



## **NOISE IMPACT ASSESSMENT**

on behalf of

**Homes by Honey Ltd**

for

**Penistone Road, Fenay Bridge**

**Report Number NA102384-5**

**Date of Report 21 October 2025**

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# Summary

A noise assessment has been undertaken to predict the potential impact of noise on a proposed residential development at Penistone Road, Fenay Bridge. It accompanies an application to discharge a planning condition associated with the development.

Environmental sound surveys have been undertaken to establish the existing sound climate at the locations of proposed noise sensitive receptors (NSRs) during periods representative of a typical 24-hour period. An initial noise risk assessment of the development has been undertaken.

A baseline computer noise model of the proposed development and surrounding site has been assembled based on the proposed site layout, recorded noise levels, and noise levels reported for Reliance Precision Ltd.

The likely noise levels at building façades and within external amenity areas have been predicted using CadnaA and are presented within this report. Based on the results of the computer modelling and the proposed site layout, mitigation has been proposed in terms of glazing and ventilation specifications and barrier treatments for amenity areas close to Penistone Road. No mitigation is proposed in relation to the activities at Reliance Precision as mitigation required for the control of road traffic noise is sufficient to control noise ingress.

The assessment concludes that, provided appropriate mitigation is undertaken as recommended, the impact of noise associated with the proposed development is likely to be low.

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## **Advisory Note**

The suitability of any recommended noise mitigation measures within this report should be approved by the relevant architects, structural engineers, building contractors, fire consultants and material manufacturers constituting the wider design team, prior to procurement and field application. This should ensure that when the recommended noise control measures are implemented on site, they will satisfy the requirements of all disciplines and not cause any health and safety issues.

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# 1 Introduction

- 1.1 Miller Goodall Ltd has undertaken a noise assessment to accompany an application to discharge a planning condition for a residential development of 67 units at Penistone Road, Fenay Bridge. The following condition has been provided in relation to the development at Penistone Road, Fenay Bridge:

*"Prior to works above foundation level commencing, notwithstanding the submitted information, a Noise Impact Assessment report shall be submitted to and approved in writing by the Local Planning Authority. The Noise Impact Assessment demonstrate how each dwelling hereby approved shall adhere to BS8233 regarding sound insulation and noise reduction. The report shall:*

- a) *Clearly show which habitable rooms in which plots will not achieve satisfactory indoor sound levels with windows open (35dB daytime / 30dB nighttime) and for these rooms provide a detailed specification of the noise mitigation measures that are necessary to achieve satisfactory indoor sound levels, including (but not necessarily limited to) the potential use of acoustic barriers an alternative ventilation scheme, where required.*
- b) *Clearly show which external amenity areas at which plots will have daytime noise levels that exceed 50dB LAeq,16hour and for these plots provide a detailed specification for the additional noise mitigation measures that are required so that the outdoor noise levels at these plots does not exceed 50 dB LAeq,16hour.*

*All works which form part of the approved scheme shall be completed prior to occupation of the aforementioned plots and retained thereafter. "*

- 1.2 The report assesses the potential impact of environmental noise on the proposed development and provides details of mitigation measures that are required to achieve appropriate internal and external noise criteria.

## 2 Policy, Standards and Guidance

2.1 The following planning policy and acoustics standards and guidance have been considered in this assessment:

- Noise Policy Statement for England (NPSE)
- National Planning Policy Framework (NPPF)
- ProPG: Planning & Noise, Professional Practice Guidance on Planning & Noise: New Residential Development, May 2017 (ProPG)
- BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' (BS 8233)
- BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' (BS 4142)
- Acoustics, Ventilation and Overheating: Residential Design Guide Version 1.1 (AVO)

2.2 Further detail of the scope and extent of this guidance is provided in **Appendix A: Policy, Standards and Guidance**.

## 3 Site Description

3.1 The site location is shown in **Appendix B: Site and Monitoring Location**. It is in a semi-rural location to the south-western edge of Fenay Bridge, approximately three miles south-east of Huddersfield Town Centre. The site is bounded to the north by Rowley Lane, with the village of Fenay Bridge surrounding the site to the north and east. The western boundary of the site is formed by Penistone Road, with farmland and a golf course beyond, while the southern boundary is adjacent to Reliance Precision Limited (RPL).

3.2 The primary noise source in the area is Penistone Road to the west of the site, with potential for noise from RPL to the south. RPL is a manufacturer of custom-built, high precision measurement instrumentation, and motion control components and systems. It is understood that RPL operate a workshop directly to the south of the site. The site can operate 24 hour a day although it has not done so on a regular basis in the recent past. It is understood that the current normal working hours at RPL are typically 0530–2300 hours, with some nightshift work occasionally taking place on weekdays.

3.3 The topography of the area is such that the development site rises in height from west to east. The southern boundary of the site drops down to the RPL site which lies below the level of the housing development. The topography of the RPL site is such that there is a steep slope

up to the rear carpark at the eastern site boundary, and the carpark overlooks the roof of the existing main production workshop.

## 4 Proposed Development

- 4.1 The development comprises 67 dwellings on a currently undeveloped plot of land. The proposed layout is presented in **Appendix C: Assessed Site Layout and Assessment Positions**.

## 5 Assessment Methodology

- 5.1 An assessment of the impact of environmental noise, from both road traffic and RPL, on the proposed development has been undertaken to compare the noise with recognised criteria contained within relevant guidance described in **Section 2**, and detailed in **Appendix A: Policy, Standards and Guidance**.
- 5.2 An environmental noise survey has been undertaken to quantify the existing levels of sound at the site and to enable a noise model of the site to be created and calibrated. This model has been used to predict noise levels across the site and at proposed dwellings to enable potential mitigation measures to be considered to ensure noise criteria are achieved both internally and in external amenity areas.

## 6 Environmental Sound Survey

### 6.1 Measurements Procedure

- 6.1.1 Attended and unattended environmental sound monitoring was undertaken at two positions at the site. Unattended measurements were undertaken between approximately 13:45 on Thursday, 3<sup>rd</sup> July 2025 and 10:15 on Tuesday, 8<sup>th</sup> July 2025 adjacent to RPL. Attended measurements were undertaken between approximately 12:20 and 15:20 on 8<sup>th</sup> September 2025 close to Penistone Road. These monitoring positions are considered representative of the existing environmental sound climate at the site.
- 6.1.2 The unattended monitoring position, MPI, is indicated in the figure presented in **Appendix C: Assessed Site Layout and Assessment Positions** along with the attended monitoring position MP2. This additional short-term attended environmental sound monitoring position

was used to quantify the noise from Penistone Road, using the CRTN shortened measurement procedure.

6.1.3 Measurement positions were as described in **Table 1**.

**Table 1: Noise monitoring locations**

Monitoring Location	Location Description
MP1	The microphone was mounted on a tripod in the free-field approximately 1.5 m above local ground level, approximately 105 m from Penistone Road and 25 m from the façade of the RPL building.
MP2	The microphone was mounted on a tripod in the free-field approximately 1.5 m above local ground level, approximately 4 m from Penistone Road and 11 m from Rowley Lane.

6.1.4 Measurements were undertaken in accordance with BS 7445-1: 2003<sup>1</sup>. Details of the equipment used are set out in **Table 2**.

**Table 2: Noise monitoring equipment**

Monitoring Location	Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
MP1	Class 1 <sup>[4],[5]</sup> Integrating Real Time 1/3 Octave Sound Analyser	NOR 140	Norsonic	1406017	13/09/2023	06431/4
	Microphone	NOR 1209	Norsonic	14448	13/09/2023	06431/4
	Pre-amplifier	NOR 1225	Norsonic	358159	13/09/2023	06431/4
	Class 1 Field Calibrator	Type 4231	Brüel & Kjær	2478249	22/08/2024	06881/1
	Outdoor Microphone Housing	NOR1217	Norsonic	N/A	N/A	N/A
MP2	Class 1 <sup>[4],[5]</sup> Integrating Real Time 1/3 Octave Sound Analyser	XL2-TA	NTi Audio	A2A-11111-E0	16/10/2023	05451/1

<sup>1</sup> BS 7445-1: 2003 Description and measurement of environmental noise - Part 1: Guide to quantities and procedures

Monitoring Location	Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
	Microphone	MA220	NTi Audio	6908	16/10/2023	05451/1
	Pre-amplifier	MC230A	NTi Audio	A14423	16/10/2023	05451/1
	Class 1 Field Calibrator	CAL 200	Larson Davies	14154	22/08/2024	06881/2
	Outdoor Microphone Housing	WP30	NTi Audio	N/A	N/A	N/A

6.1.5 The calibration of the sound level meter was checked before and after the measurements, with negligible deviation ( $\leq 0.1$  dB) recorded.

6.1.6 Each measurement period consisted of sequential 100 ms samples. The data has been extracted using NTi Data Explorer/NorReview software and analysed using an in-house Excel processing sheet to analytically determine representative  $L_{Aeq}$ ,  $L_{A90}$  and  $L_{AF,max}$  sound levels. The 100 ms sound levels have not been presented in this report but are kept on file for future reference.

## 6.2 Environmental Sound Climate

6.2.1 During the installation of the equipment at MPI, the sound climate was observed to consist primarily of road traffic noise on Penistone Road, with some low-frequency plant noise audible from the RPL building and some bird noise.

6.2.2 At MP2, noise from road traffic on Penistone Road dominated the noise climate.

## 6.3 Weather Conditions

6.3.1 Weather conditions were monitored throughout the unattended noise survey period with a Davis Vantage Vue weather station, which recorded wind speed and direction, precipitation, temperature etc. The weather data recorded by the logger on site was reviewed to detect periods where wind speeds may exceed 5 m/s and periods of rainfall. Wind speeds did not exceed 3.6 m/s at any time during the survey period. Where rain fell consistently for 45 minutes or more, or rainfall was "heavy" (defined as 4 mm per hour or more), the corresponding noise data was removed from the analysis.

6.3.2 Periods of data removed due to rain are as follows:

- 06/07/2025, 07:00 – 07:45
- 06/07/2025, 19:15 – 21:45
- 06/07/2025, 22:00 – 07/07/2025, 02:15

6.3.3 Throughout the attended noise monitoring, weather conditions were consistently around 17 ° C, dry and with wind roughly 4 m/s from the north east throughout the survey. No noise survey data was therefore removed.

## 7 Monitoring Results

7.1 A time history graph for the full unattended monitoring period at MPI, plotted in 15-minute time intervals, is presented in **Appendix D: Environmental Sound Survey Results**. All data are presented as sound pressure levels in dB re 20 µPa. A summary of the broadband measurement data for the unattended monitoring at MPI is provided in **Table 3**.

**Table 3: Summary of unattended environmental sound monitoring results at MPI**

Date	Day	Period	Start Time hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}^{*1}$ dB	Overall $L_{AF,max}^{*2}$ .dB	$L_{A90,T}^{*3}$ dB
03/07/2025	Thursday	Daytime	13:44	09:16	66.1	99.8	57
04/07/2025	Friday	Daytime	07:00	16:00	65.6	96.7	60
05/07/2025	Saturday	Daytime	07:00	16:00	56.1	80.6	49
06/07/2025	Sunday	Daytime	07:00	16:00	56.8	80.8	48
07/07/2025	Monday	Daytime	07:00	16:00	60.3	85.4	54
08/07/2025	Tuesday	Daytime	07:00	12:45	60.7	85.1	49
03/07/2025 to 04/07/2025	Thurs to Fri	Night-time	23:00	08:00	57.8	79.8	29
04/07/2025 to 05/07/2025	Fri to Sat	Night-time	23:00	08:00	49.4	73.6	34
05/07/2025 to 06/07/2025	Sat to Sun	Night-time	23:00	08:00	48.6	77.0	32

Date	Day	Period	Start Time hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}^{*1}$ dB	Overall $L_{AF,max}^{*2}$ .dB	$L_{A90,T}^{*3}$ dB
06/07/2025							
to	Sun to Mon	Night-time	23:00	08:00	53.4	81.7	33
07/07/2025							
07/07/2025							
to	Mon to Tues	Night-time	23:00	08:00	52.4	71.7	30
08/07/2025							
<b>Overall Daytime Levels</b>					<b>62.5</b>	<b>99.8</b>	<b>51</b>
<b>Overall Night-time Levels</b>					<b>53.5</b>	<b>81.7</b>	<b>32</b>

\*1. The values presented for the  $L_{Aeq,T}$  are the log average of the  $L_{Aeq,15min}$  values recorded within the corresponding period, of length T.

\*2. The values presented for the  $L_{AF,max}$  are the highest  $L_{AF,max,2min}$  values recorded within the period.

\*3. The values presented for the  $L_{A90,T}$  have been calculated using the LRB Method from the Little Red Book of Acoustics<sup>2</sup>, from the  $L_{A90,15min}$  values recorded within the corresponding period, of length T. The value presented is the most commonly occurring  $L_{A90, 15min}$  value during the period, for which no less than 45% of the total histogram data occurs below.

7.2 The broadband measurement data for the attended monitoring at MP2 is shown in **Table 4**.

**Table 4: Attended sound monitoring results on Monday, 8 September 2025 at MP2**

Monitoring Position	Start Time hh:mm	Elapsed Time, T hh:mm:ss	$L_{Aeq,T}$ dB	Period $L_{AF,max}$ dB	$L_{A10,T}$ dB	$L_{A90,T}$ dB
MP2	12:22	00:38:00	71.6	94.6	74	60
	13:00	01:00:00	70.6	89.4	74	59
	14:00	01:00:00	71.1	89.4	74	61
	15:00	00:21:52	71.6	83.1	75	64

7.3 Each measurement period consisted of sequential 100 ms samples which allows the variation in noise level over time to be assessed. The 100 ms noise levels have not been presented in this report but are kept on file for future reference.

<sup>2</sup> The Little Red Book of Acoustics: A Practical Guide, Fourth Edition (2024) published by Blue Tree Acoustics

7.4 The equations for converting CRTN  $L_{10(18\text{-hour})}$  values to  $L_{Aeq,16\text{hour}}$  and  $L_{Aeq,8\text{hour}}$  values are not provided in the original CRTN guidance. These conversion formulas are derived from DEFRA's "Technical Guidance for Noise Mapping England" (DEFRA, 2018)<sup>3</sup> and are widely accepted in UK noise assessment practice. Using the DEFRA calculation procedures, the day- and night-time  $L_{Aeq,T}$  values have been determined, as shown in **Table 5**.

**Table 5: Summary broadband calculated values at MP2**

Measurement Location	Measured $L_{A10}$ (dB)	Calculated $L_{Aeq,16hr}$ (dB)	Calculated $L_{Aeq,8hr}$ (dB)
MP2	74	70.8	63.1

7.5 This procedure was also followed for the octave-band values to generate a spectrum for modelling. These calculated figures are shown in **Table 6**.

**Table 6: Calculated Day- and Night-time Ambient Noise Levels at MP2**

Location	Period, T	Calculated Sound Pressure Levels (dB) at Octave Band Centre Frequency (Hz)								$L_{Aeq,T}$ dB(A)
		63	125	250	500	1k	2k	4k	8k	
MP2 Day	16 hours	68.7	63.3	64.0	63.7	66.8	65.5	59.3	41.9	70.8
MP2 Night	8 hours	60.8	55.7	56.4	56.1	59.0	57.8	52.0	35.5	63.1
MP2 $L_{AF,max}$	10 <sup>th</sup> highest 2-minute	87.1	79.8	76.8	78.3	81.0	83.9	79.6	58.4	87.8

7.6 Background noise levels have been established for new and existing dwellings to the north of RPL based on the Little Red Book method described in **Table 3** and are;

- Daytime 49 dB  $L_{A90,1\text{hour}}$ . This is 1 dB above the level used by BTA in their assessment,
- Night-time 32 dB  $L_{A90,15\text{mins}}$ . This is 3 dB above the level used by BTA in their assessment.

<sup>3</sup> Department for Environment, Food & Rural Affairs (DEFRA), 2018. "Technical Guidance for Noise Mapping England." Version 4.2, July 2018. Available at:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/726867/noise-mapping-technical-guidance.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726867/noise-mapping-technical-guidance.pdf)

# 8 Noise Modelling Methodology

## 8.1 General Model Set up

- 8.1.1 A baseline noise model of noise affecting the proposed development as depicted in the Planning Layout drawing (Project No: C005, Drawing No: 102, Revision: H, dated May 2024) has been assembled using CadnaA noise modelling software.
- 8.1.2 The general horizontal plan information of the area surrounding and including the proposed development site was imported from Google Earth. This was used to determine road positions, building footprint areas and relative locations and is considered accurate to within 5%.
- 8.1.3 Topography was imported from the DEFRA LIDAR dataset, and existing building height information was input based on site observations.
- 8.1.4 The following parameters were assigned to the model:
- Propagation of noise using algorithms within ISO 9613:2024 *Acoustics - Attenuation of sound during propagation outdoors*.
  - Default ground absorption  $G = 0.8$ . Representing soft ground across the site.
  - No adverse meteorological effects.
  - Roads were modelled as line sources at a height of 0.5 m above ground level and calibrated using spectral data measured during the survey.
  - Noise from RPL modelled based on data from *Blue Tree Acoustics* report (detailed below)
  - Two orders of reflection.
  - Buildings are reflecting with smooth non-structured facades.
- 8.1.5 Details of the proposed site layout have been obtained from drawings, CAD files and data sheets provided by the client.

## 8.2 Reliance Precision Ltd Inputs

8.2.1 Noise data has been taken directly from the Blue Tree Acoustics (BTA) report<sup>4</sup> dated 11/12/2024 submitted in relation to previous planning submissions for this site and modelled to the best of our understanding based on their report. The noise levels used within the model are shown in **Table 7**.

**Table 7: Blue Tree Acoustics, Reliance Precision Noise Data Used in Modelling**

Source	Metric (SWL or SPL)	Calculated Sound Levels (dB) at Octave Band Centre Frequency (Hz)								$L_{Aeq,T}$ dB(A)
		63	125	250	500	1k	2k	4k	8k	
Reliance Workshop	Internal Level <sup>1</sup>	73.0	75.0	72.0	71.0	71.0	69.0	69.0	-	76.2
Extract Fan	SWL	79.5	75.0	71.9	70.1	72.8	69.9	65.7	58.0	76.5
Forklift	SWL	78.0	76.0	78.6	83.3	79.3	81.7	73.2	67.5	86.3
Skip	SWL	81.3	90.6	92.1	89.4	88.2	86.0	82.1	74.9	93.2

<sup>1</sup> Reliance workshop data is an internal sound level, which has been modelled as area sources with sound transmission through indicative Kingspan KS1000Rw lightweight wall / roof panels, detailed in **Table 8**.

8.2.2 It is stated in the BTA report that the existing workshop construction comprises a masonry base of approximately 2.5 m height with insulated cladding panels on steel frame above. There are GRP-style rooflights in the existing workshop building. **Table 8** shows the assumed sound insulation of the insulated cladding on the workshop building.

**Table 8: Assumed Sound Insulation of Workshop Insulated Cladding**

Element	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)								Sound Reduction Performance $R_w + C_{tr}$ (dB)
	63	125	250	500	1k	2k	4k	8k	
Kingspan KS1000Rw	13	16	21	24	20	25	42	42	21

8.2.3 From the BTA report, it is unclear where the different noise sources are located and when they are in operation, so assumptions have been made regarding locations and operating hours. The forklift truck has been modelled as a line source looping around the west side of the RPL site, and in constant motion throughout the 16-hour daytime period. It is anticipated

<sup>4</sup> Blue Tree Acoustics "Potential impact of established industrial use upon proposed adjacent residential development, Rowley Mills, Penistone Road, Huddersfield Indicative Sound Assessment Report" Document ref. 03780-730102

that the forklift would not operate in this manner (i.e. externally) during the night-time hours overnight (23:00 – 07:00). The skip is assumed to be the at the north west corner of the RPL building and is modelled as a constant source of noise also during the day but not used at night. These two activities would cause a noise impact on nearby existing dwellings were they to occur on a regular basis.

8.2.4 In contrast, the workshop and extract noise are modelled as being in constant operation throughout the 24-hour period to ensure worst-case assessments. The extract fan is modelled at 6 m above ground level.

### 8.3 Model Calibration

8.3.1 Noise level receptor points were incorporated into the CadnaA model at the noise survey measurement locations to calibrate the model using the measured octave band  $L_{eq}$  and  $L_{Fmax}$  noise levels. The modelled results agreed with the measured results to within  $\pm 1$  dB  $L_{Aeq}$  and  $\pm 1$  dB  $L_{AF,max}$ .

### 8.4 Modelled Scenarios

8.4.1 Five scenarios have been modelled using the plans provided:

- daytime  $L_{Aeq,16hr}$  noise levels affecting the site at 1.5 m (building façade levels);
- daytime  $L_{Aeq,16hr}$  noise levels affecting the site at 1.5 m (external amenity areas);
- daytime  $L_{Aeq,16hr}$  noise levels affecting the site at 4.0 m;
- night-time  $L_{Aeq,8hr}$  noise levels at 4.0 m; and
- night-time  $L_{AF,max}$  noise levels at 4.0 m.

8.4.2 Noise contour plots have been generated for each of the five scenarios to demonstrate that all scenarios covered by the planning condition have been considered.

8.4.3 Specific noise levels from RPL have been calculated at existing and proposed dwellings.

## 9 Noise Model Predictions

### 9.1 Façade Noise

9.1.1 Screenshots from the CadnaA model are provided in **Appendix E: Noise Model Outputs**. They indicate that, at the worst-affected dwellings:

- daytime  $L_{Aeq,16h}$  noise levels at the worst affected façades of proposed dwellings are more than 50 dB;
- Night-time  $L_{Aeq,8h}$  noise levels at the worst affected façades of proposed dwellings are more than 45 dB;

9.1.2 These noise levels do not allow window openings to be used for ventilation purposes (except for purge ventilation) at the worst-affected façades of the development. External noise levels recorded at the site are above the threshold levels below which internal noise levels remain achievable with the use of open windows for ventilation. In addition, external noise levels in some amenity areas are also above the threshold level of acceptability. Therefore, mitigation measures to reduce noise impacts are required.

### 9.2 Amenity Areas

9.2.1 The CadnaA noise model predicts that daytime  $L_{Aeq,16h}$  noise levels within one external amenity area of the dwelling closest to the road sources is more than 50 dB  $L_{Aeq,16hour}$  required by the planning condition. Therefore, mitigation measures to reduce potential noise impacts are required.

## 10 BS 4142 Assessments

10.1 A BS 4142 noise impact assessment has been undertaken to assess the potential noise impact from RPL on an existing nearby NSR and the most affected location within the development. The locations of these receptors are shown in **Appendix C: Assessed Site Layout and Assessment Positions**.

10.2 The following BS 4142 assessments consider both the day- and night-time impacts (07:00 – 23:00, and 23:00 – 07:00 respectively). Based on the assumptions in **Section 8.2** regarding the operations and noise at RPL, the BS 4142 assessment of noise impact at the worst-affected

existing noise sensitive receptors in the day- and night-time periods are shown in **Appendix C: Assessed Site Layout and Assessment Positions**.

**Table 9: BS 4142:2014 Noise Impact Assessment**

Assessment Period	Receptor	Background Sound Level, dB $L_{A90,15min}$	Specific Sound Level, dB $L_{Aeq,Tr}$	Acoustic Feature Correction, dB	Rating Level, dB $L_{Ar,Tr}$	Excess of Rating level over Background Sound Level, dB	Initial Estimate of Impact, Depending on the Context
Day	NSR1	49	40	+6	46	-3	
	NSR2a		46	+6	52	<b>+3</b>	
Night	NSR1	32	29	0	29	-3	
	NSR2b		34	0	34	<b>+2</b>	

10.3 For the daytime assessments, it is considered that impulsive noise sources (for example, banging sounds from loading) may be present in RPL and an acoustic feature correction of 6 dB has been applied. This has not been applied for night-time noise as it is not anticipated that this type of activity will regularly occur outside the workshop at RPL through the nighttime hours due to the impact on existing dwellings. At NSR1, if daytime activities were to occur throughout the night-time, the rating level would be in the region of 14 dB ( $40 + 6 - 32$ ) above the background sound level, which would have a significant adverse effect.

10.4 The “worst case” model of noise associated with RPL results predicted in specific noise levels at the new dwellings which are higher than those predicted by BTA who predicted specific noise levels of 34 to 37 dB  $L_{Aeq}$  from the existing workshop with existing operations. This assessment can, therefore, be considered to be a conservative assessment as actual noise levels are likely to be lower than those modelled here

10.5 As the data suggests, the new dwellings are in closer proximity to the noise sources at RPL, and thus the absolute noise levels at the proposed dwellings are higher than at existing receptors.

10.6 The initial assessment of the impact of noise from existing operations at RPL is low to negligible for the daytime period and night-time periods at NSR2a and NSR2b. However, road traffic noise is predicted to be louder at the new dwellings than the noise from operations at

RPL. For this reason, noise mitigation will be provided to the front elevation of dwellings with façades facing RPL and amenity areas for these dwellings will be located at the rear. In addition, during the night-time period when impacts are expected to be greater, the occupants of the new dwellings are likely to be inside their homes. Overall, in the context of the development, the impact is expected to be low.

## 11 Ventilation and Overheating

- 11.1 A Level 1 risk assessment for the worst affected receptor located at Plot 41 (worst affected dwelling) has been completed in line with Table 3-2 of the Acoustics, Ventilation and Overheating Residential Design Guide.
- 11.2 The predicted noise levels indicate that the risk level is Medium, indicating there is an increasing risk of adverse effect and opening windows may not be used as the primary means of mitigating overheating conditions. Alternative means of ventilation must be considered and, while a Level 2 assessment is still considered optional, it may be considered appropriate depending on the scale of the development.

## 12 Noise Mitigation

### 12.1 Internal Noise Levels

- 12.1.1 Calculations have been undertaken to assess the minimum performance required from potential glazing and ventilation elements of the proposed dwellings to meet the required internal criteria. These noise ingress calculations were undertaken based on the methodology in BS EN 12354-3<sup>5</sup>. An example calculation for Plot 41, which modelling indicates is the plot subjected to the highest overall levels of noise, is based on dimensions measured from plans and elevations of the worst-affected dwelling, and are detailed in the following section.
- 12.1.2 The following assumptions were made regarding internal rooms:
- Assessed within ground floor living rooms with an internal volume of 71 m<sup>3</sup>;
  - Assessed within first floor bedrooms with an internal volume of 27 m<sup>3</sup>;

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<sup>5</sup> BS EN 12354-3:2017 Building acoustics – Estimation of acoustic performance of buildings from the performance of elements. Part 3: Airborne sound insulation against outdoor sound

- 'Normal' internal surface finishes e.g. carpeted with curtains etc.;
- Glazed area of 6.4 m<sup>2</sup> per living room;
- Glazed area of 1.5 m<sup>2</sup> per bedroom;
- Two passive ventilation elements per living room;
- One passive ventilation element per bedroom;
- Typical twin-leaf masonry façade and slate roof with 1 x 12.5 mm plasterboard ceiling.

12.1.3 The façade noise levels predicted are shown in **Table 10** have been used in the calculations. The most onerous parameter driving the glazing specification is highlighted.

**Table 10: Façade Noise Levels**

Room Type (floor)	Parameter	Incident Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)								External level (dB)
		63	125	250	500	1k	2k	4k	8k	
		Living Room (Ground)	<i>L<sub>Aeq</sub> day</i>	60.8	53.8	49.2	47.5	54.8	54.2	
Bedroom (First)	<i>L<sub>Aeq</sub> day</i>	60.2	54.1	52.2	50.5	55.6	55.1	47.4	24.7	59.8
	<i>L<sub>Aeq</sub> night</i>	52.3	46.3	44.5	42.8	47.5	47.0	39.8	18.0	52.0
	<i>L<sub>AF,max</sub> night</i>	71.7	63.4	58.0	58.1	62.6	66.2	60.4	34.1	69.6

12.1.4 The noise modelling shows that noise due to Penistone Road is significantly louder than noise due to operations at Reliance Precision Ltd. The minimum sound reduction indices of non-glazed façade elements used in the calculation are provided in **Table 11**.

**Table 11: Minimum sound reduction indices of non-glazed façade elements**

Element	Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)								Sound Reduction Performance <i>R<sub>w</sub> + C<sub>tr</sub></i> (dB)
	63	125	250	500	1k	2k	4k	8k	
	Wall	35	37	42	52	60	63	68	
Roof/Ceiling	18	24	34	40	45	49	49	49	36

12.1.5 A summary of the outcome of the noise ingress calculations is provided in **Table 12**.

**Table 12: Predicted internal noise levels**

Description	External Noise Levels		BS 8233 Criteria		Predicted Internal Noise Levels		Exceedance of Criteria		Proposed Glazing and Ventilation
	dB $L_{Aeq,T}$	dB $L_{AF,max}$	dB $L_{Aeq,T}$	dB $L_{AF,max}$	dB $L_{Aeq,T}$	dB $L_{AF,max}$	dB $L_{Aeq,T}$	dB $L_{AF,max}$	
Daytime, Ground Floor Living Rooms	59	N/A	35	N/A	33	N/A	- 2	N/A	Specification Type 1
Daytime, First Floor, Bedrooms	60	N/A	35	N/A	33	N/A	- 2	N/A	
Night-Time, First Floor, Bedrooms	52	70	30	45	25	42	- 5	- 3	

12.1.6 **Table 13** presents the mitigation treatments concluded for use across the development. The locations where these mitigations are required are shown in the figures in **Appendix E: Noise Model Outputs**.

**Table 13: Glazing and Ventilation Mitigation Treatments**

Description	Minimum Sound Reduction Index	
	Glazing	Ventilation
<b>Specification Type 1</b>	<p style="text-align: center;"><b>27 dB <math>R_w + C_{tr}</math></b></p> <p><b>Example specification</b> 4 mm float glass pane / 12 mm air gap / 4 mm float glass pane i.e. Standard Thermal Double Glazing</p>	<b>31 dB <math>D_{ne,w}</math></b>
<b>Specification Type 2</b>	Openable windows may be used for ventilation– no acoustic treatment required.	

## 12.2 External Noise Levels

12.2.1 The predicted daytime noise levels across the whole open site are currently above 50 dB  $L_{Aeq}$  and as such, do not comply with the Local Authority’s daytime noise criteria in external amenity spaces. While it is expected that noise levels across the site will reduce with increased distance from both Penistone Road and Reliance, it is recommended that noise barriers are provided to mitigate against noise so that the conditioned noise criteria are achieved.

12.2.2 To control noise from Penistone Road (the primary noise source across the site), increased height fencing is required around some of the most exposed external amenity areas to the

west of the site. 1.8 m barriers are typical close-boarded garden fences and are shown for completeness.

- 12.2.3 The barriers are to be constructed from continuous, imperforate material with a minimum mass of 12 kg/m<sup>2</sup> and is to extend from the ground to a minimum height as shown in **Appendix F: Noise Barriers** above the finalised ground levels of the site at the relevant locations. Close-boarded or overlapped timber panelling with no holes would likely be suitable in this regard; hit-and-miss fencing would not. Alternatively, a proprietary acoustic fence with a minimum weighted sound reduction index of 25 dB  $R_w$  would be appropriate.
- 12.2.4 A figure showing the output from the noise model with this mitigation in place is presented in **Appendix G: Noise Levels in Mitigated External Amenity Areas**. The figure shows the predicted noise levels at receiver locations and corresponding noise contours for the proposed development with mitigation included. External noise levels are below 50 dB  $L_{Aeq,16hr}$  in all external amenity areas.

## 13 Summary and Conclusion

- 13.1 A noise assessment has been undertaken to predict the potential impact of environmental noise on a proposed residential development at Penistone Road, Fenay Bridge.
- 13.2 An environmental sound survey to establish the existing sound climate at the site has been undertaken. A computer noise model of the proposed development and surrounding site has been assembled, based on the site layout plan, and calibrated using sound levels recorded.
- 13.3 Based on the results of the computer noise modelling, noise mitigation has been devised for the development as a combination of acoustically rated trickle vents, and barriers. This mitigation has been designed to control noise ingress to dwellings to achieve the conditioned noise limits (as well as BS 8233 criteria). Additional mitigation has been proposed to limit noise levels in external amenity areas to 50 dB  $L_{Aeq,16hour}$  to comply with the Planning Condition.
- 13.4 Based on the assessments undertaken and provided, the recommended acoustic design and any associated mitigation measures are implemented, the assessment concludes that the impact of noise on the proposed development is likely to be low and compliance with the Planning Conditions to be achieved. As such, based on the results of this report, we would expect that the Planning Condition would be discharged.

# APPENDICES

# Appendix A: Policy, Standards and Guidance

## 1 Noise Policy Statement for England

1.1 The Noise Policy Statement for England (NPSE<sup>6</sup>) sets out the long-term vision of noise policy.

The Noise Policy aims, as presented in this document, are:

*“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

- *avoid significant adverse effects on health and quality of life;*
- *mitigate and minimise adverse effects on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.”*

1.2 The NPSE makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and the quality of life occur.

1.3 The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case:

*“...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development”.*

1.4 Importantly, the NPSE goes on to state:

*“This does not mean that such adverse effects cannot occur”.*

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<sup>6</sup>Noise Policy Statement for England, Defra, March 2010

1.5 The Statement does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that:

*“Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available”*

1.6 It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

## **2 National Planning Policy Framework**

2.1 The National Planning Policy Framework (NPPF<sup>7</sup>) was updated most recently in February 2025. The NPPF advises that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives). One of these is an environmental objective which is described in par. 8 (c):

*“to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”*

2.2 At par. 187 NPPF advises that:

*“Planning policies and decisions should contribute to and enhance the natural and local environment by:*

*e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans...”*

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<sup>7</sup> National Planning Policy Framework, Ministry of Housing, Communities and Local Government, December 2023

2.3 Par. 198 goes on to state:

*“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

*a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*

*b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; ...”*

2.4 Par. 200 seeks to ensure that any development does not prejudice the legally permitted operations and activities of other, existing non-residential uses, stating:

*“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”*

### **3 ProPG: Planning & Noise, Professional Practice Guidance on Planning & Noise: New Residential Development, May 2017 (ProPG)**

- 3.1 The primary goal of ProPG is to assist the delivery of sustainable development by promoting good health and wellbeing through the effective management of noise. It seeks to do that through encouraging a good acoustic design process in and around proposed new residential development having regard to national policy on planning and noise.
- 3.2 It provides a recommended approach for new residential development that would be exposed predominantly to noise from existing transport sources. The recommended

approach is also considered suitable where some industrial or commercial noise contributes to the acoustic environment provided that it is not dominant

3.3 ProPG promotes a 2-stage, approach. The two sequential stages of the overall approach are:

Stage 1 – an initial noise risk assessment of the proposed development site; and

Stage 2 – a systematic consideration of four key elements. The four key elements to be considered in parallel

- Element 1 – demonstrating a “Good Acoustic Design Process”;
- Element 2 – observing internal “Noise Level Guidelines”;
- Element 3 – undertaking an “External Amenity Area Noise Assessment”; and
- Element 4 – consideration of “Other Relevant Issues”.

3.4 The approach is underpinned by the preparation and delivery of an “Acoustic Design Statement” (ADS), unless a site is assessed as negligible risk, in which case an ADS is not necessary.

## 4 BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

4.1 This standard provides recommended guideline acoustic design criteria for new dwellings and is supported by guidance contained within WHO GCN<sup>8</sup>. The guideline noise design criteria of BS 8233 apply to external noise “without a specific character” (previously and sometimes termed or referred to as “anonymous noise”) such as that associated with road and rail traffic.

### *Internal Amenity*

4.2 The Standard states that for external noise without a specific character, such as road traffic, it is desirable that the internal ambient noise level does not exceed the guideline values shown in **Table A4.1**.

4.3 The note to paragraph 7.7.1 states that where noise has a specific character (i.e. it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to

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<sup>8</sup> World Health Organisation Guidelines for Community Noise, 1999

attract attention, or has strong low-frequency content) “lower noise limits might be appropriate”.

**Table A4.1: BS 8233: 2014 guideline indoor ambient noise levels for dwellings**

Location	Activity	07:00 to 23:00	23:00 to 07:00
Living Room	Resting	35 dB $L_{Aeq,16hr}$	-
Dining room/area	Dining	40 dB $L_{Aeq,16hr}$	-
Bedroom	Sleeping (daytime resting)	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

4.4 Note 7 to Table 4 of BS 8233 states:

*“Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.”*

4.5 Guidance on reasonable acoustic design criteria for individual noise events are also provided, and the Standard advises that:

*“regular individual noise events...can cause sleep disturbance. A guideline value may be set in terms of SEL<sup>9</sup> or  $L_{Amax,F}$  depending on the character and number of events per night. Sporadic noise events could require separate values”.*

4.6 For Internal spaces, the Standard states that:

*“..to avoid sleep disturbance, sound pressure levels at the outside facades of living spaces should not exceed 45 dB  $L_{Aeq}$  (taken as a façade level, and equating to a free-field external level of 42 dB  $L_{Aeq}$ ) and 60 dB  $L_{AFmax}$  so that people may sleep with bedroom windows open.”*

### External Amenity

4.7 BS 8233:2014 adopts guideline external noise values provided in WHO for external amenity areas such as gardens, patios and private outdoor amenity spaces. BS 8233:2014 adopts

<sup>9</sup> Sound exposure level or  $L_{AE}$

guideline external noise level limits provided in WHO for external amenity areas such as gardens and patios. The standard states that it is “desirable” that the external noise does not exceed 50 dB  $L_{Aeq,16hr}$  with an upper guideline value of 55 dB  $L_{Aeq,16hr}$  whilst recognising in paragraph 7.7.3.2 that development in higher noise areas, such as urban areas or those close to the transport network, may require a compromise between elevated noise levels (i.e., above 55 dB  $L_{Aeq,16hr}$ ) and other factors that determine if development in such areas is warranted. In such circumstances, the development should be designed to achieve the lowest practicable noise levels in external amenity areas, but should not be prohibited.

#### 4.8 The standard also states:

*“Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB  $L_{Aeq,T}$  or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space.”*

## **5 BS 4142:2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’ (BS 4142)**

5.1 BS 4142:2014+A1:2019<sup>10</sup> provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. It replaced the 1997 edition of the Standard in October 2014 and was amended in June 2019. The amended version corrected a number of printing errors and further clarified that the standard is used to assess external noise levels, and not internal noise levels (although this can form part of the discussion regarding context). The key aspects of the Standard are summarised below.

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<sup>10</sup> BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

5.2 The standard presents a method of assessing potential noise impact by comparing the noise level due to industrial sources (the Rating Level) with that of the existing background noise level at the nearest noise sensitive receiver in the absence of the source (the Background Sound Level).

5.3 The Specific Noise Level – the noise level produced by the source in question at the assessment location – is determined and a correction applied for certain undesirable acoustic features such as tonality, impulsivity or intermittency. The corrected Specific Noise Level is referred to as the Rating Level.

5.4 In order to assess the noise impact, the Background Sound Level is arithmetically subtracted from the Rating Level. The standard states the following:

- *Typically, the greater this difference, the greater the magnitude of the impact,*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context,*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context,*
- *The lower the Rating Level is relative to the measured Background Sound Level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the Rating Level does not exceed the Background Sound Level, this is an indication of the specific sound source having a low impact, depending on the context.*

5.5 In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014+A1:2019 edition places emphasis upon an appreciation of the context, as follows:

*An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.*

5.6 The 2014 edition of BS 4142 also introduced a requirement to consider and report the uncertainty in the data and associated calculations and to take reasonably practicable steps to reduce the level of uncertainty.

## 6 Calculation of Road Traffic Noise (CRTN)

6.1 Guidance and methodologies for predicting road traffic noise are detailed in the document Calculation of Road Traffic Noise (CRTN)<sup>11</sup>. This methodology combines data on road traffic flows, mean traffic speeds and traffic composition in terms of percentage of Heavy Goods Vehicles (HGV), road and site layouts in order to calculate and predict road traffic noise at a selected location. A methodology for the calculation of hourly road traffic noise is also presented. The  $L_{A10(18\text{ hour})}$  parameter has historically shown a good correlation with community response to road traffic noise and is often referred to as the 'UK traffic noise index'.

6.2 Within CRTN is also a "Shortened Measurement Procedure" which provides a method for estimating the  $L_{10(18\text{ hour})}$  from measurements of the  $L_{10}$  over three consecutive hours between 10:00 and 17:00. The  $L_{10(18\text{-hour})}$  hour value is then given by the following formula:

$$L_{10(18\text{-hour})} = L_{10(3\text{-hour})} - 1dB(A)$$

6.3 Where:

$$L_{10(3\text{-hour})} = \frac{1}{3} \sum_{10 \leq t \leq 14}^{t+2} L_{10(\text{hourly})_t}$$

t signifies the start time of the individual hourly  $L_{10}$  dB(A) values.

6.4  $L_{Aeq,16\text{hour}}$  and  $L_{Aeq,8\text{hour}}$  values have then been calculated using the methods described in DEFRA guidance for the purposes of assessment within CadnaA. The equations used are as follows:

$$L_{Aeq,16\text{hour}} = 10 \log \left\{ \left( \frac{1}{16} \right) \times \left[ \left( 12 \times 10^{\frac{L_{day}}{10}} \right) + \left( 4 \times 10^{\frac{L_{evening}}{10}} \right) \right] \right\}$$

6.5 And,

$$L_{Aeq,8\text{hour}} = 0.90 \times L_{A10,18\text{hour}} - 3.77$$

6.6  $L_{day}$  and  $L_{evening}$  are defined for non-motorway roads as follows:

$$L_{day} = 0.95 \times L_{A10,18h} + 1.44$$

$$L_{evening} = 0.97 \times L_{A10,18h} - 2.87$$

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<sup>11</sup> Calculation of Road Traffic Noise, DoT, 1988

6.7 And for motorways only as follows:

$$L_{day} = 0.98 \times L_{A10,18h} + 0.09$$
$$L_{evening} = 0.89 \times L_{A10,18h} + 5.08$$

6.8 Paragraph 41.2 of CRTN relates to sampling times and advises that the minimum sample length to gather valid  $L_{10}$  data is given by the formula:

$$t_{min} = \left( \frac{4000}{q} + \frac{120}{r} \right) \text{ minutes}$$

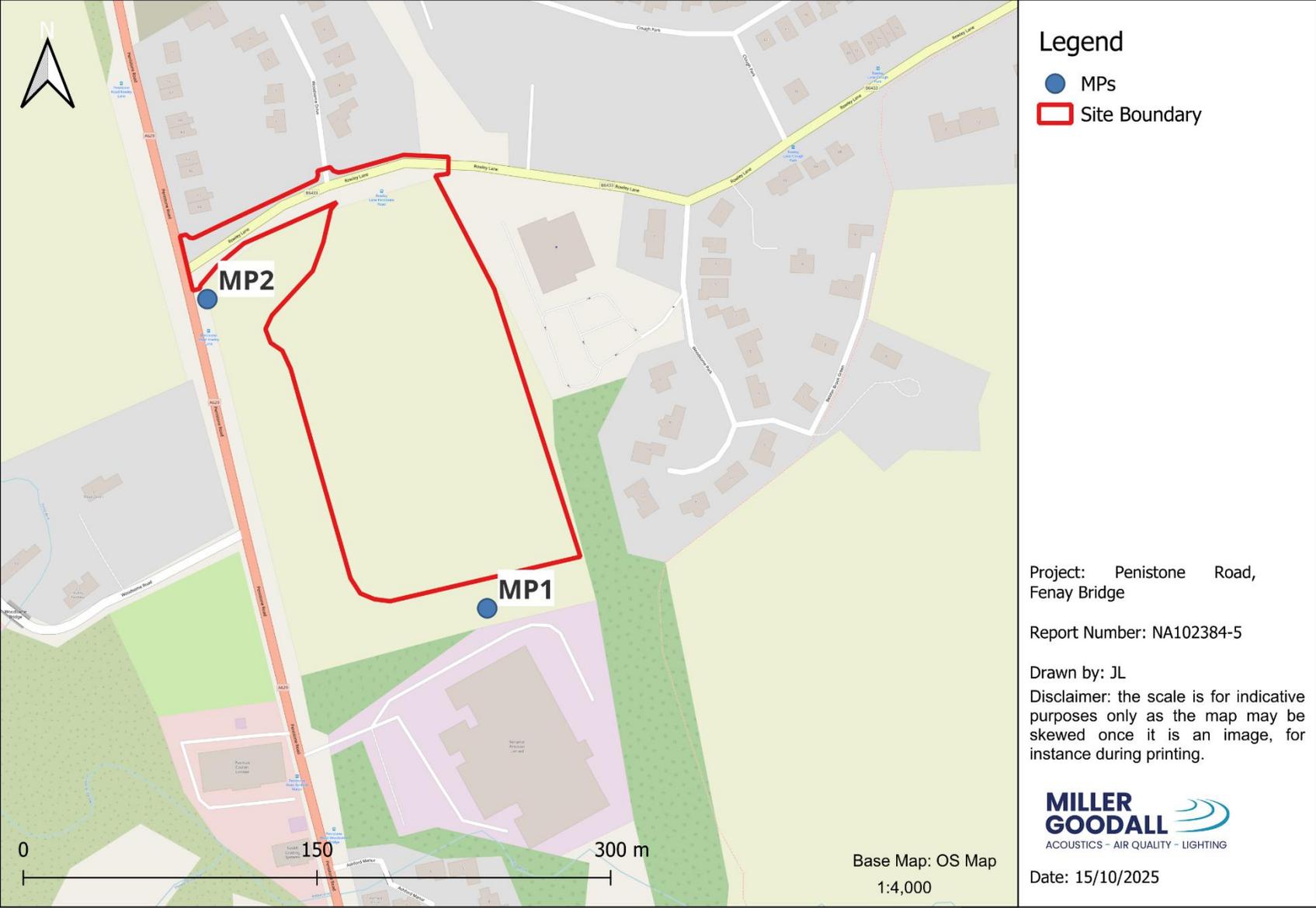
6.9 Where:

q = number of vehicles per hour

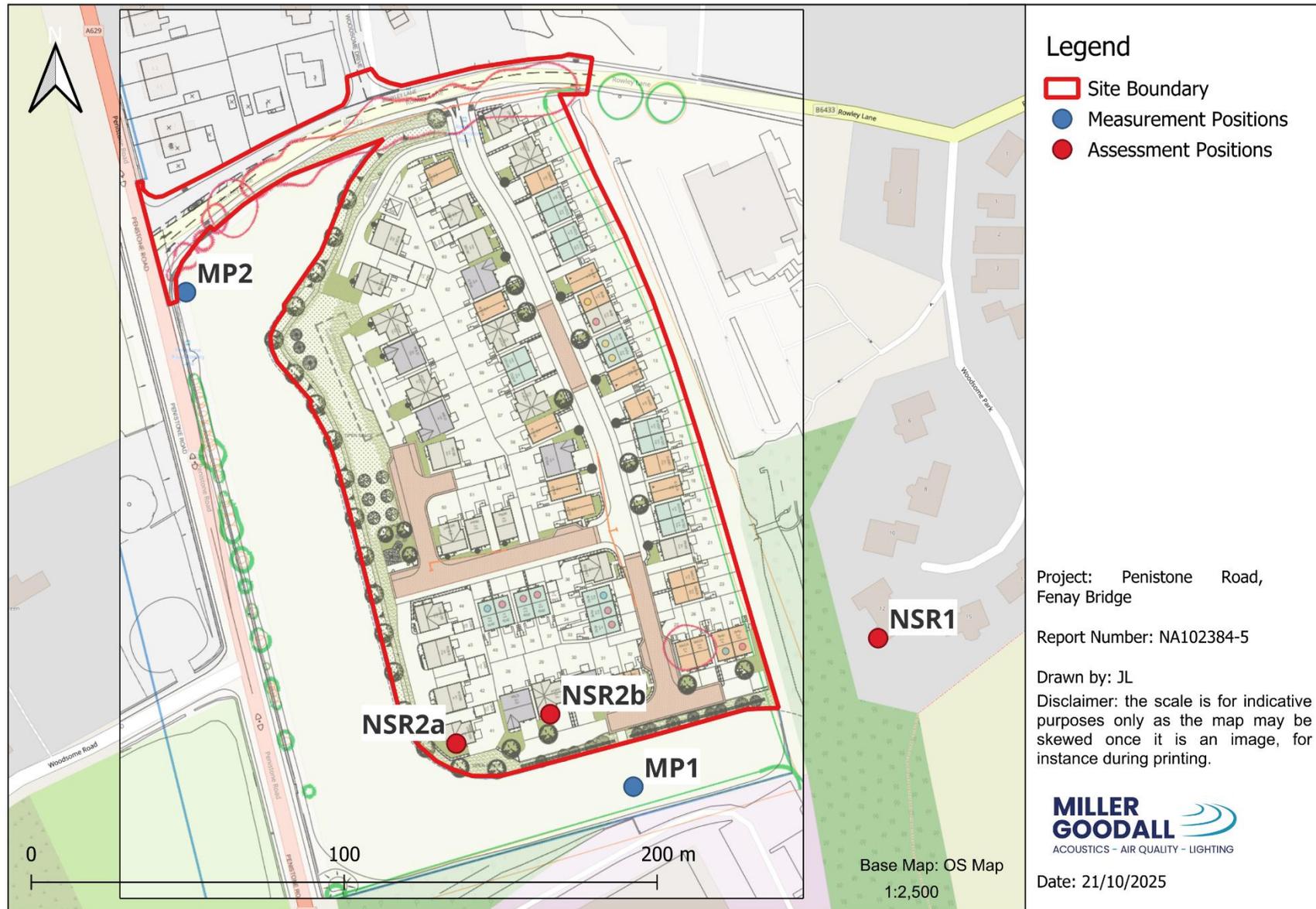
r = measurement samples per minute (100 ms sampling = 600 samples per minute)

6.10 The number of vehicles (based on a 25-minute count) was estimated at 170 per hour.

# Appendix B: Site and Monitoring Location



# Appendix C: Assessed Site Layout and Assessment Positions



# Appendix D: Environmental Sound Survey Results

Table 14: MPI logger data

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
03/07/2025 13:45	00:15	64.5	83.8	56
03/07/2025 14:00	00:15	65.1	86.5	57
03/07/2025 14:15	00:15	64.6	77.7	60
03/07/2025 14:30	00:15	71.1	88.3	62
03/07/2025 14:45	00:15	71.5	99.5	61
03/07/2025 15:00	00:15	65.8	87.1	60
03/07/2025 15:15	00:15	64.3	78.5	59
03/07/2025 15:30	00:15	68.6	84.5	60
03/07/2025 15:45	00:15	70.6	83.7	64
03/07/2025 16:00	00:15	70.4	90.5	65
03/07/2025 16:15	00:15	67.0	87.7	62
03/07/2025 16:30	00:15	65.7	89.2	60
03/07/2025 16:45	00:15	64.1	71.8	61
03/07/2025 17:00	00:15	65.2	80.2	61
03/07/2025 17:15	00:15	64.4	76.6	60
03/07/2025 17:30	00:15	65.4	88.4	60
03/07/2025 17:45	00:15	64.0	77.2	60
03/07/2025 18:00	00:15	65.0	78.3	60
03/07/2025 18:15	00:15	72.0	99.8	60
03/07/2025 18:30	00:15	65.3	85.5	58
03/07/2025 18:45	00:15	63.2	70.6	57
03/07/2025 19:00	00:15	63.6	77.5	57
03/07/2025 19:15	00:15	65.1	87.6	57
03/07/2025 19:30	00:15	62.4	73.3	54
03/07/2025 19:45	00:15	63.0	73.6	54
03/07/2025 20:00	00:15	63.3	81.8	52
03/07/2025 20:15	00:15	64.3	87.1	53

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
03/07/2025 20:30	00:15	63.3	76.4	52
03/07/2025 20:45	00:15	64.2	85.1	49
03/07/2025 21:00	00:15	62.6	74.6	51
03/07/2025 21:15	00:15	62.0	71.5	51
03/07/2025 21:30	00:15	60.0	74.4	47
03/07/2025 21:45	00:15	60.6	71.4	47
03/07/2025 22:00	00:15	60.8	71.4	46
03/07/2025 22:15	00:15	60.8	75.1	46
03/07/2025 22:30	00:15	59.7	73.5	40
03/07/2025 22:45	00:15	58.4	73.9	43
03/07/2025 23:00	00:15	58.2	72.6	38
03/07/2025 23:15	00:15	57.1	70.5	33
03/07/2025 23:30	00:15	56.2	70.9	32
03/07/2025 23:45	00:15	56.2	77.6	34
04/07/2025 00:00	00:15	53.9	71.7	34
04/07/2025 00:15	00:15	52.2	68.9	33
04/07/2025 00:30	00:15	52.6	71.2	33
04/07/2025 00:45	00:15	52.4	73.4	34
04/07/2025 01:00	00:15	51.8	69.2	35
04/07/2025 01:15	00:15	49.0	72.9	31
04/07/2025 01:30	00:15	54.7	74.0	32
04/07/2025 01:45	00:15	50.5	71.3	31
04/07/2025 02:00	00:15	48.0	66.5	31
04/07/2025 02:15	00:15	51.8	72.4	34
04/07/2025 02:30	00:15	43.1	64.6	30
04/07/2025 02:45	00:15	49.4	71.2	29
04/07/2025 03:00	00:15	52.0	73.0	29
04/07/2025 03:15	00:15	51.6	71.0	30
04/07/2025 03:30	00:15	52.3	73.9	29
04/07/2025 03:45	00:15	52.6	73.1	29

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
04/07/2025 04:00	00:15	51.1	71.5	40
04/07/2025 04:15	00:15	54.8	72.5	41
04/07/2025 04:30	00:15	54.2	67.6	39
04/07/2025 04:45	00:15	57.9	76.6	40
04/07/2025 05:00	00:15	58.5	78.8	39
04/07/2025 05:15	00:15	59.8	75.7	41
04/07/2025 05:30	00:15	60.7	71.8	44
04/07/2025 05:45	00:15	61.7	76.3	44
04/07/2025 06:00	00:15	62.0	79.8	46
04/07/2025 06:15	00:15	63.2	76.7	49
04/07/2025 06:30	00:15	64.1	77.3	53
04/07/2025 06:45	00:15	64.7	74.1	55
04/07/2025 07:00	00:15	64.7	79.8	56
04/07/2025 07:15	00:15	65.4	81.3	60
04/07/2025 07:30	00:15	65.2	81.6	59
04/07/2025 07:45	00:15	65.7	81.4	61
04/07/2025 08:00	00:15	70.1	94.3	63
04/07/2025 08:15	00:15	71.2	96.7	64
04/07/2025 08:30	00:15	70.5	86.0	65
04/07/2025 08:45	00:15	74.0	80.1	65
04/07/2025 09:00	00:15	71.5	79.0	66
04/07/2025 09:15	00:15	66.3	80.7	61
04/07/2025 09:30	00:15	64.7	77.0	60
04/07/2025 09:45	00:15	65.3	79.7	60
04/07/2025 10:00	00:15	65.5	79.7	59
04/07/2025 10:15	00:15	65.2	78.0	61
04/07/2025 10:30	00:15	65.2	77.0	61
04/07/2025 10:45	00:15	67.1	82.9	61
04/07/2025 11:00	00:15	67.1	82.1	63
04/07/2025 11:15	00:15	67.2	91.6	60

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
04/07/2025 11:30	00:15	64.7	74.2	61
04/07/2025 11:45	00:15	65.5	79.1	61
04/07/2025 12:00	00:15	64.8	85.3	60
04/07/2025 12:15	00:15	65.1	78.6	61
04/07/2025 12:30	00:15	65.2	76.9	61
04/07/2025 12:45	00:15	64.9	77.6	61
04/07/2025 13:00	00:15	64.7	78.4	60
04/07/2025 13:15	00:15	64.9	77.7	61
04/07/2025 13:30	00:15	65.1	80.4	60
04/07/2025 13:45	00:15	65.0	76.1	60
04/07/2025 14:00	00:15	66.8	94.2	60
04/07/2025 14:15	00:15	64.6	75.8	61
04/07/2025 14:30	00:15	64.6	76.7	60
04/07/2025 14:45	00:15	65.3	77.4	62
04/07/2025 15:00	00:15	65.5	82.3	61
04/07/2025 15:15	00:15	66.6	87.1	61
04/07/2025 15:30	00:15	65.2	80.2	61
04/07/2025 15:45	00:15	64.7	71.7	62
04/07/2025 16:00	00:15	64.6	74.5	61
04/07/2025 16:15	00:15	64.9	78.3	61
04/07/2025 16:30	00:15	65.5	76.5	61
04/07/2025 16:45	00:15	65.6	88.2	62
04/07/2025 17:00	00:15	65.3	72.9	61
04/07/2025 17:15	00:15	65.8	85.1	61
04/07/2025 17:30	00:15	65.5	79.6	62
04/07/2025 17:45	00:15	65.8	78.2	62
04/07/2025 18:00	00:15	65.4	76.6	60
04/07/2025 18:15	00:15	65.3	83.7	60
04/07/2025 18:30	00:15	64.6	75.6	59
04/07/2025 18:45	00:15	65.1	79.5	60

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
04/07/2025 19:00	00:15	65.2	86.6	56
04/07/2025 19:15	00:15	56.0	65.3	50
04/07/2025 19:30	00:15	55.8	70.7	49
04/07/2025 19:45	00:15	55.0	68.8	48
04/07/2025 20:00	00:15	57.4	82.1	49
04/07/2025 20:15	00:15	55.4	67.4	47
04/07/2025 20:30	00:15	54.5	72.1	45
04/07/2025 20:45	00:15	54.4	66.5	44
04/07/2025 21:00	00:15	55.9	73.6	44
04/07/2025 21:15	00:15	55.3	78.1	44
04/07/2025 21:30	00:15	52.7	62.3	44
04/07/2025 21:45	00:15	52.5	65.7	42
04/07/2025 22:00	00:15	52.3	66.2	41
04/07/2025 22:15	00:15	55.5	78.4	41
04/07/2025 22:30	00:15	51.8	64.2	42
04/07/2025 22:45	00:15	51.7	68.8	38
04/07/2025 23:00	00:15	52.0	64.1	40
04/07/2025 23:15	00:15	50.5	64.9	39
04/07/2025 23:30	00:15	51.4	67.7	38
04/07/2025 23:45	00:15	49.3	64.7	36
05/07/2025 00:00	00:15	48.0	63.7	36
05/07/2025 00:15	00:15	48.3	61.4	35
05/07/2025 00:30	00:15	46.7	61.6	33
05/07/2025 00:45	00:15	46.8	62.6	34
05/07/2025 01:00	00:15	48.4	68.3	34
05/07/2025 01:15	00:15	47.8	64.3	36
05/07/2025 01:30	00:15	47.1	67.0	35
05/07/2025 01:45	00:15	45.8	64.3	33
05/07/2025 02:00	00:15	47.5	68.4	34
05/07/2025 02:15	00:15	48.6	66.9	32

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
05/07/2025 02:30	00:15	45.3	65.5	32
05/07/2025 02:45	00:15	46.4	65.6	33
05/07/2025 03:00	00:15	44.6	66.4	31
05/07/2025 03:15	00:15	44.1	60.3	34
05/07/2025 03:30	00:15	46.3	63.6	32
05/07/2025 03:45	00:15	44.0	61.3	29
05/07/2025 04:00	00:15	47.4	65.6	30
05/07/2025 04:15	00:15	46.7	67.7	34
05/07/2025 04:30	00:15	44.2	64.2	34
05/07/2025 04:45	00:15	44.6	61.2	34
05/07/2025 05:00	00:15	47.4	63.0	33
05/07/2025 05:15	00:15	49.6	63.6	34
05/07/2025 05:30	00:15	53.0	69.9	36
05/07/2025 05:45	00:15	53.8	71.2	36
05/07/2025 06:00	00:15	52.5	68.2	37
05/07/2025 06:15	00:15	53.9	73.6	38
05/07/2025 06:30	00:15	53.6	68.8	38
05/07/2025 06:45	00:15	51.6	63.8	36
05/07/2025 07:00	00:15	53.2	67.6	39
05/07/2025 07:15	00:15	54.5	68.3	42
05/07/2025 07:30	00:15	54.9	63.1	44
05/07/2025 07:45	00:15	55.6	70.7	42
05/07/2025 08:00	00:15	55.5	67.1	46
05/07/2025 08:15	00:15	56.0	74.2	47
05/07/2025 08:30	00:15	56.2	64.4	48
05/07/2025 08:45	00:15	57.2	71.3	51
05/07/2025 09:00	00:15	56.1	66.3	48
05/07/2025 09:15	00:15	57.7	80.2	48
05/07/2025 09:30	00:15	57.9	75.7	51
05/07/2025 09:45	00:15	56.5	69.1	51

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
05/07/2025 10:00	00:15	56.5	69.4	52
05/07/2025 10:15	00:15	57.3	71.7	52
05/07/2025 10:30	00:15	57.2	71.9	51
05/07/2025 10:45	00:15	56.3	69.9	50
05/07/2025 11:00	00:15	58.5	79.9	52
05/07/2025 11:15	00:15	56.7	68.0	52
05/07/2025 11:30	00:15	57.1	72.3	53
05/07/2025 11:45	00:15	57.7	78.6	53
05/07/2025 12:00	00:15	57.8	76.2	53
05/07/2025 12:15	00:15	57.2	69.8	53
05/07/2025 12:30	00:15	56.6	63.4	52
05/07/2025 12:45	00:15	56.0	64.6	49
05/07/2025 13:00	00:15	57.2	78.9	51
05/07/2025 13:15	00:15	55.5	64.5	51
05/07/2025 13:30	00:15	55.7	65.8	50
05/07/2025 13:45	00:15	56.6	69.4	52
05/07/2025 14:00	00:15	56.2	72.0	51
05/07/2025 14:15	00:15	56.8	77.1	52
05/07/2025 14:30	00:15	57.0	71.7	51
05/07/2025 14:45	00:15	56.5	74.1	51
05/07/2025 15:00	00:15	56.0	67.3	51
05/07/2025 15:15	00:15	55.1	67.0	50
05/07/2025 15:30	00:15	55.6	64.5	50
05/07/2025 15:45	00:15	56.1	66.9	50
05/07/2025 16:00	00:15	56.9	73.6	49
05/07/2025 16:15	00:15	57.7	75.0	51
05/07/2025 16:30	00:15	55.6	69.9	49
05/07/2025 16:45	00:15	55.6	63.3	49
05/07/2025 17:00	00:15	55.5	69.3	50
05/07/2025 17:15	00:15	56.8	75.4	50

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
05/07/2025 17:30	00:15	57.3	73.7	49
05/07/2025 17:45	00:15	57.3	76.8	49
05/07/2025 18:00	00:15	55.9	69.4	49
05/07/2025 18:15	00:15	55.8	65.0	47
05/07/2025 18:30	00:15	57.3	74.2	47
05/07/2025 18:45	00:15	54.7	65.7	47
05/07/2025 19:00	00:15	55.3	66.3	48
05/07/2025 19:15	00:15	56.4	73.8	45
05/07/2025 19:30	00:15	55.5	73.1	46
05/07/2025 19:45	00:15	55.6	74.5	42
05/07/2025 20:00	00:15	54.2	64.5	43
05/07/2025 20:15	00:15	55.7	76.6	41
05/07/2025 20:30	00:15	53.6	64.5	41
05/07/2025 20:45	00:15	54.6	73.4	41
05/07/2025 21:00	00:15	56.3	74.2	44
05/07/2025 21:15	00:15	52.7	66.5	39
05/07/2025 21:30	00:15	54.6	75.7	41
05/07/2025 21:45	00:15	52.2	68.3	39
05/07/2025 22:00	00:15	53.5	72.7	40
05/07/2025 22:15	00:15	52.5	69.1	40
05/07/2025 22:30	00:15	52.3	70.7	38
05/07/2025 22:45	00:15	56.4	80.6	38
05/07/2025 23:00	00:15	51.3	66.5	37
05/07/2025 23:15	00:15	52.1	70.5	37
05/07/2025 23:30	00:15	51.9	74.9	34
05/07/2025 23:45	00:15	48.7	65.2	32
06/07/2025 00:00	00:15	52.1	72.0	35
06/07/2025 00:15	00:15	50.1	66.8	34
06/07/2025 00:30	00:15	55.4	77.0	33
06/07/2025 00:45	00:15	49.0	74.2	31

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
06/07/2025 01:00	00:15	46.9	62.0	30
06/07/2025 01:15	00:15	45.5	65.1	29
06/07/2025 01:30	00:15	44.9	61.9	27
06/07/2025 01:45	00:15	45.0	61.4	27
06/07/2025 02:00	00:15	47.0	64.9	27
06/07/2025 02:15	00:15	44.9	62.6	25
06/07/2025 02:30	00:15	47.3	62.3	25
06/07/2025 02:45	00:15	46.6	60.4	26
06/07/2025 03:00	00:15	44.1	62.7	24
06/07/2025 03:15	00:15	44.3	58.9	25
06/07/2025 03:30	00:15	41.9	66.0	24
06/07/2025 03:45	00:15	43.6	61.3	25
06/07/2025 04:00	00:15	45.3	75.1	27
06/07/2025 04:15	00:15	47.9	73.2	33
06/07/2025 04:30	00:15	46.5	68.2	32
06/07/2025 04:45	00:15	46.0	63.1	32
06/07/2025 05:00	00:15	44.4	62.7	32
06/07/2025 05:15	00:15	45.4	64.0	33
06/07/2025 05:30	00:15	44.8	60.2	32
06/07/2025 05:45	00:15	45.9	61.8	32
06/07/2025 06:00	00:15	47.6	63.8	32
06/07/2025 06:15	00:15	46.4	65.1	34
06/07/2025 06:30	00:15	49.7	61.7	38
06/07/2025 06:45	00:15	52.7	65.4	42
06/07/2025 07:00	00:15	54.8	66.8	45
06/07/2025 07:15	00:15	54.6	67.6	39
06/07/2025 07:30	00:15	53.5	68.6	37
06/07/2025 07:45	00:15	54.2	70.2	38
06/07/2025 08:00	00:15	55.5	77.8	38
06/07/2025 08:15	00:15	52.9	69.0	37

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
06/07/2025 08:30	00:15	54.3	65.9	41
06/07/2025 08:45	00:15	54.2	64.6	42
06/07/2025 09:00	00:15	53.8	66.2	42
06/07/2025 09:15	00:15	54.3	63.5	42
06/07/2025 09:30	00:15	55.5	63.6	47
06/07/2025 09:45	00:15	56.1	67.0	48
06/07/2025 10:00	00:15	56.0	71.7	49
06/07/2025 10:15	00:15	56.3	64.6	49
06/07/2025 10:30	00:15	56.3	68.9	50
06/07/2025 10:45	00:15	56.1	62.6	51
06/07/2025 11:00	00:15	56.7	67.6	50
06/07/2025 11:15	00:15	56.0	71.0	51
06/07/2025 11:30	00:15	56.4	64.9	51
06/07/2025 11:45	00:15	57.8	80.8	52
06/07/2025 12:00	00:15	57.2	73.5	52
06/07/2025 12:15	00:15	57.5	64.9	53
06/07/2025 12:30	00:15	57.1	68.2	52
06/07/2025 12:45	00:15	57.1	63.6	53
06/07/2025 13:00	00:15	58.2	73.6	53
06/07/2025 13:15	00:15	57.2	72.0	52
06/07/2025 13:30	00:15	57.2	72.5	52
06/07/2025 13:45	00:15	55.5	65.1	50
06/07/2025 14:00	00:15	55.5	72.7	49
06/07/2025 14:15	00:15	56.7	69.4	50
06/07/2025 14:30	00:15	58.1	73.3	51
06/07/2025 14:45	00:15	60.1	79.7	53
06/07/2025 15:00	00:15	57.2	71.6	50
06/07/2025 15:15	00:15	57.0	70.4	50
06/07/2025 15:30	00:15	56.7	69.7	50
06/07/2025 15:45	00:15	56.9	66.0	51

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
06/07/2025 16:00	00:15	55.9	65.9	50
06/07/2025 16:15	00:15	55.3	62.6	47
06/07/2025 16:30	00:15	58.4	76.8	48
06/07/2025 16:45	00:15	56.1	76.8	48
06/07/2025 17:00	00:15	56.3	72.7	49
06/07/2025 17:15	00:15	55.9	69.6	48
06/07/2025 17:30	00:15	56.1	63.4	48
06/07/2025 17:45	00:15	59.0	78.4	46
06/07/2025 18:00	00:15	56.2	72.2	46
06/07/2025 18:15	00:15	56.6	71.2	49
06/07/2025 18:30	00:15	56.0	69.5	48
06/07/2025 18:45	00:15	56.0	72.0	46
06/07/2025 19:00	00:15	56.5	69.4	47
06/07/2025 19:15	00:15	59.1	72.2	45
06/07/2025 19:30	00:15	58.1	68.4	45
06/07/2025 19:45	00:15	59.5	75.6	49
06/07/2025 20:00	00:15	59.7	70.2	48
06/07/2025 20:15	00:15	60.1	68.6	49
06/07/2025 20:30	00:15	58.0	69.0	46
06/07/2025 20:45	00:15	58.4	69.0	44
06/07/2025 21:00	00:15	57.8	67.8	43
06/07/2025 21:15	00:15	57.8	72.4	42
06/07/2025 21:30	00:15	56.5	70.2	42
06/07/2025 21:45	00:15	55.6	72.7	38
06/07/2025 22:00	00:15	55.5	69.2	40
06/07/2025 22:15	00:15	54.9	72.1	38
06/07/2025 22:30	00:15	54.6	69.5	35
06/07/2025 22:45	00:15	55.4	69.4	43
06/07/2025 23:00	00:15	52.9	66.2	38
06/07/2025 23:15	00:15	51.6	72.7	37

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
06/07/2025 23:30	00:15	53.2	68.9	38
06/07/2025 23:45	00:15	53.8	71.0	38
07/07/2025 00:00	00:15	53.9	70.0	37
07/07/2025 00:15	00:15	50.1	66.6	36
07/07/2025 00:30	00:15	49.3	68.3	34
07/07/2025 00:45	00:15	48.7	67.3	34
07/07/2025 01:00	00:15	49.6	66.3	39
07/07/2025 01:15	00:15	47.8	64.0	36
07/07/2025 01:30	00:15	49.4	69.4	37
07/07/2025 01:45	00:15	46.0	64.0	33
07/07/2025 02:00	00:15	47.2	64.0	31
07/07/2025 02:15	00:15	46.4	66.3	31
07/07/2025 02:30	00:15	45.5	66.8	32
07/07/2025 02:45	00:15	47.0	70.4	32
07/07/2025 03:00	00:15	49.2	70.5	31
07/07/2025 03:15	00:15	49.9	69.8	29
07/07/2025 03:30	00:15	47.8	65.9	30
07/07/2025 03:45	00:15	50.3	71.1	32
07/07/2025 04:00	00:15	46.5	62.8	33
07/07/2025 04:15	00:15	48.5	68.1	33
07/07/2025 04:30	00:15	53.9	70.5	33
07/07/2025 04:45	00:15	51.3	68.0	35
07/07/2025 05:00	00:15	51.1	65.8	36
07/07/2025 05:15	00:15	55.2	69.1	40
07/07/2025 05:30	00:15	57.3	70.3	43
07/07/2025 05:45	00:15	56.3	67.7	43
07/07/2025 06:00	00:15	56.9	69.0	45
07/07/2025 06:15	00:15	58.3	81.7	47
07/07/2025 06:30	00:15	59.6	78.2	47
07/07/2025 06:45	00:15	59.2	74.7	50

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
07/07/2025 07:45	00:15	60.4	71.0	56
07/07/2025 08:00	00:15	60.1	75.2	57
07/07/2025 08:15	00:15	60.4	73.4	57
07/07/2025 08:30	00:15	60.9	76.1	57
07/07/2025 08:45	00:15	60.4	79.6	56
07/07/2025 09:00	00:15	60.3	76.7	56
07/07/2025 09:15	00:15	59.4	70.6	52
07/07/2025 09:30	00:15	59.3	67.8	55
07/07/2025 09:45	00:15	59.4	68.6	54
07/07/2025 10:00	00:15	60.1	79.2	54
07/07/2025 10:15	00:15	59.5	80.5	54
07/07/2025 10:30	00:15	58.8	69.5	52
07/07/2025 10:45	00:15	59.4	70.3	55
07/07/2025 11:00	00:15	59.5	69.9	54
07/07/2025 11:15	00:15	59.7	74.2	54
07/07/2025 11:30	00:15	59.9	75.9	54
07/07/2025 11:45	00:15	60.5	76.5	55
07/07/2025 12:00	00:15	60.8	75.7	56
07/07/2025 12:15	00:15	60.4	76.6	56
07/07/2025 12:30	00:15	60.9	73.4	56
07/07/2025 12:45	00:15	62.3	82.6	56
07/07/2025 13:00	00:15	61.0	73.8	57
07/07/2025 13:15	00:15	61.0	79.2	55
07/07/2025 13:30	00:15	58.8	69.3	52
07/07/2025 13:45	00:15	59.8	75.2	54
07/07/2025 14:00	00:15	59.3	72.1	54
07/07/2025 14:15	00:15	59.3	73.1	55
07/07/2025 14:30	00:15	60.0	72.3	55
07/07/2025 14:45	00:15	59.5	73.8	54
07/07/2025 15:00	00:15	60.3	72.7	56

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
07/07/2025 15:15	00:15	60.6	76.5	56
07/07/2025 15:30	00:15	59.5	73.7	55
07/07/2025 15:45	00:15	60.7	75.0	56
07/07/2025 16:00	00:15	61.0	80.2	57
07/07/2025 16:15	00:15	60.0	72.0	56
07/07/2025 16:30	00:15	59.7	74.2	56
07/07/2025 16:45	00:15	61.8	84.0	55
07/07/2025 17:00	00:15	60.4	79.1	56
07/07/2025 17:15	00:15	59.8	71.5	56
07/07/2025 17:30	00:15	59.7	77.4	56
07/07/2025 17:45	00:15	59.8	72.0	56
07/07/2025 18:00	00:15	62.0	84.5	56
07/07/2025 18:15	00:15	63.1	85.4	58
07/07/2025 18:30	00:15	63.6	83.4	58
07/07/2025 18:45	00:15	59.7	76.1	54
07/07/2025 19:00	00:15	59.0	72.1	53
07/07/2025 21:45	00:15	55.1	68.9	45
08/07/2025 02:00	00:15	49.5	70.8	30
08/07/2025 02:15	00:15	46.5	67.6	30
08/07/2025 02:30	00:15	42.1	60.6	29
08/07/2025 02:45	00:15	36.9	57.7	29
08/07/2025 03:00	00:15	46.2	67.2	30
08/07/2025 03:15	00:15	42.6	63.3	30
08/07/2025 03:30	00:15	47.1	71.7	31
08/07/2025 03:45	00:15	44.9	64.0	32
08/07/2025 04:00	00:15	46.8	66.3	35
08/07/2025 04:15	00:15	45.0	62.4	35
08/07/2025 04:30	00:15	48.7	69.2	36
08/07/2025 04:45	00:15	51.7	67.7	38
08/07/2025 05:00	00:15	51.3	67.4	38

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A90}$ (dB)
08/07/2025 05:15	00:15	51.1	65.4	38
08/07/2025 05:30	00:15	54.9	70.5	41
08/07/2025 05:45	00:15	54.8	65.8	43
08/07/2025 06:00	00:15	56.1	66.3	46
08/07/2025 06:15	00:15	56.2	66.9	46
08/07/2025 06:30	00:15	56.8	70.5	48
08/07/2025 06:45	00:15	57.3	70.0	49
08/07/2025 07:00	00:15	54.6	64.5	47
08/07/2025 07:15	00:15	54.2	69.0	49
08/07/2025 07:30	00:15	54.2	72.3	50
08/07/2025 07:45	00:15	52.6	64.5	49
08/07/2025 08:00	00:15	53.5	71.6	50
08/07/2025 08:15	00:15	55.6	73.1	50
08/07/2025 08:30	00:15	55.6	72.8	49
08/07/2025 08:45	00:15	62.8	81.6	53
08/07/2025 09:00	00:15	66.0	84.8	59
08/07/2025 09:15	00:15	65.5	85.1	56
08/07/2025 09:30	00:15	62.6	83.6	56
08/07/2025 09:45	00:15	60.5	78.5	53
08/07/2025 10:00	00:15	61.3	78.3	55
08/07/2025 10:15	00:15	59.3	75.1	54

**Table 15: MP2 Measurement Data**

Start Time (hh:mm)	Elapsed Time (hh:mm)	$L_{Aeq}$ (dB)	$L_{AF,max}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)
08/09/2025 12:15	00:08	71.2	87.2	74	62
08/09/2025 12:30	00:15	72.0	94.6	74	58
08/09/2025 12:45	00:15	71.3	87.5	74	60
08/09/2025 13:00	00:15	70.3	88.9	74	57
08/09/2025 13:15	00:15	70.9	87.3	74	61
08/09/2025 13:30	00:15	71.0	89.4	74	60
08/09/2025 13:45	00:15	70.2	86.5	73	59
08/09/2025 14:00	00:15	70.7	89.4	74	59
08/09/2025 14:15	00:15	70.8	85.2	74	60
08/09/2025 14:30	00:15	71.6	88.9	74	64
08/09/2025 14:45	00:14	71.3	89.2	74	62
08/09/2025 15:00	00:15	71.7	83.1	75	65
08/09/2025 15:15	00:06	71.6	80.8	75	64

Areas highlighted in orange in **Figure 1** have been excluded due to inclement weather recorded at the site. Shorter periods of inclement weather are not highlighted so clarity is maintained in the graphic.

Figure 1: Time History Graph

Penistone Road, Fenay Bridge

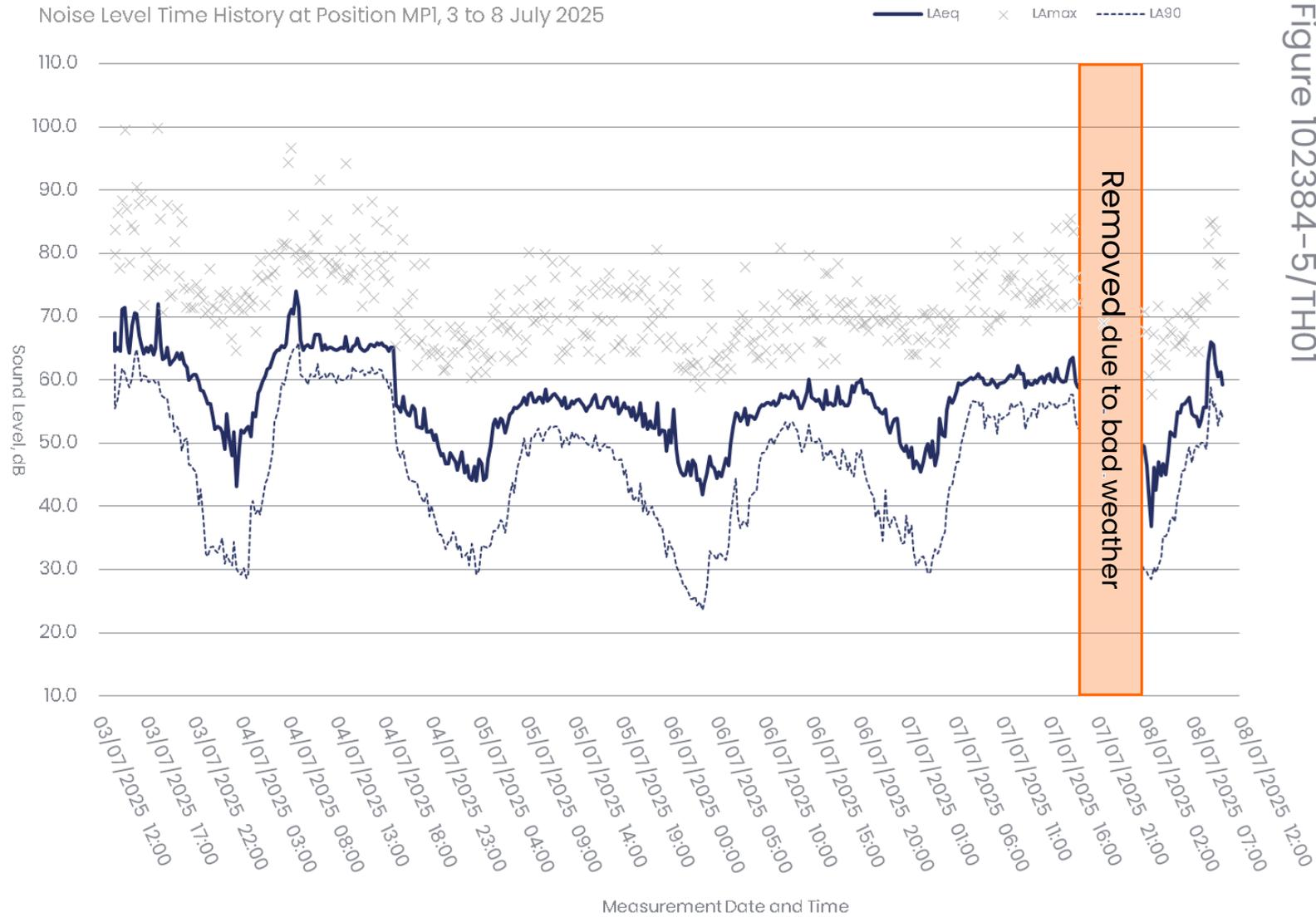


Figure 102384-5/TH01

# Appendix E: Noise Model Outputs



**Fig E1: Predicted LAeq,T  
Cumulative Daytime @ 1.5 m**

Miller Goodall Ltd  
 Ashworth House  
 Deakins Business Park  
 Egerton  
 Bolton  
 BL7 9RP  
 Tel: 01204 596166  
 E-mail: info@millergoodall.co.uk  
 www.millergoodall.co.uk

**Object & Grid Legend**

- Openable Windows (< 48 dB)
- Mitigation Required (> 48 dB)
- + Point Source
- Line Source
- Area Source
- vert. Area Source
- Building
- Barrier

Rev.	Date	Purpose	Drawn By	Approved By
1	20/10/2025	Initial Issue	JL	WW



Project: Penistone Road

Client: Homes By Honey Ltd

Not To Scale

Report Number: NA102384-5



**Fig E2: Predicted LAeq,T  
Cumulative Daytime @ 4 m**

Miller Goodall Ltd  
 Ashworth House  
 Deakins Business Park  
 Egerton  
 Bolton  
 BL7 9RP  
 Tel: 01204 596166  
 E-mail: info@millergoodall.co.uk  
 www.millergoodall.co.uk

**Object & Grid Legend**

- Openable Windows (< 48 dB)
- Mitigation Required (> 48 dB)
- + Point Source
- Line Source
- Area Source
- vert. Area Source
- Building
- Barrier

Rev.	Date	Purpose	Drawn By	Approved By
1	20/10/2025	Initial Issue	JL	WW



Project: Penistone Road

Client: Homes By Honey Ltd

Not To Scale

Report Number: NA102384-5



**Fig E3: Predicted LAeq,T  
Cumulative Night-time @ 4 m**

Miller Goodall Ltd  
 Ashworth House  
 Deakins Business Park  
 Egerton  
 Bolton  
 BL7 9RP  
 Tel: 01204 596166  
 E-mail: info@millergoodall.co.uk  
 www.millergoodall.co.uk

**Object & Grid Legend**

- Openable Windows (< 43 dB)
- Mitigation Required (> 43 dB)
- + Point Source
- Line Source
- Area Source
- vert. Area Source
- Building
- Barrier

Rev.	Date	Purpose	Drawn By	Approved By
1	20/10/2025	Initial Issue	JL	WW



Project: Penistone Road

Client: Homes By Honey Ltd

Not To Scale

Report Number: NA102384-5



**Fig E4: Predicted LAF,Max Night-time @ 4 m**

Miller Goodall Ltd  
 Ashworth House  
 Deakins Business Park  
 Egerton  
 Bolton  
 BL7 9RP  
 Tel: 01204 596166  
 E-mail: info@millergoodall.co.uk  
 www.millergoodall.co.uk

**Object & Grid Legend**

- Openable Windows (< 58 dB)
- Mitigation Required (> 58 dB)
- + Point Source
- Line Source
- Area Source
- vert. Area Source
- Building
- Barrier

Rev.	Date	Purpose	Drawn By	Approved By
1	20/10/2025	Initial Issue	JL	WW



Project: Penistone Road

Client: Homes By Honey Ltd

Not To Scale	Report Number: NA102384-5
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**Fig E5: Predicted LAeq,T  
Cumulative Daytime @ 1.5 m**

Miller Goodall Ltd  
 Ashworth House  
 Deakins Business Park  
 Egerton  
 Bolton  
 BL7 9RP  
 Tel: 01204 596166  
 E-mail: info@millergoodall.co.uk  
 www.millergoodall.co.uk

**Object & Grid Legend**

- Openable Windows (< 48 dB)
- Mitigation Required (> 48 dB)
- +
- Point Source
- Line Source
- ▭ Area Source
- vert. Area Source
- ▭ Building
- Barrier
- ⊕ Building Evaluation

Rev.	Date	Purpose	Drawn By	Approved By
1	20/10/2025	Initial Issue	JL	WW



Project: Penistone Road

Client: Homes By Honey Ltd

Not To Scale

Report Number: NA102384-5



**Fig E6: Predicted LAeq,T  
Cumulative Daytime @ 4 m**

Miller Goodall Ltd  
 Ashworth House  
 Deakins Business Park  
 Egerton  
 Bolton  
 BL7 9RP  
 Tel: 01204 596166  
 E-mail: info@millergoodall.co.uk  
 www.millergoodall.co.uk

**Object & Grid Legend**

- Openable Windows (< 48 dB)
- Mitigation Required (> 48 dB)
- +
- Point Source
- Line Source
- ▭ Area Source
- vert. Area Source
- ▭ Building
- Barrier
- ⊕ Building Evaluation

Rev.	Date	Purpose	Drawn By	Approved By
1	20/10/2025	Initial Issue	JL	WW



Project: Penistone Road

Client: Homes By Honey Ltd

Not To Scale

Report Number: NA102384-5



**Fig E7: Predicted LAeq,T  
Cumulative Night-time @ 4 m**

Miller Goodall Ltd  
 Ashworth House  
 Deakins Business Park  
 Egerton  
 Bolton  
 BL7 9RP  
 Tel: 01204 596166  
 E-mail: info@millergoodall.co.uk  
 www.millergoodall.co.uk

**Object & Grid Legend**

- Openable Windows (< 43 dB)
- Mitigation Required (> 43 dB)

- + Point Source
- Line Source
- Area Source
- vert. Area Source
- Building
- Barrier
- Building Evaluation

Rev.	Date	Purpose	Drawn By	Approved By
1	20/10/2025	Initial Issue	JL	WW



Project: Penistone Road

Client: Homes By Honey Ltd

Not To Scale

Report Number: NA102384-5



**Fig E8: Predicted LAF,Max  
Night-time @ 4 m**

Miller Goodall Ltd  
 Ashworth House  
 Deakins Business Park  
 Egerton  
 Bolton  
 BL7 9RP  
 Tel: 01204 596166  
 E-mail: info@millergoodall.co.uk  
 www.millergoodall.co.uk

**Object & Grid Legend**

- Openable Windows (< 58 dB)
- Mitigation Required (> 58 dB)

- + Point Source
- Line Source
- ▭ Area Source
- ▭ vert. Area Source
- ▭ Building
- Barrier
- ⊕ Building Evaluation

Rev.	Date	Purpose	Drawn By	Approved By
1	20/10/2025	Initial Issue	JL	WW



Project: Penistone Road

Client: Homes By Honey Ltd

Not To Scale

Report Number: NA102384-5

# Appendix F: Noise Barriers



**Fig F1: Barriers for External Amenity Noise Mitigation**

Miller Goodall Ltd  
 Ashworth House  
 Deakins Business Park  
 Egerton  
 Bolton  
 BL7 9RP  
 Tel: 01204 596166  
 E-mail: info@millergoodall.co.uk  
 www.millergoodall.co.uk

**Object & Grid Legend**

-  Building
-  Barrier
-  Existing Walls
-  1.8 m Fence
-  2.2 m Fence
-  2.8 m Fence
-  3.0 m Fence

Rev.	Date	Purpose	Drawn By	Approved By
1	20/10/2025	Initial Issue	JL	WW



Project: Penistone Road

Client: Homes By Honey Ltd

Not To Scale | Report Number: NA102384-5

# Appendix G: Noise Levels in Mitigated External Amenity Areas



**Fig G1: Predicted Mitigated LAeq,T  
Cumulative Daytime @ 1.5 m - Gardens**

Miller Goodall Ltd  
 Ashworth House  
 Deakins Business Park  
 Egerton  
 Bolton  
 BL7 9RP  
 Tel: 01204 596166  
 E-mail: info@millergoodall.co.uk  
 www.millergoodall.co.uk

**Object & Grid Legend**

- ... <= 50 dB LAeq,T
- 50 < ... dB LAeq,T
- Point Source
- Line Source
- Area Source
- vert. Area Source
- Building
- Barrier

Rev.	Date	Purpose	Drawn By	Approved By
1	20/10/2025	Initial Issue	JL	WW



Project: Penistone Road

Client: Homes By Honey Ltd

Not To Scale

Report Number: NA102384-5

## Glossary of Terms

**Decibel (dB)** The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20  $\mu\text{Pa}$ , the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is usually only perceptible under laboratory conditions.

**dB  $L_A$**  Decibels measured on a sound level meter incorporating a frequency weighting (A-weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB  $L_A$  broadly agree with an individual's assessment of loudness. A change of 3 dB  $L_A$  is the minimum perceptible under normal conditions, and a change of 10 dB  $L_A$  corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB  $L_A$ ; normal conversation about 60 dB  $L_A$  at 1 meter; heavy road traffic about 80 dB  $L_A$  at 10 meters; the level near a pneumatic drill about 100 dB  $L_A$ .

**$L_{A90,T}$**  The A-weighted noise level exceeded for 90% of the specified measurement period ( $T$ ). In BS 4142:2014+A1:2019 it is used to define background noise level.

**$L_{Aeq,T}$**  The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period ( $T$ ).  $L_{Aeq,T}$  is used to describe many types of noise and can be measured directly with an integrating sound level meter.

**$L_{AF,max}$**  The highest A-weighted noise level recorded during the time-period using a Fast time-weighting. It is usually used to describe the highest noise level that occurred during the event.

**$L_{A10(18\text{ hour})}$**  Often referred to as the UK road traffic noise index, this is the arithmetic average of the values of  $L_{A10}$  hourly for each of the 18 one-hour periods between 06:00 and 00:00.

**$R_w$**  Single number rating used to describe the sound insulation of building elements and is defined in BS EN ISO 10140-2: 2010 (formerly BS EN ISO 140-3:1995). It is

derived by measurement under laboratory conditions and does not take into account the effects of flanking transmissions.

**$D_{ne,w}$**  The weighted element-normalized level difference is a single figure rating used to describe the sound insulation of small elements within a larger construction and is defined in BS EN ISO 10140-2:2010 (BS EN ISO 140-10:1991). It is most often used to rate the sound insulation performance of ventilator units e.g. trickle vents.

**$C_{tr}$**  A single-number spectrum adaptation term used to characterise the sound insulation rating with respect to urban traffic. It is defined in ISO 717-1:2013.

