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The Milne Trust

STAKEHILL DEVELOPMENT

Environmental Statement Volume I Chapter 9 - Noise
and Vibration

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WSP

Kings Orchard
1 Queen Street
Bristol
BS2 0HQ

Phone: +44 117 930 6200

WSP.com



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ABBREVIATIONS AND GLOSSARY

ABBREVIATIONS

EA	Environment Agency
NSR	Noise Sensitive Receptor
NPPF	National Planning Policy Framework
NPSE	Noise Policy Statement for England
CRTN	Calculation of Road Traffic Noise
BS4142	British Standard 4142: Methods for Rating and Assessing Industrial and Commercial Sound
DMRB	Design Manual for Roads and Bridges
$L_{Aeq,16h}$	Equivalent Continuous Sound Level (16 hours)
L_{A90}	90th Percentile Sound Level
DEFRA	Department for Environment, Food & Rural Affairs
WHO	World Health Organisation

GLOSSARY

Noise Sensitive Receptor (NSR)	Locations such as residential properties, schools, and hospitals where noise may have a significant impact.
L_{Aeq}	Equivalent continuous sound level, a measure of sound energy over a period of time.
L_{A90}	Background sound level exceeded for 90% of the measurement period.
L_{Amax}	Maximum sound level during a specified period.
Mitigation	Measures undertaken to reduce adverse environmental effects.
Residual Effect	The remaining effect after mitigation measures have been applied.
SOAEL	Significant Observed Adverse Effect Level – the noise level above which significant adverse effects on health and quality of life occur.
LOAEL	Lowest Observed Adverse Effect Level – the noise level above which adverse effects on health and quality of life can be detected.

9 NOISE AND VIBRATION

9.1 INTRODUCTION

- 9.1.1. This chapter reports the outcome of the assessment of likely significant effects of noise and vibration arising from the Proposed Development, including impacts on both existing and proposed sensitive receptors. This chapter has been produced by BWB Consulting.

ADDITIONAL MITIGATION MEASURES

- 9.1.2. The assessment of noise and vibration has established that the following additional mitigation measures are required:

Construction Phase:

- 9.1.3. Implementation of a CEMP incorporating best practices to minimise noise and vibration during construction. Measures include:

- Use of quieter, modern plant and equipment.
- Restricted working hours for noisy works (08:00–18:00 weekdays; 08:00–13:00 Saturdays, with no Sunday or bank holiday work unless otherwise approved).
- Deployment of temporary acoustic barriers along the site boundaries, particularly near sensitive receptors on Bentley Avenue and Stakehill Lane.
- Enforcement of a no-idling policy for vehicles and equipment.

Operational Phase:

Acoustic Barriers:

- Permanent acoustic barriers are proposed along the northern and eastern boundaries of the site (near the A627(M)). These barriers can reduce noise levels by around 10 dB depending on height, material, and placement. Such acoustic barriers or earth bunds along major sources of noise can reduce incident noise levels at proposed residential dwellings, and therefore reduce the requirement for an external building fabric with a high sound insulation performance and even make possible the placement of outdoor private gardens facing such major sources of noise.

Enhanced Building Envelope Insulation:

- 9.1.4. Specification of enhanced glazing and ventilation systems to meet internal noise level criteria. Measures include:

- Acoustically uprated glazing.
- Acoustic ventilation and passive or active cooling systems where necessary.

Relationship with Existing Businesses:

- Adoption of good acoustic design principles to ensure compatibility between new residential uses and existing businesses. Strategic placement of roads and buffer zones between noise producing existing businesses and proposed dwellings.

Operational Controls for Industrial Noise:

9.1.5. Noise from fixed plant and Heavy goods vehicle (HGV) activities will be controlled to ensure compliance with the requirements of the Local Planning Authority taking into consideration the assessment methodology. This includes, where necessary:

- Acoustic enclosures and attenuators for plant equipment.
- Citing equipment and loading bays so that the building's mass can provide sound reduction.

Strategic Landscaping:

- Creation of landscaped buffer zones to reduce noise exposure in outdoor garden spaces at proposed residential properties. These measures will also enhance visual and environmental quality.

RESIDUAL EFFECTS

9.1.6. The following residual effects have been identified:

Construction Phase

9.1.7. There is likely to be a worst case temporary, direct minor adverse effect on nearby residential receptors during the construction phase. This impact is not significant and will be managed through the implementation of a Construction Environmental Management Plan (CEMP) that incorporates best practices for noise and vibration mitigation.

Operational Phase

Proposed Residential Receptors:

- A worst case direct, permanent minor adverse residual effect on outdoor garden areas is expected due to road traffic and industrial noise, which is not significant. Measures will be put in place where practicable for the effects to be reduced to negligible.
- Internal noise levels will meet acceptable standards with the proposed mitigation measures, including enhanced acoustic insulation and ventilation systems.
- Residual effects associated with HGV activities and fixed plant noise emissions at the proposed employment uses are deemed negligible if appropriate mitigation measures are put in, in order to comply with the typical requirements of the local planning authority.

Existing Businesses:

- Impacts from industrial activities are managed through embedded mitigation measures in the design. Residual effects are negligible and not significant, ensuring the continued operation of businesses without imposing operational constraints.

MONITORING REQUIREMENTS

9.1.8. The following monitoring requirements have been identified:

Construction Phase:

- Noise monitoring to ensure compliance with CEMP measures and agreed noise thresholds.

Operational Phase:

- Measurement of internal and external noise levels at proposed sensitive receptors, with a focus on residential dwellings along Bentley Avenue and the A627(M) to confirm mitigation effectiveness.
- Noise assessment in relation to the impacts of fixed plant, employment use traffic and HGV activity noise levels to ensure compliance with established limits and operational constraints including compliance with any relevant planning conditions.

ENVIRONMENTAL ENHANCEMENT OPPORTUNITIES

9.1.9. The following environmental enhancement opportunities have been identified:

Improved Acoustic Environments:

- Integration of noise-reducing infrastructure and strategic landscaping for enhanced acoustic conditions at the proposed residential areas.

Quality of Life Enhancements:

- Creation of quiet zones and green buffers near sensitive receptors to improve the quality of life for residents.

Mitigation for Existing Businesses:

- Strategic integration of acoustic screening and façade design to ensure operational flexibility for existing businesses while protecting sensitive receptors.

REMAINDER OF CHAPTER

9.1.10. The remainder of this chapter describes the assessment methodology, the baseline conditions, and the significant effects identified during the assessment. It outlines the additional mitigation measures required to avoid, reduce, or offset significant adverse effects and details the residual effects and any required monitoring. Opportunities for environmental enhancement are also discussed.

9.1.11. This chapter (and its associated figures and appendices) is intended to be read as part of the wider Environmental Statement (ES), with particular reference to:

- Appendix 9.1: Baseline Noise Survey Data
- Appendix 9.2: Construction noise and vibration assessment
- Appendix 9.3: Road Traffic Noise Impact Assessment
- Appendix 9.4: Noise from Proposed commercial/Industrial Noise onto existing and proposed receptors
- Appendix 9.5: Noise from road traffic affecting proposed receptors
- Appendix 9.6: Noise from Existing Businesses Affecting Proposed Receptors

9.2 LEGISLATIVE FRAMEWORK, POLICY AND GUIDANCE

LEGISLATIVE FRAMEWORK

9.2.1. The applicable legislative framework relevant to this assessment includes:

- Environmental Protection Act 1990 (EPA 1990): Governs noise as a statutory nuisance if it causes significant interference with the enjoyment of property or is prejudicial to health. Local authorities can serve abatement notices requiring mitigation (**REF 9.1**).

- Control of Pollution Act 1974 (COPA 1974): Applies restrictions on construction noise, including working hours and permissible noise levels, to minimise disturbance to nearby residents (**REF 9.2**).
- Noise Insulation Regulations 1975 (as amended 1988): Addresses noise from road traffic associated with new or altered highways (**REF 9.3**).
- Traffic Management Act 2004: Relevant to the management of road traffic during the construction and operational phases of the development (**REF 9.4**).

9.2.2. No additional legislative documents were directly referred to in preparing this chapter beyond those listed above.

POLICY

9.2.3. Relevant policy documents include:

- **Noise Policy Statement for England (NPSE)**: Provides a framework to manage noise and its impacts on health and quality of life while promoting sustainable development. It defines three aims: avoid significant adverse impacts, mitigate adverse impacts, and improve health and quality of life where possible (**REF 9.5**).
- **National Planning Policy Framework (NPPF, 2024)**: Noise-related guidance is included under the section "Conserving and Enhancing the Natural Environment." and "Ground conditions and pollution" sections emphasises the need to mitigate and minimise noise impacts to prevent adverse effects on health and quality of life (LOAEL), in line with government noise policy. The framework also references managing noise through the planning process and ensuring that developments are appropriate for their context, taking into account the sensitivity of receptors and the need for effective mitigation (**REF 9.6**).
- **Local Planning Policies**: Specific to the project's jurisdiction, ensuring compatibility with local standards for noise pollution and mitigation (**REF 9.7**).

9.2.4. This chapter aligns with the Government's National Planning Practice Guidance (NPPG) (**REF 9.1**), which outlines thresholds for noise impacts and emphasises mitigation and good acoustic design principles.

GUIDANCE

9.2.5. The following guidance documents were used in the preparation of this chapter:

- **BS 8233:2014**: Guidance on sound insulation and noise reduction for buildings, detailing acceptable indoor and outdoor noise levels for residential and other sensitive uses (**REF 9.8**).
- **World Health Organisation (WHO) 1999 Guidelines for Community Noise**: Provides thresholds for environmental noise to protect health, including limits for sleep disturbance and outdoor living areas (**REF 9.9**).
- **BS 4142:2014+A1:2019**: Methods for rating and assessing industrial and commercial sound, used for evaluating impacts on sensitive receptors (**REF 9.10**).
- **Design Manual for Roads and Bridges (DMRB), LA111**: Relevant for assessing noise and vibration impacts from road traffic (**REF 9.11**).
- **ProPG: Planning and Noise – New Residential Development**: Offers recommendations for good acoustic design to minimise noise impacts on new residential areas (**REF 9.12**).
- **Institute of Environmental Assessment** (now Institute of Environmental Management and Assessment (IEMA's)) 'Guidelines for the Environmental Assessment of Road Traffic' (**REF 9.13**).

- **Approved Document O: Overheating:** includes specific noise constraints relevant to internal noise levels which control whether windows can open to combat overheating (**REF 9.14**).
- **BS5228-1:2019+A1:2019:** Code of Practice for noise and vibration control on construction and open sites – Noise (**REF 9.15**).
- **BS 5228-2:2009+A1:2014:** Code of practice for noise and vibration control on construction and open sites – Vibration (**REF 9.16**).
- Department for Transport/ Welsh Office (1998), Calculation of Road Traffic Noise (**CRTN**). (**REF 9.17**).

9.2.6. This chapter relies on the above documents for a structured and robust assessment methodology, supplemented by professional judgment and site-specific considerations. Where specific guidance was not available, industry best practices and established methodologies were applied.

9.3 CONSULTATION, SCOPE, METHODOLOGY AND SIGNIFICANCE CRITERIA

CONSULTATION UNDERTAKEN TO DATE

9.3.1. **Table 9-1** provides a summary of the consultation activities undertaken in support of the preparation of this assessment.

Table 9-1 - Summary of Consultation Undertaken

Body / organisation	Individual / stat body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
Rochdale Borough Council	Paul Fletcher, Environmental Health Specialist Lead	23 May 2024 - Email consultation regarding the noise assessment methodology	Methodology confirmed as acceptable. Requested that noise arising from development be controlled to 5 dB below existing background levels.

SCOPE OF THE ASSESSMENT

- 9.3.2. The scope of this assessment has been established through an ongoing scoping process. Further information can be found in **Chapter 5: Approach to EIA**.
- 9.3.3. This section provides an update to the scope of the assessment and re-iterates the evidence base for scoping out elements following further iterative assessment. The scoping opinion (**REF 9.18**) issued by Rochdale Borough Council identified "Noise and Vibration" as a key topic to be included in the Environmental Statement due to the potential for significant effects on nearby sensitive receptors, particularly existing residential properties.
- 9.3.4. At the scoping stage, it was agreed that noise and vibration impacts during both the construction and operational phases of the development should be assessed. The evidence base includes consultation feedback from Rochdale Borough Council and the project's Environmental Health Specialist Lead, which confirmed the methodology and set specific noise limits (in relation to proposed industrial noise sources).
- 9.3.5. Since the scoping stage, additional technical details of the development have been confirmed, including updates to the indicative masterplan and specific site activities. These details have not

resulted in changes to the scope for noise and vibration but have reinforced the need to evaluate impacts from construction activities, road traffic movements including HGV movements, and operational fixed plant equipment.

Elements Scoped Out Of The Assessment

- 9.3.6. The elements shown in **Table 9-2** are not considered to give rise to likely significant effects as a result of the Proposed Development and have therefore not been considered within this assessment:

Table 9-2 - Elements Scoped Out of the Assessment

Element scoped out	Justification
Noise from small-scale construction activities	Expected to be negligible due to low-intensity construction methods and adherence to best practice guidance.
Noise impacts at receptors more than 1 km away	Noise predictions and baseline data indicate that significant noise effects are unlikely beyond this distance due to attenuation and screening by existing structures.

Elements Scoped Into The Assessment

Construction Phase

- 9.3.7. The following elements are considered to have the potential to give rise to likely significant effects during construction of the Proposed Development and have therefore been considered within this assessment:

- Noise from construction plant and equipment.
- Vibration impacts on nearby sensitive receptors, particularly residential properties.

- 9.3.8. The following elements are considered to have the potential to give rise to likely significant effects during operation of the Proposed Development and have therefore been considered within this assessment:

- Noise from fixed plant and building services equipment associated with the employment land.
- Noise from HGV movements and loading/unloading activities within the employment land.
- Noise impacts on existing and new residential properties from industrial and traffic sources.
- Existing businesses affected by proposed new noise sensitive use, as well as construction noise/vibration.

Extent of the Study Area

- 9.3.9. The study area has been defined based on guidance from relevant standards. It encompasses:

- The development site boundary.
- A 1 km radius around the site, focusing on sensitive receptors such as existing residential properties along Stakehill Lane, Bentley Avenue, and Boarshaw Lane.
- Transportation routes affected by operational traffic (but only for road links that are located around 1km from the Site).

Assessment Methodology

9.3.10. The assessment includes the following scope of works:

- Assessment of the effects of construction noise and vibration on Existing Sensitive Receptors (ESRs), in the vicinity of the Site.
- Assessment of the effects of operational noise due to changes in road traffic on ESRs in the vicinity of the Site (within around 1 km from the Site).
- Assessment of the effects of fixed plant and HGV activities at Proposed Sensitive Receptors (PSRs) and at ESRs.
- Assessment of the effects of operational noise due to changes in road traffic on ESRs and at PSRs.
- Assessment of the effects of increased traffic associated with the proposed employment uses at PSRs and at ESRs.
- Assessment of the impact of the proposals to existing businesses.

9.3.11. The Site Suitability Assessment includes the following scope of works:

- Assessment of existing and future¹ noise sources on PSRs.

Construction Phase²

Construction Noise

9.3.12. The construction works are expected to include several sequential phases, such as:

- Excavation and substructure works;
- Drainage works;
- Superstructure and building envelopes;
- Fitting out; and
- Hard landscaping/highways infrastructure.

9.3.13. Since a contractor has not yet been appointed, precise details on construction activities, equipment, or timelines are unavailable. To address this, an indicative qualitative construction noise assessment was conducted using the guidance outlined in BS 5228-1:2009+A1:2019³, assuming worst-case noise generation scenarios at the nearest Noise Sensitive Receptors (NSRs).

9.3.14. The noise assessment utilized 'Example Method 1 – The ABC Method' from BS 5228-1(Ref 9.17) to identify potential impacts on residential NSRs. Two scenarios were analysed:

- A worst-case scenario assumes construction activities occurring 15 m from NSRs.
- An average scenario assumes construction activities at 150 m from NSRs.

¹ Limited to a review of predicted increase in road traffic without the development

² Additional information is provided within Appendix 7.2

³ BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise

- 9.3.15. The criterion for identifying potentially significant effects was based on exceedance of $L_{Aeq,T}$ threshold values defined in the ABC method, which are determined by ambient noise levels at NSRs. A noise increase is considered potentially significant under the ABC method when the predicted construction noise level exceeds the threshold level set for the ambient noise category (A, B, or C). The degree of significance depends on the magnitude of the exceedance above the threshold.
- 9.3.16. The magnitude of the impact of construction noise is classified in accordance with the descriptors in **Table 9-3**.

Table 9-3 - Construction Noise Magnitude of Impact

Criteria	Magnitude of Impact
Exceedance of ABC Threshold Value by more than 5 dB	High
Exceedance of ABC Threshold Value up to 5 dB	Medium
Equal to or below the ABC Threshold Value by up to 5 dB	Low
Below the ABC Threshold Value by more than 5 dB	Very Low

Construction Vibration

Effects on Humans

- 9.3.17. Construction vibration has the potential to impact occupants of buildings near the works. BS 5228-2:2009+A1:2014⁴ provides guidance on the perception of vibration within occupied buildings, including a simple method for assessing annoyance and evaluating the risk of cosmetic damage associated with vibration.
- 9.3.18. The potential impact depends on the type of construction activities, ground conditions, and distance to Noise Sensitive Receptors (NSRs). As part of the Proposed Development, vibration from site compaction activities, such as the use of vibratory rollers, is anticipated to be a key source of vibration. These activities have the potential to be conducted within close proximity to NSRs. The duration and intensity of compaction will need to be carefully managed to minimise potential effects.
- 9.3.19. The following criteria set out in **Table 9-4**, has been adopted and is based upon the guidance on effects of vibration levels applicable to human perception as presented within BS5228-2 (Ref 9.18). The corresponding vibration ranges and associated magnitude of effect ratings adopted for the purpose of this assessment have also been included within **Table 9-4**.

⁴ BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - vibration

Table 9-4 - Magnitude of Effect Applicable to Construction Vibration – Applicable to Human Perception

Vibration Level (Peak Particle Velocity, PPV)	Effect	Magnitude of Impact
>10.0 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level	High
1.0 > 10.0 mm/s	Onset of complaints in residential environments	Medium
0.3 > 1.0 mm/s	Onset of perceptibility in residential environments	Low
< 0.3 mm/s	Unlikely to be perceptible in residential environments	Very Low

- 9.3.20. For residential receptors and other high sensitivity receptors, the Lowest Observed Adverse Effect Level (LOAEL)⁵ is defined as a Peak Particle Velocity (PPV) of 0.3 mm/s (millimetres per second), this being the point at which construction vibration is likely to become perceptible. The Significant Observed Adverse Effect Level (SOAEL)⁶ is defined as a PPV of 1.0 mm/s, this being the level at which construction vibration can be tolerated with prior warning.
- 9.3.21. At receptors above the SOAEL, further consideration of whether an effect is significant is undertaken using professional judgement, taking account of the duration and frequency of the effect, as well as the time of evening/ night that the effect would be experienced.

Effects on Buildings

In addition to human annoyance, building structures may be affected by high levels of vibration. However, BS 6472-2 (**Ref 9.19**). states that the likelihood of structural or cosmetic damage is very low, even at vibration levels above perception thresholds. Therefore, if vibration levels are controlled to address human perception thresholds, it is highly unlikely that buildings will experience structural or cosmetic damage from construction activities such as site compaction.

Operational Phase

Fixed plant and HGV activities from the proposed employment uses

- 9.3.22. A preliminary assessment has been conducted to evaluate the potential noise impact from fixed plant and HGV activities associated with the proposed Employment Uses located (or rather proposed to be located) towards the south of the site. This assessment is based on assumptions regarding the type, number, location, and operation of such plant and equipment, as detailed information is unavailable at this stage due to the outline nature of the application.
- 9.3.23. The assessment incorporates worst-case scenarios which are however based on the indicative masterplan using typical noise emission levels from comparable developments and industry-standard noise data. In the absence of precise details, BS 4142:2014+A1:2019⁶ has been used to

⁵ See Ref 7.13, and Ref 7.1

⁶ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (see also Appendix 7.4)

specify suitable noise control limits for fixed plant and operations, including appropriate corrections for acoustic characteristics (e.g., tonality, impulsivity, or intermittency).

9.3.24. To minimise the potential noise impact of fixed plant and associated activities:

- The rating level ($L_{Ar,T}$) of noise generated by fixed plant should not exceed the prevailing background sound level ($L_{A90,T}$) at the nearest Noise Sensitive Receptors (NSRs).
- For cumulative effects, all external plant and activities should be designed and controlled such that the overall rating level is less than or equal to the lowest measured background sound level during the relevant operational periods. However, it should be noted that the Local Planning Authority have indicated their preference that noise impacts are designed to at least 5 dB below the representative background sound level at relevant receptors.

Table 9-5 outlines the criteria adopted for assessing the impact magnitude of combined fixed plant and HGV noise, based on the difference between the Rating Level ($L_{Ar,T}$) and the representative background sound level ($L_{A90,T}$).

Table 9-5 - Fixed Plant and HGV Noise Magnitude of Impact

Criteria	Magnitude of Impact
Rating Level exceeds background sound level by more than 10 dB	High
Rating Level exceeds background sound level by up to 5 dB	Medium
Rating Level equals the background sound level	Low
Rating Level is more than 10 dB below background sound level	Very Low

9.3.25. In relation to these sources, the LOAEL is achieved when the rating Level equals the background sound level and the SOAEL is set at when the rating level exceeds background sound levels by more than 10 dB.

Noise from Existing Sources on Proposed Receptors

9.3.26. Noise from existing sources such as road traffic and noise from existing businesses has the potential to affect the proposed residential land uses on the site. The significance of effect is not defined for proposed sensitive receptors as they are not present before the development so do not experience a change or effect as a result of the development. However, it can be considered that where BS 8233⁷ or WHO⁸ Guidelines are exceeded this is the equivalent of a significant effect.

⁷ BS 8233: *Guidance on sound insulation and noise reduction for buildings*. London: BSI.

⁸ World Health Organization, 1999. *Guidelines for Community Noise*. Geneva: WHO.

Development Generated Road Traffic Noise

- 9.3.27. An increase in road traffic due to the site has the potential to increase the noise levels at NSRs in the vicinity of the site.
- 9.3.28. Traffic data was provided by the project's Transport Consultant WSP, and this information was used to assess impacts associated with the change (either from existing baseline levels, or from the introduction of the development proposals) in traffic flows around the development Site. However, in relation to development generated road traffic associated with the proposed Employment Use an additional assessment was undertaken based on likely road traffic flows associated with the employment uses and various relevant assumptions.
- 9.3.29. The Design Manual for Roads and Bridges (DMRB): LA111 Noise and Vibration (revision 2) (**Ref 9.20**) sets out procedures for undertaking the environmental assessment of new road schemes, including the assessment of noise impacts from road traffic. When undertaking a DMRB assessment, the methodology contained within the Department for Transport 1988 document Calculation of Road Traffic Noise (CRTN) (**Ref 9.17**) should be used to calculate levels of road traffic noise.
- 9.3.30. The DMRB assessment methodology suggests that the magnitude of noise changes from a project should be classified into levels of impact. LA111 considers how the magnitude of change can be affected by whether a noise level change occurs in the short term (e.g., as a result of a sudden opening of a scheme), or in the long term (e.g., gradually over time, such as that associated with natural traffic growth).
- 9.3.31. The example classification scales are presented in **Table 9-6**:

Table 9-6 - Classification of Magnitude of Noise Impacts in the Short Term and Long Term

Short Term		Long Term	
Noise Change, dB LA10, 18h	Magnitude of Impact	Noise Change, dB LA10, 18h	Magnitude of Impact
0	Very Low	<3	Very Low
0.1 to 0.9	Low	3.0 to 4.9	Low
1.0 to 2.9	Medium	5 to 9.9	Medium
3.0 to 4.9	High	10+	High

- 9.3.32. DMRB LA 111 states that the Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Levels (SOAEL) shall be set for all noise sensitive receptors within the Study Area, for time periods when they are in use. LOAEL and SOAEL considered in this assessment are defined in **Table 9-7** below, which is reproduced from Table 3.49.1 of DMRB LA 111. These LOAEL and SOAEL values are considered to apply to both dwellings and other noise sensitive receptors for the purpose of this assessment.

Table 9-7 - Initial Assessment of Operational Noise Significance

Time Period	LOAEL	SOAEL
Day (06:00 – 24:00)	55 dB LA10,18hr (façade)	68 dB LA10,18hr (façade)
Night (23:00-07:00)	40 dB Lnight, outside (free-field)	55 dB Lnight, outside (free-field)

9.3.33. It is considered that a potentially significant noise change occurs when there is:

- A 1 dB change in noise level in either the short-term or long-term when the resulting noise level exceeds the SOAEL. In the long-term, the noise level must also change by at least 1 dB when comparing the Do Minimum 2017 and Do Something 2032 scenarios to ensure the change is as a result of the proposed scheme as opposed to a change that would happen even if the proposed scheme did not go ahead;
- A 3 dB change in the short-term or 5 dB change in the long-term (i.e. “moderate” change from DMRB LA 111) where the resulting noise level is between the LOAEL and SOAEL; and,
- Where noise levels are below the LOAEL, significant effects are not expected.

Receptor Sensitivity

9.3.34. In accordance with the principles of EIA, the sensitivity of receptors (existing and proposed) to noise or vibration impacts during either construction or operational phases are defined in **Table 9-8**.

Table 9-8 - Sensitivity/Value of Receptor

Sensitivity/Value of Resource/Receptor	Description	Examples of Receptor Usage
Very High	Receptors where noise or vibration will significantly affect the function of a receptor	Auditoria/studios; and Specialist medical/teaching centres, or laboratories with highly sensitive equipment;
High	Receptors where people or operations are particularly susceptible to noise or vibration. Sensitive ecological receptors known to be vulnerable to the effects of noise or vibration.	Residential; Quiet outdoor areas used for recreation; Conference facilities; Schools/educational facilities in the daytime; Hospitals/residential care homes; Libraries; and Ecologically sensitive areas for example Special Protection Areas (SPAs)
Medium	Receptors moderately sensitivity to or vibration where it may cause some distraction or disturbance	Offices; Restaurants; and Sports grounds when spectator or noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf).

Sensitivity/Value of Resource/Receptor	Description	Examples of Receptor Usage
Low	Receptors where distraction or disturbance of people from noise or vibration is minimal	Residences and other buildings not occupied during working hours; Factories and working environments with existing high noise levels; and Sports grounds when spectator or noise is a normal part of the event.

9.3.35. For the purpose of this assessment, all nearby affected receptors (including proposed receptors) are considered to have a high sensitivity as they are residential in nature. The existing businesses are however considered to have a medium sensitivity in relation to noise impacts from the proposed development.

9.3.36. Relevant models and analysis:

- Manual calculations using the CRTN methodology were employed to predict operational noise impacts on sensitive receptors.
- Traffic noise predictions employed Design Manual for Roads and Bridges (DMRB) methodology to assess road traffic noise impacts.
- Conventional assessment methods were used to establish the impacts at proposed residential receptors, fixed plant and HGV activities, including from traffic flows associated with the proposed employment uses.

9.3.37. Tables and diagrams summarising baseline data, measurement results, and the results of calculations are provided in Appendices 9.1 to 9.5.

SIGNIFICANCE CRITERIA

9.3.38. The following terminology has been used in the assessment to define the effects:

- Adverse – detrimental or negative effects to an environmental resource or receptor;
- Negligible – imperceptible effects to an environmental resource or receptor; or
- Beneficial – advantageous or positive effect to an environmental resource or receptor.

9.3.39. Where adverse or beneficial effects have been identified, these have been assessed against the following significance scale:

- Major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards;
- Moderate – limited effect (by extent, duration or magnitude), which may be considered significant; or
- Minor – slight, very short or highly localised effect of no significant consequence.
- Negligible (not significant).

9.3.40. Effects can also be characterised as temporary or permanent and either short-term or long-term depending on the duration of the effect.

Characterisation of Effect

Construction Phase

- 9.3.41. Any impacts associated with the construction of the Proposed Development are likely to be short-term and temporary in nature. The significance of any impacts is identified in accordance with relevant guidance.

Operational Phase

- 9.3.42. Any impacts associated with the operational phase of the Proposed Development are likely to be long term in nature. The impact of the Site is determined with regard to the change in existing noise levels at nearest NSRs to the Site.

Significance of Effects

- 9.3.43. The significance of effect resulting from each individual potential impact type above is derived from the magnitude of the impact and the sensitivity or value of the affected receptor using the matrix presented in Error! Reference source not found..

Table 9-9 - Classification of Effects

Sensitivity/Value of Resource/Receptor	Magnitude of Impact			
	High	Medium	Low	Very Low
Very High	Major	Major	Moderate	Minor
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible

- 9.3.44. With respect to the Classification of Effects outcomes from **Error! Reference source not found.**, effects of negligible and minor are Not Significant, whereas effects of moderate and major are considered to be Significant, in EIA terms.
- 9.3.45. In assessing noise and vibration impacts, this chapter goes beyond the identification of significant effects, as defined by EIA terminology, to also consider measures to minimise and reduce adverse effects to the lowest observed adverse effect level (LOAEL) or below, where it is reasonable and practicable to do so. While significant effects represent the threshold at which impacts are deemed likely to have a material influence on decision-making, LOAEL represents the point at which adverse effects may begin to be perceived by sensitive receptors, even if these effects are not classified as significant in EIA terms.
- 9.3.46. Adopting this approach is essential to align with best practice guidance, including the principles of the National Planning Policy Framework (NPPF) (**Ref 9.6**) and associated planning practice

guidance, which emphasise the need to mitigate and minimise adverse impacts wherever possible. However, it is acknowledged that achieving LOAEL or below may not always be feasible or proportionate, particularly where baseline conditions already exceed this level, and where mitigation measures would not reasonably improve conditions further. In such cases, it is important to demonstrate that significant effects resulting from the development have been mitigated to pre-development levels, ensuring that the development does not exacerbate existing adverse conditions.

- 9.3.47. This approach reflects the precautionary principle and the "As Low As Reasonably Practicable" (ALARP) standard, ensuring that the development proactively addresses potential effects to the extent feasible. Where noise and vibration impacts cannot be reduced to LOAEL or below, justification is provided to show that mitigation measures are proportionate and that all reasonable steps have been taken to minimise adverse effects. By focusing on mitigating significant effects and applying practicable measures to reduce non-significant effects where possible, the development contributes to overall sustainability and acceptability.

9.4 BASELINE CONDITIONS

DESK STUDY

- 9.4.1. A desk-based assessment was undertaken to identify the baseline noise environment within the study area. The following sources of data were reviewed:
- Ordnance Survey maps to determine the site layout and nearby sensitive receptors.
 - Local authority guidance and policies, including the scoping opinion issued by Rochdale Borough Council.
 - Traffic data⁹ provided by the transport consultant to assess road traffic noise impacts.
 - Results of noise mapping undertaken by DEFRA (2024).
- 9.4.2. The available noise contours published by Manchester Airport indicate that aircraft noise is unlikely to be an issue on site and no further consideration has been given to such noise in this ES chapter.

SITE VISIT AND SURVEYS

- 9.4.3. The site is located to the northeast of Middleton and lies to the north and east of the existing Stakehill Industrial Estate. The main sources of noise are considered to be:
- The A627(M) to the north and east of the site; and
 - Commercial/industrial noise associated with the existing businesses at Stakehill Industrial Estate to the south and east of the site.
 - Noise associated with the proposed employment uses.
- 9.4.4. Baseline noise monitoring was conducted at representative locations to characterise the existing noise climate. Site visits and attended measurements were carried out to observe dominant noise

⁹ With the latest version of traffic flows received on 7 January 2025

sources. Full details of the baseline survey are available in Appendix 9.1: Baseline Noise Survey Data.

FUTURE BASELINE

Without Development:

Road Traffic Noise:

- Noise levels from the A627(M) and surrounding roads are anticipated to increase slightly due to background traffic growth and committed developments in the area (Do-Minimum scenario). Specific increases in noise levels (e.g., 2.0–2.9 dB) have been identified on key links such as the A627(M) Slattocks Link.
- At Bentley Avenue, noise levels are expected to increase more significantly (15 dB) under the Do-Minimum scenario, reflecting increased traffic flows.

Industrial Noise:

- Operational noise from existing industrial uses is expected to persist at current levels, assuming no changes to industrial schedules or operations.

With Development:

Construction Noise:

- 9.4.5. Temporary, localised increases in noise levels are expected during construction activities, such as site preparation, compaction, and equipment use, particularly near Bentley Avenue and other sensitive receptors located very close to the red line boundary of the Proposed Development. These impacts will be managed through a Construction Environmental Management Plan (CEMP).

Operational Noise:

- Changes to the noise profile associated with the development traffic are predicted to be negligible.
- Noise associated with the proposed employment uses may impact existing and proposed nearby noise sensitive receptors.

SUMMARY

- 9.4.6. Significant changes to the baseline environment are anticipated in the Do-Minimum scenario, particularly for Bentley Avenue and A627(M) due to increased road traffic noise. With the proposed development, localised increases in noise levels are expected near sensitive receptors, but such increases are negligible in relation to existing residential premises but are significant in relation to proposed residential premises.

9.5 SENSITIVE RECEPTORS

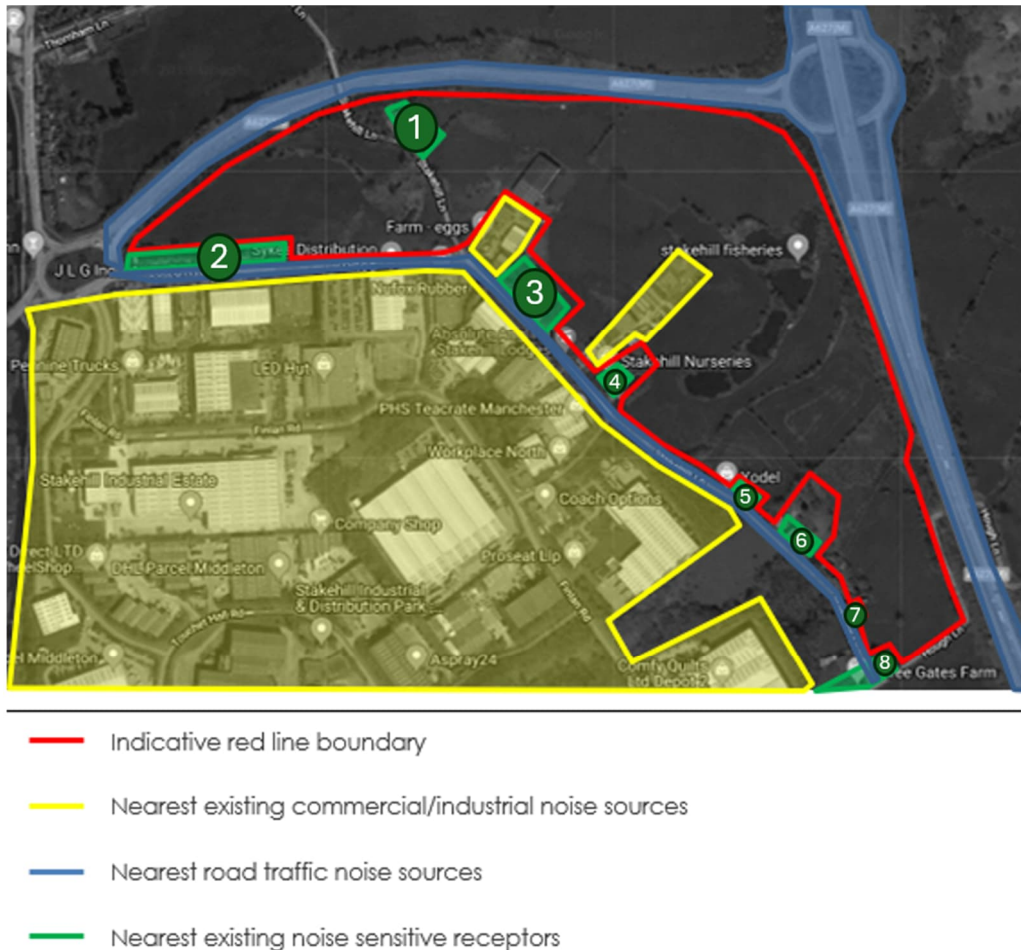
IDENTIFICATION OF SENSITIVE RECEPTORS

- 9.5.1. The nearest Noise Sensitive Receptors (NSRs), including both existing sensitive receptors (ESRs) and proposed sensitive receptors (PSRs), are located in various directions around the site. The nearest existing noise sensitive receptors to the site are:
- NSR1: Dwellings on Stakehill Lane (north of the site, adjacent to the A627(M)).
 - NSR2: Dwellings on the North Side of Bentley Avenue (west of the site).

- NSR3-8: Dwellings overlooking Stakehill Lane (south to southwest of the site)
- Existing businesses near and within the red line boundary.

9.5.2. The main features of the site location's pertinent to noise are shown in **Figure 9-1**.

Figure 9-1 - Site Location and Areas of Interest in relation to Noise Impacts



- 9.5.3. The proposed site will be split into two class uses; residential and employment. Therefore, the proposed residential dwellings may be affected by existing and proposed industrial noise (as well as road traffic noise). It is unknown whether the proposed residential dwellings will also be affected by construction noise and vibration, and this is scoped out of this assessment.
- 9.5.4. An impact may be experienced at other receptors, but this is likely to be equal to or less than those receptors stated above.

9.6 ASSESSMENT OF POTENTIAL EFFECTS, MITIGATION AND RESIDUAL EFFECTS

CONSTRUCTION PHASE

- 9.6.1. During the construction phase, noise and vibration impacts are anticipated from activities such as site preparation, site compaction, and operation of machinery. This section summarises the potential effects on identified sensitive receptors, additional mitigation measures, and residual effects

following mitigation. The full assessment is shown in Appendix 9.2: Construction noise and vibration assessment.

Assumptions and Methodology

- Assessments have been conducted in line with BS 5228-1:2009+A1:2014 for noise and BS 5228-2:2009+A1:2014 for vibration.
- Additional mitigation measures, including compliance with a Construction Environmental Management Plan (CEMP), are assumed to be in place.
- The distance of construction activities to the most affected receptors has been set at 15 m as a reasonable worst-case scenario (refer to Figure 9.1 and the illustrative masterplan), however the average scenario has been set where construction activities occur around 150 m from a sensitive receptor.
- Note: The noise and vibration impacts of HGV movements on public roads during construction have not been assessed as part of this study due to lack of relevant information. However, it should be noted that the noise impacts during construction include for noise associated with HGV movements within the site.

Table 9-10 - Assessment of Potential Effects, Additional Mitigation, Residual Effects and Monitoring During Construction

Sensitive Receptor	Potential Effects	Additional Mitigation	Residual Effects and Monitoring
Residential Properties (e.g., Stakehill Lane, Bentley Avenue)	Potential Effects: - Noise impacts: During peak earthworks and construction activities, predicted worst-case noise levels may reach up to 93 dB LAeq,T at 15 m, representing a high magnitude of impact. - Vibration impacts: During vibratory compaction activities, worst-case vibration levels are predicted to reach 0.78 mm/s (PPV), representing a low magnitude of impact, however such level exceeds the LOAEL. Sensitivity: High. Magnitude of Change: - High (noise, worst-case); - Low (vibration, worst-case). Effect:	Implement a detailed Construction Environmental Management Plan (CEMP), including: - Noise management measures for high-impact activities (e.g., earthworks, concrete cutting). - A no-idling policy for vehicles and equipment. - Designated haul routes to reduce noise impacts. - Temporary acoustic barriers (e.g., 3 m solid hoardings or noise screens) to reduce noise levels by at least 10 dB at nearby receptors. - Schedule noisy activities during standard working hours (08:00–18:00 weekdays; 08:00–13:00 Saturdays).	Residual Effects: Noise Impacts: With the CEMP and mitigation measures in place: Noise impacts during high-intensity activities (e.g., earthworks and concrete works) will be reduced to Minor Adverse at close proximity, which is not significant. Noise impacts during lower-intensity activities (e.g., landscaping and internal fitting out) will be reduced to Negligible. Vibration Impacts: Residual vibration effects are predicted to remain at Minor Adverse or Negligible across all receptors, with no significant effects anticipated.

Sensitive Receptor	Potential Effects	Additional Mitigation	Residual Effects and Monitoring
	- Noise: Temporary, short-term, major adverse (Significant). - Vibration: Temporary, short-term, minor adverse (Not Significant).	- Use low-noise equipment compliant with modern noise emission standards and ensure regular maintenance. - Deploy a community communication strategy to inform residents about high-noise activities and address concerns. - Monitor noise levels at key receptors and adjust activities if thresholds are exceeded. - Use equipment designed to minimise vibration impacts. - Carry out high vibration activities as the maximum possible distance from sensitive receptors.	Monitoring: - Fortnightly compliance checks on noise and vibration levels. - Real-time noise and vibration monitoring during high-impact activities (e.g., vibratory compaction). - Periodic review and updates to the CEMP based on monitoring data and stakeholder feedback.

OPERATIONAL PHASE

- 9.6.2. During the operational phase, noise impacts are primarily associated with increased traffic volumes, industrial activity, and operational noise from the development. The potential effects on sensitive receptors, proposed mitigation measures, and residual effects are summarised in **Table 9-11**. The full assessments are shown in **Appendix 9.3: Road Traffic Noise Impact Assessment**, **Appendix 9.4: Noise from Proposed commercial/Industrial Noise onto existing and proposed receptors**, **Appendix 9.5: Noise from road traffic affecting proposed receptors** and **Appendix 9.6: Noise from Existing Businesses Affecting Proposed Receptors**.

Table 9-11 - Assessment of Potential Effects, Additional Mitigation, Residual Effects And Monitoring During Operation

Sensitive Receptor	Potential Effects	Additional Mitigation	Residual Effects and Monitoring
Existing Residential Properties	Road Traffic Noise on Existing Road Network: Increased noise from vehicle movements along the relevant surrounding roads and especially road traffic along Bentley Avenue and the A627(M). Based on the proposed methodology it is anticipated that existing residential properties will be subject to Negligible effects (not	Not Applicable	None required

Sensitive Receptor	Potential Effects	Additional Mitigation	Residual Effects and Monitoring
	significant) of noise associated with the increased in road traffic due to the proposed development.		
Existing Residential Properties (especially NSR3-8) and Proposed Residential Properties	Operational Noise: HGV deliveries, loading/unloading, and fixed plant could affect internal and external environments, including garden areas. Where noise level limits are achieved Minor adverse effects (not significant) are predicted in relation to fixed plant noise impacts. The receptor's sensitivity is high.	- o Install acoustic enclosures or barriers around fixed plant. - o Optimise loading bay orientation and introduce noise screens. - o Implement quieter operational equipment.	Residual effects are predicted to be minor adverse (not significant) to negligible following mitigation.
Existing Residential Properties (especially NSR3-8)	Road Traffic on Proposed Access Road. The potential daytime impact associated with the new access road into the employment uses would be near the LOAEL and as such the impact would be Negligible adverse (not significant). Where night-time vehicle movements are required they will be controlled such that noise levels are below the LOAEL set out in DMRB of 40 dB Lnight.	No specific additional mitigation required.	Residual effects are expected to remain Negligible adverse (not significant) due to controlled operational measures. No specific monitoring is proposed.
Proposed Residential Dwellings	Road Traffic Noise on Existing Road Network: Incident road traffic noise levels from the A627(M) and surrounding roads are expected to exceed acceptable thresholds in outdoor and indoor environments. Outdoor amenity areas may experience noise levels of 55–70 dB LAeq,16h. Indoor noise levels near major roads may exceed BS8233:2014/ADO thresholds, especially if windows are open.	- o Install acoustic barriers along northern and eastern boundaries, with a minimum height of 2.5 m to 3.5 m in high-exposure areas, reducing noise by at least 10 dB. - o Use building layout to orient gardens and sensitive areas away from primary noise sources. - o Specify enhanced glazing and ventilation systems, for areas with higher noise levels. - o Provide mechanical ventilation or passive cooling to maintain comfort while ensuring windows can remain closed in high-noise areas in	Residual effects for indoor noise are expected to be negligible following mitigation. Outdoor amenity areas exposed to >55 dB may result in moderate adverse effects but can be reduced to a minor or negligible effect through barriers and strategic layout. Monitoring should include post-completion compliance checks to verify barrier effectiveness and internal noise reductions.

Sensitive Receptor	Potential Effects	Additional Mitigation	Residual Effects and Monitoring
		order to combat potentially overheating conditions.	
Proposed residential gardens near JLG Industries	Noise impacts from powered tools and machinery (e.g., drills, saws) affecting outdoor amenity areas. Commercial noise levels from JLG Industries may exceed acceptable thresholds in outdoor and indoor environments. This is equivalent to a significant effect.	- Position gardens and noise-sensitive spaces away from boundaries with JLG Industries. - Use internal roads as buffers and specify high-spec glazing and ventilation for nearby new buildings.	Residual effects are expected to be the equivalent of a not significant effect due to controlled operational measures. No specific monitoring is proposed.
Proposed residential gardens near RDM Engineering	Noise impacts from forklift movements and loading/unloading of goods vehicles affecting outdoor amenity areas. Observations stated road traffic noise from Stakehill Lane was dominant at the location of the proposed receptors. It considered that noise from RDM Engineering will not affect proposed residential development.	No specific additional mitigation required.	Residual effects are expected to remain as the equivalent of a not significant effect due to controlled operational measures. No specific monitoring is proposed.
Other proposed residential areas adjacent to industrial businesses	Minimal impacts from other businesses, as they are not significant noise sources.	None required for general areas. Maintain design strategies such as setbacks and internal roads as buffers.	No specific monitoring is proposed.

Notes:

- Outdoor spaces—particularly gardens within the proposed residential areas—require detailed consideration to ensure acceptable noise levels are achieved. These spaces play a critical role in residents' quality of life and should be designed to meet relevant guidelines, such as those in BS 8233:2014, which recommend outdoor noise levels not exceeding 50–55 dB for garden areas. However, it should be noted that there will be garden areas in the development where due to screening and distance attenuation, suitable outdoor noise levels will be complied with.
 - Effectiveness of Acoustic Barriers: The installation of acoustic barriers along some property boundaries near roads has been proposed to mitigate noise impacts on outdoor spaces.

These barriers will be constructed from materials with proven sound attenuation properties (e.g., dense timber or masonry) and strategically placed to shield gardens from dominant noise sources, including road traffic from the A627(M) and industrial activities.

- **Garden Layout and Placement:** The indicative masterplan design has incorporated setbacks from major roads and industrial premises to further reduce noise exposure. However, it is acknowledged that some garden areas may still face noise levels that exceed the guidance levels in BS8233:2014 (Ref 9.8), particularly those closest to the A627(M). Additional landscaping, including the use of earth bunds, will supplement acoustic barriers to enhance their effectiveness.
- **Enhanced building facades** should ensure windows, trickle ventilators, and other elements provide sound insulation compliant with Approved Document O (Ref 9.14), BS8233:2014, and WHO Guidelines for Community Noise (Ref 9.9). The use of façade sound insulation is also proposed as a mitigation measure in relation to incident industrial noise.
- **Active or passive cooling systems** will prevent residents from relying on open windows during warm months, thus maintaining acoustic comfort indoors.

CUMULATIVE EFFECTS

- 9.6.3. At the time of writing, a specific list of committed developments, has not been provided for inclusion in this assessment. However, the traffic data received for the do minimum scenario indicates significant increases in road traffic volumes (compared to the 2025 baseline scenario). These increases are likely attributable to the influence of other developments in the area, which suggests that cumulative effects have been inherently captured within the baseline noise environment.
- 9.6.4. Consequently, while no explicit assessment of committed developments has been conducted, the analysis should be regarded as encompassing cumulative effects to some extent. The observed traffic increases, and their resulting impact on the baseline noise environment, are reflective of broader development activity in the vicinity.

9.7 OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT

- **Noise Barriers as Habitat Features:** Acoustic barriers could be designed as green walls to enhance biodiversity while mitigating noise impacts.
- **Educational Collaboration:** Noise monitoring data can be shared with nearby schools for educational purposes and to foster community engagement.
- **Enhanced Landscaping:** Strategic use of vegetation to both mitigate noise and improve visual appeal along major access routes.

9.8 DIFFICULTIES AND UNCERTAINTIES

- **Traffic Growth Projections:** Predicted noise impacts rely on traffic flow estimates, which are subject to uncertainties in regional growth rates and economic factors.
- **Industrial Noise Variability:** Changes in operational schedules of neighbouring industrial activities could alter baseline conditions over time however given the low noise levels from industrial activities this is unlikely to make a significant difference to the assessment.

9.9 SUMMARY

9.9.1. **Table 9-12** provides a summary of the findings of the assessment.

Table 9-12 - Summary of the Findings of the Assessment

Construction Phase					
Receptor	Potential Effects	Significance of Effects Prior to Mitigation/Enhancement	Additional Mitigation	Residual Effects	Monitoring
Existing Residential Properties (e.g., Stakehill Lane, Bentley Avenue)	Elevated noise and vibration from construction activities.	Major Adverse (significant) T / D / MT	Implement a Construction Environmental Management Plan with measures including:	Minor Adverse (not significant) provided noise level limits are met	Real-time noise and vibration monitoring during high-impact activities (e.g., vibratory compaction), where appropriate. Periodic review and updates to the CEMP based on monitoring data and stakeholder feedback.
			- Noise control for high-impact activities and no-idling policies. - Designated haul routes and temporary barriers to reduce noise. - Schedule noisy works within standard hours. - Use low-noise, well-maintained equipment and vibration-minimising tools. - Maintain distance for high-vibration activities from sensitive receptors. - Monitor noise levels and adjust as needed. - Communicate with the community about noisy	T / D / MT	

			activities and address concerns.		
Operational Phase					
Noise Sensitive Receptor	Potential Effects	Significance of Effects Prior to Mitigation/Enhancement	Additional Mitigation	Residual Effects	Monitoring
Existing Residential Properties	Increased vehicle movements on surrounding roads due to road traffic associated with the development, particularly Bentley Avenue and the A627(M), are not expected to cause significant noise impacts.	Negligible (not significant). P/D/LT	None Proposed	Negligible (not significant). P/D/LT	No monitoring requirement
Existing Residential Properties and Proposed Residential Properties	HGV activities, loading/unloading, and fixed plant operations may significantly impact internal and external environments, including gardens	Minor adverse (not significant) P/D/LT	■ Install acoustic enclosures or barriers around fixed plant. ■ Optimise loading bay orientation and introduce noise screens.	Minor adverse to Negligible (not significant). P/D/LT	No monitoring requirement

Existing Residential Properties	Daytime traffic from proposed employment uses would be near the LOAEL, with no significant impact. Night-time vehicle movements will be controlled to keep noise levels below the DMRB LOAEL of 40 dB L_{night} .	Moderate Adverse ¹⁰ (significant) P/D/LT	- Adopt strict operational controls to restrict night-time HGV movements. - Apply periodic maintenance to vehicles and access road surfaces to limit noise emissions. - Designate specific access routes and implement a no-idling policy for vehicles.	Minor Adverse to Negligible (not significant), P/D/LT	No specific monitoring is proposed.
Proposed Residential Dwellings	Noise from the A627(M) and surrounding roads is expected to exceed acceptable thresholds, with outdoor areas reaching 55–70 dB $L_{Aeq,16h}$. Indoor noise levels near major roads may surpass BS8233:2014/ADO limits, particularly with open windows.	Major to Moderate Adverse (significant) P / D / LT	- Install 2.5–3.5 m acoustic barriers along northern and eastern boundaries to reduce noise by at least 10 dB. - Design building layouts to shield gardens and sensitive areas from noise sources.	Minor Adverse to negligible (not significant) P / D / LT	Monitoring should include post-completion compliance checks to verify barrier effectiveness and internal noise reductions.

¹⁰ Significance assigned precautionary due to unknowns in relation to nighttime noise impacts, and due to outline nature of development (where for instance the access road into the employment uses could be located nearer to the exiting residential receptors)

			■ Use enhanced glazing and ventilation systems in high-noise areas. ■ Provide mechanical ventilation or passive cooling to ensure comfort and reduce reliance on open windows in noisy conditions.		
Proposed residential gardens near JLG Industries	Noise impacts from powered tools and machinery (e.g., drills, saws) affecting outdoor amenity areas.	Moderate Adverse (significant) P / D / LT	Place gardens away from boundaries adjacent to JLG Industries. Use internal roads as buffer zones. Acoustic barriers (2.5–3.5 m) could be installed along boundaries to reduce noise. Measures secured through planning conditions.	Negligible P / D / LT	Monitoring of noise levels post-occupancy at receptor locations. Results reviewed in consultation with local authorities, and additional measures implemented if thresholds are exceeded.
Proposed residential gardens near RDM Engineering	Noise impacts from forklift movements and loading/unloading of goods vehicles affecting outdoor amenity areas.	Moderate Adverse (significant) P / D / LT	Position gardens and noise-sensitive spaces away from boundaries with RDM Engineering. Use internal roads as buffers and specify high-spec glazing and ventilation for nearby buildings. Measures secured through planning conditions.	Negligible P / D / LT	Post-occupancy noise monitoring to verify effectiveness of barriers and building design. Responsibility assigned to the developer during the first year of occupancy.

Other proposed residential areas adjacent to industrial businesses	Minimal impacts from other businesses, as they are not significant noise sources.	Negligible P / D / LT	None required for general areas. Maintain design strategies such as setbacks and internal roads as buffers.	Negligible P / D / LT	No specific monitoring needed, but general feedback from residents can inform future adjustments.
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Key to table:

P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short Term, Medium Term or Long Term, N/A = Not Applicable

- 9.9.2. This summary emphasises a comprehensive approach to managing noise and vibration impacts. The proposed mitigation measures address potential effects on both existing and proposed sensitive receptors, keeping residual impacts within acceptable levels. There is no requirement for ongoing monitoring during the operational phase, however such monitoring is recommended for the construction phase.

9.10 REFERENCES

- **Reference 9.1:** Environmental Protection Act 1990 (EPA). [Online] Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents> [Accessed: December 2024].
- **Reference 9.2:** Control of Pollution Act 1974 (COPA). [Online] Available at: <https://www.legislation.gov.uk/ukpga/1974/40> [Accessed: December 2024].
- **Reference 9.3:** Noise Insulation Regulations 1975 (as amended 1988). *Legislation addressing noise from road traffic associated with new or altered highways.*
- **Reference 9.4:** Noise Insulation Regulations 1975 (as amended 1988). *Legislation addressing noise from road traffic associated with new or altered highways.*
- **Reference 9.5:** Noise Policy Statement for England, 2010 Department for Environment, Food and Rural Affairs
- **Reference 9.6:** National Planning Policy Framework (NPPF), 2023. *Guidance on noise-related impacts in "Conserving and Enhancing the Natural Environment" and "Ground Conditions and Pollution".*
- **Reference 9.7:** Local Planning Policies. *Specific to the project's jurisdiction, ensuring compatibility with local standards for noise pollution and mitigation.*
- **Reference 9.8:** British Standards Institution, 2014. *BS 8233: Guidance on sound insulation and noise reduction for buildings.* London: BSI.
- **Reference 9.9:** World Health Organization, 1999. *Guidelines for Community Noise.* Geneva: WHO.
- **Reference 9.10:** British Standards Institution, 2019. *BS 4142: Methods for rating and assessing industrial and commercial sound.* London: BSI.
- **Reference 9.11:** Highways England, 2020. *Design Manual for Roads and Bridges, LA111: Noise and vibration.* London: Highways England.
- **Reference 9.12:** Institute of Acoustics and Association of Noise Consultants, 2017. *ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise for New Residential Development.* St Albans: IOA.
- **Reference 9.13:** Institute of Environmental Assessment (now Institute of Environmental Management and Assessment (IEMA)), 1993. *Guidelines for the Environmental Assessment of Road Traffic.* Lincoln: IEMA.
- **Reference 9.14:** Approved Document O: Overheating: includes specific noise constraints relevant to internal noise levels which control whether windows can open to combat overheating.
- **Reference 9.15:** BS5228-1:2019+A1:2019- Code of Practice for noise and vibration control on construction and open sites – Noise
- **Reference 9.16:** BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration
- **Reference 9.17:** Department for Transport/ Welsh Office (1998), *Calculation of Road Traffic Noise (CRTN).*
- **Reference 9.18:** Rochdale Borough Council, 2024. *Scoping Opinion for Stakehill Development.* Rochdale: RBC.
- **Reference 9.19:** BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration
- **Reference 9.20:** Highways England, 2020. *Design Manual for Roads and Bridges, LA111: Noise and vibration.* London: Highways England.

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