Environmental Noise Solutions Limited

Suite 24
Doncaster Business Innovation Centre
Ten Pound Walk
Doncaster
DN4 5HX

Proposed Residential Development
Land to the North of Shaw Lane, Carlton, Barnsley

Noise Impact Assessment

For:
Countryside Properties (UK) Ltd

15th June 2026

Ref: NIA-12537-26-12874-v2 Shaw Lane, Carlton
Author: T. Crabb BSc(hons), MIOA

Contents

1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Countryside Properties (UK) Ltd (hereafter referred to as 'the client') to undertake a noise impact assessment for a proposed residential development on land to the north of Shaw Lane, Carlton, Barnsley (hereafter referred to as 'the site').

The objectives of the noise impact assessment were to:

- Determine external noise levels at the site
- Assess the potential impact of the external noise climate on the proposed residential development with reference to relevant guidelines
- Provide recommendations for a scheme of sound attenuation works, as necessary, to protect future occupants of the proposed residential development from a loss of amenity due to noise

This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation) and boundary treatments. It has been prepared to accompany a planning application to be submitted to Barnsley Metropolitan Borough Council.

The report has been prepared on behalf of the client for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult the client and ENS as to the extent to which the findings may be appropriate for their use.

A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

1.2 Site Description and Development Proposals

The site is located in a mixed-use setting to the east of Carlton, near Barnsley, as shown (highlighted in red) in Figure 1.1.

Figure 1.1: Location of Development

The site is bound by:

- Shaw Lane to the south
- A railway line to the east, with industrial/commercial premises beyond
- Agricultural land to the north and west

Development proposals are for 214 no. residential dwellings with associated landscaping and access roads. Layout plans indicate that the residential footprint is set back circa 15 metres from the nearside kerb of Shaw Lane.

The adjacent railway line is very sparsely used, with a single two-way journey each day to Ardagh Glass circa 1.8 km to the south, as required, during weekday afternoons. The line itself is elevated with a circa 5-metre-high embankment.

The industrial estate beyond the railway line on Boulder Bridge Lane is home to various breakers yards and metal recycling premises operating during daytime hours.

The noise environment at the site is characterised by local road traffic on Shaw Lane, distant road traffic on the surrounding road network, birdsong, and noise associated with yard activity at the nearby industrial estate.

2 Policy Context and Assessment Guidance

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)[1] was updated in February 2025 and sets out the Government's planning policies for England and how these are expected to be applied.

Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 187 where it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of…..noise pollution'.

Paragraph 198 advises that:

'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…..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'.

With regard to extant community noise sources and the potential to affect proposed new developments, Paragraph 200 states that:

'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.'

The NPPF also refers to the 2010 DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF.

2.2 Noise Policy Statement for England

The Noise Policy Statement for England[2] (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision 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
- Where possible, contribute to the improvement of health and quality of life

1 National Planning Policy Framework. Ministry of Housing, Communities and Local Government (2023)
2 Government Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. March 2010.

The NPSE describes the following levels at which noise impacts may be identified:

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

According to the explanatory notes in the statement, where a noise level falls between the lowest observable adverse effect level (LOAEL) and a level which represents a significant observable adverse effect level (SOAEL):

'….all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.'

2.3 Planning Practice Guidance on Noise

Planning Practice Guidance[3] (PPG) is an online resource which provides additional guidance and elaboration on the NPPF. It advises that the Local Planning Authority should consider the acoustic environment in relation to:

- 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
- Whether or not a good standard of amenity can be achieved

In line with the Explanatory Note of the NPSE, the PPG references the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL.

The PPG also provides general advice on the typical options available for mitigating noise, suggesting that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

'Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed'.

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. The following guidance documents provide some meaningful context.

3 Planning Practice Guidance on Noise: http://planningguidance.planningportal.gov.uk/blog/guidance/noise/

2.4 ProPG Planning and Noise: New Residential Development

ProPG Planning and Noise: New Residential Development (ProPG)[4] was published in 2017 by the Association of Noise Consultants, Institute of Acoustics and the Chartered Institute of Environmental Health.

Stage 2: Element 2 of ProPG sets indoor ambient noise levels for residential dwellings based on the guidance contained in British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'[5] (BS 8233), see Table 2.2.

Table 2.2: Indoor Ambient Noise Levels in Dwellings

Activity	Location	Good Indoor Ambient Noise Levels	
Resting	Living Room	35 dB $L_{Aeq\ (0700\text{-}2300)}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq\ (0700\text{-}2300)}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq\ (0700\text{-}2300)}$	30 dB $L_{Aeq\ (2300\text{-}0700)}$

Note 4 to the above table states:

'A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night.'

Note 5 to the above table states:

'Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7'.

This is consistent with the guidance contained within the PPG, which states that:

'... consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations'.

The NPPF PPG requires that the character of the noise is taken into account. In relation to potential commercial noise impacting upon the development, Annex B of BS 8233 describes methods for assessing the acceptability of a noise spectrum for a given application through the use of Noise Rating (NR) curves.

This is a graphical method for assigning a single-number rating to a noise spectrum, and many local authorities have a requirement to comply with NR30 in habitable rooms during the daytime and NR25 in bedrooms at night where commercial noise may be present.

4 'ProPG Planning and Noise: New Residential Development (ProPG)', 2017. Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH)

5 British Standards Institution (2014). *British Standard 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings.*

In addition to the above, Annex B of BS 8233 describes methods for assessing the acceptability of a noise spectrum for a given application through the use of Noise Rating (NR) curves. This is a graphical method for assigning a single-number rating to a noise spectrum, and many local authorities have a requirement to comply with NR30 in habitable rooms during the daytime and NR25 in bedrooms at night where commercial noise may be present.

On the basis of the above, the following criteria (with windows closed and an alternative means of ventilation provided) are considered appropriate for the proposed development and considered to represent good resting and sleeping conditions:

- ≤ 40 dB $L_{Aeq\ (0700\text{-}2300)}$ in dining rooms during the daytime
- ≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ and NR30 in living rooms and bedrooms during the daytime
- ≤ 30 dB $L_{Aeq\ (2300\text{-}0700)}$ and NR25 in bedrooms during the night-time
- 45 dB L_{AFMax} not regularly exceeded during the night-time

With regard to external amenity, ProPG reflects the advice given in BS 8233 as follows:

'The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50–55 dB $L_{Aeq,16hr}$.'

'These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces.'

2.5 Approved Document O

Approved Document O, 2021 is written in support of Part O of Schedule 1 to the Building Regulations 2010. The approved document details methods of addressing overheating of residential dwellings and is applicable only across England.

The approved document has the following relevant guidance in Section 3 regarding noise ingress into buildings:

'In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

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

- *40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am)*
- *55dB L_{Amax}, more than 10 times a night (between 11pm and 7am)'*

3 Noise Survey

3.1 Overview

In order to determine the level of external noise affecting the proposed development, noise monitoring was carried out on Monday 23rd February through to Tuesday 24th February 2026, with further monitoring on Thursday 14th May through to Thursday 21st May.

The adopted noise monitoring positions (shown in Appendix 2) were as follows:

- MP1 was located along the southern boundary of the site, at 10 metres from Shaw Lane and at 4 metres above ground level (AGL)
- MP1A was located along the southern boundary of the site, at 20 metres from Shaw Lane and at 4 metres AGL
- MP2 was located along the eastern boundary of the site at 4 metres AGL
- MP2A was located along the eastern boundary of the site at 8 metres AGL (to maximise line-of-sight over the 5-metre-high railway embankment to the industrial estate above)

Noise measurements were undertaken in free field conditions using NTi XL3 Type 1 integrating sound level meters. Each meter was connected to a windshield covered microphone positioned at the locations detailed above. The measurement system calibration was verified immediately before and after the survey period using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration levels greater than 0.5 dB was noted.

Measurements consisted of A–weighted broadband parameters including L_{Aeq}, L_{A10} L_{A90}, and L_{AFmax} together with linear octave band data.

The noted weather conditions throughout the survey were dry with wind speeds < 5 m/s. Weather conditions were therefore considered appropriate for noise monitoring.

3.2 Summary

Table 3.1 and 3.2 present summaries of the noise data for each measurement session, at each monitoring position, rounded to the nearest decibel. Appendix 3 contains the full long-term data at MP2A.

Table 3.1: Summary of Noise Measurement Data (February 2026)

Position	Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	L_{AFMax} (dB)	Comments
MP1	23/02/2026	1030–2300	62	47	69	-	Road traffic on Shaw Lane dominant
	24/03/2026	0700–1300	63	49	69	-	
	23-24/02/2026	2300–0700	58	45	60	77*	
MP1A	23/02/2026	1106–1121	57	48	60	-	Road traffic on Shaw Lane dominant
MP2	23/02/2026	1030–2300	47	40	51	-	Distant traffic, faint distant yard activity
	24/03/2026	0700–1300	50	48	55	-	
	23-24/02/2026	2300–0700	42	35	52	60*	Distant traffic, no yard activity
* *11th highest maximum noise level event during the night-time*							

Table 3.2: Summary of Noise Measurement Data (May 2026)

Position	Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	L_{AFMax} (dB)	Comments
MP2A	14/05/2026	1526–2300	50	37	51	-	Distant traffic, no yard activity
	15/05/2026	0700–2300	52	38	55	-	Distant road traffic, distant yard activity between 0710 hours and 1650 hours (up to 57 dB $L_{Aeq\ (1\ hour)}$)
	16/05/2026	0700–2300	46	39	48	-	Distant traffic, no yard activity at weekends
	17/05/2026	0700–2300	48	40	51	-	
	18/05/2026	0700–2300	56	42	60	-	Distant road traffic, distant yard activity between 0715 hours and 1740 hours (up to 60 dB $L_{Aeq\ (1\ hour)}$)
	19/05/2026	0700–2300	54	44	56	-	Distant road traffic, distant yard activity between 0715 hours and 1600 hours (up to 57 dB $L_{Aeq\ (1\ hour)}$)
	20/05/2026	0700–2300	53	43	56	-	
	21/05/2026	0700–0945	53	47	56	-	
	14-15/05/2026	2300–0700	42	34	45	62*	Distant road traffic, significant birdsong from 0400 hours
	15-16/05/2026	2300–0700	42	35	44	62*	
	16-17/05/2026	2300–0700	43	35	46	61*	
	17-18/05/2026	2300–0700	43	35	47	61*	
	18-19/05/2026	2300–0700	45	37	49	60*	
	19-20/05/2026	2300–0700	45	38	49	62*	
	20-21/05/2026	2300–0700	43	36	47	60*	
* *11th highest maximum noise level event during the night-time*							

3.3 Analysis

Noise Associated with Commercial Uses

The noise environment along the eastern boundary of the site was due to distant road traffic on Shaw Lane, birdsong, and activity at the nearby industrial estate.

Daytime and night-time ambient noise levels at MP2 were measured at up to **56 dB $L_{Aeq\ (0700–2300)}$** and **48 dB $L_{Aeq\ (2300–0700)}$** respectively. Typical (11th highest) maximum noise levels were measured at up to **62 dB L_{AFMax}** during the night-time

The worst-case short-term noise levels during yard activity at the industrial estate were up to **60 dB $L_{Aeq\ (1\ hour)}$**. Table 3.3 presents the corresponding octave band frequency data for this worst-case period, rounded to the nearest decibel.

Table 3.3: MP2A Worst-Case Octave Band Frequency Data

Octave Band L_{eq}								dB L_{Aeq}
63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
57	54	57	54	55	55	51	46	60

Noise Associated with Road Traffic

The noise environment at the southern boundary of the site was predominantly due to road traffic on Shaw Lane.

Daytime and night-time ambient noise levels at MP1 were measured at **63 dB $L_{Aeq\ (0700–2300)}$** and **58 dB $L_{Aeq\ (2300–0700)}$** respectively. Typical (11th highest) maximum noise levels were measured at **77 dB L_{AFMax}** during the night-time.

Ambient noise levels decreased with increasing distance from Shaw Lane, with comparative distance measurements at MP1 (10m) and MP1A (20m) illustrating point-source propagation of -6 dB per doubling of distance.

4 Noise Assessment

4.1 Design Noise Levels

Noise levels at MP1 (10 metres from Shaw Lane) are as follows:

- ≤ **63 dB $L_{Aeq\ (0700\text{-}2300)}$** during the daytime
- ≤ **58 dB $L_{Aeq\ (2300\text{-}0700)}$** during the night-time
- ≤ 77 **dB L_{AFMax}** during the night-time

The first row of dwellings are set back circa 15 metres from Shaw Lane. Correcting noise levels at MP1 for distance, this equates to design noise levels of:

- ≤ **60 dB $L_{Aeq\ (0700\text{-}2300)}$** during the daytime
- ≤ **55 dB $L_{Aeq\ (2300\text{-}0700)}$** during the night-time
- ≤ **74 dB L_{AFMax}** during the night-time

Remaining plots are at least 50 metres from Shaw Lane. This equates to design noise levels of:

- ≤ **49 dB $L_{Aeq\ (0700\text{-}2300)}$** during the daytime
- ≤ **44 dB $L_{Aeq\ (2300\text{-}0700)}$** during the night-time
- ≤ **63 dB L_{AFMax}** during the night-time

Worst-case design noise levels at dwellings adjacent to/fronting towards the commercial uses to the east are **60 dB $L_{Aeq\ (1\ hour)}$.**

4.2 Internal Noise Amenity

In order to calculate the sound insulation requirements of the building envelope for habitable rooms throughout the development, the Building Research Establishment (BRE) building envelope insulation calculation spreadsheet was used. This spreadsheet is based on the calculation methodology advocated in BS 8233. The spreadsheet allows input of external noise levels, typical room dimensions and reverberation time together with parameters for the various elements of the building envelope and calculates the internal noise level in terms of the external noise level metric (L_{Aeq} and L_{AFMax} in this case).

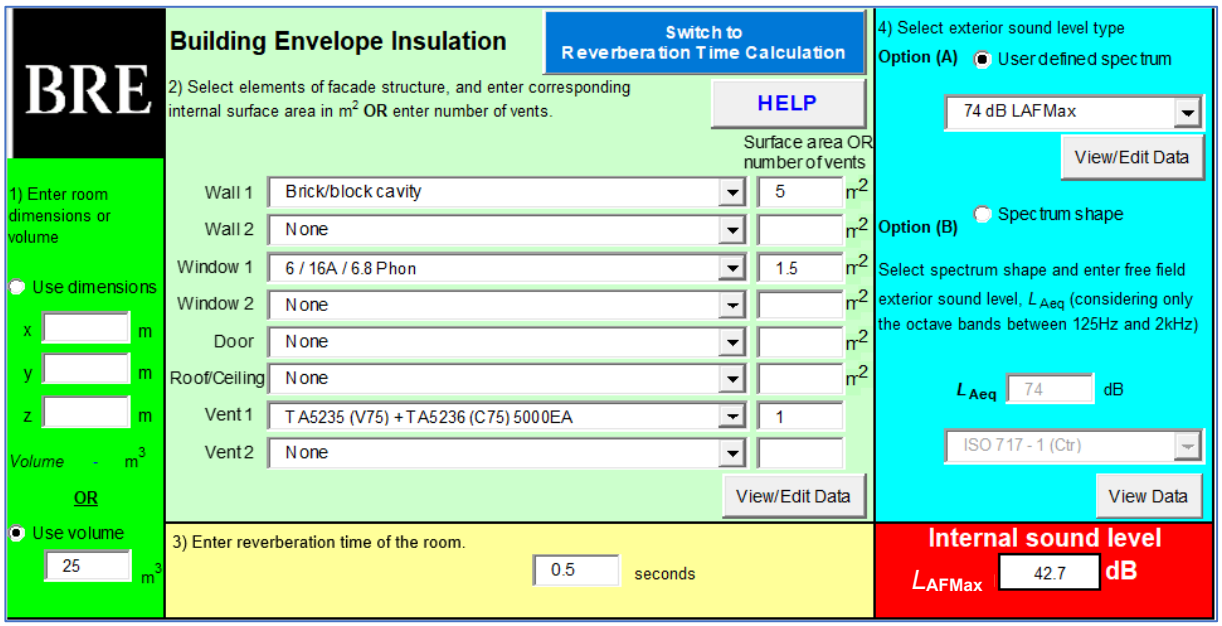
It is understood that dwellings throughout the site are to be provided with a mechanical extract ventilation (MEV) system. Approved Document F 'Ventilation' (ADF) states that where MEV is used, background ventilators of at least 4000 mm² EA must be provided to each habitable room, with 1 no. ventilator required per bedroom and 2 no. ventilators required in living rooms.

Plots Adjacent to Shaw Lane

Road-fronting habitable rooms of dwellings fronting towards Shaw Lane should be fitted with enhanced laminated glazing rated at least **34 dB R_w+C_{tr}** (such as 6 mm glass / 12 mm Argon / 6.8 mm Pilkington Optiphon) in conjunction with acoustic trickle vents rated at least **37 dB $D_{n,e,w}+C_{tr}$** per 4000 mm² such as Titon V75 vent (TA5235) with C75 canopy (TA5236) or equivalent.

As evidenced in the calculation sheet below, this configuration, will provide circa 31 dB(A) sound insulation from external to internal at the site.

Figure 4.1: Indicative BRE Calculation Spreadsheet



The resultant internal noise levels are set out in the table below.

Table 4.1 – External Noise Levels and Resultant Internal Noise Levels

External Noise Level	Reduction	Resultant Internal Level
≤ 60 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 55 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 74 dB L_{AFMax}	–31 dB	≤ 29 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 24 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 43 dB L_{AFMax}

The rears of plots fronting towards Shaw Lane may be fitted with double-glazing rated at least **25 dB R_w+C_{tr}** (such as 4 mm glass / 6-20 cavity / 4 mm glass) in conjunction with trickle vents rated at least **32 dB $D_{n,e,w}$** per 4000 mm² EA (vent open) such as the Titon Trimvent Select Xtra S13 with XC13 canopy.

Plots Adjacent to the Eastern Boundary

Habitable rooms of plots adjacent to/fronting towards the eastern boundary of the site should be fitted with enhanced laminated glazing rated at least **34 dB R_w+C_{tr}** in conjunction with acoustic trickle vents rated at least **37 dB $D_{n,e,w}+C_{tr}$** per 4000 mm² (vent open).

Adopting octave data from the worst-case noise level of **60 dB $L_{Aeq\ (1\ hour)}$** as detailed in Table 3.3, the following BS 8233 calculation spreadsheet demonstrates that habitable rooms fronting towards the eastern boundary will readily achieve compliance with the noise rating target of NR 30 (and also meet the more onerous NR 25 criteria) with glazing/ventilation as specified. Ambient noise levels are also at least 8 dB below the criteria contained in BS 8233.

Figure 4.2: NR30 Assessment for Habitable Rooms on the Eastern Boundary (Volume = 25 m³)

	Octave Frequency Band (Hz)								L_{Aeq}
	63	125	250	500	1000	2000	4000	8000	
Worst Case Noise Level	57	54	57	54	55	55	51	46	60
External Wall (5.2 m²)	38	41	45	45	54	58	58	58	
6/16A/6.8 Phon glazing (2 m²)	26.8	21.0	28.0	37.0	48.0	48.0	54.0	54.0	
Titon TA5235 (V75) + TA5236 (C75) 5000EA (1 no.)	34.5	37.5	35.4	32.1	39.8	46.1	59.7	58	
Total Façade Reduction	-29.3	-26.0	-30.6	-30.3	-38.2	-44.0	-54.3	-53.5	
10 log (S/A)	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	
External to Internal Correction	+3	+3	+3	+3	+3	+3	+3	+3	
INTERNAL NOISE LEVEL	30	30	29	26	20	13	0	0	27
NR30	59	48	40	34	30	27	25	23	
Compliant	✓	✓	✓	✓	✓	✓	✓	✓	
NR25	55	44	35	29	25	22	20	18	
Compliant	✓	✓	✓	✓	✓	✓	✓	✓	

Remaining habitable rooms of these plots may be fitted with standard glazing rated at least **25 dB R_w+C_{tr}** in conjunction with standard trickle vents or wall vents rated at least **32 dB $D_{n,e,w}$** per 4000 mm² EA (vent open).

Remaining Plots

Remaining habitable rooms throughout the site may be fitted with double glazing rated at least **25 dB R_w+C_{tr}** in conjunction with standard trickle vents or wall vents rated at least **32 dB $D_{n,e,w}$** per 8000 mm² EA (vent open).

General Points

Appendix 4 contains an annotated glazing/ventilation markup.

Noise levels at the site will readily satisfy the internal noise criteria contained in Section 2.4 with the provision of glazing and ventilation as specified above.

The ceilings (and side cheeks to the dormer windows) in any room-in-roof bedrooms requiring enhanced glazing should be double boarded, with 100 mm (minimum) mineral wool insulation above. The glazing requirements are also applicable to 'Velux' windows.

The following points should be noted:

- The glazing recommendations apply to the window within a sealed unit. It is the responsibility of the window supplier to ensure that the window frame does not compromise the performance of the glazing.
- When selecting a glazing system to satisfy the requirements outlined above, it is important to ensure that the $R_w + C_{tr}$ value is achieved (rather than simply the R_w value). Published R_w values tend to be higher than corresponding $R_w + C_{tr}$ values; therefore, incorrect selection could result in an overestimation of sound reduction performance which in turn could result in higher internal noise levels.
- The opening and free area of the ventilation units should be checked by a mechanical service engineer before designs are finalised. Should the equivalent open area be insufficient to meet the minimum requirements of ADF, it may be necessary to increase the number of units per habitable room. Where this applies, the required sound reduction of the ventilation units may need to be increased accordingly
- Internal noise levels due to mechanical ventilation plant should not exceed 26 dB(A) in bedrooms and 30 dB(A) in living rooms

4.3 External Amenity

Daytime ambient noise levels at the façades of dwellings adjacent to Shaw Lane are circa **60 dB L_{Aeq} (0700–2300).**

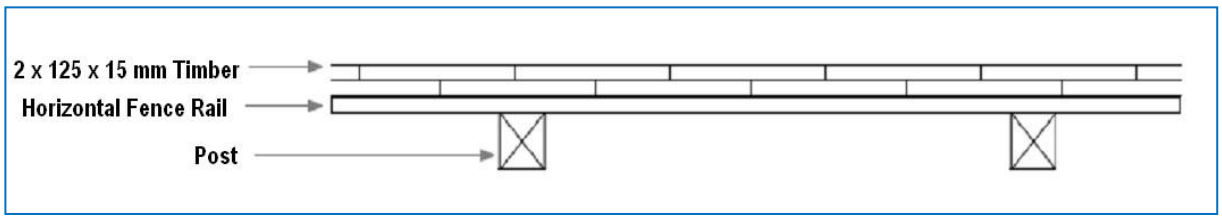
The site layout indicates that dwellings adjacent to Shaw Lane will 'front onto' the road, such that gardens of these plots will be screened by the dwellings themselves.

In order to reduce garden levels as low as practicable, where gardens are still partially exposed to the road, it is recommended that they are provided with solid timber fences or brick walls, at a height of circa 2.4 metres above road level (see Appendix 4 for barrier locations).

A brick wall of any construction is appropriate, providing there are no gaps in the construction.

If a solid timber fence is installed, then it should be ensured that it has a mass per unit area of ≥ 10 kg/m2. The fence should have no gaps or holes and should be fully sealed at the ground (i.e. include a gravel board).

An indicative acoustic fence detail is illustrated below. The double-thickness solid timber construction is considered robust and appropriate.



Gardens along the eastern boundary will be significantly screened from the nearby commercial uses by the intervening 5-metre-high railway embankment.

5 Mitigation of Overheating

ADO states that for moderate risk locations (i.e. outside of London) the minimum free area of the open window should be at least 4% of the floor area of the room.

As the open area varies as a function of the floor area, for a typical floor-to-ceiling height of 2.4m, a free area of 4% of the floor area equates to an external to internal noise reduction of 10 dB.

With reference to the internal targets contained in ADO, it is assumed that open windows can form the overheating mitigation strategy with no additional ventilation or cooling, providing the external noise levels outside bedrooms at night do not exceed **50 dB $L_{Aeq\ (2300\text{-}0700)}$** and **65 dB L_{AFMax}** (more than 10 times).

Night-time noise levels at dwellings adjacent to/fronting towards Shaw Lane are **≤ 55 dB $L_{Aeq\ (2300\text{-}0700)}$** and **≤ 74 dB L_{AFMax},** meaning that bedroom windows of these plots are assumed to be closed during night-time hours (see Appendix 5 for façade locations where bedroom windows are assumed to be closed during night-time hours).

This information should be provided to the overheating assessor for the site, in order to determine the extent of additional mitigation required to comply with ADO.

For remaining bedrooms, windows may be opened to the minimum free area of 4% of the floor area, meaning that the overheating mitigation strategy is not constrained by acoustics.

6 Summary and Conclusions

A noise impact assessment has been undertaken for the proposed residential development on land to the north of Shaw Lane, Carlton, Barnsley.

The noise environment at the site is characterised by local road traffic on Shaw Lane, distant road traffic on the surrounding road network, birdsong, and noise associated with yard activity at the nearby industrial estate.

A scheme of sound insulation has been developed to protect residential amenity from the ambient noise climate. As a consequence, the ambient noise climate is not considered to represent a constraint to the proposed residential development.

Appendix 1 – Abbreviations and Definitions

Sound Pressure Level (L_p)
The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 µPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$L_p = 20 \log_{10}(p/p_o)$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_o = reference sound pressure (20 µPa).

A-weighting
A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$
The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night-time noise levels.

$L_{A10, T}$
The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T. $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

$L_{A90, T}$
The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

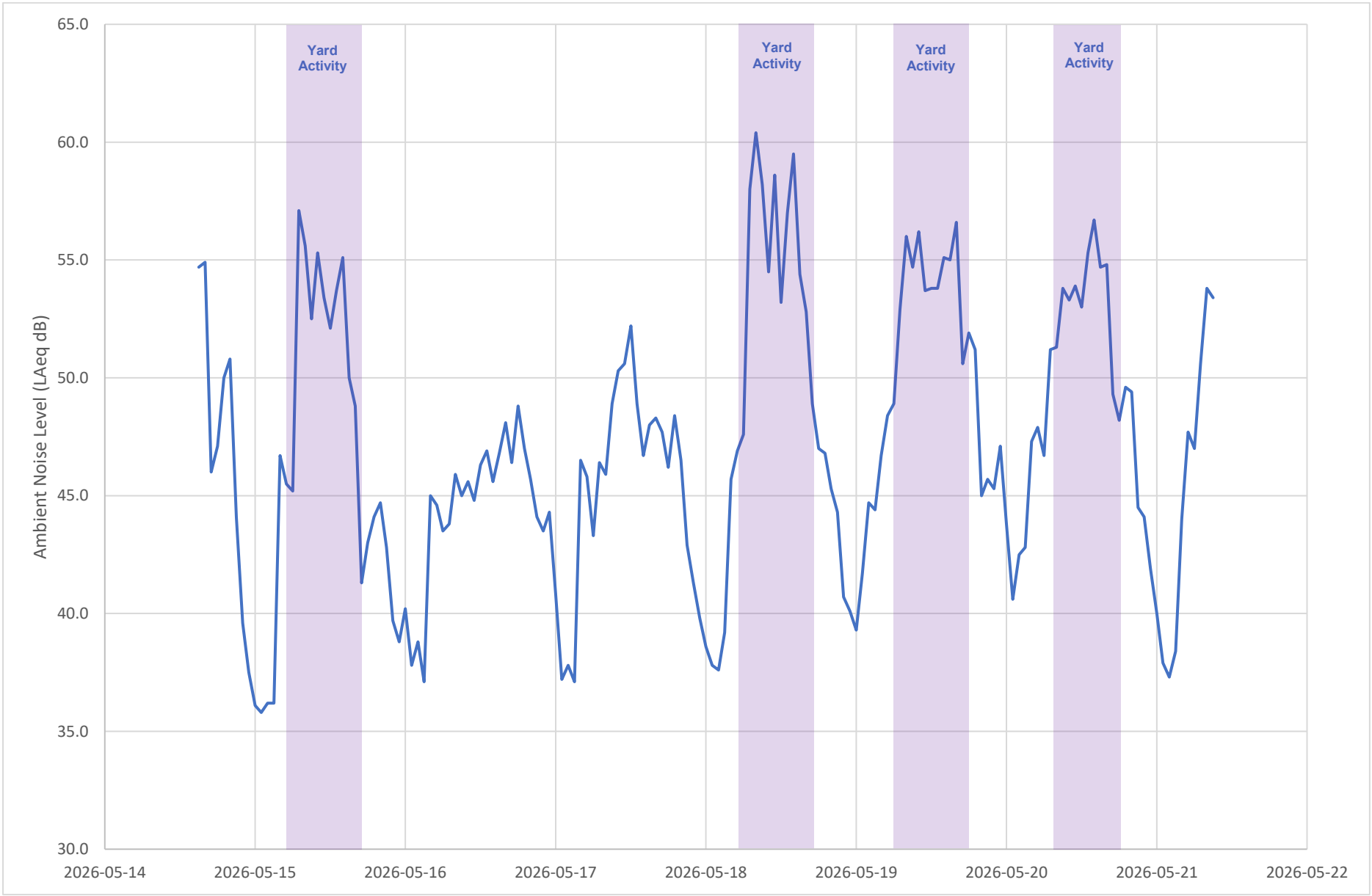
$L_{AF\ max}$
The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

Single Event Level / Sound Exposure Level (SEL or L_{AE})
The energy produced by a discrete noise event averaged over one second, regardless of the event duration. This allows for comparison between different noise events which occur over different lengths of time.

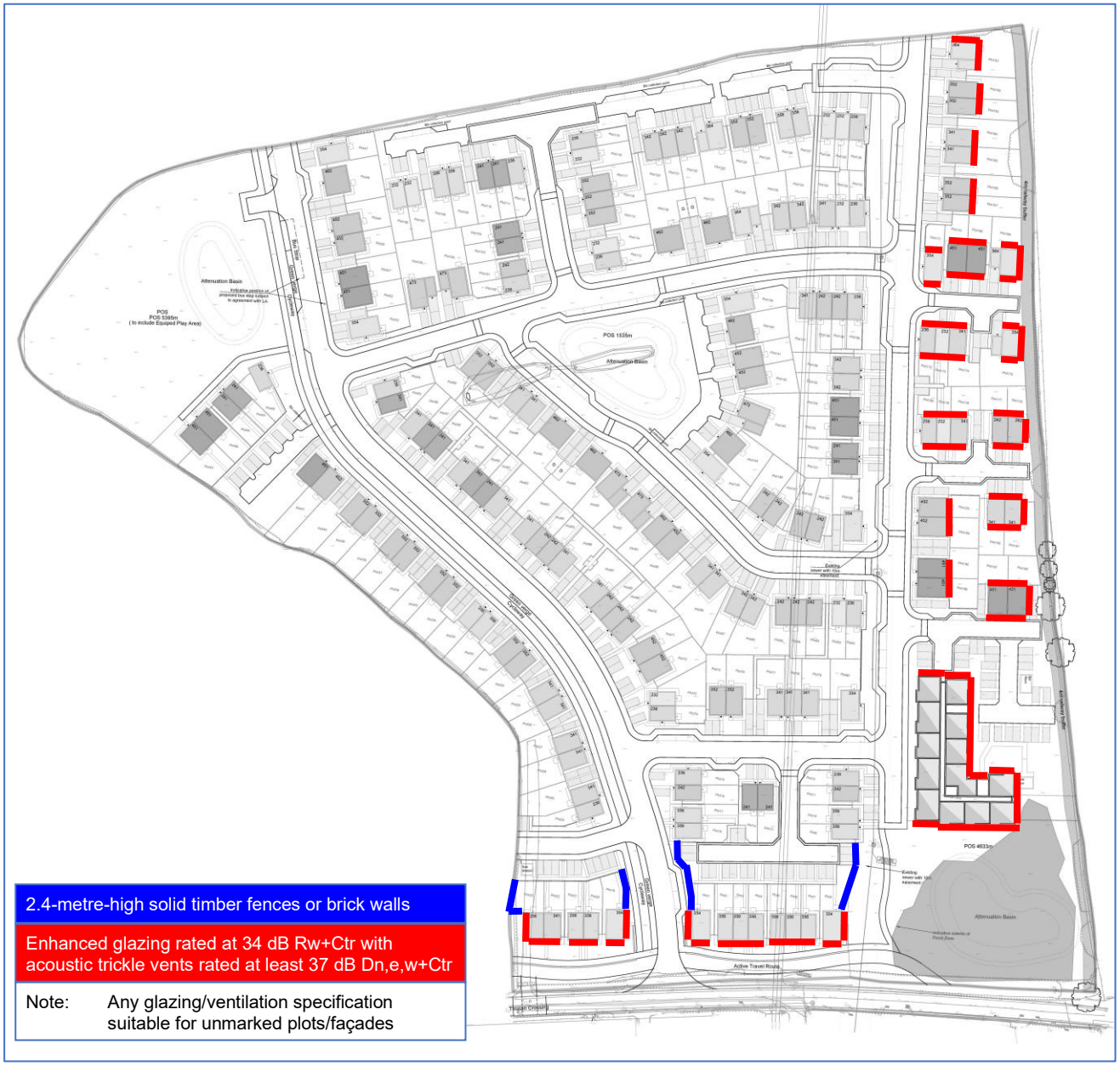
Weighted Sound Reduction Index (R_W)
Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_W is used to characterise the insulation of a material or product that has been measured in a laboratory).

Appendix 2 – Noise Measurement Positions

Appendix 3 – Long Term Data Summary (MP2A)



Appendix 4 – Scheme of Sound Attenuation



Appendix 5 – Approved Document O Assessment