HOARE LEA

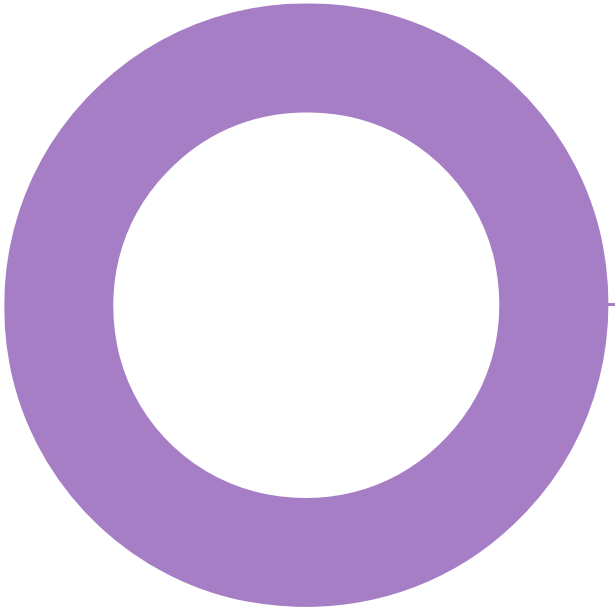
Longsight Road Langho. Langho.

Hallam Land Management Limited.

ACOUSTICS

ENVIRONMENTAL NOISE & VIBRATION REPORT

REVISION 01 – 26 FEBRUARY 2025



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
00	28/11/2024	Initial issue	GK	AP	PM
01	26/02/2025	Minor amendments	AP	PM	PM

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Contents.

Executive summary

Hoare Lea haven been appointed by Hallam Land Management Limited to provide acoustic and vibration advice for the proposed development of a greenfield site within Langho. The site is located within the jurisdiction of Ribble Valley Borough Council.

An environmental noise and vibration survey has been carried out at the site between 13 November and 20 November 2024. The aim of the survey was to determine the existing noise levels across the site, and also to assess groundborne vibration impact from adjacent rail lines.

Noise findings

The representative background sound levels measured during the survey were $L_{A90,15min}$ 42 dB during the daytime (07:00 to 23:00 hrs) and $L_{A90,15min}$ 23 dB at night-time (23:00 to 07:00 hrs).

Based on the external noise levels measured, minimum glazing sound insulation performance for the north and south perimeter of the development are presented which are most exposed to the nearby noise sources. These are achievable with suitably selected double glazing configurations.

The assessment of suitable ventilation strategies can be summarised as follows:

- To provide background ventilation, attenuated passive vents (e.g. trickle vents) or mechanical systems (e.g. MVHRs) are recommended to the worst affected dwellings. Reliance on openable windows is expected to be suitable further into the development where there is sufficient distance and screening from the main noise sources.
- For summertime cooling, reliance on openable windows would result in internal noise levels that exceed the requirement of Approved Document O (ADO) in bedrooms within worst affected dwellings. Alternative ventilation methods can be considered (e.g. attenuated ventilators or mechanical ventilation) along with further thermal assessment in line with ADO. Reliance on openable windows is expected to be suitable further into the development where there is sufficient distance and screening from the main noise sources.

Maximum plant noise limits have been specified based on BS 4142 guidance.

Vibration findings

Groundborne vibration impact from adjacent rail has been assessed in terms of the following,

- Tactile vibration (or feelable vibration) – risk of this effect is within BS 6472-1:2008 limits (less than low probability of adverse comment). Human-perceived vibration is therefore not expected to be a concern for the development.
- Re-radiated noise (generated by structural vibration) – while no limits are stipulated by the Council, our assessment indicates expected levels at the closest dwelling (southern boundary) are expected to lie below 35 dB L_{ASmax}. This is a typical guidance value for re-radiated noise.

This report is suitable for submission to the Local Planning Authority in support of the proposed development.

1. Introduction.

Hoare Lea have been appointed to provide acoustic and vibration advice for the proposed new housing development along Longsight Road in Langho. The site is located within the jurisdiction of Ribble Valley Borough Council.

An environmental noise and vibration survey has been carried out on site between 13 November and 20 November 2024. The aim of the survey was to determine the existing noise levels across the site and to quantify the levels of vibration caused by trains passing along the adjacent railway line.

This report presents the findings of the noise and vibration survey and reviews the data with respect to the requirements of the relevant standards. Preliminary recommendations for control measures are provided where appropriate.

This report is suitable for submission to the Local Authority in relation to the outline planning application for residential development at Longsight Road, Langho..

2. Site and development details.

2.1 Site location and proposal.

The proposed scheme comprises a new build housing estate on an existing greenfield site, converting it from farmland to a residential area.

The site is located to the north of Langho, north of the railway line, east of Whitehalgh Lane, south of Longsight Road and east of Northcote Park, Pringle Homes site. The nearest noise sensitive receptors have been identified as the existing dwellings to the east, south, and west of the site.

The location of the site is indicated in Figure 1 alongside the noise sensitive receptors.

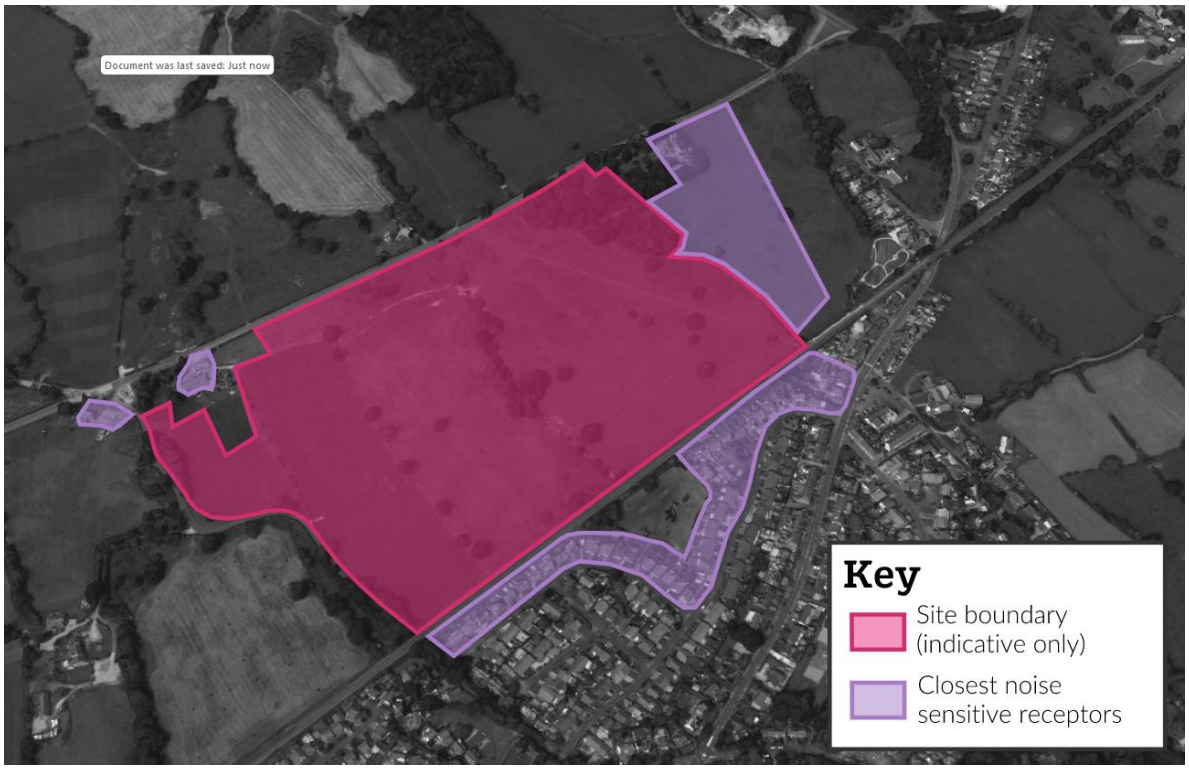


Figure 1: Aerial photograph showing development location and context (courtesy of Google Maps).

2.2 Surrounding area.

The existing site is located adjacent to Langho. The development is surrounded by a mix of farmland and residential uses.

3. Acoustic criteria.

A full review of key national and local planning policy is provided in Appendix A.

3.1 Internal noise levels in dwellings.

3.1.1 Local Authority planning guidance.

The Ribble Valley Borough Council Core Strategy 2008 (December 2014) does not contain any policies relevant to internal and external noise levels to be achieved in dwellings.

Therefore, it is considered appropriate to use standard acoustic guidance document BS 8233 to set out criteria as follows.

3.1.2 BS 8233.

BS 8233:2014 '*Guidance on sound insulation and noise reduction for buildings'* is the current British Standard providing guidance for acoustic requirements within buildings, and is included for reference. The standard advises appropriate criteria and limits for different building types including dwellings. The BS 8233 internal design criteria for dwellings are set out in Table 1.

Activity	Location	Time Period	
		Day (07:00 to 23:00)	Night (23:00 to 07:00)
Resting	Living rooms	35 dB $L_{Aeq,16hr}$	N/A
Dining	Dining Room / Area	40 dB $L_{Aeq,16hr}$	N/A
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

Table 1: Indoor ambient noise levels or dwellings.

BS 8233 also refers to the requirement to control noise intrusion from individual events during the night to reduce the risk of sleep disturbance. In line with the World Health Organisation Guidelines for Community Noise, it is proposed that the internal noise level from individual events should not normally exceed L_{Amax} 45 dB during the night.

3.1.3 Approved Document O.

The scheme is required to comply with the requirements of Approved Document O (2021 Edition) to the Building Regulations 2010 (ADO).

ADO requires the overheating strategy to take account of the likelihood that windows will be closed in bedrooms during sleeping hours (23:00 – 07:00) due to external noise. The document states the internal noise level above which occupants are likely to close windows to avoid noise disturbance / sleep disruption. These are defined in Paragraph 3.3 as follows:

Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).

b. 55dB L_{AFmax}, more than 10 times a night (between 11pm and 7am).

3.2 Plant noise emissions.

3.2.1 Local Authority planning guidance.

The Ribble Valley Borough Council Core Strategy 2008 (December 2014) does not contain specific noise criteria in relation to plant noise emissions.

On this basis, suitable criteria are to be targeted based on recognised guidance summarised below.

3.2.2 BS 4142:2014 guidance.

The general principle of the BS 4142 assessment criteria is that noise nuisance can be avoided providing there is no significant change in the prevailing background noise conditions at any surrounding noise sensitive premises once the new equipment is operational.

Where the assessment indicates that the noise rating level of new plant would be 10 dB or greater above the background noise level, the standard judges that sound to be of significant adverse impact. A difference of 5 dB is considered to result in adverse impact. Where the rating noise level of the plant is equal to or below background noise, there is likely to be low impact.

Based on this, the rating level for all new plant and machinery should be no more than equal to the existing representative background noise levels.

Further corrections should be applied if the plant noise contains tonal, intermittent, and/or impulsive characteristics. The magnitude of these corrections is dependent upon the subjective perceptibility of the tones/impulses present in line with BS 4142.

3.3 Vibration.

3.3.1 Tactile Vibration – Vibration Dose Values

BS 6472-1 (BS 6472-1: 2008: 'Guide to Evaluation of Human Exposure to Vibration in Buildings') provides guidance on predicting the human response to vibration in buildings within the frequency range 0.5 Hz to 80 Hz. This British Standard states that the human response to vibration within buildings is best evaluated using the Vibration Dose Value (VDV). The VDV can be used to estimate the probability of adverse comment which might be expected from human beings experiencing vibration in buildings.

BS 6472-1 provides a method for measuring the VDV over a 16 hour daytime period (0700 to 2300) or 8 hour night-time period (2300 to 0700) and a method for estimating the VDV (eVDV) from the measurements of vibration acceleration as a weighted frequency component (W_b in the vertical axis, W_d in the horizontal axis).

Table 2 VDV ranges which might result in various probabilities of adverse comment within residential buildings

Place and time	Low Probability of Adverse Comment $ms^{-1.75}$	Adverse Comment Possible $ms^{-1.75}$	Adverse Comment Probable $ms^{-1.75}$
Residential Buildings - Day 16h	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential Buildings - Night 8h	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

Where a less than low probability of adverse comment is given, this represents an assessment where it is likely that no adverse comments are likely and therefore vibration intrusion is not significant.

3.3.2 Re-radiated noise

This is the noise that is radiated by the building structure owing to groundborne vibration entering the structure. While no nationally legislated limit exists for re-radiated noise, a 35 dB L_{ASmax} (maximum noise level measured with a 'Slow' weighting) is typical for re-radiated noise within residential developments. This limit is commonly adopted within London boroughs for control of re-radiated noise from trains.

The industry standard Association of Noise Consultants (ANC) Guidelines (not intended to form part of, any national standard or legislation) details the likely significant effects associated with ground-borne/re-radiated

noise and vibration and provides examples of ground-borne noise criteria adopted on different railway projects in the UK including High Speed 1 (HS1) and the Channel Tunnel Rail Link (CTRL) as shown below.

Table 3 Impact classification for various levels of groundborne or re-radiated noise.

Impact classification	Ground-Borne Noise Level dB $L_{Amax,slow}$ (measured indoors, near the centre of any dwelling room on the ground floor)	
Negligible	<35	Not significant
Low	35-39	
Medium	40-44	Significant impact
High	45-49	
Very High	>49	

As per above, if re-radiated noise can be controlled to a limit of 35 dB L_{ASmax} then the associated impact is expected to be negligible. As such, for the purposes of this report a 35 dB level has been considered as a design limit for residential spaces within the development.

4. Environmental noise survey.

4.1 Methodology.

An environmental noise survey has been carried out over a period of 7 days between 13 November 2024 and 20 November 2024. During this time, short term attended measurements and long-term unattended measurements were carried out. Full details of the equipment used, as well as weather information are provided in Appendix B.

The survey measurement position and key noise sources are indicated on the annotated aerial photograph presented in Figure 2. Position P1 and P2 indicated the unattended measurement positions located on the north and south of the site, whilst positions A1 and A2 indicated the attended survey positions at the north and south of the site.

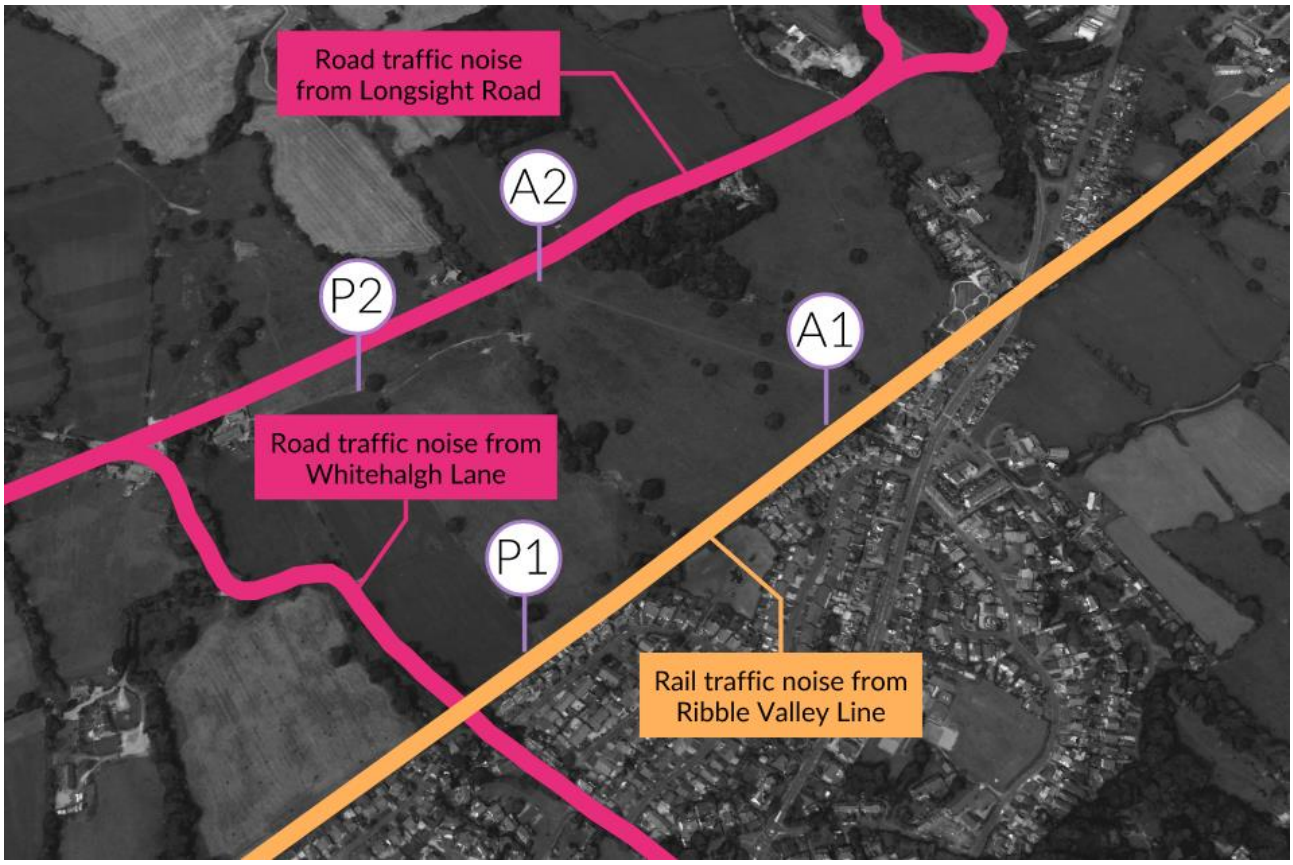


Figure 2: Aerial photograph of measurement positions (courtesy of Google Maps).

4.2 Observations.

The prevalent noise sources on site were noted to be road traffic noise from Longsight Road as well as rail traffic noise from the Ribble Valley Line. Rail traffic was infrequent while the road traffic provided consistent noise. Air traffic and bird song was also audible over the site, but not considered a significant noise source.

4.3 Attended measurement results.

The results of the attended measurements are summarised in Table 3, with reference to measurement position A1 and A2 in Figure 2. The attended measurements were carried out on 13th November 2024 and the results are considered free-field levels. Attended measurements were directly synchronised with the unattended loggers.

Measurement Position	Start Time	Measured sound levels (dB)			Notes
		$L_{Aeq,5min}$	$L_{Amax,5min}$	$L_{A90,5min}$	
A1	13/11/2024 14:30	68	81	51	Noise levels driven by road and rail traffic noise. Two trains arrived and departed Langho Train Station during the measurements (one in each direction). This occurred during the 14:30 and 14:50 measurements.
	13/11/2024 14:35	53	63	50	
	13/11/2024 14:40	54	61	50	
	13/11/2024 14:45	54	61	51	

Measurement Position	Start Time	Measured sound levels (dB)			Notes
		$L_{Aeq,5min}$	$L_{Amax,5min}$	$L_{A90,5min}$	
	13/11/2024 14:50	59	73	52	
A2	13/11/2024 15:00	75	85	59	Noise levels driven by road traffic noise along Longsight Road.
	13/11/2024 15:05	76	86	62	
	13/11/2024 15:10	75	85	61	

Table 3: Summary of results obtained from attended survey.

4.4 Unattended measurement results.

The results of the unattended noise measurements are presented to follow. A graph showing the results from the unattended logging survey is presented in Appendix C. The ambient sound levels measured at position P1 are presented in Table 4 and position P2 in Table 5.

Measurement Date	Ambient sound level, dB $L_{Aeq,T}$	
	Daytime (0700-2300)	Night-time (2300-0700)
Wednesday 13th May 2024	56	50
Thursday 14th May 2024	55	48
Friday 15th June 2024	55	49
Saturday 16th June 2024	55	46
Sunday 17th June 2024	50	48
Monday 18th June 2024	56	48
Tuesday 19th June 2024	56	49
Wednesday 20th June 2024	56	-
Typical	55	48

Table 4: Ambient sound levels measured during unattended measurements at P1.

Measurement Date	Ambient sound level, dB $L_{Aeq,T}$	
	Daytime (0700-2300)	Night-time (2300-0700)
Wednesday 13th May 2024	57	55
Thursday 14th May 2024	60	51
Friday 15th June 2024	58	51
Saturday 16th June 2024	58	52
Sunday 17th June 2024	58	55
Monday 18th June 2024	58	52

Measurement Date	Ambient sound level, dB $L_{Aeq,T}$	
	Daytime (0700-2300)	Night-time (2300-0700)
Tuesday 19th June 2024	59	56
Wednesday 20th June 2024	61	-
Typical	**59**	**54**

Table 5: Ambient sound levels measured during unattended measurements at P2.

In line with the guidance within BS 4142, a statistical analysis of the measured background sound levels has been presented in Figure 3 and Figure 4 for position P1 and P2 respectively.

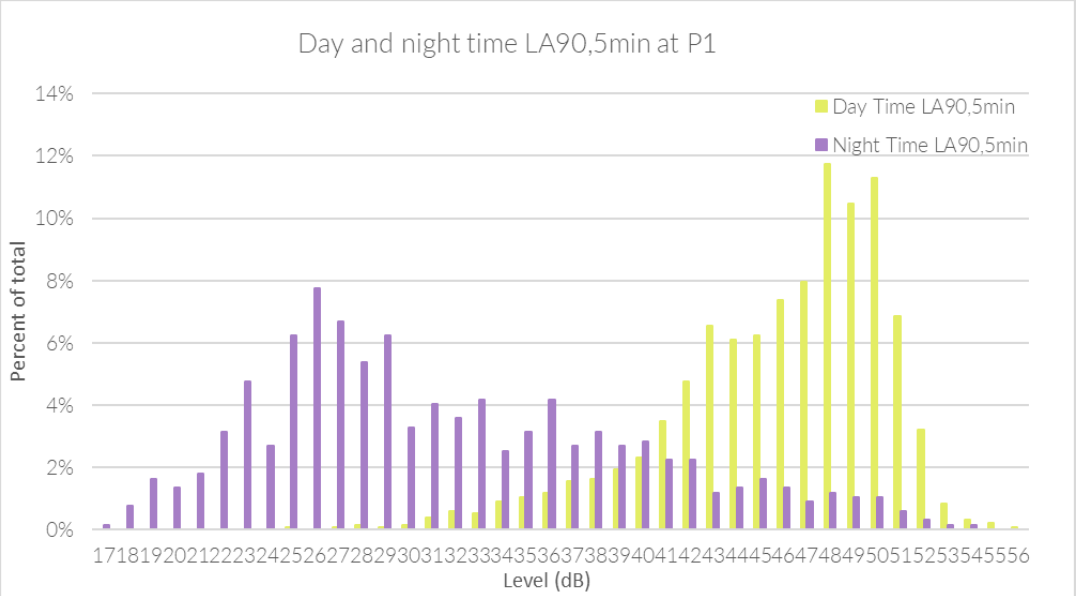


Figure 3: Statistical analysis of background sound levels captured at position P1.

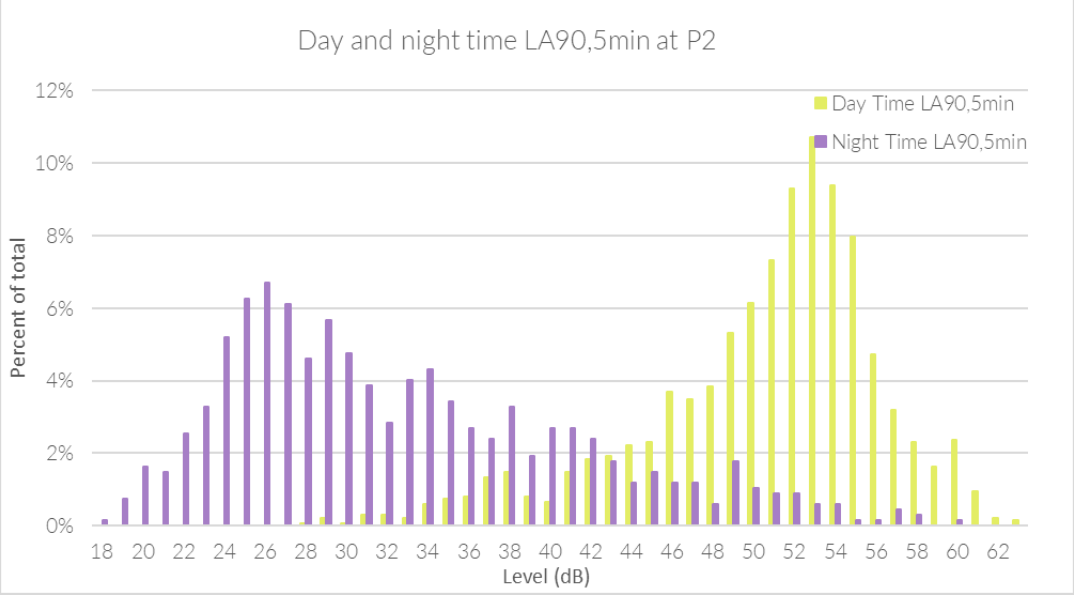


Figure 4: Statistical analysis of background sound levels captured at position P2.

The typical background sound level considered to be representative of the closest noise-sensitive receptors is presented below:

- Daytime background sound level: 42 dB $L_{A90,\ 5min}$
- Night-time background sound level: 23 dB $L_{A90,\ 5min}$

4.5 Event noise due to trains.

Available train schedules suggest that there is typically one passenger train per hour in each direction between 06:00 and 00:00. The line is also used by freight trains which available schedules suggest occur during daytime hours only.

A statistical analysis of maximum noise levels measured at Position P1 during the noise survey is presented in Figure 5. This suggests a typical maximum noise level for a train pass of 81 dB $L_{AF,max}$ at Position P1.

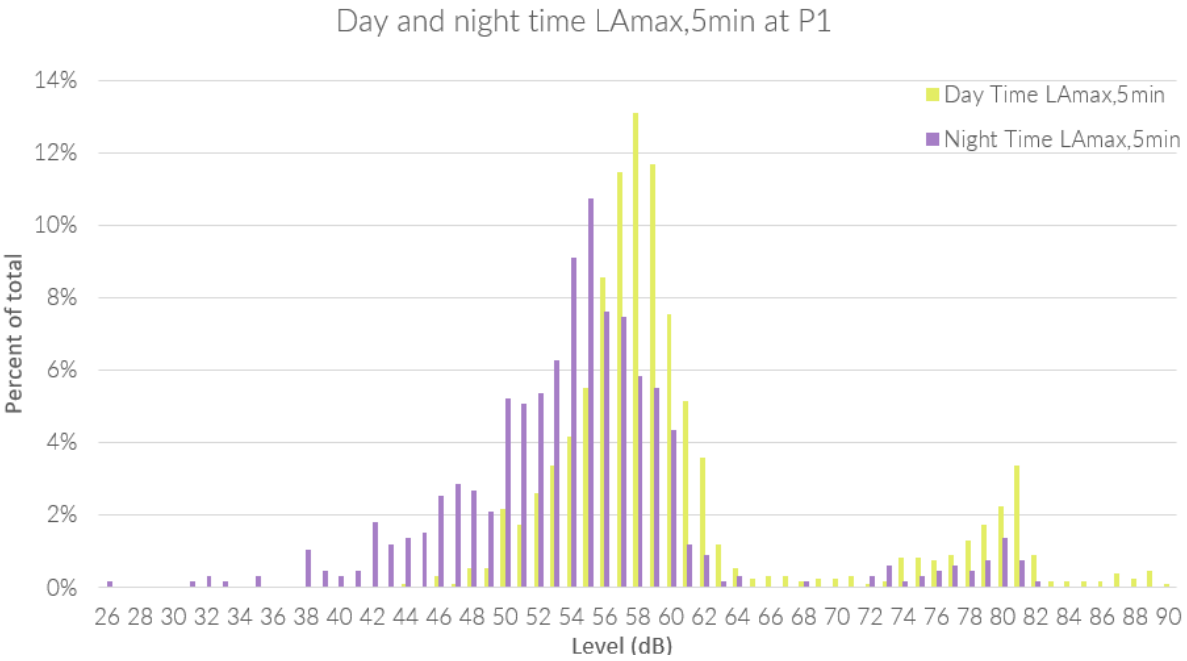


Figure 5 Statistical analysis of maximum noise levels at Position P1

5. Vibration survey.

5.1 Methodology

An attended vibration survey was carried out on 20 November 2024 (daytime hours) on the proposed site. Full details of the equipment used are provided in Appendix B.

The survey measurement positions and key vibration sources are indicated on the annotated aerial photograph presented in Figure 6. Position V1 and V2 indicates the attended survey positions at the site boundary and 30 am back from the site boundary respectively.

Figure 6: Aerial photograph of vibration measurement positions (courtesy of Google Maps).

5.2 Vibration Dose Value (VDV).

The VDVs presented were evaluated over the vertical axis as the measured values along this axis were consistently higher than the horizontal axes across all measurements.

The day and night VDVs were calculated using the following procedure:

- Cumulative VDVs were first calculated for the attended measurements per position.
- As per BS6472-1:2008 guidance, the 16h day and 8h night-time VDVs were calculated considering the measurement periods.
- Building loss and low floor amplifications were utilised to allow the effect of building structure to the incoming vibration.

Per above, an estimate of the 16h day and 8h night-time VDVs in proposed homes at the measurement positions were calculated. The results are presented below.

Position	Day		Night	
	VDV	Probability of Adverse Comment	VDV	Probability of Adverse Comment
V1	0.0591	< Low	0.0497	< Low
V2	0.0235	< Low	0.0198	< Low

Table 6: VDV's for the measurement positions considered in the vibration survey.

5.3 Re-radiated noise levels.

In order to predict and assess the potential for vibration to generate disturbing levels of re-radiated noise, the vibration data was assessed in terms of slow weighted time function, and the converted to sound pressure

within a room (using Kurweil method, assuming radiation efficiency of unity throughout the frequency range of interest). Slow weightings are more traditionally used in assessment of underground rail networks, fast weightings are more typical for general traffic noise assessments.

Table 7 below provides a summary of the predicted $L_{Amax,S}$ at each measurement position. It should be noted that in order to undertake this assessment, building losses and amplifications have been assumed. At this stage, the building type has been assumed to be a 'Single family residence type on spread footing or raft foundation and a 'low' floor resonance amplification has been used.

Measurement position	Re-radiated noise $L_{Amax,S}$ dB Z-axis
V1	34
V2	25

Table 7: Predicted ground floor re-radiated noise (mean value) at each measurement position.

6. Building envelope design.

6.1 External noise levels – 3D acoustic modelling.

Based on the results of the noise survey, a 3D acoustic model of the site has been created using the CadnaA industry standard software package. This predicts the external noise levels across the development based on the calibrated noise levels measured during the noise survey. The modelling considers the effect of distance attenuation, screening, and sound reflections between existing / proposed buildings.

A noise map of the development during daytime and night-time conditions are presented in Figure 7 and Figure 8 respectively.

Figure 7: Calculated $L_{eq,16hr}$ external noise levels across the development (day).

Figure 8: Calculated $L_{eq,8hr}$ external noise levels across the development (night).

6.2 Façade sound insulation assessment.

6.2.1 Basis.

The site layout is not yet developed to comment on specific measures for each dwelling given the application is in outline form seeking detailed permission for access to, but not within, the site only. Therefore, a façade assessment has been carried out assuming the nearest residential façades are set back 10 m from both the Ribble Valley Railway Line and Longsight Road. This is considered to represent the most onerous acoustic conditions for the site.

Typical bedroom dimensions of 4 m x 3 m x 2.4 m with 50% glazing on the longest façade has been assumed in the calculations at this stage. It is assumed that typical cavity masonry external walls would be provided with a minimum sound insulation performance of R_w+C_{tr} 42 dB.

As there are scheduled train passes at the start and end of the night time period (06:00 - 07:00 and 23:00 - 00:00), which are critical periods for potential sleep disturbance, it is proposed that the typical maximum noise level from train passes be designed not to exceed the 45 dB $L_{AF,max}$ criteria stated in Section 3.2.2. This is therefore considered in the façade assessment.

6.2.2 External glazing.

Based on the above, the new glazing elements should be selected to achieve the following sound insulation performances. This is to ensure that environmental noise is controlled in the properties in line with the criteria set out in Section 3.1.

Façade	Minimum glazing sound insulation performance
Façade 10m from site boundary (railway side)	$R_w + C_{tr}$ 34 dB [1]
Façade 10m from site boundary (road side)	$R_w + C_{tr}$ 36 dB

Table 8: Minimum sound insulation performance of glazing elements.

[1] This performance requirement is driven by controlling maximum noise levels from train pass events.

The sound insulation performances should apply to the glazing units as a whole, inclusive of framing and furniture.

Lower sound insulation performances will be possible at locations within the site that are set back further from the road and rail noise sources. Many dwellings would also be expected to benefit from acoustic screening from other buildings within the site. A detailed assessment will need to be carried out as part of any future Reserved Matters application.

6.2.3 Ventilation strategy.

6.2.3.1 Background ventilation.

The sound reduction provided by an open window depends on a number of factors, including degree of opening arrangement, window size, spectrum of external noise, location of external noise source, size of room, etc. In addition, there is very limited test data for specific windows when they are open.

A typical estimate for an open window to provide background ventilation is 12-15 dB, which has been used in this assessment.

Based on external noise levels at building façades set back 10 m from the site boundary, open windows are not a suitable strategy to provide background ventilation. It is therefore recommended that attenuated passive ventilators (e.g. trickle vents) or mechanical ventilation be provided to control external noise break-in in line with the noise limits given in Section 3.1.2 for the dwellings that are more exposed to the noise sources.

It is anticipated that further into the development site, due to level drop off with distance and screening, opening windows could be adopted as a suitable strategy to provide background ventilation. This would require further review during the detailed design once site layouts are developed.

6.2.3.2 Control of overheating.

A typical estimate for a window that is wide open to provide cooling is 9-12 dB, which has been used in this assessment.

Based on external noise levels at building façades set back 10 m, and in line with Approved Document O, open windows are not a suitable strategy to control overheating for the dwellings more exposed to the noise sources affecting the site. On the railway side, this is due to the maximum noise levels due to train passes that occur during the night time period. It is therefore recommended that other ventilation strategies are developed. This could include attenuated ventilators or mechanical strategies.

It is anticipated that further into the development site, due to level drop off with distance and screening, opening windows could be adopted as a suitable strategy to control overheating. This would require further review during the detailed design once site layouts are developed.

7. Vibration assessment.

7.1 Physical perception of vibration.

The VDV results presented in Section 5.2 indicates a less than low likelihood of adverse complaint as far as BS 6472-1:2008 criteria are considered. Consequently, the risk of adverse human-perceived vibration is therefore not expected to be a concern for the development.

7.2 Re-radiated noise.

Based on the result of the vibration measurements set out in Section 5.2, the re-radiated noise levels due to ground borne vibration are unlikely to exceed the target 35 dB L_{ASmax} level at dwellings located along the boundary of the site parallel to the Ribble Valley Railway Line. Consequently, the site does not present a risk in terms of meeting guideline targets.

8. Plant noise limits.

Based on the criteria set out in Section 3.2.2 and the survey results, the cumulative maximum sound pressure levels for fixed plant, equipment and machinery associated with the development shall not exceed the levels present in Table 2 at 1m from the nearest noise sensitive premises.

Table 9 Maximum permissible sound pressure levels at 1m from the nearest noise sensitive premise.

Time of day	Maximum sound pressure level at 1m from the nearest noise sensitive premises
07:00 to 23:00 hours	42 dB $L_{Ar,1hr}$
23:00 to 07:00 hours	23 dB $L_{Ar,15min}$

These plant noise limits include any corrections for intermittency, tonality or other discernible acoustic characteristics.

Appendix A: Policy and guidance.

National policy.

Noise Policy Statement for England.

The *Noise Policy Statement for England* (NPSE) advises that noise impacts should be assessed on the basis of adverse and significant adverse effects but does not provide any specific guidance on assessment methods or noise limits.

The NPSE introduces the concepts summarised in Table 10 that can be applied when considering the significance of noise impacts, which are applied by the World Health Organization.

The document advises that it is not possible to have '*a single objective noise based measure…. that is applicable to all sources of noise in all situations*'. It further advises that the sound level at which an adverse effect occurs is likely to be different for different noise sources, for different receptors at different times.

Effect Level	Description
No Observed Effect Level (NOEL)	This is the noise level below which no effect can be detected. In simple terms, below this level of noise, there is no detectable effect on health and quality of life due to the noise being assessed.
Lowest Observed Adverse Effect Level (LOAEL)	This is the level of noise above which adverse effects on health and quality of life can be detected.
Significant Observed Adverse Effect Level (SOAEL)	This is the level of noise above which significant adverse effects on health and quality of life occur.

Table 10: NPSE observed effect levels.

National Planning Policy Framework.

National Planning Policy Framework (NPPF) sets out the Government's planning policies and how these are expected to be applied. In relation to noise and vibration, NPPF section 15 paragraphs 180, 191 and 192 are presented below:

'*180. Planning policies and decisions should contribute to and enhance the natural and local environment by:*

e. preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability'

'*191. 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:*

1. *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;*
2. *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;*

and

3. *limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

'*193. 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.*'

Planning Practice Guidance.

Online Planning Practice Guidance (PPG) has been published to provide greater details in relation to the relevance of noise to the planning process following the introduction of the NPPF and NPSE.

This guidance states, under the heading *'How to Determine the Noise Impact'*, that the following should be considered by Local Authorities:

- *'whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.'*

In line with NPSE, this includes identifying where noise exposure is above or below the significant observed adverse effect level and the lowest observed adverse effect level for a given situation during the operation of the Proposed Development.

Further guidance on each of the various observed effect levels set out in the NPSE is provided in the table detailed in the section headed 'How to Recognise when Noise could be a concern?' which is reproduced in Table 11.

It is important to note that no specific noise parameters are defined in the text or target noise levels provided. Under the heading 'What factors influence whether noise could be a Concern?', the subjective nature of noise is discussed. It is stated that there is no simple relationship between noise levels and the impact on those affected. This depends on how various factors combine in particular situations.

In respect of mixed-use developments, the following guidance is provided:

'When proposed developments could include activities that would be covered by the licensing regime, local planning authorities should consider whether the potential for adverse noise impacts will be addressed through licensing controls (including license conditions). Local planning authorities should not however presume that license conditions will provide for noise management in all instances and should liaise with the licensing authority.'

Perception	Example of outcomes	Increasing effect level	Action
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable and not Intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.		No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect Level	Avoid
Noticeable and disruptive	Extensive and regular changes in behaviour and/or inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Table 11: PPG observed effects.

Approved Document O: 2021.
The scheme is required to comply with the requirements of Approved Document O (2021 Edition) to the Building Regulations 2010 (ADO).

ADO requires the overheating strategy to take account of the likelihood that windows will be closed in bedrooms during sleeping hours (23:00 – 07:00) due to external noise. The document states the internal noise

level above which occupants are likely to close windows to avoid noise disturbance / sleep disruption. These are defined in Paragraph 3.3 as follows:

Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).

b. 55dB L_{AFmax}, more than 10 times a night (between 11pm and 7am).

The ventilation strategy to mitigate overheating in line with the requirements of ADO must therefore be developed such that there is no reliance on open windows in bedrooms between 23:00 to 07:00 if this would cause the above noise levels to be exceeded.

Local plan.

The Ribble Valley Borough Council Core Strategy 2008 (December 2014) does not contain specific guidance on noise.

As no further guidance is provided, it is deemed appropriate to use further recognised guidance.

Recognised guidance.

British Standard 4142.

Current Government advice to Local Planning Authorities in both England and Wales refers to British Standard 4142:2014 (BS 4142) as being the appropriate guidance for assessing commercial operations and fixed building services plant noise. The British Standard provides an objective method for rating the significance of impact from industrial and commercial operations. It describes a means of determining sound levels from fixed plant installations and determining the background sound levels that prevail on a site.

The assessment of the impacts is based on the subtraction of the pre-existing background sound level ($L_{A90,T}$) from the rating level ($L_{Ar,Tr}$).

The standard does not give a definitive method for determining the background sound level but instead, as a commentary, states that *"the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods"*.

Clause 8.1.4, which discusses the monitoring duration, states *"there is no "single" background sound level as this is a fluctuating parameter. However, the background sound level used for the assessment should be representative of the period being assessed."* As a note to this clause the following commentary is given on obtaining a representative backgrounds sound level:

"To obtain a representative background sound level a series of either sequential or disaggregated measurements ought to be carried out for the period(s) of interest, possibly on more than one occasion. A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value."

The rating level is defined objectively as the specific source noise level in question (either measured or predicted) with graduated corrections for tonality (up to +6 dB(A)), impulsivity (up to +9 dB(A)), intermittency (+3 dB(A)) and other sound characteristics (+3 dB(A)) which may be determined either subjectively or objectively, if necessary.

The background sound level is subtracted from the rating level. The following is considered when evaluating the potential impact:

- A difference of around +10 dB is likely to be an indication of a significant adverse impact, depending on context;
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on context; and
- A difference of +0 dB or less is an indication of the specific sound source having a low impact, depending on the context.

It also states '*where background sound levels and rating levels are low, absolute levels might be as, or more, relevant that the margin by which the rating level exceeds the background. This is especially true at night.*'.

British Standard 8233.

BS 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*' provides guidance for control of noise in and around buildings. The British Standard advises appropriate criteria and limits for different situations including rooms for residential purposes. The advice for living accommodation (Table 4 of BS 8233:2014) is reproduced below in Table 12. These are desirable internal ambient noise levels for spaces when they are unoccupied. These values are based on the guidelines published by the WHO in *Guidelines for Community Noise*.

Table 12 BS8233: guideline indoor ambient noise levels for dwellings.

Activity	Location	Daytime (07:00 to 23:00)	Night-time (23:00 to 07:00)
Resting	Living room	35 dB $L_{Aeq,16\ h}$	-
Dining	Dining Room / Area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16\ h}$	30 dB $L_{Aeq,8\ h}$

Supplementary Notes 2, 4 and 7 to Table 4 within BS 8233 are reproduced below for reference:

'NOTE 2 The levels shown in Table 4 are based on the existing guidelines issued by the World Health Organization…

NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,\ F}$ depending on the character and number of events per night….

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above the WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable conditions still achieved.'

As no specific value is provided in BS 8233 for noise from individual events (see Note 4 above), it is common practice to consider the guidance from the World Health Organization *'Night noise guidelines for Europe'.* The WHO document states that for a good night's sleep, a maximum sound level of L_{AFmax} 45 dB should not be exceeded more than 10-15 times per night.

For gardens and terraces, the Standard states that it is desirable that the steady noise level does not exceed $L_{Aeq,T}$ 50 dB whilst a level of $L_{Aeq,T}$ 55 dB would be acceptable in noisier environments. However, BS 8233 states that, *'it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable…In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited'*.

Appendix B: Survey and equipment details.

Equipment details.

Noise.

Table B1 summarises the details of the equipment used during the environmental noise survey. All equipment used was within dates of calibration and calibration certificates are available on request.

Item	Description	Serial Number	Calibration Expiration Date
Unattended Sound Level Meter – P1	Rion - Sound Level Meter: NL-52 Rion - Microphone: UC-59 Rion - Pre-amplifier: NH-25	00297868 14887 88079	14/04/2025
Unattended Sound Level Meter – P2	Rion - Sound Level Meter: NL-52 Rion - Microphone: UC-59 Rion - Pre-amplifier: NH-25	00732162 16798 32190	08/03/2026
Attended Sound Level Meter	Brüel and Kjær – Sound Level Meter: 2250 Brüel and Kjær – Microphone: 4189 Brüel and Kjær – Pre-amplifier: ZC-0032	3003815 2887159 29116	20/11/2025

Table B1: Equipment used during environmental noise survey.

Vibration.

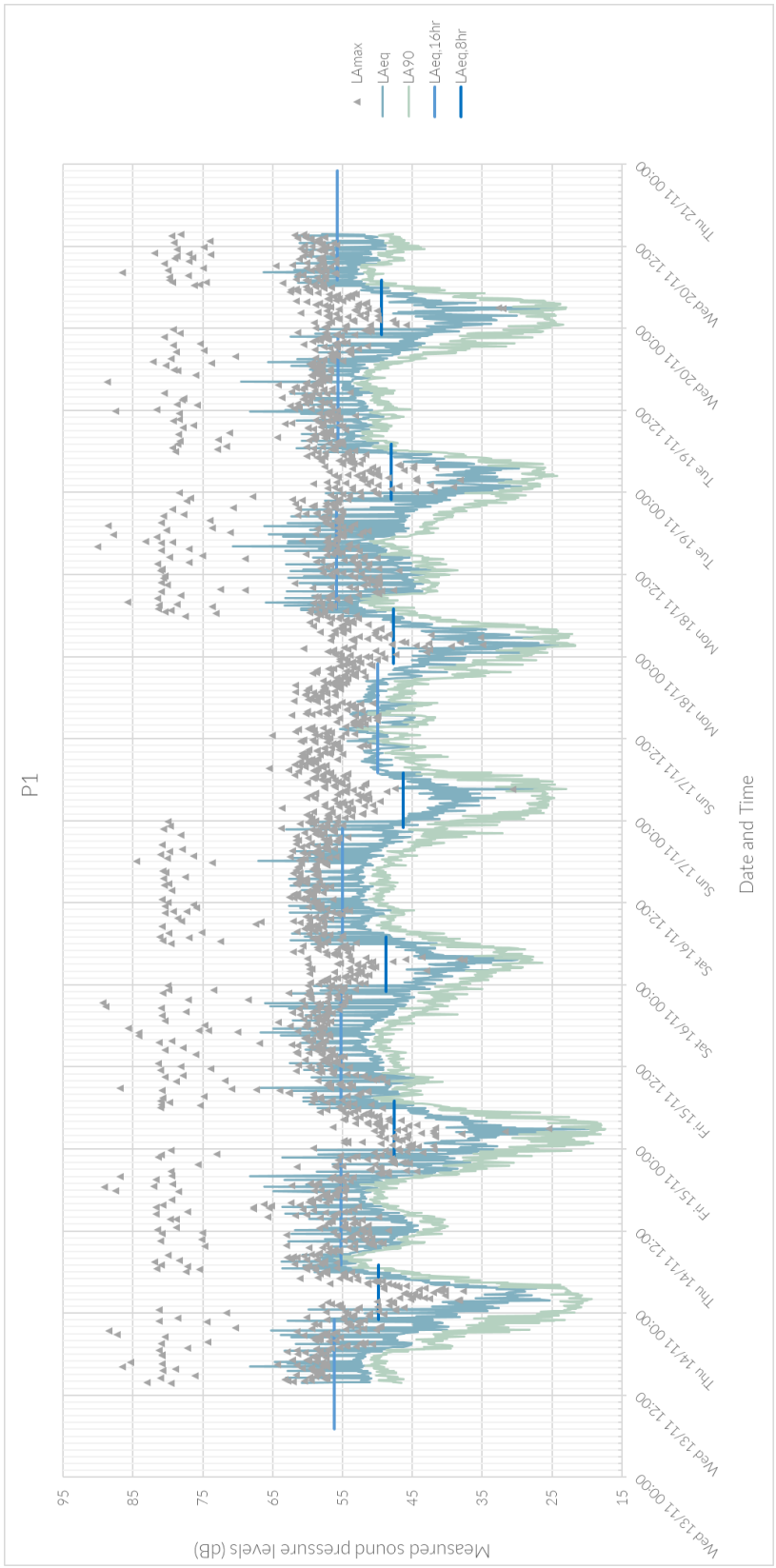
All equipment used was within dates of calibration and calibration certificates are available on request.

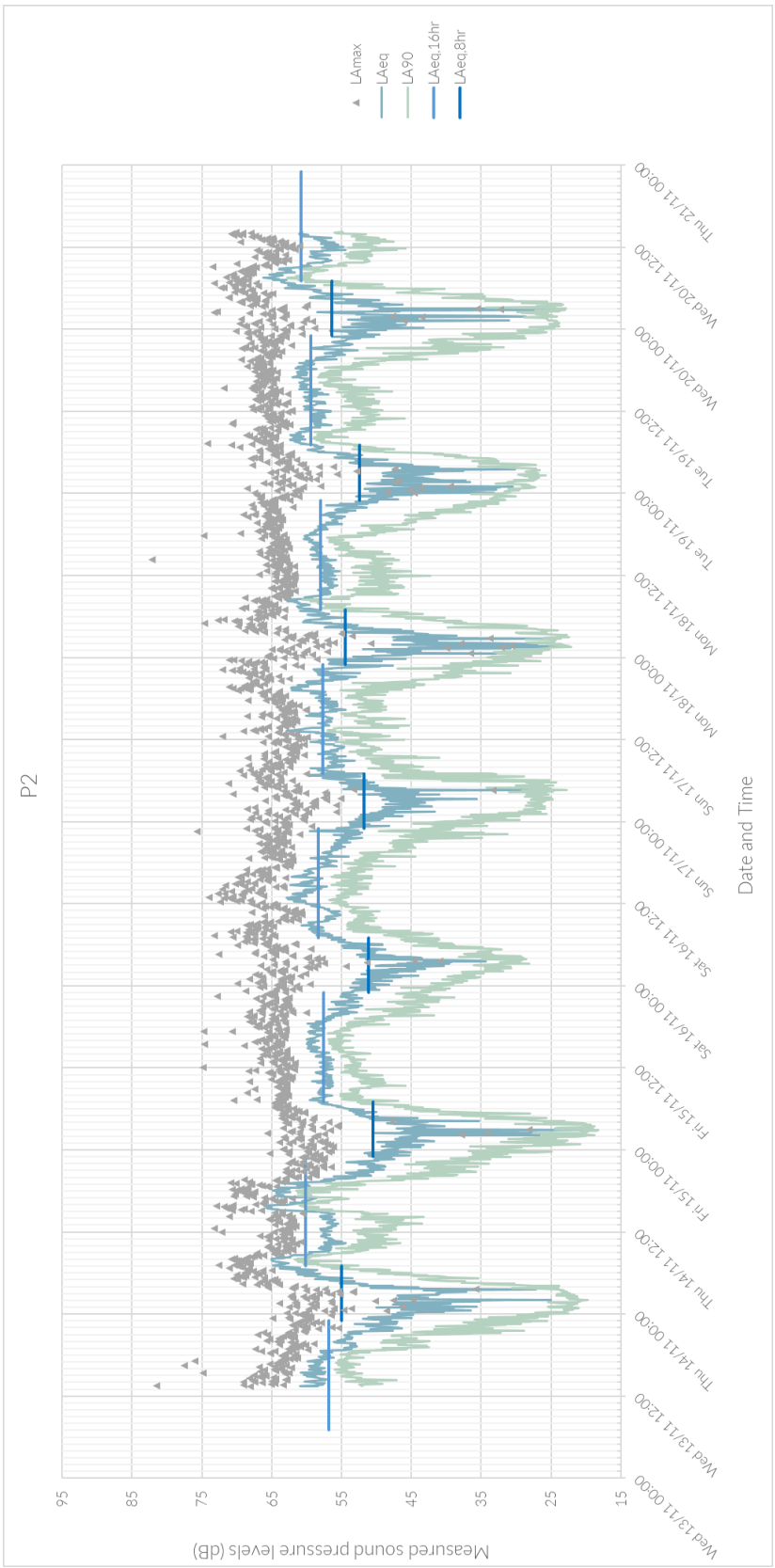
Weather information.

Weather reports for the area indicate that temperatures ranged between -1 °C and 12 °C. Periods of wind and rain were not substantial to have affected the measurement results.

The measured data is therefore considered suitable as being representative of typical conditions.

Appendix C: Time history of unattended measurements.




LAmax
LAeq
LA90
LAeq,16hr
LAeq,8hr
P2
Measured sound pressure levels (dB)
95
85
75
65
55
45
35
25
15
Wed 13/11 00.00
Wed 13/11 12.00
Thu 14/11 00.00
Thu 14/11 12.00
Fri 15/11 00.00
Fri 15/11 12.00
Sat 16/11 00.00
Sat 16/11 12.00
Sun 17/11 00.00
Sun 17/11 12.00
Mon 18/11 00.00
Mon 18/11 12.00
Tue 19/11 00.00
Tue 19/11 12.00
Wed 20/11 00.00
Wed 20/11 12.00
Thu 21/11 00.00
Date and Time

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