



145 Rossiter Road, Koo Wee Rup

Acoustic Design Report

M251022RP1 Revision A

Wednesday, 7 January 2026



Document Information

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Glossary

A-weighting	A spectrum adaption that is applied to measured noise levels to represent human hearing at typical levels of environmental noise. A-weighted levels are used as human hearing does not respond equally at all frequencies.
Adjustments	Adjustments may be applied to effective noise levels noise sources to account for annoying noise character, duration and/or measurement position.
Aggravated noise	Noise defined by the Environment Protection Regulations to exceed the noise limits established under the Noise Protocol by more than 15 dB, or to exceed a noise level of 75 dB L_{Aeq} during the day period, 70 dB L_{Aeq} during the evening period or 65 dB L_{Aeq} during the night period.
Ambient noise	The overall environmental noise level at a given location caused by all noise sources in the area, both near and far, including all forms of traffic, industry, lawnmowers, insects, animals and the like. It is typically described by the L_{Aeq} metric.
Background Level	The Background Level determined in accordance with the Noise Protocol, for different times of day.
Background noise	The underlying noise level at a given location, measured in the absence of a noise source under investigation and any other short-term noise sources such as intermittent traffic, industry, lawnmowers, insect, animals and the like. It is typically described using the L_{A90} metric.
Day period	Monday to Saturday (except public holidays), from 7 am to 6 pm as defined in the Environment Protection Regulations.
dB	Decibel—a unit of measurement used to express sound level. It is based on a logarithmic scale which means a sound that is 3 dB higher has twice as much energy. We typically perceive a 10 dB increase in sound as a doubling of loudness.
Duration adjustment A_{dur}	If noise emissions from the commercial, industrial or trade premises do not occur continuously over the whole 30-minute period, a duration adjustment is applied to represent the level of noise over the 30-minute period.
Effective noise level	The level of noise, expressed as an $L_{Aeq,30min}$, emitted from the commercial, industrial or trade premises after relevant adjustments have been applied.
Environment Protection Regulations	The Victorian <i>Environment Protection Regulations</i> are subordinate legislation to the <i>Environment Protection Act 2017</i> . They give force to noise limits for commercial, industrial and trade premises.
EPA Victoria	Environment Protection Authority Victoria.
Evening period	Monday to Saturday, from 6 pm to 10 pm; and Sunday and public holidays, from 7 am to 10 pm, as defined in the Environment Protection Regulations.
Extraneous noise	Extraneous noise refers to any noise that is not part of the noise emissions from a noise source and is not relevant to the typical background noise. Extraneous noise includes noise from aircraft, local traffic, construction works, insects, bird chirping, people talking, rustling leaves, and the effect of wind on the microphone diaphragm.
Frequency (Hz)	The number of times a sound pressure wave oscillates (moves back and forth) in one second. Fast movements produce high frequency sound (high pitch/tone), but slow movements mean the frequency (pitch/tone) is low. 1 Hz is equal to 1 cycle per second.

GED	General Environmental Duty – As defined by Section 25(1) of the <i>Environment Protection Act 2017</i> , it requires that any person who is engaging in an activity that may give rise to risks of harm to human health or the environment from pollution or waste must minimise those risks, so far as reasonably practicable.
Impulse adjustment A_{imp}	When noise is impulsive in character than an adjustment of +2 dB for just detectable impulse character of the noise, adjustment of +5 dB for prominent impulse character of the noise.
Intermittency adjustment A_{int}	An intermittency adjustment is applied to situations where noise from a commercial, industrial or trade premises increases noticeably in level on multiple occasions during a 30-minute period.
L_{A90}	A-weighted sound pressure level, measured using the Fast time-weighting, that is exceeded for 90% of the time interval considered. The L_{A90} metric is often used to quantify the background noise level in an environment.
L_{A10}	A-weighted noise level exceeded for 10 % of the measurement time. The L_{10} level represents the typical upper noise level and is often used to represent traffic or music noise.
$L_{A10,18hr}$	The L_{A10} level from road or rail traffic between 6 am and midnight. This metric is used to assess road traffic noise levels at residences within Victoria.
L_{Aeq}	The equivalent continuous A-weighted sound pressure level. It is the value of the A-weighted sound pressure level of a continuous steady sound that has the same acoustic energy as a given time-varying A- weighted sound pressure level when determined over the same measurement time interval. The L_{Aeq} metric is used to quantify the effective noise level from a premises.
Noise Limit	The maximum effective noise level allowed in a noise sensitive area, as determined in accordance with the Noise Protocol.
Night period	Between 10 pm and 7 am of the following day as defined in the Environment Protection Regulations.
Noise Protocol	Environmental Protection Authority 1826.4 <i>Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues</i> . The current version is published by EPA Victoria on its website.
Noise sensitive area	Defined by the Environment Protection Regulations as the part of the land within the boundary of a parcel of land that is: • within 10 m of the outside of external walls of dwellings (including a residential care facility but not including a caretaker's house), residential building or noise sensitive residential use, or • within 10 m of the outside of external walls of any dormitory, ward, bedroom or living room of a caretaker's house, hospital, hotel, residential hotel, motel, specialist disability accommodation, corrective institution, tourist establishment, retirement village or residential village, or • within 10 m of the outside of external walls of a classroom or any room in which learning occurs during the operating hours of a child care centre, kindergarten, primary school or secondary school.
R_w	Weighted Sound Reduction Index: A laboratory measured value of the acoustic separation provided by a single building element (such as a wall). The higher the R_w the better the noise isolation provided by a building element.
Tonal adjustment A_{tone}	When noise is tonal in nature then an adjustment is applied depending on the prominence of the tonality. Examples of tonal noise may include reversing beepers or transformer hum.



Unreasonable noise	Noise that is unreasonable due to its character as defined under the Environment Protection Act or because it is prescribed to be unreasonable, for example because it exceeds a noise limit set forth under the Environment Protection Regulations.
Zone Level	The Zone Level determined on the basis of land zoning around a noise sensitive area in a rural area in accordance with the Noise Protocol.
Zoning Level	The Zoning Level determined on the basis of land zoning around a noise sensitive area in an urban area in accordance with the Noise Protocol.

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1 Introduction

KLM has engaged Resonate to assess impacts of traffic noise levels from the existing Koo Wee Rup Bypass on future dwellings at 145 Rossiter Road, Koo Wee Rup in accordance with the relevant policies from Department of Transport and Planning (DTP).

The traffic noise prediction model for the Koo Wee Rup Bypass has been developed based on noise monitoring and estimated traffic volumes.

To verify current traffic conditions a traffic noise survey at 145 Rossiter Road was conducted from 20 to 28 November 2025.

2 Site description

2.1 Site location

The proposed development site at 145 Rossiter Road is bounded by the Koo Wee Rup Bypass. Figure 1 shows the site location and a site layout is presented in Figure 2.



Figure 1 Indicative site location



Figure 2 Proposed site layout

3 Legislation, policy and guidelines

3.1 General Environmental Duty

Section 25(1) of the *Environment Protection Act 2017* (the Act) sets forth the General Environmental Duty, which states:

A person who is engaging in an activity that may give rise to risks of harm to human health or the environment from pollution or waste must minimise those risks, so far as reasonably practicable.

Should the Site be developed, the developer has an obligation to understand the risks associated with road traffic noise and to take reasonably practicable steps to minimise those risks.

3.2 VicRoads requirements

The relevant guidance for assessing road traffic noise on new residential developments is taken from the VicRoads document *Requirements of Developers – Noise Sensitive Uses* (VicRoads Document). This document establishes noise levels consistent with those applied under the VicRoads *Traffic noise reduction policy 2005*, which applies when a freeway is constructed or upgraded near existing residential land uses.

The noise assessment criteria for multi-unit low level residential development from the VicRoads document have been adopted and they are summarised below. Note that the below criteria refer to the $L_{10(18hr)}$ measured between 6 am and midnight:

Where it is a practical option to erect a noise barrier to protect a large number of buildings in a sub-division, then the developments should be subject to the following noise requirements:

1. No new allotment should be created such that there is insufficient space at the 75 dB(A) noise contour, to erect a house or other noise sensitive development, (that is, the area of the allotment at the 75 dB(A) contour or lesser noise level, must be of a sufficient size to build a dwelling).
2. The developer shall attenuate traffic noise from a Freeway to a level of 63 dB(A) or less, at the most exposed façade of the noise sensitive building.
3. The noise sensitive buildings adjacent to the Freeway should also be designed and constructed to protect internal noise sensitive areas. That is, the building layout should have the service areas (laundry, bathroom, garage, etc.) facing the freeway whilst the noise sensitive uses (bedrooms, living areas, etc.) are located away from the freeway side of the building. Furthermore, for the exposed façade, window and door openings should be of a minimum size.
4. Council should request the developer to provide a report by a qualified acoustic consultant outlining the necessary noise control measures to achieve the preferred actions outlined above.
5. The adopted noise attenuation requirements will be met for 10 years after finalization of the development or, where relevant, for each stage of the development.
6. The noise fence shall have a design life of not less than 50 years.
7. After the installation of noise barriers erected to satisfy the requirement of (2) above, noise measurements shall be taken at several suitable locations that have been agreed to by all relevant parties. The results of the measurements will be distributed to these parties. It should be noted that the measurements should demonstrate that the noise barrier would perform as required in (6) above.
8. Should the performance of the barrier not comply with the objective, then the Council shall require the developer to modify the barrier to achieve the objective.

Where the developer decides, in consultation with VicRoads and Council that it is not desirable to erect high noise barriers then the following conditions should apply to the permits.

9. The noise sensitive buildings adjacent to the Freeway must be designed and constructed to meet the desirable acoustic standards set out in AS 2107-2000 *“Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors”*. It should be recognized that AS2107-2000 does not adequately consider peak noise levels. Due regard should also be given to the requirements set out in AS 3671-1989 *“Acoustics – Road Traffic Noise Intrusion – Building Siting and Construction”*.

10. The building layout requirements in part 3, above, will apply.

11. The developer must provide a fence that visually screens the traffic from the view at the lowest habitable level of the development. This screen would be expected to screen out vehicles that are up to 3.5 metres high.

12. Council should request the developer to provide a report by a qualified acoustic consultant outlining the necessary noise control measures to achieve the preferred actions outlined above.

13. After the development has been completed a survey of the internal noise levels should be undertaken within several suitable buildings to demonstrate that the internal noise levels have been achieved. The results of the measurements will be distributed to the relevant parties.

14. Should the internal noise levels not comply with the AS 2107-2000 objectives, then the Council should require the developer to undertake works rectifying the situation.

4 Noise survey

To monitor road traffic noise from the Koo Wee Rup Bypass, a noise monitor was installed within the proposed site at 145 Rossiter Road as shown in Figure 1. The monitoring was carried out in accordance with the VicRoads *Traffic Noise Measurement Requirements for Acoustic Consultants* from 20 to 28 November 2025. The hourly L_{A10} , L_{A90} and L_{Aeq} were measured in accordance with the *Traffic Noise Measurement Requirements for Acoustic Consultants*.

The road traffic noise monitoring conducted was used to calibrate the traffic volumes provided against the monitored noise levels.

The instruments used for the noise monitoring are detailed in Appendix A and a photograph of the noise logger setup is given in Appendix B.

Data affected by rain or excessive wind has been excluded in accordance with VicRoads requirements based on weather data collected at the nearest Bureau of Meteorology (BoM) station at Koo Wee Rup.

Table 1 presents the averaged road traffic noise level $L_{A10,18hr}$ at 145 Rossiter Road based on monitored noise levels and the monitored hourly noise levels are presented graphically in Appendix C.

Table 1 Averaged Road traffic noise level $L_{A10,18hr}$

Location	Measured noise level, $L_{A10,18hr}$, dB
As shown in Figure 1	56

5 Road traffic noise prediction model

5.1 Prediction model

Road traffic noise levels at the site have been predicted using an acoustic prediction software, SoundPLAN 9.0, implementing the Calculation of Road Traffic Noise (CoRTN) 1988 to calculate the $L_{A10,18hr}$ traffic noise level. CoRTN, as implemented by SoundPLAN, is widely used for the assessment of road traffic noise in Victoria and Australia generally.

The traffic volume predictions for the Koo Wee Rup Bypass presented in WSP report *SUBURBAN ROADS UPGRADE (SRU) HEALESVILLE-KOO WEE RUP ROAD (PRINCES FREEWAY EAST TO MANKS ROAD) – ROAD TRAFFIC NOISE ASSESSMENT - 2135645A-SE-27-TPL-REP-0001 Rev01* has been adopted for the predictions in this assessment. For the current project the model has been updated to predict the current noise levels at the site as well as projected noise levels in 10 years (2035) in accordance with VicRoads Document.

Table 2 presents the traffic conditions adopted from WSP report.

Table 2 Traffic conditions for Koo Wee Rup in accordance with WSP report

Forecast year	Annual Average Daily Traffic ⁽⁴⁾	Traffic volume, 18 Hour ⁽¹⁾	Commercial vehicle, % ⁽²⁾
2016	12,732	12,900 ⁽³⁾	19
2031	24,304	24,600 ⁽³⁾	17

- (1) Average weekday 18-hour traffic flow (0600 – 00000 hrs)
- (2) Percentage of commercial (heavy) vehicles in volume
- (3) Derived based on 2016 and 2031 Annual Average Daily Traffic Volumes converted to Average Weekday 18-hour Traffic Flow
- (4) Derived from 'North of Manks Road' from *2135645A-SE-27-TPL-REP-0001 Rev01*

Based on the predicted traffic volumes provided in Table 2, traffic volumes for the current year (2025) and a 10-year forecast (2035) has been estimated for the assessment.

Table 3 Traffic conditions for Koo Wee Rup

Forecast year	Traffic volume, 18 Hour ⁽¹⁾	Commercial vehicle, % ⁽²⁾
2025	19,002	18 ⁽³⁾
2035	29,221	17

- (1) Average weekday 18-hour traffic flow (0600 – 00000 hrs)
- (2) Percentage of commercial (heavy) vehicles in volume
- (3) Assumed commercial vehicle reduction based between the forecasted years of 2016 and 2031

5.2 Prediction model calibration

To verify the noise prediction model, the model calibration factor was derived by a comparison of the predicted road traffic noise level with the noise monitoring that was conducted at the site.

Table 4 presents the comparison between the monitored and predicted road traffic noise levels to determine the calibration factor of the model.

Table 4 Prediction model calibration factor

Road traffic noise level, $L_{A10,18h}$ dB		Model calibration factor, dB
Measured	Predicted	
56	54	+2

The calibration factor of +2 dB was implemented in the predicted model for the current project.

6 Assessment

Table 5 presents the predicted $L_{A10,18hr}$ traffic noise levels at the ground and first floor of the allotments closest to the Koo Wee Rup Bypass in 2035.

Table 5 Predicted traffic noise levels at nearest allotments

Allotment ⁽¹⁾	Predicted traffic noise level, $L_{10,18hr}$, dB(A)	Criteria, dB(A)	Compliance with noise criteria?
69 Ground Floor	56	63	✓
69 Level 1	58	63	✓
68 Ground Floor	56	63	✓
68 Level 1	58	63	✓
67 Ground Floor	56	63	✓
67 Level 1	58	63	✓
66 Ground Floor	57	63	✓
66 Level 1	58	63	✓
65 Ground Floor	57	63	✓
65 Level 1	59	63	✓
64 Ground Floor	57	63	✓
64 Level 1	59	63	✓
63 Ground Floor	57	63	✓
63 Level 1	59	63	✓
62 Ground Floor	57	63	✓
62 Level 1	59	63	✓
61 Ground Floor	57	63	✓
61 Level 1	59	63	✓
60 Ground Floor	57	63	✓
60 Level 1	58	63	✓
59 Ground Floor	56	63	✓
59 Level 1	58	63	✓
58 Ground Floor	56	63	✓
58 Level 1	58	63	✓

(1) The allotment number is shown in Figure 2.

The table above demonstrates that predicted traffic noise levels at nearest residential allotments meet the traffic noise assessment criteria of $L_{10,18hr}$ 63 dB(A) presented in the VicRoads Document. Given that compliance is achieved at the nearest proposed dwellings, compliance can be expected at the developments further away from the Koo Wee



Rup Bypass. Consequently, no specific noise mitigations to the proposed allotments are required in terms of traffic noise impact.

The predicted traffic noise contour map at the ground floor is shown in Appendix D. Given that the application relates only to the subdivisions and proposed building locations haven't been developed or provided, receiver locations have been placed at the border of each proposed allotment nearest to the Koo Wee Rup Bypass as a worst-case situation. A façade correction of + 2.5 dB has also been included in the prediction according to VicRoads Document.

7 Conclusion

The assessment of road traffic noise from the Koo Wee Rup Bypass on the proposed subdivision development at 145 Rossiter Road, Koo Wee Rup has been undertaken against the VicRoads document *Requirements of Developers – Noise Sensitive Uses*.

The predicted traffic volumes for the Koo Wee Rup Bypass presented in the WSP report for Koo Wee Rup Bypass development has been adopted for the current project. The model was verified by means of monitored traffic noise levels by Resonate from 20 November to 28 November 2025.

Predicted traffic noise levels for 2035 (in 10 years after finalization of the subdivision development) meet the requirement stated in the VicRoads document *Requirements of Developers – Noise Sensitive Uses*. The traffic noise criteria $L_{10,18h}$ 63 dB(A) at the most exposed façade of the noise sensitive building has been achieved at all proposed allotments on ground floor and level 1.

Appendix A—Instruments for noise survey

Table A1 presents the details of the instruments used for noise measurements.

Table A1 Instruments used for noise measurements

Unit	Serial number	Laboratory calibration valid until
RION NL-42 Class 2 sound level meter	946979	20 August 2026
B&K 4231 Acoustic calibrator	2528316	26 March 2026

The sound level meters were checked for the calibrations before and after measurements and no significant drifts were observed.

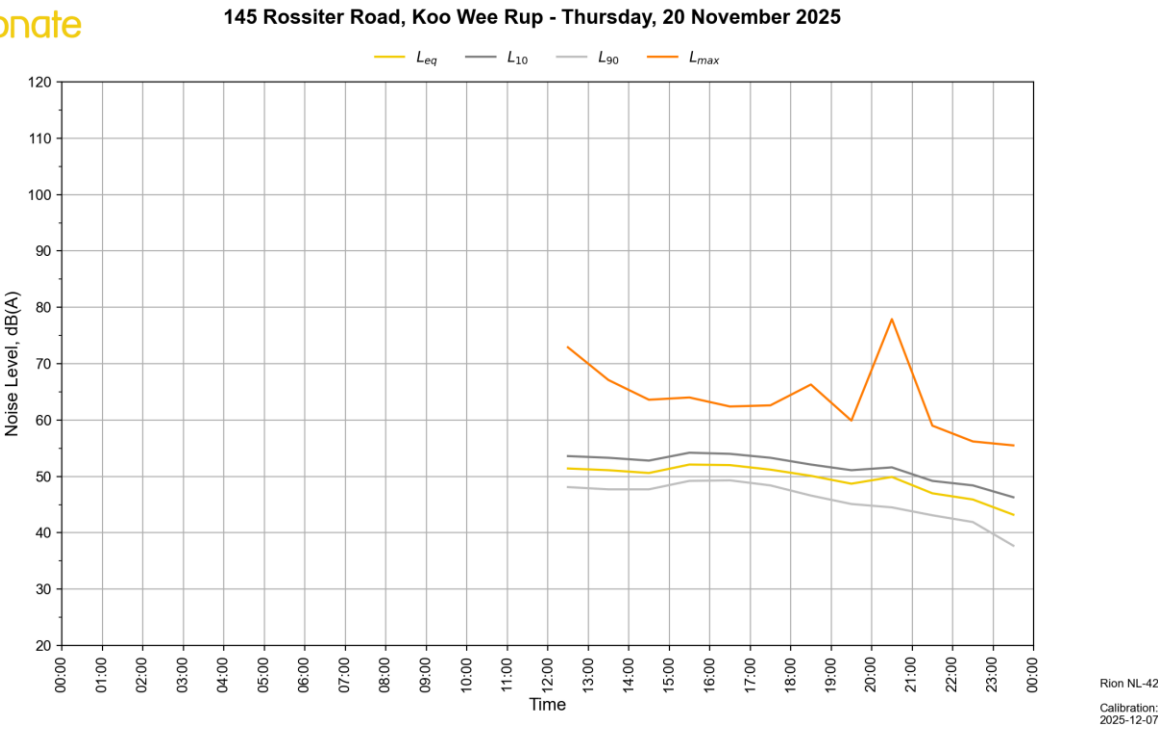
All instruments are under current calibrations carried out by a NATA accredited laboratory. Copies of the calibration certificates can be provided upon request.

Appendix B—Photograph of noise logger setup

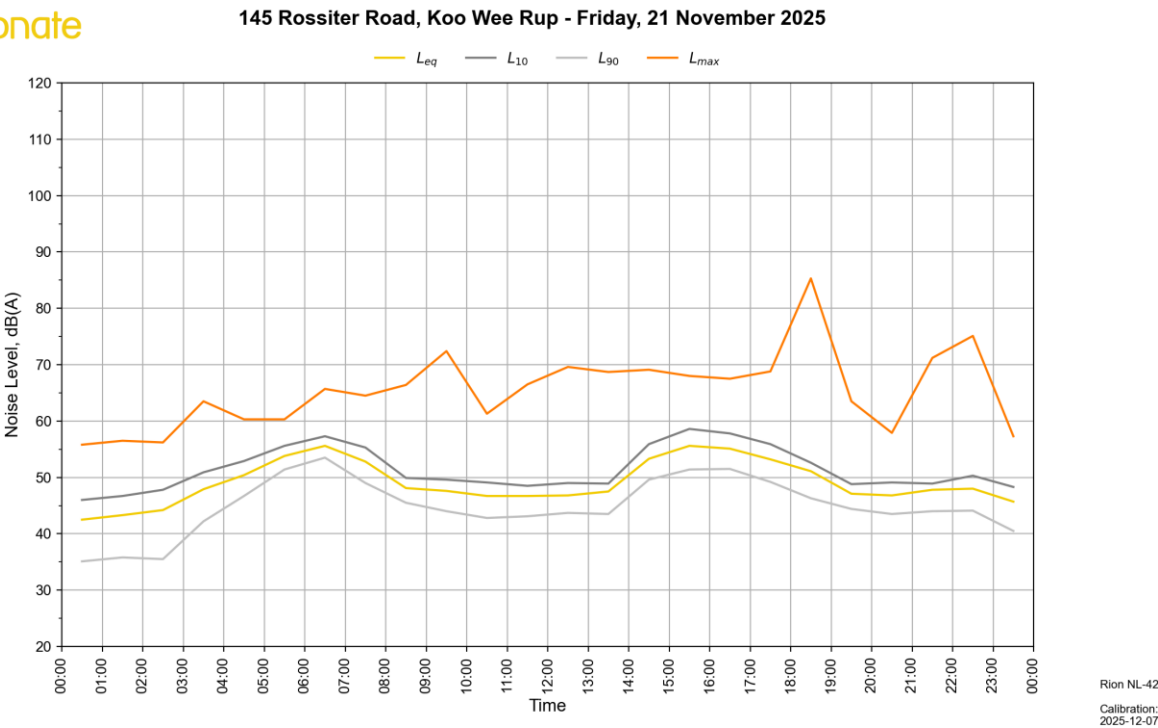


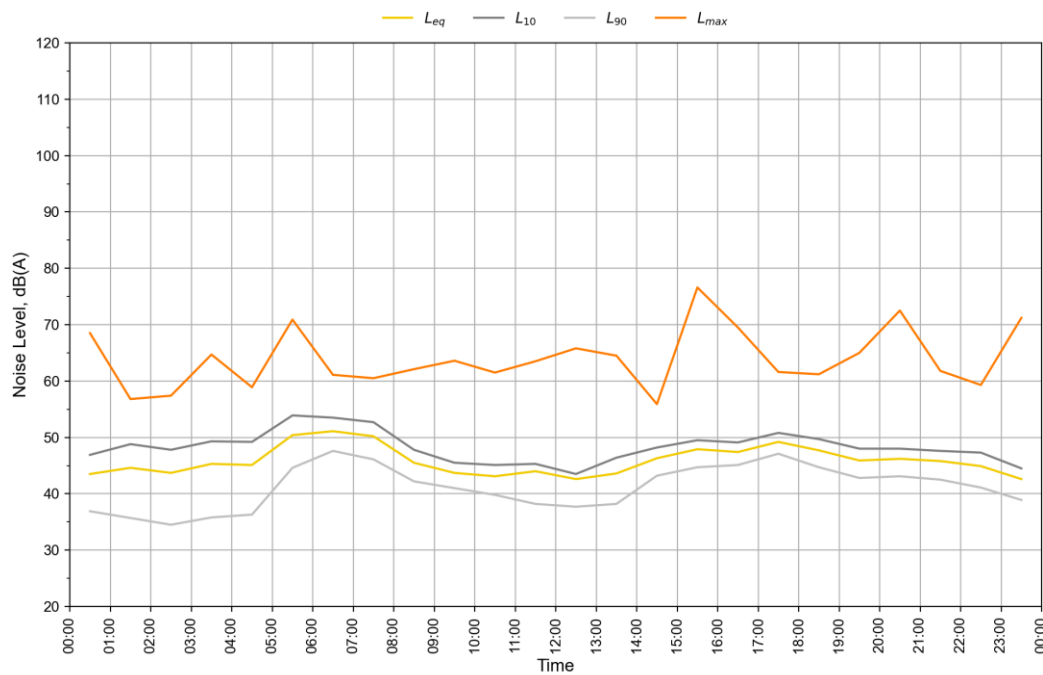
Appendix C—Monitored noise levels

Resonate

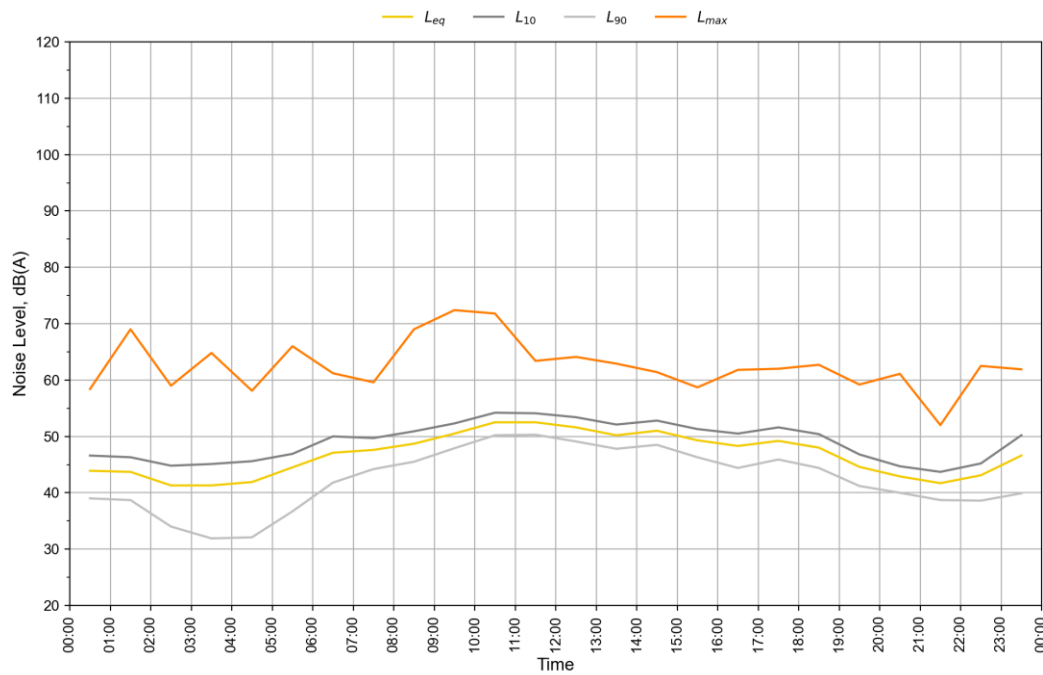


Resonate



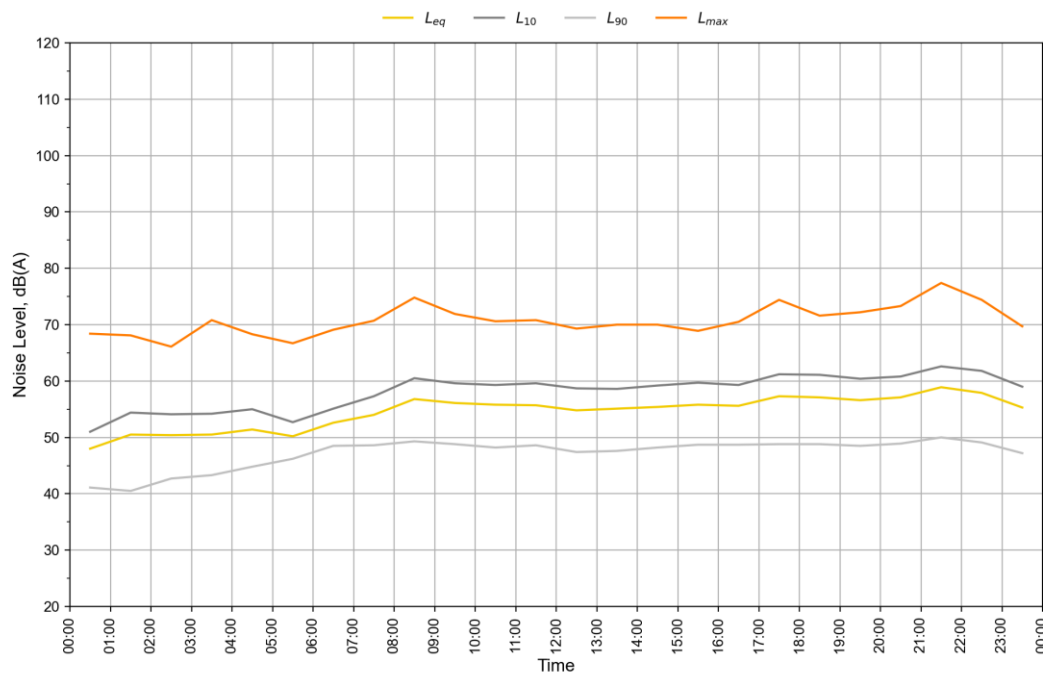


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Calibration:
2025-12-07



Rion NL-42
Calibration:
2025-12-07

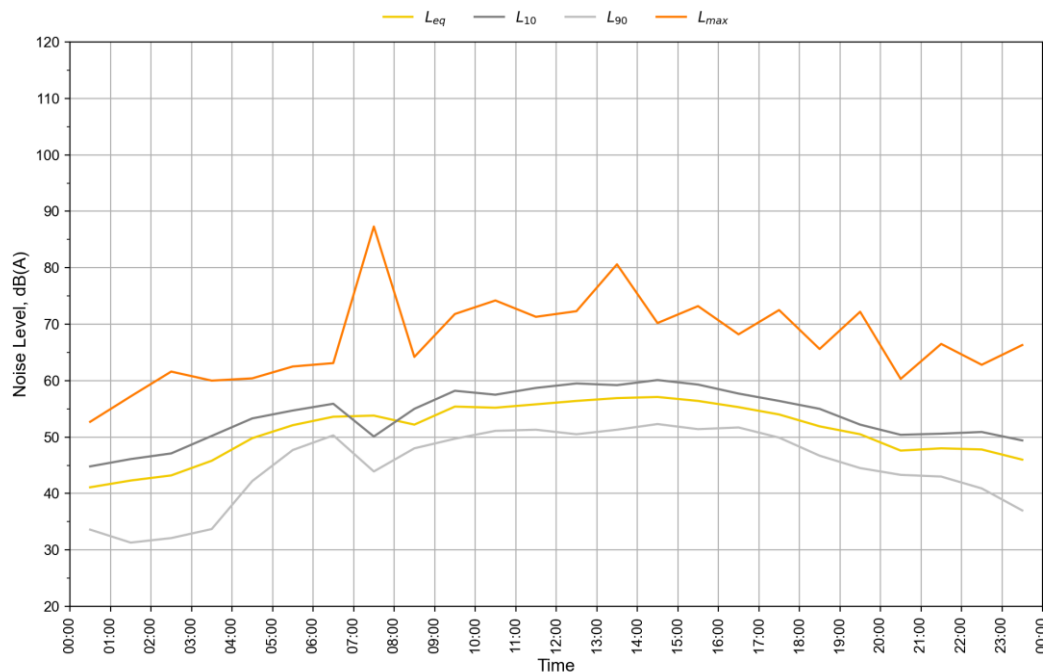
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Rion NL-42

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2025-12-07

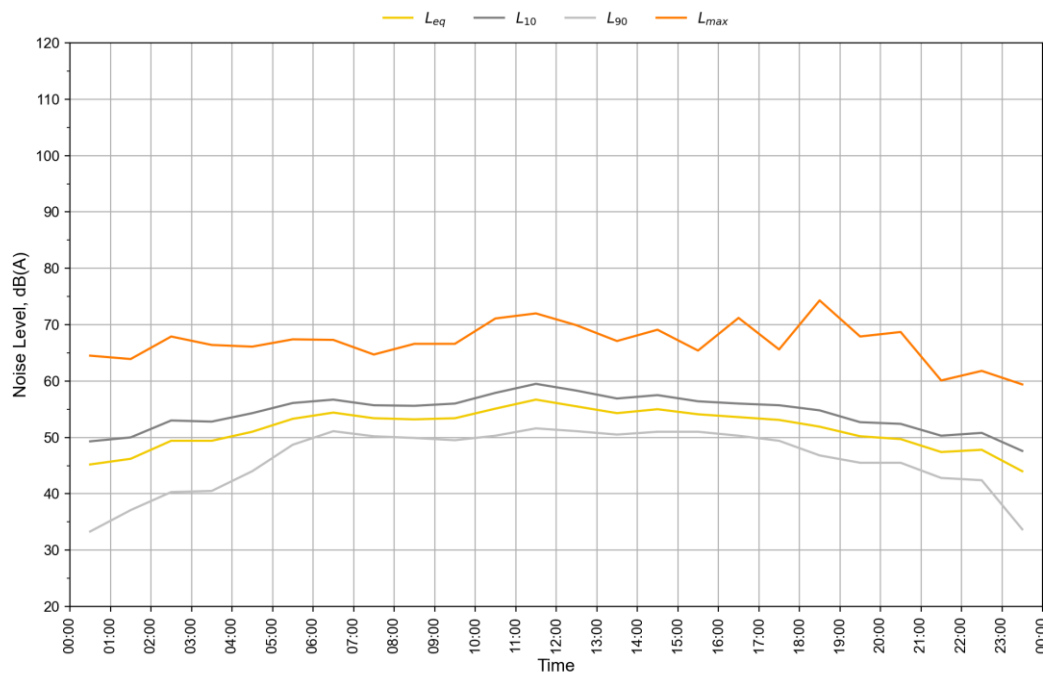
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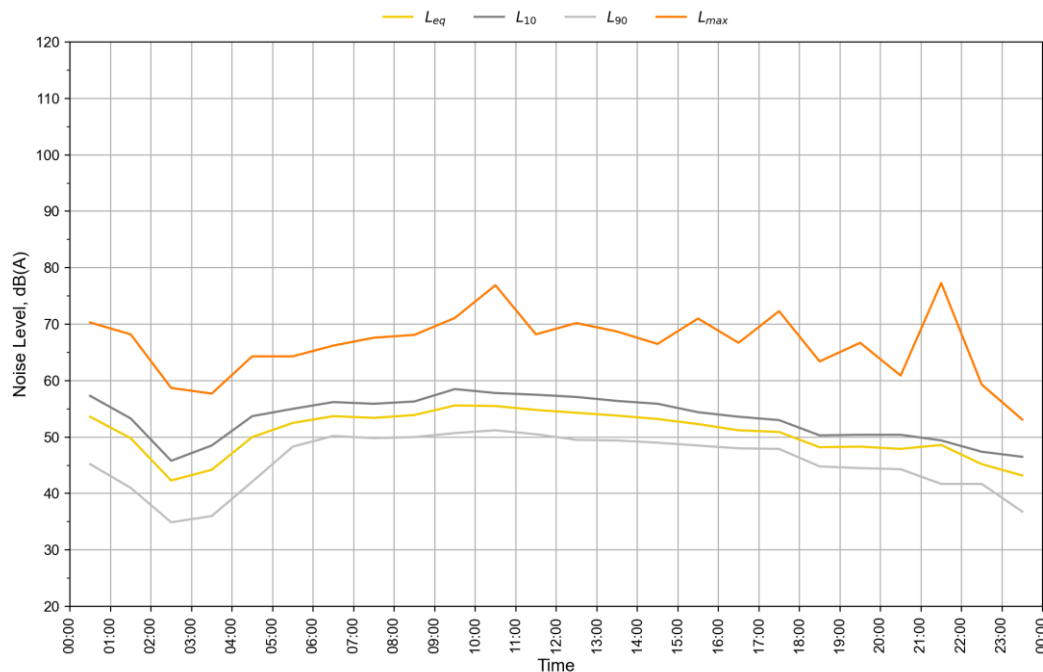
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Rion NL-42

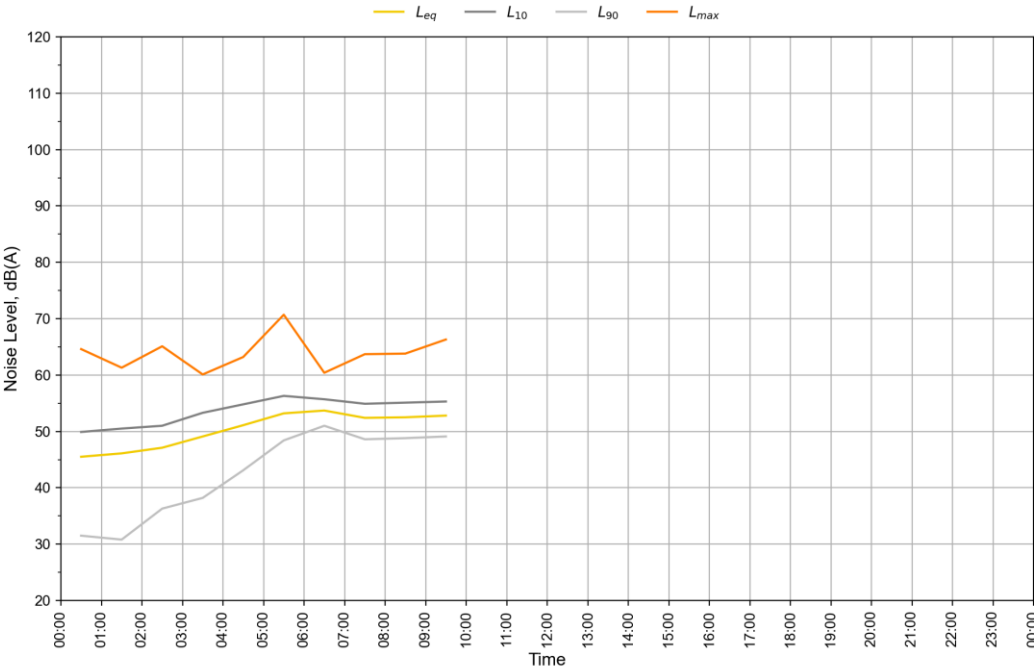
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145 Rossiter Road, Koo Wee Rup - Tuesday, 25 November 2025



Rion NL-42

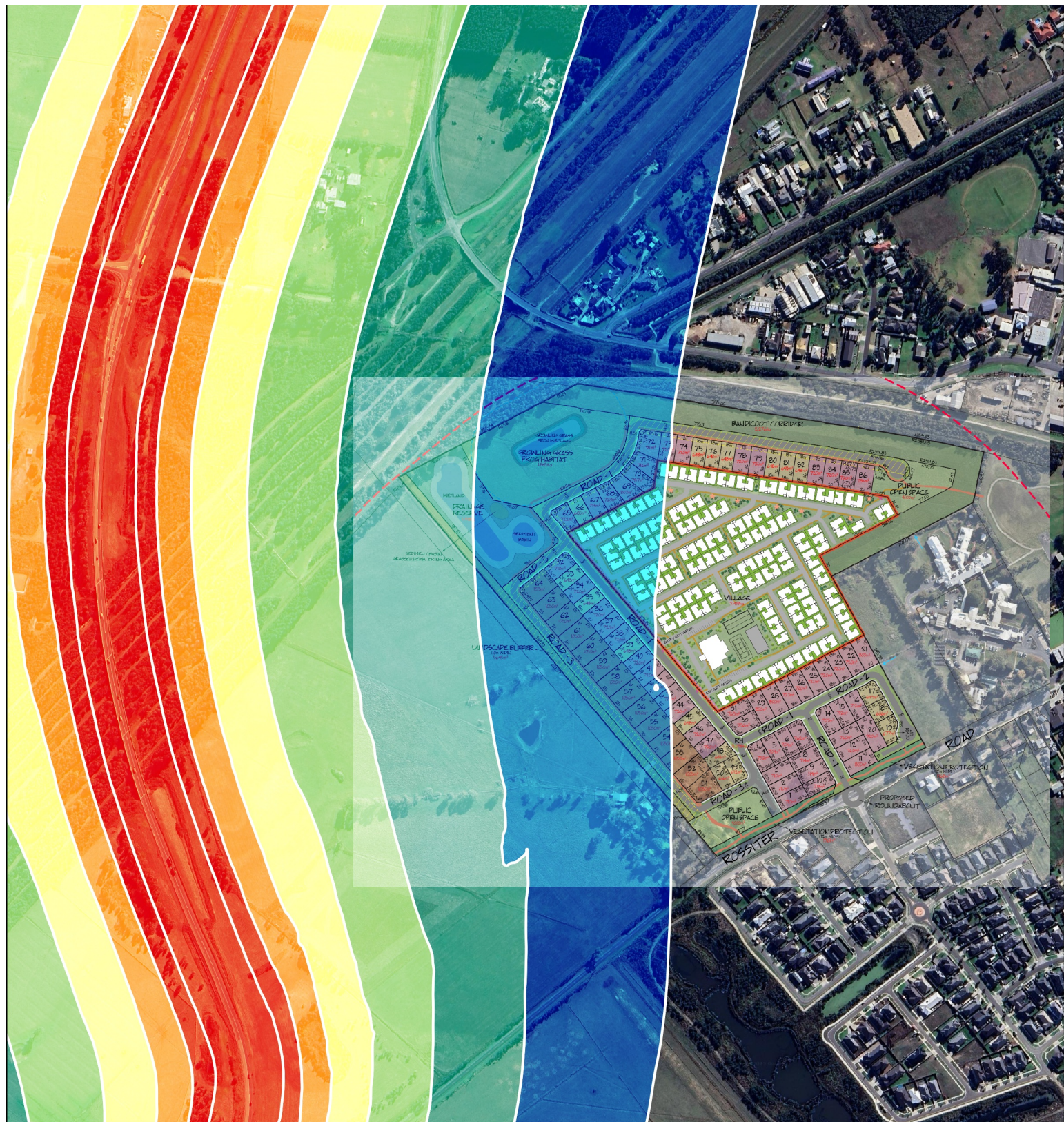
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Calibration:
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Appendix D—Predicted traffic noise contour maps



Appendix D - Predicted traffic noise contour maps

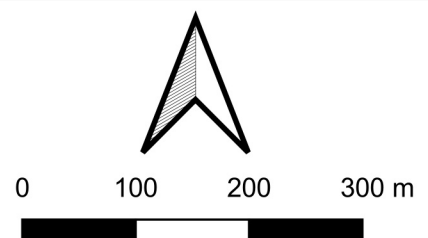
145 Rossiter Road, Koo Wee Rup

PROJECT NUMBER M230555
DRAWN BY HM
DATE ISSUED December 2025
CLIENT KLM Spatial
IMAGERY MetroMap

Legend

Traffic noise level, L10,18hr

- 57 - 60 dB(A)
- 60 - 63 dB(A)
- 63 - 65 dB(A)
- 65 - 68 dB(A)
- 68 - 71 dB(A)
- 71 - 74 dB(A)
- > 74 dB(A)



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