

RIPLEY VALLEY STATE HIGH SCHOOL

Noise Impact Assessment

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2026/RIP/5146

Date: 02 October 2026



11 May 2026

Group GSA

QE025-02F02 Ripley Noise Impact Assessment (r1)

Document details

Detail	Reference
Doc reference:	QE025-02F02 Ripley Noise Impact Assessment (r1)
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Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
1-12-2025	Issued as draft		R0	J.S		J.S
23-02-2025	Issued as final		R1	J.S		J.S
8-05-2026	Revised for EDQ submission		R2	J.S		J.S
File Path: C:\Users\james.small\Desktop\Project docs\Ripley SS\QE025-02F02 Ripley Noise Impact Assessment (r1).docx						

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Contents

1	Introduction	1
1.1	Referenced documentation	1
1.2	Site background	2
1.3	Noise sensitive receivers	2
2	Proposed development	4
3	Noise environment	6
3.1	Background	6
3.2	Ambient noise measurements	6
4	Noise criteria	7
4.1	Environmental Protection Act 1994	7
4.1.1	Section 440U: Air-conditioning equipment	7
4.1.2	440X: Open-air events	7
4.1.3	Section 440W: Indoor venues	8
4.2	Department of Environment and Science – Environmental Protection (Noise) Policy 2019	9
4.3	Ripley Valley PDA – Development Scheme	9
4.4	Noise emission objectives	10
5	Assessment of noise impacts	11
5.1	Preliminary review	11
5.2	Noise from the carpark	11
5.3	Noise from the multipurpose hall	12
5.3.1	Source noise levels	12
5.3.2	Multipurpose hall constructions	13
5.4	Sporting oval	13
5.5	Noise from ballcourts	13
5.6	Predicted noise levels	14
5.7	Discussion	15
5.8	Mechanical plant	15
6	Road traffic noise assessment	16
6.1	Road noise criteria	16
6.2	Road traffic noise levels	17
6.3	Road traffic noise levels	18
6.4	Assessment of outdoor educational areas	18
7	Rail noise assessment	20
7.1	Background	20
7.2	Rail noise criteria	20
7.3	Modelling	20

7.4	Predicted noise levels	21
7.5	Rail assessment outcomes	21
7.6	Naturally ventilated spaces	21
8	Recommendations	22
8.1	Noise emission requirements	22
8.1.1	Mechanical plant	22
8.1.2	Multipurpose ball courts	22
8.1.3	Multipurpose hall	22
8.1.4	Sporting oval	22
8.2	Road and rail noise impacts	23
APPENDIX A	Glossary of terminology	24
APPENDIX B	Noise monitoring data	27
APPENDIX C	Masterplan drawings	28

List of tables

Table 2-1: Master plan facilities	4
Table 3-1: Existing ambient noise levels (unattended noise monitoring)	6
Table 4-1: EPP (Noise) acoustic quality objectives	9
Table 4-2: Project noise criteria	10
Table 5-1: Driveway noise sources	11
Table 5-2: Internal sound pressure level	12
Table 5-3: MPH facade constructions	13
Table 5-4: Predicted noise levels	14
Table 6-1: Maximum acoustic levels (SDAP)	16
Table 6-2: Road traffic noise intrusion criteria	16
Table 6-3: Modelling parameters	17
Table 6-4: Model calibration	17
Table 6-5: Façade reflected noise level	18
Table 7-1: Predicted rail noise levels	21

List of figures

Figure 1-1: Site survey	3
Figure 2-1: Master Plan	5
Figure 6-1: Traffic noise contours (1.5m)	19

1 Introduction

This document presents the assessment of noise impacts associated with the proposed Ripley Valley State School ('the Project') to be located along Wensley Road, Ripley Qld ('subject site').

This noise impact assessment has been prepared on behalf of the State of Queensland, represented by the Department of Education (Applicant), in support of a Priority Development Area (PDA) development application over part of land at 54 Wensley Road, and 581 – 617 Ripley Road, Ripley QLD 4306 and described as Lots 190 and 191 on SL18 (site). This PDA development application seeks approval from the MEDQ for a development permit for a material change of use for educational establishment, community facility, indoor sport and recreation, and outdoor sport and recreation.

The Applicant proposes a State secondary school for Years 7–12, delivered in stages:

- Stage 1 opening in 2029 with capacity for 917 enrolments.
- Stage 2 opening in 2031 with a cumulative enrolment capacity for 1,813.
- Further undefined stage to provide a cumulative enrolment capacity of 2,043.

Please note, community facility, indoor sport and recreation, and outdoor sport and recreation have only been included to ensure the school facilities can be hired to external user groups (if necessary), consistent with common practice at schools throughout Queensland.

This study includes the assessment of noise impacts due to the operation of the development, and includes description and analysis of the following:

- Existing acoustic environment in the vicinity of the subject site.
- Acoustic criteria applicable to the operation of the development.
- Noise sources associated with the use of the development.
- Noise management principles to be employed to meet minimise noise from the uses as practicable.

1.1 Referenced documentation

This document addresses the requirements of:

- Ipswich City Council
- Qld Environmental Protection Act 1994
- Qld Environmental Protection (Noise) Policy 2019

Appendix A contains a glossary of acoustic terms used in this report.

1.2 Site background

The Project is to be located on a green field site within Ripley Valley. The existing and future uses surrounding the subject site is categorised by the following:

- Ripley Road to the north, with residential dwellings beyond
- Future open recreational space to the east
- Designated future Ipswich to Springfield rail corridor to the south
- Future residential dwellings across Wensley Road to the west

Vehicle access to the subject site will be via Wensley Road adjoining the western boundary and via Ripley Road to the north.

1.3 Noise sensitive receivers

Noise sensitive receivers in proximity to the development which have been used for assessment purposes are provided as follows:

- Southern receivers - 54 Wensley Road (approximately 143m southwest of the sporting ovals)
- Northern receivers - Residential dwellings across Ripley Road
- Western receivers – Future dwellings across Wensley Road

LEGEND	
	Ripley Valley State School
	Noise monitoring
	Future rail infrastructure



Figure 1-1: Site survey



Ripley Valley State High School
Noise Impact Assessment

2 Proposed development

The Project is to be delivered in a staged approach, with school facilities to be provided under the master plan in Table 2-1.

Table 2-1: Master plan facilities

Precinct	Development
Administration	- Central campus service hub includes, finance, enrolments, - health services, support staff & P+C. - Incorporating admin & student services.
Resource Centre	- Central campus resource & information centre - Quiet study areas, VR Areas - Recording areas - Small group / class areas
Covered Areas	- Central Covered Area - Middle precinct covered area
Refectory	- Central campus Refectory - Potential for outdoor/indoor eating areas
Staff Accommodation	2 staff centres including meeting/professional development area - Shower & change facilities
Student Amenities	- Middle precinct Amenities - Central Amenities - MP Sports Centre - Distributed Amenities
Staff Amenities	- Administration - Student amenities blocks - Resource centre - Multi-purpose sports - Staff centres - Operational services - Refectory
Operational Services	- Central bulk store - Cleaners base, secure store & decanting area - Refuse & recycling centre - Operational services manager
Grounds Care	Grounds care store
Sport Equipment Storage	Sports Store (adjacent to Grounds care Store and possibly located adjacent to Oval
Sports/ Play Facilities	- Platforms for 4 Outdoor Multipurpose courts (basketball & Netball) with 2 fully developed in Stage 1 2 court indoor multi-purpose sports centre - Type C sports Oval

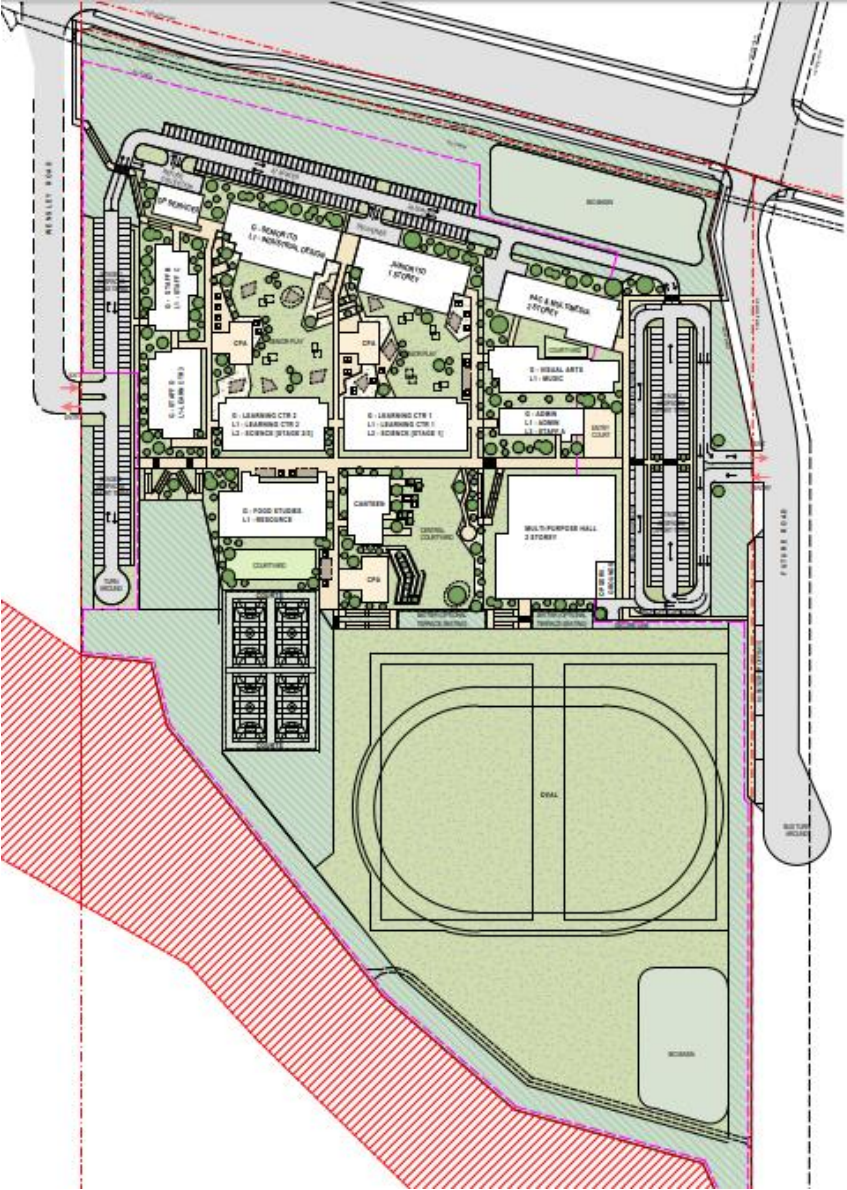
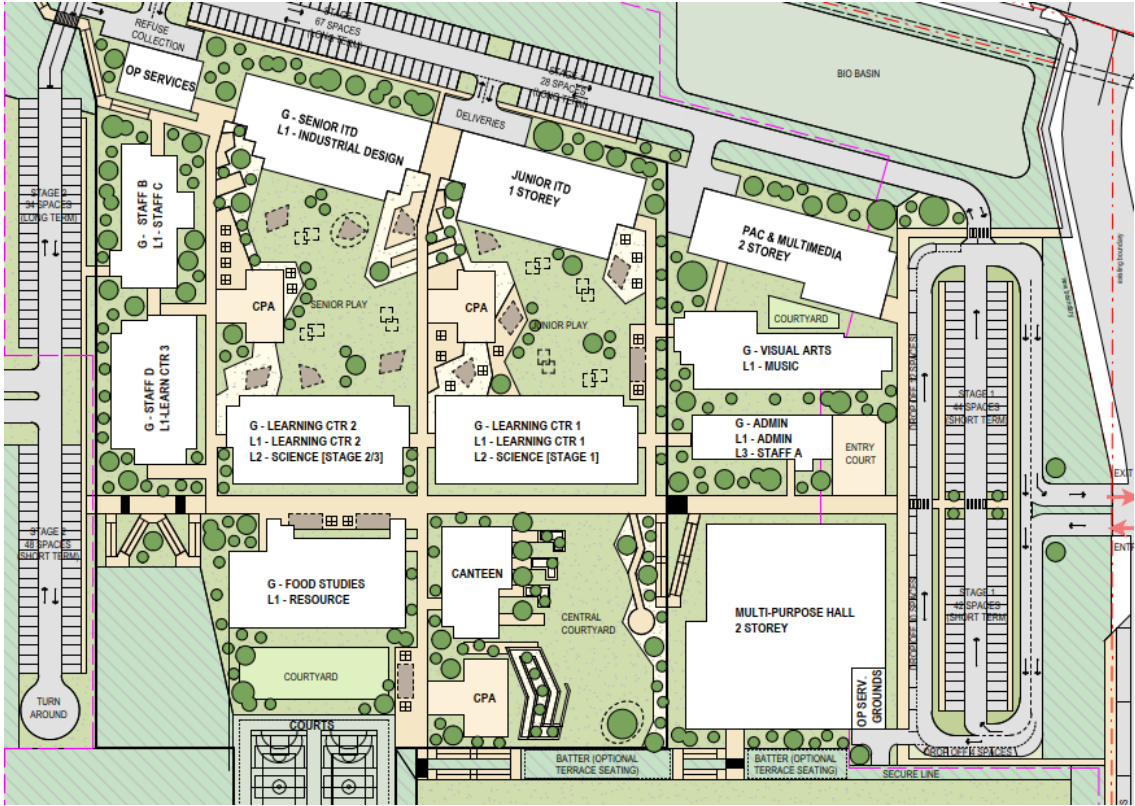


Figure 2-1: Master Plan



Ripley Valley State High School
Noise Impact Assessment

3 Noise environment

3.1 Background

The existing noise environment is categorised by road traffic noise in proximity to Ripley Valley Road. Ripley Valley Road is proposed to be widened, which will reduce the buffer between road traffic noise and the Project northern boundary. It is noted that a significant setback is proposed along the northern boundary of the development.

The future Ipswich to Springfield rail corridor passes through the southwest corner of the project site. Rail movements and associated noise impacts would become apparent as part of the infrastructure project.

3.2 Ambient noise measurements

Noise measurement of existing ambient noise levels was conducted over a continuous 5-day period commencing on Wednesday 28 January 2026. The measurements were conducted using an unattended noise logger, located along the northern boundary.

The test instrumentation consisted of:

- Portable Noise Logger: NTi-XL2 (S/N: A2A-12467-E0).
- Acoustical Calibrator: Larson Davis/ NTi CAL200 (S/N 15600).

The results of the ambient noise logging are presented graphically in Appendix B of this report and summarized in Table 3-1.

The average ambient results include values for the L_{A01} ¹, L_{A10} ², L_{Aeq} ³ and L_{Amax} ⁴ for each of the day, evening and night periods. For the L_{Amax} , L_{A01} and L_{A10} parameters, arithmetic averaging has been used. For L_{Aeq} , logarithmic averaging has been used. For L_{A90} ⁵ the result has been calculated as the Rating Background Level (RBL) of the dataset in accordance with accepted practice.

Table 3-1: Existing ambient noise levels (unattended noise monitoring)

Logger location	Time of Day	Average Noise Levels (dBA)				
		L_{A01}	L_{A10}	L_{A90} (RBL)	L_{Aeq}	L_{Amax}
M1	Day (7am-6pm)	69	65	52	62	76
	Evening (6pm-10pm)	67	64	49	61	74
	Night (10pm-7am)	64	58	35	57	70

¹ L_{A01} is the A-weighted sound pressure level exceeded for 1% of the time.

² L_{A10} is the A-weighted sound pressure level exceeded for 10% of the time.

³ L_{Aeq} is the equivalent or energy-averaged A-weighted sound pressure level.

⁴ L_{Amax} is the average of the maximum A-weighted sound pressure levels occurring within the consecutive 15 minute samples.

⁵ L_{A90} is the A-weighted sound pressure level exceeded for 90% of the time.

4 Noise criteria

Criteria applicable to the assessment of noise impacts from the operation of the development have been adopted from the following:

- Environmental Protection Act 1994 'the Act'
- Environmental Protection (Noise) Policy 2019
- Ripley Valley Priority Development Area – Development Scheme Amendment No. 2

4.1 Environmental Protection Act 1994

The object of this Act is to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ecologically sustainable development).

The Act describes a number of offences relating to noise emission, including building work, regulated devices (e.g. power tools), pumps, air-conditioning equipment, refrigeration equipment, etc.

4.1.1 Section 440U: Air-conditioning equipment

(1) *This section applies to premises at or for which there is air conditioning equipment.*

(2) *An occupier of the premises must not use, or permit the use of, the equipment on any day—*

(a) before 7a.m, if it makes a noise of more than 3dB(A) above the background level; or

(b) from 7a.m. to 10p.m, if it makes a noise of more than 5dB(A) above the background level; or

(c) after 10p.m, if it makes a noise of more than 3dB(A) above the background level.

4.1.2 440X: Open-air events

(1) *An occupier of premises must not use, or permit the use of, the premises for an open-air event on any day –*

(a) before 7a.m, if the use causes audible noise; or

(b) from 7a.m. to 10p.m, if the use causes noise of more than 70dB(A); or

(c) from 10p.m. to midnight, if the use causes noise of more than the lesser of the following –

(i) 50dB(A);

(ii) 10dB(A) above the background level.

(2) *However, subsection (1) does not apply to licensed premises.*

(3) *Also, subsection (1)(b) does not apply if –*

- (a) the premises is, or is part of, an educational institution; and*
- (b) the use of the premises for an open-air event is organised by or for the educational institution for non-commercial purposes of the institution.*

Should the oval be hired out to host events that are not organised by nor for the school, or if the oval is hired out to third parties for for-profit and/or commercial purposes, the noise emissions from the oval (or part/s of the oval) would need to comply with the noise emission criteria prescribed by the EPP (Noise).

4.1.3 Section 440W: Indoor venues

- (1) An occupier of a building must not use, or permit the use of, the building as an indoor venue on any day—*
 - a) before 7a.m, if the use makes an audible noise; or*
 - b) from 7a.m. to 10p.m, if the use makes a noise of more than 5dB(A) above the background level;*
or
 - c) from 10p.m. to midnight, if the use makes a noise of more than 3dB(A) above the background level.*
- (2) However, subsection (1) (b) does not apply if—*
 - d) the building is, or is part of, an educational institution; and*
 - e) the use of the building as an indoor venue is organised by or for the educational institution for non-commercial purposes of the institution.*

The noise assessment criteria provided under Section 440W of the EP Act do not apply where the activity is “..organised by or for the educational institution for non-commercial purposes of the institution”.

4.2 Department of Environment and Science – Environmental Protection (Noise) Policy 2019

Schedule 1 of the EPP (Noise) 2019 presents outdoor and indoor acoustic quality objectives during the day, evening and night-time periods. These objectives apply to all forms of noise experienced by a receptor.

The acoustic quality objectives for uses in proximity to the subject site are reproduced in Table 4-1. It can be seen in this table that the objectives are presented in terms of the adjusted L_{Aeq} , L_{A10} and L_{A01} noise levels measured over a 1-hour time period.

Table 4-1: EPP (Noise) acoustic quality objectives

Sensitive Receptor	Time of Day	Acoustic Quality Objectives (dBA)		
		L_{Aeq} , adj, 1hr	L_{A10} , adj, 1hr	L_{A01} , adj, 1hr
Residence (for outdoors)	Daytime and Evening	50	55	65
Residence (for indoors)	Daytime and Evening	35	40	45
	Night-time	30	35	40

The internal noise objective for the day and evening is 35dB L_{Aeq} 1 hour. This internal objective can be approximated to an external objective by adding 10dB across an open façade. The resultant external objective would be 45dB L_{Aeq} 1 hour.

4.3 Ripley Valley PDA – Development Scheme

The Ripley Valley PDA Development Scheme provides a basis for assessment within the PDA. Whilst the development scheme provides overarching goals for noise, there are no objective acoustic requirements within the PDA. For example,

Residences and other sensitive uses are protected from the impacts of noise and dust from regional transport corridors.

Development delivers.. manages air quality, noise and hazardous materials according to current standards

Noise emissions from the Project will therefore be addressed in accordance with the EPP (Noise) 2019 and the EP Act.

4.4 Noise emission objectives

Project noise emission objectives have been established based on the requirements dictated by the Act and EPP (Noise) 2019. Noise emission criteria applicable to the use of the school is provided in Table 4-2.

Table 4-2: Project noise criteria

Noise source	Type of use	Noise requirement	Noise criteria	Noise objective, dB L _{Aeq} 1 hour	
				Day BG = 52	Evening BG = 49
MPH	Educational	EP Act	N/A	-	-
	Community use	EPP (Noise) EP Act	45 BG + 5dB	45	45
MP Courts	Educational	EP Act	N/A	-	-
Sports Field	Community use	EPP (Noise)	45	45	45
Carpark	All	EPP (Noise)	45	45	45
Mechanical plant	All	EPP (Noise) EP Act	45 BG + 5dB	45	45

5 Assessment of noise impacts

Noise impacts to receivers external to the site has been addressed for the following noise sources:

- Noise associated with the carpark
- Noise from the multipurpose hall
- Noise from multipurpose ball courts and ovals
- New mechanical plant servicing the Project

5.1 Preliminary review

A preliminary review of noise impacts has been undertaken, for which we provide the following initial commentary:

- Noise emissions from the PAC does not appear to be an immediate risk (largely due to the façade being closed).
- The MP Hall is located further to the south, which will likely permit third party use whilst still being passively ventilated. Consideration will also be given to potential rail noise impacts.
- The school oval and courts maximise proximity to residential dwellings (future and existing) whilst creating a buffer to rail noise.
- Senior and Junior play are located central to the school which will minimise noise impact to external receivers and impacts from Ripley Road.

5.2 Noise from the carpark

New carparks are proposed with access via Wensley Road to the west and future access road along the eastern boundary.

Noise associated with vehicles accessing these carparks have been addressed. Predictions utilising the sound power levels and conditions provided in Table 5-1.

Table 5-1: Driveway noise sources

Activity	Sound power level, dBA	Vehicles per hour (vph)
Cars moving (10km/h)	84 assessed as L_{Aeq}	168

5.3 Noise from the multipurpose hall

It is our understanding that the MPH may be utilised for third party use. Whilst noise from educational use would be exempt from assessment as per Part 440W of the EP Act, noise from third party use would need to be assessed.

The MPH would be designed to mitigate rain noise impacts on the roof. These treatments have been considered in predicting noise breakout from the use of the hall. Acoustic ratings to external walls would also need to be considered, however this would be undertaken as part of the schematic design of the buildings.

The potential third party use of the MPH is unknown; however, the following is envisaged noise generated within the MPH could be associated with:

- Amplified speech and music
- Indoor sports
- Dance classes

The MPH would typically be naturally ventilated as per previous DoE projects.

5.3.1 Source noise levels

Noise from the operation of the MPH has been assessed for each noise source nominated above. Windows and/or doors to the MPH have been assumed to be open, encompassing an area of approximately 45m² on each of the northern and southern facades.

Sound pressure levels within the MPH are provided in Table 5-2.

Table 5-2: Internal sound pressure level

Measurement description	Sound pressure level, dB								
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Within MPH (amplified music and speech)	94	96	86	87	83	81	82	78	90
Within MPH (dance)	89	91	81	82	78	76	77	73	85
Within MPH (sport)	65	71	70	74	76	75	64	51	80

5.3.2 Multipurpose hall constructions

Acoustic constructions utilised for the assessment are provided in Table 5-3. Such constructions are provided as proof of concept, and would be subject to assessment during the schematic design and detailed design phases of the MPH. It is noted that the façade openings for ventilation will be the predominant contributor to noise emanating from the MPH.

Table 5-3: MPH facade constructions

	Building element	Recommended construction	Approximate Rw
MPH	Roof / ceiling	0.5mm sheet metal cladding - Bradford Anticon 60 blanket. - Minimum 250mm ceiling cavity filled with 75mm thick 14kg/m3 density insulation - Perforate plasterboard	30
	External walls	125mm tilt concrete panel	50

5.4 Sporting oval

The following assumptions are made for the assessment of noise from the sporting oval:

- It is assumed that the oval will be completely vacated and lights out by 10:00p.m.
- Worst-case of 60 people at the oval at any given hour, consisting of 60 players (four teams of 15 players) for training.
- It is assumed that spectators will only be spectating and talking during a typical practice session (i.e. no loud cheering and/or shouting).
- Sound power levels were taken from a previous similar project of a junior soccer game. It is assumed that noise emissions for other games such as touch football and rugby will be similar to soccer (e.g. similar noise levels when kicking a ball, passing a ball, etc.). The sound power levels for a practice session were scaled to account for 60 players on the field.

5.5 Noise from ballcourts

Typical noise levels for hardcourt sporting activities likely to be held on the ballcourts were obtained from our database and library files.

Noise from ball court activities varies considerably given the use (e.g. basketball, tennis, netball, futsal) and the patrons using the court. To this author's knowledge, no large-scale data capture of noise associated with such sports has been undertaken in Australia which would provide a robust statistical value for assessment purposes. Accordingly, a sound power level for ball court activities has been adopted which is toward the upper range of measurements conducted by RTA.

In determining noise levels associated with the courts, RTA have adopted a sound power level of 94dB L_{Aeq} which is considered conservative for this assessment.

5.6 Predicted noise levels

Predicted noise levels from the operation of school uses are provided in Table 5-4. Predicted noise levels consider the constructions in Section 8.

Receivers have been grouped by worst case locations, namely:

- Northern receivers (across Ripley Road)
- Southern receivers (nearest existing dwellings to the southwest and south)
- Future western receivers (across Wensley Road)

Eastern receivers include predominantly community recreation facilities which are not acoustically sensitive. Predicted noise levels consider acoustic treatments nominated in Section 8.

Table 5-4: Predicted noise levels

Noise source	Conditions	Assessment location	Predicted noise level, dB L _{Aeq} 1 hour	Noise emission objective dB, L _{Aeq}	
				Day (7am to 6pm)	Evening (6pm to 10pm)
Carpark	N/A	Northern	33	45	45
		Southern	26	45	45
		Western	33	45	45
MPH (amplified speech and music)	Façade open	Northern	44	45	45
		Southern	45	45	45
		Western	42	45	45
MPH (dance class)	Façade open	Northern	39	45	45
		Southern	40	45	45
		Western	37	45	45
MPH (indoor sports)	Façade open	Northern	34	45	45
		Southern	35	45	45
		Western	32	45	45
MP Courts	N/A	Northern	< 25	45	45
		Southern	33	45	45
		Western	38	4	4
Sporting Fields	N/A	Northern	46	45	45
		Southern	50	45	45
		Western	50	45	45

5.7 Discussion

Noise emissions from the use of the school have been assessed. With regard to each proposed activity, we note:

- Noise from the carpark is expected to meet noise emission objectives.
- Noise associated with indoor uses, external courts and sporting fields is not assessable under the provisions of the EP Act. Noise from potential third-party use has been addressed.
- Noise from third party use of the multipurpose ball courts is expected to meet noise emission objectives.
- Noise from third party use of the oval is expected to result in some exceedances of noise emission criteria, up to 5dB for the day and evening period. It is noted however that this would not be atypical for residential dwellings in proximity to sporting ovals.
- Predicted noise levels indicate that noise generated within the MPH during sporting and dance classes is expected to meet noise emission targets.
- Noise during events with amplified speech and music is capable of meeting noise emission targets, however, should not exceed the internal noise levels provided in Section 5.3.1. The size and location of ventilation openings may result in some exceedance of the noise emission criteria for amplified music and speech events.

5.8 Mechanical plant

A detailed assessment of mechanical plant servicing the Project has not been conducted due to the infancy of the development design. However, the following should be considered when siting plant equipment in order to minimise noise impacts from plant operation on adjoining uses:

- Air-conditioning condenser units should be located on facades opposite those facing residential dwellings in order to maximise distance and screening to receivers (e.g. southern, northern or eastern sides of buildings).
- Exhaust and supply fans may require internally lined duct work on the intake and discharge and should ideally face away from the west, north and east boundaries (e.g. face east).

The mechanical services for the building will be designed to ensure that the limits previously presented in Table 4-2 are met. These limits are to be co-ordinated with the mechanical engineer's design.

A detailed assessment of the noise impact from mechanical plant will be undertaken as part of the schematic design and design developments stages once noise data is available.

6 Road traffic noise assessment

Ripley Road is not classified as a transport noise corridor, nor is it listed as a state-controlled road. Accordingly, road traffic noise impacts are not required to be assessed against State Code 1 of the *State Development Assessment Provisions* (SDAP).

An assessment of road traffic noise impacts has included for future planning purposes in order to determine expected levels of acoustic impact associated with Ripley Road.

6.1 Road noise criteria

Whilst the requirements of SDAP State Code 1 are not applicable to the subject site, the criteria contained therein have been used as a basis for assessment. The acoustic requirements applicable to the project, as per Table 2 and Table 3 of the SDAP are reproduced in Table 6-1.

Table 6-1: Maximum acoustic levels (SDAP)

Type of occupancy / activity	Design sound level
Indoor education areas	≤ 35 dB L_{Aeq} (1 hour) (internal)
Outdoor education areas	≤ 63 dB L_{10} (12 hour) (free field)

Further to the SDAP requirements, internal noise levels are to meet the requirements of the DoE design standards and has been reproduced in Table 6-2.

Table 6-2: Road traffic noise intrusion criteria

Type of occupancy / activity	Internal design sound level, L_{A10} 30min
GLA	35
Drama studios, dance, assembly	35
Music and practice rooms	35
Meeting rooms, interview, counselling	40
Resource and breakout areas	40
Teacher preparation areas, study areas	40
Laboratories, art and design spaces, electronics workshops	40
Circulation spaces	45
Dining rooms	45
Offices, medical rooms, staff rooms	40
Change rooms	50
Toilet	50
Kitchens	60

6.2 Road traffic noise levels

Road traffic noise impacting the development have been established using the Calculation of Road Traffic Noise Model (CoRTN). Traffic noise modelling parameters are provided in Table 6-3.

Table 6-3: Modelling parameters

Modelling parameter	Description
Algorithm	Calculation of Road Traffic Noise (CoRTN)
Road traffic volumes source	PTT Traffic Consultants
Growth rate	10% growth
AADT 2026	14,990
AADT 2032	30,560
18-hour volume	94% of AADT
Heavy vehicles	5.6%
Façade correction	+2.5dB
Vehicle speed	70km/h
Elevations	1m contours from Geoscience Australia Elevation Information System (ELVIS).
Pavement type	Dense graded asphalt
Ground attenuation	Soft ground

The noise model has been calibrated against measured noise levels at the subject site, the results of which are provided in Table 6-4. The model is verified where the difference between the calculated noise level and measured noise level is within +/- 2dB.

Table 6-4: Model calibration

Location	Predicted noise level, dB LA10 18 hour	Measured noise level, dB LA10 18 hour	Difference, dB
Logger location	66.3	66.6 ¹	-0.3

1. Includes façade reflection

Ripley Road will be widened in front of the subject site as part of the Ipswich City Council Ripley Road and Fischer Road Upgrade project. The footprint for the road widening has been used for determining future road traffic noise impacts on the development.

6.3 Road traffic noise levels

Worst case calculated road traffic noise levels impacting the development are provided in Table 6-5. Road traffic noise contours are provided in Figure 6-1.

Table 6-5: Façade reflected noise level

Location	Road traffic noise level, dB	
	L _{A10} 18 hour	L _{Aeq} 1 hour
North	65	63
West	62	60
East	62	60

Calculated road traffic noise levels indicate that suitable internal noise levels can be achieved within educational areas with moderate levels of acoustic treatment. This would typically entail:

- Acoustic louvres or sliding windows
- Acoustic treatment to light weight façade constructions, particularly in proximity to Ripley Road.
- Acoustic treatment to roof / ceiling constructions, particularly in proximity to Ripley Road.

6.4 Assessment of outdoor educational areas

With consideration to outdoor education areas, we provide the following commentary:

- Outdoor learning areas associated with general learning areas. Such outdoor learning areas should be located on the southern façade of buildings fronting Ripley Road.
- Junior plan and senior play areas are expected to meet the 63dB L_{A10} 12 hour free field condition of SDAP PO44 (refer to Table 6-1).

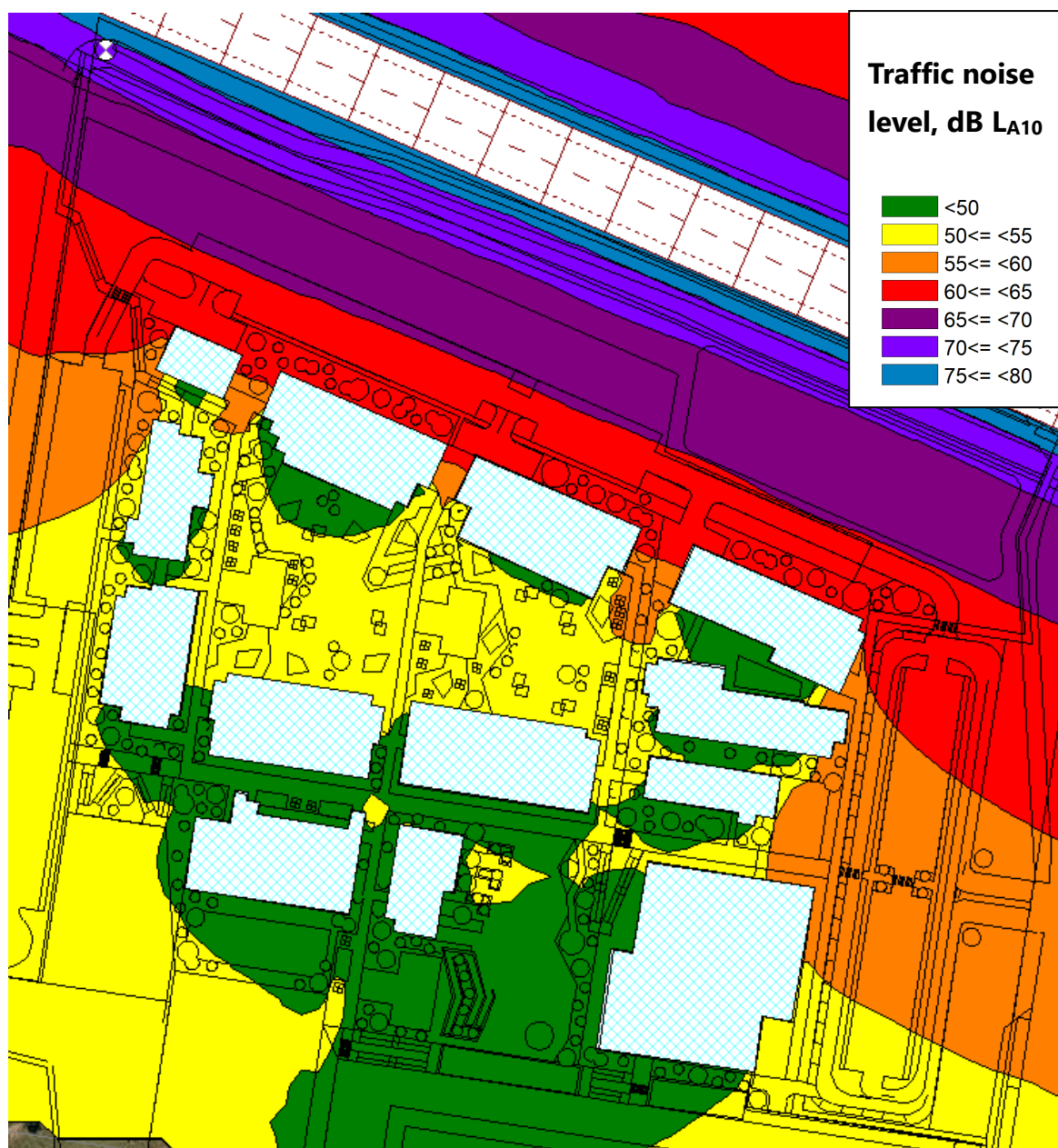


Figure 6-1: Traffic noise contours
(1.5m)



**Ripley Valley State High
School**

Noise Impact Assessment

7 Rail noise assessment

7.1 Background

A preliminary assessment of rail noise impacts is to be undertaken. Detailed design or noise modelling of the rail corridor has not been conducted and accordingly noise impacts from the corridor will be undertaken at a high level only.

7.2 Rail noise criteria

We would anticipate that SDAP State Code 2 objectives would apply as typical to educational projects, and would include:

- Maximum façade noise levels (façade corrected)
 - 65dBA L_{eq} 1 hour
 - 87dBA single event maximum
- Outdoor education and play areas
 - 62dBA L_{eq} 12 hour – outdoor education and play areas and
 - 84dBA single event maximum level
- Indoor education areas
 - 50dBA single event maximum level

The L_{Aeq} criteria is dependent on overall exposure to rail noise within a specific period, and as such requires parameters around movements and train length to be assessed. We note that in absence of rail movements, the L_{Aeq} criteria would not be assessable, and accordingly would not be applied in this instance. Single event maximum (SEM) levels can be somewhat approximated and would form the basis of the assessment.

7.3 Modelling

In the absence of specific information regarding the rail alignment and infrastructure (e.g. elevation, rail barriers etc), predictive modelling will be limited. Noise predictions will be undertaken with consideration to the following:

- The Kilde 67/130 noise model, as adopted by TMR for the assessment of rail impacts, can provide an estimation of rail noise impact, however the parameters of the model will be limited given the infancy of the corridor design.
- A high-level distance calculation based on a typical IMU train movement at a specific speed can be undertaken. In the absence of specific information, this would be based on an assumption of flat terrain. Such predictions would likely lead to a conservative assessment of rail noise impacts.

- It is also noted that rail acoustic barriers may be installed as part of the rail corridor design, which may in fact result in noise levels being significantly lower than those predicted using simplified methods (i.e. modelling in the absence of rail corridor physical and operational characteristics).

7.4 Predicted noise levels

Rail noise predictions using the Kilde 61/130 noise model have been undertaken. Worst case noise levels at each potentially impacted building are provided in Table 7-1.

Table 7-1: Predicted rail noise levels

Building	Predicted SEM	Internal noise criteria, SEM	Reduction required
Food studies / resources	71	50	21
MPH	67	50	17
GLC 2	69	50	19

7.5 Rail assessment outcomes

Predicted noise levels indicate that a reduction of up to 21dB would be required at the worst affected building (food studies & resource centre) to mitigate rail noise.

A 21dB reduction would be afforded by standard building constructions with windows closed. Louvred windows would be required to be acoustic type (e.g. Breezeway Altair or Jalousie Safetyline) with a minimum Rw 28.

Standard façade construction is assumed to be sheet metal on steel studs or structural members with cavity insulation and internal plasterboard.

7.6 Naturally ventilated spaces

Whilst multipurpose halls would be considered as indoor education areas, it is common practice for such spaces to be naturally ventilated. In such instances, we would assume that whilst noise levels within these spaces may exceed rail noise objectives, it would be acceptable on the basis that the space is naturally ventilated only. Incorporating mechanical ventilation to such spaces based on a preliminary noise corridor (and with consideration to limitations in modelling) is considered to be overly conservative.

8 Recommendations

8.1 Noise emission requirements

8.1.1 Mechanical plant

Noise from the operation of mechanical plant is to meet the noise emission requirements nominate in Section 4.4 of this report.

8.1.2 Multipurpose ball courts

No additional acoustic treatments are expected to be required to the multipurpose ball courts in order to meet noise emission requirements.

8.1.3 Multipurpose hall

The following recommendations are provided for the third-party operation of the multipurpose hall (i.e. not for educational purposes):

- Where amplified music and speech is utilised, amplified equipment should be limited to ensure that noise emission requirements are met. A detailed noise assessment may be required for such uses once ventilation opening sizes and orientation is finalised.
- No additional acoustic treatments are recommended for dance class and indoor sporting use within the MPH.
- Acoustic treatment to the MPH should be reviewed as part of the schematic design and detailed phases to ensure that noise emission requirements (third party use) are met.

Complaint management procedures should be incorporated to ensure that any complaints from the local community are recorded and acted upon.

8.1.4 Sporting oval

In the event the sporting oval is to be used for third party use, a noise management plan should be prepared in order to reduce noise impacts as practically possible. This may include hours of operation, restrictions on amplified music or public announcement systems, and complaint management procedures.

8.2 Road and rail noise impacts

The schematic design of the project has yet to be undertaken and as such internal layouts and the façade construction have yet to be determined. Accordingly, prescriptive acoustic treatments to meet internal noise requirements cannot be provided at this stage.

However, the following should be undertaken to ensure that traffic noise intrusion meet internal noise requirements.

- Glazing, façade and roof/ceiling constructions should be designed and selected to meet internal noise requirements dictated by DoE design standards.
- Classrooms should include air conditioning or alternative sources of ventilation to ensure that windows can be closed.

APPENDIX A Glossary of terminology

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

Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.		
Amenity	A desirable or useful feature or facility of a building or place.		
A-weighting	A filter applied to the sound recording made by a microphone to approximate the response of the human ear.		
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the LA90 noise level if measured as an overall level or an L90 noise level when measured in octave or third-octave bands.		
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of common sounds in our environment:		
	threshold of hearing	0 dB	The faintest sound we can hear, defined as 20 micro Pascal
		10 dB	Human breathing
	almost silent	20 dB	
		30 dB	Quiet bedroom or in a quiet national park location
	generally quiet	40 dB	Library
		50 dB	Typical office space or ambience in the city at night
	moderately loud	60 dB	CBD mall at lunch time
		70 dB	The sound of a car passing on the street
	loud	80 dB	Loud music played at home
		90 dB	The sound of a truck passing on the street
	very loud	100 dB	Indoor rock band concert
		110 dB	Operating a chainsaw or jackhammer
	extremely loud	120 dB	Jet plane take-off at 100m away
		130 dB	
	threshold of pain	140 dB	Military jet take-off at 25m away
dB(A)	A-weighted decibel. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter is denoted as dB(A). Practically all noise is measured using the A filter.		
Discontinuous Construction	A wall system having a minimum 20mm cavity between two separate leaves, where, for other than masonry there is no mechanical linkage between leaves except at the periphery.		
EPA	Environment Protection Authority		

Field Test	A test of the sound insulation performance in-situ. See also 'Laboratory Test' The sound insulation performance between building spaces can be measured by conducting a field test, for example, early during the construction stage or on completion. A field test is conducted in a non-ideal acoustic environment. It is generally not possible to measure the performance of an individual building element accurately as the results can be affected by numerous field conditions.
FIIC	Field Impact Isolation Class. A measure of the noise impact performance of a floor. The value indicates the resistance of the floor to the transmission of impact sound and is measured using a standard tapping machine. It is measured in-situ and is therefore subject to the inherent accuracies involved in such a measurement. The term is defined in ASTM E492 and E1007. It is a field measure of the level of impact sound transmitted to a space via a floor. The equivalent measurement in a laboratory is termed the IIC. The higher the value the better the performance.
Flanking	Flanking is the transfer of sound through paths around a building element rather than through the building element material directly. For example, sound travelling through a gap underneath a door or a gap at the top of a wall.
IIC	Impact Isolation Class A measure of the noise impact performance of a floor. It is measured in very controlled conditions in a laboratory and is characterised by how much sound reaches the receiving room from the operation a standard tapping machine placed on the floor. The term is defined in ASTM E492 and E1007. The higher the number the better the performance.
Impact Noise	The noise in a room, caused by impact or collision of an object onto the walls or the floor. Typical sources of impact noise are footsteps on the floor above a tenancy and the slamming of doors on cupboards mounted on the common wall between tenancies.
L90	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
LAeq or Leq	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time, which would produce the same energy as a fluctuating sound level. When A-weighted, this is written as the LAeq.
Lmax	The maximum sound pressure level measured over a given period. When A-weighted, this is usually written as the Lmax.
Ln,w	Weighted Normalised Impact Sound Pressure Level A measure of the sound level transmitted from impacts on a floor to a tenancy below. It is measured in very controlled conditions in a laboratory and is characterised by how much sound reaches the receiving room from a standard tapping machine. A lower value indicates a better performing floor.
LnT,w	Weighted Standardised Field Impact Sound Pressure Level As for Ln,w but measured in-situ and therefore subject to the inherent accuracies involved in such a measurement. The equivalent measurement in a laboratory is the Ln,w. A lower value indicates a better performing floor.
Laboratory Test	The performance of a building element when measured in a laboratory. The sound insulation performance of a building element installed in a building however can differ from its laboratory performance for many reasons including the quality of workmanship, the size and shape of the space in which the measurement is conducted, flanking paths and the specific characteristics of the material used which may vary from batch to batch.

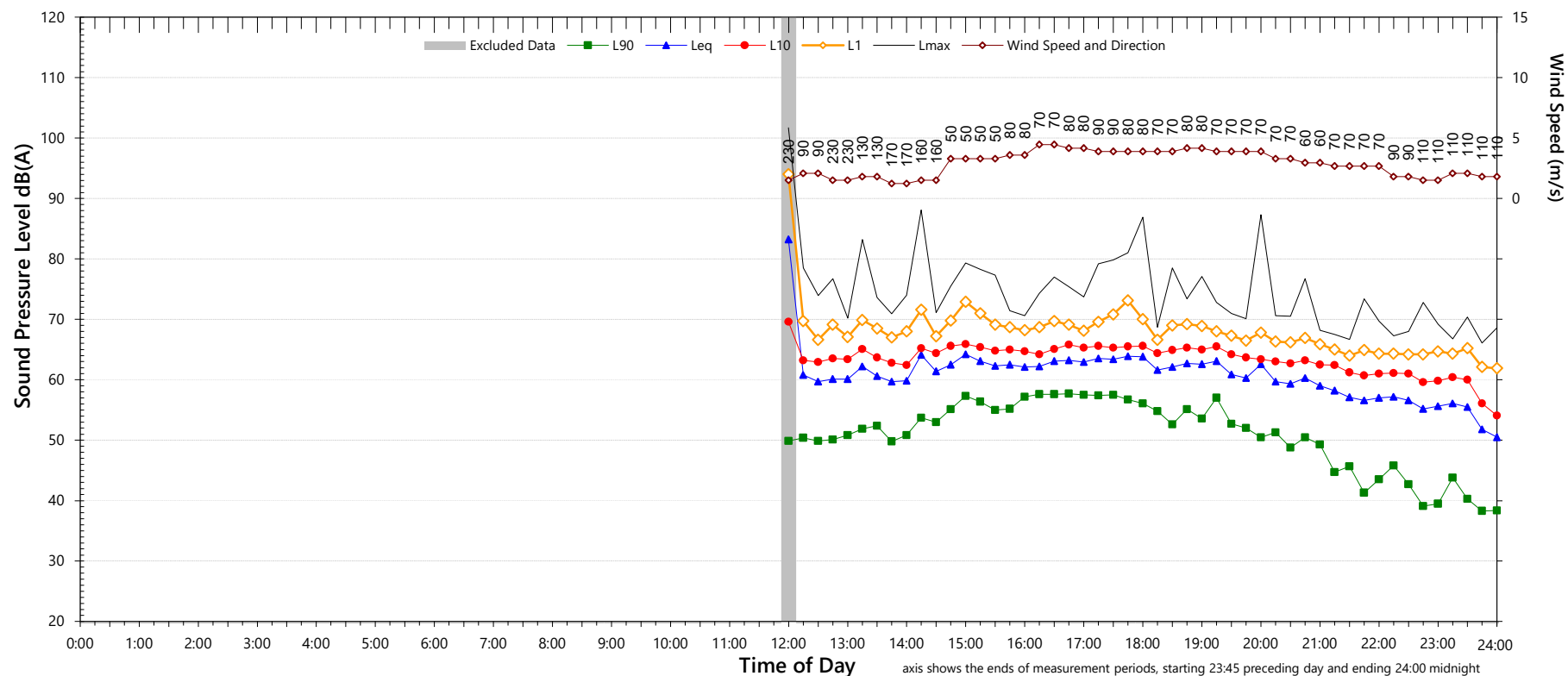
NRC	Noise Reduction Coefficient. A measure of the ability of a material to absorb sound. The NRC is generally a number between 0 and 1 but in some circumstances can be slightly greater than 1 because of absorption at the edges of the material. A material with an NRC rating of 1 absorbs 100% of incoming sound, that is, no sound is reflected back from the material. The NRS is the average of the absorption coefficient measured in the octave bands 250Hz, 500Hz, 1kHz & 2kHz which correspond to the predominant frequencies associated with the human voice.
Partition wall	A wall dividing two rooms.
Rw	Weighted Sound Reduction Index A measure of the sound insulation performance of a building element. It is measured in very controlled conditions in a laboratory. The term supersedes the value STC which was used in older versions of the Building Code of Australia. Rw is measured and calculated using the procedure in ISO 717-1. The related field measurement is the DnT,w. The higher the value the better the acoustic performance of the building element.
R'w	Weighted Apparent Sound Reduction Index. As for Rw but measured in-situ and therefore subject to the inherent accuracies involved in such a measurement. The higher the value the better the acoustic performance of the building element.
Sound absorption	The ability of a material to absorb sound energy by conversion to thermal energy.
Sound Insulation	Sound insulation refers to the ability of a construction or building element to limit noise transmission through the building element. The sound insulation of a material can be described by the Rw and the sound insulation between two rooms can be described by the DnT,w.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 pico watt.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone referenced to 20 micro Pascal.
Structure-borne Noise	Audible noise generated by vibration induced in the ground and/or a structure. Vibration can be generated by impact or by solid contact with a vibrating machine. Structure-borne noise cannot be attenuated by barriers or walls but requires the isolation of the vibration source itself. This can be achieved using a resilient element placed between the vibration source and its support such as rubber, neoprene or springs or by physical separation (using an air gap for example). Examples of structure-borne noise include the noise of trains in underground tunnels heard to a listener above the ground, the sound of footsteps on the floor above a listener and the sound of a lift car passing in a shaft. See also 'Impact Noise'.
Transmission Loss	The sound level difference between one room or area and another, usually of sound transmitted through an intervening partition or wall. Also the vibration level difference between one point and another. For example, if the sound level on one side of a wall is 100dB and 65dB on the other side, it is said that the transmission loss of the wall is 35dB. If the transmission loss is normalised or standardised, it then becomes the Rw or R'w or DnT,w.

APPENDIX B Noise monitoring data

Unattended Noise Monitoring Results

Wensley Road, Ripley - Ripley Road

Wednesday, 28 January 2026



Representative Noise Levels			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
Lmax	77	73	70
L ₁	69	67	65
L ₁₀	65	63	58
L ₉₀	52	47	37
Leq	62	61	57

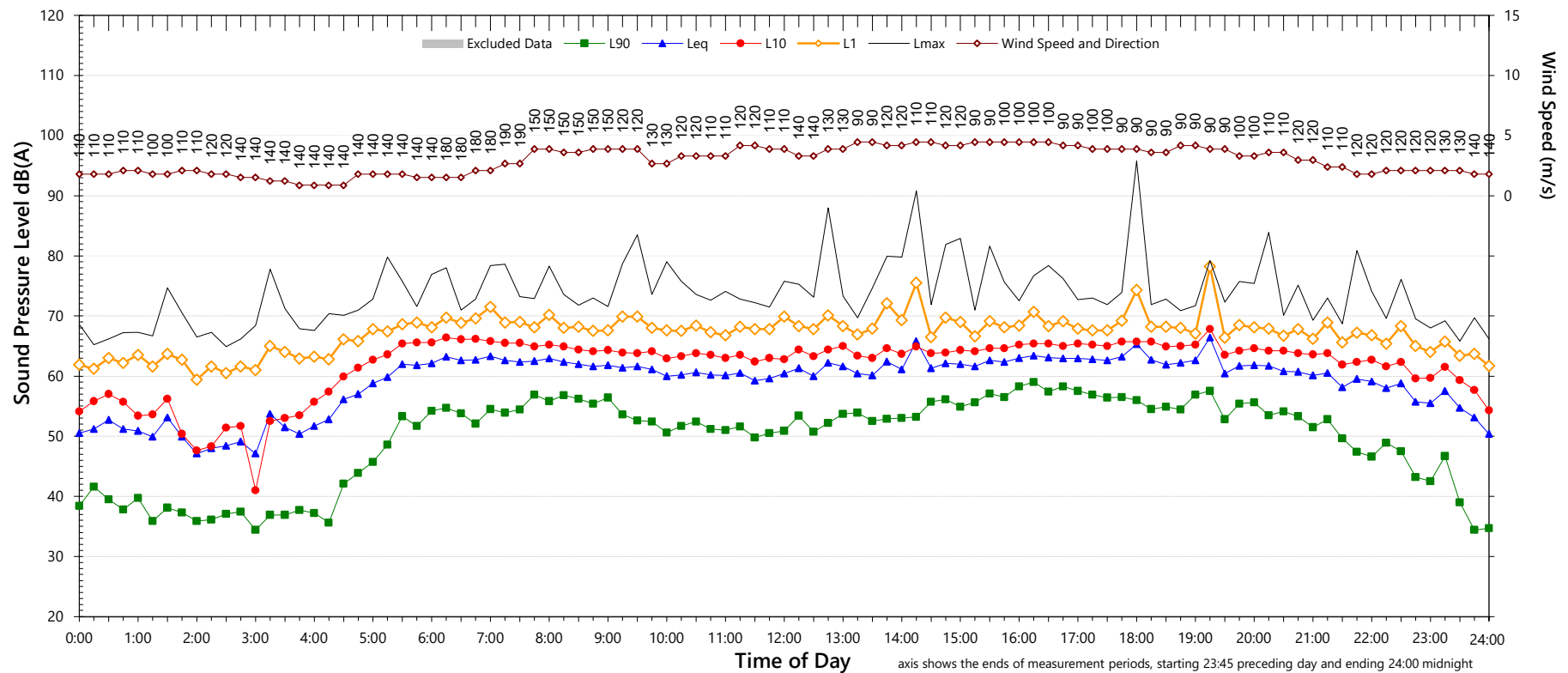
Notes:

1. Grey areas indicate periods of time that are either affected by rain, wind or other extraneous factors
2. Graphed & tabulated data measured in free-field

Unattended Noise Monitoring Results

Wensley Road, Ripley - Ripley Road

Thursday, 29 January 2026



Representative Noise Levels			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
Lmax	76	74	71
L ₁	69	68	65
L ₁₀	64	64	58
L ₉₀	52	51	34
Leq	62	62	58

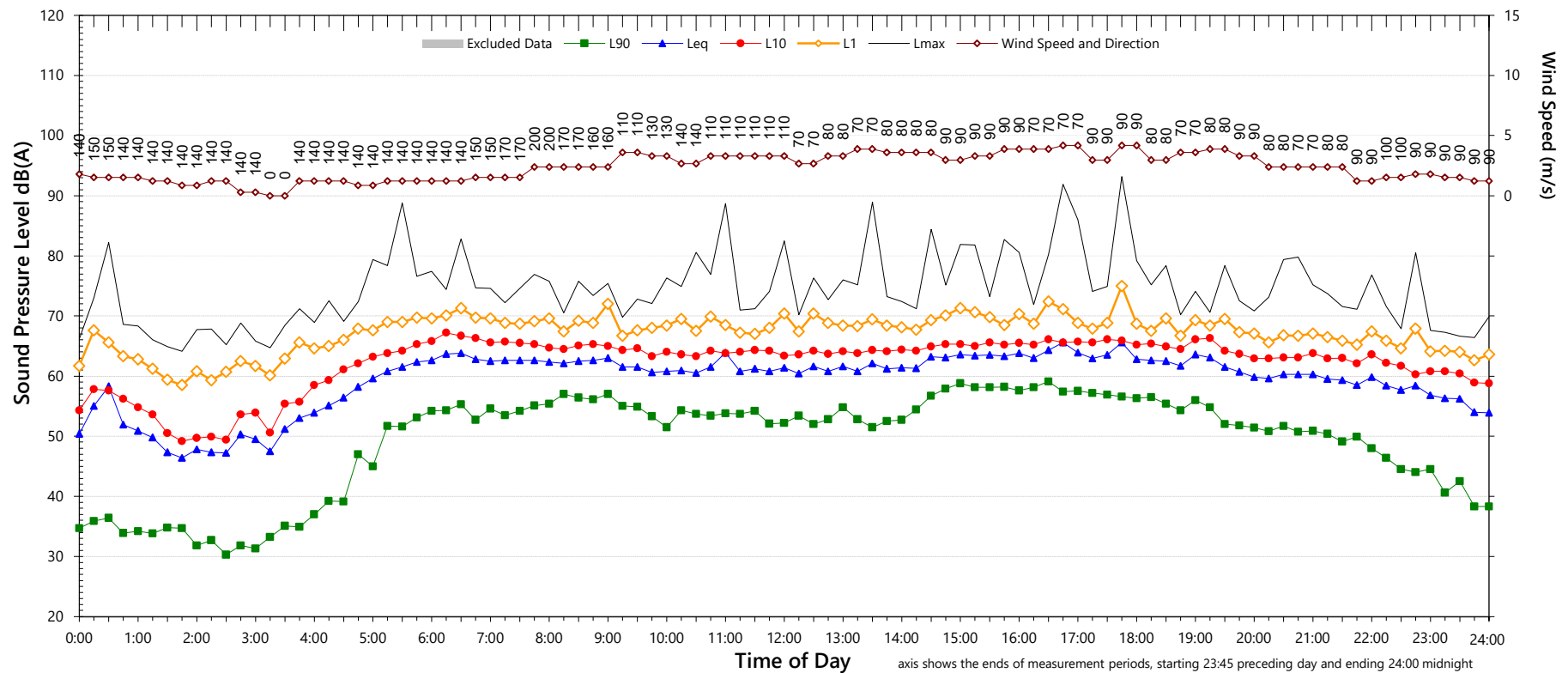
Notes:

1. Grey areas indicate periods of time that are either affected by rain, wind or other extraneous factors
2. Graphed & tabulated data measured in free-field

Unattended Noise Monitoring Results

Wensley Road, Ripley - Ripley Road

Friday, 30 January 2026



Representative Noise Levels			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
Lmax	77	74	71
L ₁	69	67	65
L ₁₀	65	64	57
L ₉₀	53	50	34
Leq	63	61	58

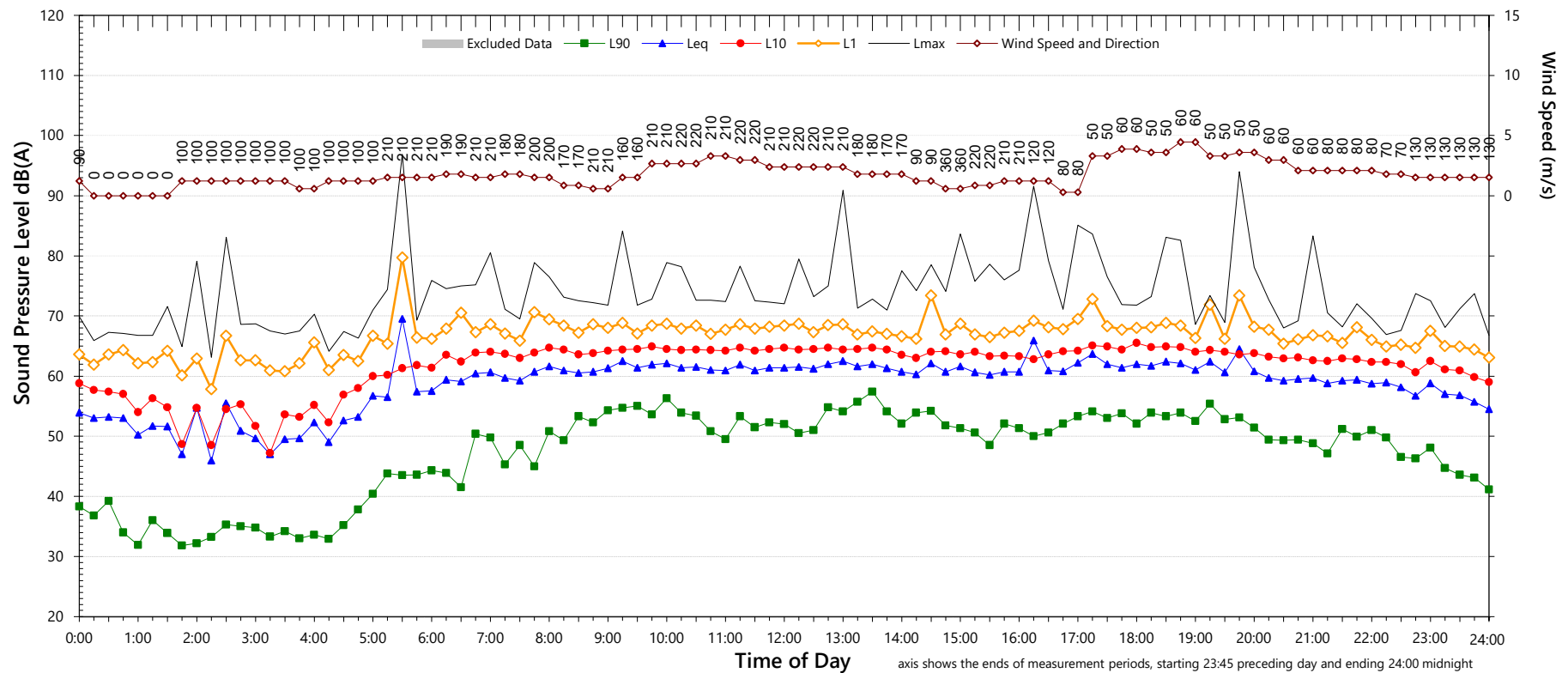
Notes:

1. Grey areas indicate periods of time that are either affected by rain, wind or other extraneous factors
2. Graphed & tabulated data measured in free-field

Unattended Noise Monitoring Results

Wensley Road, Ripley - Ripley Road

Saturday, 31 January 2026



Representative Noise Levels			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
Lmax	76	75	70
L ₁	68	68	64
L ₁₀	64	64	58
L ₉₀	50	50	34
Leq	62	61	55

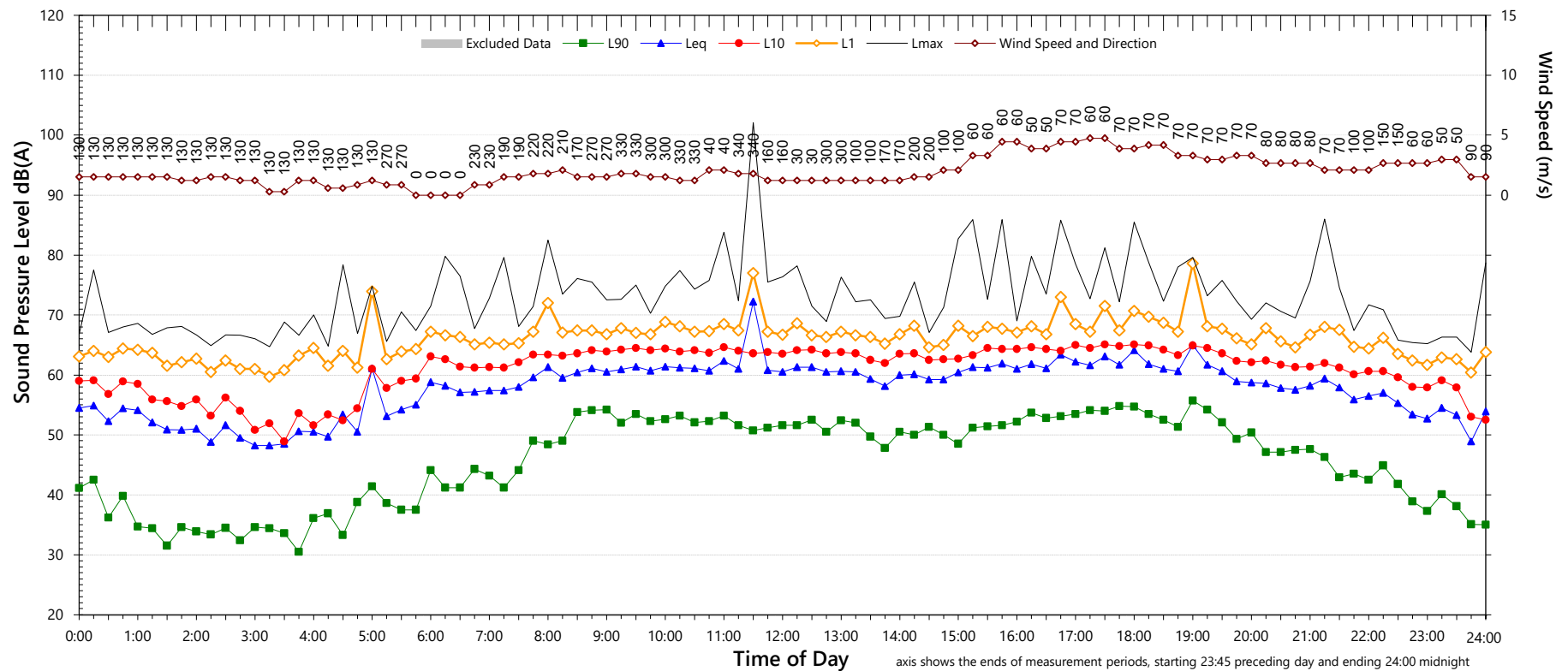
Notes:

1. Grey areas indicate periods of time that are either affected by rain, wind or other extraneous factors
2. Graphed & tabulated data measured in free-field

Unattended Noise Monitoring Results

Wensley Road, Ripley - Ripley Road

Sunday, 1 February 2026



Representative Noise Levels			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
Lmax	76	74	70
L ₁	68	68	64
L ₁₀	64	63	57
L ₉₀	50	46	34
Leq	62	60	58

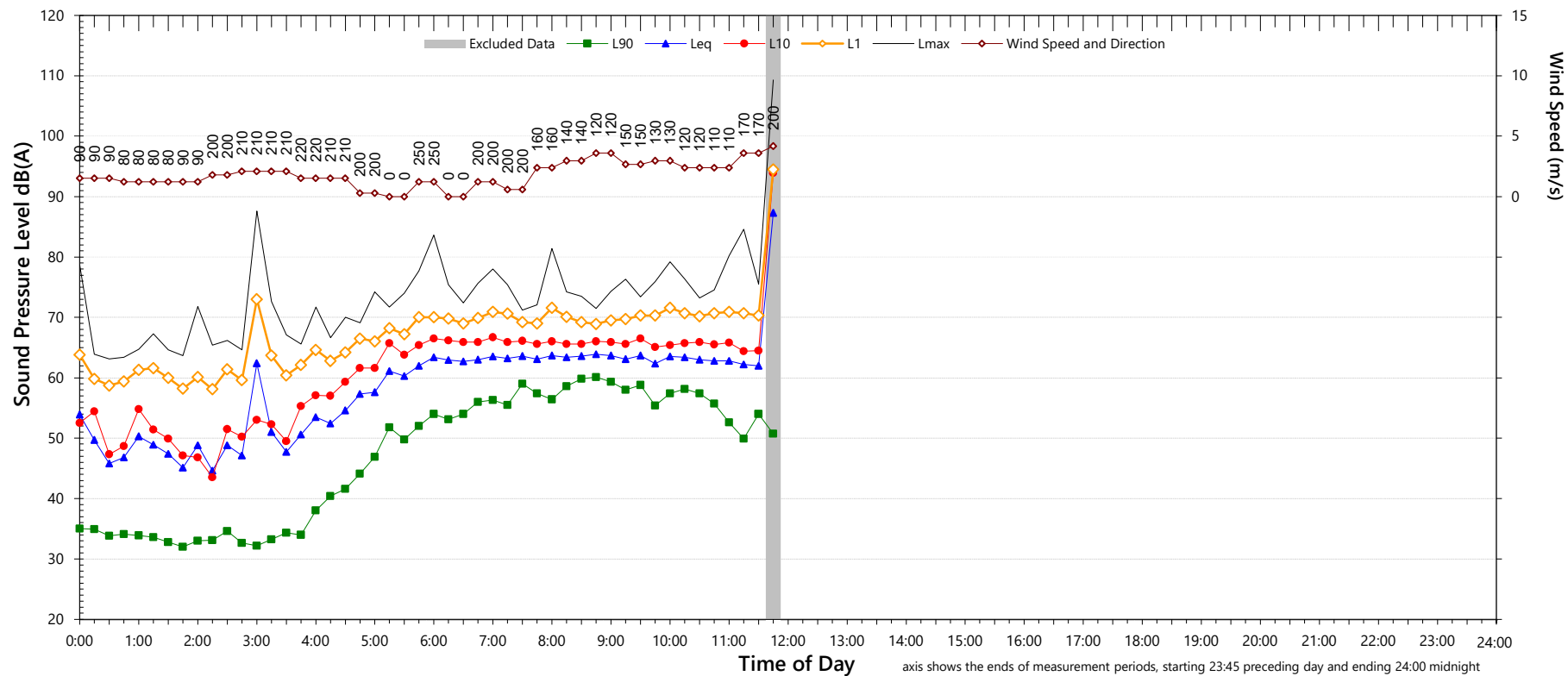
Notes:

1. Grey areas indicate periods of time that are either affected by rain, wind or other extraneous factors
2. Graphed & tabulated data measured in free-field

Unattended Noise Monitoring Results

Wensley Road, Ripley - Ripley Road

Monday, 2 February 2026



Representative Noise Levels			
Descriptor	Day	Evening	Night ²
	7am-6pm	6pm-10pm	10pm-7am
Lmax	76	-	-
L ₁	70	-	-
L ₁₀	66	-	-
L ₉₀	54	-	-
Leq	63	-	-

Notes:

1. Grey areas indicate periods of time that are either affected by rain, wind or other extraneous factors
2. Graphed & tabulated data measured in free-field

APPENDIX C Masterplan drawings

