.1 Noise sources

Noise levels of children playing are referenced from the AAAC guidelines that present effective sound power levels and associated noise spectra for groups of 10 children in age groups of 0-2 years, 2-3 years, and 3-5 years. Outdoor play noise levels are directly calculated from these sound levels.

Table 5. Effective sound power levels ($L_{Aeq\ 15\ mins}$) for groups of 10 children playing

Number and age of children	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1000	2000	4000	8000	
10 children – 0 to 2 years	54	60	66	72	74	71	67	64	78
10 children – 2 to 3 years	61	67	73	79	81	78	74	70	85
10 children – 3 to 5 years	64	70	75	81	83	80	76	72	87

Notes:
1. An effective sound power level takes into account the directionality of sound from a source where the source orientation is varying, such as for children in outdoor play areas.
2. The AAAC advise that a -6 dB adjustment can be made to each age group for children involved in passive play.

5.4.2 Assessment locations

Noise levels are assessed at the most affected point on or within the boundary of neighbouring residential receivers and 1.5 metres above either the ground or relevant upper floor level. Each assessment location is shown in the image below and further qualified in the following table.

Table 6. Assessment locations

ID	Receiver type and address	Assessment location
R1	Residential / 68 Ryans Road, Gilleston Heights	Ground-floor nearest boundary
R2	Residential / 64 Ryans Road, Gilleston Heights	Ground-floor nearest boundary
R3	Residential / 62 Ryans Road, Gilleston Heights	Ground-floor nearest boundary
R4	Residential / 60 Ryans Road, Gilleston Heights	Ground-floor nearest boundary
R5	Residential / 22 Vintage Drive, Gilleston Heights	Ground-floor nearest boundary
R6	Residential / 13 Vintage Drive, Gilleston Heights	Ground-floor nearest boundary
R7	Vacant land	Ground-floor nearest boundary

Notes:
1. Noise is assessed at 1.5 metres above the ground, or for upper-floor locations, at 1.5 metres above the floor level.

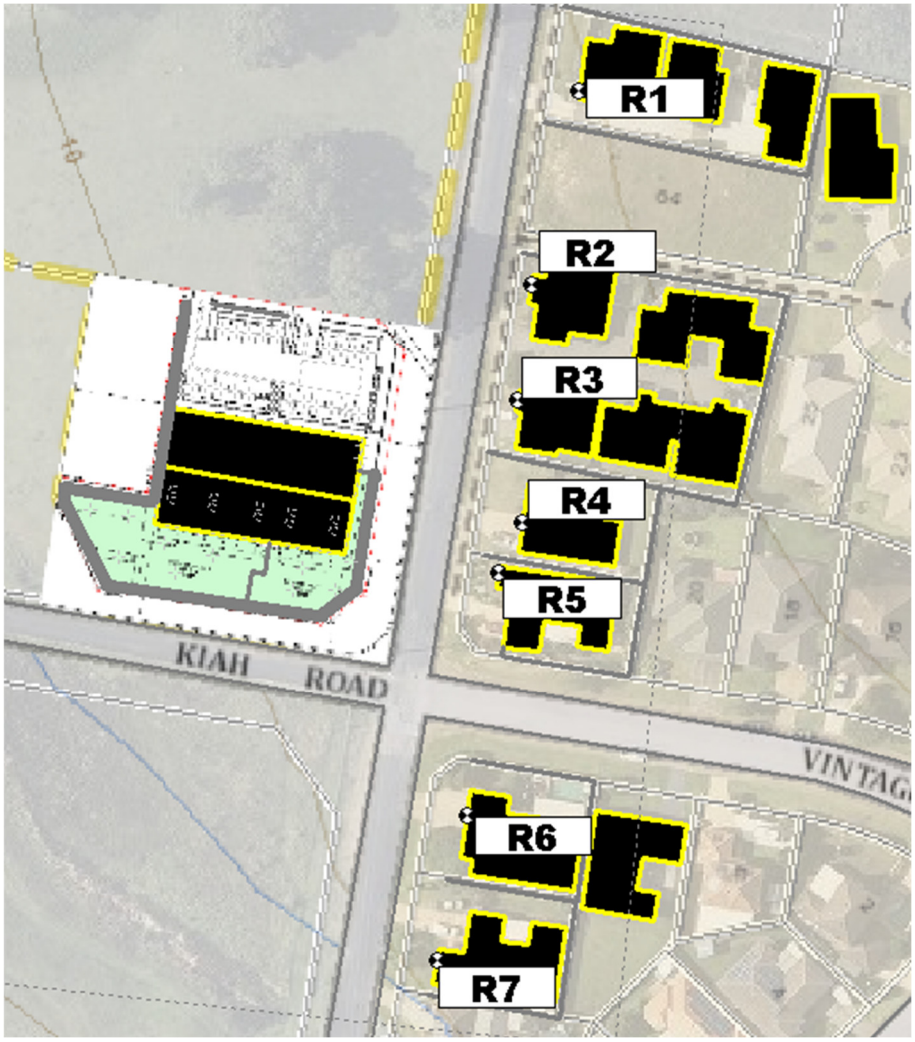


Figure 5. Assessment locations – Outdoor play areas assessment

5.4.3 Calculated receiver levels

The following scenarios have been considered for the outdoor play areas:

- Scenario 1.1: 36 children aged 0-2 years and 20 children aged 3-5 years
- Scenario 1.2: 40 children aged 2-3 years

The calculated noise levels are inclusive of all recommended acoustic controls and treatments from Section 5.4.4. The following noise levels are calculated for each of the identified assessment locations:

Table 7. Calculated noise levels, $L_{Aeq\ 15\ minutes}$ [dB] – Scenario 1.1 (2 – 5 year olds)		
Assessment location	**Noise criteria**	**Calculated noise level**
R1: Residential dwelling: Ground-floor	45	27
R2: Residential dwelling: Ground-floor	45	31
R3: Residential dwelling: Ground-floor	45	34
R4: Residential dwelling: Ground-floor	45	39
R5: Residential dwelling: Ground-floor	45	42
R6: Residential dwelling: Ground-floor	45	36
R7: Vacant	45	34

Table 8. Calculated noise levels, $L_{Aeq\ 15\ minutes}$ [dB] – Scenario 1.2 (0 – 2 year olds)		
Assessment location	**Noise criteria**	**Calculated noise level**
R1: Residential dwelling: Ground-floor	45	22
R2: Residential dwelling: Ground-floor	45	26
R3: Residential dwelling: Ground-floor	45	28
R4: Residential dwelling: Ground-floor	45	36
R5: Residential dwelling: Ground-floor	45	41
R6: Residential dwelling: Ground-floor	45	37
R7: Vacant	45	38

The above noise levels are inclusive of all recommended acoustic controls and treatments from below.

5.4.4 Recommendations – outdoor play

The following noise controls are recommended for the outdoor play areas:

- No more than 40 kids should occupy outdoor play area 2 (2-5 years old) at any one time.
- A 1.8-meter solid noise barrier must be installed around the boundaries of the outdoor play areas.
- The noise barriers are to be constructed of either:
  a. Double-lapped and capped timber
  b. 9 mm fibre cement sheeting fixed to a suitable framing structure
  c. Masonry (70 mm thick or above)
  d. Transparent materials such as 10.38 mm laminated glass or 15 mm thick Perspex panels
  e. Proprietary noise wall solutions such as SlimWall by Modular Walls or similar
- It is to be noted that gaps between the panels and the posts or the ground will significantly reduce the effectiveness of the noise barrier and may lead to non-compliant noise levels at the adjoining premises. Therefore, all gaps should be minimised.

5.5 ASSESSMENT OF INDOOR PLAY / MECHANICAL PLANT / PARKING ZONES – SCENARIO 2

5.5.1 Noise sources

Indoor playroom noise levels are derived from these sound levels as well as applying a correction for the reverberant field in the room. The reverberant room noise level presumes an internal reverberation time within each playroom not exceeding 0.7 sec.

The calculated indoor playroom noise levels are:

Table 9. Indoor playroom noise levels ($L_{Aeq\ 15\ mins}$)

Room type	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1000	2000	4000	8000	
0 to 2 years (40 children)	45	52	58	64	66	63	59	55	70
2 to 3 years (40 children)	52	58	64	70	73	70	65	61	76
3 to 5 years (18 children)	55	62	66	73	75	72	67	63	79

The energy-average noise level (L_{Aeq}) emitted from vehicles accessing the parking areas is calculated from the sound power level of vehicles (cars travelling/opening and closing of car doors/car engines starting) and the frequency of parking movements.

The frequency of parking movements is referenced from the traffic and parking report by (Transport and Traffic Planning Associates). The traffic report nominates peak traffic generation as 31 vehicles per hour. This equates to 8 parking movements in 15-minutes.

Vehicle noise levels used in the assessment are derived from measurement data obtained by Koikas Acoustics, as summarised below:

Table 10. Carpark sound power levels. dB(A)

Source	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1000	2000	4000	8000	
Car travelling (at-grade) *Moving point source at 10 kmph*	59	62	67	71	74	73	70	61	78
Garbage truck travelling (at-grade) *Moving point source at 10 kmph*	68	73	78	85	90	89	84	73	94
Car doors open and close once in 15-minutes *Stationary point source*	37	45	44	49	47	49	43	34	55
The car engine starts once in 15-minutes *Stationary point source*	31	35	34	42	45	48	47	42	53

The mechanical plant and equipment required to service the development will also require assessment, however, the details of the mechanical systems are not known at this early stage in the design. Koikas Acoustics has completed a preliminary assessment using indicative plant and equipment commonly used in childcare centres. A detailed assessment of noise emitted by the mechanical plant is typically conditioned within the consent and completed before the Construction Certificate.

Table 11. Mechanical plant sound power levels L_{Aweq} [dB]

Source	1/1 octave band centre frequency [Hz]								Total
	63	125	250	500	1000	2000	4000	8000	
AC Condenser Unit	71	72	68	66	63	59	54	48	69
Kitchen Exhaust Fan	67	63	66	63	61	53	48	43	65

5.5.2 Assessment locations

Noise levels are assessed at the most affected point on or within the boundary of neighbouring residential receivers and 1.5 metres above either the ground or relevant upper floor level. Each assessment location is shown in the image below and further qualified in the following table.

Table 12. Assessment locations

ID	Receiver type and address	Assessment location
R1	Residential / 68 Ryans Road, Gilleston Heights	Ground level – nearest boundary
R2	Residential / 64 Ryans Road, Gilleston Heights	Ground level – nearest boundary
R3	Residential / 62 Ryans Road, Gilleston Heights	Ground level – nearest boundary
R4	Residential / 60 Ryans Road, Gilleston Heights	Ground level – nearest boundary
R5	Residential / 22 Vintage Drive, Gilleston Heights	Ground level – nearest boundary
R6	Residential / 13 Vintage Drive, Gilleston Heights	Ground level – nearest boundary
R7	Residential / 54 Ryans Road, Gilleston Heights	Ground level – nearest boundary
Notes: 1.	Noise is assessed at 1.5 metres above the ground, or for upper-floor locations, at 1.5 metres above the floor level.	

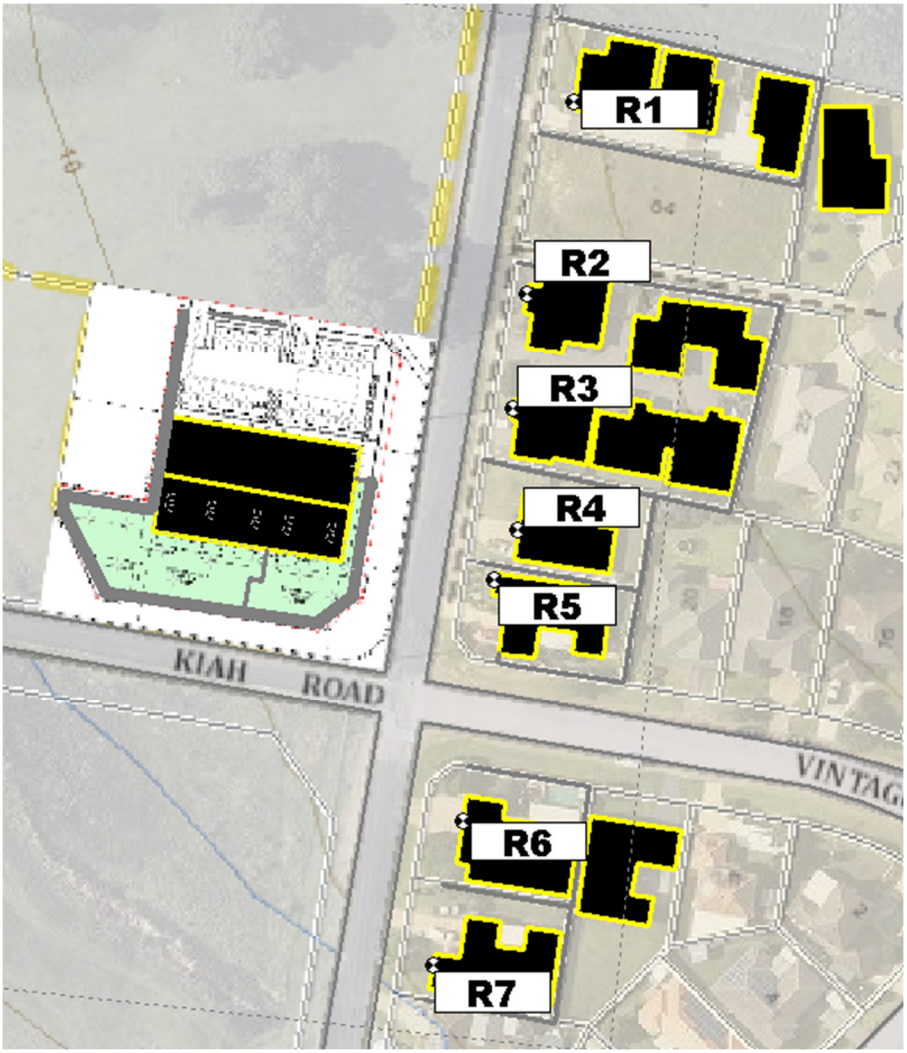


Figure 6. Assessment locations – Outdoor play areas assessment

5.5.3 Calculated receiver levels

The following noise levels are calculated for each of the identified assessment locations:

Table 13. Calculated noise levels, $L_{Aeq\ 15\ minutes}$ [dB] – Scenario 2

Assessment location	Noise criteria	Calculated noise level
Residential / 68 Ryans Road, Gilleston Heights	42	33
Residential / 64 Ryans Road, Gilleston Heights	42	38
Residential / 62 Ryans Road, Gilleston Heights	42	40
Residential / 60 Ryans Road, Gilleston Heights	42	39
Residential / 22 Vintage Drive, Gilleston Heights	42	37
Residential / 13 Vintage Drive, Gilleston Heights	42	30
Residential / 54 Ryans Road, Gilleston Heights	42	25

The above noise levels are inclusive of all recommended acoustic controls and treatments from below.

5.5.4 Recommendations – indoor play / mechanical / parking zones

The following noise controls are recommended for the outdoor play areas:

- Sliding doors and windows should remain closed when children are playing indoors, and the noise levels of children should be managed where possible.
- The mechanical plant and equipment used in this assessment are indicative of typical mechanical plant that could be expected to be in use on a similar site, however, a detailed mechanical plant and equipment design should be carried out by a mechanical engineer and a detailed noise assessment should be undertaken before construction.
- The AC condenser units used in this assessment were Daikin RXYMQ9AY1
- The kitchen exhaust fan used in this assessment was a Fantech CPE0406FR

5.6 ASSESSMENT OF ON-ROAD VEHICLE NOISE – SCENARIO 3

5.6.1 Noise sources

Due to the proposed development, additional road traffic along Ryans Road could potentially affect several residential premises along the road. The most noise-sensitive locations are summarised below and shown in Appendix B.

Noise modelling was conducted using the road module of CadnaA. The existing traffic volumes of the road were calibrated based on road surface, speed, and light/heavy vehicle volumes. The additional vehicles due to the use of the development were then added to the calibrated existing volumes to determine the road traffic noise increase.

As mentioned previously in this report Transport and Traffic Planning Associates have predicted 62 additional vehicle trips during the AM peak hour for this development. Koikas Acoustics assumes that all vehicles will be using Ryans Road as the primary access corridor to the childcare centre as this is the main connecting road to the local road network.

As such, Kooikas Acoustics have conducted the increased road traffic assessment using road noise source in CadnaA that calculates the road traffic noise levels in accordance with RLS 90 standard and the following parameters:

- Peak period: 190 vehicles per hour (existing) assumed 10% of vehicles are heavy vehicles
- Peak period: additional 31 vehicles per hour (proposed)
- Road width of 6 metres
- Speed limit of 50 km/h for vehicles
- Road surface of smooth mastix asphalt
- Road gradient: auto av
- Drefl of 0

5.6.2 Additional Road Traffic Noise Impact to Surrounding Premises

The existing and proposed additional road traffic noise impact from the childcare centre to surrounding residential premises are summarised in the table below.

Table 14. Additional Road Traffic Noise Levels at the Surrounding Premises – Scenario 3

Receivers		Calculated External Noise Levels $L_{Aeq,1hr}$	Noise Criteria $L_{Aeq,1hr}$	Compliance Achieved
Scenario 3.1 (Exisitng)	R1 (Residential)	62	2 dB Increase	-
	R2 (Residential)	63		-
	R3 (Residential)	63		-
	R4 (Residential)	60		-
	R5 (Residential)	62		-
	R6 (Residential)	61		-
	R7 (Residential)	62		-
Scenario 3.1 (Proposed)	R1 (Residential)	62	64	YES
	R2 (Residential)	64	65	YES
	R3 (Residential)	64	65	YES
	R4 (Residential)	62	62	YES
	R5 (Residential)	63	64	YES
	R6 (Residential)	62	63	YES
	R7 (Residential)	63	64	YES

The proposed increased road traffic noise impacts due to the operation of the proposed childcare centre are found to be within the allowable 2 dB increase outlined in the EPA's Road Noise Policy, and therefore, no further noise mitigation measures are required.

5.7 ASSESSMENT OF POTENTIAL SLEEP DISTURBANCE – SCENARIO 4

5.7.1 Noise sources

Where vehicles access the car park before 7 am, the following L_{Amax} noise levels are used to assess potential sleep disturbance impacts on residential neighbours:

- Car doors – L_{wAmax} (sound power level) 93 dB

5.7.2 Assessment locations

Noise levels are assessed outside the windows/doors of habitable rooms in neighbouring residential properties at a distance of 1 metre from the façade. Note: façade reflections are not considered in the assessed noise level. The height of the receiver location is equivalent to 1.5 metres above either the ground or relevant upper floor level. Each assessment location is shown in the image below and further qualified in the following table.

Table 15. Assessment locations

ID	Receiver type and address	Assessment location
R1	Residential / 68 Ryans Road, Gilleston Heights	Ground-floor nearest boundary
R2	Residential / 64 Ryans Road, Gilleston Heights	Ground-floor nearest boundary
R3	Residential / 62 Ryans Road, Gilleston Heights	Ground-floor nearest boundary
R4	Residential / 60 Ryans Road, Gilleston Heights	Ground-floor nearest boundary
R5	Residential / 22 Vintage Drive, Gilleston Heights	Ground-floor nearest boundary
R6	Residential / 13 Vintage Drive, Gilleston Heights	Ground-floor nearest boundary
R7	Residential / 54 Ryans Road, Gilleston Heights	Ground-floor nearest boundary
Notes: 1.	Noise is assessed at 1.5 metres above the ground, or for upper-floor locations, at 1.5 metres above the floor level.	

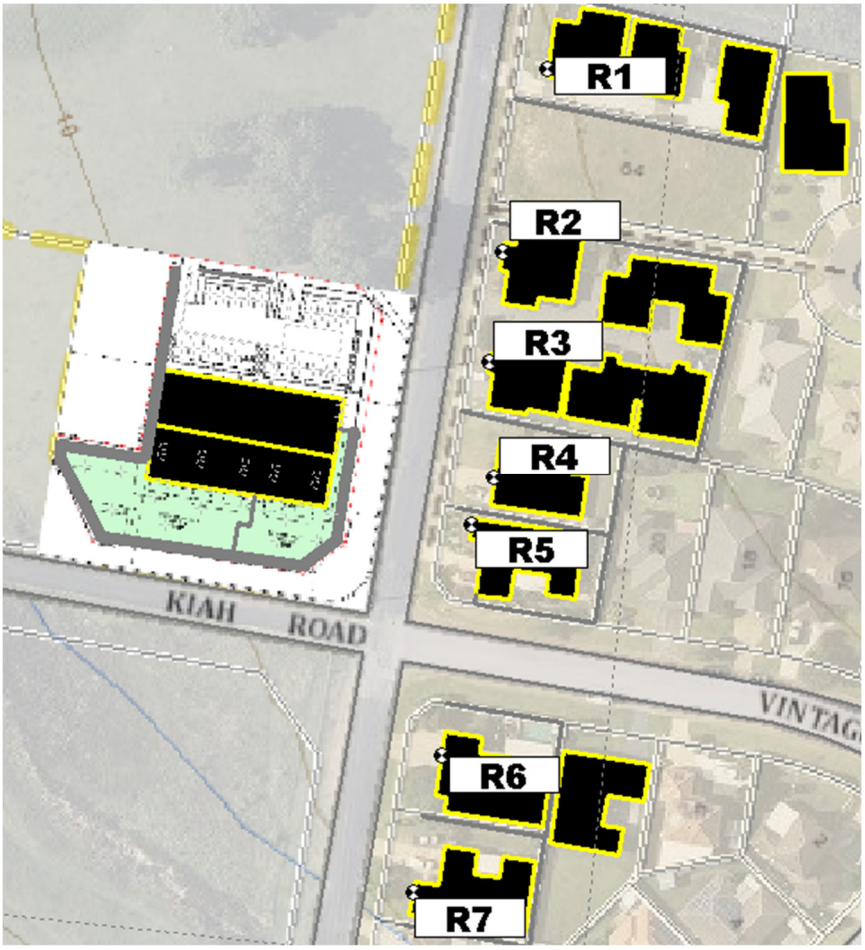


Figure 7. Assessment locations – Outdoor play areas assessment

5.7.3 Calculated receiver levels

The following noise levels are calculated for each of the identified assessment locations:

Table 16. Calculated noise levels, L_{Amax}[dB]

Assessment location	Noise criteria	Calculated noise level
Residential / 68 Ryans Road, Gilleston Heights	52	25
Residential / 64 Ryans Road, Gilleston Heights	52	30
Residential / 62 Ryans Road, Gilleston Heights	52	32
Residential / 60 Ryans Road, Gilleston Heights	52	30
Residential / 22 Vintage Drive, Gilleston Heights	52	29
Residential / 13 Vintage Drive, Gilleston Heights	52	22
Residential / 54 Ryans Road, Gilleston Heights	52	19

5.7.4 Recommendations – sleep disturbance

The following noise controls are recommended for the early-morning staff arrivals:

- All staff members on-site before 7 am should take care to make as little noise as possible.

6.0 SUMMARY OF RECOMMENDATIONS

6.1 OUTDOOR PLAY AREA RECOMMENDATIONS

- No more than 40 kids should occupy outdoor play area 2 (2-5 years old) at any one time.
- A 1.8-meter solid noise barrier must be installed around the boundaries of the outdoor play areas.
- The noise barriers are to be constructed of either:
    f. Double-lapped and capped timber.
    g. 9 mm fibre cement sheeting fixed to a suitable framing structure.
    h. Masonry (70 mm thick or above).
    i. Transparent materials such as 10.38 mm laminated glass or 15 mm thick Perspex panels.
    j. Proprietary noise wall solutions such as SlimWall by Modular Walls or similar.
- It is to be noted that gaps between the panels and the posts or the ground will significantly reduce the effectiveness of the noise barrier and may lead to non-compliant noise levels at the adjoining premises. Therefore, all gaps should be minimised.

6.2 INDOOR PLAY AREAS / MECHANICAL PLANT / PARKING AREAS

- Sliding doors and windows should remain closed when children are playing indoors, and the noise levels of children should be managed where possible.
- The mechanical plant and equipment used in this assessment is indicative of typical mechanical plant that could be expected to be in use on a similar site, however, a detailed mechanical plant and equipment design should be carried out by a mechanical engineer and a detailed noise assessment should be undertaken before construction.
- The AC condenser units used in this assessment were Daikin RXYMQ9AY1.
- The kitchen exhaust fan used in this assessment was a Fantech CPE0406FR.

6.3 MITIGATION OF SLEEP DISTURBANCE

- All staff members on-site before 7 am should take care to make as little noise as possible.

7.0 CONCLUSION

Koikas Acoustics was requested to conduct an acoustical assessment and prepare a report for the proposed development of a childcare centre at 41-63 Ryans Road, Gillieston Heights. The acoustical report is to accompany a development application to be submitted to Maitland City Council.

The assessment considers potential noise impacts on future occupants of the development, and surrounding residents such that acceptable acoustic amenity is maintained.

Acoustic planning levels have been referenced from current EPA RNP, SEPP, CCPG, POEO, and AAAC Guidelines acoustic planning guidelines and requirements.

The included recommendations are based on designs prepared by Shaddock Architects.

The conclusions reached in this acoustical report should assist Council in making their determination of the proposal. A further detailed acoustical report may be required for the CC submission should the building design be amended, or as required by Council.

Of the assessed components of noise, the following conclusions have been reached:

- The childcare centre can achieve an acceptable noise outcome for neighbouring residents provided that several noise controls are included within the design and operation of the facility. These recommendations are outlined in detail within the preceding sections of this report. It must be noted that the predictions of this report include typical noise attributed to mechanical plant and equipment, as such, a detailed mechanical plant assessment should be conducted before construction.

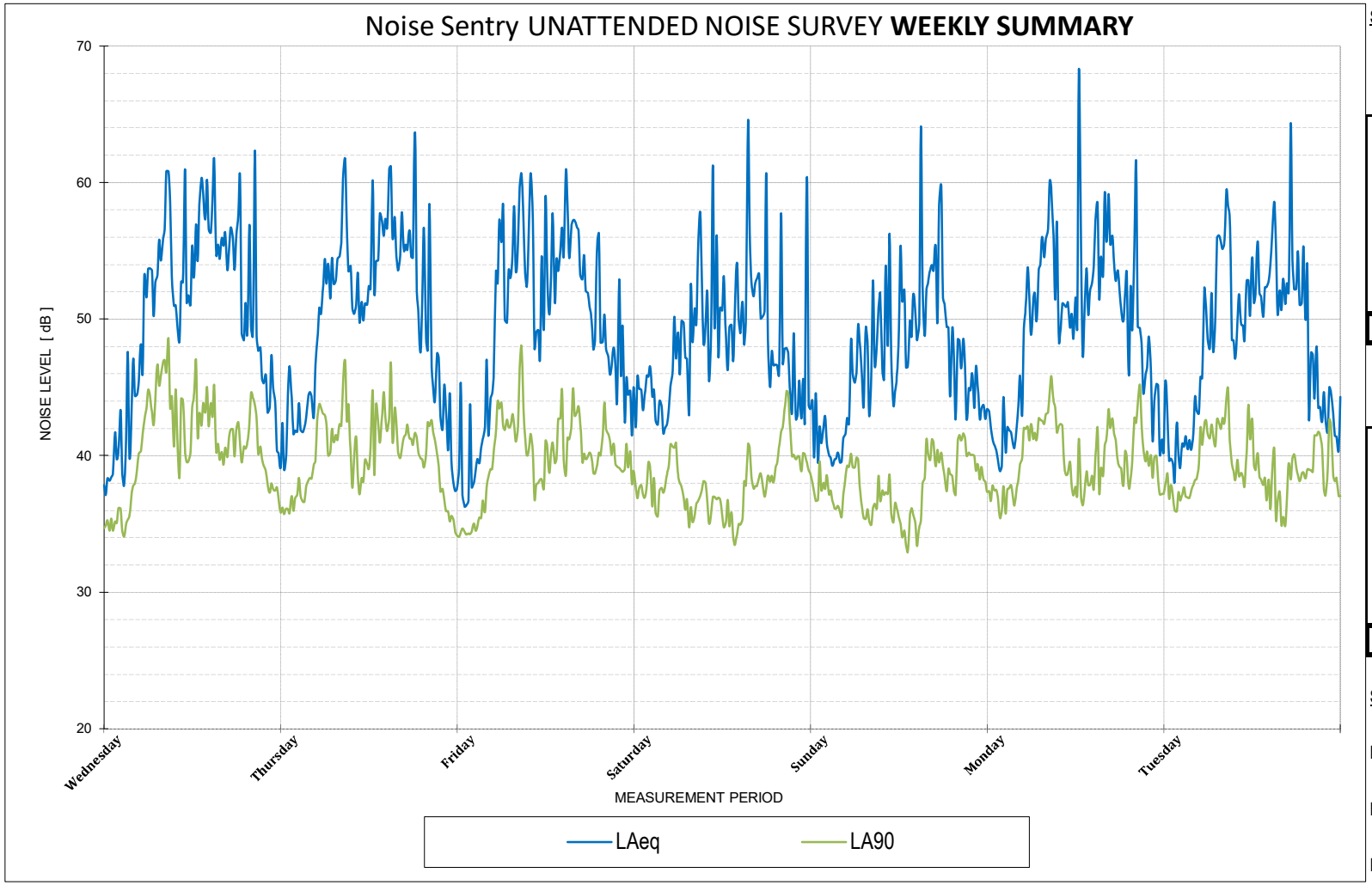
In our professional opinion, there is sufficient scope within the proposed building design to achieve the applied acoustic planning guidelines.

APPENDIX A

APPENDIX A

APPENDIX A

WEEKLY SUMMARY **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **PERIOD:** 20 to 26 November 2024



Sundays and Public Holidays the hours change to 0800

NSRT Noise Sentry 10

SUMMARY OF AMBIENT LEVELS

	LA90 Daytime	*LA90* Evening	*LA90* Night-time
Day 1	40	40	35
Day 2	39	39	36
Day 3	38	39	34
Day 4	35	38	37
Day 5	34	37	36
Day 6	37	38	37
Day 7	36	38	37
RBL	**37**	**38**	**36**

	LAeq Daytime	*LAeq* Evening	*LAeq* Night-time
Day 1	57	55	47
Day 2	56	55	47
Day 3	56	50	49
Day 4	54	52	46
Day 5	54	48	48
Day 6	56	53	46
Day 7	55	50	45
Average	**55**	**52**	**47**

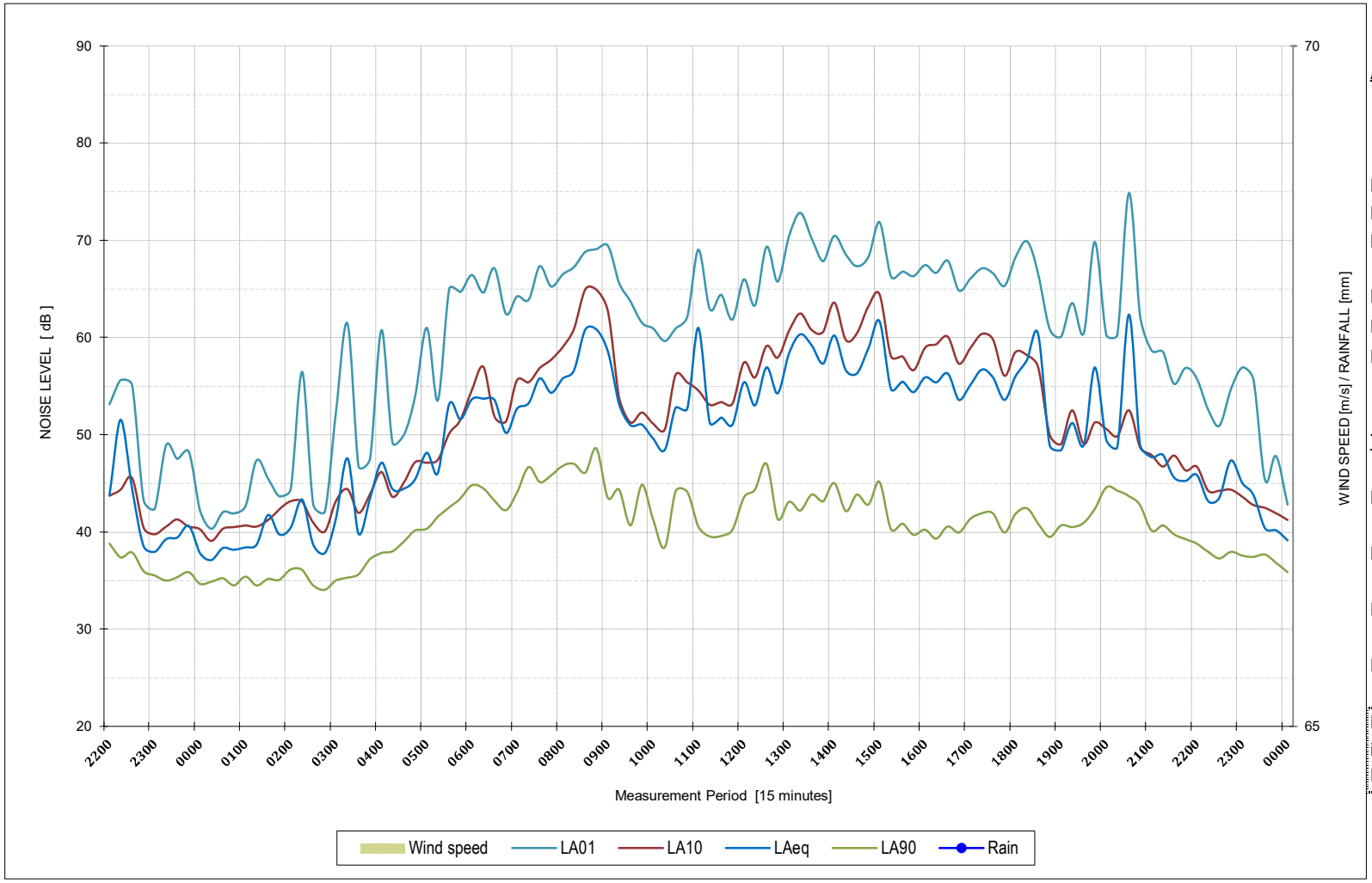
SUMMARY OF TRAFFIC LEVELS

LAeq 15 hrs	0700-2200	55	dB
LAeq 9 hrs	2200-0700	47	dB
Max LAeq 1 hr	0700-2200	58	dB
Max LAeq 1 hr	2200-0700	52	dB

Maximum noise events as defined in the Environmental Noise Management Manual 7 day average - [LAmax - LAeq ≥ 15]	19

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 1 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Wednesday, 20 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	40	dB
LA90 Evening	1800-2200	40	dB
LA90 Night-time	2200-0700	35	dB
LAeq Daytime	0700-1800	57	dB
LAeq Evening	1800-2200	55	dB
LAeq Night-time	2200-0700	47	dB

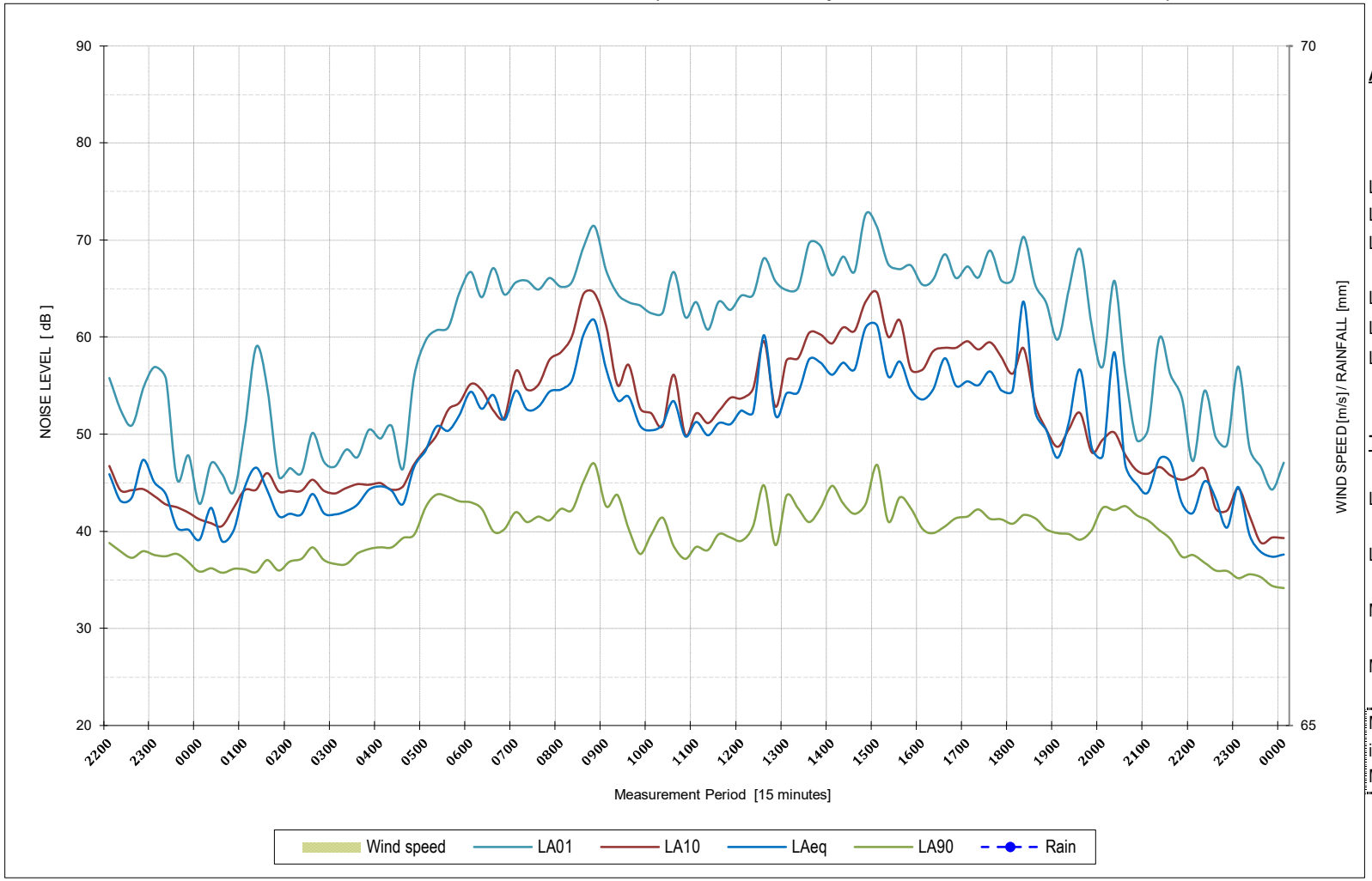
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	56	dB
LAeq 9 hours	2200-0700	47	dB
Max LAeq 1 hour	0700-2200	59	dB
Max LAeq 1 hour	2200-0700	52	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	22

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 2 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Thursday, 21 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	39	dB
LA90 Evening	1800-2200	39	dB
LA90 Night-time	2200-0700	36	dB
LAeq Daytime	0700-1800	56	dB
LAeq Evening	1800-2200	55	dB
LAeq Night-time	2200-0700	47	dB

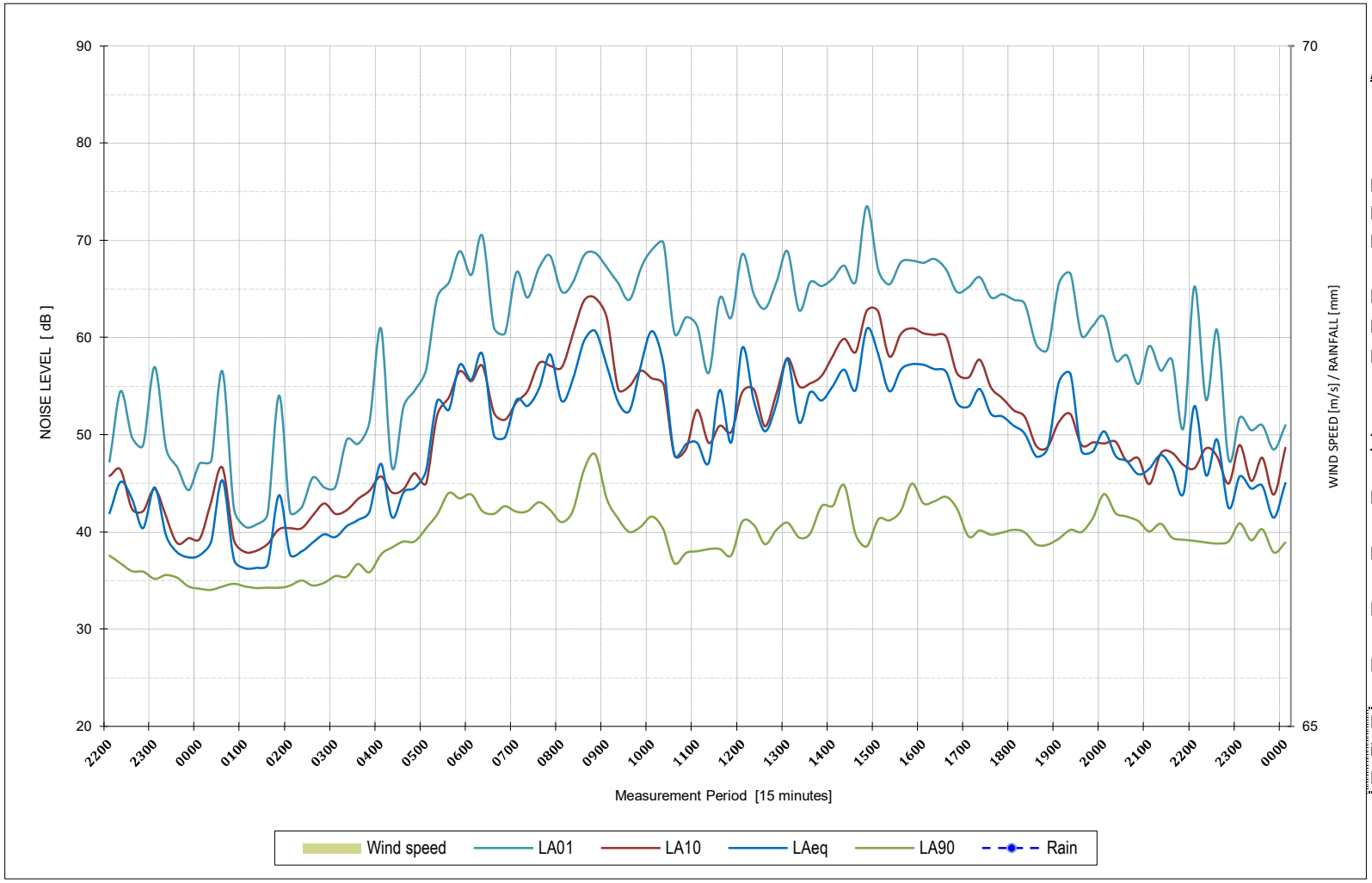
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	56	dB
LAeq 9 hours	2200-0700	47	dB
Max LAeq 1 hour	0700-2200	59	dB
Max LAeq 1 hour	2200-0700	52	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	23

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 3 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Friday, 22 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	38	dB
LA90 Evening	1800-2200	39	dB
LA90 Night-time	2200-0700	34	dB
LAeq Daytime	0700-1800	56	dB
LAeq Evening	1800-2200	50	dB
LAeq Night-time	2200-0700	49	dB

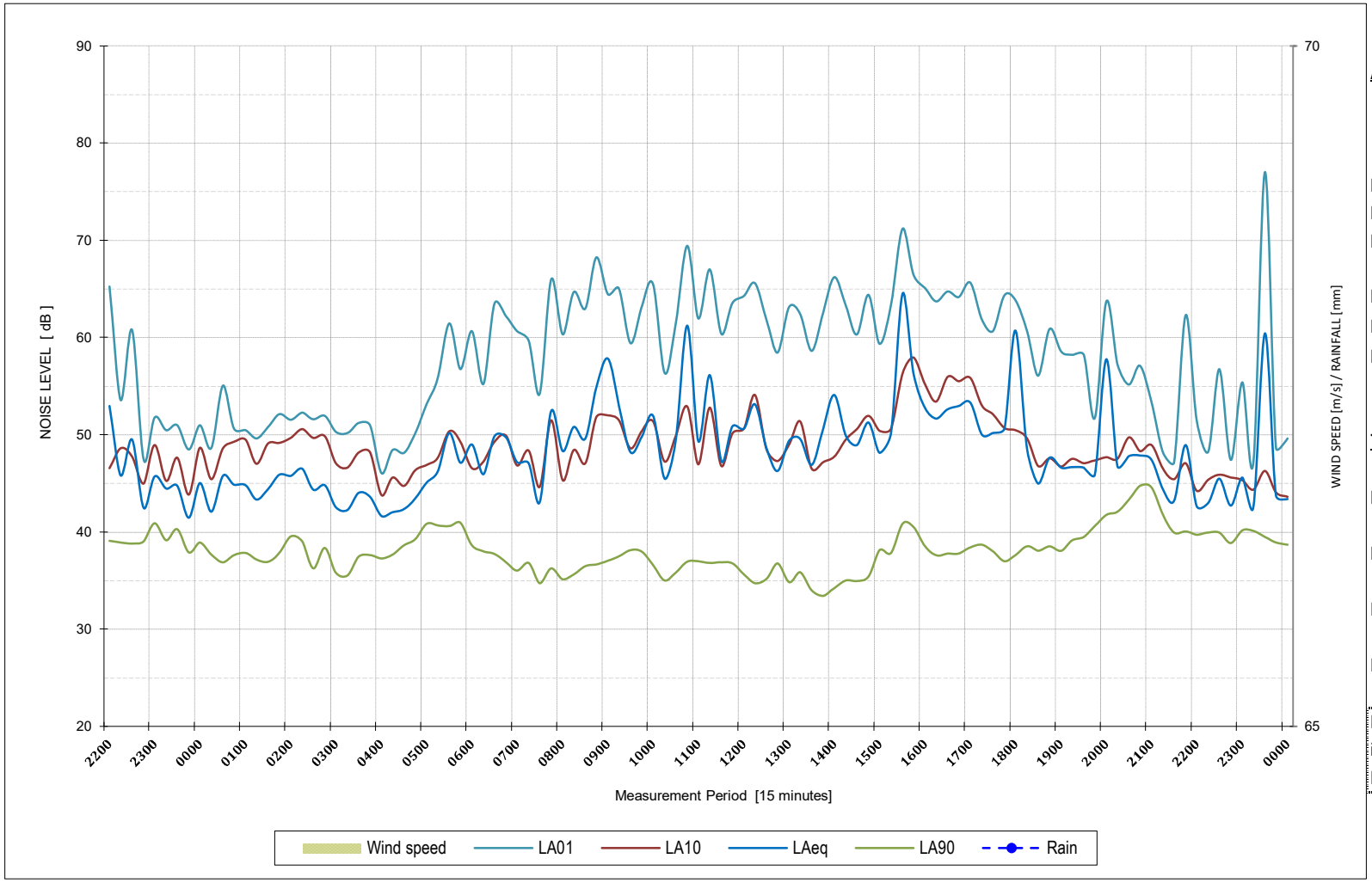
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	55	dB
LAeq 9 hours	2200-0700	49	dB
Max LAeq 1 hour	0700-2200	58	dB
Max LAeq 1 hour	2200-0700	55	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	18

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 4 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Saturday, 23 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	35	dB
LA90 Evening	1800-2200	38	dB
LA90 Night-time	2200-0700	37	dB
LAeq Daytime	0700-1800	54	dB
LAeq Evening	1800-2200	52	dB
LAeq Night-time	2200-0700	46	dB

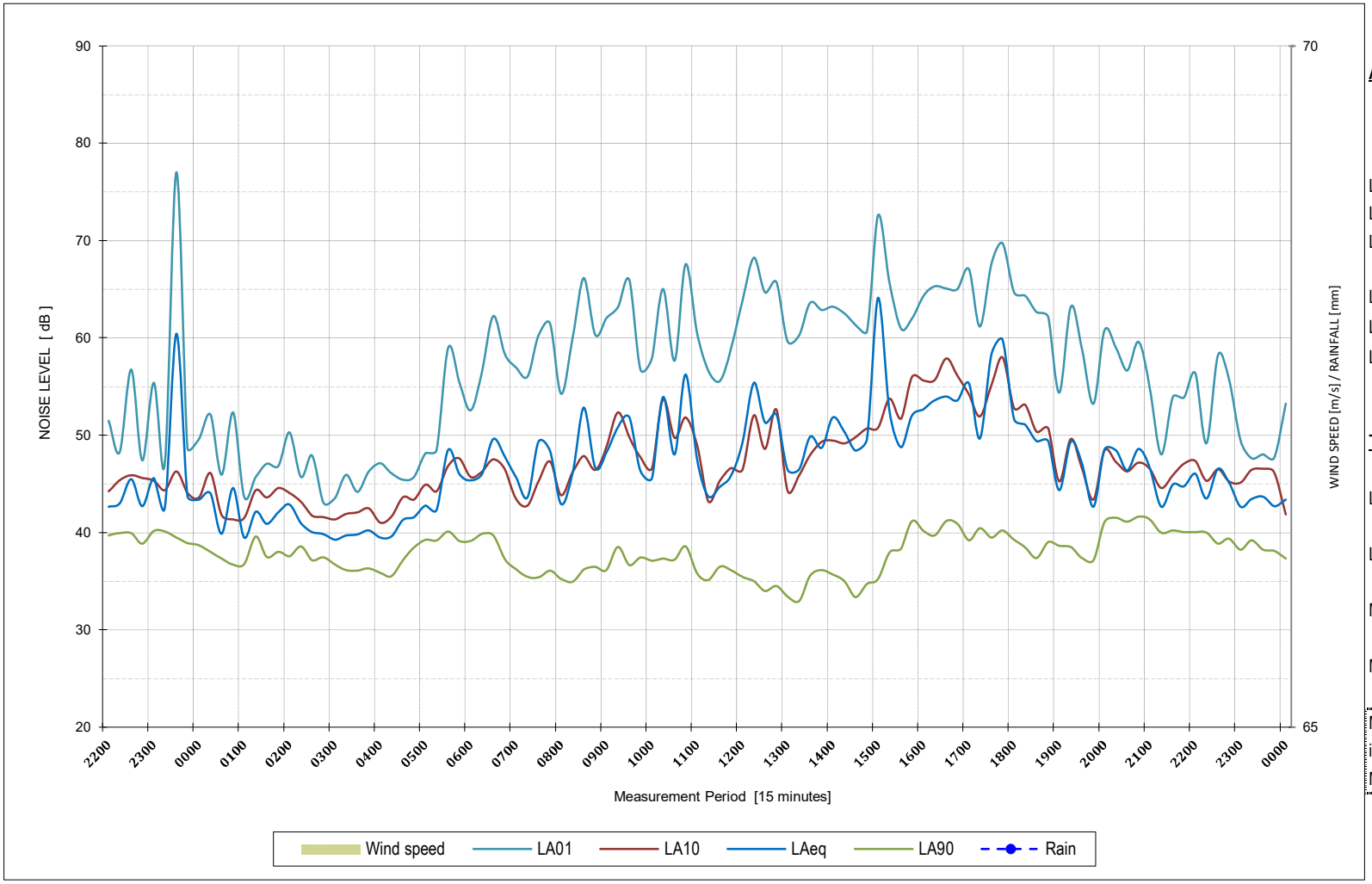
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	53	dB
LAeq 9 hours	2200-0700	46	dB
Max LAeq 1 hour	0700-2200	56	dB
Max LAeq 1 hour	2200-0700	48	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	12

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 5 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Sunday, 24 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0800-1800	34	dB
LA90 Evening	1800-2200	37	dB
LA90 Night-time	2200-0800	36	dB
LAeq Daytime	0800-1800	54	dB
LAeq Evening	1800-2200	48	dB
LAeq Night-time	2200-0800	48	dB

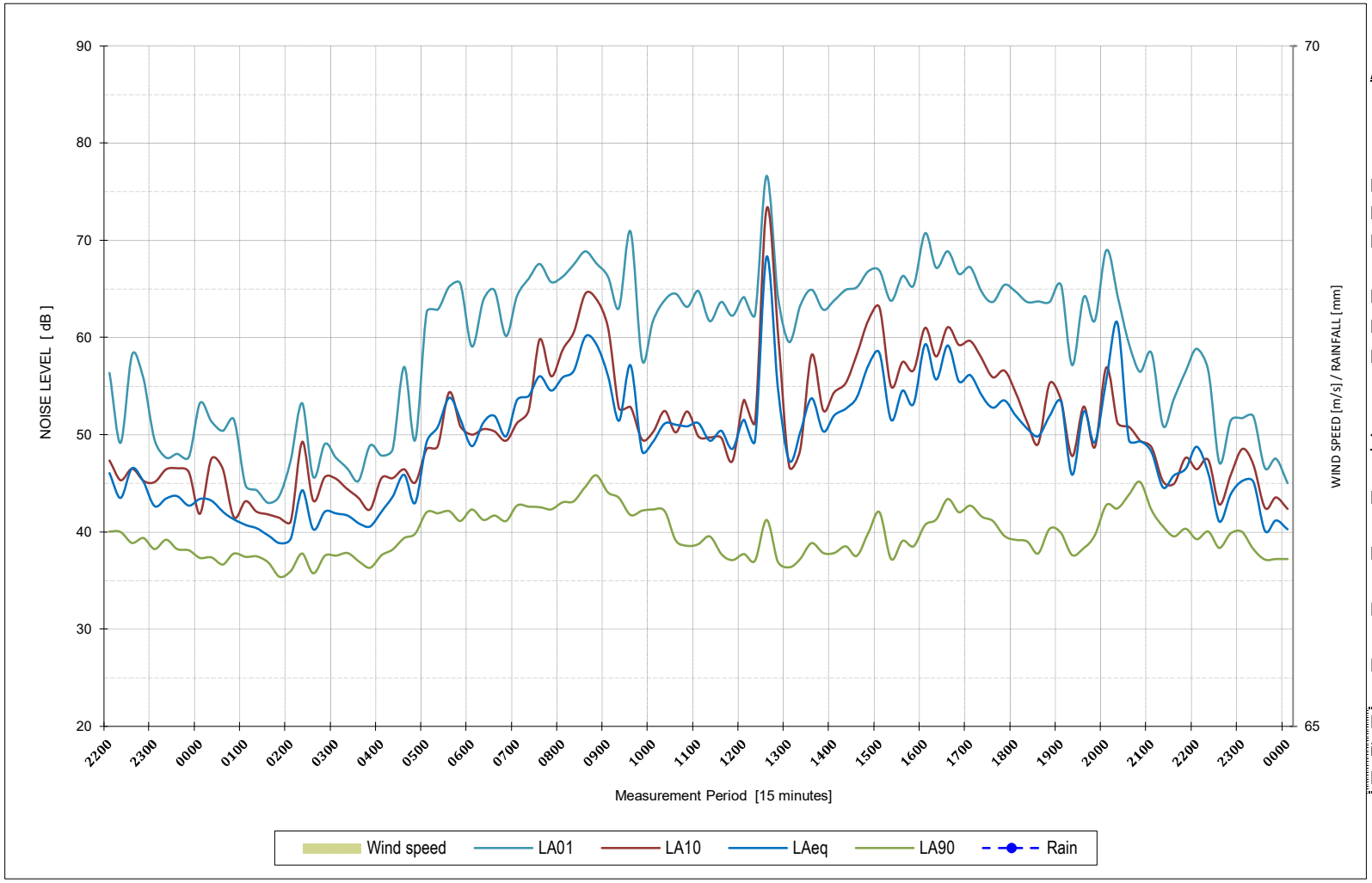
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	52	dB
LAeq 9 hours	2200-0700	48	dB
Max LAeq 1 hour	0700-2200	57	dB
Max LAeq 1 hour	2200-0700	53	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	19

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 6 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Monday, 25 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	37	dB
LA90 Evening	1800-2200	38	dB
LA90 Night-time	2200-0700	37	dB
LAeq Daytime	0700-1800	56	dB
LAeq Evening	1800-2200	53	dB
LAeq Night-time	2200-0700	46	dB

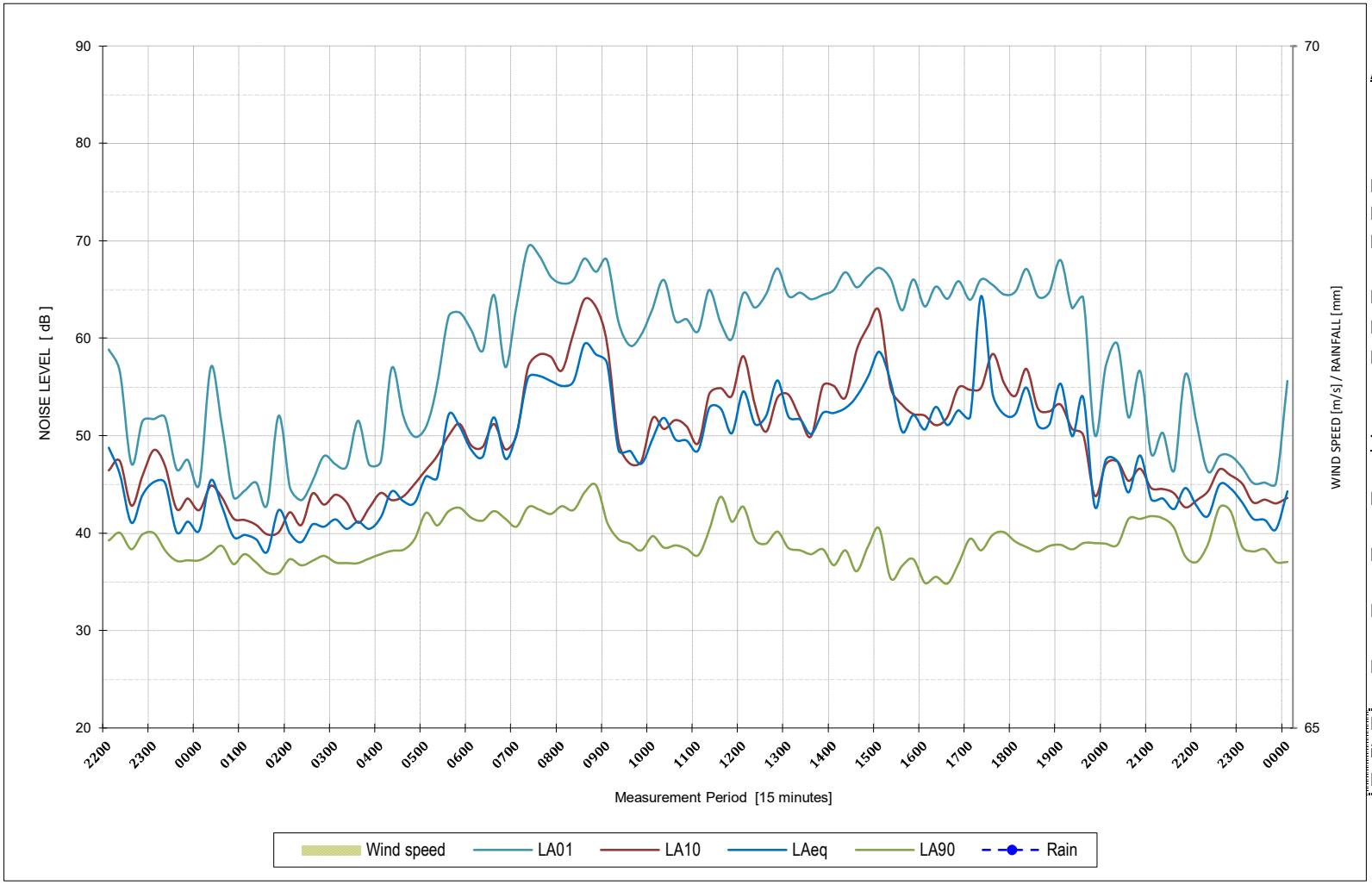
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	56	dB
LAeq 9 hours	2200-0700	46	dB
Max LAeq 1 hour	0700-2200	58	dB
Max LAeq 1 hour	2200-0700	51	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	18

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 7 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Tuesday, 26 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	36	dB
LA90 Evening	1800-2200	38	dB
LA90 Night-time	2200-0700	37	dB
LAeq Daytime	0700-1800	55	dB
LAeq Evening	1800-2200	50	dB
LAeq Night-time	2200-0700	45	dB

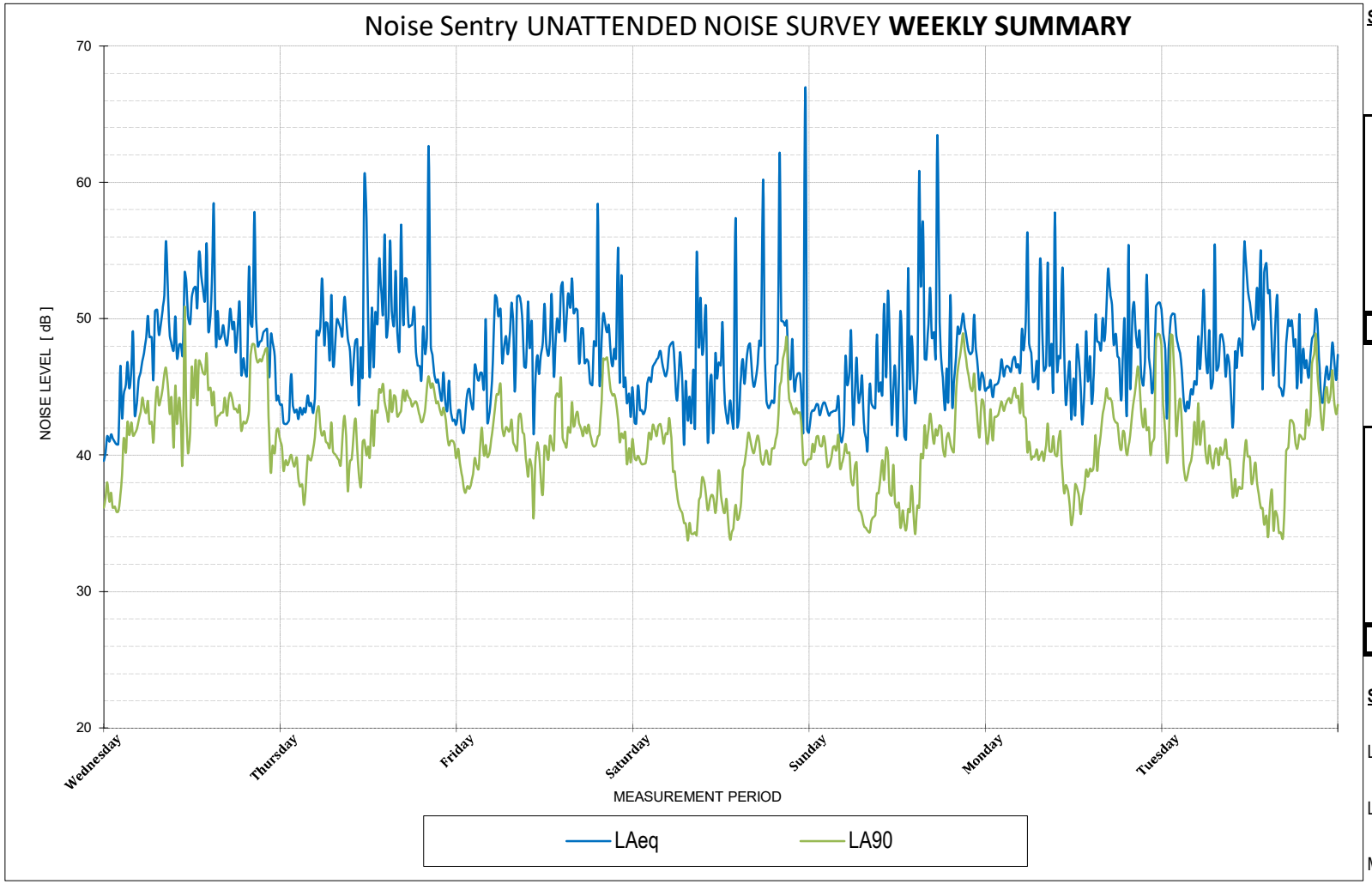
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	54	dB
LAeq 9 hours	2200-0700	45	dB
Max LAeq 1 hour	0700-2200	57	dB
Max LAeq 1 hour	2200-0700	50	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	23

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

WEEKLY SUMMARY **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **PERIOD:** 20 to 26 November 2024



Sundays and Public Holidays the hours change to 0800

NSRT Noise Sentry 7

SUMMARY OF AMBIENT LEVELS

	LA90 Daytime	*LA90* Evening	*LA90* Night-time
Day 1	42	42	36
Day 2	40	43	38
Day 3	39	41	38
Day 4	34	40	38
Day 5	35	40	36
Day 6	37	41	41
Day 7	35	41	39
RBL	**37**	**41**	**38**

	LAeq Daytime	*LAeq* Evening	*LAeq* Night-time
Day 1	51	51	45
Day 2	52	52	47
Day 3	50	50	46
Day 4	49	52	47
Day 5	52	48	52
Day 6	49	49	48
Day 7	50	48	48
Average	**51**	**50**	**48**

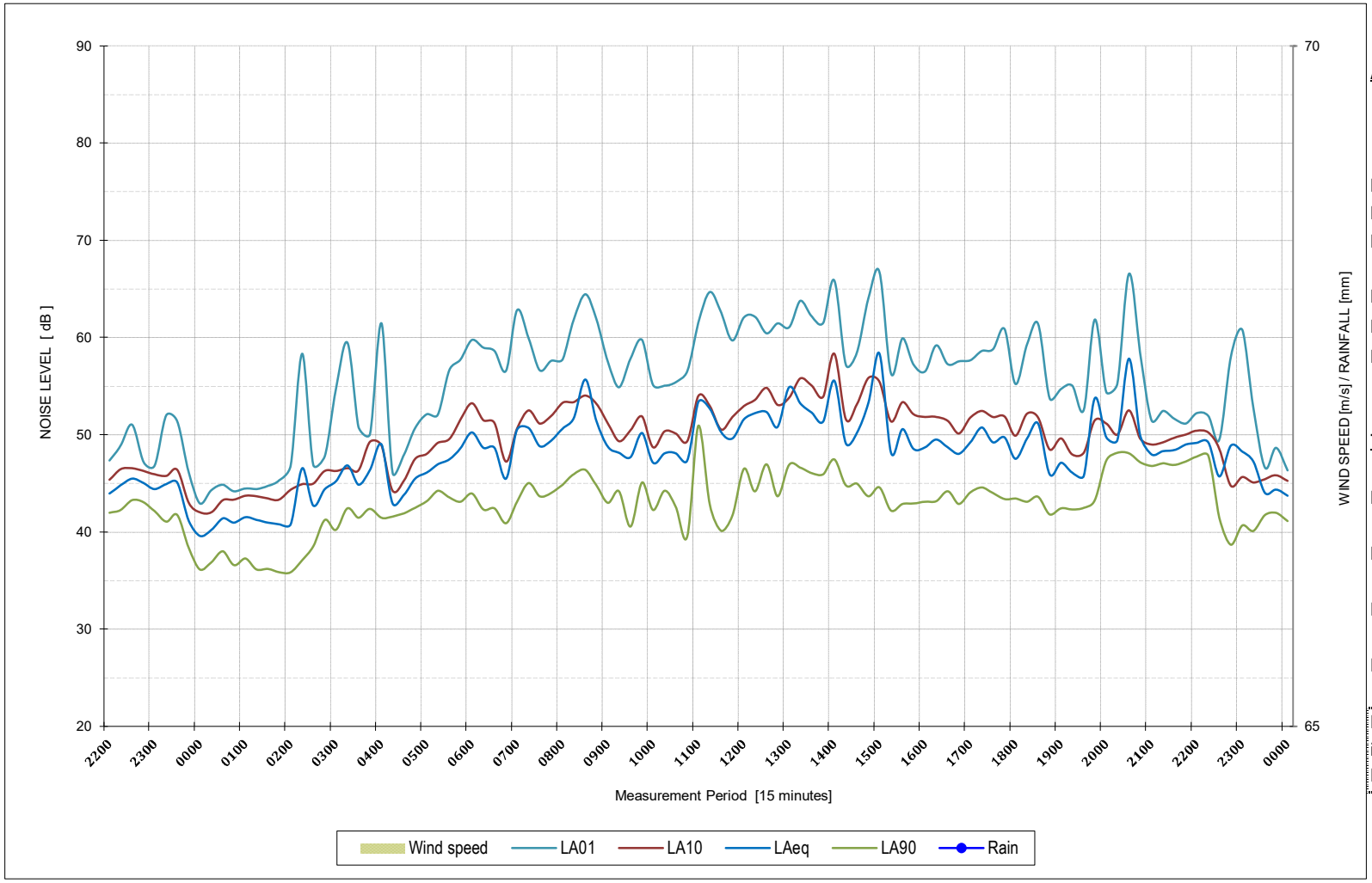
SUMMARY OF TRAFFIC LEVELS

LAeq 15 hrs	0700-2200	50	dB
LAeq 9 hrs	2200-0700	48	dB
Max LAeq 1 hr	0700-2200	53	dB
Max LAeq 1 hr	2200-0700	50	dB

Maximum noise events as defined in the Environmental Noise Management Manual 7 day average - [LAmax - LAeq ≥ 15]	12

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 1 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Wednesday, 20 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	42	dB
LA90 Evening	1800-2200	42	dB
LA90 Night-time	2200-0700	36	dB
LAeq Daytime	0700-1800	51	dB
LAeq Evening	1800-2200	51	dB
LAeq Night-time	2200-0700	45	dB

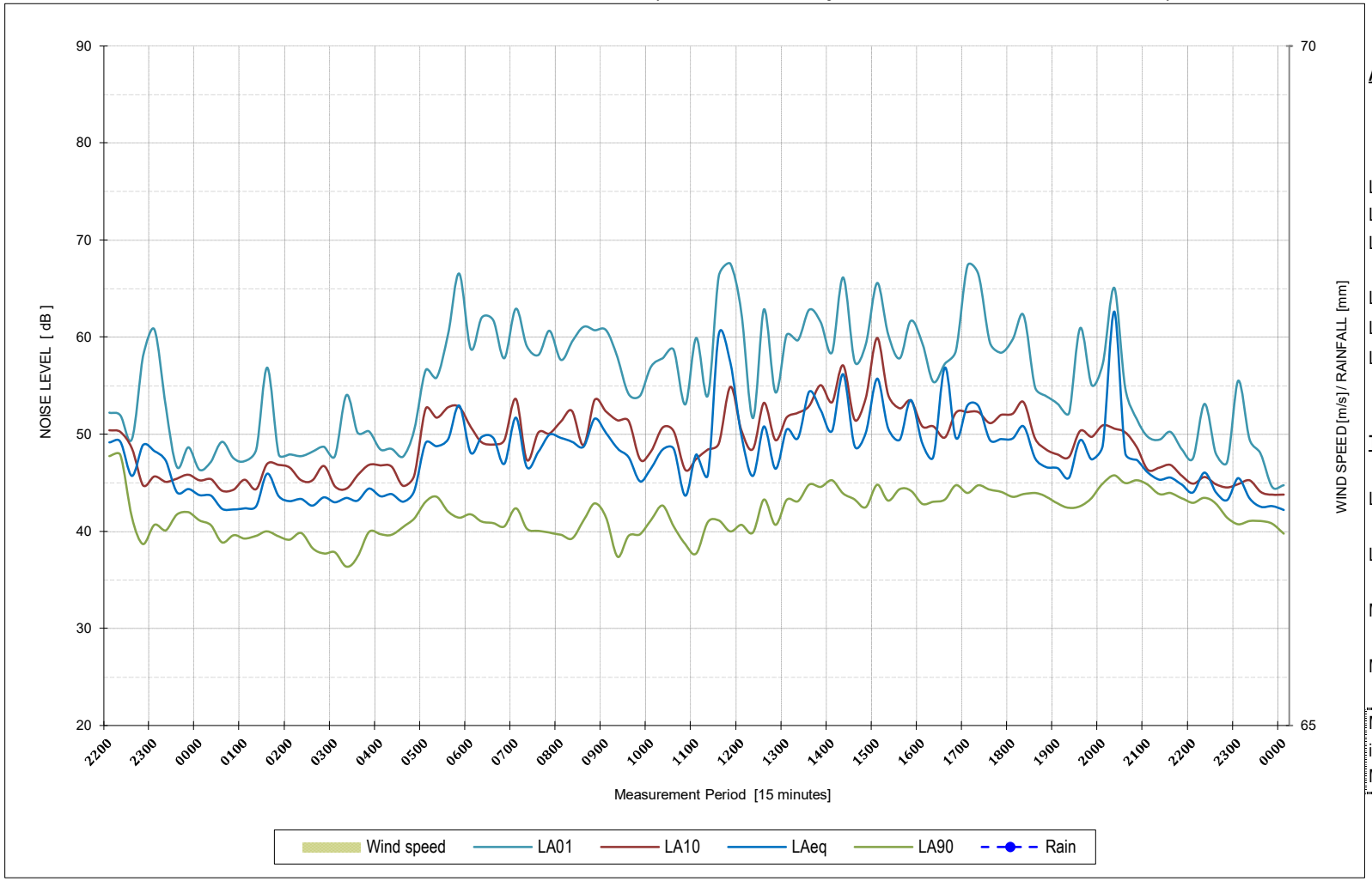
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	51	dB
LAeq 9 hours	2200-0700	45	dB
Max LAeq 1 hour	0700-2200	53	dB
Max LAeq 1 hour	2200-0700	48	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	14

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 2 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Thursday, 21 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	40	dB
LA90 Evening	1800-2200	43	dB
LA90 Night-time	2200-0700	38	dB
LAeq Daytime	0700-1800	52	dB
LAeq Evening	1800-2200	52	dB
LAeq Night-time	2200-0700	47	dB

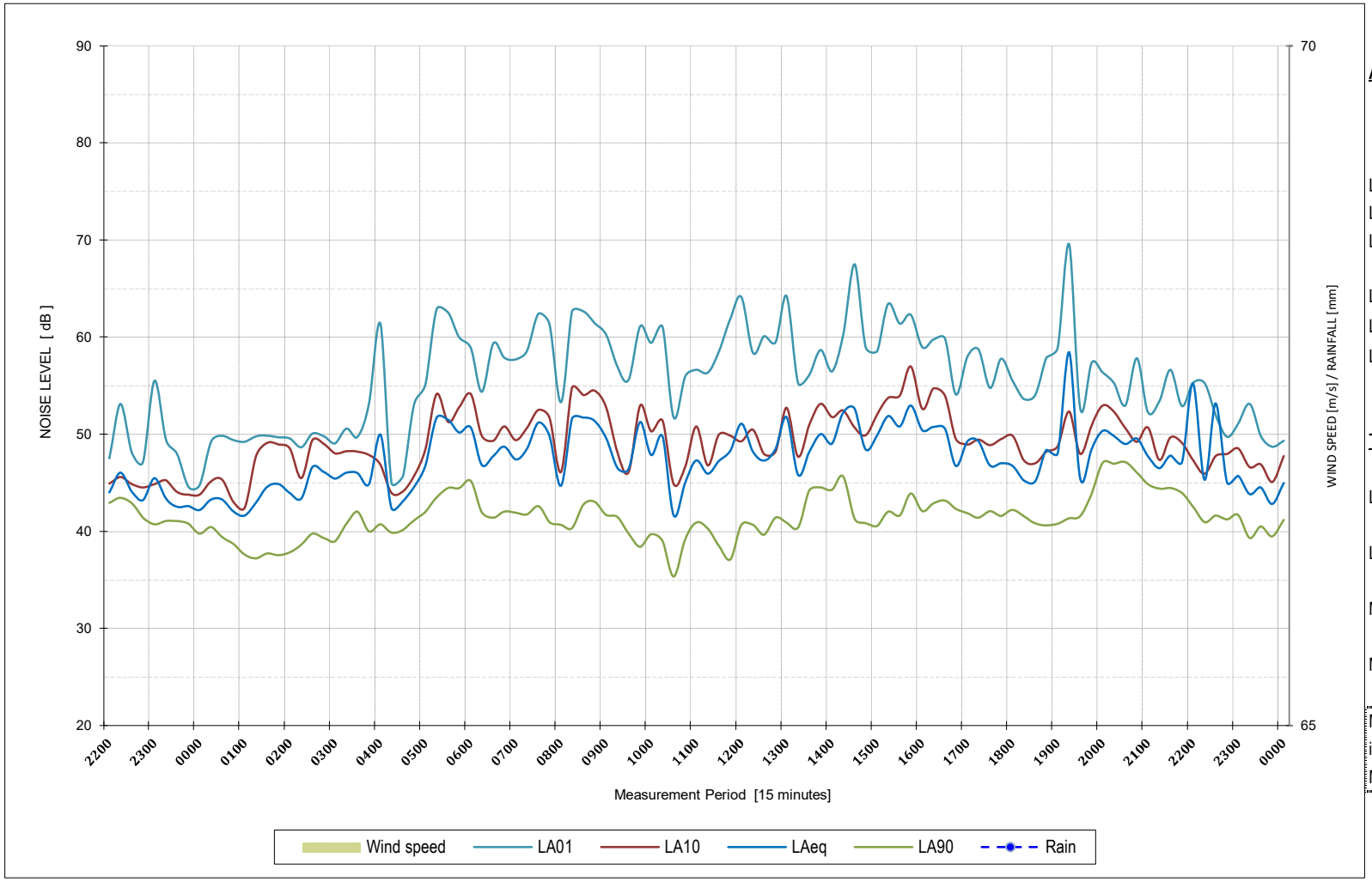
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	52	dB
LAeq 9 hours	2200-0700	47	dB
Max LAeq 1 hour	0700-2200	56	dB
Max LAeq 1 hour	2200-0700	50	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	12

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 3 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Friday, 22 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	39	dB
LA90 Evening	1800-2200	41	dB
LA90 Night-time	2200-0700	38	dB
LAeq Daytime	0700-1800	50	dB
LAeq Evening	1800-2200	50	dB
LAeq Night-time	2200-0700	46	dB

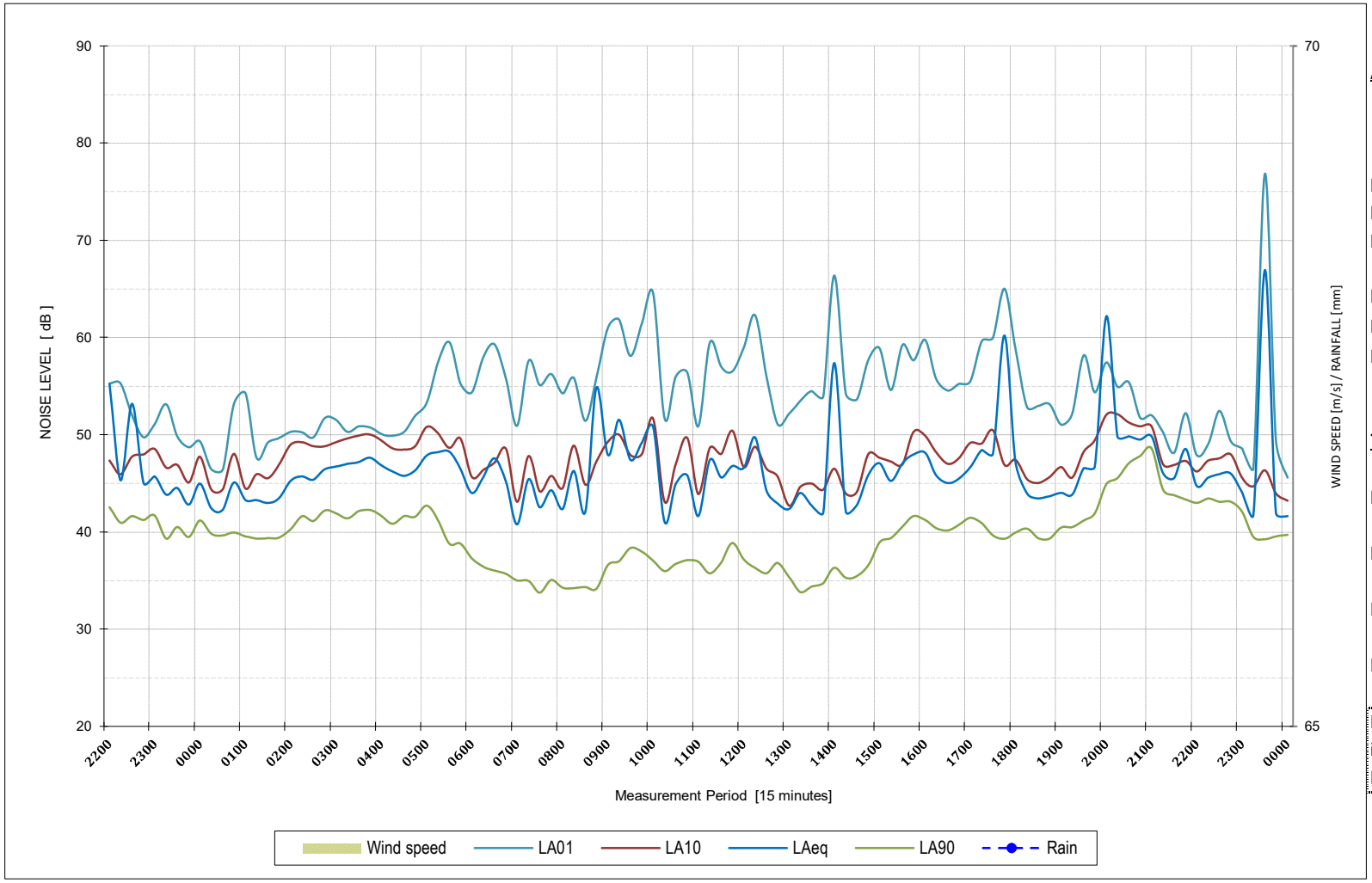
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	50	dB
LAeq 9 hours	2200-0700	46	dB
Max LAeq 1 hour	0700-2200	51	dB
Max LAeq 1 hour	2200-0700	50	dB

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

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 4 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Saturday, 23 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	34	dB
LA90 Evening	1800-2200	40	dB
LA90 Night-time	2200-0700	38	dB
LAeq Daytime	0700-1800	49	dB
LAeq Evening	1800-2200	52	dB
LAeq Night-time	2200-0700	47	dB

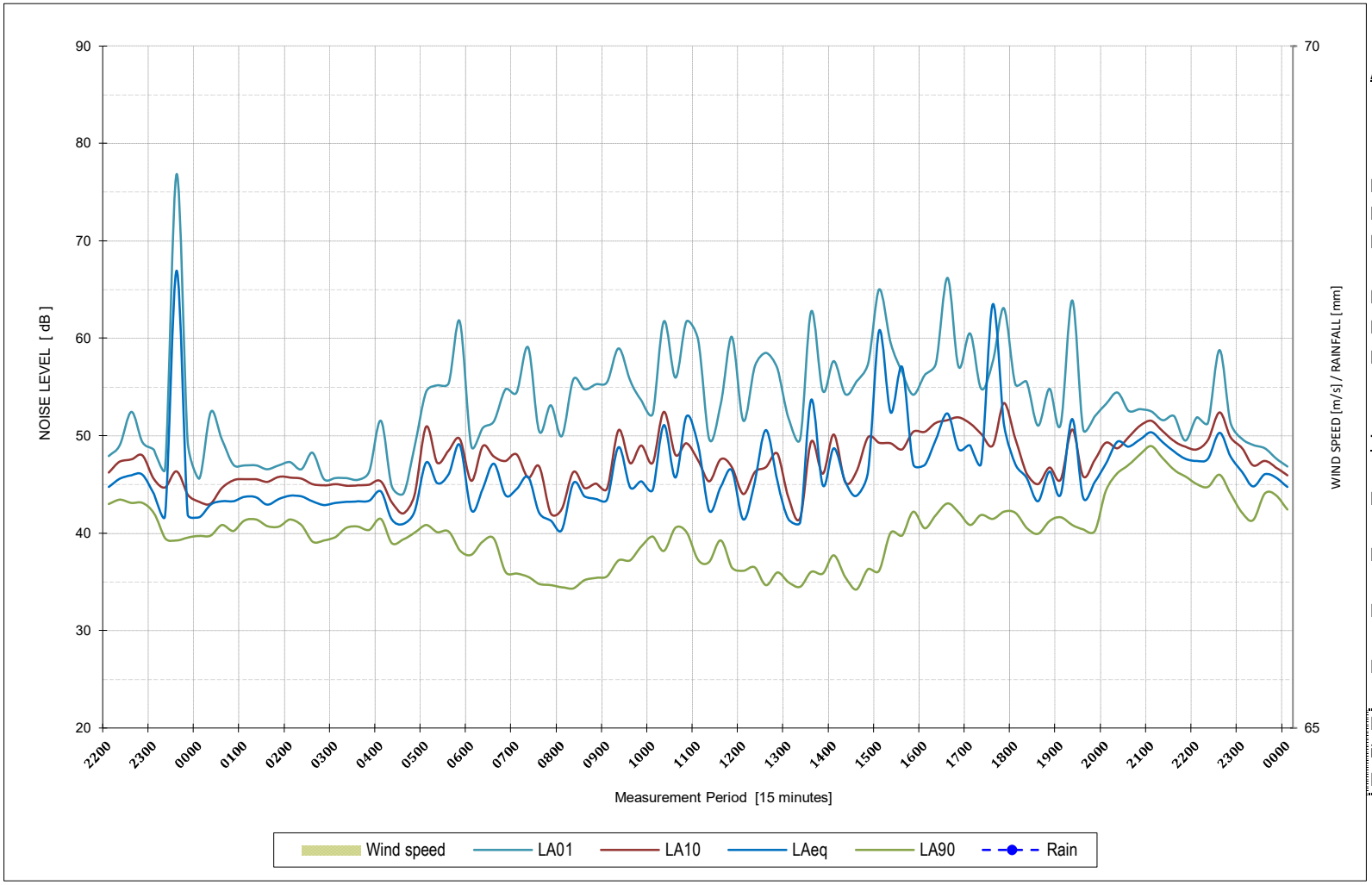
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	50	dB
LAeq 9 hours	2200-0700	47	dB
Max LAeq 1 hour	0700-2200	55	dB
Max LAeq 1 hour	2200-0700	48	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	11

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 5 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Sunday, 24 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0800-1800	35	dB
LA90 Evening	1800-2200	40	dB
LA90 Night-time	2200-0800	36	dB
LAeq Daytime	0800-1800	52	dB
LAeq Evening	1800-2200	48	dB
LAeq Night-time	2200-0800	52	dB

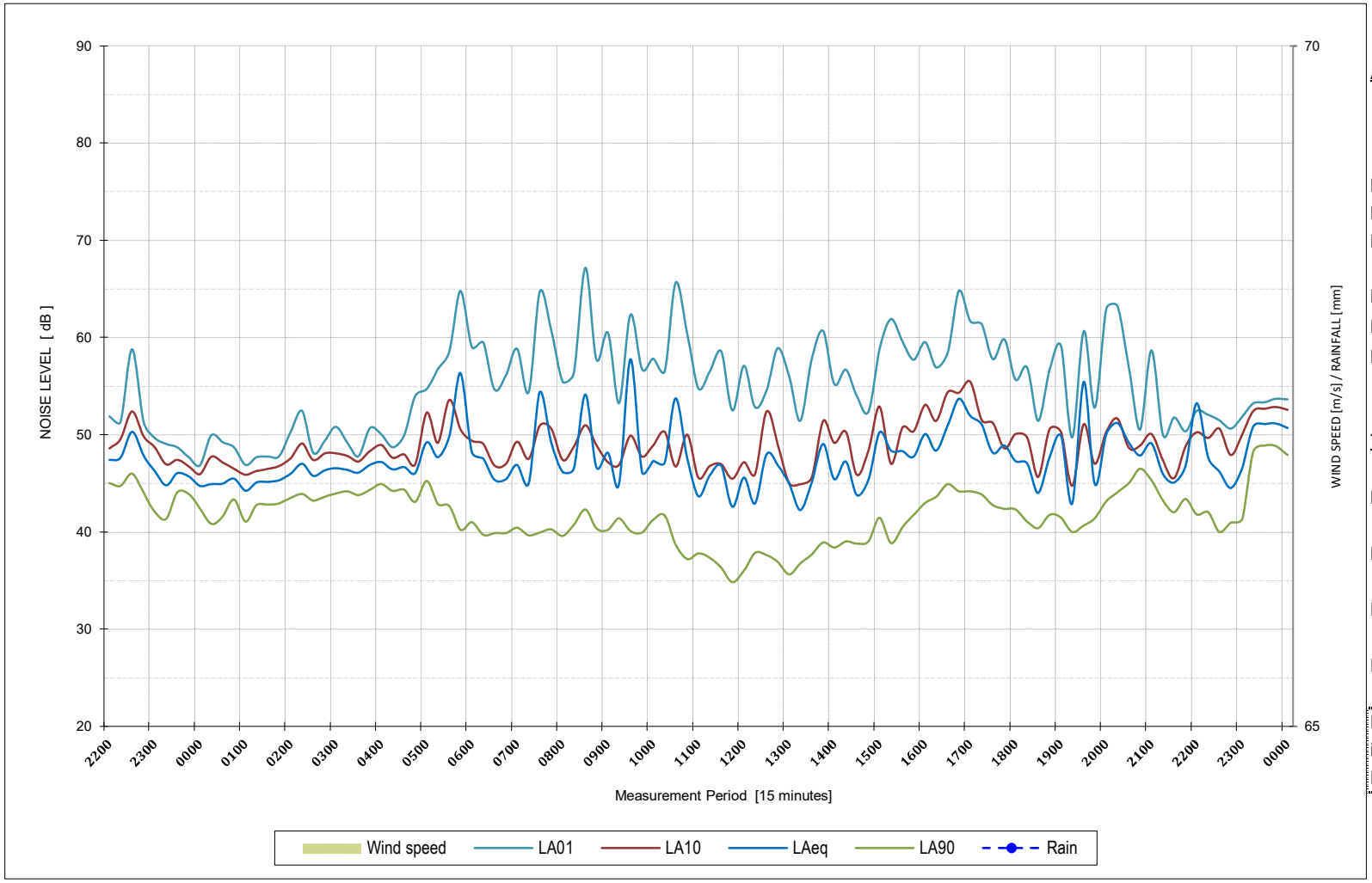
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	51	dB
LAeq 9 hours	2200-0700	53	dB
Max LAeq 1 hour	0700-2200	56	dB
Max LAeq 1 hour	2200-0700	58	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	12

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 6 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Monday, 25 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	37	dB
LA90 Evening	1800-2200	41	dB
LA90 Night-time	2200-0700	41	dB
LAeq Daytime	0700-1800	49	dB
LAeq Evening	1800-2200	49	dB
LAeq Night-time	2200-0700	48	dB

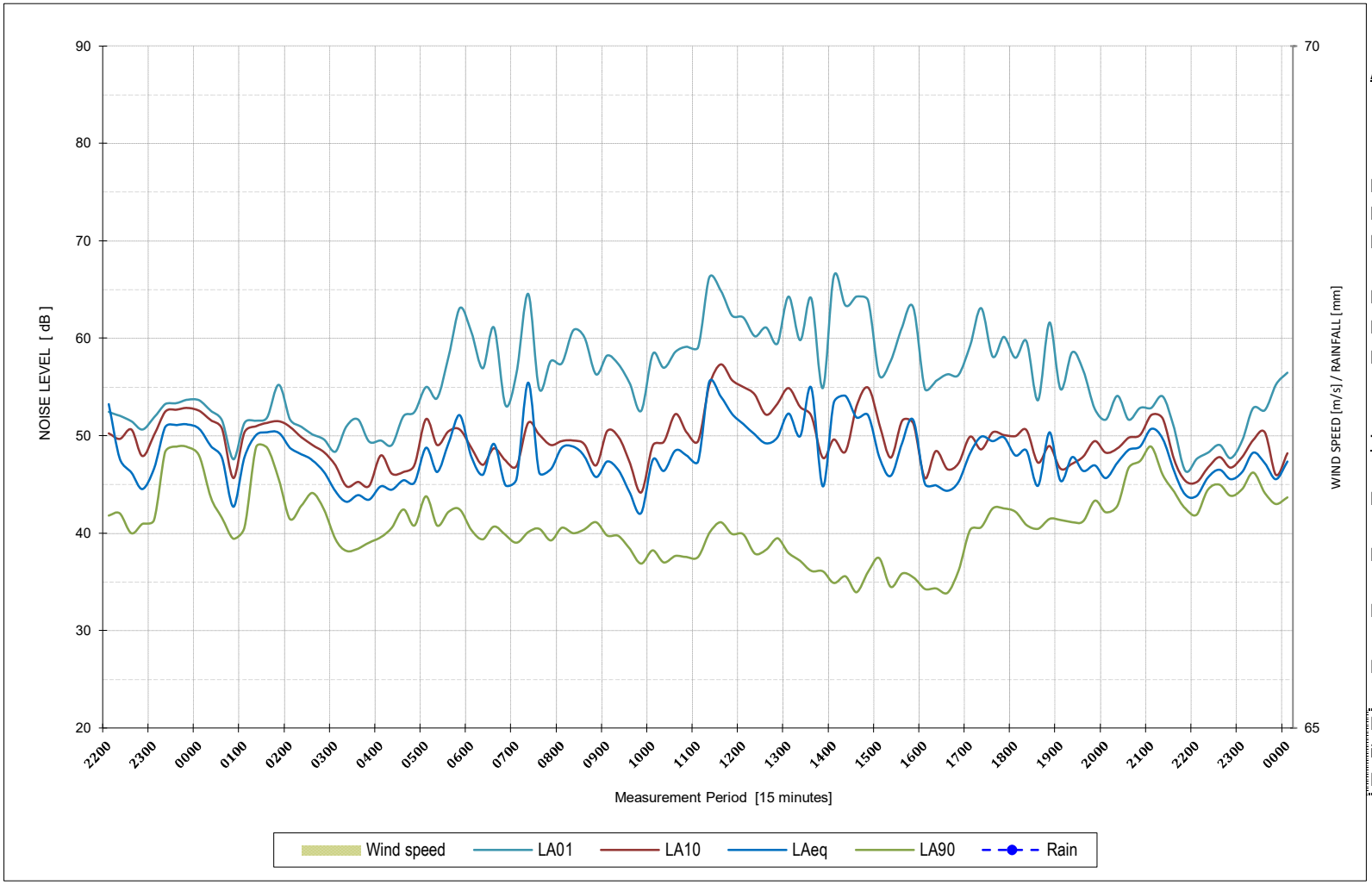
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	49	dB
LAeq 9 hours	2200-0700	48	dB
Max LAeq 1 hour	0700-2200	52	dB
Max LAeq 1 hour	2200-0700	51	dB

Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	6

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

DAY 7 **LOGGER LOCATION:** 43-61 Ryans Road, Gillieston Heights **DATE:** Tuesday, 26 November 2024



AMBIENT NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	35	dB
LA90 Evening	1800-2200	41	dB
LA90 Night-time	2200-0700	39	dB
LAeq Daytime	0700-1800	50	dB
LAeq Evening	1800-2200	48	dB
LAeq Night-time	2200-0700	48	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	50	dB
LAeq 9 hours	2200-0700	48	dB
Max LAeq 1 hour	0700-2200	52	dB
Max LAeq 1 hour	2200-0700	50	dB

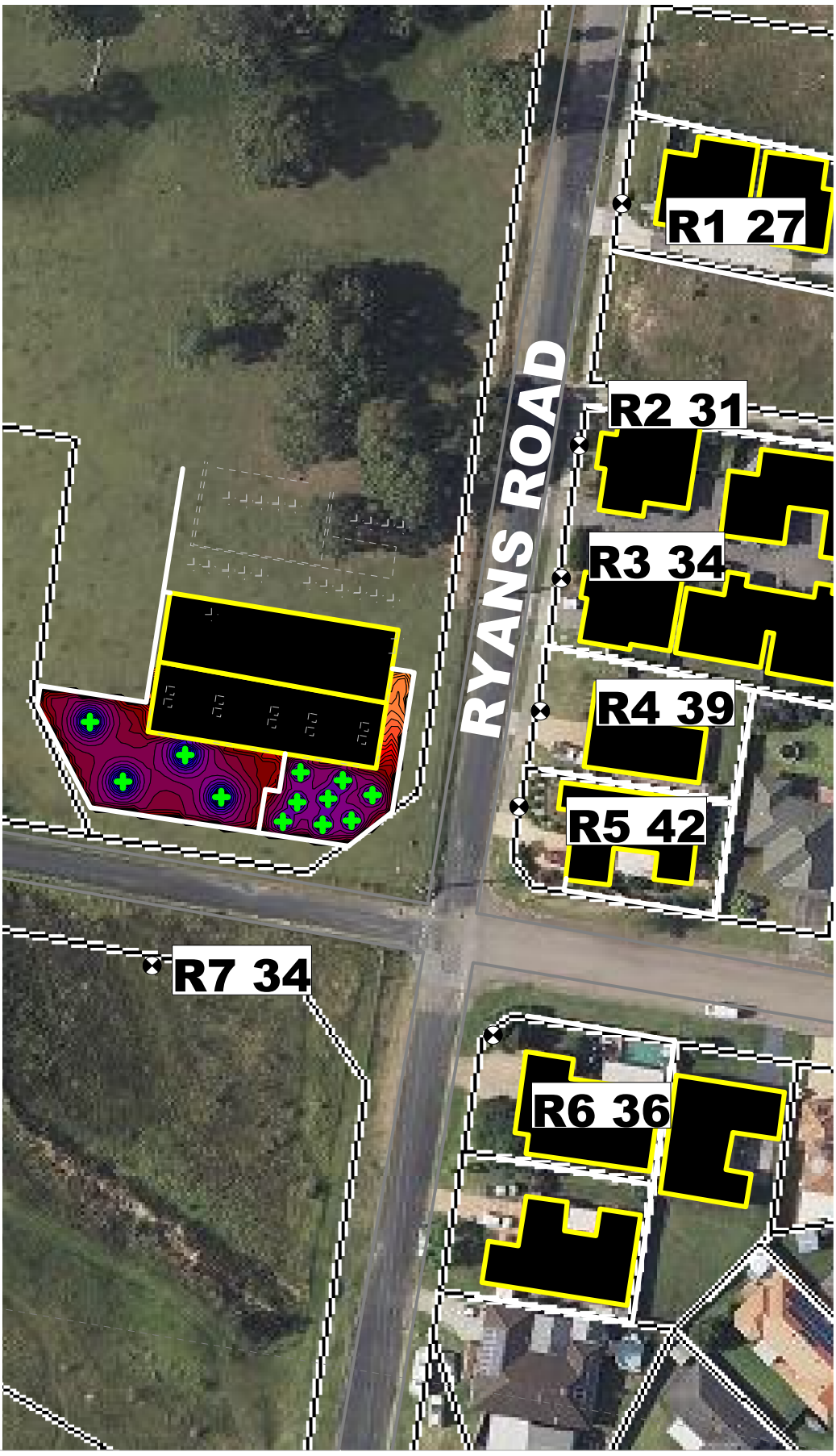
Maximum noise events as defined in the Environmental Noise Management Manual [LAmax - LAeq ≥ 15]	11

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

APPENDIX B

APPENDIX B

APPENDIX B



Scenario 1.1
Outdoor Play Areas
**** NOISE SOURCES ****

~ 36 children aged 0-2 years old
~ 20 children aged 3-5 years old

Note:
- LAeq,15minutes noise contours and receiver pointsare at a height of 1.5 m above the natural ground level

- The maximum reading at the nearest resident is 42 dB.

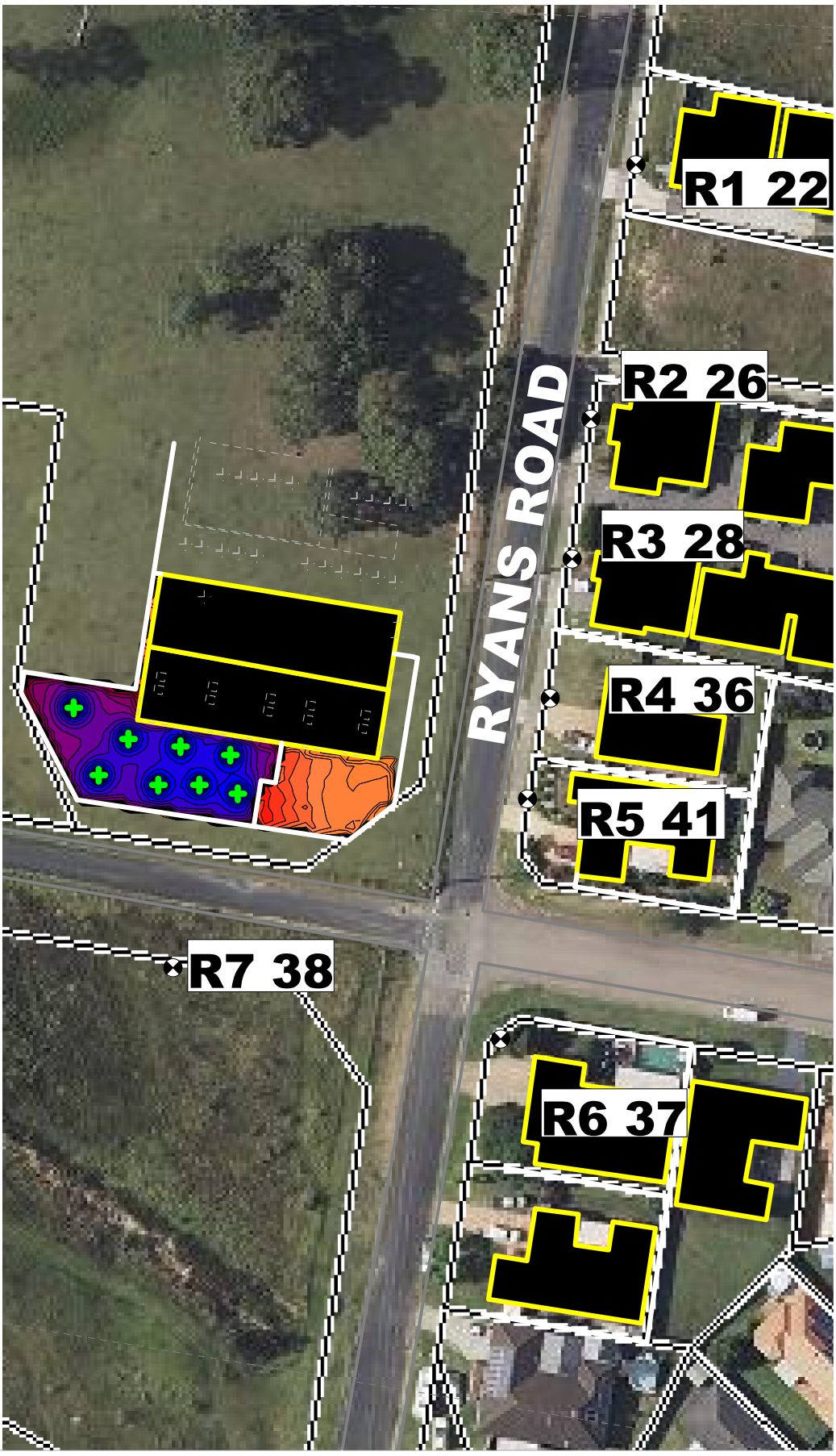
PRINT DATE: 14/02/25

Point Source
Line Source
Area Source
vert. Area Source
Building
Barrier
Ground Absorption
Contour Line
Receiver
Calculation Area

> 40.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 6451
CLIENT: EXP Capital
SITE ADDRESS: 76-81 Ryans Road, Gillieston Heights
ASSESSED TO: AAAC Guidelines
LIMITING CRITERIA: See Acoustic Report



Scenario 1.2
Outdoor Play Areas
**** NOISE SOURCES ****

~ 40 children aged 2-3 years old

Note:
- LAeq,15minutes noise contours and receiver pointsare at a height of 1.5 m above the natural ground level

- The maximum reading at the nearest resident is 41 dB.

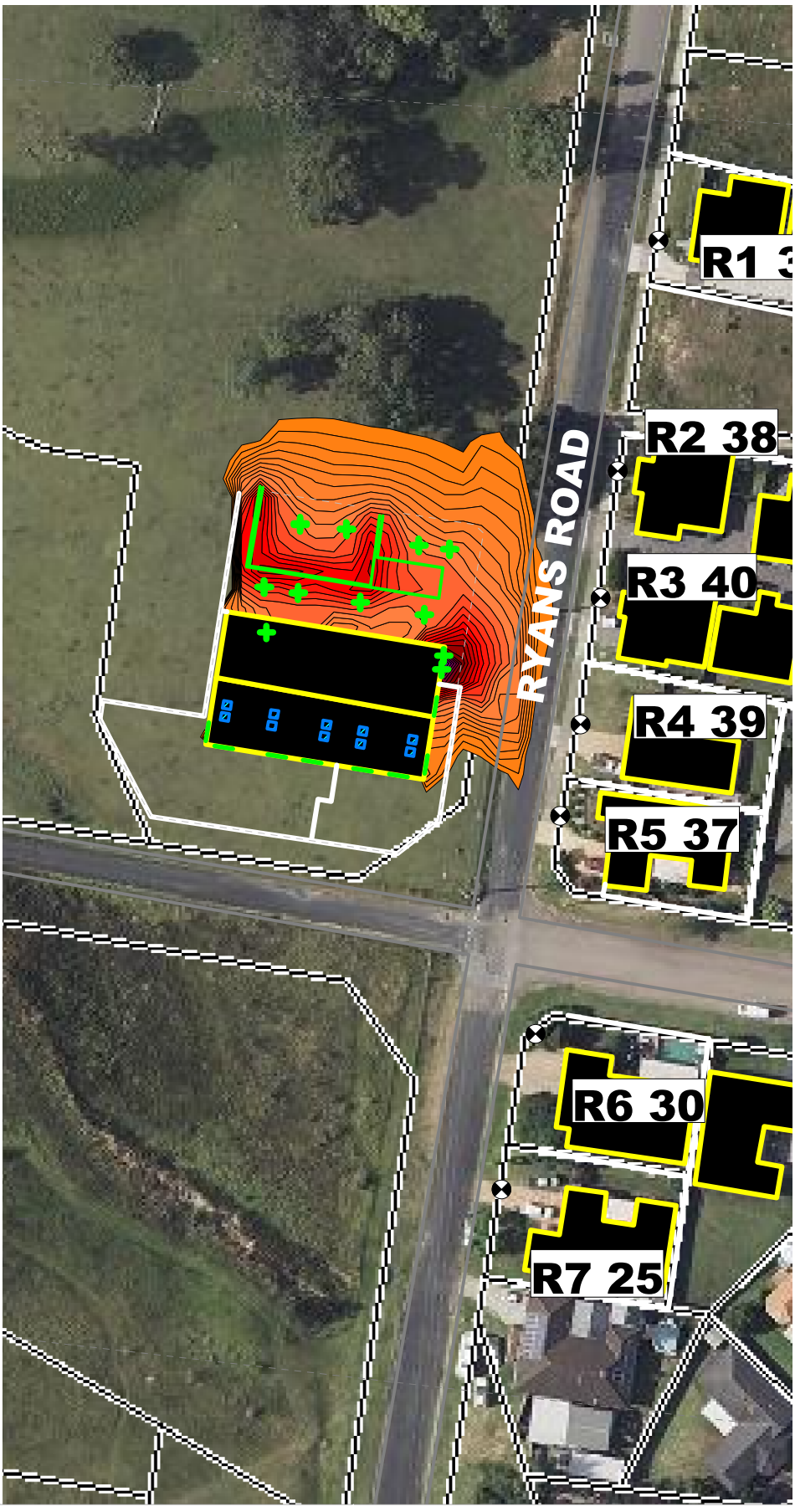
PRINT DATE: 14/02/25

Point Source
Line Source
Area Source
vert. Area Source
Building
Barrier
Ground Absorption
Contour Line
Receiver
Calculation Area

> 40.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 6451
CLIENT: EXP Capital
SITE ADDRESS: 76-81 Ryans Road, Gillieston Heights
ASSESSED TO: AAAC Guidelines
LIMITING CRITERIA: See Acoustic Report



Scenario 2
**** NOISE SOURCES ****

~ 8 vehicle doors opening/closing
~ 8 vehicle ignition sequences
~ 8 vehicles traversing site
~ 1 garbage truck traversing site
~ 2 AC condenser units
~ 1 kitchen exhaust fan
~ Breakout noise from skylights
~ Brekaout noise from doors and windows
~ 96 children using indoor spaces

Note:
- LAeq,15minutes noise contours and receiver pointsare at a height of 1.5 m above the natural ground level

- The maximum reading at the nearest resident is 40 dB.

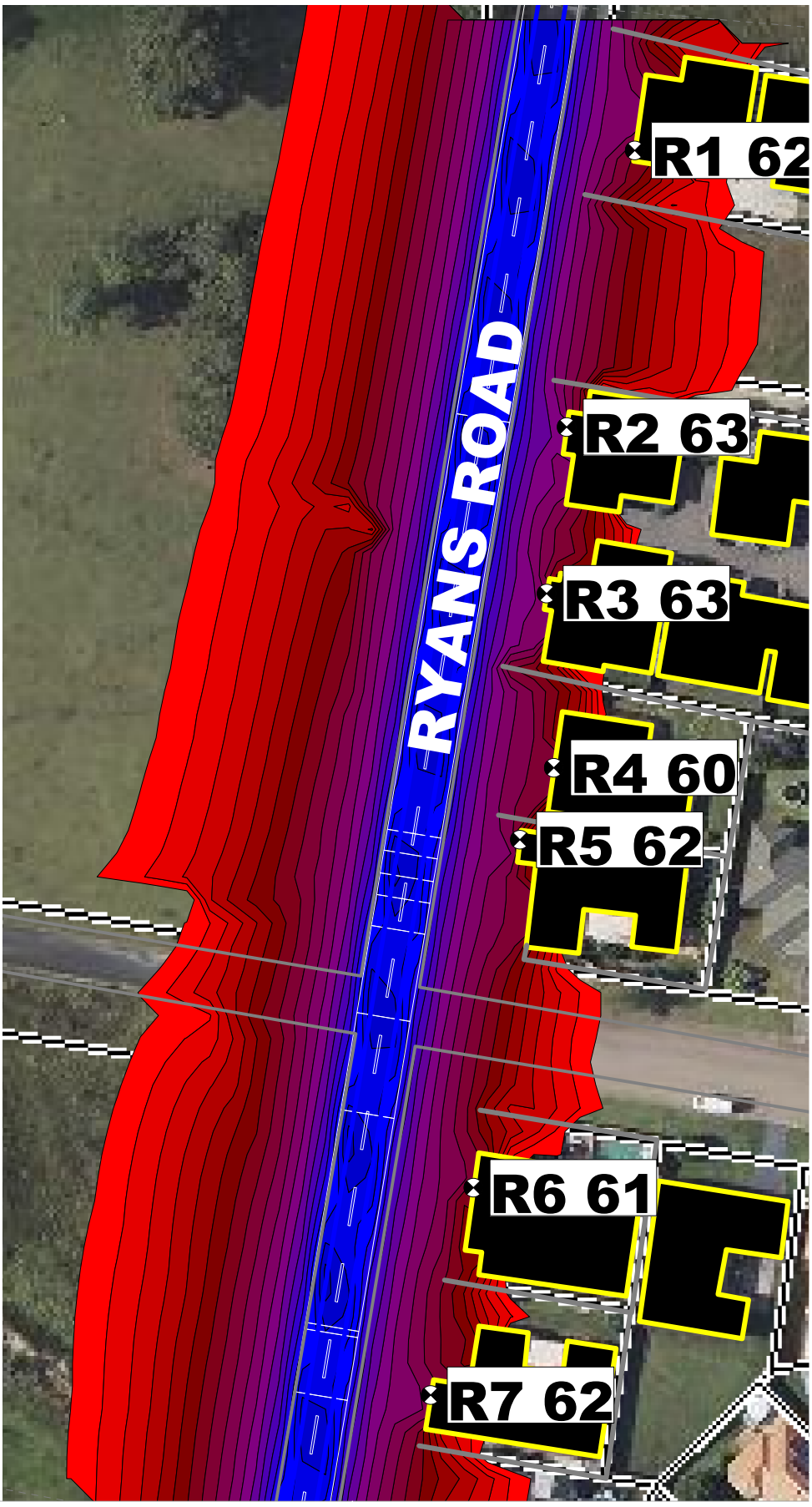
PRINT DATE: 14/02/25

Point Source
Line Source
Area Source
vert. Area Source
Building
Barrier
Ground Absorption
Contour Line
Receiver
Calculation Area

> 40.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 6451
CLIENT: EXP Capital
SITE ADDRESS: 76-81 Ryans Road, Gillieston H
ASSESSED TO: AAAC Guidelines
LIMITING CRITERIA: See Acoustic Report



Scenario 3.1 (Existing)
**** NOISE SOURCES ****

~ 190 vehicles travelling on Ryans Road

Note:
- LAeq,1hour noise contours and receiver pointsare at a height of 1.5 m above the natural ground level

- The maximum reading at the nearest resident is 63 dB.

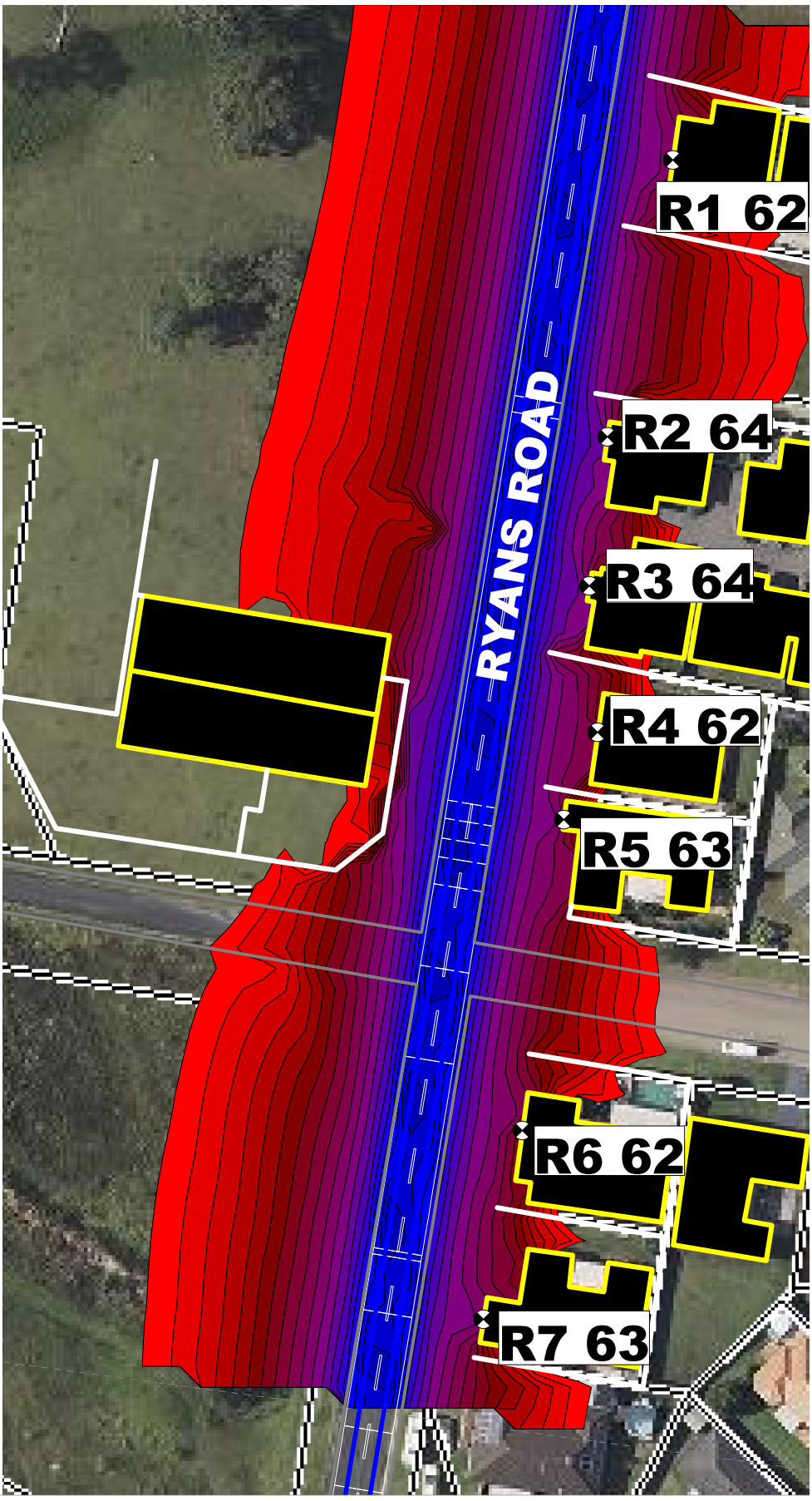
PRINT DATE: 14/02/25

Road
Building
Barrier
Ground Absorption
Contour Line
Receiver
Calculation Area

> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 6451
CLIENT: EXP Capital
SITE ADDRESS: 76-81 Ryans Road, Gillieston Hei
ASSESSED TO: NSW EPA Road Noise Policy
LIMITING CRITERIA: See Acoustic Report



Scenario 3.2 (Proposed)
**** NOISE SOURCES ****

~ 222 vehicles travelling on Ryans Road

Note:
- LAeq,1hour noise contours and receiver pointsare at a height of 1.5 m above the natural ground level

- The maximum reading at the nearest resident is 64 dB.

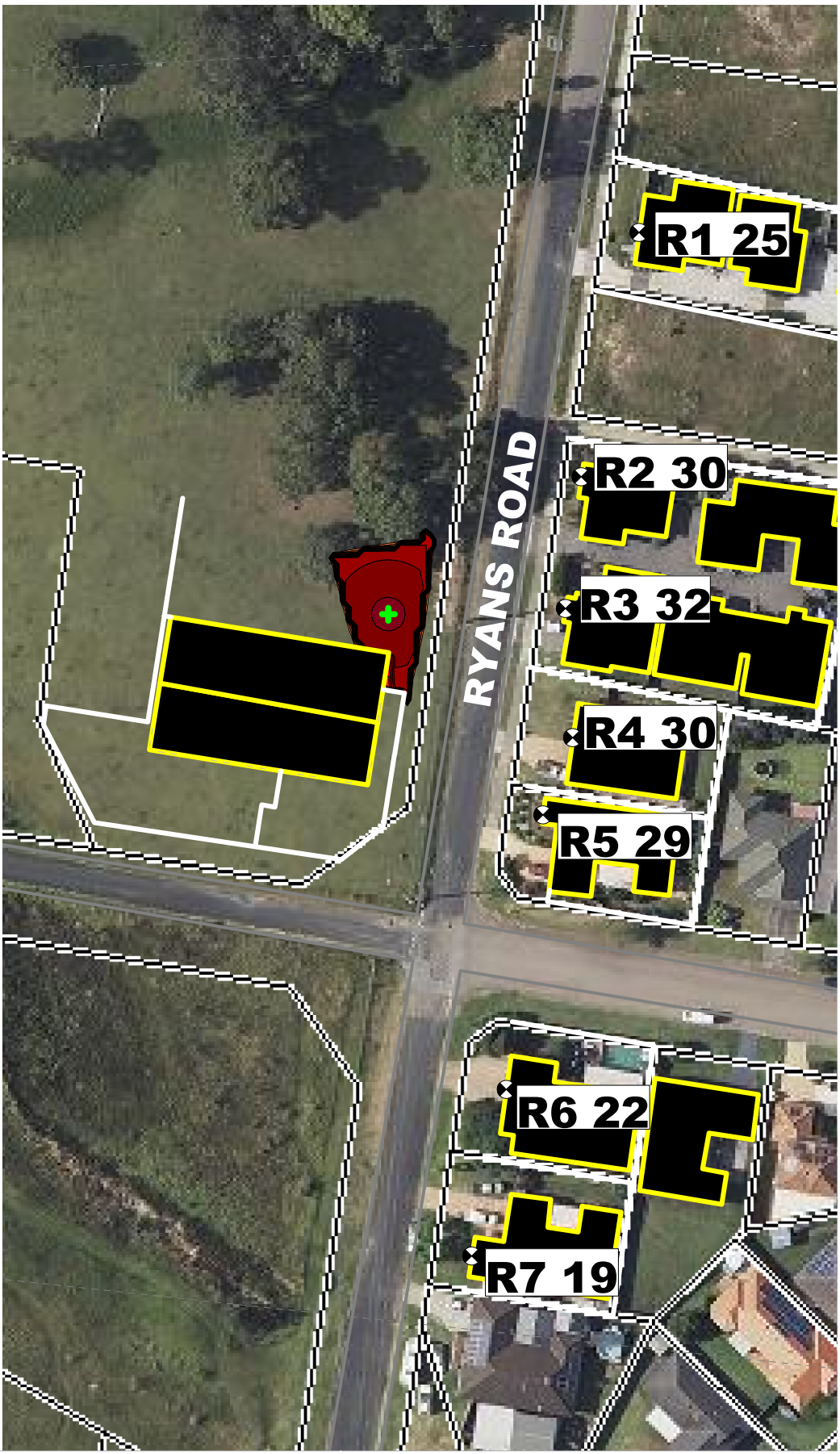
PRINT DATE: 14/02/25

vert. Area Source
Road
Building
Barrier
Ground Absorption
Contour Line
Receiver
Calculation Area

> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 6451
CLIENT: EXP Capital
SITE ADDRESS: 76-81 Ryans Road, Gillieston Hei
ASSESSED TO: NSW EPA Road Noise Policy
LIMITING CRITERIA: See Acoustic Report



Scenario 4
**** NOISE SOURCES ****

~ 1 vehicle door opening/closing

Note:
- LAmax noise contours and receiver pointsare at a height of 1.5 m above the natural ground level

- The maximum reading at the nearest resident is 32 dB.

PRINT DATE: 14/02/25

Point Source
vert. Area Source
Building
Barrier
Ground Absorption
Contour Line
Receiver
Calculation Area

> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 6451
CLIENT: EXP Capital
SITE ADDRESS: 76-81 Ryans Road, Gillieston Heights
ASSESSED TO: AAAC Guidelines
LIMITING CRITERIA: See Acoustic Report