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133 WINDMILL STREET, GRAVESEND

NOISE ASSESSMENT

Technical Report: R9433-2 Rev 1

Date: 30th January 2026

For: Planning Issues Ltd
Churchill House
Parkside
Ringwood
BH24 3SG

24 Acoustics Document Control Sheet

Project Title: 133 Windmill Street, Gravesend – Noise Assessment

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1.0 INTRODUCTION

- 1.1 A new retirement living development is proposed on the site at 133 Windmill Street (Gravesend, Kent). 24 Acoustics has been appointed by Planning Issues Ltd on behalf of Churchill Living and Housing 21 to undertake a noise assessment to accompany a full planning application for the proposals, which comprise a new 4-storey building with 67 one-bedroom apartments.
- 1.2 The site is bounded by roads, with Windmill Street to the east and Wrotham Road (A227) to the west. Accordingly, this noise impact assessment has included:
- Environmental noise monitoring;
 - Consideration of the noise arising from nearby sources affecting the site;
 - Assessment of internal noise levels within the proposed apartments;
 - Assessment of external noise levels within external amenity.
- 1.3 This report presents the results of the assessment, following site visits and ambient noise surveys undertaken between 10th and 17th December 2025.
- 1.4 All noise levels in this report are presented in dB relative to 20μPa.

2.0 SITE DESCRIPTION

- 2.1 The site, which is currently unoccupied, is bounded by Windmill Street to the east, Wrotham Road (A227) to the west, Woodville Place to the north and Zion Place to the south.
- 2.2 The neighbouring area comprises a combination of residential and commercial buildings.
- 2.3 The proposed development comprises the construction of a four-storey apartment block of 1-bedroom apartments.
- 2.4 The proposed site location is shown in Figure 1 and the proposed ground floor site layout is shown in Figure 2.
- 2.5 Parking and garden areas will be provided around the new building, with vehicular access be provided from Woodville Place.

3.0 CRITERIA

National Planning Policy Framework & Noise Policy Statement for England

3.1 The National Planning Policy Framework (NPPF) [Reference 1] states that planning policies and decisions should aim to:

- *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 quality of life.*
- *Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

3.2 The NPPF also refers to the Noise Policy Statement for England (NPSE) [Reference 2] which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government's long-term vision to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development' which is supported by the following aims.

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life.*

3.3 The NPSE defines the concept of a 'significant observed adverse effect level' (SOAEL) as 'the level above which significant adverse effects on health and quality of life occur'. The following guidance is provided within the NPSE:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

- 3.4 The Planning Practice Guidance (PPG) [Reference 3] is written to support the NPPF with more specific planning guidance. The PPG reflects the NPSE and states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It also states that opportunities should be taken, where practicable, to achieve improvements to the acoustic environment. The NPPG states that noise can over-ride other planning concerns but should not be considered in isolation from the other economic, social and environmental dimensions of the proposed development.
- 3.5 The PPG expands upon the concept of SOAEL (together with Lowest Observable Adverse Effect Level, LOAEL and No Observed Effect Level, NOEL) as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system.

BS 8233: 2014 and WHO Guidelines

- 3.6 BS 8233: 2014 [Reference 4] provides design guidance for dwelling houses, flats and rooms in residential use and recommends that internal noise levels in dwellings do not exceed 35 dB $L_{Aeq,16\text{ hour}}$ in living rooms and bedrooms during the day, 40 dB $L_{Aeq,16\text{ hour}}$ in dining rooms during the day and 30 dB $L_{Aeq,8\text{ hour}}$ in bedrooms at night.
- 3.7 BS 8233: 2014 also notes that *“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.”*
- 3.8 Although the guidelines have no formal standing, the World Health Organisation (WHO) provides guidance on desirable internal noise levels to minimise the risk of sleep disturbance. The WHO 2000 guidelines [Reference 5] suggest internal night-time noise levels not exceeding 30 dB $L_{Aeq,8hr}$ or regularly (10 – 15 times per night) exceeding 45 dB $L_{Amax,f}$ for ‘a good night’s sleep’.
- 3.9 BS 8233:2014 suggests an upper guideline value of 55 dB $L_{Aeq,16hr}$ for noise levels in external amenity spaces such as gardens. This is considered an aspirational limit and BS 8233 recognises that the desirable noise levels for external amenity areas are not always achievable in certain locations. The standard also states that development should not be prohibited on the basis of noise levels within external amenity areas

Professional Practice Guidance on Planning & Noise (ProPG)

3.10 The Professional Practice Guidance on Planning and Noise (ProPG) [Reference 6] was published jointly by the Association of Noise Consultants, Institute of Acoustics and Chartered Institute of Environmental Health in May 2017. The guidance relates to the consideration of existing sources of transportation noise upon proposed new residential development and strives to:

- *Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;*
- *Encourage the process of good acoustic design in and around new residential developments;*
- *Outline what should be taken into account in deciding planning applications for new noise-sensitive developments;*
- *Improve understanding of how to determine the extent of potential noise impact and effect; and*
- *Assist the delivery of sustainable development.*

3.11 The guidance describes a recommended approach for new residential development, which includes four key elements of the assessment process, identified below:

- (i) Good acoustic design process;
- (ii) Internal noise level guidelines;
- (iii) External amenity area noise assessment;
- (iv) Assessment of other relevant issues.

Summary of Proposed Criteria

3.12 The impact of noise upon the site has been assessed with reference to BS 8233: 2014 and the WHO Guidelines for recommended internal noise levels inside the properties.

3.13 The following thresholds have been adopted:

- Noise levels inside the properties:
 - ≤ 35 dB $L_{Aeq, 16 \text{ hour}}$ in bedrooms and living rooms during the daytime (07:00 to 23:00 hours)
 - ≤ 40 dB $L_{Aeq, 16 \text{ hour}}$ in dining rooms during the daytime (07:00 to 23:00 hours)
 - ≤ 30 dB $L_{Aeq, 8 \text{ hour}}$ in bedrooms at night (23:00 to 07:00 hours)

- ≤ 45 dB $L_{Amax,f}$ in bedrooms for regular events at night (23:00 to 07:00 hours)
- Noise levels in external amenity areas considered against the aspirational guideline values stated in BS 8233: 2014

4.0 ENVIRONMENTAL NOISE MEASUREMENTS

Measurement Instrumentation and Procedure

- 4.1 Environmental noise measurements were obtained over the 10th to 17th December 2025 in order to establish existing ambient noise levels at the site. Instrumentation was setup to assess noise arising from nearby sources, including road traffic. Ambient noise levels were measured using the following equipment:
- 2 x Rion precision sound level meter Type NL-52;
 - Brüel & Kjær acoustic calibrator Type 4231.
- 4.2 The survey locations are shown in Figure 1 and described below:
- Location 1 – northeast corner of the site, at approximately 4 metres above ground level (free-field conditions)
 - Location 2 – southwest corner of the site, at approximately 4 metres above ground level (free-field conditions)
- 4.3 The instrumentation was configured to continuously measure and store overall A-weighted statistical parameters including L_{Aeq} , L_{Amax} and L_{A90} (all measured on fast response) over 1-minute intervals. Measurements were made in accordance with BS 7445: 1991 "Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use" [Reference 7].
- 4.4 The instrumentation was equipped with an environmental microphone and an extension cable. The instruments were powered by external batteries and stored in a weatherproof case. The calibration of all instrumentation was verified before and after the tests and no significant signal variation occurred. Calibration of 24 Acoustics' equipment is traceable to National Standards.
- 4.5 The weather conditions throughout the survey were generally dry, with wind speeds not exceeding 5 m/s during the entire monitoring period.

Results and Observations

- 4.6 The free-field ambient (L_{Aeq}) data values measured have been averaged to obtain overall 16-hour daytime and 8-hour night-time free field noise levels. Typical maximum night-time noise levels have been determined in terms of the 10th highest value during each night-time period. By analysing these results, representative overall noise levels have been determined.
- 4.7 Prevailing noise levels at the site are determined by road traffic from the local network, primarily Windmill Street and Wrotham Road. No other significant sources of noise have been identified.
- 4.8 The noise survey results are summarised in Table 1 and shown graphically in Appendix B.

Measurement Location	Representative Sound Pressure Levels		
	dB L_{Aeq} , 16 hour (07:00 - 23:00)	dB L_{Aeq} , 8 hour (23:00 - 07:00)	Typical L_{Amax} , fast, 5 min (23:00 - 07:00)
1	68	61	81
2	63	60	75

Table 1 - Summary of Measured Noise Levels

5.0 CALCULATIONS AND ASSESSMENT

- 5.1 Calculations have been undertaken using the noise measurement results to determine the sound reduction requirements for façade elements to habitable rooms. The calculations are based on the latest drawings provided by Planning Issues Ltd.
- 5.2 Non-glazed elements of the façade shall be designed and specified to achieve a minimum sound insulation performance of 52 dB R_w . This required performance is readily achieved by traditional cavity masonry constructions.

Glazing

- 5.3 Minimum acoustic requirements for glazing have been specified in accordance with room types and calculated free-field noise levels outside each window. Two levels of sound reduction performance ($G1$ and $G2$) have been established to account for different levels of exposure to traffic noise at each façade section.

- 5.4 The minimum required sound reduction performances for glazing are stated in Table 2. Marked-up drawings indicating where each level of sound reduction performance applies are presented in Figures 3 and 4.

Glazing Reference	Minimum SRI (dB) per Octave Band Centre Frequency (Hz)						Minimum R_w (dB)
	125	250	500	1k	2k	4k	
G1	24	25	31	42	44	49	36
G2	24	20	25	35	38	35	31

Table 2 - Glazing Sound Insulation Specifications – Habitable Rooms

- 5.5 In making a comparison with the values in Table 2, it is important that the glazing figures used are the result of tests in accordance with ISO 10140, Part 2: 2010 and that the quoted minimum sound reduction specifications are met by the entire glazing system as a whole, including frames, seals, any insulated panels and not just the glass. The requirements also apply to any external glazed doors to habitable rooms (i.e. from gardens).
- 5.6 In order to assist with the selection process, the following glazing configurations (which, if installed correctly, would be capable of achieving the required sound reduction performances) are presented:
- G1
6 mm glass: 12 mm cavity (minimum): 6.4 mm Stadip Silence
 - G2
4 mm glass: 12 mm cavity (minimum): 4 mm glass

Ventilation

- 5.7 The ventilation types have been specified in terms of V1, V2 and V3, as depicted in Figures 5 and 6.
- 5.8 The minimum required sound reduction performances for ventilators are stated in Table 3.

Ventilation Strategy Reference	Minimum SRI (dB) per Octave Band Centre Frequency (Hz)						Minimum $D_{n,e,w}$ (dB)
	125	250	500	1k	2k	4k	
V1	37	37	36	47	49	55	44
V2	40	36	34	35	44	40	38
V3	40	36	35	31	32	37	32

Table 3 - Trickle Ventilators Sound Insulation Specifications – Habitable Rooms

- 5.9 In making a comparison with the values in Table 3, it is important that the figures used are the result of laboratory tests with the vent in the open position. Note that the stated minimum performance values assume two ventilators per habitable room.
- 5.10 For guidance purposes, the following ventilator types would be capable of achieving the required sound reduction performances:
- V1 – Acoustically attenuated trickle ventilator or through-wall ventilator
 - V2 – Acoustically attenuated trickle ventilator
 - V3 – Standard trickle ventilator
- 5.11 Alternatively, mechanical ventilation with heat recovery (e.g. MVHR) would be suitable in lieu of passive ventilators.
- 5.12 Ventilation should be specified to achieve the background ventilation requirements of Approved Document F.
- 5.13 The above assessment demonstrates that the internal noise level criteria, as outlined in section 3, will be readily achievable, subject to the appropriate specification and design of the external façade elements.

Noise Levels in External Amenity Areas

- 5.14 As shown in the site plan in Figure 2, an external amenity area is proposed in the southern portion of the site. This area will benefit from acoustic screening provided by the proposed building with relation to Windmill Street to the east, and is set back from Wrotham Road to the west.
- 5.15 Based on the measured noise levels, correcting for distance and acoustic screening from the building, noise levels in the majority of the amenity space would be at or below 55 dB $L_{Aeq, 16 \text{ hour}}$. These noise levels are in line with the aspirational guideline values from BS 8233 for external amenity areas.

6.0 CONCLUSIONS

- 6.1 24 Acoustics has been appointed by Planning Issues Ltd on behalf of Churchill Living and Housing 21 to undertake a noise impact assessment to support planning application with relation to a new retirement living development proposed on the site at 133 Windmill Street, Gravesend.
- 6.1 This report has addressed the impact of noise from road traffic on the proposed apartments.
- 6.14 Ambient noise measurements have been carried out at the site to determine the level of noise from the existing noise sources, during daytime and night-time periods.
- 6.15 Recommendations have been provided for the acoustic performance of double-glazing and ventilation systems to habitable rooms. It is concluded that, with the recommended measures given, noise within habitable rooms would comply with maximum internal levels as stated in BS 8233:2014.
- 6.16 Noise levels in external amenity areas during the day are predicted to be no greater than 55 dB $L_{Aeq,16hr}$ which is acceptable.
- 6.17 On the above basis, it is considered that an appropriate acoustic environment can be provided to the proposed retirement living apartments and external amenity spaces.

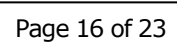
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2. DEFRA, Noise Policy Statement for England, March 2010.
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7. British Standards Institution. British Standard 7445: 1991 Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use.

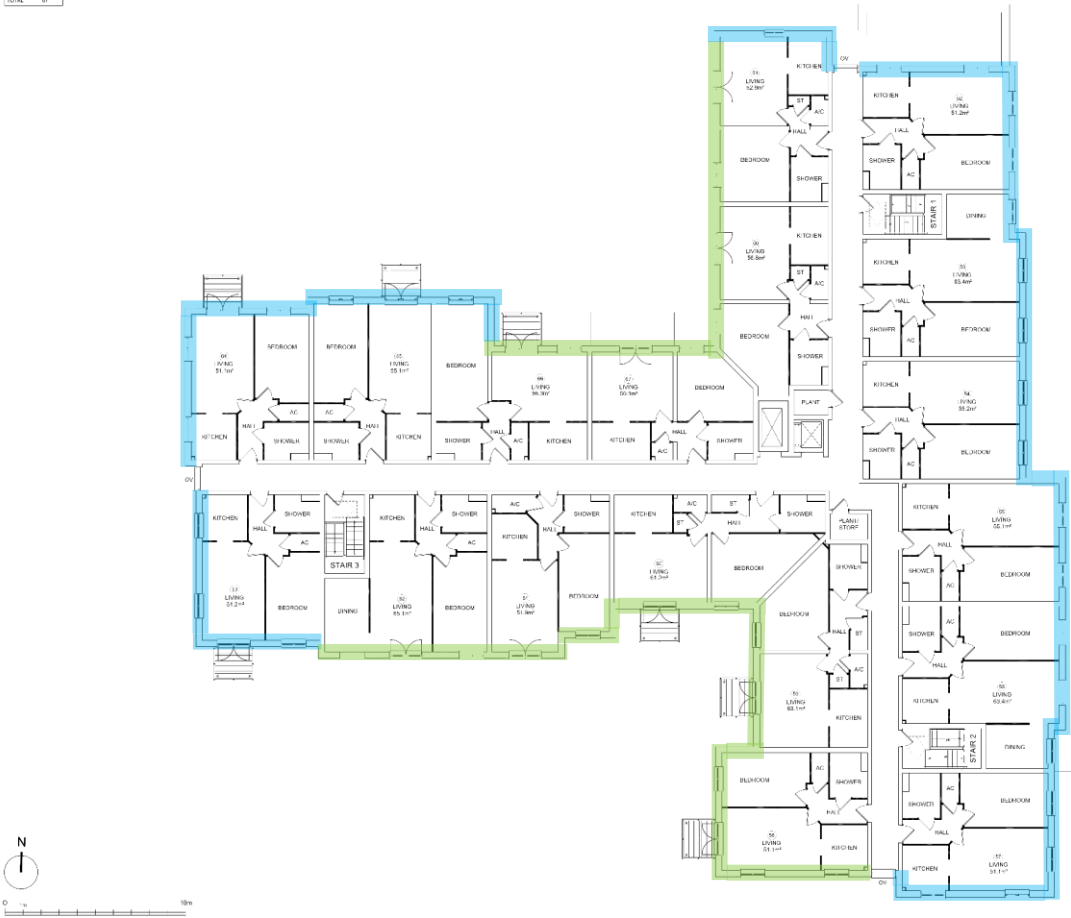


Project: 133 Windmill Street, Gravesend	Title: Proposed Site Location and Measurement Locations		 24Acoustics
DWG No: Figure 1	Scale: N.T.S.	Rev: 0	
Date: January 2026	Drawn By: BN	Job No: 9433-2	





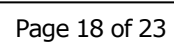
	BED
G	15
M	19
W	10
ST	15
TOTAL	59



Proposed Retirement Apartments on
land formerly Gravesend Police Station, Windmill St, Gravesend, DA12 1DB

- G1 (min. R_{w} 36 dB)
- G2 (min. R_{w} 31 dB)

Project: 133 Windmill Street, Gravesend	Title: Noise Reduction Requirements for Glazing – 2 nd and 3 rd Floors		
DWG No: Figure 4	Scale: N.T.S.	Rev: 0	
Date: January 2026	Drawn By: BN	Job No: 9433-2	



	WED
S	10
W	16
Th	17
F	18
S	19
TOTAL	87



Proposed Retirement Apartments on
land formerly Gravesend Police Station, Windmill St, Gravesend, DA12 1DB

- V1 (min. $D_{n,e,w}$ 44 dB)
- V2 (min. $D_{n,e,w}$ 38 dB)
- V3 (min. $D_{n,e,w}$ 32 dB)

Project: 133 Windmill Street, Gravesend	Title: Noise Reduction Requirements for Ventilators – 2 nd and 3 rd Floors		 24Acoustics
DWG No: Figure 6	Scale: N.T.S.	Rev: 0	
Date: January 2026	Drawn By: BN	Job No: 9433-2	

APPENDIX A: ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

- The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

- The L_{Aeq} noise level

This is the "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

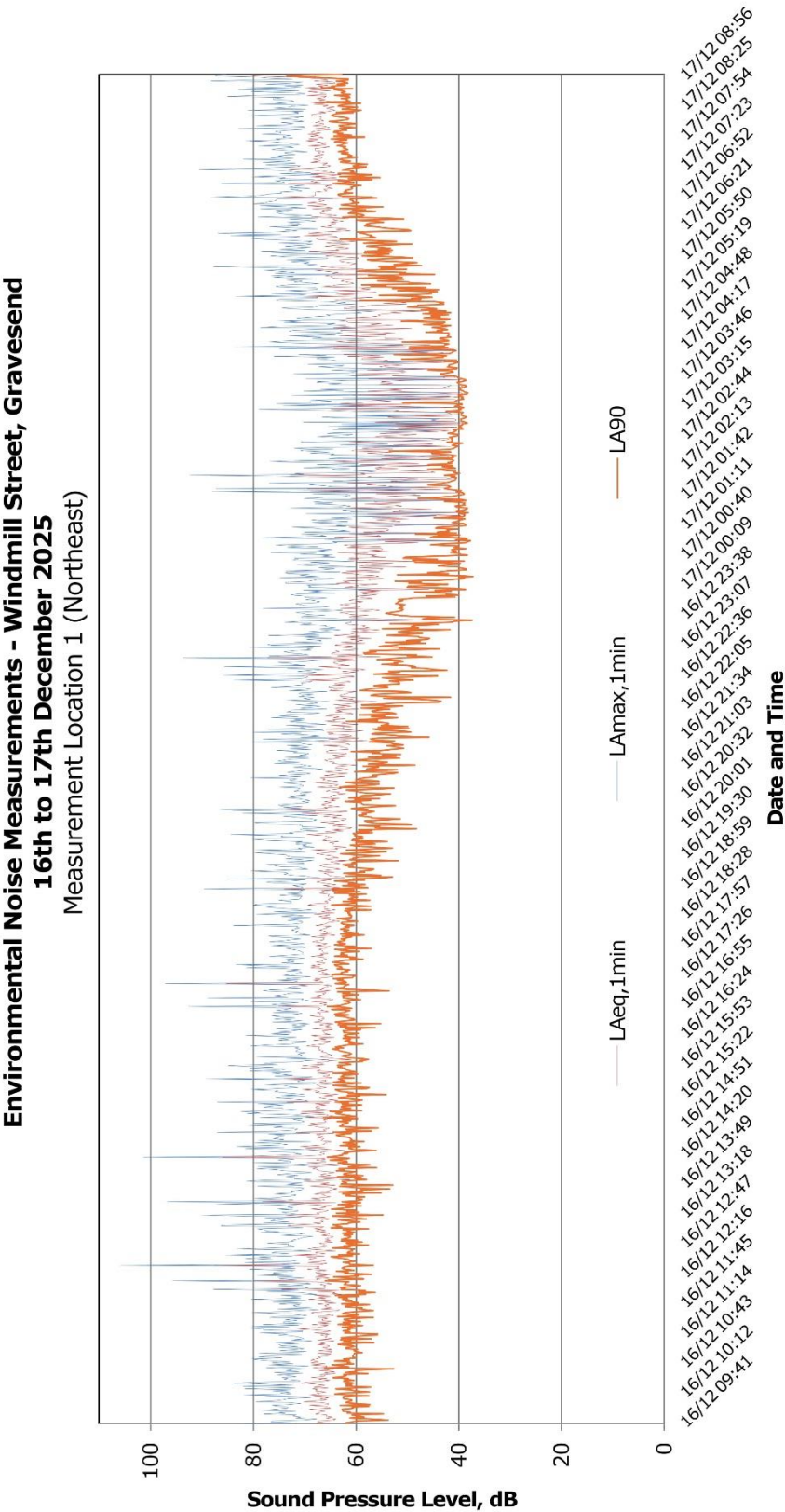
- The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

- The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B: ENVIRONMENTAL NOISE MEASUREMENTS



Environmental Noise Measurements - Windmill Street, Gravesend
10th to 16th December 2025
Measurement Location 2 (Southwest)

