Appendix 10.1

TECHNICAL GLOSSARY

Appendix 10.1 Technical Glossary

Table 10.1: Technical acoustic terms and definitions

Technical Term	Definition
A-weighting	The sensitivity of the ear is frequency dependent. Sound level meters are fitted with a weighting network which approximates to this response and allows sound levels to be expressed as an overall single figure value, in dB(A).
Ambient noise	Usually expressed using $L_{Aeq,T}$ unit, commonly understood to include all sound sources present at any particular site, regardless of whether they are actually defined as noise.
Background noise	The steady noise attributable to less prominent and mostly distant sound sources above which identifiable specific noise sources intrude.
The decibel (dB)	The unit used to describe the magnitude of sound is the decibel (dB) and the quantity measured is the sound pressure level. The decibel scale is logarithmic, and it ascribes equal values to proportional changes in sound pressure, which is a characteristic of the ear. Use of a logarithmic scale has the added advantage that it compresses the very wide range of sound pressures to which the ear may typically be exposed to a more manageable range of numbers. The threshold of hearing occurs at approximately 0 dB (which corresponds to a reference sound pressure of 2x10-5 Pa) and the threshold of pain is around 120 dB. The sound energy radiated by a source can also be expressed in decibels. The sound power is a measure of the total sound energy radiated by a source per second, in Watts. The sound power level, Lw, is expressed in decibels, referenced to 1012 W.
Frequency (Hz)	Frequency is analogous to musical pitch. It depends upon the rate of vibration of the air molecules that transmit the sound and is measured as the number of cycles per second or Hertz (Hz). The human ear is sensitive to sound in the range 20 Hz to 20,000 Hz (20 kHz). For acoustic engineering purposes, the frequency range is normally divided up into discrete bands. The most used bands are octave bands, in which the upper limiting frequency for any band is twice the lower limiting frequency, and one-third octave bands, in which each octave band is divided into three. The bands are described by their centre frequency value and the ranges which are typically used for building acoustics purposes are 63 Hz to 4 kHz (octave bands) and 100 Hz to 3150 Hz (one-third octave bands).
$L_{A10,18h}$	$L_{A10,18h}$ is the noise level exceeded for 10% of an 18-hour period (06:00 to 00:00) and is normally used in the UK to assess road traffic noise.
L_{A90}	L_{A90} is the noise level exceeded for 90% of the time and is normally used to describe background noise.
$L_{Aeq,\ T}$	The most widely applicable unit is the equivalent continuous A-weighted sound pressure level ($L_{Aeq,T}$). It is an energy average and is defined as the level of a notional sound which (over a defined period of time, T) would deliver the same A-weighted sound energy as the actual fluctuating sound.
$L_{Amax,T}$	$L_{Amax,T}$ is the maximum A-weighted sound pressure level, normally associated with a time weighting, F (fast) - $L_{AFmax,T}$, or S (slow) - $L_{ASmax,T}$.
Meteorological effects	Temperature and wind gradients affect noise transmission, especially over large distances. The wind effects range from increasing the level by typically 2 dB downwind, to reducing it by typically 10 dB upwind – or even more in extreme conditions. Temperature and wind gradients are variable and difficult to predict.

Technical Term	Definition
Peak particle velocity (PPV)	Peak Particle Velocity (PPV) is the instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position. PPV is the simplest indicator of both perceptibility and the risk of damage to structures.
Reflection	When sound waves encounter a hard surface, such as concrete, brickwork, glass, timber or plasterboard, they are reflected from it. As a result, the sound pressure level measured immediately in front of a building façade is approximately 3 dB higher than it would be in the absence of the façade.
Screening and diffraction	If a solid screen is introduced between a source and receiver, interrupting the sound path, a reduction in sound level is experienced. This reduction is limited, however, by diffraction of the sound energy at the edges of the screen. Screens can provide valuable noise attenuation, however. For example, a timber boarded fence built next to a motorway can reduce noise levels on the land immediately beyond, typically by around 10 dB(A). The best results are obtained when a screen is situated close to the source or close to the receiver.
Sound	The physical vibration in the air, propagating away from a source, whether heard or not.

Appendix 10.2

LEGISLATION, PLANNING POLICY AND GUIDANCE – FURTHER INFORMATION

Appendix 10.2 Legislation, Planning Policy and Guidance – Further Information

Table 10.2: Legislation Relevant to Noise and Vibration

Legislation	Description
Planning Act 2008	The Planning Act 2008 grants statutory authority unless there is a provision in a granted DCO to the contrary, with regard to noise nuisance. The Act also provides powers to modify legislation.
Land Compensation Act 1973 (LCA)	The Land Compensation Act 1973 provides for depreciation of an interest in land value caused by noise as a physical factor from public works (highway or aerodrome) to be compensated by the responsible authority. Compensation is payable where the noise either arises from activity on land taken (injurious affection) (Part II of the Act), or is physically unconnected to the land interest (Part 1 claims). The Act provides powers to sound-proof (noise insulate) buildings from noise arising from highways and aerodromes, and to pay expenses of persons moving temporarily during construction works (due to noise).
Noise Insulation Regulations 1975 and Noise Insulation (Amendment) Regulations 1988. Regulations under the LCA 1973.	The Noise Insulation Regulations 1975 set out the requirements under which buildings may qualify for noise insulation or to receive grants in relation to noise from new or altered roads. The Regulations also provide discretionary powers to provide noise insulation or temporary rehousing with regard to the construction of new or altered roads.
Control of Pollution Act 1974	The Control of Pollution Act 1974 provides the definition of Best Practicable Means (BPM) to minimise noise (including vibration), the basis for defence against noise abatement action taken by a local authority (section 60). The Act also provides for i) persons responsible to seek prior consent for works on construction sites including BPM steps to minimise noise and ii) the basis for defining codes of practice (applies to BS 5228:2009+A1:2014 ‘Code of practice for noise and vibration control on construction and open sites, Part 1: Noise and Part 2: Vibration’).
Environmental Protection Act (EPA) 1990	The Environmental Protection Act 1990 sets out the duty for local authorities to investigate and, where identified, take abatement action against noise nuisance. The Act provides the definition of Best Practicable Means (BPM) to minimise noise (including vibration), the basis for defence against noise abatement action taken by a local authority (section 80). The Act also provides for individuals to seek for abatement action to be taken by a magistrate’s court against noise nuisance (section 82).
The Environmental Noise (England) Regulations 2006	The Environmental Noise Regulations 2006 implement the EU Environmental Noise Directive (END) 2002/49/EC relating to the assessment and management of environmental noise. The regulations set out the requirement to undertake strategic noise mapping, on a five-year cycle, and implement Noise Action Plans for agglomerations and major roads, railways and airports.
Noise and Statutory Nuisance Act 1993	The Noise and Statutory Nuisance Act 1993 provides an extension of powers to abate noise nuisance to a wider range of sources than the Environmental Protection Act 1990.

Table 10.3: National and Local Policy of Particular Relevance to Noise and Vibration

Policy	Description
National Planning Policy Framework (NPPF), Ministry of Housing, Communities and Local Government (MHCLG), September 2023	The NPPF states the following in relation to noise: That 'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life; 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.' (Paragraph 185). The NPPF also states that 'Planning policies and decisions should contribute to and enhance the natural and local environment by: e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution' (Paragraph 174).
Noise Policy Statement for England (NPSE), Department for Environment, Food and Rural Affairs (Defra), March 2010	The Noise Policy Statement for England sets out the long-term vision of Government noise policy to 'Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.' (para 1.6) 'This long-term vision is supported by the following aims: Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development: 1. Avoid significant adverse impacts on health and quality of life 2. Mitigate and minimise adverse impacts on health and quality of life 3. Where possible, contribute to the improvement of health and quality of life.' (para 1.7) 'There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organization. They are: NOEL – No Observed Effect Level: This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise LOAEL – Lowest Observed Adverse Effect Level: This is the level above which adverse effects on health and quality of life can be detected.' (para 2.20) 'Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed negative effect level. SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.' (para 2.21) 'The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise negative effects on health and quality of life while also considering the guiding principles of sustainable development (para 1.8). This does not mean that such negative effects cannot occur.' (para 2.24) 'it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant negative impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.' (para 2.22)

Policy	Description
The Cherwell Local Plan 2011 - 2031 (incorporating re-adopted policy Bicester 13) (adopted July 2013)	Policy PSD 1: 'Presumption in Favour of Sustainable Development' sets out the Council's framework to guide development that creates positive, sustainable growth. Namely: When considering development proposals the Council will take a proactive approach to reflect the presumption in favour of sustainable development contained in the National Planning Policy Framework. The Council will always work proactively with applicants to jointly find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area. Planning applications that accord with the policies in this Local Plan (or other part of the statutory Development Plan) will be approved without delay unless material considerations indicate otherwise. Where there are no policies relevant to the application or relevant policies are out of date at the time of making the decision then the Council will grant permission unless material considerations indicate otherwise – taking into account whether: * any adverse impacts of granting permission would significantly and demonstrably outweigh the benefits, when assessed against the policies in the National Planning Policy Framework taken as a whole; * or specific policies in the Framework indicate that development should be restricted.
Mid-Cherwell Neighbourhood Plan 2018-2031 (May 2022)	Policy PC1: Local Employment Continued commercial use of premises providing local employment within the neighbourhood area or otherwise benefiting the local economy will be encouraged. Proposals for the establishment of new small businesses will be considered favourably where they:… c)are unlikely to generate a volume of goods traffic that would have a significantly harmful effect on road safety or congestion or cause unacceptable noise and disturbance for local residents or to the rural environment and would not adversely affect on-street residential parking.

Table 10.4: Other Important and Relevant Matters to Noise and Vibration

Guidance Document	Description
Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Noise Impact Assessment (2014)	The IEMA Guidelines provide key principles and methodological guidance on environmental noise impact assessment and how to effectively integrate noise impacts into the consenting process of all types of development.
World Health Organisation (WHO) Guidelines for Community Noise, 1999	The WHO Guidelines for Community Noise are partially superseded by the WHO Environmental Noise Guidelines for the European Region, 2018. However, the guideline values for internal noise and maximum noise levels from regular noise events remain relevant in the 1999 WHO guidelines.
WHO Night Noise Guidelines for Europe, 2009	The Night Noise Guidelines for Europe recommend a lowest observed adverse effect level (LOAEL) for night-time noise and an Interim Target.
WHO Environmental Noise Guidelines for the European Region, 2018	The Environmental Noise Guidelines for the European Region provide recommendations for protecting human health from exposure to environmental noise originating from various sources including road traffic, railway and aircraft noise. The 2018 Guidelines partially superseded the WHO Guidelines for Community Noise 1999 (see earlier entry in this table) but do not supersede the Night Noise Guidelines for Europe, 2009 (see earlier entry in this table). The recommendations include guideline values for aircraft noise, road traffic noise and railway noise using Lden and L_{night} metrics in terms of the onset of health effects.
BS 5228-1:2009+A1: 2014 Code of practice for noise and vibration control on construction and open sites: Part 1 – Noise (BS 5228-1)	Part 1 of BS 5228:2009+A1:2014 relates to the potential effects of existing noise sensitive human receptors as a result of noise arising from construction activities. This includes construction vehicles travelling on haulage routes to and from the construction site.
BS 5228-2 Code of Practice for Noise and Vibration Control on Open Construction Sites – Part 2: Vibration	Part 2 of BS 5228:2009+A1:2014 relates to the potential effects of existing noise sensitive human receptors as a result of vibration arising from construction activities. This includes construction vehicles travelling on haulage routes to and from the construction site.
BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings: 1-Vibration sources other than blasting 2-Blast-induced vibration	BS 6472-1 provides best available information on the application of methods of measuring and evaluating vibration in order to assess the likelihood of adverse comment. BS 6472-2 gives guidance on human exposure to blast-induced vibration in buildings.
BS 7385-2:1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground-borne vibration	BS 7385-2 gives guidance on the assessment of the possibility of vibration-induced damage in buildings due to a variety of sources, and identifies the factors which influence the vibration response of buildings.

Guidance Document	Description
BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound	BS 4142:2014+A1:2019 is the principal assessment methodology used to carry out assessments of sound of an industrial and/or commercial nature. It provides guidance on how to undertake the monitoring, modelling and assessment of industrial and commercial sound sources affecting noise sensitive receptors.
BS 8233:2014 Guidance on sound insulation and noise reduction for buildings	Provides guidance for the control of noise in and around buildings. It is applicable to the design of new buildings, or refurbished buildings undergoing a change of use.
BS 7445-1:2003. Description and measurement of environmental noise. Guide to quantities and procedures	BS 7445-1 defines the basic quantities to be used for the description of noise in community environments and describes basic procedures for the determination of these quantities.
Planning Practice Guidance Noise – PPG(N) 2022	Planning Practice Guidance Noise 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.' (Para 001) PPG(N) aligns with the NPSE and is based on the observed effect levels approach. PPG(N) introduces Unacceptable Adverse Effect Levels (UAELs) 'At the highest extreme, noise exposure would cause extensive and sustained changes in behaviour without an ability to mitigate the effect of noise. The impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation should be prevented from occurring.' (Para 005) Paragraph 005 provides the noise exposure hierarchy table based on the likely average response which underlies the assessment for this Scheme. (Para 005) PPG(N) sets out factors that influence whether noise may be a concern. 'The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any situation'. (Para 006)
ProPG Planning & Noise – Professional Practice Guidance on Planning & Noise, 2017	Professional Practice Guidance: Planning & Noise - New Residential Development (ProPG, 2017) is a joint publication by the Chartered Institute of Environmental Health (CIEH), the Association of Noise Consultants (ANC) and the Institute of Acoustics (IoA). The primary goal of ProPG is "to assist the delivery of sustainable development by promoting good health and wellbeing through the effective management of noise". The guidance has been produced to assist practitioners in matters relating to noise and new residential development. It focusses on existing transportation noise sources and has been developed to consider the Government's overarching noise policy, planning policy and policy guidance. It has also been developed to consider other authoritative sources of guidance such as British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233:2014). The guidance provides advice for Local Planning Authorities (LPAs) and developers, and practitioners. ProPG aims to: • Advocate the full consideration of the acoustic environment from the earliest

Guidance Document	Description
	possible stage of the development control process; • Promote and encourage the process of good acoustic design in and around new residential developments; • Set out the considerations which should be taken into account in deciding planning applications for new noise-sensitive developments; • Promoting the use of appropriate noise exposure standards and policies in assessment; and • Aid in the delivery of sustainable development.
Calculation of Road Traffic Noise (CRTN) (DfT, 1988)	The Calculation of Road Traffic Noise provides a methodology for the measurement and prediction of road traffic noise. CRTN was prepared to determine entitlement under the Noise Insulation Regulations 1975, but it is stated in the document, that the guidance is equally appropriate to the calculation of traffic noise for land use planning purposes.
Design Manual for Roads and Bridges: Sustainability & Environment Appraisal LA 111 Noise and vibration (LA 111) (2020)	LA 111 provides guidance on undertaking noise and vibration assessments on the impact of road projects. This includes assessing changes in traffic on existing roads, where it outlines the magnitude of impact in the short term and long term.
Transport Research Laboratory (TRL) Report 53 'Ground vibration caused by civil engineering works', 1986	This TRL paper addresses the problem of the specification, measurement and control of ground vibration which is caused by civil engineering works. In summary, the paper provides: a methodology for trial blasting, with recommendations for the deployment and specification of the equipment; data processing and presentation format and a 'site specific' scaling method which provides improved correlation between peak particle velocity and scaled distance; discussion on the use of peak particle velocity as a damage-hazard in relation to other dynamic parameters which also effect damage to structures; consideration to options regarding the distribution of vibration associated risks between Employer and Contractor in the context of legal and contractual obligations.
TRL Report 429 (TRL 429 'Ground-borne vibration caused by mechanised construction works', 2000	This TRL report provides data and advice against which objections to schemes may be judged, and methods for predicting the environmental impact of vibration caused by the operation of mechanised construction plant. Specific topics covered in the report are: a detailed review of the literature on ground vibrations from compaction, piling, tunnelling and other mechanised construction and ground improvement techniques; a review of national and European standards providing threshold values for damage and intrusion by ground-borne vibration; the acquisition of field data from construction sites for most types of vibratory site operations; l the execution of a full-scale trial to investigate ground-borne vibration caused by vibratory compaction plant; analysis of the vibration data acquired from construction sites, the full-scale trial and other research;

Guidance Document	Description
	prediction of vibration from mechanised construction operations. The proposed predictors allow the calculation of expected vibration levels of ground-borne vibration for the following activities: vibrating rollers; vibratory piling, including vibrated casings for bored piles; percussive piling; dynamic compaction; mechanised tunnelling; l vibratory ground treatment.

Appendix 10.3

CONSTRUCTION NOISE AND VIBRATION

Appendix 10.3 Construction Noise and Vibration

For the construction noise and vibration assessment the following spatial extents were considered:

- 300m: noise effects from construction activities, such as material movements, earthworks, ground improvement and piling, crushing and breaking;
- 100m: ground-borne vibration effects from high energy construction activities, including piling works; and
- 1dB change: noise effects from construction vehicle movements to and from the construction site likely to result in a change of 1 dB $L_{Aeq, T}$ or greater.

Assessment Criteria

The construction noise and vibration assessment is primarily based on the methodologies advocated within BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites Part 1: Noise and Part 2: Vibration'.

Part 1 relates to potential effects on existing and proposed noise sensitive human receptors resulting from noise and vibration from construction activities including construction vehicles which will be undertaken. Part 2 provides guidance on the assessment of ground-borne vibration associated with activities such as demolition and construction. Annex E BS 5228-2:2009+A1:2014, describes methods of estimating vibration emanating from proposed construction activities. Additional consideration is given to BS 7385-2:1993 'Evaluation and measurement for vibration in buildings. Guide to damage levels from ground borne vibration' (BS 7385-2, 1993).

The application of the thresholds of potential effect criteria for the purpose of assessing likely significant effects in terms of the EIA Regulations, and government noise policy defined significant effects on health and quality of life, is discussed in Section 10.3 of Chapter 10: Noise and Vibration.

Construction Noise – (Fixed and Mobile Plant)

The determination of effect thresholds for the construction noise assessment is based upon the methodologies presented within Annex E of BS 5228-1:2009+A1:2014 'ABC Method', as summarised in Table 10.5.

Table 10.5: Construction Noise (Fixed and Mobile Plant) – 'ABC Method' Noise Thresholds

Noise Source	Receptor	Period	Category A	Category B	Category C
Construction noise	Residential	Daytime	65 dB $L_{Aeq,12hr}$	70 dB $L_{Aeq,12hr}$	75 dB $L_{Aeq,12hr}$
	Residential	Evening	55 dB $L_{Aeq,4hr}$	60 dB $L_{Aeq,4hr}$	65 dB $L_{Aeq,4hr}$
	Residential	Night	45 dB $L_{Aeq,8hr}$	50 dB $L_{Aeq,8hr}$	55 dB $L_{Aeq,8hr}$
Clarifications and notes: Daytime: Weekdays (0700-1900hrs) and Saturdays (0700-1300hrs) Evening: Weekdays (1900-2300hrs), Saturdays (1300-2300hrs), Sundays and Bank Holidays (0700-2300hrs) Night-time: Weekdays, Weekends and Bank Holidays (2300-0700hrs)					
*Rounded to the nearest 5 dB					

The Category A noise thresholds are assumed to align with the Lowest Observed Adverse Effect Level (LOAEL) as they are the lowest threshold in the 'ABC Method' criteria.

The Category C noise thresholds are assumed to align with a Significant Observed Adverse Effect Level (SOAEL) and is an approach consistent with other major infrastructure projects, namely: Thames Tideway Tunnel; Crossrail; and High Speed 2 (HS2) Phase 1 and 2a.

The daytime Category C (SOAEL) threshold of 75 dB $L_{Aeq,\ 12hr}$ is taken from the Committee on the Problem of Noise: Noise report (Wilson, 1963) and was set to avoid interference with normal speech indoors.

The evening Category C (SOAEL) is set at 10 dB lower than the day-time criteria, based upon advice presented within the Department of the Environment Advisory Leaflet 72 – Noise Control on Building Sites (AL 72, 1976).

The night-time Category C (SOAEL) of 55 dB $L_{Aeq,\ 8hr}$ is consistent with advice presented within the WHO Night Noise Guidelines for Europe (WHO NNG, 2009).

The UAEL thresholds were based upon the BS 5228-1 (2014) requirements for temporary rehousing, associated with construction activities of 10 of more days of working in any 15 consecutive days, or for 40 or more days in any six consecutive months, and set at 10 dB above the SOAEL.

The construction noise assessments thresholds of potential effect criteria are summarised in Table 10.6 below.

Table 10.6: Thresholds of Potential Effect Criteria (outdoor, free-field noise levels unless otherwise stated)

Noise Source	Period	LOAEL	SOAEL	UAEL
Construction Noise	Daytime	65 dB $L_{Aeq,\ 12hr}$	75 dB $L_{Aeq,\ 12hr}$	85 dB $L_{Aeq,\ 12hr}$
	Evening	55 dB $L_{Aeq,4hr}$	65 dB $L_{Aeq,4hr}$	75 dB $L_{Aeq,4hr}$
	Night	45 dB $L_{Aeq,8hr}$	55 dB $L_{Aeq,8hr}$	65 dB $L_{Aeq,8hr}$

Where development related noise exposures are shown to be lower than the LOAEL values in Table 10.6, a significant effect in terms of the EIA Regulations was not deemed to occur at residential receptors.

Development related noise exposures which fall between LOAEL and SOAEL have the potential to constitute a significant effect, subject to additional considerations, namely:

- The level of noise exposure;
- The change in the noise exposure as a result of the Development; and
- The population experiencing such change and exposure to noise as a result of the Development.

Noise Exposure Classifications

Table 10.7 provides noise level categories between the LOAEL and UAEL thresholds. Greater weight in terms of significance evaluation has been given to higher noise levels, even when occurring between the same thresholds, i.e. LOAEL and SOAEL.

Table 10.7: Noise Level Categories

Noise Level	Construction Noise		
	Daytime	Evening	Night-time
Very Low	<65dB $L_{Aeq, 12hr}$	<55dB $L_{Aeq, 4hr}$	<45dB $L_{Aeq, 8hr}$
LOAEL			
Low	66-68dB $L_{Aeq, 12hr}$	56-58dB $L_{Aeq, 4hr}$	46-48dB $L_{Aeq, 8hr}$
Medium	69-71dB $L_{Aeq, 12hr}$	59-61dB $L_{Aeq, 4hr}$	49-51dB $L_{Aeq, 8hr}$
High	72-74dB $L_{Aeq, 12hr}$	62-64dB $L_{Aeq, 4hr}$	52-54dB $L_{Aeq, 8hr}$
SOAEL			
Very High	>75dB $L_{Aeq, 12hr}$	>65dB $L_{Aeq, 4hr}$	>55dB $L_{Aeq, 8hr}$
UAEL			
Unacceptable	>85dB $L_{Aeq, 12hr}$	>75dB $L_{Aeq, 4hr}$	>65dB $L_{Aeq, 8hr}$

Magnitude of Change in Noise Exposure

The magnitude of change in noise exposure is not considered as part of the construction noise assessment given there are no permanent construction related activities associated with the Site.

Construction Vibration

Construction activities, such as vibratory compaction, have the potential to cause vibration induced adverse effects at residential receptors.

The effect of human exposure to vibration from sources other than blasting is covered in BS 6472:2008. The standard provides guidance for predicting human response to vibration in buildings over the frequency range of 0.5 Hz to 80 Hz. It presents frequency-weighting curves for humans exposed to whole-body vibration, advice on measurement methods and methods for assessing continuous, intermittent and impulsive vibrations.

BS 6472:2008 uses the vibration dose value (VDV $ms^{-1.75}$) to determine the effect of vibration on human receptors within the buildings, as "[p]resent knowledge shows that this type of vibration is best evaluated with the vibration dose value (VDV)." As noted in BS 5228-2 (2014), for construction it is considered more appropriate to consider effects of vibration levels in terms of Peak Particle Velocity (PPV mms^{-1}).

The use of the PPV metric is also consistent with the guidance within BS 7385:1993, which presents assessment criteria to be applied for the likelihood of cosmetic damage to buildings. Table 10.8 presents a summary of the assessment criteria given in terms of human building response, derived based on guidance within BS 5228-2 (2014) and BS 7385:1993.

Table 10.8: Vibration limits for human response and building (cosmetic) damage

Vibration Limit PPV mms^{-1}	Effect	Magnitude of Impact
< 0.14	Vibration unlikely to be perceptible	None
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration	Negligible
0.30	Vibration might be just perceptible in residential environments	Minor
1.00	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given the residents	Moderate
7.50	Guide value for cosmetic damage of residential buildings where dynamic loading may lead to resonance	Significant
10.00	Vibration is likely to be intolerable for any more than a very brief exposure to these levels in most building environments	Very Significant

A significant effect from construction vibration is deemed to occur where there is an exceedance of a magnitude of impact of 1.00 mms^{-1} PPV during the daytime, or 0.30 mms^{-1} PPV during the night-time periods.

Construction Noise - Road Traffic

The assessment criteria used in the construction traffic assessment is consistent with the operational road traffic noise assessment, as summarised in Table 10.9.

Table 10.9: Thresholds of Potential Effect Criteria (outdoor, free-field noise levels unless otherwise stated)

Noise Source	Period	LOAEL	SOAEL	UAEL
Construction Road Traffic	Daytime	55 dB $L_{A10,18hr\ (f)}$	68 dB $L_{A10,18hr\ (f)}$	71 dB $L_{Aeq,16hr}$
	Night	40 dB L_{night}, outside	55 dB L_{night}, outside	66 dB $L_{Aeq,8hr}$

(f) - facade

Noise Exposure Classifications

Table 10.10 provides noise level categories between the LOAEL and UAEL thresholds. Greater weight in terms of significance evaluation has been given to higher noise levels, even when occurring between the same thresholds, i.e. LOAEL and SOAEL.

Table 10.10: Noise Level Categories

Noise Level	Construction Road Traffic	
Very Low	<55dB $L_{A10,18hr\ (f)}$	<40dB L_{night}, outside
LOAEL		
Low	55-59dB $L_{A10,18hr\ (f)}$	40-45dB L_{night}, outside
Medium	60-63dB $L_{A10,18hr\ (f)}$	46-49dB L_{night}, outside
High	64-67dB $L_{A10,18hr\ (f)}$	50-54dB L_{night}, outside
SOAEL		
Very High	>=68dB $L_{A10,18hr\ (f)}$	>=55dB L_{night}, outside

Unacceptable	>=71dB $L_{Aeq,16hr}$	>=66dB $L_{Aeq, 8hr}$

Magnitude of Change in Noise Exposure

A beneficial change was deemed to occur where there was a reduction in noise level, and an adverse change was where there was an increase.

The road traffic change in noise level criteria are for both short term and long term impacts, derived from methodologies advocated in LA 111, as summarised in Table 10.11.

Table 10.11: Change in Noise Level Categories

Noise Change Category	Road Traffic Noise
Negligible	<1 dB
Low	1 – 2.9 dB
Medium	3 – 4.9 dB
High	5 – 10 dB
Very High	>10 dB

Assessment Methodology

The construction programme has start dates in 2025 and completion dates in 2026.

Modelling Inputs and Assumptions

A spreadsheet-based noise model, using source sound emission data based upon a list of indicative plant items and assumptions on the likely percentage on-time during the relevant daytime assessment period, has been used to determine the likely sound immissions at each receptor. Sound power levels for each source have been adopted based on those provided by a typical example in the absence of specific plant being finalised at this stage.

An indicative construction plant list, likely working methods and phasing has been developed for the purpose of undertaking this assessment. The following work stages have been considered:

Stage 1 – Enabling works;

Stage 2 – Foundations and drainage works;

Stage 3 – Superstructure works;

Stage 4 – Internal building fitout works; and

Stage 5 – External areas and reinstatement works.

Information on the construction phasing and the associated construction plant used is summarised in Table 10.12, Table 10.13, Table 10.14, Table 10.15 and Table 10.16. The associated sound power level information as required for the noise prediction have been taken from those detailed within Annex C of BS 5228-1 (2014) and are also presented. It is assumed the same items of plant will be for the same construction phases for the Eastern Development and Western Developments, and Development site.

For the assessment of cumulative construction noise impacts, construction noise levels for the Development + Tritax Development scenario are considered. It is understood that the construction phasing of the Development and the Tritax Development broadly align, and Phase 1, Phase 2 and Phase 3 of the Tritax Development could take place concurrently with Stage 1, Stage 2 and Stage 3 respectively of the Development construction programme. Therefore, predicted construction noise levels for both developments have been logarithmically summed together for these construction phases for the Development + Tritax Development assessment scenario.

Having reviewed the ES chapter for the Tritax Development, the assessment of construction noise has been undertaken at Baynards Green, the Travelodge and Lone Barn. For the purpose of this assessment, predicted construction noise levels from the Tritax Development at Baynards Green are considered representative of R1, R2, R3, R4 and R6 as a worst-case. Construction noise levels at the Travelodge are considered representative of R5 and Lone Barn is outside the spatial extents of the construction noise assessment for the Development and has therefore not been considered further.

Construction activities are proposed during core (‘daytime’) working hours, and this is the basis of the assessment. For activities taking place outside of these hours, prior approval from the Local Planning Authority will be sought.

Table 10.12: Stage 1 - Enabling Works Plant List

Item of Plant / Equipment	Activity	No. of Plant	% On-time	BS5228 Table Reference	dB L_{WA}
Tracked Excavator	Excavating, Clearing Site and Loading	4	75	Table C.5.18	108
Excavator - breaking attachment	Breaking out Concrete Obstructions	1	50	Table D.8.13	110
Dozer	Earthworks	2	75	Table C.2.12	109
Articulated Dump truck	Removal of Material to on site store	2	75	Table C.4.1	109
5te Dumper	Removal of Material to on site store and general material movement	2	75	Table C.4.7	106
Tipper Truck	Visiting tipping material and muck away	3 /hr	n/a	Table D.3.112	113
Road Sweeper	Maintaining haul roads and perimeter roads	1	16	Table C.4.90	104
Hiab Trucks/ low-loaders	Delivery of materials and equipment	2 /hr	n/a	Table C.2.27	108
Concrete Trucks	Visiting for site establishment works	2 /hr	n/a	Table C.4.20	108
Roller/Compactor	Compacting haul roads, temporary parking and piling mat	2	50	Table C.2.42	106
Nail Gun	Used for installing hoarding	2	33.3	Table C.4.95	101
Power Tools/circular saw/still saw/ grinder	Used for installing, hoarding gates, etc	5	50	Table C.4.93	108
Chain Saw/ Shredder	Vegetation/tree removal	2	75	Table D.2.14	114
Diesel Generator	Power for Project Welfare and Offices and Tools	1	100	Table C.4.78	94
Diesel Generator	Power for Lighting and security	1	100	Table C.4.78	94

Table 10.13: Stage 2 - Foundations and Drainage Works Plant List

Item of Plant / Equipment	Activity	No. of Plant	% On-time	BS5228 Table Reference	dB L_{WA}
Piling Rig	Installing driven precast piles	3	100	Table C.12.37	111
5te Dumper	Removal of Material to on site store and general material movement	2	75	Table C.4.7	106
Forklift Truck	General Material movement	1	50	Table D.7.94	116
Tracked Excavator	Excavating, drainage trenches and Loading, lifting	4	75	Table C.5.18	108
Excavator - breaking/pile cropping attachment	Breaking out Concrete Obstructions and cropping piles	1	50	Table D.8.13	110
Tipper Truck	Visiting tipping material and muck away	3 /hr	n/a	Table D.3.112	113
Hiab Trucks/ low-loaders /General Trucks	Delivery of materials and equipment	2 /hr	n/a	Table C.2.27	108
Concrete Trucks	Visiting for foundation and drainage works	2 /hr	n/a	Table C.4.20	108
Roller/Compactor	Maintaining areas	2	50	Table C.2.42	106
Road Sweeper	Maintaining haul roads and perimeter roads	1	16	Table C.4.90	104
Power Tools/circular saw/still saw/ grinder	Used for formwork, drainage, etc	5	50	Table C.4.93	108
Diesel Generator	Power for Project Welfare and Offices and Tools	1	100	Table C.4.78	94
Diesel Generator	Power for Lighting and security	1	100	Table C.4.78	94

Table 10.14: Stage 3 - Superstructure Works Plant List

Item of Plant / Equipment	Activity	No. of Plant	% On-time	BS5228 Table Reference	dB L_{WA}
Mobile Crane	Lifting steel frame, cladding packs, etc	2	75	Table C.3.29	98
Hiab Trucks/ low-loaders/ General Trucks	Delivery of materials and equipment	2 /hr	n/a	Table C.2.27	108
Diesel Scissor lift/Cherry pickers	Access to Steel installation and cladding installation	8	50	Table C.4.59	106
Concrete Pump	Visiting	1	100	Table C.3.25	106
Concrete Trucks	Visiting for site concrete slab works	3 /hr	n/a	Table C.4.20	108
Petrol Power Float (Overnight)	Visiting for concrete pours	2	75	Table D.6.44	100
Power Tools/circular saw/still saw/ grinder/ nut runner	Used for formwork, steel frame bolts, cladding installation, etc	8	83	Table C.4.93	108
Diesel Generator	Power for Project Welfare and Offices and Tools	1	100	Table C.4.78	94
Diesel Generator	Power for Lighting and security	1	100	Table C.4.78	94

Table 10.15: Stage 4 - Internal Building Fitout Works Plant List

Item of Plant / Equipment	Activity	No. of Plant	% On-time	BS5228 Table Reference	dB L_{WA}
Mobile Crane	Lifting equipment	1	75	Table C.3.29	98
Hiab Trucks/ low-loaders/ General Trucks	Delivery of materials and equipment	2 /hr	n/a	Table C.2.27	108
Diesel Scissor lift/Cherry pickers	General access for external services	2	50	Table C.4.59	106
Forklift Truck	General Material movement	2	50	Table D.7.94	116
Diesel Generator	Power for Project Welfare and Offices and Tools	1	100	Table C.4.78	94
Diesel Generator	Power for Lighting and security	1	100	Table C.4.78	94

Table 10.16: Stage 5 - External Area & Reinstatement Works Plant List

Item of Plant / Equipment	Activity	No. of Plant	% On-time	BS5228 Table Reference	dB L_{WA}
Mobile Crane	Lifting equipment	1	75	Table C.3.29	98
Hiab Trucks/ low-loaders/ General Trucks	Delivery of materials and equipment	2 /hr	n/a	Table C.2.27	108
Diesel Scissor lift/Cherry pickers	General access for external buildings and lighting posts	2	50	Table C.4.59	106
Forklift Truck	General Material movement	1	50	Table D.7.94	116
Power Tools/circular saw/still saw/ grinder/ nut runner	General construction all areas	20	83	Table C.4.93	108
5te Dumper	General Material Movement	1	75	Table C.4.7	106
Tracked Excavator	Excavating trenches and Loading, lifting, road works	2	75	Table C.5.18	108
Tipper Truck	Visiting tipping material and muck away	2 /hr	n/a	Table D.3.112	113
Concrete Trucks	Visiting for foundation and reinstatement works	2 /hr	n/a	Table C.4.20	108
Roller/Compactor	Maintaining areas, road works	2	50	Table C.2.42	106
Road Sweeper	Maintaining haul roads and perimeter roads	1	16	Table C.4.90	104
Diesel Generator	Power for Project Welfare and Offices and Tools	1	100	Table C.4.78	94
Diesel Generator	Power for Lighting and security	1	100	Table C.4.78	94

The assumed distances between each of the assessed receptors and the construction phasing is summarised in the following tables, and is considered to be the worst-case distance i.e. the boundary of the closest structure, assumed to be the main working area, is shown.

Table 10.17: Construction Phasing and Receptor Distances – Eastern

Receptor	Distance between Construction Working Area and Receptor, metres (W – worst-case distance to boundary of closest working area)				
	Enabling	Foundations and Drainage	Superstructure	Internal Building Fitout	External Areas and Reinstatement
R1	340	340	340	340	340
R2	160	160	160	160	160
R3	135	135	135	135	135
R4	135	135	135	135	135
R5	145	145	145	145	145
R6	160	160	160	160	160

Table 10.18: Construction Phasing and Receptor Distances – Western

Receptor	Distance between Construction Working Area and Receptor, metres (W – worst-case distance to boundary of closest working area)				
	Enabling	Foundations and Drainage	Superstructure	Internal Building Fitout	External Areas and Reinstatement
R1	140	140	140	140	140
R2	180	180	180	180	180
R3	130	130	130	130	130
R4	130	130	130	130	130
R5	480	480	480	480	480
R6	180	180	180	180	180

Table 10.19: Construction Phasing and Receptor Distances - Development

Receptor	Distance between Construction Working Area and Receptor, metres (W – worst-case distance to boundary of closest working area)				
	Enabling	Foundations and Drainage	Superstructure	Internal Building Fitout	External Areas and Reinstatement
R1	140	140	140	140	140
R2	160	160	160	160	160
R3	130	130	130	130	130
R4	130	130	130	130	130
R5	145	145	145	145	145
R6	160	160	160	160	160

Assessment of Effects

Construction Noise (Fixed and Mobile Plant)

Eastern Development

As shown in Table 10.20, when works are undertaken at the worst-case positions there are no predicted exceedances of SOAEL during any of the considered construction phases.

It is noted that whilst medium and high noise levels are likely to occur at R3, R4 and R5 during some activities associated with the Enabling Works, Foundations and Drainage and External Areas and Reinstatement phases, it is likely that the noise levels will be significantly lower than those reported, since:

- The construction activities are transient, and therefore plant is unlikely to be located at the closest point to the receptor for a prolonged period of time; and
- It is unlikely that all construction plant with the greatest noise emissions will be operated concurrently, with each phase likely to be broken down into sequential activities.

Considering these points, and accounting for the noise reductions associated with the good practice site measures to be detailed within the Construction Environmental Management Plan (CEMP), a significance outcome of 'Not Significant' is determined.

Table 10.20: Construction Noise Levels – Eastern Development

Receptor	Sound Pressure Level at Receptors, $L_{Aeq, T}$, dB				
	Enabling	Foundations and Drainage	Superstructure	Internal Building Fitout	External Areas and Reinstatement
R1	62	62	60	59	64
R2	70	70	67	66	71
R3	71	71	69	68	73
R4	71	71	69	68	73
R5	71	71	68	67	72
R6	70	70	67	66	71

Western Development

As shown in Table 10.21, when works are undertaken at the worst-case positions there are no predicted exceedances of SOAEL during any of the considered construction phases.

It is noted that whilst medium and high noise levels are likely to occur at R3, R4 and R5 during some activities associated with the Enabling Works, Foundations and Drainage and External Areas and Reinstatement phases, it is likely that the noise levels will be significantly lower than those reported, as:

- The construction activities are transient, and therefore plant is unlikely to be located at the closest point to the receptor for a prolonged period of time; and

- Not all construction plant will be operated concurrently, with each phase likely to be broken down into sequential activities.

Considering these points, and accounting for the noise reductions associated with the good practice site measures to be detailed within the Construction Environmental Management Plan (CEMP), a significance outcome of 'Not Significant' is determined.

Table 10.21: Construction Noise Levels – Western Development

Receptor	Sound Pressure Level at Receptors, $L_{Aeq, T}$, dB				
	Enabling	Foundations and Drainage	Superstructure	Internal Building Fitout	External Areas and Reinstatement
R1	71	71	68	67	72
R2	69	69	66	65	70
R3	72	72	69	68	73
R4	72	72	69	68	73
R5	59	59	56	55	60
R6	69	69	66	65	70

Development Site

As shown in Table 10.22, when works are undertaken at the worst-case positions there are no predicted exceedances of SOAEL during any of the considered construction phases.

It is noted that whilst medium and high noise levels are likely to occur at R3, R4 and R5 during some activities associated with the Enabling Works, Foundations and Drainage and External Areas and Reinstatement phases, it is likely that the noise levels will be significantly lower than those reported, as:

- The construction activities are transient, and therefore plant is unlikely to be located at the closest point to the receptor for a prolonged period of time; and
- It is unlikely that all construction plant with the greatest noise emissions will be operated concurrently, with each phase likely to be broken down into sequential activities.

Considering these points, and accounting for the noise reductions associated with the good practice site measures to be detailed within the Construction Environmental Management Plan (CEMP), a significance outcome of 'Not Significant' is determined.

Table 10.22: Construction Noise Levels - Development

Receptor	Sound Pressure Level at Receptors, $L_{Aeq, T}$, dB				
	Enabling	Foundations and Drainage	Superstructure	Internal Building Fitout	External Areas and Reinstatement
R1	71	71	68	67	72
R2	70	70	67	66	71
R3	72	72	69	68	73

Receptor	Sound Pressure Level at Receptors, $L_{Aeq, T}$, dB				
	Enabling	Foundations and Drainage	Superstructure	Internal Building Fitout	External Areas and Reinstatement
R4	72	72	69	68	73
R5	71	71	68	67	72
R6	70	70	67	66	71

Development Site + Tritax Development

As shown in Table 10.23, when construction works are undertaken concurrently with the Tritax development, there are no predicted exceedances of SOAEL during any of the considered construction phases.

It is noted that whilst medium and high noise levels are likely to occur at R3, R4 and R5 during some activities associated with the Enabling Works, Foundations and Drainage and External Areas and Reinstatement phases, it is likely that the noise levels will be significantly lower than those reported, as:

- The construction activities are transient, and therefore plant is unlikely to be located at the closest point to the receptor for a prolonged period of time; and
- It is unlikely that all construction plant with the greatest noise emissions will be operated concurrently, with each phase likely to be broken down into sequential activities.

Considering these points, and accounting for the noise reductions associated with the good practice site measures to be detailed within the Construction Environmental Management Plan (CEMP), a significance outcome of 'Not Significant' is determined.

Table 10.23: Construction Noise Levels – Development + Tritax Development

Receptor	Sound Pressure Level at Receptors, $L_{Aeq, T}$, dB				
	Enabling	Foundations and Drainage	Superstructure	Internal Building Fitout	External Areas and Reinstatement
R1	71	71	69	67	72
R2	70	70	68	66	71
R3	72	72	70	68	73
R4	72	72	70	68	73
R5	71	71	69	67	72
R6	70	70	68	66	71

Construction Vibration (and Cosmetic Damage)

The prediction of vibration levels requires an understanding of the many factors which contribute to its propagation characteristics. These generally include an understanding of the source, intermediate ground structure, and receiving structure properties.

The spatial extents of the construction vibration assessment are set at 100 m, as at greater distances the levels of vibration from construction activities are unlikely to exceed the assessment thresholds.

As shown in Table 10.17, Table 10.18, and Table 10.19 the closest receptor to the construction works in the Eastern, Western and Development Sites are at a distance of more than 100m, and outside the spatial extents of the assessment.

Eastern Development

The closest receptor to the construction works is at a distance of 135 m and therefore outside the extents of the construction vibration assessment.

Construction related vibration immissions from the Eastern Development are likely to be below 1.00 mms^{-1} PPV during the daytime, and therefore a significant effect in terms of the EIA Regulations is not deemed to occur at residential receptors.

Western Development

The closest receptor to the construction works is at a distance of 130 m and therefore outside the extents of the construction vibration assessment.

Construction related vibration immissions from the Western Development are likely to be below 1.00 mms^{-1} PPV during the daytime, and therefore a significant effect in terms of the EIA Regulations is not deemed to occur at residential receptors.

Development

The closest receptor to the construction works is at a distance of 130 m and therefore outside the extents of the construction vibration assessment.

Construction related vibration immissions from the Development Site are likely to be below 1.00 mms^{-1} PPV during the daytime, and therefore a significant effect in terms of the EIA Regulations is not deemed to occur at residential receptors.

Construction Noise - Road Traffic

Construction road traffic assumptions are derived by the transport consultants and included in Chapter 8: Transport and Access.

With reference to the construction road traffic noise change criteria, traffic flows would need to increase by at least 25% in order to result in a noise level change of approximately +/- 1 dB. Existing flows on the surrounding road network are relatively high, and therefore relatively high construction activity flows would be required in order to result in a noise level change greater than ‘negligible’.

A specific comparison of the estimated HGV movements associated with the Enabling Works against those of the baseline levels on the A43 for the Enabling Works, Eastern Development, Western Development, and Development are set out in the following sections.

Enabling Works

Table 10.24: Percentage Increase in Daily HGV Movements During Construction (2026) – Enabling Works

Link	Baseline HGV Flows (2-way)	Predicted Increase in HGV Movements	% Increase
A43 (N)	6800	20	0.29%
A43 (S)	5766	20	0.35%

A construction traffic associated percentage change in flows of less than 25% is shown, and therefore a 'negligible' change in noise level, and a significance outcome of 'Not Significant'.

Eastern Development

Table 10.25: Percentage Increase in Daily HGV Movements During Construction (2026) – Eastern Development

Link	Baseline HGV Flows (2-way)	Predicted Increase in HGV Movements	% Increase
A43 (N)	6800	20	0.29%
A43 (S)	5766	20	0.35%

A construction traffic associated percentage change in flows of less than 25% is shown, and therefore a 'negligible' change in noise level, and a significance outcome of 'Not Significant'.

Western Development

Table 10.26: Percentage Increase in Daily HGV Movements During Construction (2026) – Western Development

Link	Baseline HGV Flows (2-way)	Predicted Increase in HGV Movements	% Increase
A43 (N)	6800	20	0.29%
A43 (S)	5766	20	0.35%

A construction traffic associated percentage change in flows of less than 25% is shown, and therefore a 'negligible' change in noise level, and a significance outcome of 'Not Significant'.

Development

Table 10.27: Percentage Increase in Daily HGV Movements During Construction (2023) – Development

Link	Baseline HGV Flows (2-way)	Predicted Increase in HGV Movements	% Increase
A43 (N)	6800	40	0.58%
A43 (S)	5766	40	0.69%

A construction traffic associated percentage change in flows of less than 25% is shown, and therefore a 'negligible' change in noise level, and a significance outcome of 'Not Significant'.

Development + Tritax Development

Table 10.28: Percentage Increase in Daily HGV Movements During Construction (2023) – Development + Tritax Development

Link	Baseline HGV Flows (2-way)	Predicted Increase in HGV Movements	% Increase
A43 (N)	6800	80	1.16%
A43 (S)	5766	80	1.37%

A construction traffic associated percentage change in flows of less than 25% is shown, and therefore a 'negligible' change in noise level, and a significance outcome of 'Not Significant'.

Proposed Management and Control Measures

No specific noise or vibration mitigation associated with the construction assessment is proposed beyond the good practice site measures to be detailed within the CEMP. The good practice site measures seek to minimise potentially adverse noise and vibration effects that result from development related construction activities. The CEMP will also outline the methodology to be adopted should a complaint be received regarding excessive noise and/or vibration levels.

Appendix 10.4

OPERATIONAL SOUND

Appendix 10.4 Operational Sound

To assess the effects of operational sound, the extents of the assessment include consideration of receptors where there is a likely indication of adverse impact.

Assessment Criteria

BS 4142 (2019) is the standard applicable to the assessment of sound of an industrial nature, such as that from the operation of the Development.

The BS 4142 (2019) methodology assesses the likely effects of sound on people and premises used for residential purposes, and provides an indication of the likely magnitude of impact. The BS 4142 (2019) magnitude of impacts, including where there is an indication of 'significant adverse impact' has been aligned with the effect levels in NPSE (2010), namely the SOAEL, which is the effect level above which significant adverse effects on health and quality of life occur.

For residential receptors during the daytime and night-time periods, the SOAEL threshold is set at 10 dB greater than the background sound level, when determined in accordance with the BS 4142 (2019) assessment procedure. When this threshold is exceeded it indicates that a significant adverse effect in EIA terms is likely to occur, subject to factors relating to context.

The LOAEL threshold is exceeded where the rating level is equal to or exceeds the background sound level. This is summarised in Table 10.29 below.

Table 10.29: BS 4142 (2019) LOAEL and SOAEL Criteria

Period	LOAEL	SOAEL
Daytime (0700-2300hrs)	Equal to background sound level, $L_{A90,T}$ (with consideration of context)	Background sound level, $L_{A90,T}$ + 10 dB (with consideration of context)
Night-time (2300-0700hrs)	Equal to background sound level, $L_{A90,T}$ (with consideration of context)	Background sound level, $L_{A90,T}$ + 10 dB (with consideration of context)

Development related noise exposures which fall between LOAEL and SOAEL have the potential to constitute a significant effect, subject to additional considerations, namely:

- The magnitude of the effect;
- The change in magnitude of the effect;
- The type of effect, including its intermittency;
- The existing ambient environment;
- How effective the measures employed to mitigate the effect are, including best practicable means (BPM); and
- The duration of effect.

Assessment Methodology

BS 4142 (2019) is used to rate and assess sound of an industrial nature including but not limited to assessing sound from proposed, new, modified or additional sources of industrial sound. It contains guidance on the monitoring and assessment of industrial and commercial sound sources (including fixed installations comprising mechanical and electrical plant and equipment) affecting residential receptors.

The methodology relies on comparing the rating level, $L_{Ar,Tr}$, (i.e. the specific noise from the equipment or source plus any allowance for character correction) with the background sound level, $L_{A90,T}$ (i.e. the level that would be present without the development) over a representative time period. BS 4142 (2019) provides guidance on the measurement of background sound, the determination of specific sound and calculation of the rating level.

In order to determine the impact threshold levels for the assessment of operational industrial sound, the difference between the rating level and background sound level is considered, as advocated by the methodology within BS 4142 (2019).

Noise Baseline

The noise baseline has been characterised over a noise survey. The noise survey was undertaken 06/07/2021 – 07/07/2021 at locations representative of the closest residential receptors.

The noise survey included unattended long-term measurements, supplemented by short-term measurements. The monitoring locations are presented in Figure 10.1, and a summarised in Table 10.30.

Figure 10.1: Monitoring Locations

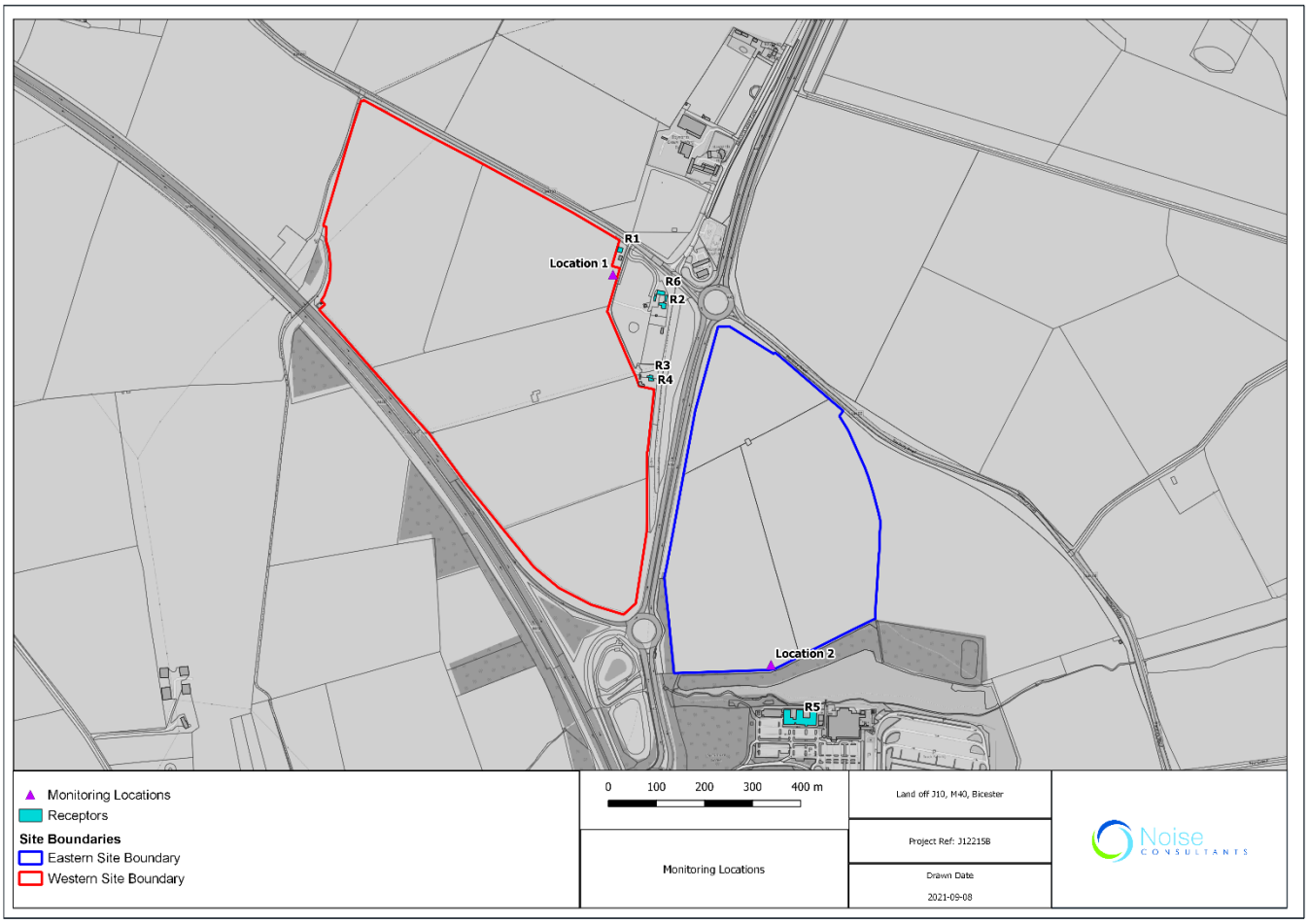


Table 10.30: Monitoring Locations

Monitoring Location	Location	Measurement Period (dd/mm/yyyy hh:mm)	Description
1	Western Site	06/07/2021 13:30hrs - 07/07/2021 13:00hrs	A measurement location at the northern section of the Western Development to quantify ambient noise levels representative of Baynard House, Baynard Barn, Medkre and The Cottages.
2	Eastern Site	06/07/2021 14:15hrs - 07/07/2021 13:30hrs	A measurement location at the southern section of the Eastern Development to quantify ambient noise levels representative of the Travelodge Hotel.

The calibration levels of the sound level meters (SLM) were checked before and after each measurement with no significant drift observed. Windshields were fitted to the microphones to minimise the effects of any wind induced sound.

Details of the monitoring instrumentation (model/serial numbers and calibration details) are summarised in Table 10.31. All instrumentation was configured to report a full suite of

environmental parameters, including L_{Aeq}, L_{A10}, L_{A90}, and L_{Amax}, in one-third octave bands, and capture audio.

Table 10.31: Monitoring Instrumentation Details

Monitoring Location	Monitoring Instrument	Serial Number	Last Calibration Date	Calibration Due Date
1	Rion NL-52 Class 1 Sound Level Meter	687044	27/02/2020	27/02/2022
2	Rion NL-52 Class 1 Sound Level Meter	1176453	03/08/2020	03/08/2022
N/a	Rion NC-75 Acoustic Calibrator	35281145	03/03/2021	03/03/2022

All measurements were conducted adopting methodologies advocated in BS 4142 (2019) and BS 7445-1:2003 'Description and measurement of environmental noise. Guide to quantities and procedures' (BS 7445, 2003). Photographs of the monitoring locations can be found in Figure 10.2 and Figure 10.3 below.

Figure 10.2: Monitoring Location 1

Figure 10.3: Monitoring Location 2

Measured Baseline Noise Levels

A summary of the measured levels used to inform the noise baseline at the closest residential receptors is presented in Table 10.32 below. The noise levels are rounded to the nearest whole decibel.

Table 10.32: Summary of Measured Baseline Noise Levels

Monitoring Location	Location	Period	dB $L_{Aeq,T}$	dB $L_{A90,15min}$ (Mean)	dB $L_{A90,15min}$ (Mode)	dB L_{Amax} (Max)
Location 1	Western Development - Adjacent to Medkre and Baynard House	Daytime (07:00 - 23:00)	59	57	58	78
		Night (23:00 - 07:00)	55	50	47	76
Location 2	Eastern Development - Adjacent to the Travelodge Hotel	Daytime (07:00 - 23:00)	57	54	55	77
		Night (23:00 - 07:00)	52	49	47	69

Time history charts of the measured levels captured are presented in Figure 10.4 and Figure 10.5. Observations of the acoustic environment at the survey locations are summarised in Table 10.33 below.

Figure 10.4: Location 1 Time History Chart

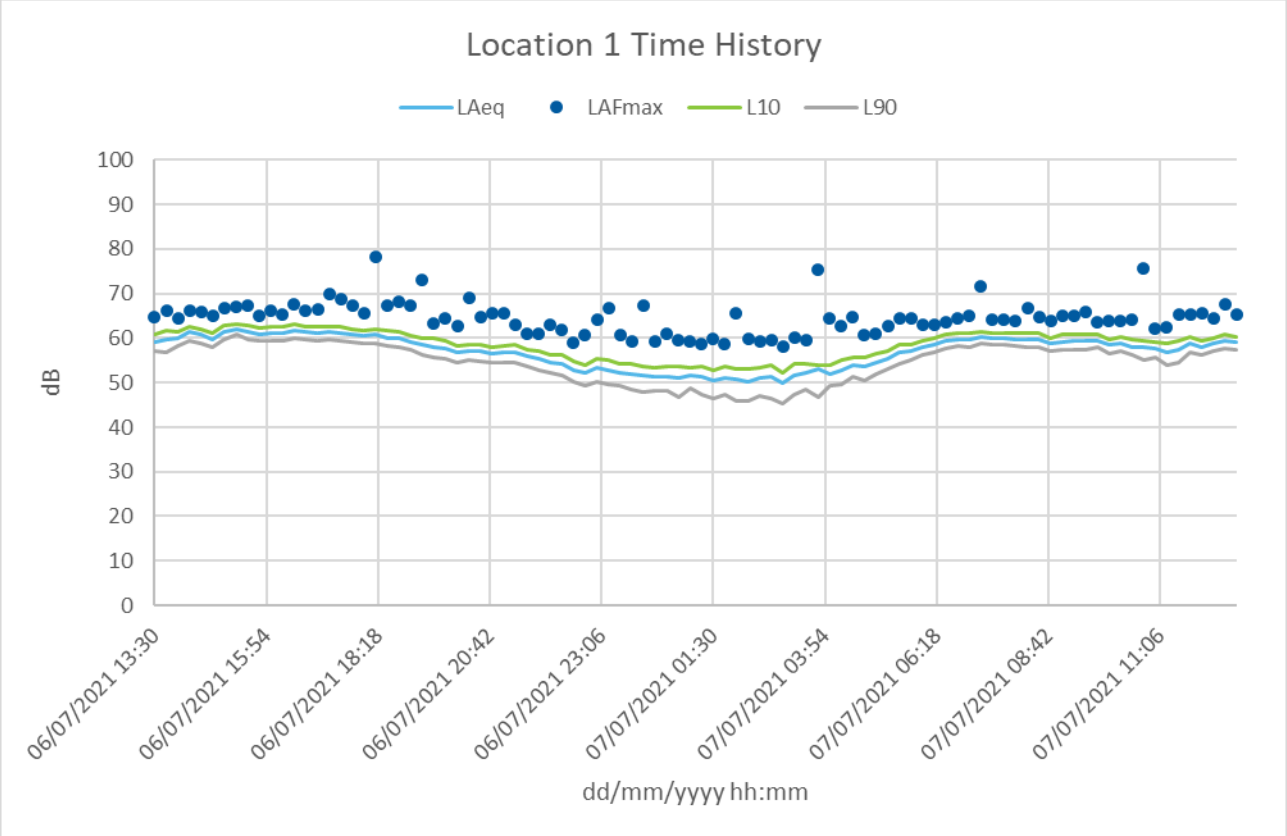


Figure 10.5: Location 2 Time History Chart

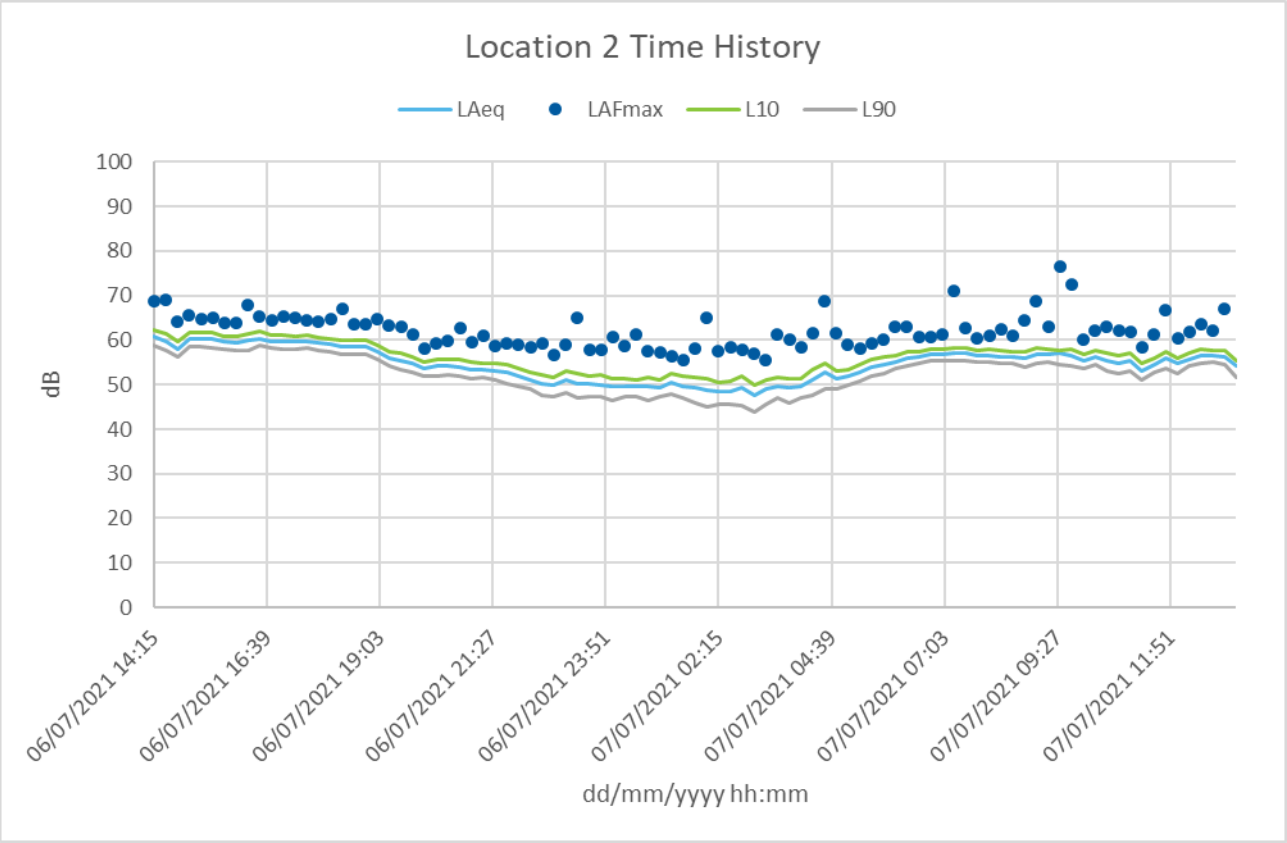


Table 10.33: Survey Observations

Monitoring Location	Observations
Location 1	Road traffic noise from the M40 to the southwest, B4100 to the north and the A43 to the east of the monitoring location was noted to be the dominant contributor to the ambient noise climate whilst an NCL consultant was on site. This included day and night periods.
Location 2	Road traffic noise from the M40 to the west and the A43 to the west of the monitoring location was noted to be the dominant contributor to the ambient noise climate whilst an NCL consultant was on site. This included day and night periods.

A representative background sound level (L_{A90}) is required to facilitate an assessment of impacts from an industrial sound source. In order to determine the representative background sound level at residential receptors for use in the assessment, consideration has been given to the mean and modal average $L_{A90,15min}$ captured at the monitoring locations, and the distribution of sound levels.

The derived background sound levels for the daytime (0700 – 1900) and night-time (2300 – 0700) periods are summarised in Table 10.34, along with a justification of the selected level to inform the assessment.

Table 10.34: Derived Background Sound Level Justification

Location	Period	Derived dB $L_{A90,15\ min}$	Justification
1	Daytime (0700-1900)	58	Most commonly occurring
	Night-time (2300-0700)	47	Most commonly occurring
2	Daytime (0700-1900)	55	Most commonly occurring
	Night-time (2300-0700)	47	Most commonly occurring

Modelling Inputs and Assumptions

The likely greatest operational sound sources from the Development include:

- Building services sound from the Development warehouses;
- Road traffic using roads within the Development site; and
- Road traffic movements in car park areas.

For the assessment of cumulative operational sound impacts, operational sound levels for the Development + Tritax Development scenario are considered.

Having reviewed the ES chapter for the Tritax Development, an assessment of operational sound has been undertaken at Baynards Green, the Travelodge and Lone Barn. For the purpose of this assessment, predicted operational sound levels from the Tritax Development at Baynards Green are considered representative of R1, R2, R3, R4 and R6 as a worst-case. Operational sound levels at the Travelodge are considered representative of R5 and Lone Barn is outside the spatial extents of the operational sound assessment for the Development and has therefore not been considered further.

Building Services Sound

Operational sound from building services has been calculated based on breakout noise from the proposed units. As details of the construction and makeup of the proposed units is unavailable at this stage, it is assumed that the cladding to be used will have similar sound reduction properties as Kingspan KS1000, which has been used on similar projects. Using an assumed internal noise level of 75 dB(A) and the assumed sound reduction index presented in Table 10.35 below, breakout sound levels have been calculated.

Table 10.35: Kingspan KS1000 Cladding SRI

Cladding	Rating, R_w	Octave Band Centre Frequency, Hz						
		125	250	500	1k	2k	4k	8k
Wall	25	18.0	20.0	24.0	20.0	29.0	39.0	47.0
Roof	23	15.0	17.0	23.0	18.0	25.0	40.0	46.0

Road traffic using roads within the Development site

Internal traffic movements have been calculated based on traffic flows derived from the transport chapter. The trip rates are determined based on the floor area of the proposed development. The trip rates and proposed floor areas for Units 1 - 5 are presented in Table 10.36 and Table 10.37, respectively. It is recognised that the final design, including location of internal roads, may change from those assessed, however the design upon which the assessment is based is considered to represent a conservative assessment.

Table 10.36: Trip Rates

Traffic Metric	Time Period	Trip Rates per 100m^2		
		Light Vehicles	HGV	Total
AM Peak	08:00-09:00	0.12	0.037	0.157
18h AAWT	06:00-24:00	1.602	0.601	2.204
8h AAWT	23:00-07:00	0.407	0.189	0.595

Table 10.37: Unit 1 - 5 Floor Areas

Proposed Warehouse Unit	Land Site	Floor Area (square meters)
Unit 1	Western	87586
Unit 2	Western	36423
Unit 3	Western	45697
Unit 4	Eastern	66081
Unit 5	Eastern	33309

Calculation of noise from traffic movements on roads within the Eastern, Western and Development Sites has been undertaken using methodologies advocated in BS5228-1 (2009). Table 10.38 presents the source sound power level data for HGV's and car movements, as used in the noise model.

Table 10.38: HGV & Light Vehicles Source Data

Source	Noise Level Reference	Octave Band Centre Frequency Lw(Z), Hz								Lw(A)
		63	125	250	500	1000	2000	4000	8000	
HGV	Measured	102.3	101.3	97.0	98.3	99.7	97.3	92.5	85.6	103.6
Car	Measured	101.3	96.2	92.7	94.2	97.8	89.5	82.7	73.8	99.3

Road traffic movements in car park areas

In the absence of a standard adopted methodology for the prediction of noise from car parks in the UK, a noise modelling exercise has been undertaken in line with the methodology of revisions 3 and 4 the Parkplatzlärmstudie des Bayerischen Landesamts für Umweltschutz (Bavarian Parking Lot Study of the Bavarian department for Environmental Protection) (the 'Bavarian method'). The calculations were undertaken using LimA® computational sound modelling software (version 2020).

The Bavarian method converts the number of movements per bay, per hour (daytime and night-time) and the number of bays within the car park into an area noise source for inclusion within the model. A $L_{Aeq,1h}$ and $L_{Aeq,15min}$ are then calculated for the day and night period respectively for an assessment in accordance with BS 4142 (2019).

The modelling is based on an assumed worst-case daytime hour and night-time 15-minute period, where all spaces in the car parks would be switched over during a shift change i.e.

- Daytime period (worst-case hour) – each space would be used by 2 vehicles per hour: and
- Night-time period (worst-case 15-minute period) – each space would be used by 2 vehicles.

Car park areas have been considered for both car parking and HGV parking taking into account the difference in source height between cars and HGVs. Car parking and HGV parking locations were provided on site plans from the architects.

For the purpose of the assessment, the operational sound level is assumed to a combination of the building services sound from the Development warehouses, road traffic using roads within the Development site and road traffic movements in car park areas. This is considered a conservative approach.

Car park areas have been considered for both car parking areas and HGV parking areas.

Assessment of Effects

The basic procedure of a BS 4142 (2019) assessment is to compare the operational sound level from the source(s) at the assessment location(s) (the specific sound level, Ls) with the existing acoustic environment (background sound level, $L_{A90,T}$).

The assessment is performed by comparing the rating level of the sound source(s), $L_{Ar,Tr}$, against the background sound level, $L_{A90,T}$. The background sound level should be measured during a period in absence of the influence of sound from the industrial sources. Guidance is provided on how to monitor and determine the background sound level, specific sound level and rating level.

Where there are certain acoustic features of the specific sound level, Ls that would likely increase the significance of impact, then an appropriate character correction is added to the specific sound level, Ls. This is referred to as the rating level $L_{Ar,Tr}$.

Character Correction Considerations

Tonality

A tonal correction between 0 and +6 dB can be applied for sounds that range from not tonal to prominently tonal. Several methodologies are presented in BS 4142 (2019) in order to determine the appropriate correction to be applied. Table 10.39 presents the subjective assessment method corrections for tonal sounds.

Table 10.39: Subjective Method – Rating Level Corrections for Tonal Sounds

Subjective assessment of sound source at the receptor	Correction
The tone is just perceptible at the receptor	+2 dB
The tone is clearly perceptible at the receptor	+4 dB
The tone is highly perceptible at the receptor	+6 dB

Impulsivity

An impulsivity correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Table 10.40 presents the subjective method corrections for impulsive sounds.

Table 10.40: Subjective Method – Rating Level Corrections for Impulsive Sounds

Subjective assessment of sound source at the receptor	Correction
Impulsivity is just perceptible at the receptor	+3 dB
Impulsivity is clearly perceptible at the receptor	+6 dB
Impulsivity is highly perceptible at the receptor	+9 dB

Intermittency and Other Sound Characteristics

Where the specific sound is of an intermittent character (i.e. it has identifiable on/off conditions), a penalty of +3 dB can be applied.

Based on the design information available, no character corrections are deemed necessary for the Development.

An assessment of impacts adopting the BS 4142 (2019) methodology for the daytime and night-time periods for the Eastern and Western Developments and the Development as a whole is set out below.

Eastern Development

Residential Receptors

A summary of the BS 4142 (2019) assessment at residential receptors is presented in the tables below.

As shown the predicted specific sound levels are more than 7 dB below the existing background sound level during the daytime. This is lower than the LOAEL threshold and a significance outcome of 'Not Significant' is determined.

During the night-time, the predicted sound levels are above the existing background by 1.7 dB and 2.2 dB at R3 and R4 respectively. This is greater than the LOAEL threshold, therefore the related noise exposures have the potential to constitute a significant effect subject to further considerations, including the change in ambient noise levels at the receptors during the assessment period.

Consideration has therefore been given to the change in the existing ambient environment associated with the proposed development. With reference to the baseline noise levels at Location 1 presented in Table 10.32, the predicted change in noise level during the night-time period associated with the proposed development is +0.9 dB and +1 dB at R3 and R4 respectively. As an increase of 3 dB is considered as the minimum perceptible under normal conditions, and an exceedance of the background sound level by 1.7 dB or 2.2 dB is 'less than adverse impact' in terms of BS 4142 (2019), a significance outcome of 'Not Significant' is determined.

Table 10.41: Assessment of Impacts – Daytime (0700-2300hrs)

Description	R1	R2	R3	R4	R6
Predicted Specific Sound Level, $L_{Aeq,T}$, dB	40.3	48.4	50.4	51.0	48.0
Character correction (Tonal)	+ 0	+ 0	+ 0	+ 0	+ 0
Rating Level $L_{Ar,Tr}$, dB	40.3	48.4	50.4	51.0	48.0
Background Sound Level dB $L_{A90,T}$ dB	58.0	58.0	58.0	58.0	58.0
Difference (Rating Level – Background Sound Level), dB	-17.7	-9.6	-7.6	-7.0	-10.0
Assessment Outcome	< LOAEL	< LOAEL	< LOAEL	< LOAEL	< LOAEL

Table 10.42: Assessment of Impacts – Night-time (2300-0700hrs)

Description	R1	R2	R3	R4	R6
Predicted Specific Sound Level, $L_{Aeq,T}$, dB	38.5	46.6	48.7	49.2	46.2
Character correction (Tonal)	+ 0	+ 0	+ 0	+ 0	+ 0
Rating Level $L_{Ar,Tr}$, dB	38.5	46.6	48.7	49.2	46.2
Background Sound Level dB $L_{A90,T}$ dB	47.0	47.0	47.0	47.0	47.0
Difference (Rating Level – Background Sound Level), dB	-8.5	-0.4	+1.7	+2.2	-0.8
Assessment Outcome	< LOAEL	< LOAEL	LOAEL – SOAEL	LOAEL – SOAEL	< LOAEL

Non-Residential Receptors

A summary of the operational sound assessment at identified non-residential receptors is presented in the table below.

As shown, the predicted sound levels during the daytime period are 1.6 dB below the noise criterion, and a significance outcome of 'Not Significant' is determined.

The predicted sound levels during the night-time period are 1.7 dB above the noise criterion. Therefore, the related noise exposure has the potential has the potential to constitute a significant effect subject to further considerations, including the change in ambient noise level at the receptor during the assessment period.

Consideration has therefore been given to the change in the existing ambient environment associated with the proposed development. With reference to the baseline noise levels at Location 2 presented in Table 10.32, the predicted change in noise level during the night-time period is +1.1 dB. As an increase of 3 dB is considered as the minimum perceptible under normal conditions, a significance outcome of 'Not Significant' is determined.

Table 10.43: Assessment of Impacts – Non-Residential Receptors

Receptor	Period	Predicted Specific Sound Level, $L_{Aeq,T}$, dB	Noise Criterion, dB	Margin, dB	Change in Ambient, dB	Outcome
R5	Daytime	48.4	50.0	-1.6	+0.6	Not Significant
R5	Night-time	46.7	45.0	+1.7	+1.1	Not Significant

Western Development

A summary of the BS 4142 (2019) assessment at residential receptors is presented in the tables below.

As shown the predicted specific sound levels are more than 7 dB below the existing background sound level during the daytime. This is lower than the LOAEL threshold and a significance outcome of 'Not Significant' is determined.

During the night-time, the predicted sound levels are above the existing background by 5.4 dB, 0.2 dB, 2.0 dB. 1.4 dB and 2.8 dB at R1, R2, R3, R4 and R6 respectively. This is greater than the LOAEL threshold, therefore the related noise exposures have the potential to constitute a significant effect subject to further considerations, including the change in ambient noise levels at the receptors during the assessment period.

Consideration has therefore been given to the change in the existing ambient environment associated with the proposed development. With reference to the baseline noise levels at Location 1 presented in Table 10.32, the predicted change in noise level during the night-time period associated with the proposed development is +1.9 dB, +0.7 dB, +1.0 dB, +0.9 dB and +1.1 dB at R1, R2, R3, R4 and R6 respectively. As an increase of 3 dB is considered as the minimum perceptible under normal conditions, a significance outcome of 'Not Significant' is determined.

Table 10.44: Assessment of Impacts – Daytime (0700-2300hrs)

Description	R1	R2	R3	R4	R6
Predicted Specific Sound Level, $L_{Aeq,T}$, dB	54.7	49.1	51.0	50.3	52.0
Character correction (Tonal)	+ 0	+ 0	+ 0	+ 0	+ 0
Rating Level $L_{Ar,Tr}$, dB	54.7	49.1	51.0	50.3	52.0
Background Sound Level dB $L_{A90,T}$ dB	58.0	58.0	58.0	58.0	58.0
Difference (Rating Level – Background Sound Level), dB	-3.3	-8.9	-7.0	-7.7	-6.0
Assessment Outcome	< LOAEL	< LOAEL	< LOAEL	< LOAEL	< LOAEL

Table 10.45: Assessment of Impacts – Night-time (2300-0700hrs)

Description	R1	R2	R3	R4	R6
Predicted Specific Sound Level, $L_{Aeq,T}$, dB	52.4	47.2	49.0	48.4	49.8
Character correction (Tonal)	+ 0	+ 0	+ 0	+ 0	+ 0
Rating Level $L_{Ar,Tr}$, dB	52.4	47.2	49.0	48.4	49.8
Background Sound Level dB $L_{A90,T}$ dB	47.0	47.0	47.0	47.0	47.0
Difference (Rating Level – Background Sound Level), dB	+5.4	+0.2	+2.0	+1.4	+2.8
Assessment Outcome	LOAEL – SOAEL	LOAEL – SOAEL	LOAEL – SOAEL	LOAEL – SOAEL	LOAEL – SOAEL

Non-Residential Receptors

A summary of the operational sound assessment at identified non-residential receptors is presented in the table below. As shown, the predicted sound levels are more than 4 dB below the noise criterion, and a significance outcome of 'Not Significant' is determined.

Table 10.46: Assessment of Impacts – Non-Residential Receptors

Receptor	Period	Predicted Specific Sound Level, $L_{Aeq,T}$, dB	Noise Criterion, dB	Margin, dB	Change in Ambient, dB	Outcome
R5	Daytime	42.4	50.0	-7.6	+0.1	Not Significant
R5	Night-time	40.5	45.0	-4.5	+0.3	Not Significant

Development

A summary of the BS 4142 (2019) assessment at residential receptors is presented in the tables below.

As shown the predicted specific sound levels are more than 3 dB below the existing background sound level during the daytime. This is lower than the LOAEL threshold and a significance outcome of 'Not Significant' is determined.

During the night-time, the predicted sound levels are above the existing background by 5.4 dB, 2.9 dB, 3.5 dB. 3.7 dB and 2.8 dB at R1, R2, R3, R4 and R6 respectively. This is greater than the LOAEL threshold, therefore the related noise exposures have the potential to constitute a significant effect subject to further considerations, including the change in ambient noise levels at the receptors during the assessment period.

Consideration has therefore been given to the change in the existing ambient environment associated with the proposed development. With reference to the baseline noise levels at Location 1 presented in Table 10.32, the predicted change in noise level during the night-time period associated with the proposed development is +1.9 dB, +1.2 dB, +1.3 dB, +1.4 dB and +1.1 dB at R1, R2, R3, R4 and R6 respectively. As an increase of 3 dB is considered as the minimum perceptible under normal conditions, a significance outcome of 'Not Significant' is determined.

Table 10.47: Assessment of Impacts – Daytime (0700-2300hrs)

Description	R1	R2	R3	R4	R6
Predicted Specific Sound Level, $L_{Aeq,T}$, dB	54.7	51.7	52.4	52.4	52.0
Character correction (Tonal)	+ 0	+ 0	+ 0	+ 0	+ 0
Rating Level $L_{Ar,Tr}$, dB	54.7	51.7	52.4	52.4	52.0
Background Sound Level dB $L_{A90,T}$ dB	58.0	58.0	58.0	58.0	58.0
Difference (Rating Level – Background Sound Level), dB	-3.3	-6.3	-5.6	-5.6	-6.0
Assessment Outcome	< LOAEL	< LOAEL	< LOAEL	< LOAEL	< LOAEL

Table 10.48: Assessment of Impacts – Night-time (2300-0700hrs)

Description	R1	R2	R3	R4	R6
Predicted Specific Sound Level, $L_{Aeq,T}$, dB	52.4	49.9	50.5	50.7	49.8
Character correction (Tonal)	+ 0	+ 0	+ 0	+ 0	+ 0
Rating Level $L_{Ar,Tr}$, dB	52.4	49.9	50.5	50.7	49.8
Background Sound Level dB $L_{A90,T}$ dB	47.0	47.0	47.0	47.0	47.0
Difference (Rating Level – Background Sound Level), dB	+5.4	+2.9	+3.5	+3.7	+2.8
Assessment Outcome	LOAEL – SOAEL	LOAEL – SOAEL	LOAEL – SOAEL	LOAEL – SOAEL	LOAEL – SOAEL

Non-Residential Receptors

A summary of the operational sound assessment at identified non-residential receptors is presented in the table below.

As shown, the predicted sound levels during the daytime period are 1.3 dB below the noise criterion, and a significance outcome of 'Not Significant' is determined.

The predicted sound levels during the night-time period are 2.0 dB above the noise criterion. Therefore, the related noise exposure has the potential to constitute a significant effect subject to further considerations, including the change in ambient noise level at the receptor during the assessment period.

Consideration has therefore been given to the change in the existing ambient environment associated with the proposed development. With reference to the baseline noise levels at Location 2 presented in Table 10.32, the predicted change in noise level during the night-time period is +1.2 dB. As an increase of 3 dB is considered as the minimum perceptible under normal conditions, a significance outcome of 'Not Significant' is determined.

Table 10.49: Assessment of Impacts – Non-Residential Receptors

Receptor	Period	Predicted Specific Sound Level, $L_{Aeq,T}$, dB	Noise Criterion, dB	Margin, dB	Change in Ambient, dB	Outcome
R5	Daytime	48.7	50.0	-1.3	+0.6	Not Significant
R5	Night-time	47.0	45.0	+2.0	+1.2	Not Significant

Proposed Management and Control Measures

The assessment outcome is 'Not Significant' for all assessed scenarios. No specific noise mitigation associated with the operational sound assessment is proposed.

Development + Tritax Development

A summary of the BS 4142 (2019) assessment at residential receptors is presented in the tables below.

As shown the predicted specific sound levels are more than 3 dB below the existing background sound level during the daytime. This is lower than the LOAEL threshold and a significance outcome of 'Not Significant' is determined.

During the night-time, the predicted sound levels are above the existing background by 5.5 dB, 3.1 dB, 3.7 dB. 3.9 dB and 3 dB at R1, R2, R3, R4 and R6 respectively. This is greater than the LOAEL threshold, therefore the related noise exposures have the potential to constitute a significant effect subject to further considerations, including the change in ambient noise levels at the receptors during the assessment period.

Consideration has therefore been given to the change in the existing ambient environment associated with the Development + Tritax Development. With reference to the baseline noise levels at Location 1 presented in Table 10.32, the predicted change in noise level during the night-time period associated with the proposed development is +1.9 dB, +1.2 dB, +1.4 dB, +1.4 dB and +1.2 dB at R1, R2, R3, R4 and R6 respectively. As an increase of 3 dB is considered as the minimum perceptible under normal conditions, a significance outcome of 'Not Significant' is determined.

Table 10.50: Assessment of Impacts – Daytime (0700-2300hrs)

Description	R1	R2	R3	R4	R6
Predicted Specific Sound Level, $L_{Aeq,T}$, dB	54.8	51.9	52.6	52.6	52.2
Character correction (Tonal)	+ 0	+ 0	+ 0	+ 0	+ 0
Rating Level $L_{Ar,Tr}$, dB	54.8	51.9	52.6	52.6	52.2
Background Sound Level dB $L_{A90,T}$ dB	58.0	58.0	58.0	58.0	58.0
Difference (Rating Level – Background Sound Level), dB	-3.2	-6.1	-5.4	-5.4	-5.8
Assessment Outcome	< LOAEL	< LOAEL	< LOAEL	< LOAEL	< LOAEL

Table 10.51: Assessment of Impacts – Night-time (2300-0700hrs)

Description	R1	R2	R3	R4	R6
Predicted Specific Sound Level, $L_{Aeq,T}$, dB	52.5	50.1	50.7	50.9	50.0
Character correction (Tonal)	+ 0	+ 0	+ 0	+ 0	+ 0
Rating Level $L_{Ar,Tr}$, dB	52.5	50.1	50.7	50.9	50.0
Background Sound Level dB $L_{A90,T}$ dB	47.0	47.0	47.0	47.0	47.0
Difference (Rating Level – Background Sound Level), dB	+5.5	+3.1	+3.7	+3.9	+3.0
Assessment Outcome	LOAEL – SOAEL	LOAEL – SOAEL	LOAEL – SOAEL	LOAEL – SOAEL	LOAEL – SOAEL

Non-Residential Receptors

A summary of the operational sound assessment at identified non-residential receptors is presented in the table below.

As shown, the predicted sound levels during the daytime period are 1.1 dB below the noise criterion, and a significance outcome of 'Not Significant' is determined.

The predicted sound levels during the night-time period are 2.2 dB above the noise criterion. Therefore, the related noise exposure has the potential to constitute a significant effect subject to further considerations, including the change in ambient noise level at the receptor during the assessment period.

Consideration has therefore been given to the change in the existing ambient environment associated with the Development + Tritax Development. With reference to the baseline noise levels at Location 2 presented in Table 10.32, the predicted change in noise level during the night-time period is +1.2 dB. As an increase of 3 dB is considered as the minimum perceptible under normal conditions, a significance outcome of 'Not Significant' is determined.

Table 10.52: Assessment of Impacts – Non-Residential Receptors

Receptor	Period	Predicted Specific Sound Level, $L_{Aeq,T}$, dB	Noise Criterion, dB	Margin, dB	Change in Ambient, dB	Outcome
R5	Daytime	48.9	50.0	-1.1	+0.6	Not Significant
R5	Night-time	47.2	45.0	+2.2	+1.2	Not Significant

Proposed Management and Control Measures

The assessment outcome is 'Not Significant' for all assessed scenarios. No specific noise mitigation associated with the operational sound assessment is proposed.

Appendix 10.5

OPERATIONAL ROAD TRAFFIC NOISE

Appendix 10.5 Operational Road Traffic Noise

For operational road traffic on new, altered or existing roads the study area was defined based on the combined extent of:

- The area within 50 m of road links with the potential to experience a short-term Basic Noise Level (BNL) change of more than 1 dB(A) as a result of the Development;
- Identified receptors with the potential to experience a short-term Basic Noise Level (BNL) change of more than 1 dB(A) as a result of the Development; and
- Where the noise level at identified receptors is forecast to exceed the relevant Lowest Adverse Effect Level (LOAEL).

Assessment Criteria

The assessment criteria is primarily based on the LOAELs and SOAELs as set out within Design Manual for Roads and Bridges: Sustainability & Environment Appraisal LA 111 Noise and vibration (LA 111, 2020).

UK policy does not define daytime or night-time UAEL values for road traffic noise. The assessment has assumed UAEL values based on advice set out within BS 8233: 2014 Guidance on sound insulation and noise reduction for buildings (BS8233, 2014) and ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise (ProPG, 2017).

It has been assumed that the target internal noise levels, as set out in BS 8233 (2014) would be deemed unacceptable once exceed by 10 dB or more. It has also been assumed that 26 dB is a reasonable and conservative assumption for the outdoor to indoor level difference. This represents the level difference expected for a property with a masonry construction and single glazed (closed) windows.

The derivation of the UAEL values from the BS 8233 (2014) daytime and night-time target internal noise levels is presented in Table 10.53.

Table 10.53: Road Traffic Noise – UAEL Threshold Derivation

Noise Source	Period	BS8233(2014) Target Internal Noise Level	Unacceptable Internal Noise Level	Unacceptable External Noise Level (UAEL)
Operational Road Traffic	Daytime	35 dB $L_{Aeq,16hr}$	45 dB $L_{Aeq,16hr}$	71 dB $L_{Aeq,16hr}$
	Night	30 dB $L_{Aeq,8hr}$	40 dB $L_{Aeq,8hr}$	66 dB $L_{Aeq,8hr}$

A summary of the assessment criteria used to assess road traffic noise is given in Table 10.54. Whilst LA 111 specifies night-time criteria as L_{night} and the derived UAEL is in terms of $L_{Aeq,\ 8hr}$, for the road traffic assessment these are considered to be equivalent as they have both been determined in relation to annual average road traffic flows.

Table 10.54: Road Traffic Noise Thresholds of Potential Effect Criteria (outdoor, free-field noise levels unless otherwise stated)

Noise Source	Period	LOAEL	SOAEL	UAEL
Operational Road Traffic	Daytime	55 dB $L_{A10,18hr\ (f)}$	68 dB $L_{A10,18hr\ (f)}$	71 dB $L_{Aeq,16hr}$
	Night	40 dB $L_{night,\ outside}$	55 dB $L_{night,\ outside}$	66 dB $L_{Aeq,8hr}$

Where development related noise exposures are shown to be lower than the LOAEL values in Table 10.54, a significant effect in terms of the EIA Regulations was not deemed to occur at residential receptors.

Development related noise exposures which fall between LOAEL and SOAEL have the potential to constitute a significant effect, subject to additional considerations, namely:

- The level of noise exposure;
- The change in the noise exposure as a result of the Development; and
- The population experiencing such change and exposure to noise as a result of the Development.

Noise Exposure Classifications

Table 10.55 provides noise level categories between the LOAEL and UAEL thresholds. Greater weight in terms of significance evaluation has been given to higher noise levels, even when occurring between the same thresholds, i.e. LOAEL and SOAEL.

Table 10.55: Noise Level Categories

Noise Level	Operational Road Traffic	
Very Low	<55dB $L_{A10,18hr\ (f)}$	<40dB $L_{night,\ outside}$
LOAEL		
Low	55-59dB $L_{A10,18hr\ (f)}$	40-45dB $L_{night,\ outside}$
Medium	60-63dB $L_{A10,18hr\ (f)}$	46-49dB $L_{night,\ outside}$
High	64-67dB $L_{A10,18hr\ (f)}$	50-54dB $L_{night,\ outside}$
SOAEL		
Very High	>=68dB $L_{A10,18hr\ (f)}$	>=55dB $L_{night,\ outside}$
UAEL		
Unacceptable	>=71dB $L_{Aeq,16hr}$	>=66dB $L_{Aeq,\ 8hr}$

(f) - facade

Magnitude of Change in Noise Exposure

A beneficial change was deemed to occur where there was a reduction in noise level, and an adverse change where there was an increase.

The road traffic change in noise level criteria has been derived from methodologies advocated in LA 111 (2020), using a combination of the short term and long term magnitude of change as summarised in Table 10.56.

Table 10.56: Change in Noise Level Categories

Noise Change Category	Road Traffic Noise
Negligible	<1 dB
Low	1 – 2.9 dB
Medium	3 – 4.9 dB
High	5 – 10 dB
Very High	>10 dB

Table 10.57 summarises the framework for evaluation of potential significant adverse effect on health and quality of life in relation to receptor newly exposed to development related noise exposures. However, in general, where a noise exposure is between the LOAEL and SOAEL, and a medium change in exposure is calculated to occur, this is most likely to result in a significant effect.

Table 10.57: Significant Adverse Effects on Health and Quality of Life

Noise Exposure Category	Magnitude of Change (increases and decreases) Category				
	Negligible Change	Low Change	Medium Change	High Change	Very High Change
Very Low Exposure	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant
Lowest Observed Adverse Effect Level (LOAEL) Exposure above LOAEL potentially significant depending upon population and the magnitude of change					
Low Exposure	Not Significant	Potentially Significant*	Potentially Significant*	Potentially Significant*	Potentially Significant*
Medium Exposure	Not Significant	Potentially Significant*	Potentially Significant*	Potentially Significant*	Potentially Significant*
High Exposure	Not Significant	Potentially Significant*	Potentially Significant*	Potentially Significant*	Potentially Significant*
Significant Observed Adverse Effect Level (SOAEL) Exposure above SOAEL due to Development considered significant on an individual receptor basis					
Very High Exposure	Not Significant	Significant	Significant	Significant	Significant
Unacceptable Observed Adverse Effect Level (UAEL)					
Unacceptable Exposure	Not Significant	Significant (individual receptors)	Significant (individual receptors)	Significant (individual receptors)	Significant (individual receptors)

*depending on population

Table 10.57 demonstrates that where noise exposure is above the LOAEL but below the SOAEL, the magnitude of change along with the scale of population experiencing this change may give rise to significant effects, which should be determined through consideration of 'additional factors'.

Assessment Methodology

The operational road traffic noise assessment has considered the following assessment years:

- 2022 - Baseline;
- 2026 - Future Baseline (without Development); and
- 2026 - Completed Development
- 2026 - Completed Development + Tritax Development

The magnitude of change in noise exposure is considered for the following scenarios:

- 2022 – Baseline vs 2026 Future Baseline (without Development); and
- 2026 Future Baseline (without Development) vs 2026 Completed Development
- 2026 Future Baseline (without Development) vs 2026 Completed Development + Tritax Development

The assessment scenario considering the 2022 Baseline year shows the likely changes in effects associated with the 2026 assessment year in the absence of the Eastern, Western and Development Sites. These effects can be attributed to non-Development related growth.

The '2026 Future Baseline (without Development) vs 2026 Completed Development + Tritax Development' assessment shows the likely changes in cumulative effects associated with the 2026 assessment year with the inclusion of the Development and the adjacent Tritax Development.

The '2026 Future Baseline (without Development) vs 2026 Completed Development' assessment is the primary assessment scenario, and as an initial scoping stage, the magnitude of change is noise exposure is considered in terms of road links with the potential to experience a short-term Basic Noise Level (BNL) change of more than 1 dB(A). Where the change in BNL on all road links is <1 dB, and therefore a 'negligible' change, a significant effect in terms of the EIA Regulations is not deemed to occur.

Where there is a road link change in BNL of more than 1 dB(A) as a result of the Development, the magnitude of change and associated noise exposures have been determined to identify where road traffic noise levels are forecast to exceed the relevant Lowest Adverse Effect Level (LOAEL).

Where development related noise exposures are shown to be lower than the LOAEL values, a significant effect in terms of the EIA Regulations is not deemed to occur.

The methodology adopted for the calculation of operational road traffic noise associated with the Development is based upon the methodology presented within the Calculation of Road Traffic Noise (CRTN, 1988).

Modelling Inputs and Assumptions

The calculations are based upon road traffic flow data provided by David Tucker Associates (DTA). Road traffic data was provided in the form of 18-hour Annual Average Weekday Traffic (AAWT) and 1-hour AAWT, with % HGV and the speed limit for the road links. Road traffic flows for roads considered in the assessment are detailed in Table 10.58, Table 10.59, Table 10.60, Table 10.61, Table 10.62, Table 10.63, Table 10.64 and Table 10.65 for the daytime and night-time periods. The road links noted are those defined in Chapter 8: Transport and Access.

Table 10.58: AAWT, 18hr Daytime Road Traffic Flows – Eastern Development

Road	Link	AAWT,18hr Two-way Traffic Flow						Speed Limit (km/h)
		2022 Baseline		2026 Future Baseline		2026 With Development		
		AAWT,18hr	% HGVs	AAWT,18hr	% HGVs	AAWT,18hr	% HGVs	
B4100	1	6168	3	6352	4	6550	5	97
B4100	2	6168	3	6352	4	6550	5	80
B4100	3	13266	4	15333	4	16964	6	80
B4100	4	13266	4	14018	4	14591	5	80
B4100	5	13206	4	14099	4	14584	4	80
A4095	6	15821	4	16988	4	17186	4	80
A4095	7	12826	2	14171	4	14281	4	80
A43	8	36494	16	39496	15	40179	16	80
B430	9	8425	5	12268	4	12400	4	97
M40S	10	103749	17	107970	17	108323	17	113
M40N	11	84241	21	88649	21	88847	21	113
A43	12	37778	18	41065	17	41793	18	113
M40N Onslip	13	5280	16	6117	15	6216	15	64
M40N Offslip	14	6474	15	7355	14	7454	14	64
M40S Onslip	15	16261	22	17050	22	17227	22	64
M40S Offslip	16	17128	19	17949	19	18126	19	64
M40 Overbridges	17	30711	13	34327	12	34735	13	80
A43 Padbury-Cherwell Link	18	47356	15	51398	15	51983	15	80
A43 north of Barleymow Roundabout	19	35689	17	38425	17	38927	17	113
A421 east	20	10985	9	11699	9	11924	9	80

Table 10.59: AAWT, 1hr Night-time Road Traffic Flows – Eastern Development

Road	Link	AAWT,1hr Two-way Traffic Flow						Speed Limit (km/h)
		2022 Baseline		2026 Future Baseline		2026 With Development		
		AAWT,1hr	% HGVs	AAWT,1hr	% HGVs	AAWT,1hr	% HGVs	
B4100	1	809	5	832	5	888	7	97
B4100	2	809	5	832	5	888	7	80
B4100	3	1716	6	1967	6	2423	14	80
B4100	4	1716	6	1810	6	1971	9	80
B4100	5	1709	7	1820	7	1956	7	80
A4095	6	2075	7	2222	7	2278	7	80
A4095	7	1660	3	1828	3	1859	3	80
A43	8	2712	35	3011	33	3202	34	80
B430	9	1090	8	1555	8	1592	8	97
M40S	10	21466	32	22307	34	22406	34	113
M40N	11	17553	27	18360	42	18415	42	113
A43	12	2785	38	3117	35	3321	36	113
M40N Onslip	13	387	35	479	30	506	31	64
M40N Offslip	14	496	30	592	27	620	28	64
M40S Onslip	15	1247	47	1315	46	1364	46	64
M40S Offslip	16	1292	39	1362	39	1411	39	64
M40 Overbridges	17	2276	31	2660	28	2774	29	80
A43 Padbury-Cherwell Link	18	3510	35	3916	35	4080	35	80
A43 north of Barleymow Roundabout	19	2616	37	2884	36	3025	36	113
A421 east	20	796	21	883	20	946	22	80

Table 10.60: AAWT, 18hr Daytime Road Traffic Flows – Western Development

Road	Link	AAWT,18hr Two-way Traffic Flow						Speed Limit (km/h)
		2022 Baseline		2026 Future Baseline		2026 With Development		
		AAWT,18hr	% HGVs	AAWT,18hr	% HGVs	AAWT,18hr	% HGVs	
B4100	1	6168	3	6352	4	6947	6	97
B4100	2	6168	3	6352	4	9724	12	80
B4100	3	13266	4	15333	4	16246	5	80
B4100	4	13266	4	14018	4	14931	5	80
B4100	5	13206	4	14099	4	14853	4	80
A4095	6	15821	4	16988	4	17345	4	80
A4095	7	12826	2	14171	4	14329	4	80
A43	8	36494	16	39496	15	40805	16	80
B430	9	8425	5	12268	4	12586	4	97
M40S	10	103749	17	107970	17	108605	17	113
M40N	11	84241	21	88649	21	89006	21	113
A43	12	37778	18	41065	17	42255	18	113
M40N Onslip	13	5280	16	6117	15	6295	15	64
M40N Offslip	14	6474	15	7355	14	7534	14	64
M40S Onslip	15	16261	22	17050	22	17368	22	64
M40S Offslip	16	17128	19	17949	19	18267	19	64
M40 Overbridges	17	30711	13	34327	12	35140	13	80
A43 Padbury-Cherwell Link	18	47356	15	51398	15	52529	15	80
A43 north of Barleymow Roundabout	19	35689	17	38425	17	39246	17	113
A421 east	20	10985	9	11699	9	12068	9	80

Table 10.61: AAWT, 1hr Night-time Road Traffic Flows – Western Development

Road	Link	AAWT,1hr Two-way Traffic Flow						Speed Limit (km/h)
		2016 Baseline		2026 Future Baseline		2026 With Development		
		AAWT,1hr	% HGVs	AAWT,1hr	% HGVs	AAWT,1hr	% HGVs	
B4100	1	809	5	832	5	999	11	97
B4100	2	809	5	832	5	1776	26	80
B4100	3	1716	6	1967	6	2222	11	80
B4100	4	1716	6	1810	6	2066	11	80
B4100	5	1709	7	1820	7	2031	7	80
A4095	6	2075	7	2222	7	2322	7	80
A4095	7	1660	3	1828	3	1873	3	80
A43	8	2712	35	3011	33	3377	34	80
B430	9	1090	8	1555	8	1644	8	97
M40S	10	21466	32	22307	34	22485	34	113
M40N	11	17553	27	18360	42	18460	42	113
A43	12	2785	38	3117	35	3450	36	113
M40N Onslip	13	387	35	479	30	528	32	64
M40N Offslip	14	496	30	592	27	642	28	64
M40S Onslip	15	1247	47	1315	46	1404	46	64
M40S Offslip	16	1292	39	1362	39	1451	39	64
M40 Overbridges	17	2276	31	2660	28	2888	29	80
A43 Padbury-Cherwell Link	18	3510	35	3916	35	4233	35	80
A43 north of Barleymow Roundabout	19	2616	37	2884	36	3114	36	113
A421 east	20	796	21	883	20	986	23	80

Table 10.62: AAWT, 18hr Daytime Road Traffic Flows – Development

Road	Link	AAWT,18hr Two-way Traffic Flow						Speed Limit (km/h)
		2022 Baseline		2026 Future Baseline		2026 With Development		
		AAWT,18hr	% HGVs	AAWT,18hr	% HGVs	AAWT,18hr	% HGVs	
B4100	1	6168	3	6352	4	7146	6	97
B4100	2	6168	3	6352	4	9923	12	80
B4100	3	13266	4	15333	4	17877	7	80
B4100	4	13266	4	14018	4	15504	6	80
B4100	5	13206	4	14099	4	15338	4	80
A4095	6	15821	4	16988	4	17543	4	80
A4095	7	12826	2	14171	4	14439	4	80
A43	8	36494	16	39496	15	41488	16	80
B430	9	8425	5	12268	4	12718	4	97
M40S	10	103749	17	107970	17	108958	17	113
M40N	11	84241	21	88649	21	89204	21	113
A43	12	37778	18	41065	17	42983	18	113
M40N Onslip	13	5280	16	6117	15	6395	15	64
M40N Offslip	14	6474	15	7355	14	7633	14	64
M40S Onslip	15	16261	22	17050	22	17544	22	64
M40S Offslip	16	17128	19	17949	19	18443	19	64
M40 Overbridges	17	30711	13	34327	12	35548	13	80
A43 Padbury-Cherwell Link	18	47356	15	51398	15	53113	15	80
A43 north of Barleymow Roundabout	19	35689	17	38425	17	39748	17	113
A421 east	20	10985	9	11699	9	12293	10	80

Table 10.63: AAWT, 1hr Night-time Road Traffic Flows – Development

Road	Link	AAWT,1hr Two-way Traffic Flow						Speed Limit (km/h)
		2022 Baseline		2026 Future Baseline		2026 With Development		
		AAWT,1hr	% HGVs	AAWT,1hr	% HGVs	AAWT,1hr	% HGVs	
B4100	1	809	5	832	5	1055	13	97
B4100	2	809	5	832	5	1832	27	80
B4100	3	1716	6	1967	6	2679	17	80
B4100	4	1716	6	1810	6	2226	13	80
B4100	5	1709	7	1820	7	2167	7	80
A4095	6	2075	7	2222	7	2378	7	80
A4095	7	1660	3	1828	3	1904	3	80
A43	8	2712	35	3011	33	3568	35	80
B430	9	1090	8	1555	8	1681	8	97
M40S	10	21466	32	22307	34	22584	34	113
M40N	11	17553	27	18360	42	18515	42	113
A43	12	2785	38	3117	35	3654	37	113
M40N Onslip	13	387	35	479	30	556	32	64
M40N Offslip	14	496	30	592	27	670	29	64
M40S Onslip	15	1247	47	1315	46	1453	46	64
M40S Offslip	16	1292	39	1362	39	1500	39	64
M40 Overbridges	17	2276	31	2660	28	3002	30	80
A43 Padbury-Cherwell Link	18	3510	35	3916	35	4396	36	80
A43 north of Barleymow Roundabout	19	2616	37	2884	36	3255	37	113
A421 east	20	796	21	883	20	1049	24	80

Table 10.64: AAWT, 18hr Daytime Road Traffic Flows – Development + Tritax Development

Road	Link	AAWT,18hr Two-way Traffic Flow						Speed Limit (km/h)
		2022 Baseline		2026 Future Baseline		2026 With Development + Tritax Development		
		AAWT,18hr	% HGVs	AAWT,18hr	% HGVs	AAWT,18hr	% HGVs	
B4100	1	6168	3	6352	4	7741	8	97
B4100	2	6168	3	6352	4	10518	13	80
B4100	3	13266	4	15333	4	22770	12	80
B4100	4	13266	4	14018	4	20397	11	80
B4100	5	13206	4	14099	4	16792	4	80
A4095	6	15821	4	16988	4	18138	4	80
A4095	7	12826	2	14171	4	14770	4	80
A43	8	36494	16	39496	15	43538	16	80
B430	9	8425	5	12268	4	13115	16	97
M40S	10	103749	17	107970	17	110015	16	113
M40N	11	84241	21	88649	21	89799	4	113
A43	12	37778	18	41065	17	45165	17	113
M40N Onslip	13	5280	16	6117	15	6692	21	64
M40N Offslip	14	6474	15	7355	14	7931	18	64
M40S Onslip	15	16261	22	17050	22	18073	18	64
M40S Offslip	16	17128	19	17949	19	18972	18	64
M40 Overbridges	17	30711	13	34327	12	36771	18	80
A43 Padbury-Cherwell Link	18	47356	15	51398	15	54865	18	80
A43 north of Barleymow Roundabout	19	35689	17	38425	17	41254	18	113
A421 east	20	10985	9	11699	9	12970	11	80

Table 10.65: AAWT, 1hr Night-time Road Traffic Flows – Development + Tritax Development

Road	Link	AAWT,1hr Two-way Traffic Flow						Speed Limit (km/h)
		2022 Baseline		2026 Future Baseline		2026 With Development + Tritax Development		
		AAWT,1hr	% HGVs	AAWT,1hr	% HGVs	AAWT,1hr	% HGVs	
B4100	1	809	5	832	5	153	17	97
B4100	2	809	5	832	5	250	28	80
B4100	3	1716	6	1967	6	506	26	80
B4100	4	1716	6	1810	6	449	25	80
B4100	5	1709	7	1820	7	322	6	80
A4095	6	2075	7	2222	7	318	7	80
A4095	7	1660	3	1828	3	250	3	80
A43	8	2712	35	3011	33	518	36	80
B430	9	1090	8	1555	8	224	36	97
M40S	10	21466	32	22307	34	2860	36	113
M40N	11	17553	27	18360	42	2335	7	113
A43	12	2785	38	3117	35	533	35	113
M40N Onslip	13	387	35	479	30	80	42	64
M40N Offslip	14	496	30	592	27	94	38	64
M40S Onslip	15	1247	47	1315	46	200	38	64
M40S Offslip	16	1292	39	1362	39	206	38	64
M40 Overbridges	17	2276	31	2660	28	418	38	80
A43 Padbury-Cherwell Link	18	3510	35	3916	35	611	38	80
A43 north of Barleymow Roundabout	19	2616	37	2884	36	460	38	113
A421 east	20	796	21	883	20	155	27	80

Receptor point calculations have been undertaken using the LimA® computational sound modelling software (v2020). The noise model includes a detailed digital terrain model to represent acoustic influence of topographical data. Calculation heights have been assumed at 1.5 m (ground floor) above ground level for the daytime period and 4 m (1st floor bedroom) above ground for the night-time period.

The model has been used to present road traffic noise levels at specific receptor points in the vicinity of the site and illustrated as contour plots.

Assessment of Effects

Eastern Development

Initial Scoping

As shown in Table 10.66, there are no road links in the vicinity of the Eastern Development with a daytime BNL change of more than 1 dB(A) for the '2026 Future Baseline (without Development) vs 2026 Completed Development' assessment scenario.

Table 10.66: AAWT, 18hr Daytime Road Traffic Flows – BNL Change 2026 Future Baseline (without Development) vs 2026 Completed Development' – Eastern Development

Road	Link	Basic Noise Level (BNL), $L_{A10,18h}$ dB		
		2026 Future Baseline (DM)	2026 With Development (DS)	DS-DM
B4100	1	70.1	70.4	0.3
B4100	2	68.7	69.0	0.3
B4100	3	72.5	73.4	0.9
B4100	4	72.1	72.5	0.4
B4100	5	72.1	72.3	0.2
A4095	6	72.9	73.0	0.1
A4095	7	72.2	72.2	0.0
A43	8	78.6	78.7	0.1
B430	9	73.1	73.1	0.0
M40S	10	85.5	85.6	0.0
M40N	11	85.1	85.1	0.0
A43	12	81.4	81.5	0.1
M40N Onslip	13	69.2	69.3	0.1
M40N Offslip	14	69.7	69.8	0.1
M40S Onslip	15	74.5	74.6	0.1
M40S Offslip	16	74.4	74.4	0.1
M40 Overbridges	17	77.5	77.6	0.1
A43 Padbury-Cherwell Link	18	79.7	79.7	0.1
A43 north of Barleymow Roundabout	19	81.0	81.1	0.1
A421 east	20	72.3	72.4	0.1

A consideration of change in night-time BNL has been used to identify areas with receptors with potentially adverse noise effects. The road traffic links and associated night-time change in BNL are summarised in Table 10.67.

Table 10.67: AAWT, 1hr Night-time Road Traffic Flows – BNL Change 2026 Future Baseline (without Development) vs 2026 Completed Development' – Eastern Development

Road	Link	Basic Noise Level (BNL), $L_{A10,1h}$ dB		
		2026 Future Baseline (DM)	2026 With Development (DS)	DS-DM
B4100	1	64.9	65.7	0.8
B4100	2	63.4	64.3	0.9
B4100	3	68.1	70.3	2.1
B4100	4	67.7	68.7	0.9
B4100	5	67.9	68.2	0.3
A4095	6	68.8	68.9	0.1
A4095	7	67.1	67.2	0.1
A43	8	73.4	73.7	0.3
B430	9	68.8	68.9	0.1
M40S	10	84.3	84.4	0.0
M40N	11	84.0	84.0	0.0
A43	12	75.9	76.2	0.3
M40N Onslip	13	61.9	62.4	0.5
M40N Offslip	14	63.2	63.6	0.4
M40S Onslip	15	69.7	69.9	0.2
M40S Offslip	16	69.3	69.5	0.2
M40 Overbridges	17	72.4	72.6	0.3
A43 Padbury-Cherwell Link	18	74.7	74.9	0.2
A43 north of Barleymow Roundabout	19	75.6	75.8	0.2
A421 east	20	66.2	66.8	0.6

As shown, the B4100 to the east of the Eastern Development (Link 3, as defined in Chapter 8: Transport and Access) is likely to experience a BNL change +2.1 dB(A). At all other links, the change in BNL is less than 1 dB(A).

Based on the outcomes of the daytime BNL evaluation shown in Table 10.66 and Table 10.67, further consideration of likely significant effects is therefore required.

Noise Exposure Classifications

The road traffic noise exposures, presented in the noise metric forms used in the noise threshold of potential effect criteria (Table 10.9) are presented in Table 10.68 and Table 10.69, and in terms of the associated noise level category as defined in Table 10.10, are presented in Table 10.70 and Table 10.71.

The magnitude of change in noise exposure has been determined for the opening year, 2026.

Noise Exposure Classifications

Table 10.68: Eastern Development - Daytime Road Traffic Noise Exposure

Receptor ID	2022 Existing Baseline		2026 Future Baseline		2026 With Development	
	$L_{A10,18hr\ (f)}$ dB	$L_{Aeq,16hr}$ dB	$L_{A10,18hr\ (f)}$ dB	$L_{Aeq,16hr}$ dB	$L_{A10,18hr\ (f)}$ dB	$L_{Aeq,16hr}$ dB
R1	68.0	63.5	68.3	63.8	68.7	64.2
R2	67.6	63.1	67.8	63.3	68.0	63.5
R3	65.9	61.4	66.0	61.5	66.1	61.6
R4	68.2	63.7	68.4	63.9	68.4	63.9
R5	69.2	64.7	69.4	64.9	69.2	64.7
R6	66.2	61.7	66.5	62.0	66.7	62.2
R7	62.4	57.9	62.6	58.1	60.9	56.4
R8	72.7	68.2	73.0	68.5	73.1	68.6
R9	65.5	61.0	65.7	61.2	65.9	61.4
R10	65.2	60.7	65.5	61.0	65.6	61.1
R11	63.1	58.6	63.4	58.9	63.5	59.0

Table 10.69: Eastern Development - Night-time Road Traffic Noise Exposure

Receptor ID	2022 Existing Baseline	2026 Future Baseline	2026 With Development
	$L_{night(outside)}$ / $L_{Aeq,\ 8hr}$ dB	$L_{night(outside)}$ / $L_{Aeq,\ 8hr}$ dB	$L_{night(outside)}$ / $L_{Aeq,\ 8hr}$ dB
R1	60.4	61.1	61.2
R2	59.8	60.5	60.6
R3	59.0	59.7	59.8
R4	61.2	61.9	62.0
R5	62.1	62.8	62.7
R6	59.6	59.9	60.5
R7	54.5	55.1	52.9
R8	62.8	63.1	63.4
R9	55.1	55.4	55.7
R10	54.2	54.5	54.9
R11	52.0	52.3	52.7

Table 10.70: Eastern Development - Daytime Road Traffic Noise Exposure (Noise Level Category)

Receptor ID	Noise Level Category		
	2022 Existing Baseline	2026 Future Baseline	2026 With Development
R1	High	Very High	Very High
R2	High	High	High
R3	High	High	High
R4	Very High	Very High	Very High
R5	Very High	Very High	Very High

Receptor ID	Noise Level Category		
	2022 Existing Baseline	2026 Future Baseline	2026 With Development
R6	High	High	High
R7	Medium	Medium	Medium
R8	Very High	Very High	Very High
R9	High	High	High
R10	High	High	High
R11	Medium	Medium	Medium

Table 10.71: Eastern Development - Night-time Road Traffic Noise Exposure (Noise Level Category)

Receptor ID	Noise Level Category		
	2022 Existing Baseline	2026 Future Baseline	2026 With Development
R1	Very High	Very High	Very High
R2	Very High	Very High	Very High
R3	Very High	Very High	Very High
R4	Very High	Very High	Very High
R5	Very High	Very High	Very High
R6	Very High	Very High	Very High
R7	High	Very High	High
R8	Very High	Very High	Very High
R9	Very High	Very High	Very High
R10	High	High	High
R11	High	High	High

As shown in Table 10.70, 'Very High' daytime noise level exposures occur at receptors R1, R4, R5 and R8. 'High' daytime noise levels occur at receptors R2, R3, R6, R9 and R10 and 'Medium' daytime noise levels occur at receptors R7 and R11 across all assessment years. During the night-time period, 'Very High' noise level exposures occur at receptors R1 – R9 and 'High' noise level exposures occur at R10 and R11 during the 2026 Future Baseline assessment year. During the 2026 With Development assessment year, 'Very High' noise level exposures occur at R1, R2, R3, R4, R5, R6, R8 and R9 and 'High' noise level exposures occur at receptors R10 and R11, as shown in Table 10.71.

Magnitude of Change in Noise Exposure

The magnitude of change in noise exposure is considered for the following scenarios:

- 2022 – Baseline vs 2026 Future Baseline (without Development); and
- 2026 Future Baseline (without Development) vs 2026 Completed Development

The first scenario has been considered for context to demonstrate the likely noise change between the 2022 Baseline and the 2026 assessment year irrespective of the Development.

The associated significance has been determined for the 2026 assessment scenario.

Noise exposure has been presented to one decimal place to inform the noise change criteria. An increase in noise level, indicated by a positive value in the 'Noise Change' column indicates an 'adverse' change. A 'beneficial' change occurs when there is a negative value in the 'Noise Change' column.

Table 10.72: Eastern Development - Daytime: 2022 Baseline vs 2026 Future Baseline (Noise Change Category)

Receptor ID	2022 Baseline	2026 Future Baseline	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{A10,18hr}$ dB	$L_{A10,18hr}$ dB	dB		
R1	68.0	68.3	0.3	Very High	Negligible
R2	67.6	67.8	0.2	High	Negligible
R3	65.9	66.0	0.1	High	Negligible
R4	68.2	68.4	0.2	Very High	Negligible
R5	69.2	69.4	0.2	Very High	Negligible
R6	66.2	66.5	0.3	High	Negligible
R7	62.4	62.6	0.2	Medium	Negligible
R8	72.7	73.0	0.3	Very High	Negligible
R9	65.5	65.7	0.2	High	Negligible
R10	65.2	65.5	0.3	High	Negligible
R11	63.1	63.4	0.3	Medium	Negligible

Table 10.73: Eastern Development - Night-time: 2022 Baseline vs 2026 Future Baseline (Noise Change Category)

Receptor ID	2022 Baseline	2026 Future Baseline	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	dB		
R1	60.4	61.1	0.7	Very High	Negligible
R2	59.8	60.5	0.7	Very High	Negligible
R3	59.0	59.7	0.7	Very High	Negligible
R4	61.2	61.9	0.7	Very High	Negligible
R5	62.1	62.8	0.7	Very High	Negligible
R6	59.6	59.9	0.3	Very High	Negligible
R7	54.5	55.1	0.6	Very High	Negligible
R8	62.8	63.1	0.3	Very High	Negligible
R9	55.1	55.4	0.3	Very High	Negligible
R10	54.2	54.5	0.3	High	Negligible
R11	52.0	52.3	0.3	High	Negligible

Table 10.74: Eastern Development - Daytime: 2026 Future Baseline vs 2026 With Development (Noise Change Category)

Receptor ID	2026 Future Baseline $L_{A10,18hr}$ dB	2026 With Development $L_{A10,18hr}$ dB	Noise Change dB	Noise Exposure Category 'End State'	Noise Change Category
R1	68.3	68.7	0.4	Very High	Negligible
R2	67.8	68.0	0.2	High	Negligible
R3	66.0	66.1	0.1	High	Negligible
R4	68.4	68.4	0.0	Very High	Negligible
R5	69.4	69.2	-0.2	Very High	Negligible
R6	66.5	66.7	0.2	High	Negligible
R7	62.6	60.9	-1.7	Medium	Negligible
R8	73.0	73.1	0.1	Very High	Negligible
R9	65.7	65.9	0.2	High	Negligible
R10	65.5	65.6	0.1	High	Negligible
R11	63.4	63.5	0.1	Medium	Negligible

Table 10.75: Eastern Development - Night-time: 2026 Future Baseline vs 2026 With Development (Noise Change Category)

Receptor ID	2026 Future Baseline $L_{Aeq,8h}$ dB	2026 With Development $L_{Aeq,8h}$ dB	Noise Change dB	Noise Exposure Category 'End State'	Noise Change Category
R1	61.1	61.2	0.1	Very High	Negligible
R2	60.5	60.6	0.1	Very High	Negligible
R3	59.7	59.8	0.1	Very High	Negligible
R4	61.9	62.0	0.1	Very High	Negligible
R5	62.8	62.7	-0.1	Very High	Negligible
R6	59.9	60.5	0.6	Very High	Negligible
R7	55.1	52.9	-2.2	High	Negligible
R8	63.1	63.4	0.3	Very High	Negligible
R9	55.4	55.7	0.3	Very High	Negligible
R10	54.5	54.9	0.4	High	Negligible
R11	52.3	52.7	0.4	High	Negligible

Significance Evaluation Summary

Significance has been quantitatively evaluated for those receptors in the vicinity of the Eastern Development and also in the vicinity of road traffic links with a change in daytime BNL of more than

1 dB(A) for the '2026 Future Baseline (without Development) vs 2026 Completed Development' assessment scenario.

Table 10.76: Eastern Development - Daytime: 2026 Future Baseline vs 2026 With Development (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	Very High	Negligible	Not Significant
R2	High	Negligible	Not Significant
R3	High	Negligible	Not Significant
R4	Very High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	High	Negligible	Not Significant
R7	Medium	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	High	Negligible	Not Significant
R10	High	Negligible	Not Significant
R11	Medium	Negligible	Not Significant

Table 10.77: Eastern Development - Night-time: 2026 Future Baseline vs 2026 With Development (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	Very High	Negligible	Not Significant
R2	Very High	Negligible	Not Significant
R3	Very High	Negligible	Not Significant
R4	Very High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	Very High	Negligible	Not Significant
R7	High	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	Very High	Negligible	Not Significant
R10	High	Negligible	Not Significant
R11	High	Negligible	Not Significant

As shown, a significance outcome of 'Not Significant' is determined for those receptors in the vicinity of the Eastern Development and in the wider assessment extent, and therefore no management and control measures are proposed.

Proposed Management and Control Measures

No specific noise management or control measures associated with the operational road traffic assessment is proposed.

Mitigation, Monitoring and Residual Effects

No specific noise mitigation or monitoring associated with the operational road traffic assessment is proposed.

Western Development

Initial Scoping

As shown in Table 10.78, there is a road link in the vicinity of the Western Development with a daytime BNL change of more than 1 dB(A) for the '2026 Future Baseline (without Development) vs 2026 Completed Development' assessment scenario.

Table 10.78: AAWT, 18hr Daytime Road Traffic Flows – BNL Change 2026 Future Baseline (without Development) vs 2026 Completed Development' – Western Development

Road	Link	Basic Noise Level (BNL), $L_{A10,18h}$ dB		
		2026 Future Baseline (DM)	2026 With Development (DS)	DS-DM
B4100	1	70.1	70.9	0.7
B4100	2	68.7	72.0	3.3
B4100	3	72.5	73.0	0.5
B4100	4	72.1	72.7	0.6
B4100	5	72.1	72.4	0.2
A4095	6	72.9	73.0	0.1
A4095	7	72.2	72.2	0.1
A43	8	78.6	78.8	0.2
B430	9	73.1	73.2	0.1
M40S	10	85.5	85.6	0.0
M40N	11	85.1	85.1	0.0
A43	12	81.4	81.5	0.2
M40N Onslip	13	69.2	69.3	0.2
M40N Offslip	14	69.7	69.9	0.2
M40S Onslip	15	74.5	74.6	0.1
M40S Offslip	16	74.4	74.5	0.1
M40 Overbridges	17	77.5	77.7	0.2
A43 Padbury-Cherwell Link	18	79.7	79.8	0.1
A43 north of Barleymow Roundabout	19	81.0	81.2	0.1
A421 east	20	72.3	72.5	0.2

A consideration of change in night-time BNL has been used to identify areas with receptors with potentially adverse noise effects. The road traffic links and associated night-time change in BNL are summarised in Table 10.79.

Table 10.79: AAWT, 1hr Night-time Road Traffic Flows – BNL Change 2026 Future Baseline (without Development) vs 2026 Completed Development' – Western Development

Road	Link	Basic Noise Level (BNL), $L_{A10,1h}$ dB		
		2026 Future Baseline (DM)	2026 With Development (DS)	DS-DM
B4100	1	64.9	67.0	2.2
B4100	2	63.4	70.4	7.0
B4100	3	68.1	69.4	1.3
B4100	4	67.7	69.2	1.4
B4100	5	67.9	68.4	0.4
A4095	6	68.8	69.0	0.2
A4095	7	67.1	67.2	0.1
A43	8	73.4	74.0	0.6
B430	9	68.8	69.0	0.2
M40S	10	84.3	84.4	0.0
M40N	11	84.0	84.1	0.0
A43	12	75.9	76.4	0.5
M40N Onslip	13	61.9	62.8	0.9
M40N Offslip	14	63.2	63.9	0.7
M40S Onslip	15	69.7	70.1	0.3
M40S Offslip	16	69.3	69.7	0.3
M40 Overbridges	17	72.4	72.9	0.5
A43 Padbury-Cherwell Link	18	74.7	75.1	0.4
A43 north of Barleymow Roundabout	19	75.6	75.9	0.4
A421 east	20	66.2	67.2	1.0

As shown in Table 10.79, the B4100 to the north of the Western Development (Link 1 and 2, as defined in Chapter 8: Transport and Access) is likely to experience a BNL changes greater than 1 dB(A) along the route, including link 3 to the north of the Eastern Development. The A421 approximately 5 km northeast of the Western Development (Link 20 as defined in chapter 8: Transport and Access) is also likely to experience a BNL change of 1 dB(A) .

Further consideration of likely significant effects is therefore required.

Noise Exposure Classifications

The road traffic noise exposures, presented in the noise metric forms used in the noise threshold of potential effect criteria (Table 10.9) are presented in Table 10.80 and Table 10.81, and in terms of the associated noise level category as defined in Table 10.10, are presented in Table 10.82 and Table 10.83.

The magnitude of change in noise exposure has been determined for the opening year, 2026.

Noise Exposure Classifications

Table 10.80: Western Development - Daytime Road Traffic Noise Exposure

Receptor ID	2022 Existing Baseline		2026 Future Baseline		2026 With Development	
	$L_{A10, 18h (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18h (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18h (f)}$ dB	$L_{Aeq, 16hr}$ dB
R1	68.0	63.5	68.3	63.8	70.9	66.4
R2	67.6	63.1	67.8	63.3	68.5	64.0
R3	65.9	61.4	66.0	61.5	65	60.5
R4	68.2	63.7	68.4	63.9	67.2	62.7
R5	69.2	64.7	69.4	64.9	69.1	64.6
R6	66.2	61.7	66.5	62.0	67.2	62.7
R7	62.4	57.9	62.6	58.1	61.8	57.3
R8	72.7	68.2	73.0	68.5	73.2	68.7
R9	65.5	61.0	65.7	61.2	65.9	61.4
R10	65.2	60.7	65.5	61.0	65.6	61.1
R11	63.1	58.6	63.4	58.9	63.5	59.0

Table 10.81: Western Development - Night-time Road Traffic Noise Exposure

Receptor ID	2022 Existing Baseline	2026 Future Baseline	2026 With Development
	$L_{Aeq, 8h}$ dB	$L_{Aeq, 8h}$ dB	$L_{Aeq, 8h}$ dB
R1	60.4	61.1	64.6
R2	59.8	60.5	61.3
R3	59.0	59.7	58.0
R4	61.2	61.9	60.3
R5	62.1	62.8	62.2
R6	59.6	59.9	62.0
R7	54.5	55.1	54.1
R8	62.8	63.1	63.5
R9	55.1	55.4	55.8
R10	54.2	54.5	55.2
R11	52.0	52.3	53.0

Table 10.82: Western Development - Daytime Road Traffic Noise Exposure (Noise Level Category)

Receptor ID	Noise Level Category		
	2022 Existing Baseline	2026 Future Baseline	2026 With Development
R1	High	Very High	Very High
R2	High	High	Very High

Receptor ID	Noise Level Category		
	2022 Existing Baseline	2026 Future Baseline	2026 With Development
R3	High	High	High
R4	Very High	Very High	High
R5	Very High	Very High	Very High
R6	High	High	High
R7	Medium	Medium	Medium
R8	Very High	Very High	Very High
R9	High	High	High
R10	High	High	High
R11	Medium	Medium	Medium

Table 10.83: Western Development - Night-time Road Traffic Noise Exposure (Noise Level Category)

Receptor ID	Noise Level Category		
	2022 Existing Baseline	2026 Future Baseline	2026 With Development
R1	Very High	Very High	Very High
R2	Very High	Very High	Very High
R3	Very High	Very High	Very High
R4	Very High	Very High	Very High
R5	Very High	Very High	Very High
R6	Very High	Very High	Very High
R7	High	Very High	High
R8	Very High	Very High	Very High
R9	Very High	Very High	Very High
R10	High	High	Very High
R11	High	High	High

As shown in Table 10.82, 'Very High' daytime noise level exposures occur at receptors R1, R4, R5, and R8, 'High' daytime noise level exposures occur at receptors R2, R3, R6, R9 and R10, and 'Medium' daytime noise level exposures occur at receptors R7 and R11 during the '2026 Future Baseline' assessment scenario. During the '2026 With Development' assessment scenario, 'Very High' daytime noise level exposures occur at receptors R1, R2, R5 and R8. 'High' daytime noise level exposures occur at receptors R3, R4, R6, R9 and R10 and 'Medium' daytime noise level exposures occur at receptors R7 and R11.

As shown in Table 10.83, during the night-time period, 'Very High' noise level exposures occur at receptors R1 – R9 and 'High' noise level exposures occur at receptors R10 and R11 during the '2026 Future Baseline' assessment scenario. During the '2026 With Development' assessment scenario, 'Very High' noise level exposures occur at R1, R2, R3, R4, R5, R6, R8, R9 and R10 and 'High' noise level exposures occur at R7 and R11.

Magnitude of Change in Noise Exposure

The magnitude of change in noise exposure is considered for the following scenarios:

- 2022 Baseline vs 2026 Future Baseline (without Development); and
- 2026 Future Baseline (without Development) vs 2026 Completed Development

The first scenario has been considered for context to demonstrate the likely noise change between the 2022 Baseline and the 2026 assessment year irrespective of the Development.

The associated significance has been determined for the 2026 assessment scenario.

Noise exposure has been presented to one decimal place to inform the noise change criteria. An increase in noise level, indicated by a positive value in the 'Noise Change' column indicates an 'adverse' change. A 'beneficial' change occurs when there is a negative value in the 'Noise Change' column.

Table 10.84: Western Development - Daytime: 2022 Baseline vs 2026 Future Baseline (Noise Change Category)

Receptor ID	2022 Baseline	2026 Future Baseline	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{A10,18h}$ dB	$L_{A10,18h}$ dB	dB		
R1	68.0	68.3	0.3	Very High	Negligible
R2	67.6	67.8	0.2	High	Negligible
R3	65.9	66.0	0.1	High	Negligible
R4	68.2	68.4	0.2	Very High	Negligible
R5	69.2	69.4	0.2	Very High	Negligible
R6	66.2	66.5	0.3	High	Negligible
R7	62.4	62.6	0.2	Medium	Negligible
R8	72.7	73.0	0.3	Very High	Negligible
R9	65.5	65.7	0.2	High	Negligible
R10	65.2	65.5	0.3	High	Negligible
R11	63.1	63.4	0.3	Medium	Negligible

Table 10.85: Western Development - Night-time: 2022 Baseline vs 2026 Future Baseline (Noise Change Category)

Receptor ID	2022 Baseline	2026 Future Baseline	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	dB		
R1	60.4	61.1	0.7	Very High	Negligible
R2	59.8	60.5	0.7	Very High	Negligible
R3	59.0	59.7	0.7	Very High	Negligible
R4	61.2	61.9	0.7	Very High	Negligible
R5	62.1	62.8	0.7	Very High	Negligible
R6	59.6	59.9	0.3	Very High	Negligible
R7	54.5	55.1	0.6	Very High	Negligible
R8	62.8	63.1	0.3	Very High	Negligible
R9	55.1	55.4	0.3	Very High	Negligible
R10	54.2	54.5	0.3	High	Negligible
R11	52.0	52.3	0.3	High	Negligible

Table 10.86: Western Development - Daytime: 2026 Future Baseline vs 2026 With Development (Noise Change Category)

Receptor ID	2026 Future Baseline $L_{A10,18h}$ dB	2026 With Development $L_{A10,18h}$ dB	Noise Change dB	Noise Exposure Category 'End State'	Noise Change Category
R1	68.3	70.9	2.6	Very High	Low
R2	67.8	68.5	0.7	Very High	Negligible
R3	66.0	65.0	-1.0	High	Negligible
R4	68.4	67.2	-1.2	High	Negligible
R5	69.4	69.1	-0.3	Very High	Negligible
R6	66.5	67.2	0.7	High	Negligible
R7	62.6	61.8	-0.8	Medium	Negligible
R8	73.0	73.2	0.2	Very High	Negligible
R9	65.7	65.9	0.2	High	Negligible
R10	65.5	65.6	0.1	High	Negligible
R11	63.4	63.5	0.1	Medium	Negligible

Table 10.87: Western Development - Night-time: 2026 Future Baseline vs 2026 With Development (Noise Change Category)

Receptor ID	2026 Future Baseline $L_{Aeq,8h}$ dB	2026 With Development $L_{Aeq,8h}$ dB	Noise Change dB	Noise Exposure Category 'End State'	Noise Change Category
R1	61.1	64.6	3.5	Very High	Medium
R2	60.5	61.3	0.8	Very High	Negligible
R3	59.7	58.0	-1.7	Very High	Negligible
R4	61.9	60.3	-1.6	Very High	Negligible
R5	62.8	62.2	-0.6	Very High	Negligible
R6	59.9	62.0	2.1	Very High	Low
R7	55.1	54.1	-1.0	High	Negligible
R8	63.1	63.5	0.4	Very High	Negligible
R9	55.4	55.8	0.4	Very High	Negligible
R10	54.5	55.2	0.7	Very High	Negligible
R11	52.3	53.0	0.7	High	Negligible

Significance Evaluation Summary

Significance has been quantitatively evaluated for those receptors in the vicinity of the Western Development also in the vicinity of road traffic links with a change in daytime BNL of more than 1 dB(A) for the '2026 Future Baseline (without Development) vs 2026 Completed Development' assessment scenario.

Table 10.88: Western Development - Daytime: 2026 Future Baseline vs 2026 With Development (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	Very High	Low	Significant
R2	Very High	Negligible	Not Significant
R3	High	Negligible	Not Significant
R4	High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	High	Negligible	Not Significant
R7	Medium	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	High	Negligible	Not Significant
R10	High	Negligible	Not Significant
R11	Medium	Negligible	Not Significant

Table 10.89: Western Development - Night-time: 2026 Future Baseline vs 2026 With Development (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	Very High	Medium	Significant
R2	Very High	Negligible	Not Significant
R3	Very High	Negligible	Not Significant
R4	Very High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	Very High	Low	Significant
R7	High	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	Very High	Negligible	Not Significant
R10	Very High	Negligible	Not Significant
R11	High	Negligible	Not Significant

As shown, a significance outcome of 'Significant' is determined at receptors R1 and R6, located in the vicinity of the Western Development. Consideration of site-specific mitigation is therefore presented.

Proposed Management and Control Measures

There are a number of mitigation strategies that can be implemented to reduce these noise levels at the receptors in the vicinity of the Western Development, with the most appropriate suite of measures subject to agreement with CDC. Noise mitigation options with respect of the receptors located in the vicinity of the Western Development, which would be considered, and delivered pre-occupation of the units (i.e. R1 and R6) include:

- A noise barrier – of sufficient density, to be located between the B4100 and the Western Development either on highways land (to be secured through a Section 278 (S.278) Agreement) or within the ownership boundary of the private dwellings. The specific design of any noise barrier will be the subject of further analysis, however for the purpose of significance evaluation a barrier with 2 metre height, located along the position illustrated in Figure 10.6 in Appendix 10.5, has been modelled;

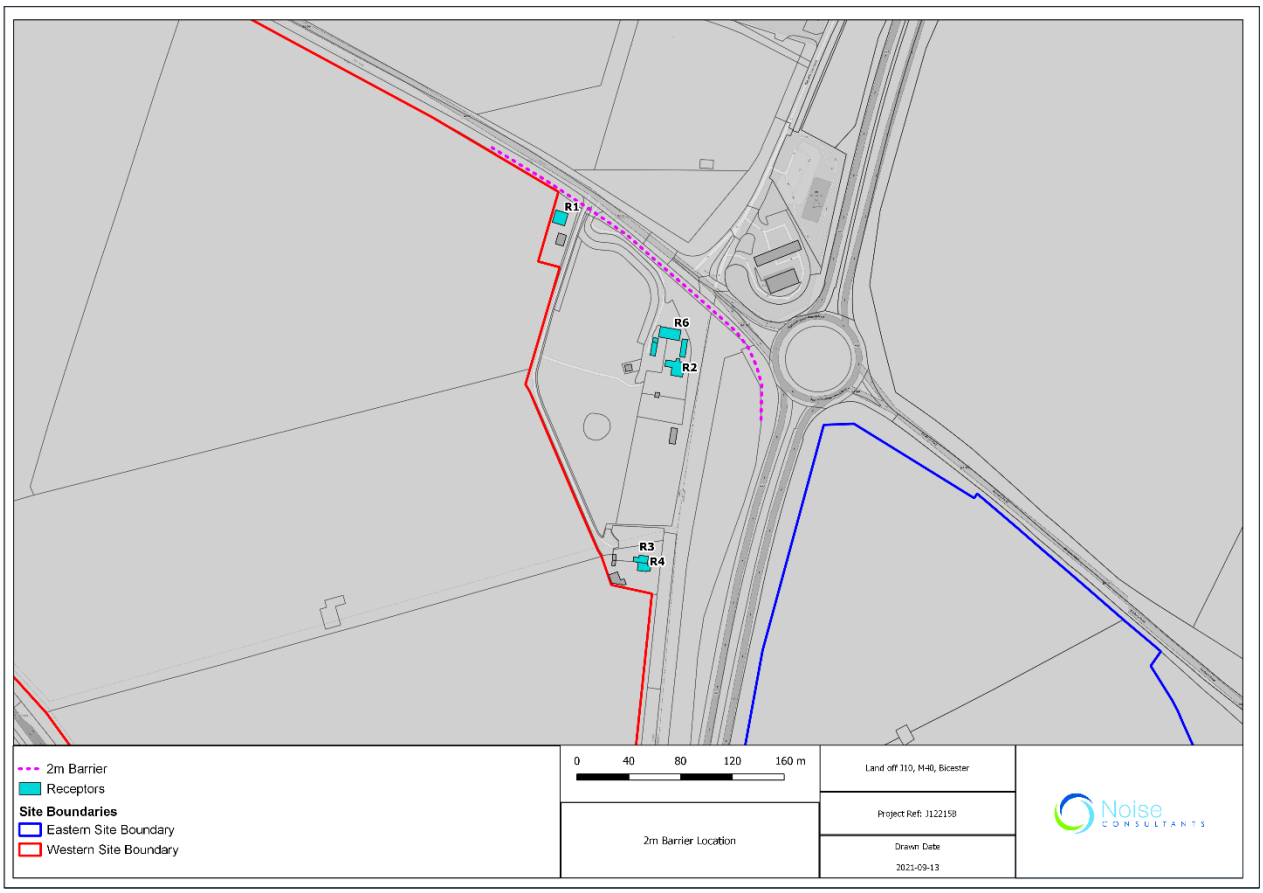
- Low noise road surfacing – depending on the speeds of the road in question, and the existing road construction, the use of low noise road surfacing can achieve reductions in the region of 3 dB(A); or

- Financial contribution to the landowner of R1 and R6, to contribute to upgrades in building insultation.

Where Western Development associated traffic can be concentrated during periods of the night-time when baseline traffic flows are greatest, such as the shoulder periods at the beginning and end of the night-time (2300-0000hrs and 0600-0700hrs), this would reduce the overall change in noise levels experienced by receptors on the B4100, and the associated significance in EIA terms.

However on a precautionary basis in the absence of any further study, the effects at these receptors are considered 'Significant'.

Figure 10.6: Noise Mitigation – 2m Noise Barrier



Mitigation, Monitoring and Residual Effects

For the purpose of significance evaluation, the noise model has been updated to include a 2 m noise barrier, and the associated assessment scenarios updated in the tables below.

Table 10.90: Western Development - Daytime Road Traffic Noise Exposure with 2 m Noise Barrier

Receptor ID	2022 Existing Baseline		2026 Future Baseline		2026 With Development	
	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB
R1	68.0	63.5	68.3	63.8	65.3	60.8
R2	67.6	63.1	67.8	63.3	65.6	61.1
R3	65.9	61.4	66.0	61.5	64.6	60.1
R4	68.2	63.7	68.4	63.9	67	62.5
R5	69.2	64.7	69.4	64.9	69.1	64.6
R6	66.2	61.7	66.5	62.0	65.2	60.7
R7	62.4	57.9	62.6	58.1	61.8	57.3
R8	72.7	68.2	73.0	68.5	73.2	68.7
R9	65.5	61.0	65.7	61.2	65.9	61.4

Receptor ID	2022 Existing Baseline		2026 Future Baseline		2026 With Development	
	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB
R10	65.2	60.7	65.5	61.0	65.6	61.1
R11	63.1	58.6	63.4	58.9	63.5	59.0

Table 10.91: Western Development – Night-time Road Traffic Noise Exposure with 2 m Noise Barrier

Receptor ID	2022 Existing Baseline	2026 Future Baseline	2026 With Development
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB
R1	60.4	61.1	61.0
R2	59.8	60.5	58.8
R3	59.0	59.7	57.4
R4	61.2	61.9	60.0
R5	62.1	62.8	62.2
R6	59.6	59.9	59.3
R7	54.5	55.1	54.1
R8	62.8	63.1	63.5
R9	55.1	55.4	55.8
R10	54.2	54.5	55.2
R11	52.0	52.3	53.0

Table 10.92: Western Development - Daytime: 2026 Future Baseline vs 2026 With Development with 2 m Noise Barrier (Noise Change Category)

Receptor ID	2026 Future Baseline	2026 With Development	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{A10,18hr}$ dB	$L_{A10,18hr}$ dB	dB		
R1	68.3	65.3	-3.0	High	Negligible
R2	67.8	65.6	-2.2	High	Negligible
R3	66.0	64.6	-1.4	High	Negligible
R4	68.4	67.0	-1.4	High	Negligible
R5	69.4	69.1	-0.3	Very High	Negligible
R6	66.5	65.2	-1.3	High	Negligible
R7	62.6	61.8	-0.8	Medium	Negligible
R8	73.0	73.2	0.2	Very High	Negligible
R9	65.7	65.9	0.2	High	Negligible
R10	65.5	65.6	0.1	High	Negligible
R11	63.4	63.5	0.1	Medium	Negligible

Table 10.93: Western Development - Night-time: 2026 Future Baseline vs 2026 With Development with 2 m Noise Barrier (Noise Change Category)

Receptor ID	2026 Future Baseline	2026 With Development	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	dB		
R1	61.1	61.0	-0.1	Very High	Negligible
R2	60.5	58.8	-1.7	Very High	Negligible
R3	59.7	57.4	-2.3	Very High	Negligible
R4	61.9	60.0	-1.9	Very High	Negligible
R5	62.8	62.2	-0.6	Very High	Negligible
R6	59.9	59.3	-0.6	Very High	Negligible
R7	55.1	54.1	-1.0	High	Negligible
R8	63.1	63.5	0.4	Very High	Negligible
R9	55.4	55.8	0.4	Very High	Negligible
R10	54.5	55.2	0.7	Very High	Negligible
R11	52.3	53.0	0.7	High	Negligible

Table 10.94: Western Development - Daytime: 2026 Future Baseline vs 2026 With Development with 2 m Noise Barrier (Noise Change Category)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	High	Negligible	Not Significant
R2	High	Negligible	Not Significant
R3	High	Negligible	Not Significant
R4	High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	High	Negligible	Not Significant
R7	Medium	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	High	Negligible	Not Significant
R10	High	Negligible	Not Significant
R11	Medium	Negligible	Not Significant

Table 10.95: Western Development - Night-time: 2026 Future Baseline vs 2026 With Development with 2 m Noise Barrier (Noise Change Category)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	Very High	Negligible	Not Significant
R2	Very High	Negligible	Not Significant
R3	Very High	Negligible	Not Significant
R4	Very High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	Very High	Negligible	Not Significant
R7	High	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	Very High	Negligible	Not Significant
R10	Very High	Negligible	Not Significant
R11	High	Negligible	Not Significant

As shown, a significance outcome of 'Not Significant' is determined for those receptors in the vicinity of the Western Development, with the provision of a 2m noise barrier.

Further noise reductions, in the order of 3 dB, could be achieved with the provision of low noise road surfacing.

The specific mitigation measures to be adopted will be determined as part of the development of the final design.

Development

Initial Scoping

As shown in Table 10.96, there are road links in the vicinity of the Development with a daytime BNL change of more than 1 dB(A) for the '2026 Future Baseline (without Development) vs 2026 Completed Development' assessment scenario.

Table 10.96: AAWT, 18hr Daytime Road Traffic Flows – BNL Change 2026 Future Baseline (without Development) vs 2026 Completed Development' – Development

Road	Link	Basic Noise Level (BNL), $L_{A10,18h}$ dB		
		2026 Future Baseline (DM)	2026 With Development (DS)	DS-DM
B4100	1	70.1	71.1	1.0
B4100	2	68.7	72.1	3.4
B4100	3	72.5	73.8	1.3
B4100	4	72.1	73.0	0.9
B4100	5	72.1	72.5	0.4
A4095	6	72.9	73.1	0.1
A4095	7	72.2	72.2	0.1
A43	8	78.6	78.8	0.3
B430	9	73.1	73.2	0.1
M40S	10	85.5	85.6	0.0
M40N	11	85.1	85.1	0.0
A43	12	81.4	81.6	0.2
M40N Onslip	13	69.2	69.4	0.3
M40N Offslip	14	69.7	70.0	0.2
M40S Onslip	15	74.5	74.7	0.1
M40S Offslip	16	74.4	74.5	0.1
M40 Overbridges	17	77.5	77.7	0.2
A43 Padbury-Cherwell Link	18	79.7	79.9	0.2
A43 north of Barleymow Roundabout	19	81.0	81.2	0.2
A421 east	20	72.3	72.6	0.4

A consideration of change in night-time BNL has been used to identify areas with receptors with potentially adverse noise effects. The road traffic links and associated night-time change in BNL are summarised in Table 10.97.

Table 10.97: AAWT, 1hr Night-time Road Traffic Flows – BNL Change 2026 Future Baseline (without Development) vs 2026 Completed Development' – Development

Road	Link	Basic Noise Level (BNL), $L_{A10,1h}$ dB		
		2026 Future Baseline (DM)	2026 With Development (DS)	DS-DM
B4100	1	64.9	67.6	2.7
B4100	2	63.4	70.6	7.2
B4100	3	68.1	71.1	3.0
B4100	4	67.7	69.9	2.1
B4100	5	67.9	68.6	0.7
A4095	6	68.8	69.0	0.3
A4095	7	67.1	67.3	0.2
A43	8	73.4	74.3	0.9
B430	9	68.8	69.1	0.2
M40S	10	84.3	84.4	0.1
M40N	11	84.0	84.1	0.0
A43	12	75.9	76.7	0.8
M40N Onslip	13	61.9	63.3	1.4
M40N Offslip	14	63.2	64.3	1.1
M40S Onslip	15	69.7	70.2	0.5
M40S Offslip	16	69.3	69.8	0.5
M40 Overbridges	17	72.4	73.1	0.7
A43 Padbury-Cherwell Link	18	74.7	75.3	0.6
A43 north of Barleymow Roundabout	19	75.6	76.2	0.6
A421 east	20	66.2	67.7	1.5

As shown in Table 10.97, the B4100 to the north of the Development (Link 1, 2, 3 and 4 as defined in Chapter 8: Transport and Access) is likely to experience a BNL changes greater than 1 dB(A) along the route. The A421 approximately 5 km northeast of the Development (Link 20 as defined in chapter 8: Transport and Access) and the M40N on slip road and M40N off slip road is also likely to experience a BNL change of 1 dB(A) (Links 13 and 14).

Further consideration of likely significant effects is therefore required.

Noise Exposure Classifications

The road traffic noise exposures, presented in the noise metric forms used in the noise threshold of potential effect criteria (Table 10.9) are presented in Table 10.98 and Table 10.99, and in terms of the associated noise level category as defined in Table 10.10, are presented in Table 10.100 and Table 10.101.

The magnitude of change in noise exposure has been determined for the opening year, 2026.

Noise Exposure Classifications

Table 10.98: Development - Daytime Road Traffic Noise Exposure

Receptor ID	2022 Existing Baseline		2026 Future Baseline		2026 With Development	
	$L_{A10, 18h (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18h (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18h (f)}$ dB	$L_{Aeq, 16hr}$ dB
R1	68.0	63.5	68.3	63.8	71	66.5
R2	67.6	63.1	67.8	63.3	68.6	64.1
R3	65.9	61.4	66.0	61.5	65	60.5
R4	68.2	63.7	68.4	63.9	67.3	62.8
R5	69.2	64.7	69.4	64.9	68.8	64.3
R6	66.2	61.7	66.5	62.0	67.3	62.8
R7	62.4	57.9	62.6	58.1	60.8	56.3
R8	72.7	68.2	73.0	68.5	73.2	68.7
R9	65.5	61.0	65.7	61.2	66	61.5
R10	65.2	60.7	65.5	61.0	65.9	61.4
R11	63.1	58.6	63.4	58.9	63.7	59.2

Table 10.99: Development - Night-time Road Traffic Noise Exposure

Receptor ID	2022 Existing Baseline	2026 Future Baseline	2026 With Development
	$L_{Aeq, 8h}$ dB	$L_{Aeq, 8h}$ dB	$L_{Aeq, 8h}$ dB
R1	60.4	61.1	64.9
R2	59.8	60.5	61.7
R3	59.0	59.7	58.4
R4	61.2	61.9	60.6
R5	62.1	62.8	62.0
R6	59.6	59.9	62.4
R7	54.5	55.1	53.0
R8	62.8	63.1	63.9
R9	55.1	55.4	56.1
R10	54.2	54.5	55.6
R11	52.0	52.3	53.4

Table 10.100: Development - Daytime Road Traffic Noise Exposure (Noise Level Category)

Receptor ID	Noise Level Category		
	2022 Existing Baseline	2026 Future Baseline	2026 With Development
R1	High	Very High	Very High
R2	High	High	Very High
R3	High	High	High
R4	Very High	Very High	High
R5	Very High	Very High	Very High
R6	High	High	High
R7	Medium	Medium	Medium
R8	Very High	Very High	Very High
R9	High	High	High
R10	High	High	High
R11	Medium	Medium	Medium

Table 10.101: Development - Night-time Road Traffic Noise Exposure (Noise Level Category)

Receptor ID	Noise Level Category		
	2022 Existing Baseline	2026 Future Baseline	2026 With Development
R1	Very High	Very High	Very High
R2	Very High	Very High	Very High
R3	Very High	Very High	Very High
R4	Very High	Very High	Very High
R5	Very High	Very High	Very High
R6	Very High	Very High	Very High
R7	High	Very High	High
R8	Very High	Very High	Very High
R9	Very High	Very High	Very High
R10	High	High	Very High
R11	High	High	High

As shown in Table 10.100, 'Very High' daytime noise level exposures occur at receptors R1, R4, R5, and R8, 'High' daytime noise level exposures occur at receptors R2, R3, R6, R9 and R10, and 'Medium' daytime noise level exposures occur at receptors R7 and R11 during the '2026 Future Baseline' assessment scenario. During the '2026 With Development' assessment scenario, 'Very High' daytime noise level exposures occur at receptors R1, R2, R5 and R8. 'High' daytime noise level exposures occur at receptors R3, R4, R6, R9 and R10 and 'Medium' daytime noise level exposures occur at receptors R7 and R11.

As shown in Table 10.101, during the night-time period, 'Very High' noise level exposures occur at receptors R1 – R9 and 'High' noise level exposures occur at receptors R10 and R11 during the '2026 Future Baseline' assessment scenario. During the '2026 With Development' assessment

scenario, 'Very High' noise level exposures occur at R1, R2, R3, R4, R5, R6, R8, R9 and R10 and 'High' noise level exposures occur at R7 and R11.

Magnitude of Change in Noise Exposure

The magnitude of change in noise exposure is considered for the following scenarios:

- 2022 – Baseline vs 2026 Future Baseline (without Development); and
- 2026 Future Baseline (without Development) vs 2026 Completed Development

The first scenario has been considered for context to demonstrate the likely noise change between the 2022 Baseline and the 2026 assessment year irrespective of the Development.

The associated significance has been determined for the 2026 assessment scenario.

Noise exposure has been presented to one decimal place to inform the noise change criteria. An increase in noise level, indicated by a positive value in the 'Noise Change' column indicates an 'adverse' change. A 'beneficial' change occurs when there is a negative value in the 'Noise Change' column.

Table 10.102: Development - Daytime: 2022 Baseline vs 2026 Future Baseline (Noise Change Category)

Receptor ID	2022 Baseline	2026 Future Baseline	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{A10,18h}$ dB	$L_{A10,18h}$ dB	dB		
R1	68.0	68.3	0.3	Very High	Negligible
R2	67.6	67.8	0.2	High	Negligible
R3	65.9	66.0	0.1	High	Negligible
R4	68.2	68.4	0.2	Very High	Negligible
R5	69.2	69.4	0.2	Very High	Negligible
R6	66.2	66.5	0.3	High	Negligible
R7	62.4	62.6	0.2	Medium	Negligible
R8	72.7	73.0	0.3	Very High	Negligible
R9	65.5	65.7	0.2	High	Negligible
R10	65.2	65.5	0.3	High	Negligible
R11	63.1	63.4	0.3	Medium	Negligible

Table 10.103: Development - Night-time: 2022 Baseline vs 2026 Future Baseline (Noise Change Category)

Receptor ID	2022 Baseline	2026 Future Baseline	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	dB		
R1	60.4	61.1	0.7	Very High	Negligible
R2	59.8	60.5	0.7	Very High	Negligible
R3	59.0	59.7	0.7	Very High	Negligible
R4	61.2	61.9	0.7	Very High	Negligible
R5	62.1	62.8	0.7	Very High	Negligible
R6	59.6	59.9	0.3	Very High	Negligible
R7	54.5	55.1	0.6	Very High	Negligible
R8	62.8	63.1	0.3	Very High	Negligible
R9	55.1	55.4	0.3	Very High	Negligible
R10	54.2	54.5	0.3	High	Negligible
R11	52.0	52.3	0.3	High	Negligible

Table 10.104: Development - Daytime: 2026 Future Baseline vs 2026 With Development (Noise Change Category)

Receptor ID	2026 Future Baseline	2026 With Development	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{A10,18h}$ dB	$L_{A10,18h}$ dB	dB		
R1	68.3	71.0	2.7	Very High	Low
R2	67.8	68.6	0.8	Very High	Negligible
R3	66.0	65.0	-1.0	High	Negligible
R4	68.4	67.3	-1.1	High	Negligible
R5	69.4	68.8	-0.6	Very High	Negligible
R6	66.5	67.3	0.8	High	Negligible
R7	62.6	60.8	-1.8	Medium	Negligible
R8	73.0	73.2	0.2	Very High	Negligible
R9	65.7	66.0	0.3	High	Negligible
R10	65.5	65.9	0.4	High	Negligible
R11	63.4	63.7	0.3	Medium	Negligible

Table 10.105: Development - Night-time: 2026 Future Baseline vs 2026 With Development (Noise Change Category)

Receptor ID	2026 Future Baseline	2026 With Development	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	dB		
R1	61.1	64.9	3.8	Very High	Medium
R2	60.5	61.7	1.2	Very High	Low
R3	59.7	58.4	-1.3	Very High	Negligible
R4	61.9	60.6	-1.3	Very High	Negligible
R5	62.8	62.0	-0.8	Very High	Negligible
R6	59.9	62.4	2.5	Very High	Low
R7	55.1	53.0	-2.1	High	Negligible
R8	63.1	63.9	0.8	Very High	Negligible
R9	55.4	56.1	0.7	Very High	Negligible
R10	54.5	55.6	1.1	Very High	Low
R11	52.3	53.4	1.1	High	Low

Significance Evaluation Summary

Significance has been quantitatively evaluated for those receptors in the vicinity of the Development also in the vicinity of road traffic links with a change in daytime BNL of more than 1 dB(A) for the '2026 Future Baseline (without Development) vs 2026 Completed Development' assessment scenario.

Table 10.106: Development - Daytime: 2026 Future Baseline vs 2026 With Development (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	Very High	Low	Significant
R2	Very High	Negligible	Not Significant
R3	High	Negligible	Not Significant
R4	High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	High	Negligible	Not Significant
R7	Medium	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	High	Negligible	Not Significant
R10	High	Negligible	Not Significant
R11	Medium	Negligible	Not Significant

Table 10.107: Development - Night-time: 2026 Future Baseline vs 2026 With Development (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	Very High	Medium	Significant
R2	Very High	Low	Significant
R3	Very High	Negligible	Not Significant
R4	Very High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	Very High	Low	Significant
R7	High	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	Very High	Negligible	Not Significant
R10	Very High	Low	Significant
R11	High	Low	Not Significant

As shown, a significance outcome of 'Significant' is determined at receptors R1, R2 and R6, located in the vicinity of the Development. Consideration of site-specific mitigation is therefore presented.

In addition, as shown in Table 10.107, receptor R10 to the south of the A421 (Link 20 as shown in Figure 18.1, Chapter 8: Transport and Access) approximately 5 km northeast of the Development shows a significance outcome of 'Significant'. A qualitative consideration of mitigation options with respect to this receptor is also presented.

Proposed Management and Control Measures

There are a number of mitigation strategies that can be implemented to reduce these noise levels at the receptors in the vicinity of the Development, with the most appropriate suite of measures subject to agreement with CDC. Noise mitigation options with respect of the receptors located in the vicinity of the Development, which would be considered, and delivered pre-occupation of the units (i.e. R1, R2 and R6) include:

- A noise barrier – of sufficient density, to be located between the B4100 and the Western Development either on highways land (to be secured through a Section 278 (S.278) Agreement) or within the ownership boundary of the private dwellings. The specific design of any noise barrier will be the subject of further analysis, however for the purpose of significance evaluation a barrier with 2 metre height, located along the position illustrated in Figure 10.6 in Appendix 10.5, has been modelled;

- Low noise road surfacing – depending on the speeds of the road in question, and the existing road construction, the use of low noise road surfacing can achieve reductions in the region of 3 dB(A); or

- Financial contribution to the landowner of R1, R2 and R6, to contribute to upgrades in building insultation.

For receptor R10 located in the wider assessment extents, where a potential significant effect is determined for the night-time period with respect to the Development, a mitigation strategy would include consideration of a study of the night-time flow provisions set out in the Framework Travel Plan.

The specific mitigation measures to be adopted in relation to this receptor will be determined as part of the development of the final design.

Where Development associated traffic can be concentrated during periods of the night-time when baseline traffic flows are greatest, such as the shoulder periods at the beginning and end of the night-time (2300-0000hrs and 0600-0700hrs), this would reduce the overall change in noise levels experienced by receptor R10 on the A421, and the associated significance in EIA terms. However on a precautionary basis in the absence of any further study, the effects at this receptor is considered 'Significant'.

Mitigation, Monitoring and Residual Effects

For the purpose of significance evaluation, the noise model has been updated to include a 2 m noise barrier, and the associated assessment scenarios updated in the tables below.

Table 10.108: Development - Daytime Road Traffic Noise Exposure with 2 m Noise Barrier

Receptor ID	2022 Existing Baseline		2026 Future Baseline		2026 With Development	
	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB
R1	68.0	63.5	68.3	63.8	65.4	60.9
R2	67.6	63.1	67.8	63.3	65.6	61.1
R3	65.9	61.4	66.0	61.5	64.7	60.2
R4	68.2	63.7	68.4	63.9	67.1	62.6
R5	69.2	64.7	69.4	64.9	68.8	64.3
R6	66.2	61.7	66.5	62.0	65.2	60.7
R7	62.4	57.9	62.6	58.1	60.8	56.3
R8	72.7	68.2	73.0	68.5	73.2	68.7
R9	65.5	61.0	65.7	61.2	66	61.5
R10	65.2	60.7	65.5	61.0	65.9	61.4
R11	63.1	58.6	63.4	58.9	63.7	59.2

Table 10.109: Development - Night-time Road Traffic Noise Exposure with 2 m Noise Barrier

Receptor ID	2022 Existing Baseline	2026 Future Baseline	2026 With Development
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB
R1	60.4	61.1	61.2
R2	59.8	60.5	59.1
R3	59.0	59.7	57.9
R4	61.2	61.9	60.3
R5	62.1	62.8	62.0

Receptor ID	2022 Existing Baseline	2026 Future Baseline	2026 With Development
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB
R6	59.6	59.9	59.6
R7	54.5	55.1	53.0
R8	62.8	63.1	63.9
R9	55.1	55.4	56.1
R10	54.2	54.5	55.6
R11	52.0	52.3	53.4

Table 10.110: Development - Daytime: 2026 Future Baseline vs 2026 With Development with 2 m Noise Barrier (Noise Change Category)

Receptor ID	2026 Future Baseline	2026 With Development	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{A10,18hr}$ dB	$L_{A10,18hr}$ dB	dB		
R1	68.3	65.4	-2.9	High	Negligible
R2	67.8	65.6	-2.2	High	Negligible
R3	66.0	64.7	-1.3	High	Negligible
R4	68.4	67.1	-1.3	High	Negligible
R5	69.4	68.8	-0.6	Very High	Negligible
R6	66.5	65.2	-1.3	High	Negligible
R7	62.6	60.8	-1.8	Medium	Negligible
R8	73.0	73.2	0.2	Very High	Negligible
R9	65.7	66.0	0.3	High	Negligible
R10	65.5	65.9	0.4	High	Negligible
R11	63.4	63.7	0.3	Medium	Negligible

Table 10.111: Development - Night-time: 2026 Future Baseline vs 2026 With Development with 2 m Noise Barrier (Noise Change Category)

Receptor ID	2026 Future Baseline	2026 With Development	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	dB		
R1	61.1	61.2	0.1	Very High	Negligible
R2	60.5	59.1	-1.4	Very High	Negligible
R3	59.7	57.9	-1.8	Very High	Negligible
R4	61.9	60.3	-1.6	Very High	Negligible
R5	62.8	62.0	-0.8	Very High	Negligible
R6	59.9	59.6	-0.3	Very High	Negligible
R7	55.1	53.0	-2.1	High	Negligible
R8	63.1	63.9	0.8	Very High	Negligible
R9	55.4	56.1	0.7	Very High	Negligible
R10	54.5	55.6	1.1	Very High	Low
R11	52.3	53.4	1.1	High	Low

Table 10.112: Development - Daytime: 2026 Future Baseline vs 2026 With Development with 2 m Noise Barrier (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	High	Negligible	Not Significant
R2	High	Negligible	Not Significant
R3	High	Negligible	Not Significant
R4	High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	High	Negligible	Not Significant
R7	Medium	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	High	Negligible	Not Significant
R10	High	Negligible	Not Significant
R11	Medium	Negligible	Not Significant

Table 10.113: Development - Night-time: 2026 Future Baseline vs 2026 With Development with 2 m Noise Barrier (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	Very High	Negligible	Not Significant
R2	Very High	Negligible	Not Significant
R3	Very High	Negligible	Not Significant
R4	Very High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	Very High	Negligible	Not Significant
R7	High	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	Very High	Negligible	Not Significant
R10	Very High	Low	Significant
R11	High	Low	Not Significant

As shown, a significance outcome of 'Not Significant' is determined for those receptors in the vicinity of the Development, with the provision of a 2 m noise barrier.

Further noise reductions, in the order of 3 dB, could be achieved with the provision of low noise road surfacing.

The specific mitigation measures to be adopted will be determined as part of the development of the final design.

For receptor R10 located south of the A421, where a potential 'Significant' effect is determined for the night-time period with respect to the Development, reductions in the overall change in noise levels experienced at the receptors could be achieved through further consideration of the night-time flow provisions set out in the Framework Travel Plan. This would reduce the change in noise levels, and likely associated significance in EIA terms. However, on a precautionary basis in the absence of any further study, the effects at this receptor is considered 'Significant'.

Development + Tritax Development

Initial Scoping

As shown in Table 10.114, there are road links in the vicinity of the Development with a daytime BNL change of more than 1 dB(A) for the '2026 Future Baseline (without Development) vs 2026 Completed Development + Tritax Development' assessment scenario.

Table 10.114: AAWT, 18hr Daytime Road Traffic Flows – BNL Change 2026 Future Baseline (without Development) vs 2026 Completed Development + Tritax Development' – Development + Tritax Development

Road	Link	Basic Noise Level (BNL), $L_{A10,18h}$ dB		
		2026 Future Baseline (DM)	2026 With Development + Tritax Development (DS)	DS-DM
B4100	1	70.1	71.7	1.6
B4100	2	68.7	72.5	3.8
B4100	3	72.5	75.6	3.1
B4100	4	72.1	75.1	3.0
B4100	5	72.1	72.9	0.8
A4095	6	72.9	73.2	0.3
A4095	7	72.2	72.3	0.2
A43	8	78.6	79.1	0.6
B430	9	73.1	73.3	0.2
M40S	10	85.5	85.6	0.1
M40N	11	85.1	85.1	0.1
A43	12	81.4	81.9	0.5
M40N Onslip	13	69.2	69.7	0.6
M40N Offslip	14	69.7	70.2	0.5
M40S Onslip	15	74.5	74.8	0.3
M40S Offslip	16	74.4	74.7	0.3
M40 Overbridges	17	77.5	78.0	0.4
A43 Padbury-Cherwell Link	18	79.7	80.0	0.4
A43 north of Barleymow Roundabout	19	81.0	81.4	0.4
A421 east	20	72.3	73.0	0.8

A consideration of change in night-time BNL has been used to identify areas with receptors with potentially adverse noise effects. The road traffic links and associated night-time change in BNL are summarised in Table 10.115.

Table 10.115: AAWT, 1hr Night-time Road Traffic Flows – BNL Change 2026 Future Baseline (without Development) vs 2026 Completed Development + Tritax Development' – Development + Tritax Development

Road	Link	Basic Noise Level (BNL), $L_{A10,1h}$ dB		
		2026 Future Baseline (DM)	2026 With Development + Tritax Development (DS)	DS-DM
B4100	1	64.9	68.9	4.1
B4100	2	63.4	71.2	7.7
B4100	3	68.1	74.0	5.9
B4100	4	67.7	73.4	5.7
B4100	5	67.9	69.3	1.4
A4095	6	68.8	69.3	0.5
A4095	7	67.1	67.5	0.4
A43	8	73.4	75.1	1.7
B430	9	68.8	69.3	0.4
M40S	10	84.3	84.5	0.1
M40N	11	84.0	84.1	0.1
A43	12	75.9	77.4	1.5
M40N Onslip	13	61.9	64.4	2.5
M40N Offslip	14	63.2	65.2	2.1
M40S Onslip	15	69.7	70.6	0.9
M40S Offslip	16	69.3	70.3	1.0
M40 Overbridges	17	72.4	73.7	1.3
A43 Padbury-Cherwell Link	18	74.7	75.8	1.1
A43 north of Barleymow Roundabout	19	75.6	76.8	1.2
A421 east	20	66.2	68.9	2.7

As shown in Table 10.115, links 1, 2, 3, 4, 5, 8, 12, 13, 14, 16, 17, 18, 19 and 20 are likely to experience BNL changes greater than 1 dB(A) along the route.

Noise Exposure Classifications

The road traffic noise exposures, presented in the noise metric forms used in the noise threshold of potential effect criteria (Table 10.9) are presented in Table 10.116 and Table 10.117, and in terms of the associated noise level category as defined in Table 10.10, are presented in Table 10.118 and Table 10.119.

The magnitude of change in noise exposure has been determined for the opening year, 2026.

Noise Exposure Classifications

Table 10.116: Development + Tritax Development - Daytime Road Traffic Noise Exposure

Receptor ID	2022 Existing Baseline		2026 Future Baseline		2026 With Development + Tritax Development	
	$L_{A10, 18h (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18h (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18h (f)}$ dB	$L_{Aeq, 16hr}$ dB
R1	68.0	63.5	68.3	63.8	71.4	66.9
R2	67.6	63.1	67.8	63.3	68.9	64.4
R3	65.9	61.4	66.0	61.5	65.5	61.0
R4	68.2	63.7	68.4	63.9	67.5	63.0
R5	69.2	64.7	69.4	64.9	68.9	64.4
R6	66.2	61.7	66.5	62.0	67.6	63.1
R7	62.4	57.9	62.6	58.1	61.9	57.4
R8	72.7	68.2	73.0	68.5	73.4	68.9
R9	65.5	61.0	65.7	61.2	66.2	61.7
R10	65.2	60.7	65.5	61.0	66.3	61.8
R11	63.1	58.6	63.4	58.9	64	59.5

Table 10.117: Development + Tritax Development - Night-time Road Traffic Noise Exposure

Receptor ID	2022 Existing Baseline	2026 Future Baseline	2026 With Development + Tritax Development
	$L_{Aeq, 8h}$ dB	$L_{Aeq, 8h}$ dB	$L_{Aeq, 8h}$ dB
R1	60.4	61.1	65.4
R2	59.8	60.5	62.7
R3	59.0	59.7	59.4
R4	61.2	61.9	61.4
R5	62.1	62.8	62.2
R6	59.6	59.9	63.3
R7	54.5	55.1	55.1
R8	62.8	63.1	64.5
R9	55.1	55.4	56.8
R10	54.2	54.5	56.6
R11	52.0	52.3	54.3

Table 10.118: Development + Tritax Development - Daytime Road Traffic Noise Exposure (Noise Level Category)

Receptor ID	Noise Level Category		
	2022 Existing Baseline	2026 Future Baseline	2026 With Development + Tritax Development
R1	High	Very High	Very High
R2	High	High	Very High
R3	High	High	High
R4	Very High	Very High	High
R5	Very High	Very High	Very High
R6	High	High	High
R7	Medium	Medium	Medium
R8	Very High	Very High	Very High
R9	High	High	High
R10	High	High	High
R11	Medium	Medium	High

Table 10.119: Development + Tritax Development- Night-time Road Traffic Noise Exposure (Noise Level Category)

Receptor ID	Noise Level Category		
	2022 Existing Baseline	2026 Future Baseline	2026 With Development + Tritax Development
R1	Very High	Very High	Very High
R2	Very High	Very High	Very High
R3	Very High	Very High	Very High
R4	Very High	Very High	Very High
R5	Very High	Very High	Very High
R6	Very High	Very High	Very High
R7	High	Very High	Very High
R8	Very High	Very High	Very High
R9	Very High	Very High	Very High
R10	High	High	Very High
R11	High	High	High

As shown in Table 10.118, 'Very High' daytime noise level exposures occur at receptors R1, R4, R5, and R8, 'High' daytime noise level exposures occur at receptors R2, R3, R6, R9 and R10, and 'Medium' daytime noise level exposures occur at receptors R7 and R11 during the '2026 Future Baseline' assessment scenario. During the '2026 With Development + Tritax Development' assessment scenario, 'Very High' daytime noise level exposures occur at receptors R1, R2, R5 and R8. 'High' daytime noise level exposures occur at receptors R3, R4, R6, R9 and R10 and 'Medium' daytime noise level exposures occur at receptors R7 and R11.

As shown in Table 10.119, during the night-time period, 'Very High' noise level exposures occur at receptors R1 – R9 and 'High' noise level exposures occur at receptors R10 and R11 during the

'2026 Future Baseline' assessment scenario. During the '2026 With Development + Tritax Development' assessment scenario, 'Very High' noise level exposures occur at R1 – R10 and 'High' noise level exposures occur at R11.

Magnitude of Change in Noise Exposure

The magnitude of change in noise exposure is considered for the following scenarios:

- 2022 – Baseline vs 2026 Future Baseline (without Development); and
- 2026 Future Baseline (without Development) vs 2026 Completed Development + Tritax Development

The first scenario has been considered for context to demonstrate the likely noise change between the 2022 Baseline and the 2026 assessment year irrespective of the Development and Tritax Development.

The associated significance has been determined for the 2026 assessment scenario.

Noise exposure has been presented to one decimal place to inform the noise change criteria. An increase in noise level, indicated by a positive value in the 'Noise Change' column indicates an 'adverse' change. A 'beneficial' change occurs when there is a negative value in the 'Noise Change' column.

Table 10.120: Development + Tritax Development - Daytime: 2022 Baseline vs 2026 Future Baseline (Noise Change Category)

Receptor ID	2022 Baseline	2026 Future Baseline	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{A10,18h}$ dB	$L_{A10,18h}$ dB	dB		
R1	68.0	68.3	0.3	Very High	Negligible
R2	67.6	67.8	0.2	High	Negligible
R3	65.9	66.0	0.1	High	Negligible
R4	68.2	68.4	0.2	Very High	Negligible
R5	69.2	69.4	0.2	Very High	Negligible
R6	66.2	66.5	0.3	High	Negligible
R7	62.4	62.6	0.2	Medium	Negligible
R8	72.7	73.0	0.3	Very High	Negligible
R9	65.5	65.7	0.2	High	Negligible
R10	65.2	65.5	0.3	High	Negligible
R11	63.1	63.4	0.3	Medium	Negligible

Table 10.121: Development + Tritax Development - Night-time: 2022 Baseline vs 2026 Future Baseline (Noise Change Category)

Receptor ID	2022 Baseline	2026 Future Baseline	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	dB		
R1	60.4	61.1	0.7	Very High	Negligible
R2	59.8	60.5	0.7	Very High	Negligible
R3	59.0	59.7	0.7	Very High	Negligible
R4	61.2	61.9	0.7	Very High	Negligible
R5	62.1	62.8	0.7	Very High	Negligible
R6	59.6	59.9	0.3	Very High	Negligible
R7	54.5	55.1	0.6	Very High	Negligible
R8	62.8	63.1	0.3	Very High	Negligible
R9	55.1	55.4	0.3	Very High	Negligible
R10	54.2	54.5	0.3	High	Negligible
R11	52.0	52.3	0.3	High	Negligible

Table 10.122: Development + Tritax Development - Daytime: 2026 Future Baseline vs 2026 With Development + Tritax Development (Noise Change Category)

Receptor ID	2026 Future Baseline	2026 With Development + Tritax Development	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{A10,18h}$ dB	$L_{A10,18h}$ dB	dB		
R1	68.3	71.4	3.1	Very High	Medium
R2	67.8	68.9	1.1	Very High	Low
R3	66.0	65.5	-0.5	High	Negligible
R4	68.4	67.5	-0.9	High	Negligible
R5	69.4	68.9	-0.5	Very High	Negligible
R6	66.5	67.6	1.1	High	Low
R7	62.6	61.9	-0.7	Medium	Negligible
R8	73.0	73.4	0.4	Very High	Negligible
R9	65.7	66.2	0.5	High	Negligible
R10	65.5	66.3	0.8	High	Negligible
R11	63.4	64.0	0.6	High	Negligible

Table 10.123: Development + Tritax Development - Night-time: 2026 Future Baseline vs 2026 With Development + Tritax Development (Noise Change Category)

Receptor ID	2026 Future Baseline	2026 With Development + Tritax Development	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	dB		
R1	61.1	65.4	4.3	Very High	Medium
R2	60.5	62.7	2.2	Very High	Low
R3	59.7	59.4	-0.3	Very High	Negligible
R4	61.9	61.4	-0.5	Very High	Negligible
R5	62.8	62.2	-0.6	Very High	Negligible
R6	59.9	63.3	3.4	Very High	Medium
R7	55.1	55.1	0.0	Very High	Negligible
R8	63.1	64.5	1.4	Very High	Low
R9	55.4	56.8	1.4	Very High	Low
R10	54.5	56.6	2.1	Very High	Low
R11	52.3	54.3	2.0	High	Low

Significance Evaluation Summary

Significance has been quantitatively evaluated for those receptors in the vicinity of the Development also in the vicinity of road traffic links with a change in daytime BNL of more than 1 dB(A) for the '2026 Future Baseline (without Development) vs 2026 Completed Development' assessment scenario.

Table 10.124: Development + Tritax - Daytime: 2026 Future Baseline vs 2026 With Development + Tritax Development (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	Very High	Medium	Significant
R2	Very High	Low	Significant
R3	High	Negligible	Not Significant
R4	High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	High	Low	Not Significant
R7	Medium	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	High	Negligible	Not Significant
R10	High	Negligible	Not Significant
R11	High	Negligible	Not Significant

Table 10.125: Development + Tritax Development - Night-time: 2026 Future Baseline vs 2026 With Development + Tritax Development (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	Very High	Medium	Significant
R2	Very High	Low	Significant
R3	Very High	Negligible	Not Significant
R4	Very High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	Very High	Medium	Significant
R7	Very High	Negligible	Not Significant
R8	Very High	Low	Significant
R9	Very High	Low	Significant
R10	Very High	Low	Significant
R11	High	Low	Not Significant

As shown, a significance outcome of 'Significant' is determined at receptors R1, R2 and R6 located in the vicinity of the Development. Consideration of site-specific mitigation is therefore presented.

In addition, as shown in Table 10.125, receptors R8, R9 and R10 show a significance outcome of 'Significant'. A qualitative consideration of mitigation options with respect to this receptor is also presented.

Proposed Management and Control Measures

There are a number of mitigation strategies that can be implemented to reduce these noise levels at the receptors in the vicinity of the Development, with the most appropriate suite of measures subject to agreement with CDC. Noise mitigation options with respect of the receptors located in the vicinity of the Development, which would be considered, and delivered pre-occupation of the units (i.e. R1, R2 and R6) include:

- A noise barrier – of sufficient density, to be located between the B4100 and the Western Development either on highways land (to be secured through a Section 278 (S.278) Agreement) or within the ownership boundary of the private dwellings. The specific design of any noise barrier will be the subject of further analysis, however for the purpose of significance evaluation a barrier with 2 metre height, located along the position illustrated in Figure 10.6 in Appendix 10.5, has been modelled;

- Low noise road surfacing – depending on the speeds of the road in question, and the existing road construction, the use of low noise road surfacing can achieve reductions in the region of 3 dB(A); or

- Financial contribution to the landowner of R1, R2 and R6, to contribute to upgrades in building insultation.

For receptors R8, R9 and R10 located in the wider assessment extents, where a potential significant effect is determined for the night-time period with respect to the Development + Tritax Development, a mitigation strategy would include consideration of a study of the night-time flow provisions set out in the Framework Travel Plan.

The specific mitigation measures to be adopted in relation to this receptor will be determined as part of the development of the final design.

Where Development + Tritax Development associated traffic can be concentrated during periods of the night-time when baseline traffic flows are greatest, such as the shoulder periods at the beginning and end of the night-time (2300-0000hrs and 0600-0700hrs), this could potentially reduce the overall change in noise levels experienced by receptors R8, R9 and R10, and the associated significance in EIA terms. However, on a precautionary basis in the absence of any further study, the effects at these receptors is considered 'Significant'.

Mitigation, Monitoring and Residual Effects

For the purpose of significance evaluation, the noise model has been updated to include a 2 m noise barrier, and the associated assessment scenarios updated in the tables below.

Table 10.126: Development + Tritax Development - Daytime Road Traffic Noise Exposure with 2 m Noise Barrier

Receptor ID	2022 Existing Baseline		2026 Future Baseline		2026 With Development + Tritax Development	
	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB	$L_{A10, 18hr (f)}$ dB	$L_{Aeq, 16hr}$ dB
R1	68.0	63.5	68.3	63.8	65.8	61.3
R2	67.6	63.1	67.8	63.3	65.9	61.4
R3	65.9	61.4	66.0	61.5	65.1	60.6
R4	68.2	63.7	68.4	63.9	67.4	62.9
R5	69.2	64.7	69.4	64.9	68.9	64.4
R6	66.2	61.7	66.5	62.0	65.5	61.0
R7	62.4	57.9	62.6	58.1	61.9	57.4
R8	72.7	68.2	73.0	68.5	73.4	68.9
R9	65.5	61.0	65.7	61.2	66.2	61.7
R10	65.2	60.7	65.5	61.0	66.3	61.8
R11	63.1	58.6	63.4	58.9	64	59.5

Table 10.127: Development + Tritax Development - Night-time Road Traffic Noise Exposure with 2 m Noise Barrier

Receptor ID	2022 Existing Baseline	2026 Future Baseline	2026 With Development
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB
R1	60.4	61.1	61.8
R2	59.8	60.5	60.1
R3	59.0	59.7	58.9

Receptor ID	2022 Existing Baseline	2026 Future Baseline	2026 With Development
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB
R4	61.2	61.9	61.1
R5	62.1	62.8	62.2
R6	59.6	59.9	60.5
R7	54.5	55.1	55.1
R8	62.8	63.1	64.5
R9	55.1	55.4	56.8
R10	54.2	54.5	56.6
R11	52.0	52.3	54.3

Table 10.128: Development + Tritax Development - Daytime: 2026 Future Baseline vs 2026 With Development + Tritax Development with 2 m Noise Barrier (Noise Change Category)

Receptor ID	2026 Future Baseline	2026 With Development + Tritax Development	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{A10,18hr}$ dB	$L_{A10,18hr}$ dB	dB		
R1	68.3	65.8	-2.5	High	Negligible
R2	67.8	65.9	-1.9	High	Negligible
R3	66.0	65.1	-0.9	High	Negligible
R4	68.4	67.4	-1.0	High	Negligible
R5	69.4	68.9	-0.5	Very High	Negligible
R6	66.5	65.5	-1.0	High	Negligible
R7	62.6	61.9	-0.7	Medium	Negligible
R8	73.0	73.4	0.4	Very High	Negligible
R9	65.7	66.2	0.5	High	Negligible
R10	65.5	66.3	0.8	High	Negligible
R11	63.4	64.0	0.6	High	Negligible

Table 10.129: Development + Tritax Development - Night-time: 2026 Future Baseline vs 2026 With Development + Tritax Development with 2 m Noise Barrier (Noise Change Category)

Receptor ID	2026 Future Baseline	2026 With Development + Tritax Development	Noise Change	Noise Exposure Category 'End State'	Noise Change Category
	$L_{Aeq,8h}$ dB	$L_{Aeq,8h}$ dB	dB		
R1	61.1	61.8	0.7	Very High	Negligible
R2	60.5	60.1	-0.4	Very High	Negligible
R3	59.7	58.9	-0.8	Very High	Negligible
R4	61.9	61.1	-0.8	Very High	Negligible
R5	62.8	62.2	-0.6	Very High	Negligible
R6	59.9	60.5	0.6	Very High	Negligible
R7	55.1	55.1	0.0	Very High	Negligible
R8	63.1	64.5	1.4	Very High	Low
R9	55.4	56.8	1.4	Very High	Low
R10	54.5	56.6	2.1	Very High	Low
R11	52.3	54.3	2.0	High	Low

Table 10.130: Development + Tritax Development - Daytime: 2026 Future Baseline vs 2026 With Development + Tritax Development with 2 m Noise Barrier (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	High	Negligible	Not Significant
R2	High	Negligible	Not Significant
R3	High	Negligible	Not Significant
R4	High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	High	Negligible	Not Significant
R7	Medium	Negligible	Not Significant
R8	Very High	Negligible	Not Significant
R9	High	Negligible	Not Significant
R10	High	Negligible	Not Significant
R11	High	Negligible	Not Significant

Table 10.131: Development + Tritax Development - Night-time: 2026 Future Baseline vs 2026 With Development + Tritax Development with 2 m Noise Barrier (Significance Evaluation)

Receptor ID	Noise Exposure Category 'End State'	Noise Change Category	Significance Evaluation
R1	Very High	Negligible	Not Significant
R2	Very High	Negligible	Not Significant
R3	Very High	Negligible	Not Significant
R4	Very High	Negligible	Not Significant
R5	Very High	Negligible	Not Significant
R6	Very High	Negligible	Not Significant
R7	Very High	Negligible	Not Significant
R8	Very High	Low	Significant
R9	Very High	Low	Significant
R10	Very High	Low	Significant
R11	High	Low	Not Significant

As shown, a significance outcome of 'Not Significant' is determined for those receptors in the vicinity of the Development, with the provision of a 2 m noise barrier.

Further noise reductions, in the order of 3 dB, could be achieved with the provision of low noise road surfacing.

The specific mitigation measures to be adopted will be determined as part of the development of the final design.

For receptors R8, R9 and R10, where a potential significant effect is determined for the night-time period with respect to the Development + Tritax Development, reductions in the overall change in noise levels experienced at the receptors could be achieved through further consideration of the night-time flow provisions set out in the Framework Travel Plan. This would reduce the change in noise levels, and likely associated significance in EIA terms. However, on a precautionary basis in the absence of any further study, the effects at these receptors is considered 'Significant'.

Appendix 10.6

ROAD TRAFFIC NOISE CONTOURS

Appendix 10.6 Road Traffic Noise Contours

Figure 10.7: 2022 Baseline Daytime Noise Exposure Categories

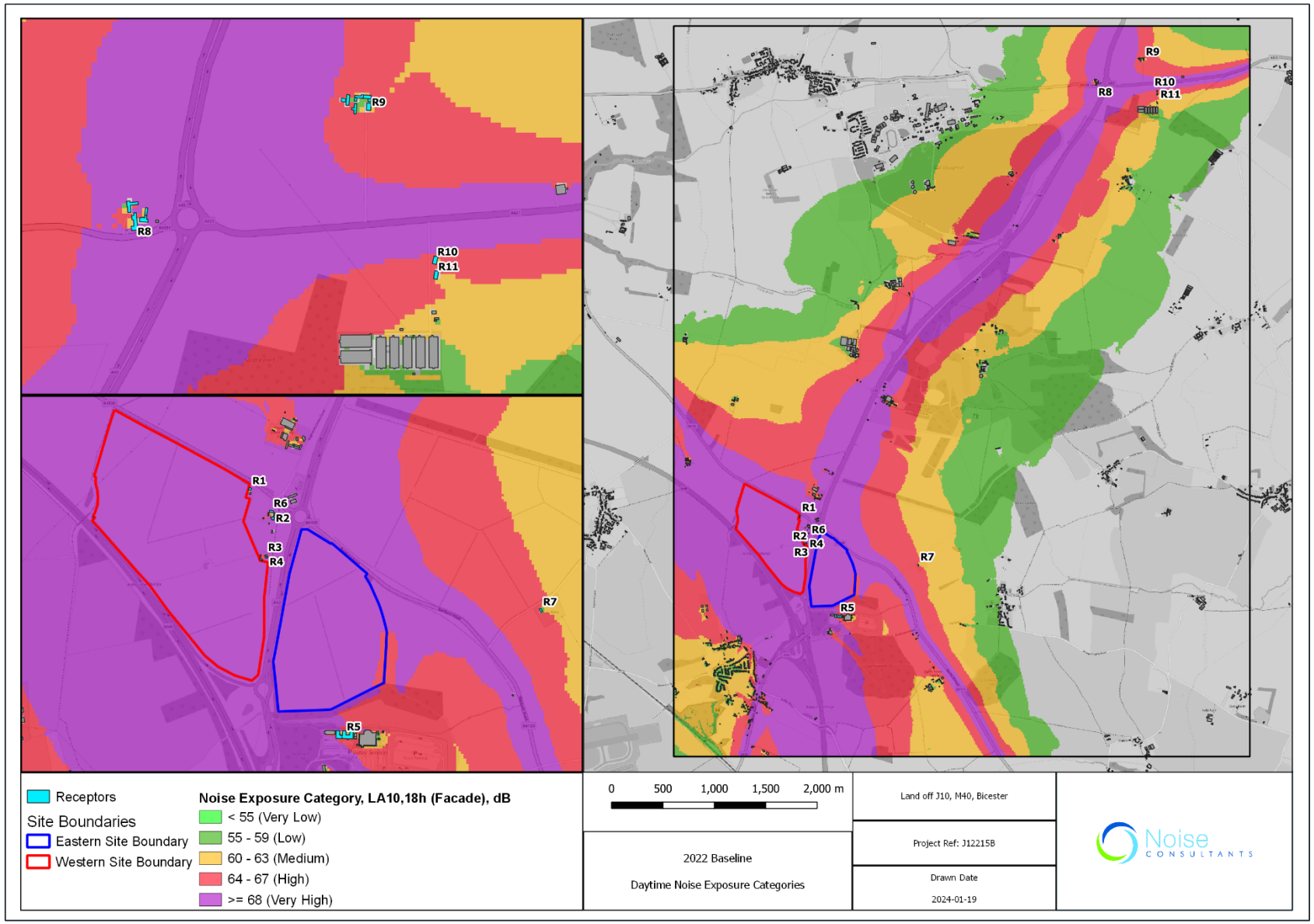


Figure 10.8: 2022 Baseline Night-time Noise Exposure Categories

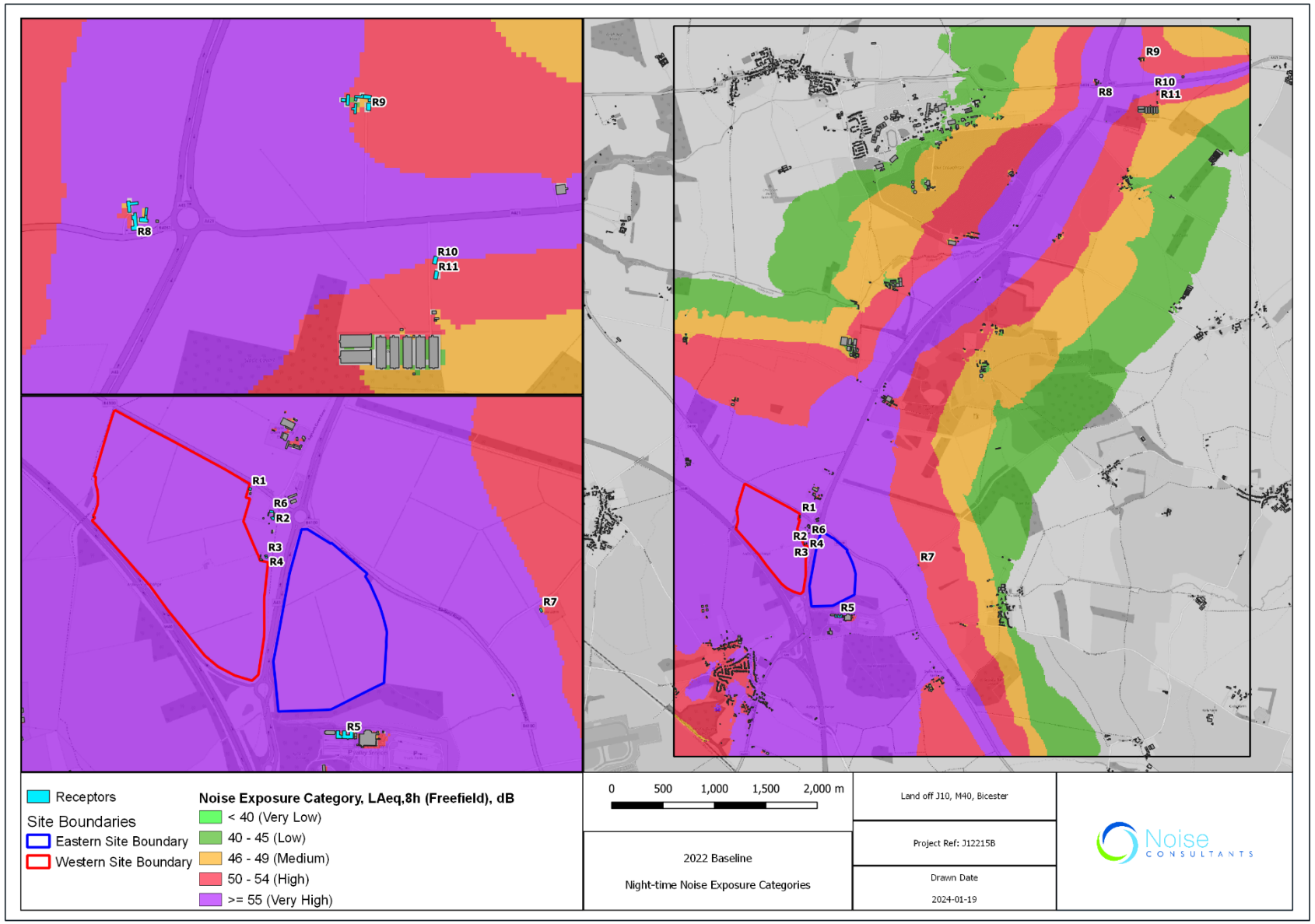


Figure 10.9: 2026 Future Baseline Daytime Noise Exposure Categories

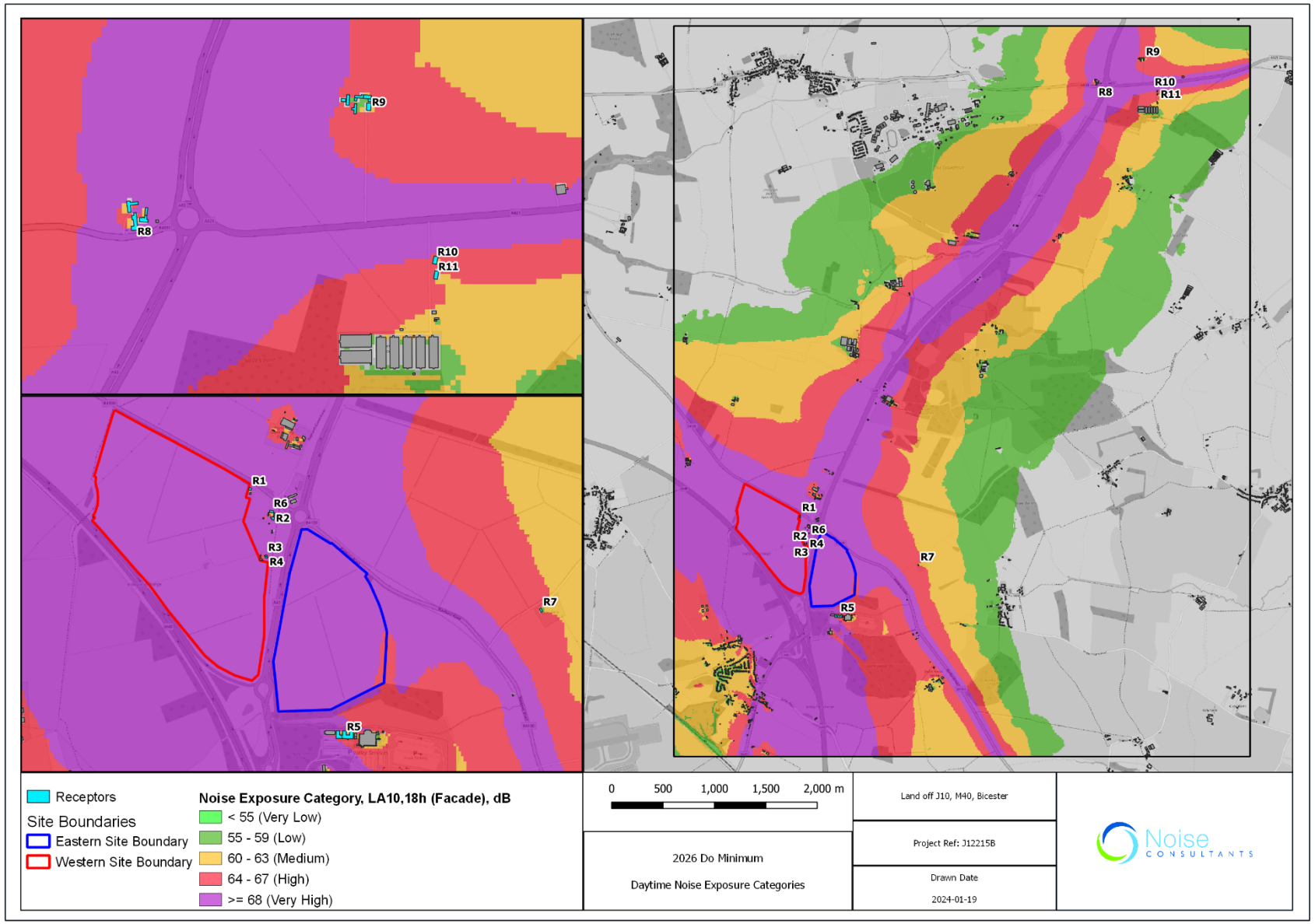


Figure 10.10: 2026 Future Baseline Night-time Noise Exposure Categories

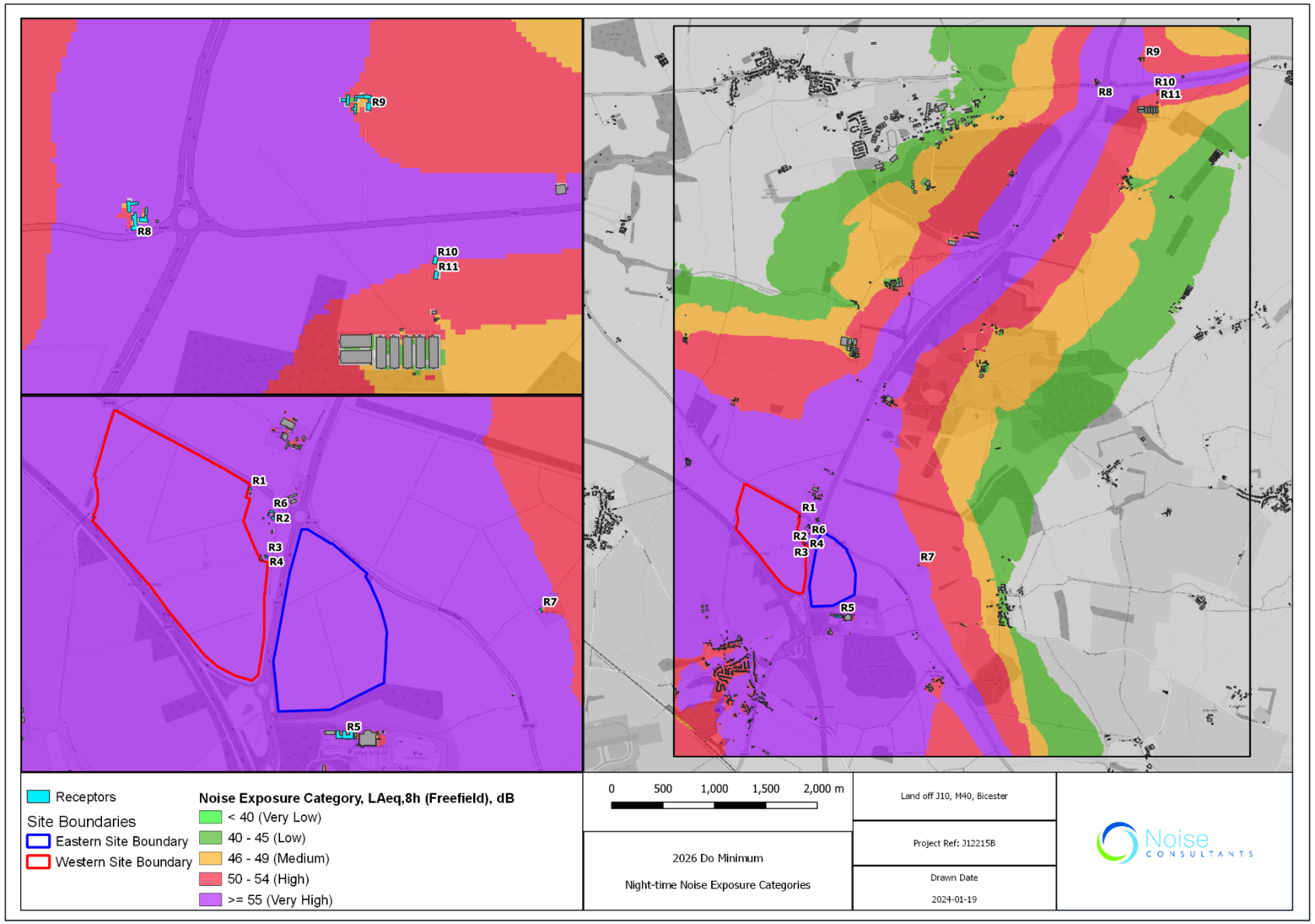


Figure 10.11: Eastern Development - 2026 With Development Daytime Noise Exposure Categories