



ENVIRONMENTAL STATEMENT

VOLUME 2

APPENDIX 9.5 – NOISE FROM ROAD TRAFFIC

AFFECTING PROPOSED RECEPTORS

Appendix 9.5: Noise from Road Traffic Affecting Proposed Receptors

Introduction

This appendix assesses the potential noise impact from road traffic on the proposed residential dwellings at the Stakehill development. The assessment utilises baseline noise monitoring data, previous road traffic noise assessments, and Defra noise mapping information. It evaluates compliance with relevant standards, including **BS8233:2014**, and proposes suitable mitigation measures to ensure acceptable noise levels in both outdoor and indoor environments.

Residential internal and external noise criteria

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS 8233) and the World Health Organisation (WHO) Guidelines for Community Noise both provide quantitative guidance for internal noise levels in and around buildings.

BS 8233 provides appropriate criteria and limits for different situations, including the design of new buildings. The relevant noise level criteria recommended in BS 8233 for residential spaces are summarised in Table 7.5.1

Table 7.5.1: Indoor Ambient Noise Levels for Dwellings, BS 8233

Activity	Location	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Resting	Living room	35 dB L _{Aeq,16h}	-
Sleeping (daytime resting)	Bedroom	35 dB L _{Aeq,16h}	30 dB L _{Aeq,8h}

It should also be noted that BS 8233 states 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_{AFmax} depending on the character and number of events per night.” However, no numerical values for internal L_{AFmax} levels in dwellings are stated within BS 8233. The *ProPG: Planning and Noise – New Residential Development (ProPG)* attempts to address this by adding the following guidance:

“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 45 dB L_{AFmax} more than 10 times a night. However, *where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events.*”

The WHO guidelines consolidate scientific knowledge on the health effects of community noise and provides guidance to environmental health authorities and professionals trying to protect people from the harmful effects of noise in non-industrial environments. The main sources of community noise are identified as road, rail and air traffic, industries, construction and public work and neighbours.

The effects of noise in dwellings are, typically, sleep disturbance, speech interference and annoyance. Relevant guideline values and the time base over which the individual guideline values apply are summarised in Table 7.5.2.

Table 7.5.2: WHO Guideline Values for Community Noise in Specific Environments

Specific environment	Critical health effects	$L_{Aeq,T}$	Time base (hours)*	L_{AFmax}
Outdoor living area	Serious annoyance, daytime and evening	55 dB	16	-
Sleeping (daytime resting)	Moderate annoyance, daytime and evening	50 dB	16	-
Inside dwellings, habitable rooms	Speech intelligibility and moderate annoyance, daytime and evening	35 dB	16	-
Inside bedrooms	Sleep disturbance, night-time	30 dB	8	45 dB
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45 dB	8	60 dB
Note: * These periods are usually taken to be 07:00 – 23:00 (16-hour day) and 23:00 – 07:00 (8-hour night)				

It can be seen from Tables 7.5.1 and 7.5.2 that the internal $L_{Aeq,T}$ criteria for day and night-time periods in BS 8233 and the WHO Guidelines are the same, and these values have been used in this assessment.

Whilst BS 8233 does not provide a quantitative guideline value for night-time noise events, the WHO guideline value inside bedrooms is 45 dB L_{AFmax} , and the ProPG suggests that this value should not be exceeded more than 10 times a night. Therefore, this criterion has been used to ensure an adequate internal night-time noise environment.

With regards to any external amenity areas, the WHO and BS 8233 recommended guideline value of 55 dB $L_{Aeq,16h}$ has been adopted during the daytime and evening.

In summary, the adopted internal and external noise criteria are as presented in Table 7.5.3 below.

Table 7.5.3 : Adopted Internal and External Target Noise Criteria

	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)	
	$L_{Aeq,16h}$	$L_{Aeq,8h}$	Typical L_{AFmax}
Internal noise levels within habitable rooms	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$	45 dB L_{AFmax}

	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
External noise levels within gardens and external amenity areas	55 dB $L_{Aeq,16h}$	-

Baseline Noise Monitoring Results

Baseline noise monitoring conducted at the site identified road traffic from the A627(M) and surrounding local roads as the dominant noise source. The following results were obtained from the monitoring:

- Daytime $L_{Aeq,16h}$: ranges from 47 to 64 dB across the site, with most measurements falling between 50 and 60 dB.
- Night-time $L_{Aeq,8h}$: ranges from 40 to 56 dB across the site.

Assessment Findings

Outdoor Amenity Areas

Noise levels in outdoor amenity areas across much of the site are expected to exceed 55 dB. The northern and eastern portions of the site, closest to the A627(M), are subject to the highest noise levels.

Indoor Living Spaces

Noise levels near the A627(M) and other major roads exceed the 50-56 dB daytime and 45-51 dB night-time external thresholds for achieving acceptable indoor noise levels (based on 15 dB attenuation through an open window in line with BS8233:2014 or achieving around 21 dB based on typical glazing and hit and miss trickle ventilators based on relevant guidance by the Association of Noise Consultants⁹). These areas will require enhanced mitigation measures to ensure compliance with BS8233:2014 and WHO Guidelines.

Screening Effect of Proposed Buildings

Once buildings are introduced on-site, they will provide significant screening for dwellings located further from the northern and eastern boundaries. This screening effect will reduce the noise levels for internal receptors.

Mitigation Measures

Outdoor Amenity Areas

- **Acoustic Barriers:**
 - For gardens exposed to 55-65 dB $L_{Aeq,16h}$, install **acoustic barriers** with a minimum height of 2.5 m to reduce noise by at least 10 dB.

- **Building Layout:**

- Position buildings to act as acoustic screens for gardens.
- Orient gardens away from primary noise sources.

Indoor Living Spaces¹⁰

- **Glazing and Ventilation¹¹:**

- For external noise levels of up to 60 dB, standard double glazing ($R_w + C_{tr}$ 31 dB) and trickle ventilators ($D_{n,e,w}$ 29 dB) will suffice.
- For highest external daytime noise levels of 64 dB, standard double glazing ($R_w + C_{tr}$ 29 dB) and mechanical ventilation, or standard double glazing ($R_w + C_{tr}$ 31 dB) and acoustic ventilators ($D_{n,e,w}$ 39 dB).

- **Alternative Ventilation:**

- For areas where closed windows are required to meet internal noise standards, provide **mechanical ventilation systems** or **passive cooling** to mitigate overheating.

- **Perimeter Mitigation:**

- Install an acoustic barrier along the northern and eastern site boundaries to provide site-wide attenuation. This will reduce the reliance on higher-performing glazing for properties further from the noise source.

Summary and Recommendations

1. Outdoor Amenity Areas:

- Areas exposed to more than 55 dB will require mitigation through acoustic barriers or strategic building placement.
- For gardens closer to the A627(M), consider bund and barrier combinations.

2. Indoor Living Spaces:

- Enhanced glazing and ventilation systems will be required for properties closest to the A627(M).
- Noise-sensitive rooms should be located on the screened side of buildings wherever possible.

Perimeter Mitigation:

- An acoustic barrier along the northern and eastern boundaries will provide substantial noise reduction for the entire development.

¹⁰

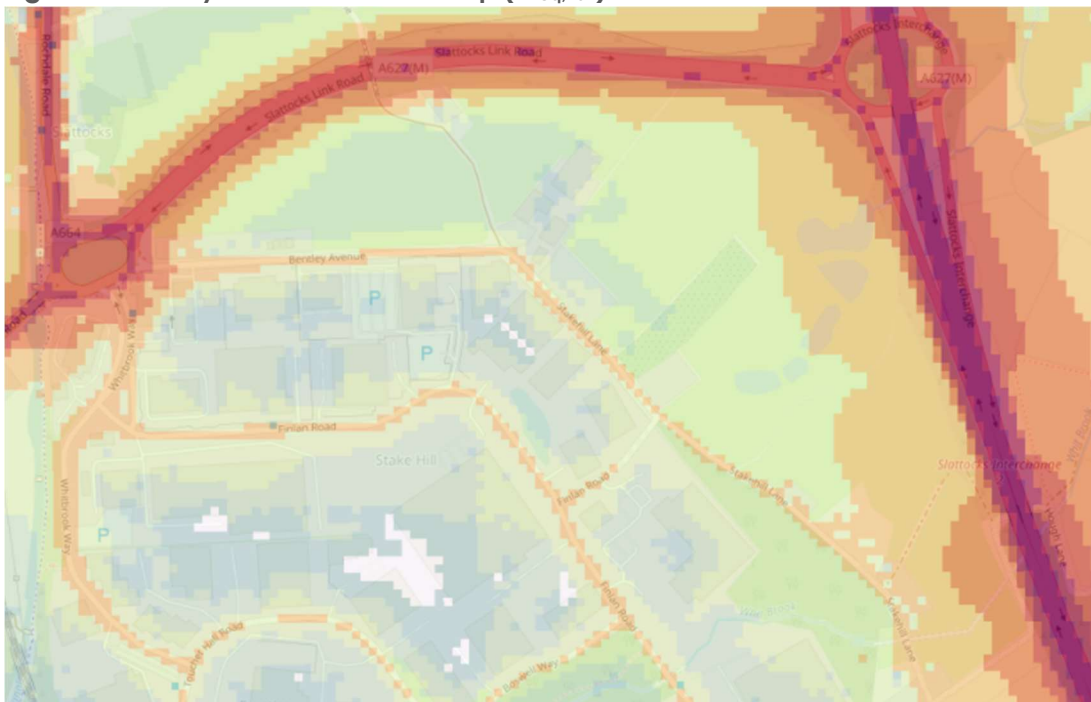
¹¹

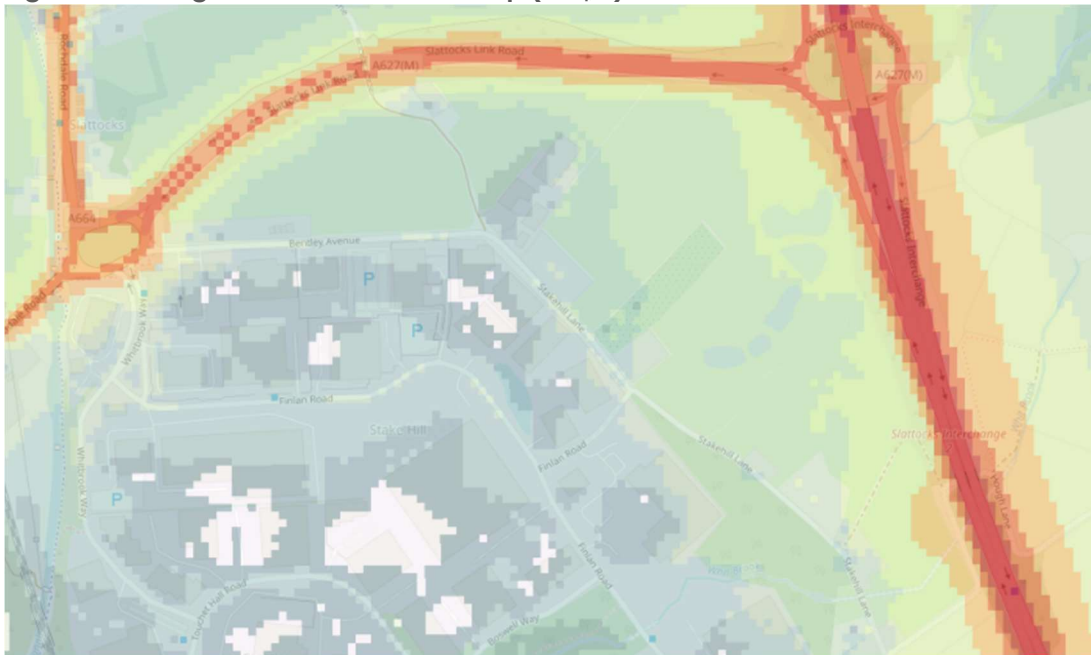
Reassessment:

- As the development design evolves, revisit the assessment to optimise mitigation strategies and confirm compliance with **BS8233:2014** standards.

Assumptions:

- Baseline noise levels from 2022 Defra noise mapping and site-specific monitoring are representative of current conditions.
- Noise reduction assumptions for barriers and building layouts are based on industry standards and typical performance data.
- Traffic growth and distribution align with traffic data provided for the operational noise assessment.
- Noise levels at receptors account for direct line-of-sight exposure, with no additional shielding beyond proposed mitigation measures.

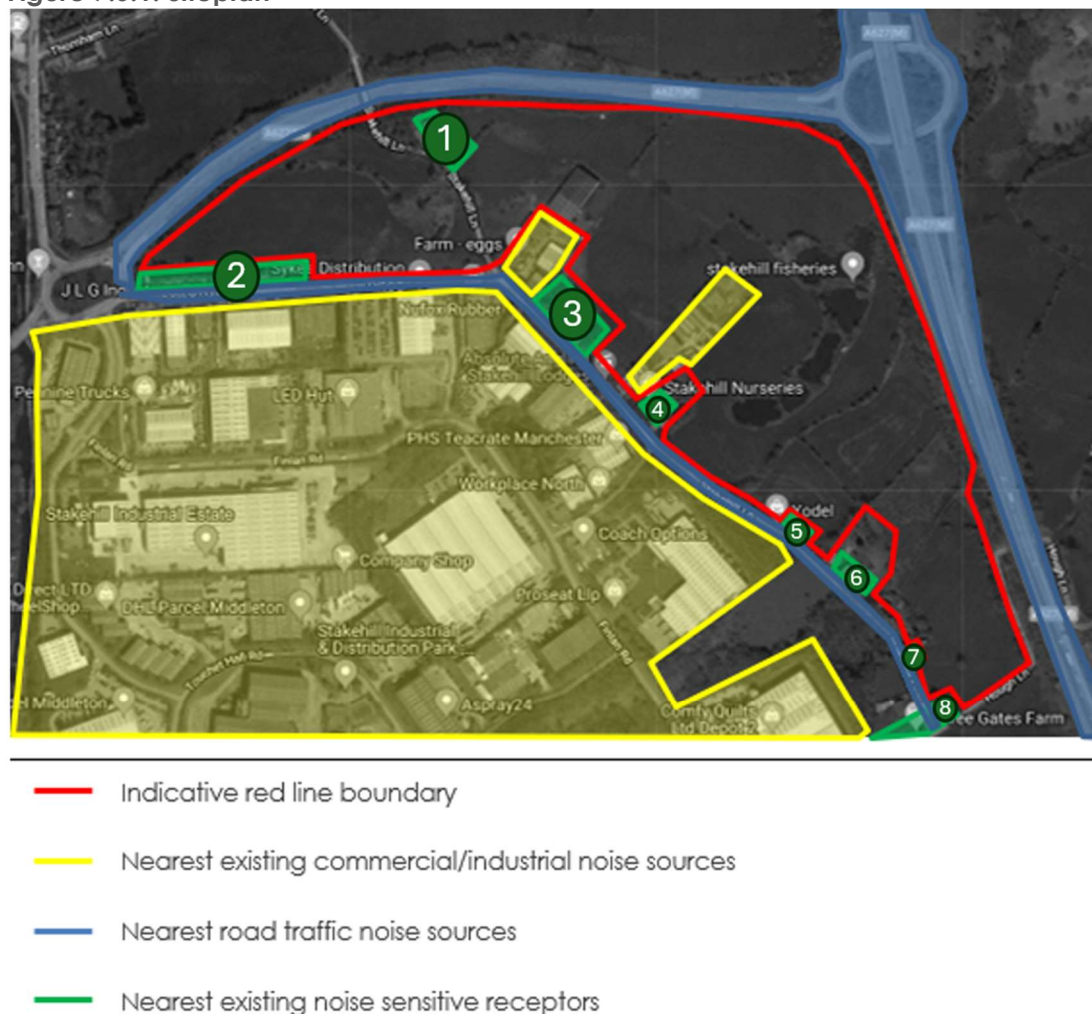
Figures**Figure 7.5.1: Daytime Defra Noise Map ($L_{Aeq,16h}$)**



Appendix 9.6: Noise from Existing Businesses Affecting Proposed Receptors

There are a number of existing businesses identified in yellow in Figure 7.6.1, all of which have the potential to generate some level of noise. The presence of existing residential receptors identified in green in Figure 7.6.1 demonstrates the principle that, with the adoption of good acoustic design, new noise sensitive receptors can be built close by without placing significant additional burden on those businesses.

Figure 7.6.1: Siteplan



A short, daytime site visit was undertaken on 13th August 2019 to make observations on the surrounding businesses in order to determine main noise sources for the purposes of master planning input.

The existing business that were determined to have the greatest potential for noise impact on the proposed receptors were JLG Industries (shown as orange Figure 7.6.2), where the dominant noise sources are powered tools and machinery, such as drills and saws, and RDM Engineering (shown in blue in Figure 7.6.2), where the primary noise source was determined to be forklift movements, as well as loading and unloading of goods vehicles.

Figure 7.6.2: Main noise producing businesses adjacent to the site as noted during the daytime site visit



While other businesses do have the potential to generate noise, no other business was deemed on the short site visit to present any additional noise concern that would need to be accounted for. In both instances, there are already existing noise sensitive receptors in close proximity to these businesses so it is unlikely that residential development on the site would further constrain the existing businesses.

It can be considered that where BS 8233 or WHO Guidelines are exceeded this is the equivalent of a significant effect.

The measurement location closest to RDM Engineering was ML1. During the noise survey it was considered that road traffic noise from Stakehill Lane was dominant at this location with minimal contribution from commercial noise. It is therefore considered that noise from RDM Engineering will not affect proposed residential development.

The measurement location closest to JLG industries was ML4. Observations at this location suggest that during times when the roller shutter door is open noise from JLG industries is dominant. Measured daytime noise levels at this location were 47-56 dB $L_{Aeq,16h}$. There is therefore potential to be exceeded BS 8233 or WHO Guidelines to be exceeded which is equivalent to a significant effect.

At this stage, it is recommended that, where possible, gardens are placed away from site boundaries bordering existing businesses, and that internal roads are used as a buffer zone between noise generative and noise sensitive uses.