10. NOISE AND VIBRATION

Introduction

10.1. This chapter, prepared by Waterman IE, presents an assessment of the likely noise and vibration effects of the Development.

10.2. This chapter provides a description of the methods used in the assessment. This is followed by a description of the relevant baseline conditions of the Site and surrounding area, together with an assessment of the likely potential effects of the Development during the construction works and once the Development is completed and operational. Mitigation measures are identified where appropriate to avoid, reduce or offset any adverse effects identified and / or enhance likely beneficial effects. Taking account of the mitigation measures, the nature and significance of the likely residual effects are described.

10.3. This chapter is supported by the following technical appendices, provided in Volume 2 of this ES:

- Appendix 10.1: Glossary of Acoustic Terminology;
- Appendix 10.2: Baseline Conditions;
- Appendix 10.3: Construction Assessment Methodology; and
- Appendix 10.4: Road Traffic Noise Assessment;

10.4. This chapter is supported by the following figures, provided at the end of this chapter:

- Figure 10.1 Noise Monitoring and Sensitive Receptor Locations

Policy Context

National Planning Policy Framework[i]

10.5. The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. The NPPF is a material consideration in planning decisions.

10.6. With regard to noise, paragraph 174 of the NPPF 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.'*

10.7. In support of this, paragraph 185 states that planning policies and decisions should aim to:

> '(a) *mitigate and reduce to a minimum potential adverse effects resulting from noise from new development- and avoid noise giving rise to significant adverse effects on health and the quality of life.*
> *(b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*'

10.8. Pollution, including noise, is defined as anything that might lead to an adverse impact on human health, the natural environment or general amenity. Annex 3, states that the NPPF replaces Planning Policy Guidance 24 'Planning and Noise' (PPG24).

10.9. Web based guidance on the NPPF, referred to as the national Planning Practice Guidance (PPG)[ii], has been issued with regard to noise, although it does not explicitly state acceptable construction noise levels or indeed acceptable operational noise levels in the context of maintaining existing residential or commercial amenity. The PPG does however outline the qualitative effects of noise exposure and what action should be taken.

Planning Practice Guidance

10.10. The national Planning Practice Guidance – Noise outlines qualitatively when noise could be a concern and states that:

> '*Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.'*

10.11. Advice is provided concerning noise exposure and its effects and puts into context the advice stated within Noise Policy Statement for England[iii] (NPSE).

Noise Policy Statement for England (2012)

10.12. The NPSE sets out the long term vision of Government noise policy as follows:

> *'Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.'*

10.13. The policy aims, through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development, to:

- Avoid significant adverse effects on health and quality of life;
- Mitigate and minimise adverse effects on health and quality of life; and
- Where possible, contribute to the improvement of health and quality of life.

10.14. The NPSE sets out three terms with regard to noise effects:

- No Observed Effect Level (NOEL);
- Lowest Observed Adverse Effect Level (LOAEL); and
- Significant Observed Adverse Effect Level (SOAEL).

10.15. The above terms are not defined in-terms of absolute levels within the NPSE which acknowledges that these will change with regard to noise source and receiver types.

Local Planning Policy

Joint Lancashire Minerals and Waste Local Plan[iv]

10.16. The joint Lancashire Minerals and Waste Local Plan contains no policies which pertain directly to noise and are relevant to the Development.

Central Lancashire Adopted Core Strategy[v]

10.17. The Central Lancashire Adopted Core Strategy contains a single policy which pertains to noise as summarised below:

> *'Policy 28: Renewables and Low Carbon Energy Schemes*
>
> *Proposals for renewable and low carbon energy schemes will be supported and planning permission granted where the following criteria are met:*
>
> *(a) The proposal would not have an unacceptable impact on landscape character and visual appearance of the local area, including the urban environment;*
> *(b) The reason of the designation of a site with statutory protection would not be compromised by the development;*
> *(c) Any noise, odour, traffic or other impact of development is mitigated so as not to cause unacceptable detriment to the local amenity;*
> *(d) Any significant adverse effects of the proposal are considered against the wider environment, social and economic benefits , including scope for appropriate mitigation, adaption and/or compensatory provisions.'*

South Ribble Borough Council Local Plan[vi]

10.18. The South Ribble Borough Council Local Plan contains no policies which particularly pertain to noise and vibration which are relevant to the proposed. Policy G17 Design Criteria for the New Development does set out design criteria for new development, however, none of these specifically relate to noise.

Legislative Context

10.19. Both national and local planning policy contains provisions to safeguard the amenity of existing and future sensitive receptors (SRs) from potential adverse noise effects associated with new development. These policy provisions are complemented by the noise assessment mechanisms and standards contained within the suite of relevant British Standard (BS) Guidelines. Together, these documents aim to ensure that appropriate safeguards are in place to protect SRs during both the construction and operation of proposed developments.

Control of Pollution Act, 1974

10.20. Part III of the Control of Pollution Act 1974[vii] (CoPA) is specifically concerned with the control of pollution. With regard to noise, the CoPA covers construction sites; noise in the street; noise abatement zones; codes of practice; and Best Practicable Means (BPM).

10.21. Under Part III Section 60 *'Control of Noise on Construction Sites'*, the Local Planning Authority (LPA) can serve a notice imposing requirements as to the way the works are to be undertaken, for the purpose of minimising noise. This may include hours of operation, specification of plant which is or is not to be used and noise limits at specified locations. These requirements may be specified before or after work has begun.

10.22. Under Part III Section 61 *'Prior Consent for Works on Construction Sites'*, the contractor undertaking the works may apply to the Local Planning Authority (LPA) for consent. The application should contain particulars about the works, the method by which they are to be carried out and the steps proposed to be taken to minimise noise resulting from the works. The LPA may attach conditions to the consent, limit or qualify consent to allow for any change of circumstances and limit the duration of the consent. The LPA has to inform the applicant of its decision on the application within 28 days from receipt.

10.23. Provided works are undertaken in accordance with the consent and this can be proven, then this acts as grounds of defence to any proceedings for an alleged offence under section 60(8) of CoPA.

10.24. Consent given under Section 60, however, does not in itself constitute any grounds of defence against any proceedings instituted under section 82 of the Environmental Protection Act 1990[viii], '*Summary proceedings by persons aggrieved by Statutory Nuisances*'.

Other Relevant Guidance

IEMA Guidelines for Environmental Noise Assessment (2014)

10.25. The IEMA Guidelines for Environmental Noise Assessment[ix] addresses the key principles of assessing noise effects and are applicable to all development proposals where noise effects may occur.

10.26. The guidance provides advice with regards to the collection of baseline noise data, prediction of noise levels and how noise should be assessed. The guidance recognises that the effect associated with a particular noise source will be dependent on a number of factors, including but not limited to the sensitivity of the receptor, frequency and duration of the noise source and time of day. However, it does not provide specific assessment criteria which developments should achieve but instead suggests that the methodology adopted should be selected on a site by site basis with reference to relevant national and local standards.

British Standard 5228 - Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1: 2009+A1:2014 and Part 2: 2009

10.27. BS 5228:2009-Part 1+A1:2014[x] provides guidance on the assessment of noise and Part 2[xi] provides guidance on vibration effects during the redevelopment of a site, including procedures for estimating noise levels from construction activities and vibration attributable to vibratory rolling and piling activities. The guidance does not define acceptable limits. However, it does provide potential methods for assessing the significance of noise and vibration effects, which should be defined on a site-specific basis. BS 5228:2009+A1 2014 also provides guidance on minimising potential effects through the use of mitigation and the adoption of BPM.

British Standard 4142 - Methods for Rating and Assessing Industrial and Commercial Sound, 2014+A1:2019

10.28. When considering noise which is industrial in nature, the primary source of guidance is BS 4142:2014 '*Method for rating and assessing industrial and commercial sound*'[xii]. BS4142 provides a method for the rating and assessment of sound of an industrial and/or commercial nature. The assessment method allows the likely effects of sound on people to be determined. The significance of the sound depends upon the margin by which the 'rating level' (LAr,Tr) exceeds the background level (LA90). Typically, the greater this difference the greater the magnitude of the impact.

10.29. The 'rating level' is equal to the specific sound level if there are no acoustic features present (tonal/impulsive/intermittent). Depending on the acoustic feature and acoustic correction of +2 to +9dB may be applied to obtain the rating noise level. Where a sound has more than one acoustic feature, the appropriate acoustic corrections are summed.

Calculation of Road Traffic Noise (CRTN): 1988

10.30. The guidance provided within CRTN[xiii] provides a method for the calculation of road traffic noise levels, taking into account factors such as distance between the road and receptor, road configuration, ground cover, screening, angle of view, reflection from façades and traffic flow, speed and composition. The noise parameter calculated is the LA10, 18 hour and is based on the 18 hour Annual Average Weekday Traffic (18hr-AAWT).

Assessment Methodology

Establishing Baseline Conditions

10.31. A baseline noise survey was conducted between 1st to 3rd of February 2022 to establish noise levels within the vicinity of sensitive receptors proximate to the Site.

Predicting Effects

10.32. The significance of effect has been assessed based on the magnitude of change or absolute level of noise or vibration due to construction and operational phases of the Development and then the sensitivity of the affected receptor.

10.33. Table 10.1 presents the assigned receptor sensitivity:

Table 10.1: Receptor Sensitivity

Receptor sensitivity	Receptor type
High	Residential, school, hospital
Medium	Office, commercial
Low	Industrial
Negligible	No receptors within 800m*

Note: * This has been adopted from BREEAM POL 05 'Reduction of noise pollution'[xiv] and is considered to be a conservative approach.

10.34. The magnitude of the predicted change in / or absolute level of noise and vibration arising from the construction and operational phases of the Development are classified with regard to the Noise Policy Statement for England's (NPSE)[xv] '*Effect Levels*' and the noise exposure levels presented within Planning Policy Guidance-Noise[xvi], and are presented in Table 10.2.

Table 10.2: Magnitude in Predicted Change / Absolute Level

Magnitude	Description
Large	Significant Observed Adverse Effect Level (SOAEL)
Medium	Above LOAEL but below SOAEL
Small	Lowest Observed Adverse Effect Level (LOAEL)
Negligible	No Observed Adverse Effect Level (NOAEL)

10.35. The effect levels are defined as follows:

- NOEL – No Observed Effect Level: Level below which no effect on health and quality of life due to noise can be detected;
- LOAEL – Lowest Observed Adverse Effect Level: Level above which adverse effects on health and quality of life can be detected; and
- SOAEL – Significant Observed Adverse Effect Level: Level above which significant adverse effects on health and quality of life occur.

10.36. Magnitude of change / absolute level as a result of the Development, is considered within the range of large, medium, small and negligible.

10.37. Consideration is given to the scale and duration (e.g., for construction, short-term for 1-2 years, medium-term for 3-5 years, long-term for 5 years and greater, and permanent, dependent upon project timeframes) and the extent of the Development when considering the level of effect.

10.38. The matrix outlined in Table 10.3 coupled with the requirements of NPSE and relevant British Standards, guidance and policy, have been used to determine the level of the effect. The predicted significance of effect is based upon the consideration of magnitude of change and sensitivity of the resource/receptor.

Table 10.3: Significance of Effect

Receptor Sensitivity	Magnitude			
	Large (SOAEL or above)	Medium (between LOAEL and SOAEL)	Small (LOAEL)	None & Negligible (NOAEL)
High	Major	Moderate to Major	Minor to Moderate	Negligible
Medium	Moderate to Major	Moderate	Minor	Negligible
Low	Minor to Moderate	Minor	Negligible to Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

10.39. Whilst Table 10.3 provides ranges, the level of effect is confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is 'beneficial' or 'adverse'. A statement is also made as to whether the level of effect is 'Significant' or 'Insignificant', again based on professional judgement.

10.40. Further explanation of the significance criteria is presented below:

- Major effect: where the Development is likely to cause a considerable change from the baseline conditions or large exceedance of the threshold level and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity. This effect is considered to be 'Significant';
- Moderate effect: where the Development is likely to cause either a considerable change from the baseline conditions or medium exceedance of the threshold level at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability. This effect is considered more likely to be 'Significant' but will be subject to professional judgement;
- Minor effect: where the Development is likely to cause a small, but noticeable change from the baseline conditions or small exceedance of the threshold level on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Development is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change. This effect is considered less likely to be 'Significant' but will be subject to professional judgement; and
- Negligible: where the Development is unlikely to cause a noticeable change or threshold level is satisfied at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change. This effect is 'Insignificant'.

10.41. Generally, significance of effects that are determined to be Moderate or greater are assessed as 'Significant', but it is ultimately dependent on professional judgement which takes account of site specifics, duration as well as the magnitude of change and sensitivity of the receptor(s).

Construction Noise and Vibration

10.42. Construction noise levels were calculated in accordance with the methodology prescribed within BS 5228-1:2009+A1:2014[xvii] for each of the major construction operations, accounting for the typical type of plant and activities expected.

10.43. The 'ABC Method' provided in BS 5228:2009-1+A1:2014 has been used to determine the category threshold values, which are determined by the time of day and existing prevailing ambient noise levels. The noise generated by construction activities is compared with the threshold value and the prevailing noise level to determine the magnitude of the construction noise. The magnitude is as detailed within The Design Manual for Roads and Bridges (DMRB) LA 111[xviii] Table 3.12 '*Construction time period – LOAEL and SOAEL*' and Table 3.16 '*Magnitude of impact and construction noise descriptors'* and information provided within Appendix E of BS 5228:2009-1+A1:2014.

10.44. There are two aspects of vibration impact which need consideration according to BS5228-2:

- The impacts on people or equipment within buildings; and
- The impacts on buildings (or other structures) themselves.

10.45. There are currently no British Standards that provide a methodology for predicting levels of vibration from demolition and construction activities other than BS 5228-2:2009+A1:2014, which relates to percussive or vibratory rolling and piling only. People are sensitive to low levels of vibration being just perceptible at 0.3 mm/s Peak Particle Velocity (PPV) in residential environments with potential for complaints at 1.0 mm/s PPV. The magnitude of vibration on people has been derived from Table B1 of BS 5228-2:2009+A1:2014 and as detailed within DMRB LA 111 Table 3.31 '*Construction vibration LOAEL and SOAELs for all receptors*' and Table 3.3 '*Vibration level – magnitude of impact*'.

10.46. The potential for damage to buildings from vibration occurs at significantly higher levels than human perceptibility, with the probability of damage tending towards zero at ≤ 12.5 mm/s PPV.

10.47. The magnitude of noise and vibration impacts arising from construction phase are presented in Table 10.4.

Table 10.4: Magnitude of Construction Noise and Vibration

Magnitude	Demolition & Construction Noise Level dB $L_{Aeq,T}$	Level of Vibration mm/s PPV	Definition
Negligible	≤ Baseline (Prevailing) Noise Level	<0.3	The effect is not of concern
Small	≤Threshold Noise Level	≥0.3 to <1	The effect is undesirable but of limited concern
Medium	>Threshold Noise Level to <Threshold +5dB (or ≤75dB $L_{Aeq,T}$, whichever is highest	≥1 to <10	The effect gives rise to some concern but is likely to be tolerable depending on scale and duration
Large	>Threshold +5dB (or >75dB $L_{Aeq,T}$, whichever is highest	≥10	The effect gives rise to serious concern and it should be considered unacceptable, except for very brief exposure depending on the absolute level

Construction Traffic

10.48. The Calculation of Road Traffic Noise (CRTN)[xix] methodology has been used to determine the potential change in road traffic noise as a result of Development construction traffic by determining the percentage change in daily traffic volume and heavy goods vehicles (HGVs). The magnitude of change in noise level is presented as Table 10.5 and is based on DMRB criteria (Table 3.17 '*Magnitude of impact at receptors*').

Table 10.5: Magnitude of increase in road traffic noise during the construction period

Magnitude	Change in Road Traffic noise with Construction Traffic (dB)	Definition
Negligible	<1.0	The effect is not of concern
Small	≥1.0 to ≤3.0	The effect is of limited concern
Medium	>3.0 to <5.0	The effect gives rise to some concern depending on absolute levels and duration
Large	≥5.0	The effect gives rise to serious concern and it should be considered unacceptable where it increases the prevailing noise levels by this amount, depending on absolute level and duration. Note: noise from another road link may be the dominant source so the predicted increase may not be realised.

Complete and Operational Development

Fixed Plant, Building Services & Operational Noise (Break-Out, On-Site Vehicles Movements)

10.49. BS 4142:2014+A1:2019[xx] *'Methods for Rating and Assessing Industrial and Commercial Sound*', provides an assessment and rating method to assess the potential impact from a range of commercial and industrial noise sources, including fixed building services plant, within site HGV movements and loading and unloading of goods and materials.

10.50. The measured or predicted noise level from the source in question, the specific sound level ($L_{Aeq,T}$), immediately outside dwellings is compared with the background sound level ($L_{A90,T}$). Where the sound contains certain acoustic features at the assessment location (e.g., tones, impulses, intermittency etc.), then a scaled character correction is added to the specific sound level to obtain the rating level ($L_{Ar,Tr}$). The greater the difference the greater the magnitude, not taking 'context' into account. Context partially overlaps with significance of effect as it takes account of the sensitivity of the receptor. Further to this, context also takes account of the level and nature of the sound and inherent design measures (such as façade insulation treatment and acoustic treatment).

10.51. Noise from both HGVs and other vehicles, such as vans, has been predicted using the industry standard computer model CadnaA noise modelling software and have been input into the noise model as moving point sources.

10.52. Table 10.6 presents the magnitude of noise emissions from fixed external plant, building services and operational noise.

10.53. For general operational noise, such as on-site vehicle movements, a comparative noise assessment is also undertaken to provide context to the predicted specific noise level. Table 10.7 presents the magnitude of the change in the prevailing noise level due to general operational noise.

Table 10.6: Magnitude of Fixed Plant and Building Services Noise Emissions

Magnitude	Rating Level dB LAr,Tr (without context) Compared to Background Sound Level (LA90)	Definition (adapted from the CCC SPD)
None	Rating Level ≥ L_{A90}-10dB	Sound is likely to be inaudible and have no discernible impact on health or quality of life. No specific noise measures likely to be required.
Negligible	Rating Level ≥L_{A90}-5dB	Where the rating level of noise is below the background sound level by at least 5dB, this indicates that the proposed NGD is likely to be acceptable from a noise perspective. CCC will seek this level of compliance in noise sensitive areas and/or where there is a requirement to mitigate creeping background effects.
Small	Rating Level ≤ L_{A90}	Where the rating level of noise is equal to, or below the background noise level, this indicates that the proposed NGD may be acceptable from a noise perspective but will be more context dependent, i.e., extent and effect on noise sensitive receivers. Compliance with this range is where there is no requirement to mitigate creeping background effects.
Medium	Rating Level ≤ L_{A90}+5dB	Where the rating level of noise does not exceed the background noise level by up to 5dB, this indicates that the proposed NGD is less likely to be acceptable from a noise perspective and will be context dependent, i.e., extent and effect on noise sensitive receivers. CCC SPD state compliance with the range is typically only applicable to non-sensitive sites or where there are overriding other reasons why development should be considered. It will typically be necessary for the applicant to confirm how adverse impacts from the NGD will be mitigated and minimised.
Large	Rating Level > L_{A90+} 5dB	Where the rating level of noise is above the background noise level by more than 5dB, this indicates that the proposed NGD is unlikely to be acceptable from a noise perspective, depending on context.

Table 10.7: Magnitude of Change in Prevailing Noise Level

Change in prevailing noise level (dB)	Magnitude
0	None
>0 to <3	Negligible
3 to <5	Small
5 to <10	Medium
≥ 10	Large

Road traffic noise

10.54. Road traffic noise has been calculated using the calculation methodology of Calculation of Road Traffic Noise[xxi]. This has been used to predict the dB $L_{A10,18\ hour}$ Basic Noise Levels (BNL) for the year of completion with and without the Development.

10.55. The calculations use the 18-hr Average Annual Weekday Traffic (AAWT) flow, % HGV composition and average vehicle speed for each road link provided by the transport consultants WSP. The magnitude of the change in road traffic noise was evaluated by considering the estimated change in the $L_{A10,18\ hour}$

road traffic noise level on the local highway network as a result of the operation of the completed Development. The DMRB LA 111 provides magnitude criteria for short-term changes in operational road traffic noise levels which are reproduced in Tables 10.8.

Table 10.8: Magnitude of Change in Road Traffic Noise

Magnitude	Short-Term Change Road Traffic Noise Level (dB)
Negligible	<1.0
Small	1.0 to 2.9
Medium	3.0 to 4.9
Large	≥5.0

Limitations and Assumptions

Construction Noise and Vibration

10.56. The BS 5228 calculation methodologies allow accurate noise levels to be determined for various construction activities. However, at this stage, specific detail on the construction plant and machinery to be used (make/model) is not known. Several assumptions have therefore been made regarding the number and type of plant to be utilised, their location, and detailed operating arrangements. Some of this information would be clarified as the detailed design progresses and later when resources are mobilised and the contractor is appointed, but other information (such as exactly where the plant operates and for how long) would remain uncertain, even after works have commenced.

10.57. Construction noise levels have been based on generic plant detail contained within BS5228-1:2009+A1:2014 and information provided by the Applicant and set out in Chapter 5 Construction Methodology and Phasing. The available information is considered sufficient to undertake a noise assessment of the construction work, focussing on key activities operating at the Site, to identify whether a significant, albeit temporary, adverse noise effect is likely to arise at the nearest sensitive receptors. Full details of assumed plant complement and distance to receptors are presented within Appendix 10.3. In this respect, a medium to high degree of confidence is assigned to the predicted significance of the potential effects.

Baseline

10.58. This assessment is based upon noise monitoring conducted at the Site in February 2022. Data provided by the Office for National Statistics suggests that road traffic flows have largely returned to pre-covid figures and as such baseline noise data is considered to be both robust and representative of the existing noise climate.

10.59. Attempt was made to confirm acceptance of baseline noise monitoring locations with the Environmental Health Department of the Local Planning Authority but no response was received.

However, the monitoring locations are the same as those previously agreed for the extant planning permission on the site and as such are considered to be both robust and representative of the existing noise climate.

Fixed Plant and Building Services

10.60. At this stage of the Development design, the specific type and configuration of fixed plant and building services are not defined. Consequently, it is not possible to undertake predictions to determine whether appropriate standards would be met, so instead appropriate plant noise emission limits have been set.

Operational Vibration

10.61. The operational phase of the Development does not introduce activities that would give rise to vibration. On this basis, assessment of operational vibration has been scoped out of the assessment.

Baseline Conditions

Sensitive Receptors

10.62. There are a number of residential receptors surrounding the Site that may be adversely impacted by the Development. Table 10.9 presents the representative sensitive receptors selected together with the assigned sensitivity level. Sensitive receptor locations are indicated on Figure 10.1. Assessment has been completed for the closest sensitive receptors only so as to represent a worst case.

Table 10.9: Sensitive Receptors

Receptor Figure 10.1	Type of Receptor	Description / Name	Approximate Distance to Site Boundary (m)	Sensitivity
SR's A	Residential	Houses on Old School Lane/Stoney Lane	175m adjacent to western Site boundary	High
SR's B	Residential	Houses on Stanifield Lane	Immediately adjacent to Site boundary	High

Baseline Noise Levels

10.63. Long-term noise measurements were conducted at four key locations from Tuesday 1st February to Thursday 3rd February 2022, covering across the Site. Figure 10.1 illustrates the noise monitoring location and are described in Table 10.10.

Table 10.10: Description of Noise Monitoring Locations

Monitoring Location (Figure 10.1)	Description	Observations
LT1	Free-field noise measurement in the northern extents of the Site, adjacent to the A582. Microphone situated approx. ~1.5m above ground level (AGL).	Road traffic passing along the A582 was the dominant noise source at this region of the Site. Traffic was continuous.
LT2	Free-field noise measurement in the eastern extents of the Site, adjacent to Wigan Road. Microphone situated approx. ~1.5m above ground level.	Road traffic passing along Wigan Road was the dominant noise source at this region of the Site. Traffic was continuous.
LT3	Free-field noise measurement in the eastern extents of the Site, adjacent to Stanifield Lane. Microphone situated approx. ~1.5m above ground level.	Road traffic passing along Stanifield Lane was the dominant noise source at this region of the Site. Traffic was continuous.

10.64. Table 10.11 presents a summary of the results with full details presented within Appendix 10.2. Analysis of the measured data illustrated that weekday and weekend noise levels were comparable and therefore combined to derive a summary of the overall measured noise levels.

Table 10.11: Summary of Measured Noise Levels

Monitoring Location	Period (Duration)	$L_{Aeq,T}$ dB	$L_{A10,T}$ dB	$L_{A90,T}$ dB		$L_{AFmax,5min}$ dB	
		Average[1]	Average[2]	Range	Average[3]	Range	90th %ile
LT1	Day (16hr)	71	73	48 – 70	68	73 – 90	80
	Night (8hr)	65	66	40 – 69	44	69 – 92	78
LT2	Day (16hr)	74	77	51 – 66	63	62 – 98	88
	Night (8hr)	65	61	47 – 64	50	59 – 90	87
LT3	Day (16hr)	59	61	42 – 58	55	59 – 93	73
	Night (8hr)	53	64	37 – 55	42	49 – 80	42

Note 1: Logarithmic average
Note 2: Arithmetic average
Note 3: Modal average

10.65. Note: [1] Logarithmic average. [2] 90th Percentile. [3] Arithmetic average of survey period. [4] Modal value.

Likely Significant Effects

Construction Phase

Noise

10.66. Table 10.12 presents the predicted construction noise levels at the sensitive receptors identified in Table 10.9 for the main 'noisy' works. The results are worst-case as they assume works are being undertaken at the closest to the receptor with no mitigation. For soil compaction, earthworks and pavement works this is taken as the Site boundary. For piling, concreting and structural works this is taken as the shortest distance from the illustrative building locations.

10.67. For assessment purposes where piling is required, Continuous Flight Auger (CFA) piling method, which is the most benign, has been assessed. Calculation details together with assessment methodology to determine magnitude are presented in Appendix 10.3. Table 10.13 also presents the significance of effect, taking account of the sensitivity of the receptors identified in Table 10.9 and absolute predicted noise level in relation to the derived baseline noise level and threshold construction noise level. For each receptor, the daytime construction threshold level is 65dB $L_{Aeq,T}$. All effects are adverse, temporary and local.

Table 10.12: Construction Noise Level

ID	SR	Earthworks	Piling (CFA)	Concreting	Pavement
A	Old School Lane/ Stoney Lane	85	85	86	80
B	Stanifield Lane	61	61	62	56

Table 10.13: Construction Noise Effects

ID	SR	Earthworks	Piling (CFA)	Concreting	Pavement
A	Old School Lane / Stoney Lane	Major Adverse	Major Adverse	Major Adverse	Major Adverse
B	Stanifield Lane	Negligible	Negligible	Negligible	Negligible

10.68. The above assessment has been completed for the closest SRs to the Development. Should the residential part of the Development (Zone E) be constructed prior to the rest of the Development (Zones A to D), effects as presented for SR A, major adverse, would be expected for these receptors.

Vibration

10.69. Table 10.14 presents typical distances for various construction operations, which give rise to just perceptible vibration.

Table 10.14: Distance at which Vibration is just Perceptible

Construction Activity	Distance from Activity when Vibration may Just be Perceptible (metres)
Heavy vehicles	5 – 10
Excavation	10 – 15
CFA Piling	15 – 20

Note: Distances for perceptibility are only indicative and dependent upon a number of factors, such as the radial distance between source and receiver, ground conditions, and underlying geology.

10.70. Table 10.15 presents the qualitative level of vibration effects based on distance of construction works from the receptor and sensitivity of the receptor.

Table 10.15: Qualitative Effect from Vibration

SR ID	SR	Shortest Distance to Site Boundary	Shortest Distance to CFA Piling Works	Level of Effect On Disturbance to Humans
A	Old School Lane / Stoney Lane	10	10	Moderate Adverse
B	Stanifield Lane	150	150	Negligible

10.71. Due to distance separation between sensitive receptors and the construction works, the potential for adverse effects (disturbance to humans) resultant from vibration is considered to be short term, temporary and of moderate significance at SR A and of short term, temporary and of negligible significance at SR B. Such impacts would also be expected for residential receptors which form part of the Development.

10.72. Mitigation measures would be considered to reduce any potential adverse effects resultant from construction vibration and are outlined in the relevant section to this chapter.

Traffic

10.73. Construction traffic is likely to access the Site via the main distributor roads surrounding the Site, including Stanifield Lane, Lostock Lane (A582) and A49 Wigan Road. Once the primary access to the Site is constructed during the first phase of Development, vehicles will be able to access the Site from the Strategic Road Network via the M65 and M6. All traffic will be encouraged to avoid local settlement centres such as Bamber Bridge and Leyland.

10.74. At this stage in the application process and given the outline nature of the application the total number of construction vehicles is not yet known. However, typically for a perceptible increase in noise levels to arise a change in vehicle numbers of greater than 25% would be required. Given the busy nature of the surrounding road network such an increase in road traffic is unlikely and as such effects associated with construction related road traffic noise are considered negligible.

Complete and Operational Development

Fixed Mechanical Plant and Building Services

10.75. Given the outline nature of the application there are no specific details on fixed external plant and building services at this stage in the design of the Development. Given the lack of detail at this stage,

it is anticipated that noise from fixed mechanical plant and building services would be controlled through planning condition.

10.76. For this location the recommended criteria for fixed external plant and building services noise is not to exceed the prevailing representative background sound levels for the specific time period, but with a minimum rating value of 30dB $L_{Ar,Tr}$ during the night-time (23:00-07:00) period and a maximum rating value of 45dB $L_{Ar,Tr}$ during the day (07:00-19:00) and evening (19:00-23:00) periods. Rating levels of this magnitude would safeguard the existing residential amenity.

Table 10.16: Plant Noise Limits Based on Background Sound Levels

Monitoring Location	Period (Duration)	Typical Background Noise Level (dB $L_{A90,T}$)	Plant Noise Limit dB $L_{Ar,Tr}$ [1]
SRA – Old School Lane / Stoney Lane	Day (16hr)	55	≤45
	Night (8hr)	42	≤35
SRB – Stanifield Lane	Day (16hr)	55	≤45
	Night (8hr)	42	≤35

Note: [1] This will need to take account of acoustic character as defined in BS4142:2014+A1:2019. [2] Same noise criteria adopted as during the evening and night-time period as it doesn't make acoustic sense to set a daytime limit lower than the evening and night-time periods when the ambient noise levels (dB LAeq) is 3dB higher during the day when compared to that measured during the evening and night-time periods.

10.77. Provided the recommended noise limits in Table 10.16 are satisfied then both the magnitude and significance of effect are negligible and therefore insignificant. Achievement of these levels is likely to require mitigation, depending on the location of the fixed external plant and building services.

Noise Breakout from Industrial Storage and Commercial Uses

10.78. The Development includes a number of uses, these include a mix of industrial, storage and commercial uses located across Development Zones A, B, C and D. Given the outline nature of the Development the future occupants of the commercial, industrial and storage uses are not known. However, the construction of the units would be such that the building fabric would provide sufficient attenuation to noise to below the limiting criteria set out in Table 10.16. The control of noise breakout through the building fabric could be controlled by way of an appropriately worded planning condition to ensure negligible effects.

HGV Movements

10.79. Given the outline nature of the application, the exact number, vehicle types and opening hours of the units are not known. However, to allow the potential effects of the Development to be identified an indicative assessment has been completed based upon the illustrative masterplan. The assessment

accounts for noise from HGVs movements in/out and within the Site together with loading/unloading operations have the potential to adversely impact on the nearest sensitive receptors. This will be dependent on the number of HGVs, on-site manoeuvres (including reverse alarms), type of loading/unloading operations (via loading dock/side unloading) and operational hours.

10.80. As previously described noise from both HGVs and other vehicles, such as vans, has been predicted using CadnaA noise modelling software and have been input into the noise model as moving point sources.

10.81. The assumption is that all HGVs would be unloading via a docking system with no external loading via fork-lift trucks (FLTs) with vans unloaded by hand.

10.82. Tables 10.17 presents the predicted daytime and night-time operational noise levels associated with HGV movements.

Table 10.17: Scenario 1 Predicted Operational Daytime Noise Levels BS4142 Assessment

SR ID	SR	Period	Operational Specific Noise Level dB $L_{Aeq,T}$	Rating Penalty	Background Sound Level dB $L_{A90,T}$	Rating Level minus Background Sound Level	Effect with Context
A	Old School Lane / Stoney Lane	Daytime	45	0	55	-10	Negligible
		Night-time	38	0	42	-4	Negligible
B	Stanifield Lane	Daytime	42	0	55	-13	Negligible
		Night-time	34	0	42	-8	Negligible

10.83. Further to the above, at all of the locations the predicted specific sound level is below the prevailing ambient daytime and night-time noise levels resulting in negligible effects.

10.84. Further assessment of HGV noise would be completed as the design progresses and noise associated with these sources could be controlled by way of an appropriately worded planning condition.

Road Traffic Noise

10.85. Table 10.18 presents the predicted change in road traffic noise levels on the surrounding road network. The predicted increase in road traffic vehicles is predicted to be negligible except on M6 J8/5 (Northbound) and J4/J5 A6 Lostock Ln (Westbound) where an increase is predicted. These predicted increases are due to low flows in the with scheme scenario. In real terms the absolute levels are relatively low for busy A roads and Motorways. Full calculation details are presented in Appendix 10.4.

Table 10.18: Predicted Change in Road Traffic Noise Levels

Road Link	Predicted Change Road Traffic Noise Level dB(A)	Magnitude	Significance of Effect	Significance
B5254 (Northbound)	0.1	Negligible	Negligible	Insignificant
B5254 (Southbound)	0.2			
A582 Lostock Ln (Eastbound)	0.2			
A582 Lostock Ln (Westbound)	0.1			
Stanifield Ln (Northbound)	0.3			
Stanifield Ln (Southbound)	0.1			
Farington Road (Eastbound)	0.0			
Farington Road (Westbound)	0.1			
A6 London Way (Northbound)	0.1			
M65 Access (Northbound)	0.3			
M65 Access (Southbound)	0.1			
A582 Lostock Ln (Eastbound)	0.3			
A582 Lostock Ln (Westbound)	0.2			
Cuerden Way (Northbound)	0.5			
Cuerden Way (Southbound)	0.2			
J3/J4 A6 Lostock Ln (Eastbound)	0.1			
J3/J4 A6 Lostock Ln (Westbound)	0.0			
Three Rings Retail Park (Northbound)	0.0			
Three Rings Retail Park (Southbound)	0.1			
J2/J3 A6 Lostock Ln (Eastbound)	0.3			
J2/J3 A6 Lostock Ln (Westbound)	0.0			
B6258 (Northbound)	0.0			
B6258 (Southbound)	0.1			
J4/J5 A6 Lostock Ln (Eastbound)	0.3			
J4/J5 A6 Lostock Ln (Westbound)	0.0			
J4/9 A49 Wigan Rd (Northbound)	0.1			
J4/9 A49 Wigan Rd (Southbound)	0.1			
J3/J4 A6 Lostock Ln (Eastbound)	0.4			
J3/J4 A6 Lostock Ln (Westbound)	0.2			
M6 North (Northbound)	0.5			
M6 North (Southbound)	0.1	Negligible	Negligible	Insignificant
Church Rd (Eastbound)	0.3			
Church Rd (Westbound)	0.3			
M6 J8/5 (Northbound)	6.0	Large	Major	Significant
M6 J8/5 (Southbound)	0.0	Negligible	Negligible	Insignificant
J4/J5 A6 Lostock Ln (Eastbound)	0.5			

Road Link	Predicted Change Road Traffic Noise Level dB(A)	Magnitude	Significance of Effect	Significance
J4/J5 A6 Lostock Ln (Westbound)	1.2	Small	Minor	Insignificant
A5083 Stanified Ln (Northbound)	0.6	Negligible	Negligible	Insignificant

10.86. Further to the above it is important to note that there is a Noise Important Area (NIA) located immediately to the north of the site adjacent to the east bound carriageway of the A582. A predicted increase in noise levels along this road with the development in place would be 0.3dB. Such an increase would be imperceptible and as such it is unlikely that the development would adversely impacts upon the NIA.

Mitigation Measures

Construction Phase

10.87. A Construction Environmental Management Plan (CEMP) would be secured by planning condition and formulated in consultation with LCC, incorporating relevant legislation and other relevant guidance – see Chapter 5 Construction Methodology and Phasing generally for a discussion of some of the assumptions applying to the likely CEMP. The CEMP would set out a range of mitigation measures and environmental controls which would include the management of construction related noise and vibration. Control measures to minimise noise and would include but not limited to:

- Use of hoarding to the required height and density appropriate to the noise sensitivity of the Site;
- Use of modern, quiet and well-maintained machinery such as electric powered plant, where possible and hoists should use the Variable Frequency Converter drive system;
- Vehicles and mechanical plant used for the works would be fitted with exhaust silencers, which would be maintained in good and efficient working order and operated in such a manner as to minimise noise emissions in accordance with the relevant EU / UK noise limits applicable to that equipment or no noisier than would be expected based the noise levels quoted in BS 5228.
- Avoidance of unnecessary noise (such as engines idling between operations, excessive revving or engines) by effective site management.
- Use of acoustic screens or enclosures where possible to reduce localised noise emissions around key plant;
- Establish noise and vibration target levels (a Section 61 agreement under the Control of Pollution Act 1974 (COPA)) to reduce noise and vibration to a minimum in accordance with best practicable means, as defined in Section 72 of COPA;
- Off-site prefabrication or preparation of building elements where possible to reduce on-site works;
- Where required, monitoring of noise and vibration levels;

- Changing, where possible, methods and processes to keep noise and vibration levels low as reasonably practicable (e.g. dismantling rather than traditional demolition works where adjoining or immediately adjacent to buildings);
- Resilient mounting of plant/equipment where required to prevent vibration transfer into building structures;
- Use of broad-band audible alarms wherever practicable including reversing alarms and other equipment such as mobile elevated work platforms;
- Positioning and or screening plant as far away from residential property as physically possible.
- Works would be limited to the specified hours (08:00 and 18:00 Monday to Friday and 08:00 to 13:0 on Saturdays, excluding Public Holidays). Any works outside of these times will be agreed in advance with Lancashire County Council; and
- Liaison with the occupants of adjacent properties most likely to be affected by noise or vibration from activities on the Site. The occupants should be informed of the nature of the works, proposed hours of work and anticipated duration prior to the commencement of activities.

Construction traffic

10.88. Although potential effects are predicted to be predominantly negligible and therefore insignificant, it is recommended a Construction Logistics Plan secured by way of a planning condition is implemented to ensure the proposed construction traffic logistics is followed. This should include deliveries on a 'just in time basis' to avoid queuing of vehicles.

10.89. On the local road network, which has high volumes of traffic and HGVs, the additional vehicles during the construction period have been assessed to be insignificant. Despite this, consideration would also be given to the avoidance (or limited) use of these roads during peak hours, where practicable.

Complete and Operational Development

Fixed Plant and Building Services

10.90. Specific detail on the type and number of fixed plant and building services are not known, together with location. At this stage plant specification is sufficiently flexible as to ensure that suitably quiet, non-tonal plant can be procured and / or mitigation options such as screening (e.g., acoustic louvres) can be installed as necessary to ensure that guideline noise criteria are satisfied.

10.91. Measures to control noise from fixed mechanical plant to the required level would be inherent in the detailed design of the Development and secured through reserved matters applicationsmay include:

- Procurement of 'quiet' non-tonal plant;

- Locate plant and air vents away from sensitive receptors;
- Acoustic enclosures;
- In-duct attenuators;
- Acoustic louvres; and
- Isolation of plant from building structures.

Noise Breakout

10.92. The building envelope of the units would be designed to provide sufficient sound insulation to control noise break out from the industrial, storage and commercial units. Typically building fabric providing an acoustic performance of greater than 32dB R_{w+ctr} would be adequate.

HGV Movement

10.93. Noise associated with HGV movements associated with the proposed industrial and storage uses has been predicted to give rise to negligible adverse effects based upon the current indicative layout. Further assessment would be completed as the design progresses and where necessary acoustic screening provided between industrial uses and sensitive receptors. Control of noise associated with HGV movements within the Development could be secured by way of a suitably worded planning condition.

Road Traffic Noise

10.94. The greatest increase in noise levels is predicted to arise on the M6 Junction 8/5 Northbound. Although significant impacts have been identified on this link the overall predicted noise level is considered to be relatively low (61.7dB $L_{A10,18\ hour}$) given its location adjacent to the M6, as such no additional mitigation is proposed.

Residual Effects

Construction Phase

10.95. Based on information within BS5228-1:2009+A1:2014, the above mitigation measures should afford 15dB(A) of attenuation.

10.96. Table 10.19 presents the predicted level of noise and associated significance with mitigation of construction noise. The predicted effects are temporary, local and adverse effects of minor significance for SR A and Negligible effects for SRB.

Table 10.19: Construction noise level

ID	SR	Earthworks	Piling (CFA)	Concreting	Pavement
A	Old School Lane / Stoney Lane	68 Minor Adverse	67 Minor Adverse	68 Minor Adverse	68 Minor Adverse
B	Stanifield Lane	56 Negligible	55 Negligible	47 Negligible	41 Negligible

10.97. Table 10.20 presents the significance of the level of effect.

Table 10.20: Significance of residual effect from construction noise

SR ID	SR	Description	Significance
A	Old School Lane / Stoney Lane	When works are undertaken at the shortest distance away, there is the potential for the construction threshold noise level of 65dB $L_{Aeq,T}$ be exceeded but below the 75dB $L_{Aeq,T}$ which is regarded as the threshold limit.	**Minor Adverse - Insignificant**
B	Stanifield Lane	With CEMP provisions, the predicted construction noise levels are at or below the derived environmental noise levels.	**Negligible - Insignificant**

10.98. With the implementation of a CEMP, the effect at the sensitive receptor locations is considered be insignificant, provided the construction threshold noise limit of 75dB $L_{Aeq,T}$ is not exceeded. This could be controlled through a live noise monitoring system which would provide notification to the Principal Contractor before the noise limit is exceeded so that action can be taken, where required.

10.99. Should the construction threshold limit of 75dB $L_{Aeq,T}$ be exceeded, resulting in 'Significant' adverse effects, this would reduce to insignificant where the number of days that the noise levels are greater than75dB $L_{Aeq,T}$ does not exceed ten or more consecutive days (excluding Sunday's and Bank Holidays) or the total number of days does not exceed 40 in any six consecutive months. This reflects guidance contained within BS5228-1:2009+A1:2014, where above these levels, residents may qualify for temporary rehousing, and DMRB LA 111.

10.100. With the introduction of the CEMP and based on distance separation between works and receptors, the residual vibration effects are considered to be negligible and therefore insignificant at all receptors.

Operational Development

Fixed Plant and Building Services

10.101. With the implementation of mitigation to achieve the recommended plant noise limits within Table 10.16 residual effects would be **negligible and therefore insignificant.**

Noise Breakout

10.102. With the implementation of a façade providing a suitable degree of attenuation to noise the residual effects would be **negligible and therefore insignificant.**

HGV Noise

10.103. Based upon the indicative masterplan negligible effects as a result of HGV movements have been predicted. Residual effects would remain **negligible and as such insignificant.**

Road Traffic Noise

10.104. When considering both the change in noise levels and the overall predicted ambient noise levels the residual effects associated with road traffic noise are considered to be at worst **minor adverse and insignificant.**

Cumulative Effects

10.105. This section presents the assessment of cumulative effects (Type 2 Effects) resulting from the combination of effects from several developments (in this case, the Development together with other reasonably foreseeable schemes (hereafter referred to as 'cumulative schemes'), which individually might be insignificant, but when considered together could create a significant cumulative effect. The assessment of Type 1 Effects (resulting from the combination of individual effects from the Development) is presented in Chapter 13 Summary and Residual Effects.

Construction Phase

10.106. In the event that any cumulative schemes located within 200m of the Development are constructed concurrently, Type 2 cumulative noise and vibration effects could occur. There are currently no cumulative schemes located within 200m of the Development.

10.107. Nonetheless, should any cumulative development take place concurrently with the Development; provided mitigation in the form of suitable CEMPs are implemented at each of the cumulative schemes, the likely Type 2 cumulative residual effects in relation to construction generated noise and vibration are expected to be no different from those assessed for the Development, namely negligible to moderate adverse, local, temporary effects.

Operational Phase

10.108. Traffic data used to undertake the Road Traffic Noise assessment incorporates traffic flows for all cumulative schemes likely to be operational within this period as well as forecast growth in traffic. As such, it is considered a robust assessment. The predicted residual cumulative effect of traffic noise on all links are negligible.

10.109. For all other operational effects given the intervening distance between the Development and adjacent cumulative schemes, operational cumulative effects are considered to be negligible.

Summary

10.110. The noise and vibration effects of the Development have been established in accordance with published guidelines and best-practice. The assessment has used comprehensive baseline noise and vibration monitoring surveys, together with the identification of local receptors which would be sensitive to noise and vibration. The dominant noise sources at the Site are road traffic associated with the surrounding local highway network.

10.111. Construction works are likely to include activities that are predicted to result in a temporary increase in noise and vibration levels within areas and immediately adjacent to the Development. In particular, when activities are occurring closest to the sensitive receptors, this could result in temporary short-term effects on nearby occupants. A number of measures would be taken to minimise the amount of noise and vibration arising from the Site such as the careful selection of modern and quiet plant and machinery; the erection of suitable hoardings; the setting of noise and vibration limit levels which would be previously agreed with LCC; and the selection of specific construction techniques which would minimise levels of vibration. These measures would be included in the CEMP. With these measures in place residual noise effects would be predominantly negligible to moderate adverse effects, when works are being undertaken in close proximity to sensitive receptors.

10.112. With regards to vibration the majority of the identified sensitive receptors would be located at a sufficient distance from the works to ensure vibration effects would be negligible. However, for those receptors located within 10m of CFA piling some negligible to minor adverse effects are predicted.

10.113. With regard to the existing flows on the surrounding road network, it is considered that the likely effect of construction vehicles on noise levels would give rise to negligible effects at receptors during peak times, reducing to negligible significance at all other times. However, provided a traffic management scheme is implemented as part of the CEMP, negligible effects are anticipated for all sequences.

10.114. Items of fixed mechanical and building services plant, have the potential to generate noise. Suitable noise level limits have therefore been proposed to ensure that noise from plant does not cause disturbance at existing or future noise sensitive receptors and therefore negligible effects from these sources are expected provided noise limits are satisfied.

10.115. Noise effects from noise break out from non-residential uses are predicted to be negligible, controlled through façade design and management of open spaces. Servicing and deliveries would also give rise to negligible effects given careful design and management of service and delivery areas.

10.116. An assessment of the change in noise levels resulting from additional traffic generated by the Development is negligible for the majority of transport links.

10.117. Table 10.21 contains a summary of the likely significant effects of the Development.

Table 10.21: Table of Significance – Noise

Potential Effect	Nature of Effect (Permanent/ Temporary)	Significance (Major/Moderate/ Minor) (Beneficial/ Adverse/ Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/ Minor) (Beneficial/ Adverse/ Negligible)
				I	UK	E	R	C	B	L	
Construction											
Noise	Temporary	Major Adverse significant)	Mitigation measures as outlined in CEMP							X	Minor Adverse (insignificant)
Vibration	Temporary	Moderate Adverse (significant)	Mitigation measures as outlined in CEMP							X	Negligible (insignificant)
Traffic	Temporary	Negligible (insignificant)	Preparation of a construction logistics plan,							X	Negligible (insignificant)
Completed Development											
Fixed mechanical plant and building services	Permanent	Negligible (insignificant)	Compliance with plant noise limits							X	Negligible (insignificant)
Noise Breakout from Industrial, Storage and Commercial Uses	Permanent	Negligible (insignificant)	Provision of façade providing adequate acoustic performance.							X	Negligible (insignificant)
HGV Movements	Permanent	Negligible (insignificant)	None required							X	Negligible (insignificant)
Road Traffic Noise	Permanent	Major (significant)	None required				x				Minor Adverse (insignificant)
Cumulative Effects											
Construction											
Noise	Temporary	Major Adverse (significant)	Mitigation measures as outlined in CEMP							X	Minor Adverse (insignificant)
Vibration	Temporary	Moderate Adverse (significant)	Mitigation measures as outlined in CEMP							X	Negligible (insignificant)
Traffic	Temporary	Negligible (insignificant)	Preparation of a construction logistics plan,							X	Negligible (insignificant)
Operation											
Fixed mechanical plant and building services	Permanent	Negligible (insignificant)	Compliance with plant noise limits							X	Negligible (insignificant)

Road Traffic Noise	Permanent	Major (significant)	None required				x				Minor Adverse (insignificant)

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

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