OXFORDSHIRE
STRATEGIC RAIL FREIGHT INTERCHANGE

DCO Submission

Environmental Statement

Chapter 5: Noise and Vibration

Document 6.5
Rev A

On behalf of
Oxfordshire Railfreight Limited

Prepared by Vanguardia Ltd
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APPENDICES

5.1 INTRODUCTION

5.1.1 This ES Chapter considers the potential noise and vibration effects that may arise as a result of the construction and operation of the proposed Oxfordshire Strategic Rail Freight Interchange (OxSRFI) development, as set out in Table 1.4 of ES Chapter 1 (Introduction), and ES Chapter 2 (Description of Development and Alternatives).

5.1.2 The Proposed Development has the potential to generate noise from the following sources:

- Construction of the OxSRFI development which includes the Main Site and the Highway Works (from both the construction traffic and construction works);
- The change in road traffic flows on the highway network around the Main Site, including any effects of the Highway Works during the operational phase;
- The freight trains serving the Rail Terminal which will be travelling on the Chiltern Main Line;
- Operational activity at the Main Site, including:
    - The road traffic serving the SRFI on the internal roads within the Main Site;
    - The freight trains serving the Rail Terminal moving within the Main Site, including the associated loading and unloading activities;
    - Heavy goods vehicles (HGVs) and other operational activity at the Main Site, such as manoeuvring, loading and unloading at the proposed warehouses and Rail Terminal;
    - Fixed mechanical services plant and equipment associated with the warehousing at the Main Site.

5.1.3 With reference to the potential effects of vibration during the construction of the Proposed Development, only piling has been identified as having the potential to generate levels of vibration that could adversely affect nearby sensitive receptors – the only piling anticipated to be required are the contiguous piles that will be needed to create the bunding to the north of the Rail Terminal, not within the Development Area (Zone A on the Parameters Plan (Document 2.5).

5.1.4 With regard to the potential for vibration from construction traffic, it is not expected that there would be any significant adverse effects and has therefore

been scoped out of the assessment. Road surfaces along construction routes should be appropriately maintained to minimise potential irregularities.

5.1.5 It is also possible that the additional freight trains travelling on the Chiltern Main Line serving the Rail Terminal could lead to an increase in perceptible vibration at receptors in close proximity to the line during the operational phase of the Proposed Development, and this forms part of the assessment.

5.1.6 It has been agreed through the Scoping Opinion (Document 6.32) that vibration from HGVs travelling along access roads could be scoped out of the operational phase assessment, providing that explanation is given regarding how the roads would be maintained to avoid vibration issues subsequently arising[1].

5.1.7 This ES Chapter sets out the assessment methodologies, data sources used to inform the assessment including details of the baseline surveys and identifies the likely impacts and effects with regard to noise and vibration as well as any mitigation measures required to minimise effects at the identified noise or vibration sensitive receptors.

5.1.8 This ES Chapter is supported by the following technical appendices:

- Appendix 5.1 Glossary of Terms
- Appendix 5.2 Noise and Vibration Receptor Locations
- Appendix 5.3 Noise and Vibration Monitoring Locations
- Appendix 5.4 Summary of Noise and Vibration Survey Monitoring Equipment
- Appendix 5.5 Noise Survey Summary Results
- Appendix 5.6 Noise Action Planning – Important Areas
- Appendix 5.7 Derivation of Background Sound Levels for SRFI Operational Noise Assessment
- Appendix 5.8 Construction Noise Information
- Appendix 5.9 Construction Noise Predictions
- Appendix 5.10 Operational Noise Assumptions
- Appendix 5.11 Mainline Rail Information and Predictions
- Appendix 5.12 Operational Road Traffic Noise Predictions and Assessment
- Appendix 5.13 Operational Noise Predictions

[1] Section 4.3, ID 4.3.1, Ref 5.129 of Scoping Opinion (Document 6.32)

Competency

5.1.9 This ES Chapter has been prepared by Vanguardia (a Buro Happold Company). Vanguardia is an acoustic consultancy with extensive experience in providing Environmental Statement noise and vibration chapters for a wide range of schemes, including previously securing consent for a Strategic Rail Freight Interchange under the Development Consent Order process. The practice is also member of the Association of Noise Consultants.

5.1.10 The noise and vibration surveys, predictions, assessments, and preparation of this draft chapter have been carried out by suitably qualified and experienced acousticians who are members of the Institute of Acoustics (IoA), the professional body for acousticians and noise consultants in the UK, following the guidance set out in Government policy and relevant British Standards.

5.1.11 The chapter was written by an Associate Director who is a Corporate Member of the IOA with over 15 years' experience in environmental acoustic consultancy and has been reviewed by another Corporate Member of the IoA with over 12 years' experience, and the teams Discipline Lead who has over 18 years' experience working in the field of acoustics and noise control.

5.2 ASSESSMENT SCOPE AND METHODOLOGY

Consultation and Engagement

2021 Scoping Opinion

5.2.1 In July 2021 the Planning Inspectorate (PINS) returned their Scoping Opinion to the Applicant. The Scoping Opinion (Document 6.32) indicated that some items should be included in the assessment over and above those described in the Scoping Report. The comments related to noise and vibration are provided in Table 5.1 and Table 5.2. A summary of the actions undertaken in response to the comments are also provided in the final column of the tables.

Table 5.1 PINS Scoping Opinion Response with Respect to Noise and Vibration – Applicant's Proposed Matters to Scope Out

Applicant's Proposed Matters to Scope Out	Inspectorate's Comments	Actions Taken by Applicant's Noise Consultant
Vibration arising from Heavy Goods Vehicles (HGVs) on access roads	The Scoping Report seeks to scope out vibration arising from HGVs on access roads on the grounds that the access roads would be newly surfaced and smooth, limiting the potential for any significant vibration effects. The Inspectorate agrees that this matter can be scoped out during operation. The ES and mitigation documents should explain how roads will be maintained to avoid vibration issues during operation. An assessment of vibration arising from construction traffic should be included in the ES, where significant effects are likely to occur.	Agreed. This ES Chapter explains that the roads will be constructed pursuant to agreed standards and maintained by the relevant highway authority. New access roads will be in a newly surfaced and smooth state avoiding irregularities that would give rise to vibration. Existing roads will be appropriately maintained by the Highways Authority to minimise potential irregularities. Therefore, it is considered very unlikely that significant effects would arise due to construction traffic and has therefore been scoped out of the assessment.

Table 5.2 PINS Scoping Opinion Response with Respect to Noise and Vibration – Other Points

Consultee	Comments Raised	Actions Taken by Applicant's Noise Consultant
PINS	Sensitive Receptors: The ES should explain the criteria used to define sensitive receptors. Public buildings and spaces should be considered in addition to residential properties.	Agreed. This has been addressed in this ES chapter.
PINS	Ecological receptors: Paragraph 5.121 states that "for ecological receptors suitable information will be provided to the project ecologist to inform their assessment". The project ecologist should also be involved in designing the methodology to ensure that the baseline is properly established.	Agreed. Ecological receptors have been informed by FPCR (the Applicant's ecologists).
PINS	Impacts: Paragraph 5.127 lists potential noise sources. For clarity, in the ES noise impacts should be classed as construction or operation impacts (or both).	This ES Chapter indicates whether the predicted impacts are during the

Consultee	Comments Raised	Actions Taken by Applicant's Noise Consultant
		construction or operational phase.
PINS	Time Periods: Table N2 describes the day time period 07:00 – 23:00. It is assumed that this is an error and should read 07:00-19:00, since the evening period is defined as 19:00-23:00.	This was a typographical error and has been amended.
Cherwell District Council – Environmental Health	Confirmation required that the vibration assessment (para 5.110) will include both passenger and goods trains. The text reads '…from passenger and trains…', this should read 'passenger and goods trains'?	The operational vibration assessment includes both passenger and freight trains.
	Noted that the monitoring locations, methodology and duration for the baseline survey to be discussed with CDC as the scheme evolves and details confirmed (paras 5.111 and 5.112).	Liaison took place with CDC prior to the baseline surveys in 2021 and 2025 to agree the monitoring positions, period and durations.
	Agree that vibration from construction (piling) and freight trains in the operational phase (para 5.128) should be scoped in.	Agreed. This is reflected in this ES Chapter.
	For the construction phase agree mitigation measures can be secured through a Construction Environmental Management Plan (CEMP).	No action required – measures will be secured through the CEMP (see ES Appendix 2.3).
Ardley with Fewcott Parish Council	The ES should consider the effect of additional noise sources on the parish area, both in so far as they will affect residents and wildlife.	There are several representative receptors located in the Parish Council's area that have been considered as part of the assessment in this ES Chapter.
Middleton Stoney Parish Council	Noise pollution which would be created by this development is a particular concern. We note that this will be explored in the Environmental Statement, but we would encourage this to be done in a high level of detail, and in consultation with the local community.	The impacts and effects of noise have been considered in detail in this ES Chapter. Liaison has occurred with officers from Cherwell District Council in their role as representatives of the community, as well as the Stage 1 (non-statutory) and 2 (statutory) public consultations.
Network Rail	Impact of noise and vibration in relation to train stabling/idling (including within the new sidings) should be included within the assessment.	The assessment will consider the noise impacts from freight trains stabling and idling within the SRFI. No vibration would be

Consultee	Comments Raised	Actions Taken by Applicant's Noise Consultant
		expected from these activities and therefore this has not been considered.

Consultation with Cherwell District Council (CDC) in 2021

5.2.2 The Applicant's noise consultants liaised with CDC to confirm the assessment and survey methodology for the initial 2021 survey. CDC acknowledged the proposals by email on the 17th May 2021 and confirmed the approach was considered satisfactory. The associated correspondence with CDC is summarised in Table 5.3.

Table 5.3 CDC Liaison in 2021

Consultee	Applicant's Noise Consultant's message to Consultee	Consultee's Comments
CDC EHO	29 / 04 /21 *(After an introduction to the consultee and details of the proposals and position at the time)* We are looking to organise the baseline noise surveys and I wanted to consult on our indicative monitoring plan of where we have identified we need to undertake noise and vibration surveys. (A Proposed Site plan and monitoring location plan was attached and details of the proposals were presented to the Consultee). The noise surveys will use class 1 monitoring equipment set to measure in 15-minute intervals and will record the L_{Aeq}, L_{Amax}, L_{Amin}, L_{A1}, L_{A10}, LA_{90} parameters. To determine existing vibration environment, it is proposed to undertake attended vibration measurements at Quarry Cottages, Ardley and Crossroads Farm, which are the closest receptors to the existing rail line. Sample measurements will be undertaken taken to determine the levels from passenger and freight trains at the receptor locations. It is proposed to undertake the surveys in the window between the 7th June 2021 to the end of the school term in July 2021. As lockdown measures continue to be eased it is considered this should give the most representative data available at this time.	17/05/21 The proposals and the indicative monitoring locations and survey window are satisfactory.

5.2.3 Following the initial liaison, a meeting took place with the CDC EHO online on the 18th November 2021. This meeting focused on the assessment

methodology and a summary of the main points from that meeting are presented in Table 5.4 below.

Table 5.4 Notes from Meeting with CDC held in November 2021

Meeting Attendees	**Key Points Raised in Meeting in November 2021.**
CDC EHO & Applicants Noise Consultant	• Operational noise impact will be based on the principles of BS 4142:2014+A1:2019; • The overall approach will be based on the format used for the Northampton Gateway DCO; • The main noise and vibration sources were discussed; • The method of calculating the typical background noise level and the sensitivity test approach were discussed.

Stage 1 (non-statutory) consultation in 2022

5.2.4 Stage 1 consultation for the Proposed development was undertaken in 2022, during which a number of consultees raised points with regard to the potential noise and vibration impacts of the Proposed Development as summarised in Table 5.5.

Table 5.1 Stage 1 Consultation event consultee feedback and responses

Consultee	**Consultee's Comments**	**Applicant's Noise Consultant's Response**
CPRE, Cherwell District	General broad comments were raised regarding the potential impact of the Proposed Development	The effect of the Proposed Development's noise and vibration impacts have been considered in detail within this ES Chapter.
Berks, Bucks & Oxon Wildlife Trust		
Dorchester Living		
Mid-Cherwell Neighbourhood Plan Forum		
Steeple Aston and Middle Aston		
Lower Heyford Parish		

Consultation in 2025

5.2.5 Following the public pause of the OxSRFI scheme, the Applicant's noise consultants liaised with CDC in 2025 by email to once again confirm assessment methodology and the approach to the repeated baseline survey. The approach was again confirmed to be appropriate; details of this are presented below in Table 5.6.

Table 5.6 CDC Liaison in 2025

Consultee	Applicant's Noise Consultant's message to Consultee	Consultee's Comments
CDC EHO	12/02/25 The plan in 2025 is to repeat the survey from 2021 so I was hoping to confirm with you this approach is still suitable and that nothing significant has changed to alter our approach this year?	18/02/25 CDC representative replied: *I am not aware that there have been any significant changes proposals to repeat the same survey undertaken in 2021 are satisfactory*
	17/03/25 After not being able to secure the same unattended noise monitoring location Castle Fields and along Church Road, alternatives were proposed to CDC.	18/03/25 CDC representative replied: *The proposals outlined in your email for the noise and vibration survey are acceptable*
	11/04/25 An attachment detailing the assessment methodology was presented to CDC for comment	14/04/25 CDC representative replied: *The methodology looks fine*.

Stage 2 (statutory) consultation in 2025

5.2.6 Statutory consultees specific to noise and vibration were again consulted during the Stage 2 statutory consultation. A joint response to this consultation was provided by Oxfordshire County Council (OCC) and CDC.

5.2.7 A summary of the key comments from the Stage 2 (statutory) consultation response from OCC and CDC, together with a summary of the actions undertaken in response to the comments are provided in Table 5.7 below. An online meeting was held between the Applicant, the Applicant's noise consultant and an Environmental Health Officer from CDC on 26th January 2026 to discuss the comments and associated responses.

Table 5.7 OCC and CDC joint comments on Stage 2 Statutory Consultation

Comment	Applicant's Noise Consultant's Response/action taken
8.4.4 The methodology and baseline conditions for the construction and operational phase are agreed and accepted, including the findings of the preliminary assessment.	Noted and agreed.
8.4.3 Cherwell Local Plan Policy BSC 8 notes that planning decisions can have an effect on noise to sensitive receptors, which can impact health and well-being for local communities.	During the meeting the approach to the assessment of operational noise using BS 24142:2014+A1:2019 as set out within this ES Chapter was summarised.

Comment	Applicant's Noise Consultant's Response/action taken
Guidance from CDC also states that any industrial or commercial development must not cause an increase in background noise levels at the nearest noise sensitive property, or at the boundary of the property. 8.4.6 CDC's target level for operational noise would be a rating noise level of a minimum of 5dBA below pre-existing background noise levels when measured at the boundary of any noise sensitive receptor.	Following the determination of the initial estimate of impact from subtracting the rating level from the background level, context must be taken into account and how this would modify the impact at the receptor. This is discussed in paragraphs 5.2.79 to 5.2.93 of this ES Chapter. CDC indicated that the 5 dB below background requirement was from a standard planning condition and was not a "hard and fast" criterion. Deviations from this criterion would be considered and the approach described above, was considered to be appropriate.
8.4.5 Further assessment of road traffic noise is to be undertaken for the operational phase once detailed traffic data is available.	This ES Chapter now includes a full assessment of operational phase road traffic noise impacts.
8.4.7 Paragraph 5.7.4 under Cumulative Effects mentions that the Heyford Park Scheme and the recent application for an additional 9,000 dwellings has been considered in the assessment.	The effects of the Proposed Development on the adjacent Heyford Park scheme (planning reference 25/02190/Hybrid) as well as the David Wilson Homes (was Pye Homes) and Richborough Estates schemes has been considered through the inclusion of these locations as receptors for the various elements of the assessment as identified in Table 5.10 of this ES Chapter (receptors R30, R30A, R34 and R34A). Furthermore, to mitigate and minimise the potential noise effects along the western site boundary with these development, extensive inherent mitigation has been designed into the scheme in the form of earth bunding around the Main Site.
8.4.9 Paragraph 5.8.3 refers to construction noise impacts being mitigated through a Construction Environmental Management Plan details of which are yet to be seen. Operational adverse noise impacts are proposed to be mitigated through embedded mitigation which includes bunding and acoustic barriers to the north of the site. Further details on these acoustic barriers is required before it can be determined whether these are acceptable.	A draft CEMP was provided with the Stage 2 (statutory) consultation material and had been recirculated to the Planning officer at CDC. The full submission of the DCO application will include a CEMP (ES Appendix 2.3). It was agreed that confirmation would be provided within the noise chapter or wider application documents regarding the proposed height and extent of the acoustic barriers and the mitigation bunding. This information is provided in the Design Approach Document DAD (Document 5.5A) and the Parameters Plan (Document 2.5) and is discussed in Section 5.5 of this ES Chapter. The detail of the acoustic fencing will be secured through DCO requirements as part of the detailed approval.

Comment	Applicant's Noise Consultant's Response/action taken
8.4.10 Given the scale of the highways works proposed and in light of the full traffic noise assessment and associated highways works being undertaken it is not possible to determine whether the criteria of excessive noise as contained in paragraph 5.227 of the NPS is being triggered and whether the proposed mitigation is sufficient.	The paragraph referenced is the introductory paragraph of the noise and vibration section of the NPS. The policy test for noise is detailed in paragraph 5.241 of the NPS which is set out in paragraph 5.3.9 of this ES Chapter and has been the basis for the assessment.

5.2.8 A summary of the key comments from the Stage 2 (statutory) consultation response from National Highways is presented in Table 5.8 below.

Table 5.8 National Highways comments on Stage 2 Statutory Consultation

Comment	Response/action taken
Sufficient detail is not yet available to allow for the reliable prediction of noise from night-time [construction] works, but it is considered that these would also be unlikely to exceed the SOAEL. Paragraph 5.5.12 states that noise from night-time works would be 'appropriately managed' but no further detail is given. It would be helpful to understand if the Applicant intends to apply for Section 61 consent for such works and if the noise arising from them will be monitored.	As discussed in paragraph 5.2.43, full details of out of hours construction works and how these will be managed will be provided in the relevant phase-specific Construction Environment Management Plan (P-CEMP) produced for each phase prior to the relevant works being undertaken. This will also set out the monitoring regime for the works. Whether an application for a Section 61 Consent would be submitted will be decided by the contractor appointed to undertake the relevant works package.
9.4 As there are no sensitive receptors within 100m of the Junction 10 and the A43 works, and 100m is the recommended study area in DMRB LA111 Noise and Vibration for construction vibration, vibration effects are considered negligible.	Noted and agreed.
9.5. An assessment of construction noise and vibration with respect to the works at Junction 9 has not been completed at this stage but it is understood that this will be included within the final ES. National Highways will review this assessment when it is available.	As assessment of construction noise and vibration has not been undertaken for Junction 9 of the M40, as the closest sensitive receptors are more than 300m from these works (see DMRB paragraph 3.5 Note 1). Therefore, an assessment is not considered to be required (see paragraph 5.2.10).
The LOAEL and SOAEL values for operational road traffic noise are given in Table 5.13 and are consistent with those presented in LA111. Impact classifications for changes in road traffic noise are provided in Table 5.14, for the daytime, and Table	The approach taken in the ES endeavours to align the significance of an effect in noise policy terms with EIA significance, to avoid having two different levels of significant effects. Under this approach, a significant

Comment	Response/action taken
5.15, for the night-time. It is unclear why the long-term change classifications, provided in Table 3.54b of LA111, have been used for the short-term changes in daytime noise when levels are below the SOAEL. This should be given further justification as it is a dilution of the impact classifications, which from LA111, are independent of the absolute level. Furthermore, significant effects are only classified for receptors with operational road traffic noise above the SOAEL. This is in direct contrast to LA111 where any receptor subject to more than a negligible change in road traffic noise may be significantly affected depending on the context.	effect does not occur at a level of noise exposure below the SOAEL threshold. The long-term change classification from LA111 has been applied to the less sensitive daytime period, when the Do Something noise exposure is below the SOAEL. There is usually greater tolerance for change below the SOAEL, compared to when the Do Something noise exposure is so high that it is already above the SOAEL. Therefore, the short-term classifications from LA111 have been used for exposure levels above the SOAEL during the day i.e. a relatively small increase in road traffic noise can result in a significant effect. During the night-time period, the short-term classifications from LA111 have been used for noise exposures both above and below the SOAEL, reflecting the greater sensitivity during the night. This is consistent with the approach at other similar schemes such as Northampton Gateway and East Midlands Gateway Phase 2 and was the methodology described in detail in the 2021 Scoping Report.
9.9. National Highways has a Key Performance Indicator to mitigate households affected by noise located in Noise Important Areas and is more broadly committed to reducing excessive noise across the network where practically possible. Receptor R9, adjacent to the A43 north of Junction 10, sits within a Noise Important Area and opportunities should be sought to improve noise for affected residents, such as utilising sympathetic design measures, and implementing mitigation measures where appropriate. We are happy to discuss this, and any other matters related to noise and vibration, at the appropriate time.	The impact of the Proposed Development on Noise Important Areas has been considered by the inclusion of these two receptors. This is discussed in paragraph 5.5.51 and 5.5.52.
9.10. Detailed construction and operational noise predictions for works that interact with the SRN are not presented at this stage. These should be completed prior to submission, with consideration given to the criteria for significant effects, as outlined above.	Detailed construction and operational predictions have been provided for relevant works.

Study Area

5.2.9 The noise and vibration assessment is based on a receptor led approach, focusing on the receptors likely to be most affected, which are usually those which are closest and/or most exposed to source of noise or vibration being assessed.

5.2.10 However, there are some distance related criteria for certain impacts and effects which will be taken into account in selecting the receptors for each element of the assessment. These are discussed below:

- Construction noise from highway works – DMRB (paragraph 3.5 Note 1) indicates that a study area of 300 m from the closest construction activity is normally sufficient;
- Operational noise from highway works – DMRB (paragraph 3.44) indicates this should be considered within 600 m of new road links or links physically changed or bypassed by the Proposed Development, and within 50 m of other road links with the potential to experience a change in the Basic Noise Level (BNL) of more than 1.0 dB(A) as a result of the Proposed Development. The basic noise level is the calculated reference noise level from a road link, based on its traffic characteristics. It represents the A-weighted sound pressure level exceeded for 10% of the time (L_{A10}) at a reference distance of 10 metres from the nearside carriageway edge.
- Operational noise from additional movements on mainline rail network – the Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996[2] and Calculation of Railway Noise (1995)[3] indicate a distance of 300 m from the nearest running rail should be considered.

Receptor Identification

5.2.11 Sensitive receptors are identified as locations where a human or ecological habitat could be exposed to increased levels of noise and/or vibration due to the proposed development.

[2] Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996
[3] Calculation of Railway Noise, Department of Transport (1995)

5.2.12 These usually include the nearest receptors to a proposed development or highway works, on the basis that these represent the worst affected receptors. That means that the impact at all other locations would be no greater, and in many cases, lower than at the receptors included in the assessment.

5.2.13 Regarding the sensitivity of the receptors, Table 5.9 summarises the sensitivity of different types of receptors to noise and vibration.

Table 5.9 Receptor Sensitivity

Receptor Sensitivity	Description
High	Receptors where people or operational activities are extremely susceptible to effects from noise and vibration. For example, residential accommodation, hospital operating theatres/high dependency units, care homes etc.
Medium	Receptors where people are moderately susceptible to noise and vibration. For example: offices, schools and universities, hospital wards, temporary holiday accommodation and hotels, places of worship, private gardens and outdoor areas used for stationary recreation;
Low	Receptors with a low susceptibility to disturbance from noise and vibration. For example: sports grounds bars, cafes, restaurants.

5.2.14 A review was undertaken of the surrounding area to identify the nearest sensitive receptors to the Application Site and considering the study area guidance discussed above.

5.2.15 As the Proposed Development comprises several different elements, such as the Rail Terminal at the Main Site, the new Ardley Bypass and other Highways Works, not all receptors will be potentially affected by the same sources of noise, and not all receptors will be potentially affected by vibration. Consequently, the potential impacts and effects have been considered at different receptor locations depending on which sources are likely to have potential to cause adverse impacts and effects.

5.2.16 Broadly, these are the receptors closest to the particular source, although there are some exceptions to this, e.g., road traffic noise receptors on the wider road network or receptors which would fall outside the study area but have been included in response to consultation comments.

5.2.17 The receptors used in the assessment are identified below and have been split into residential receptors and non-residential receptors.

Residential Receptors

5.2.18 The residential receptors selected for assessment are listed in Table 5.10 together with the expected relevant sources of noise from the Proposed Development that might affect them. The locations of the receptors relative to the Proposed Development Order Limits are shown in **ES Appendix 5.2**.

5.2.19 Where different facades of the same receptor are considered in the assessment, the façade is denoted after the receptor number. For example, 'R5-N' indicates the receptor on the northern façade of receptor 5, while 'R5-S' indicates the receptor on the southern façade.

5.2.20 A receptor height of 1.5m is used to represent ground floor windows which is used for the assessment of daytime impacts and a height of 4.5m represents first floor windows which is considered to represent bedroom windows and therefore used to assess night-time impacts. Where the receptor only has one storey, the ground floor receptor is also used to assess night-time impacts.

Table 5.10 Residential receptors considered and which assessments they are included in

Receptor		Construction Noise	Road Traffic Noise	Mainline Rail Noise	Main Site Operational Noise
R00	Property in Woods - South	Y	-	Y	Y
R02	Forge Place – West	-	-	Y	Y
R03	100 East Street – South	-	-	Y	Y
R05-N	Crossroads Farm - North		-	Y	-
R05-S	Crossroads Farm - South	Y	Y	-	Y
R06-E	Quarry Cottages - East	-	-	Y	Y
R06-S	Quarry Cottages - South	Y	Y	Y	Y
R07	Fewcott Lodge - South	-	Y	-	-
R08	Almscar - North	-	Y	-	-
R09-E	The Cottages - East	Y	Y	-	-
R09-S	The Cottages - South	Y	-	-	-
R10-E	26/28 Ardley Road - East	Y	Y	-	-
R10-W	26/28 Ardley Road - West	-	Y	-	-
R11-E	2/4 Ardley Road - East	Y	Y	-	-
R11-S	2/4 Ardley Road - South	-	Y	-	-
R12	Castle Fields - South	Y	-	-	Y
R13-N	Manor Farm Ardley - North	-	Y	-	-
R13-S	Manor Farm Ardley - South	Y	-	-	Y
R14-E	Church Road - East	-	Y	-	-

Receptor		Construction Noise	Road Traffic Noise	Mainline Rail Noise	Main Site Operational Noise
R14-W	Church Road - West	Y	-	-	Y
R15	Orchard Cottage - South	Y	-	-	Y
R16-N	Exton Cottage - North	-	Y	-	-
R16-S	Exton Cottage - South	-	Y	-	-
R16-W	Exton Cottage - West	-	Y	-	-
R17-W	Fox & Hounds - West	-	Y	-	-
R18-S	1 St Marys Walk - South	-	Y	-	-
R18-W	1 St Marys Walk - West	-	Y	-	-
R19-N	Grooms Cottage - North	-	Y	-	-
R19-E	Grooms Cottage - East	Y	Y	-	-
R20-N	Barnhouse Kennels - North	-	Y	-	-
R20-S	Barnhouse Kennels – South	-	Y	-	-
R20-W	Barnhouse Kennels – West	Y	Y	-	-
R21-N	Foxfield Farm – North	-	Y	-	-
R21-E	Foxfield Farm – East	-	Y	-	-
R22	Woodbine Cottage – West	-	Y	-	-
R23	1/2 Jersey Cottages – East	-	Y	-	-
R24-E	3 Station Road – East	-	Y	-	-
R24-W	3 Station Road – West		Y	-	Y
R25	Wood View – South	-	-	-	Y
R26-E	The Bungalow – East	-	Y	-	-
R26-S	The Bungalow – South	-	Y	-	Y
R26-W	The Bungalow – West	-	-	-	Y
R27-E	Upland Cottage – East	-	Y	Y	-
R27-S	Upland Cottage – South	Y	Y	Y	Y
R27-W	Upland Cottage – West	-	Y	Y	Y
R28-W	Ardley Field Farm Cottages – West*	Y	Y	-	Y
R30 -E	Upper Heyford – East	Y	-	-	Y
R30-S	Upper Heyford – South	Y	-	-	Y
R30-W	Upper Heyford – West	Y	-	-	Y
R30A	Upper Heyford	-	-	-	Y
R31	Camp Road – East	Y	-	-	Y
R32	Heyford Grange – East	Y	-	-	Y
R33	42 Trenchard Close – East	Y	-	-	Y
R34	David Wilson Homes (was Pye Homes) – East	-	-	-	Y
R34A	Richborough Estates Residential Development	Y	-	-	Y
R35 -N	50 Duvall Park – North		Y	-	-
R35-E	50 Duvall Park – East	Y	-	-	Y

Receptor		Construction Noise	Road Traffic Noise	Mainline Rail Noise	Main Site Operational Noise
R36	Manor Farm - North	Y	Y	-	Y
R37-N	4 Manor Farm Cottages – North	Y	Y	-	Y
R37-E	4 Manor Farm Cottages – East	-	Y	-	Y
R38	1 Manor Farm Cottages - South	-	Y	-	-
R39-S	Dewars Farm – South	-	Y	-	-
R39-W	Dewars Farm – West	Y	Y	-	Y
R40-E	Dewars Farm Cottages – East	-	Y	-	-
R40-W	Dewars Farm Cottages – West	-	Y	-	-
R41-W	Bucknell Lodge – West	-	Y	-	-
R42-S	40 Middleton Road – South	-	-	Y	-
R42-W	40 Middleton Road – West	-	-	Y	-
R43	Homelands Farm – South	-	-	Y	-
R46 – E	Holly Tree House – East	Y	Y	-	-
R46 – W	Holly Tree House – West	-	Y		
R47 – E	Chapel Cottage – East	Y	Y	-	-
R47 – N	Chapel Cottage - North		Y		
R47 – S	Chapel Cottage - South		Y		
R48-N	Gaygle Brook Cottage - North	Y	Y	-	-
R48-E	Gaygle Brook Cottage - East	-	Y	-	-
R48A - N	Rigaletto – North	-	Y	-	-
R48A - E	Rigaletto – East	-	Y		
R49	Bicester Road				
R50 – E	56 Ardley Road	Y	Y	-	-
R51 - N	Travelodge (Cherwell Valley Services)	Y	Y	-	-
R52 - E	Jersey Arms – East	-	Y	-	-
R52 – W	Jersey Arms West	-	Y	-	-
T01	22 Fewcott Road	-	Y	-	-
T02	North Street	-	Y	-	-
T03	Lower Heyford	-	Y	-	-
T04	Rosebank	-	Y	-	-
T05	Middleton Road	-	Y	-	-
T06	Lovelynch House	-	Y	-	-
T07	Isis Ave/Howes Lane	-	Y	-	-
T08	Chesterton	-	Y	-	-
T09	Trefoil Drive	-	Y	-	-
T10	Isis Avenue	-	Y	-	-
T11	Camp Road	-	Y	-	-
T12	Stoke Wood Lane	-	Y	-	-

Receptor		Construction Noise	Road Traffic Noise	Mainline Rail Noise	Main Site Operational Noise
T13	The Green	-	Y	-	-
Notes: Receptor numbering may not be consecutive as receptors may have been scoped in and out of the assessment as the scheme has evolved. R28 is currently in use as an office but CDC application references 11/00314/F and 11/00316/F require the residential use of the premises to be reinstated upon the expiration of the gas compound operations or use thereof, whichever is the later. A Scoping Opinion request was submitted in 2022 (OCC application reference MW.0076/22) set out a proposal to extend operations until 2035 with restoration by 2037.					

5.2.21 Receptors R02 and R03 lie outside of the study area but have been included in the assessment following comments raised by a local resident during the Stage 2 (statutory) consultation process in relation to potential noise impacts of the Proposed Development on Fritwell.

5.2.22 Receptors T01 to T13 have been added to the assessment specifically to consider the impacts of changes in road traffic noise on the wider road network.

5.2.23 The effects of any potential increase in ground borne vibration from additional freight trains serving the Rail Terminal have been assessed at two receptors: R42 40 Middleton Road and R05 Crosslands Farm. The locations of the receptors are shown in **ES Appendix 5.2**.

Non-Residential Receptors

5.2.24 With regard to non-residential receptors, the locations listed in Table 5.11 have been identified. Receptors O1 to O5 were identified in Oxfordshire County Council's consultation response to the Scoping Opinion as needing to be considered in the noise assessment. The other non-residential receptors have been identified in consultation with FPCR (the Applicant's ecologist).

Table 5.11 Non-residential receptor locations and sources of noise to be considered

Receptor	Type of non-residential receptor	Construction Noise	Road Traffic Noise	Mainline Rail Noise	Main Site Operational Noise
O1 St Marys Church, Ardley	Place of Worship	-	Y	-	-
O2 Ardley Village Hall	Community Hub	Y	Y	-	-

Receptor	Type of non-residential receptor	Construction Noise	Road Traffic Noise	Mainline Rail Noise	Main Site Operational Noise
O3 Ardley Playing Fields	Public Recreation	Y	Y	-	-
O4 Ardley Woods (also part of Ardley Cutting and Quarry SSSI).	Public Recreation/ Ecology	Y	-	Y	Y
O5 Ardley Fields Quarry Local Wildlife Site (LWS)	Ecology	Y	Y	Y	Y
O6 Ardley Fields Ponds West LWS	Ecology	Y	Y	-	Y
O7 The Heath proposed District Wildlife Site (pDWS)	Ecology	Y	Y	-	Y
O8 Upper Heyford Airfield (LWS)	Ecology	Y	Y	Y	Y

5.2.25 The locations of these receptors are also shown in **ES Appendix 5.2.**

5.2.26 For non-residential receptors, sensitivity to noise depends on their usage. In general, they are less sensitive than residential receptors, in which case the thresholds for the Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL)[4] can be defined at higher levels (see Section 5.3 of this ES Chapter for details of these terms). The effect level thresholds for these other receptors have been dealt with on a case-by-case basis. The terms referred to in this paragraph and their role in the assessment methodology are set out in further detail below.

5.2.27 For the non-ecological and non-residential receptors identified above (O1, O2, O3), the main noise source affecting all receptors is the potential change in road traffic noise. These receptors will be included in that assessment. Additionally, receptor O3 has been included in the construction assessment of the M40 J10 Highways works as a receptor.

5.2.28 The potential noise impacts of the Proposed Development on ecological receptors (O4, O5, O6, O7 and O8) and the species present in these habitats will be considered as part of the assessment within ES Chapter 6 (Ecology). It is understood that these sites are primarily designated for the flora that is present in these habitats and any fauna present is not particularly sensitive to noise. The main concern relates to species that are likely to have some sensitivity to noise, including birds, with wintering birds, breeding birds and farmland birds understood to potentially be present at some of the receptor

[4] See paragraph 5.3.12 and Table 5.27 for further details of the terms LOAEL and SOAEL

locations. Therefore, the primary purpose of including these receptors in this ES Chapter is to inform the ecologist of the noise levels that could be expected.

Approach to the Assessment

5.2.29 The Proposed Development has the potential to give rise to several different types of noise and vibration impacts. Broadly speaking, these comprise:

- Construction noise arising from development of the Main Site and the Highway Works;
- Construction vibration (depending on the construction piling techniques to be used);
- Operational road traffic noise resulting from the change in road traffic flows on the highway network around the Main Site and associated Highway Works;
- Operational railway noise from the freight trains serving the Rail Terminal travelling along the Chiltern Line;
- Operational vibration arising from the freight trains serving the Rail Terminal travelling along the Chiltern Main Line; and
- Operational noise arising from activity at the Main Site.

5.2.30 In general, the assessment methodology used for each type of source is different in terms of how the potential noise or vibration impact is predicted and how the effect is assessed. In line with government policy[5] and where practicable, thresholds levels have been defined for LOAELs and SOAELs[6] for the different noise sources considered in the assessment.

5.2.31 The assumptions that have been made for each element of the predictions and subsequent assessment has been clearly stated in the supporting technical appendices. In general, where the receptor is a building, sound has been predicted at a distance of 1m from the receptor façade, and unless otherwise stated, excludes the effect of acoustic reflection from that façade (i.e. a free field level at the façade).

5.2.32 The Institute of Environmental Management and Assessment (IEMA) published their Guidelines for Environmental Noise Impact Assessment in 2014[7]. The document describes a process for undertaking such assessments.

[5] See paragraph 5.3.3
[6] See paragraph 5.3.12 and
Table for further details of the terms LOAEL and SOAEL
[7] Guidelines for Environmental Noise Impact Assessment, IEMA (2014)

It notes that the extent of the effects of noise impact can rarely be determined solely by the difference between current and future noise levels, and that there are other factors to consider when determining potential effects. This principle has been followed in the assessment.

5.2.33 The magnitude of the impact and the significance of the effect is dependent upon several factors, including:

- the existing sound environment;
- the noise level generated from the particular activity;
- the change from the baseline (existing sound environment) or future baseline (i.e. the 'do minimum' situation) as a result of the new noise source;
- the duration, timing and character of the different noise sources; and
- in some situations, the number of dwellings affected can form part of the assessment of significance.

5.2.34 The criteria for determining the extent of the impacts and effects of noise and vibration inherently reflect the potential effects on human health and wellbeing and thus enable any adverse effects from the Proposed Development to be identified. Where threshold values are presented, these are generally based on residential dwellings and private amenity spaces to reflect the impact on human health. The greater the adverse effect at the receptor, the greater the potential impacts on human health and wellbeing.

5.2.35 The assessment methodologies and significance criteria applied to each element of the assessment are described below.

Construction Phase

Construction Traffic

5.2.36 To assess potential construction traffic noise effects, the Basic Noise Levels (BNLs) have been calculated in accordance with the Calculation of Road Traffic Noise[8] (CRTN) for the road links supplied by the Transport Consultant. These links cover the main routes along which construction traffic is expected to travel. They are based on the average daily construction traffic flows in each year, compared to the appropriate baseline scenario without construction traffic.

[8] Calculation of Road Traffic Noise, Department of Transport (1988)

5.2.37 Three scenarios have been considered:

- Year 2 – prior to Ardley Bypass with construction traffic still using the B430;
- Year 3 – prior to the opening of the Ardley Bypass (with construction traffic still using the B430); and
- Year 3 – post completion of the Ardley Bypass (with construction traffic then travelling along the Ardley Bypass instead of the B430).

5.2.38 The significance of construction traffic noise effects has been determined using the thresholds set out in Table 5.12, which reflect those set out in Table 3.17 of the DMRB LA111[9] Noise and Vibration document with respect to construction traffic.

Table 5.12 Thresholds of potential effects of construction traffic at residential receptors

Magnitude of Impact	Increase in noise level (L_{A10} dB)
Major	Greater than or equal to 5.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Minor	Greater than or equal to 1.0 and less than 3.0
Negligible	Less than 1.0
Note: Construction traffic noise shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding; *a) 10 or more days or nights in any 15 consecutive days or nights* *b) A total number of days exceeding 40 in any 6 consecutive months.*	

Construction Noise

5.2.39 In relation to demolition and construction noise impacts, an indication of the potential noise effects of construction activities has been determined at the relevant nearby sensitive receptors as listed in Table 5.10.

5.2.40 Noise levels have been predicted at the relevant receptors based on previous experience and indicative information provided about the proposed construction activities that will be undertaken for the Main Site, the Ardley Bypass (AB), M40 Junction 10 Highways Works, the Heyford Park Link Road (HPLR) and the Middleton Stoney Relief Road (MSRR). The construction noise arising from the proposed Highway Works at Baynard's Green has been

[9] National Highways (2020), Design Manual for Roads and Bridges, LA 111: Noise and vibration, revision 2 (DMRB)

considered as part of the predictions undertaken for the M40 Junction 10 Works, rather than as a separate assessment. The construction activities undertaken at Baynard's Green are unlikely to result in any greater effects than those associated with the M40 J10 works, and therefore the latter are representative of the effects that may occur.

5.2.41 An assessment of the Works associated with the M40 Junction 9 has not been undertaken as there are no receptors within 300m of these works. With regard to the construction activities associated with Work No. 35 'Foul Sewer Outfall to Bicester', which runs between the B4030 (to the east of the connection with the MSRR) and runs east along Middleton Stoney Road until it reaches the point where it crosses Pingle Stream, only high-level information is currently available regarding these works. Therefore, a quantitative assessment has not been undertaken. Instead, the potential impacts and effects of these works are considered in high level qualitative terms using professional judgement. It is noted that full details will be provided through DCO requirements in the relevant P-CEMP produced for each works package prior to them being undertaken.

5.2.42 The construction predictions for the Main Site, Ardley Bypass, M40 Junction 10, Heyford Park Link Road and Middleton Stoney Relief Road have been based on estimates of the type and numbers of plant and equipment likely to be used, together with their estimated usage (or on-time) during a typical working day. These estimates are based on detailed information provided by contractors prior to the construction of a similar type of development and based on information from contractors addressing specific aspects in relation to the Main Site (i.e., the need for rock crushing and piling of retaining walls). The estimates are detailed in **ES Appendix 5.8**.

5.2.43 For works outside the typical daytime hours, the likely impacts are dependent on multiple factors, including the specific location of the works, the time they take place (and the corresponding threshold levels), and exactly what works need to be undertaken, which may be limited compared with those taking place during core hours. This level of detail is not available at this time and therefore out-of-hours works have been considered in high-level qualitative terms, on the basis that full details will be provided through DCO requirements in the relevant P-CEMP produced for each works package prior to them being undertaken. As stated in the CEMP (**ES Appendix 2.3**), the relevant planning authority would be notified of these works at least 28 days prior to commencement.

5.2.44 For each activity, the contributions for each item of plant were combined and generally modelled as a single activity point source. Many of the identified construction activities will occur across the Main Site and along the length of the Ardley Bypass, M40 Junction 10 works and Middleton Stoney Relief Road. For these activities, the associated point source was modelled in several different locations within the wider works areas to give an indication of the likely noise exposure at each relevant receptor when the activity is near to that receptor. Other activities, such as piling for the retaining wall to the north of the Main Site, are expected to only occur in a particular part of the Main Site, and the predictions reflect this.

5.2.45 The construction noise predictions do not consider the potential screening effect of the proposed earthworks and bunding around the perimeter of the site. This is part of the embedded mitigation for the operational phase of the Proposed Development only. While this will be built out during the construction phase, it effects will vary over the construction programme depending on the sequence and progress of the works. Therefore, as a worst case scenario, it is assumed not to provide any attenuation of construction noise, meaning that robust and worst-case assumptions have been considered for these predictions.

5.2.46 While the measures in the CEMP are embedded mitigation for the construction phase of the development, it is difficult to be prescriptive about the numerical reduction they would provide at each receptor. Therefore, the effect of these measures is considered in qualitative terms only.

5.2.47 The construction noise predictions have been based on the principles of the methodology contained within Annex F of British Standard BS 5228-1:2009+A1:2014[10]. The propagation of construction noise has been predicted following the principles of the ISO 9613-2:2024[11] methodology, assuming moderate downwind propagation between the source and receptors.

5.2.48 The significance of potentially adverse construction noise effects has been determined using the thresholds set out in Table 5.13. The values are based on the guidance within Annex E of BS 5228-1:2009+A1:2014 and the effects that construction noise can have on those exposed to it. The thresholds are expressed in terms of current Government policy (i.e., LOAELs and SOAELs).

[10] BS 5228-1:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites, Part 1: Noise
[11] ISO 9613-2:2024 Acoustics – Attenuation of sound during propagation outdoors – Part 2: Engineering method for the prediction of sound pressure levels outdoors, ISO (2024)

Table 5.13 Thresholds of potential effects of construction noise at residential buildings

Effect	Time Period	Threshold Value ($L_{Aeq, T}$)[a]
LOAEL	Day (07:00 – 19:00)	65
	Evening (19.00 – 23.00)	55
	Night (23.00 – 07.00)	45
SOAEL	Day (07:00 – 19:00)	75
	Evening (19.00 – 23.00)	65
	Night (23.00 – 07.00)	55

Notes:
[a] *These effects are expected to occur if the programme of works indicates that the relevant threshold values are likely to be exceeded over a period of at least one month. The values apply to a location one metre from a residential building façade containing a window, ignoring the effect of the acoustic reflection from that façade.*

5.2.49 Where necessary, measures to avoid any significant adverse effects on health and quality of life, and to mitigate and reduce to a minimum any adverse effects, have been identified. This includes the use of best practicable means (BPM) to reduce effects and/or deliver mitigation.

Construction Vibration

5.2.50 It is understood that contiguous piling will be required to form the bund structure to the north of the rail terminal. An assessment has been undertaken regarding the potential vibration impact from piling at the nearest receptors. This assessment follows the method set out in BS 5228-2:2009+A1:2014[12].

5.2.51 Although the concepts of LOAEL and SOAEL in Government policy refer only to noise exposure, it is helpful to adopt the same principles when assessing vibration impact and effect. Table 5.14 sets out the construction vibration exposure thresholds based on the guidance within Annex B of BS 5228-2:2009+A1:2014.

Table 5.14 Thresholds of potential effects of construction vibration at residential buildings[13]

Effect	Threshold Value (PPV, mm/s)[a]

[12] BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control Construction and Open Sites, Part 2: Vibration
[13] These threshold express the guidance values quoted in Annex B of BS 5228-2:2009+A1:2014 in terms in terms of LOAEL and SOAEL, based on the definitions of the potential effects. This approach

LOAEL	0.3
SOAEL	1.0[b]
Notes: [a] This is the level at a residential receptor. [b] Guidance in BS 5228-2:2009+A1:2014 states that this level of exposure can be tolerated by those affected if prior warning and explanation has been given. It goes on to state that a level of 10 mm/s is likely to be intolerable in most building environments for any more than a very brief exposure.	

Operational Phase

Operational Phase - Road Traffic Noise

5.2.52 The noise levels associated with changes in road traffic on the surrounding road network arising from the Proposed Development have been predicted using the noise modelling software CadnaA which incorporates the methodology detailed in the Department for Transport memorandum, Calculation of Road Traffic Noise (CRTN).

5.2.53 This assessment has been based on traffic data, which has been extracted from the Bicester Transport Model (BTM) strategic transport model. The AAWT traffic flow data is calculated by taking the peak period modelled traffic flows and combining them together using appropriate factors. Further details regarding the production of the ES traffic data are provided in the Transport Assessment in **ES Appendix 3.1** (also see ES Chapter 3 (Transport)).

5.2.54 For the assessment of road traffic noise, the noise levels arising from road traffic have been predicted at the relevant receptor locations for the following core scenarios:

- 2031 Opening Year (OY) Do Minimum (DM) – reference case without the Proposed Development traffic;
- 2031 Opening Year (OY) Do Something (DS) – includes the traffic associated with first phase of the Proposed Development and the effects of the first phase of highway mitigation (see the Transport Assessment in ES Appendix 3.1 (see ES Chapter 3 (Transport)));
- 2034 Completion Year (CY) Do Minimum (DM) – reference case without the Proposed Development traffic; and

was used in the assessment for the Northampton Gateway Rail Freight DCO application, which was approved by the Secretary of State.

- 2034 Completion Year (CY) Do Something (DS) – includes all development traffic and the effects of all proposed highway mitigation (see the Transport Assessment in ES Appendix 3.1).

5.2.55 The DS scenarios listed above do not reflect the impact of the modal shift targets that are set out in the Framework Travel Plan (ES Appendix 3.2), which is embedded mitigation, and would reduce light vehicle traffic associated with the Proposed Development. Therefore, the DS scenarios are considered a worst-case.

5.2.56 The flows used for the DM and DS scenarios include the cumulative effects of the agreed committed developments as detailed in the Transport Assessment in ES Appendix 3.1. They also include the traffic and highway improvements associated with the proposed Albion Land development at Baynard's Green[14].

5.2.57 In addition to the core scenarios outlined above, the Transport Consultant was required by the Transport Working Group to consider two sensitivity test scenarios:

- 2042 Do Minimum (DM) and Do Something (DS), which is the end of the draft Local Plan; and
- 2034 Completion Year DS with the proposed Tritax scheme at Baynard's Green[15].

5.2.58 To align with the Transport Assessment (ES Appendix 3.1), the potential road traffic noise effects of these sensitivity test scenarios have been considered, but this information is provided for information only and does not form part of the ES assessment in terms of the determination of the overall effects arising from the Proposed Development. The 2042 scenarios are based on the proposed allocations in the draft Local Plan (which may not be adopted) and the transport models do not include any potential highways mitigation that may be required to deliver these proposed allocations and therefore limited weight can be given to the outcomes of the assessment based on this scenario. In addition, both the Albion Land and Tritax schemes at Baynard's Green were refused planning consent at the CDC planning at committee on 15th January 2026.

[14] Albion Land scheme (planning applications references 21/03268/OUT, 21/03267/OUT, and 21/03266/F)
[15] Tritax scheme (planning application reference 22/01340/OUT)

5.2.59 The significance of potentially adverse road traffic noise effects is based on a combination of the predicted noise exposure at receptors and the difference between the Do Minimum and Do Something scenarios.

5.2.60 The noise exposure thresholds are set out in Table 5.15. These has been derived from the effects that road traffic noise can have on those affected[16] and are expressed in terms of Government policy.

Table 5.15 Thresholds of potential effects of road traffic noise (residential receptors)

Time period	Effect	Noise Exposure Threshold Value
Day (07:00-23:00)	LOAEL	50 dB $L_{Aeq\ 16\ hour}$ (free-field)[a,b]
	SOAEL	63 dB $L_{Aeq\ 16\ hour}$ (free-field)[a,c]
Night (23.00-07.00)	LOAEL	40 dB L_{night} (free-field)
	SOAEL	55 dB L_{night} (free-field)
Notes: [a] This is the *average daily value (07:00 – 23:00 hours) at a position one metre from a residential building façade containing a window, ignoring the effect of an acoustic reflection from that façade.* *b* equivalent to 55 dB $L_{A10,18hr}$ façade *c* equivalent 68 dB $L_{A10,18hr}$ façade		

5.2.61 If the Do Something noise exposure exceeds the daytime LOAEL threshold, the change between the results of the corresponding Do Minimum and Do Something scenario (i.e., for the same year) has been calculated. The change has then been compared to the magnitude of impact categories presented in Table 5.16, depending on whether the Do Something exposure level is between LOAEL and SOAEL, or equal to above SOAEL.

[16] The evidence for using some these values can be found in guidance from the World Health Organisation. Similar values have been used for the assessment of other schemes such as A14 DCO and Northampton Gateway DCO and are presented in the Design Manual for Roads and Bridges.

Table 5.16 Descriptors of impact magnitude of daytime road traffic noise change

Magnitude of Impact	Do Something Noise Exposure	
	Between LOAEL and SOAEL	**SOAEL or greater**
No Change	0	0
Negligible	Up to 2.9 dB(A)	Up to 0.9 dB(A)
Minor	3.0 – 4.9 dB(A)	**1.0 – 2.9 dB(A)**
Moderate	5.0 – 9.9 dB(A)	**3.0 – 4.9 dB(A)**
Major	10.0 dB(A) and over	**5.0 dB(A) and over**
NOTE: If the result for any property falls in the categories shown by the shaded boxes with the values in bold, this indicates that the property is regarded as experiencing a significant adverse effect.		

5.2.62 Where both the predicted road traffic noise level for the Do Something scenario exceeds the daytime SOAEL from Table 5.15 and the change between the Do Minimum and Do-Something scenarios is within the ranges shown in the shaded boxes with bold text from Table 5.16, then a significant effect is indicated.

5.2.63 A similar approach is followed for night-time, if the Do Something noise exposure exceeds the LOAEL threshold, the change between the corresponding Do Minimum and Do Something scenarios is calculated and compared to the impact categories in Table 5.17 depending on whether the Do Something exposure level is between LOAEL and SOAEL, or equal to above SOAEL.

Table 5.172 Descriptors of impact magnitude of night-time road traffic noise change

Magnitude of Impact	Do Something Noise Exposure	
	Between LOAEL and SOAEL	**SOAEL or greater**
No Change	0	0
Negligible	Up to 0.9 dB(A)	Up to 0.9 dB(A)
Minor	1.0 – 2.9 dB(A)	**1.0 – 2.9 dB(A)**
Moderate	3.0 – 4.9 dB(A)	**3.0 – 4.9 dB(A)**
Major	5.0 dB(A) and over	**5.0 dB(A) and over**

5.2.64 Where both the predicted road traffic noise level for the Do Something scenario exceeds the night-time SOAEL from Table 5.15 and the change between the Do Minimum and Do-Something scenarios is within the ranges shown in the shaded boxes with bold text from Table 5.17, then a significant effect is indicated.

Operational Railway Noise

5.2.65 Changes in railway noise from freight trains serving the SRFI travelling along the Chiltern line in proximity to the Main Site have been predicted in accordance with the methodology in the Calculation of Railway Noise. Impacts have been considered at receptors within a longitudinal distance of 2,300 m along the track from the proposed connection between the main line and the Rail Terminal. The distance of 2,300 m is considered appropriate and proportionate as the trains departing the Rail Terminal will take approximately 2,000 m to accelerate to full speed. Receptors have been considered within a lateral distance of 300 m from the track based on the specifications of the Calculation of Railway Noise[17] (CRN).

5.2.66 Predictions have been undertaken for the baseline situation (i.e. do minimum, DM) and then with the Proposed Development (i.e. do something, DS). The potential effects of the predicted change in noise levels have been assessed in accordance with the relevant policy requirements as described throughout this methodology section.

5.2.67 The significance of potentially adverse railway noise effects has been based on a combination of the predicted noise exposure at receptors and the difference between a future baseline year without the Development (Do Minimum) compared with the associated traffic with the Development (Do Something).

5.2.68 The noise exposure thresholds are set out in Table 5.18. These have been derived from the effects that railway noise can have on those affected[18] and are expressed in terms of Government policy.

[17] Calculation of Railway Noise, Department of Transport (1995)
[18] The evidence for using some these values can be found in guidance from the World Health Organisation. Similar values have been used for the assessment of other schemes such as HS2 and Northampton Gateway DCO.

Table 5.18 Thresholds of potential effects of railway noise at residential buildings

Effect	Time Period	Threshold Value ($L_{Aeq,T}$)[a,b]
LOAEL	07.00 – 23.00	50
	23.00 – 07.00	40
SOAEL	07.00 – 23.00	65
	23.00 – 07.00	55

Notes:
[a] *This is the average daily value at a position one metre from a residential building façade containing a window, ignoring the effect of an acoustic reflection from that façade.*
[b] *For the night-time period of 23.00 – 07.00, the relevant noise indicator is L_{night}.*

5.2.69 If the daytime LOAEL threshold value is exceeded, Table 5.19 sets out how the magnitude of the impact is described taking account of both the change in daytime noise exposure and the resulting exposure.

Table 5.19 Descriptors of impact magnitude of daytime railway noise change

Magnitude of Impact	Resulting Do Something Exposure Level	
	Between LOAEL & SOAEL	SOAEL or greater
No Change	0	0
Negligible	Up to 2.9 dB(A)	Up to 0.9 dB(A)
Minor	3.0 – 4.9 dB(A)	**1.0 – 2.9 dB(A)**
Moderate	5.0 – 9.9 dB(A)	**3.0 – 4.9 dB(A)**
Major	10.0 dB(A) and over	**5.0 dB(A) and over**

5.2.70 Whether or not a significant adverse effect is expected to occur during the daytime has been determined through a two-stage process. Firstly, the predicted Do Something noise level (with the Proposed Development) has been compared with the LOAEL and SOAEL values shown in Table 5.18 to determine whether they are below the LOAEL, between the LOAEL and SOAEL or at/above the SOAEL. Secondly, the change in daytime railway noise due to the Proposed Development has been considered (i.e. the difference between the Do Minimum and Do Something scenarios). Table 5.19 is then used to determine the extent of the impact. If the result for any property falls in the categories shown by the shaded boxes with text in bold, that indicates that the property is regarded as experiencing a significant adverse effect.

5.2.71 If the night-time LOAEL threshold is exceeded, the data in Table 5.20 sets out how the magnitude of the impact is described taking account of the change in night-time noise exposure and the resulting exposure.

Table 5.20 Descriptors of impact magnitude of night-time railway noise change

Magnitude of Impact	Resulting Exposure	
	Between LOAEL & SOAEL	**SOAEL or greater**
No Change	0	0
Negligible	Up to 0.9 dB(A)	Up to 0.9 dB(A)
Minor	1.0 - 2.9 dB(A)	**1.0 – 2.9 dB(A)**
Moderate	3.0 – 4.9 dB(A)	**3.0 – 4.9 dB(A)**
Major	5.0 dB(A) and over	**5.0 dB(A) and over**

5.2.72 Whether or not a significant adverse effect is expected to occur at night has been determined through a two-stage process. Firstly, the predicted Do Something noise level (with the Proposed Development) has been compared to the LOAEL and SOAEL values shown in Table 5.18, to determine whether they are below the LOAEL, between the LOAEL and SOAEL or at or above the SOAEL. Secondly, the change in night-time railway noise due to the Proposed Development has been considered (i.e. the difference between the Do Minimum and Do Something scenarios). Table 5.20 is then used to determine the extent of the impact. If the result for any property falls in the categories shown by the shaded boxes with text in bold, that indicates that the property is regarded as experiencing a significant adverse effect.

Operational Noise from Main Site

5.2.73 Sound from operational activities taking place at the Main Site has the potential to cause impacts at nearby receptors during the day and night-time period. Noise will be generated from the following main sources:

- Rail movements inside the SRFI, i.e., freight train movements on the internal tracks;
- HGV movements inside the SRFI (both from the main highway network and between the Rail Terminal and the warehouses);
- HGV loading, unloading and manoeuvring activities associated with the Rail Terminal and the warehousing. This could include the use of gantry

cranes, reach stackers and empty container handlers at the Rail Terminal; and
- Mechanical services plant serving the warehousing.

5.2.74 Two different methods of prediction have been used depending on the type of source, both of which assume downwind propagation between source and receptor. These are:

- Calculation of Railway Noise (CRN) for freight trains travelling on the internal railway tracks.
- ISO 9613-2:2024 for all other sources, together with appropriate source data; and

5.2.75 The results from the various assessment methodologies have been processed so as to determine the impact during the peak hour of operations in the 16-hour daytime period (07.00 – 23.00), and the peak 15 minutes of operations in the 8-hour night-time period (23.00 – 07.00). These are the assessment periods stated within BS 4142:2014+A1:2019[19] and represent a worst-case situation.

5.2.76 The following information has been incorporated into the prediction model:

- The expected peak level of HGV activity at the proposed warehousing and Rail Terminal, including travel on the internal access roads;
- The number of and type of freight train movements, including arrival, departure and shunting manoeuvres;
- The expected activities at the Rail Terminal including the likely durations that equipment will be operational within the assessment periods;
- The potential layout of the site has been based on the Illustrative Masterplan (Document 2.6), including the size and heights of the proposed warehousing which is considered to be a reasonable worst-case representation of the proposed scheme parameters which are set out in the Main Site Design Approach Document (DAD) (Document 5.5A) and the Parameters Plan (Document 2.5); and
- The proposed topography for the site, including the inherent screening effects of bunding and landscaping which is proposed to be fixed as a scheme parameter.

[19] BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

5.2.77 Two scenarios have been considered in relation to the operation of the rail terminal:

- Opening Year – assuming the rail terminal operates without any gantry cranes, i.e., using empty container handlers and reach stackers. This is based on 4 trains using the terminal over a 24 hour period;
- Future Year – assuming the rail terminal operates with gantry cranes, reach stackers and empty container handlers. This is based on up to 12 trains using the terminal over a 24 hour period (as described in ES Chapter 2 (Description of Development and Alternatives)).

5.2.78 For both scenarios, predictions have been based on all warehousing in use, meaning that robust assumptions have been considered. The assumptions made for the calculations are detailed in **ES Appendix 5.10**.

5.2.79 The assessment of the potential sound impacts from the operation of the Main Site has been based on the principles and guidance provided in BS 4142:2014+A1:2019. This methodology provides an initial estimate of impact based on the difference between the sound source being assessed (the specific sound level) and the existing background sound level at the receptor location, followed by consideration of the context in which the sound at the receptor occurs.

5.2.80 The standard also states that certain characteristics, if perceptible at the receptor location can increase the extent of the impact over that expected from a simple difference in noise levels. These characteristics include tonality, impulsivity and intermittency. The standard describes various options for taking any such features into account and for determining what is described in the standard as a rating level.

5.2.81 The standard states that the initial extent of the impact can be determined by subtracting the typical background sound level from the rating level. The greater the difference, the greater the magnitude of the initial impact estimate. Section 11 of the standard indicates that:

- A difference of around +10 dB[20] or more is likely to be an indication of a significant adverse impact, depending on the context;

[20] BS 4142 states that: All the measurements and values used throughout this standard are “A” weighted. Where “A” weighting is not explicit in the descriptor, it is to be assumed in all cases, except where it is clearly stated that it is not applicable, as in the case of tones.

- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;
- Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context; and
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact.

5.2.82 While the difference between the rating level and background sound level provides an initial estimate of the impact, the standard indicates in section 11 that other factors should be considered in terms of the context in which the sound occurs, such as:

- the resultant absolute noise level;
- how the character and level of the specific sound source relates to the existing sound environment;
- sensitivity of receptor; and
- the façade insulation of the receptor, where relevant.

5.2.83 Regarding the consideration of the absolute levels of sound, the relevant guideline values provided in BS 8233:2014[21] have been referenced. Table 4 of that standard sets out desirable internal levels to be achieved in new dwellings from external sources. This would take into consideration the façade sound insulation of the dwelling, usually in terms of the propagation through a partially open window. If the façade of the property had been mitigated against external noise and had alternative form of ventilation installed, the enhanced insulation of the façade would be taken into consideration. The table also provides information regarding desirable levels of sound for external amenity spaces associated with dwellings. The various values from BS 8233:2014 are summarised in Table 5.21 below.

Table 5.21 Summary of guideline sound levels from BS 8233:2014

Location (activity)	Time Period	Desirable Sound Level not to be exceeded
Inside Bedrooms and Living Rooms (resting)	Day (07:00 – 23:00)	35 - 40 dB $L_{Aeq,T}$
Inside Bedrooms (sleeping)	Night (23:00 – 07:00)	30 - 35 dB $L_{Aeq,T}$

[21] BS 8233:2014: Guidance on sound insulation and noise reduction for buildings, BSI (2014)

Location (activity)	Time Period	Desirable Sound Level not to be exceeded
Inside Dining Room/area (dining)	Day (07:00 – 23:00)	40 - 45 dB $L_{Aeq,T}$
External Amenity Space	Day (07:00 – 23:00)	50 - 55 dB $L_{Aeq,T}$

5.2.84 The lower values shown in the range of sound levels in **Table 5.21** above are generally regarded as the LOAEL for steady external sound, i.e., no adverse effect due to the impact of the sound would be expected below these values. If the sound has certain characteristics, it could be appropriate to consider a lower value as the LOAEL. Alternatively, a correction for those characteristics could be applied to the predicted levels, i.e., the predicted noise levels would be increased by adding a correction to account for characteristics that may increase the impact at a receptor. The latter is the approach followed in this assessment, with the rating levels (i.e., including any appropriate corrections for the acoustic character of the noise present at the receptor location) being used as the basis of the assessment of the absolute noise levels.

5.2.85 Applying the principles outlined above, three operational assessment scenarios have been considered:

- **Night-time Internal** – During the night-time period, people will generally be in their bedrooms sleeping and therefore it is the absolute level internally at night which is most relevant to consider rather than the change in the external noise level. Therefore, the initial estimate of the impact is amended by the context of the expected internal noise levels in bedrooms. The internal noise level is derived by assuming a 12 dB reduction on the free field external level through a partially open window;
- **Daytime Internal** – With regard to internal noise levels during the daytime, the same approach can be taken as at night, i.e., it is the internal level which is most important rather than the change in the external noise level. So, the initial estimate of impact is amended by the context of the internal noise levels; and
- **Daytime External** – For external noise levels in amenity spaces such as gardens, the initial estimate of impact would be determined by the change in noise level, however consideration of the absolute level will determine the extent to which the sound would be present and whether or not it is intrusive.

5.2.86 The approach that has been taken is explained in more detail below.

5.2.87 To determine the initial estimate of the external impact based on the change from the background sound level, the criteria in Table 5.22 below has been used. This is based on the guidance within BS 4142:2014+A1:2019 set out above. It is noted that BS 4142:2014+A1:2019 does not specify a level of change that equates to an unacceptable adverse impact.

Table 5.22 Magnitude of impact based on change from background sound level

Excess of Rating Level vs Background	Magnitude of Impact	Initial Effect
Equal to or below background	No adverse impact likely	Below LOAEL
+1 to +4	Possible adverse impact	Adverse effects may start to occur for some people
+5 to +9	Adverse impact	Above LOAEL but below SOAEL
+10 and above	Significant adverse impact	At or above SOAEL

5.2.88 In terms of modifying the initial estimate of the night-time impact, by considering the absolute level of noise internally (including any corrections to account for acoustic character), the magnitude of impact has been determined according to the criteria set out in Table 5.23 below. These criteria are based on the guidance in BS 8223:2014 regarding desirable internal ambient noise levels. Above the level considered reasonable in the standard, an adverse impact is identified.

Table 5.23 Magnitude of impact based on internal rating level during the night-time

External Rating Level ($L_{Aeq,15\ mins}$ dB)	Equivalent Internal Rating Level ($L_{Aeq,15\ mins}$ dB)	Magnitude of Impact	Effect Level
Equal to or below 42	Equal to or below 30	No Adverse Impact Likely	Below LOAEL
43 - 47	31 - 35	Possible Adverse Impact	Adverse effects may start to occur for some people
48 - 51	36 – 39	Adverse Impact	Above LOAEL but below SOAEL
52 – 61	40 – 49	Significant Adverse Impact	At or above SOAEL but below UAEL

External Rating Level ($L_{Aeq,15\ mins}$ dB)	Equivalent Internal Rating Level ($L_{Aeq,15\ mins}$ dB)	Magnitude of Impact	Effect Level
62 & above	50 & above	Unacceptable Adverse Impact	At or above UAEL

5.2.89 For example, if an initial assessment indicates that, at night, the external rating level is 41 dB $L_{Aeq,15min}$ and it exceeds the background sound level by 12 dB, this would be considered a significant adverse impact, according to Table 5.22. However, when considering the context in terms of the absolute sound level, the internal rating level assuming a partially open window is 29 dB $L_{Aeq,15min}$ (41 – 12 = 29). According to Table 5.23, this value does not exceed the LOAEL of 30 dB $L_{Aeq,15min}$ and as shown in Table 5.23, at this level no adverse impact would be likely at the receptor location. Therefore, no specific mitigation measures are required to be undertaken in response to the noise being generated.

5.2.90 In terms of considering the absolute level of noise internally during the day, the magnitude of impact has been determined according to the criteria set out in Table 5.24 below. These criteria are based on the guidance in BS 8223:2014 regarding desirable internal ambient noise levels. Above the level considered reasonable in the standard, an adverse impact is identified.

Table 5.24 Magnitude of impact based on internal rating level during the daytime

External Rating Level ($L_{Aeq,1\ hour}$ dB)	Internal Rating Level ($L_{Aeq,1\ hour}$ dB)	Magnitude of Impact	Effect Level
Equal to or below 47	Equal to or below 35	No Adverse Impact Likely	Below LOAEL
48 – 51	36 - 39	Possible Adverse Impact	Adverse effects may start to occur for some people
52 – 56	40 - 44	Adverse Impact	Above LOAEL but below SOAEL
57 – 66	45 - 54	Significant Adverse	At or above SOAEL but below UAEL
67 & above	55 & above	Unacceptable Adverse	At or above UAEL

5.2.91 For example, an initial assessment indicates that during the day, the external rating level is 54 dB $L_{Aeq,1hour}$ and it exceeds the background sound level by 12 dB. According to Table 5.22 this excess over the background sound level would be considered a significant adverse impact. However, when considering the context, in terms of the absolute level, the internal rating level

is 42 dB $L_{Aeq,1hour}$ (54 – 12 = 42). According to Table 5.24, this value falls between the LOAEL and SOAEL and would equate to an adverse impact at the receptor location. In accordance with noise policy at this level of impact, reasonable steps should be taken to mitigate and reduce to a minimum the noise generated.

5.2.92 In terms of the absolute level of noise externally in outdoor amenity spaces during the day, the magnitude of impact has been determined according to the potential change to background level then against the criteria set out in Table 5.25 below. These criteria are based on the guidance in BS 8223:2014 regarding desirable external noise levels in amenity spaces. Above the level considered reasonable in the standard, an adverse impact is identified.

Table 5.25 Magnitude of impact based on external rating level during the daytime

External Rating Level ($L_{Aeq,1\ hour}$ dB)	Magnitude of Impact	Effect Level
Equal to or below 50	No Adverse Impact Likely	Below LOAEL
51 – 54	Possible Adverse Impact	Adverse effects may start to occur for some people
55 – 64	Adverse Impact	Above LOAEL but below SOAEL
65 - 74	Significant Adverse	At or above SOAEL but below UAEL
75 & above	Unacceptable Adverse	At or above UAEL

5.2.93 For example, an initial assessment indicates during the day that the external rating level would be 45 dB $L_{Aeq,1hour}$ which exceeds the background sound level by 7 dB. According to Table 5.22 this would equate to an adverse impact. But the absolute level of 45 dB is below the LOAEL described in Table 5.25 which is based on the description in the PPG:N hierarchy table (Table 5.27 below); "*noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life*" (compared to the situation were the source not present).

Impact of Maximum Sound Levels

5.2.94 The World Health Organisation's Guidelines for Community Noise[22] has been used to consider the potential impact from any maximum short-term noise levels from operations at the Main Site during the night-time period.

5.2.95 The guidelines state that, for good sleep, indoor sound pressure levels should not exceed around 45 dB L_{AFmax} more than 10–15 times per night. This is equated to a level at the outside façade of 60 dB L_{AFmax} with a partially open window. It is generally accepted that this criterion is a LOAEL.

Operational sound from fixed mechanical plant and equipment

5.2.96 There is likely to be an element of fixed plant associated with the Proposed Development, such as plant used for the ventilation, cooling and heating of the development buildings. Prior to the occupants of the buildings being known, information regarding the type, number or location of these units is not available.

5.2.97 To provide a context for managing and limiting any future noise impacts on nearby receptors, the corresponding background sound levels used for the assessment of operational sound in this assessment have been provided separately (see **ES Appendix 5.7**).

5.2.98 It is proposed that, prior to installation, details of the fixed plant will be submitted to the relevant planning authority for approval. As part of this process, sound from the proposed plant installations will be assessed following the principles of BS 4142:2014+A1:2019 in relation to the background sound levels for each relevant receptor as provided in **ES Appendix 5.7** together with consideration of sound from other relevant operational sources and, if required, details of any mitigation provided to demonstrate compliance with Government and Local policy.

5.2.99 Items of plant will be selected and located to minimise any noise that may result from their operation at the receptor locations as far as reasonably practicable and, if necessary, mitigated to avoid potentially significant effects occurring.

Operational Railway Vibration

5.2.100 A proportionate and appropriate assessment has been carried out by evaluating the potential change in vibration from freight trains on the Chiltern

[22] Guidelines for Community Noise, WHO (1999)

Main Line at receptors within a longitudinal distance of 2,300m along the track from the proposed connection between the mainline and the Rail Terminal. An assessment has been made for any receptors within a lateral distance of 85m[23] from the track using the measurements from the baseline survey and factoring them in accordance with the increased number of freight trains.

5.2.101 This lateral distance within 2,300m includes one identified receptor (R42 40 Middleton Road). Due to being unable to establish a secure monitoring location near this receptor and due to the lack of freight trains along the Chiltern Line, measured vibration data obtained at a similar distance to the rail track from the Northampton Gateway DCO application[24] has been adopted as a worst-case.

5.2.102 The baseline vibration survey undertaken at receptors nearby the Proposed Development but outside the lateral 85m distance from the track has been included to confirm the existing vibration levels experienced at locations nearest to the mainline and proposed rail terminal.

5.2.103 Although the concepts regarding LOAEL and SOAEL in Government policy refer only to noise exposure, it is helpful to adopt the same principles when assessing vibration impact and effect. Table 5.26 sets out the railway vibration exposure thresholds together with the descriptors for the magnitude of impact. These have been derived from the guidance in BS 6472:2008[25].

Table 5.26 Thresholds of potential effects of railway vibration at residential buildings

Effect	Impact Description	Vibration Exposure	
		VDV Daytime ($m/s^{1.75}$)	VDV Night-time ($m/s^{1.75}$)
-	Negligible	< 0.2	< 0.1
LOAEL	Minor	0.2	0.1
-	Moderate	0.21 – 0.79	0.11 – 0.39
SOAEL	Major	0.8	0.4

Notes:
[a] *Usually determined in the centre of a normally loaded floor within the dwelling.*

[23] Derived from the U.S. Department of Transportation and the Federal Railroad Administration (Office of Railroad Development) (2005), High-Speed Ground Transportation Noise and Vibration Impact Assessment, Federal Railroad Administration and 242 U.S. Department of Transportation and the Federal Transport Administration (2006), Transit Noise and Vibration Impact Assessment Guidance Manual, Federal Transit Administration, and as used on the HS2 phase 1, 2a and 2B ESs.
[24] The Northampton Gateway Rail Freight Interchange Order 2019 (SI NO. 1358)
[25] British Standard 6472: 2008 Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting, BSi

Limitations and Assumptions

5.2.104 The following assumptions are relevant to the noise and vibration assessment:

- The construction methods and equipment likely to be used have been estimated based on experience of other similar developments and information specific to this scheme confirmed by the project team. These assumptions are documented in the assessment.
- Several assumptions have been made in terms of the types, locations and intensity of operational activities at the Main Site (both at the warehousing and the Rail Terminal). These assumptions have been made in combination with the rail consultant and traffic consultant and are also based on experience of other SRFIs. The assumptions are documented within the assessment and **ES Appendix 5.10**.
- With regard to noise from fixed mechanical plant and equipment associated with the Proposed Development, as details of this plant is not available at the time of this assessment, background sound levels have been provided separately to be referenced in assessments to be undertaken once details of the fixed plant are known, secured by DCO requirement.
- For the assessment of operational noise, the bunding around the Proposed Development has been considered as embedded mitigation and factored into the noise assessment. However, for the assessment of construction noise during which it may not be completed for all phases of construction, the bunding has not been factored in to provide robust and worst-case assumptions.
- In considering internal noise levels at sensitive receptors, a typical attenuation for sound passing through a partially open window has been assumed, as detailed information regarding the specification of each receptor is not known.

5.2.105 The following limitations will apply to the assessment:

- It is impractical to predict the potential noise impact and effects from the various elements of the Proposed Development at every nearby noise-sensitive property. Instead, as is common practice, representative receptors will be carefully selected based on their location relative to the different sources of noise within the development, and their location with respect to other noise-sensitive properties nearby.

- It is also impractical to measure the existing noise and vibration environment at every receptor location. Therefore, representative noise and vibration monitoring positions have been identified and agreed with CDC. Consequently, the results at a particular monitoring location have been used to represent the existing noise environment for a cluster of receptors which broadly experience the same exposure as the monitoring positions.
- The baseline noise surveys were undertaken for a period of time considered suitable to determine the typical sound levels at the monitoring locations as it is not proportionate to monitor continuously at the identified locations.
- Sufficient detail to undertake predictions of noise from fixed plant installations is not available. The background sound levels have been defined for receptor locations around the Main Site against which an assessment can be undertaken when details are known.
- The limitations that apply to the transport data also apply to the assessment of construction and operational noise (see ES Chapter 3 (Transport)) for further information.
- The traffic flows provided for some of the road links fall below the threshold of the prediction methodology contained in CRTN; however, there are no alternative predictive methods that can be adopted with low flows. For traffic flows which fall below the CRTN low flow threshold, the modelling software used for the predictions applies the lowest valid low flow correction as a robust approach.

5.3 POLICY CONTEXT

National Policy

5.3.1 For nationally significant road, rail and strategic rail freight infrastructure projects (as defined in the Planning Act 2008), The National Networks National Policy Statement (NPS) sets out the relevant policy objectives.

National Networks National Policy Statement (NPS)[26]

5.3.2 Paragraph 5.239 of the NPS states that in decision making, due regard must have been given to the Noise Policy Statement for England[27] (NPSE), the

[26] National Networks National Policy Statement, Department for Transport (2024)
[27] Noise Policy Statement for England, Defra (2010)

National Planning Policy Framework[28] (NPPF) and the Government's associated Planning Practice Guidance on Noise[29] (PPG: N).

5.3.3 In terms of human and structural receptors, the NPS specifies (paragraph 5.233) that noise and vibration should be assessed using the principles of the relevant British Standards and other guidance. The prediction of road traffic noise should be based on the method described in Calculation of Road Traffic Noise[30] (CRTN) and prediction of noise from railways should be based on the method described in Calculation of Railway Noise[31] (CRN). For the prediction, assessment and management of construction noise, the NPS states that reference should be made to any relevant British Standards and other guidance which also give examples of mitigation strategies.

5.3.4 The NPS also states that:

> *"Applicants should consider opportunities to address the noise issues associated with the Important Areas as identified through the noise action planning process" (Paragraph 5.238).*[32]

5.3.5 Regarding mitigation, in paragraph 5.235, the NPS states that:

> *"The Examining Authority and the Secretary of State should consider whether mitigation measures are needed both for operational and construction noise over and above any which may form part of the project application. The Secretary of State may wish to impose requirements to ensure delivery and future maintenance of all mitigation measures."*

5.3.6 Furthermore, in paragraph 5.236 it states that

> *"Mitigation measures for the project should be proportionate and reasonable and may include one or more of the following:*
> - *engineering: containment of noise generated;*
> - *materials: use of materials that reduce noise, (for example low noise road surfacing);*

[28] Ministry of Housing, Communities & Local Government (2024) National Planning Policy Framework
[29] Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (2019), Planning Practice Guidance: Noise. https://www.gov.uk/guidance/noise--2
[30] Calculation of Road Traffic Noise, Department of Transport (1988)
[31] Calculation of Railway Noise, Department of Transport (1995)
[32] Important Areas are defined in the relevant Noise Action Plans produced by the Department for Environment, Food and Rural Affairs when implementing the Environmental Noise (England) Regulations 2006, as amended (SI 2006/2238).

- *lay-out: adequate distance between source and noise-sensitive receptors;*
- *incorporating good design: to minimise noise transmission through landscaping and screening by natural or purpose built barriers including topographical changes;*
- *administration: specifying appropriate noise criteria or times of use (for example, in the case of railway station public address systems)*

5.3.7 The NPS (at Paragraph 5.237) also notes that for most projects, the relevant Noise Insulation Regulations will apply (see below). This means that the assessment must consider whether the Proposed Development is likely to trigger any eligibility under the terms of these Regulations and provide an indication of any likely eligibility.

5.3.8 Regarding nuisance, Paragraph 4.53 of the NPS indicates that section 158 of the Planning Act 2008 provides a defence of statutory authority in civil or criminal proceedings for nuisance. This would cover the carrying out of development and anything else authorised by an order granting development consent, but only to the extent that the nuisance is the inevitable consequence of what has been authorised. The NPS (at Paragraph 4.55) indicates that any possible source of nuisance under section 79(1) of Part III of the Environmental Protection Act 1990 and how they may be mitigated or limited should be considered by the Examining Authority in order that appropriate requirements can be included in any subsequent order granting consent. As stated in Paragraph 5.117 (of the NPS) noise and vibration have the potential to have a detrimental impact on amenity or cause a common law nuisance or statutory nuisance[33].

5.3.9 Paragraph 5.241 of the NPS describes the obligation on the Secretary of State when considering the merits of the proposal:

> *"The Secretary of State should not grant development consent unless satisfied that the proposals will meet the following aims, within the context of Government policy on sustainable development:*

[33] Section 79(6A)(a) of the Environmental Protection Act 1990 provides that noise made by traffic is excluded from the consideration of statutory nuisance.

- *avoid[34] significant adverse impacts on health and quality of life from noise as a result of the new development;*
- *mitigate and minimise other adverse impacts on health and quality of life from noise from the new development;*
- *contribute to improvements to health and quality of life through the effective management and control of noise, where possible."*

5.3.10 These statements reflect the aims of the Noise Policy Statement for England (NPSE).

Noise Policy Statement for England (NPSE)

5.3.11 The NPSE is the overarching Government policy on noise. It seeks to clarify the underlying principles and aims in past and existing policy documents, legislation and guidance in relation to all forms of noise including environmental noise, neighbour noise and neighbourhood noise (but not noise in the workplace).

5.3.12 It uses the established concepts of No Observed Effect Level (NOEL) and Lowest Observed Adverse Effect Level (LOAEL). The NPSE extends these by introducing Significant Observed Adverse Effect Level (SOAEL). This is the level above which significant adverse effects on health and quality of life occur. However, the explanatory note to the NPSE states that it is not possible to identify a single objective value to define SOAEL for noise that is applicable to all sources of noise in all situations. It is likely to be different for different noise sources, for different receptors and at different times. The NPSE recognises that '*further research is required to increase understanding of what may constitute a significant adverse 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'.* Consequently, the practitioner must determine the appropriate threshold values to be adopted for the sources and situations being assessed, based on the available evidence.

[34] "Avoid" here does not mean a significant adverse effect cannot ever exist. Instead, it means make every effort so that significant adverse impacts do not occur. The hierarchy set out in the PPG(N) confirms this to be the case – see
Table of this ES Chapter. The reason is that the NPSE covers all sources and for historical legal reasons, there are certain circumstances (e.g., statutory nuisance legislation) where a significant adverse impact is lawfully allowed to occur.

5.3.13 The NPSE's vision is consistent with paragraph 5.195 of the NPS (paragraph 5.2.8 above). It is 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.*
> *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: Avoid significant adverse impacts on health and quality of life;*
> - *Mitigate and minimise adverse impacts on health and quality of life; and*
> - *Where possible, contribute to the improvement of health and quality of life."*

5.3.14 Within the NPSE, the phrase '*within the context of Government policy on sustainable development'* is used. This means that noise must not be treated in isolation. Instead, when implementing the aims of the policy, consideration should be given to the economic and social benefit of the activity causing the noise as well as the other environmental effects of the development. Issues relevant to this 'balance' between different aims and objectives of policy, and between benefits and impacts, is addressed holistically in the separate Planning Statement.

5.3.15 The second aim of the NPSE refers to noise impacts that lie somewhere between LOAEL and SOAEL. The NPSE asserts that, while this means that all reasonable steps should be taken to mitigate and minimise adverse effects, this does not mean that such adverse effects cannot occur.

National Planning Policy Framework (NPPF)

5.3.16 The National Planning Policy Framework (NPPF) (2024) is referenced in paragraph 5.193 of the NPS. The NPPF sets out the Government's planning policy for England. At its heart is an intention to promote more sustainable development, including delivering against economic, social, and environmental objectives and outcomes.

5.3.17 The relevant paragraphs concerning noise in the NPPF are:

- Paragraph 187: *"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 ….. noise pollution, … Development should, wherever possible, should help to improve local environmental conditions".

- Paragraph 198 "*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 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 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"

5.3.18 It can be seen from these paragraphs how the NPPF reflects the aims of the NPSE and the decision tests in the NPS. Furthermore, the NPPF makes reference to the NPSE for advice on the achievement of these policy aims, and particularly in connection with adverse impacts. It also evident from paragraph 187 that there is a higher level of impact than the significant adverse effect level, i.e., the unacceptable effect level. This is discussed further in paragraph 5.3.23 below.

Planning Practice Guidance: Noise (PPG: N)

5.3.19 Further government guidance on the consideration of noise for planning has been published as the Planning Practice Guidance for Noise (PPG: N) originally published in 2014. Its most recent revision was in July 2019. The PPG: N supports the NPPF by providing a range of advice.

5.3.20 Paragraph 003 notes that plan-making and decision making should take account of the acoustic environment and in doing so should consider:

- Whether or not a significant adverse effect is occurring or likely to occur;

- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

5.3.21 The PPG: N includes a noise exposure hierarchy table, and again makes reference to the NPSE. The hierarchy table (replicated in Table 5.27) provides descriptive (i.e., non-numerical) guidance on the potential effects of various degrees of noise exposure.

5.3.22 Paragraph 004 of the document states that while the word 'level' is used in the definitions of NOEL, LOAEL and SOAEL (see the section titled Noise Policy Statement for England above for further information on these terms), it does not mean that the effects can only be defined in terms of a single value of noise exposure. In some circumstances, adverse effects are defined in terms of a combination of more than one factor, such as noise exposure, the number of occurrences of the noise in a given time period, the duration of the noise and the time of day the noise occurs. The table confirms that adverse effects (i.e., between LOAEL and SOAEL, where noise starts to cause small changes in behaviour or attitude) should be mitigated and reduced to a minimum[35].

Table 5.27 PPG: N Noise Exposure Hierarchy Table

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No effect.	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			

[35] With the NPSE confirming in its paragraph 2.24 that reasonable steps should be taken to achieve that outcome.

Response	Examples of outcomes	Increasing effect level	Action
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

5.3.23 Increasing noise exposure will cause the SOAEL boundary to be crossed. As shown in Table 5.27, there are two levels of adverse effect above the SOAEL:

- the significant observed adverse effect – noise causes a material change in behaviour e.g. keeping windows closed or avoiding certain activities at certain times. The planning process should be used to avoid this effect occurring, for example through choice of sites and use of appropriate mitigation (discussed further below). It is undesirable for such exposure to be caused, but as mentioned in Footnote 34, there are circumstances when such effects can occur. Decisions must take account of the economic and social benefit of the activity causing or affected by the noise caused.
- the unacceptable adverse effect – noise exposure would cause extensive and sustained adverse changes in behaviour and / or health without the ability to mitigate the effects of the noise. Under these

circumstances the impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation must be prevented from occurring. While not stated in the table, the boundary this type of effect can be referred to as the unacceptable adverse effect level (UAEL).

5.3.24 Regarding appropriate mitigation measures that can be employed to avoid significant adverse effects (and mitigate and minimise adverse effects), paragraph 010 of the PPG(N) indicates that there are 4 broad types of mitigation:

- Engineering: reducing the noise generated at source and or containing the noise generate;
- Layout: where possible, optimising the distance between the source and noise sensitive receptors and/or incorporating good design to minimise noise transmission through the use of screening (by natural or purpose-built barriers or other buildings);
- Using planning conditions/obligations to restrict activities allowed on the site at certain times and/or specifying permissible noise levels differentiating as appropriate between different times of day, such as evening and late night; and
- Mitigating the impact on areas likely to be affected by noise including through noise insulation when the impact is on a building.

National Policy Summary

5.3.25 With regard to government policy on noise, it is recognised that:

- Adverse effects can occur, as long as reasonable steps have been taken to keep such effects to a minimum;
- Significant adverse effects should be avoided but there may be circumstances where this cannot be achieved, even after the application of mitigation; and
- Unacceptable adverse effects must not occur, regardless of the economic and social benefits that may arise from the activity generating the noise.

5.3.26 The NPS is clear on the need to identify the potential for noise and vibration impacts from the Proposed Development which may give rise to nuisance claims. There are no fixed noise or vibration limits that define what constitutes a statutory nuisance, but In order for action to be taken the statutory nuisance

should either be injurious to health or interfere with a person's legitimate use or enjoyment of land.

Local Policy

5.3.27 The Cherwell Local Plan 2011 – 2031[36] sets out the long-term spatial vision for the district and contains policies to assist in achieving that vision.

5.3.28 The Local Plan does not appear to contain any policies relating to noise which are applicable to the Proposed Development. However, Appendix 7 of the Local Plan sets out a list of replaced and retained saved policies from the 1996 Cherwell Local Plan. Policy Env 1 indicates that '*Development which is likely to cause materially detrimental levels of noise, vibration, smell, smoke, fumes or other type of environmental pollution will not normally be permitted*'.

5.3.29 The planning policy context is covered in further detail in the Planning Statement (Document 5.4).

Other Guidance

5.3.30 In addition, the assessment is taking into consideration a number of British Standards and other guidance documents. These include:

- Calculation of Road Traffic Noise (CRTN), 1988;
- Calculation of Railway Noise (CRN), 1995;
- Noise Insulation Regulations, 1975 (as amended 1988);
- The Noise Insulation (Railways and Other Guided Transport Systems) Regulations, 1996;
- Design Manual for Roads and Bridges (DMRB)[37], LA111 Noise and Vibration May 2020 Revision 2
- BS 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound;

[36] Cherwell District Council, 2015, The Cherwell Local Plan 2011 – 2031 (Incorporating Policy Bicester 13 re-adopted on 19 December 2016).
[37] Although strictly only applicable to scheme promulgated by National Highways for the Strategic Road Network

- BS 5228:2009+A1:2014 (Parts 1 and 2) Code of Practice for Noise and Vibration Control Construction and Open Sites;
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings;
- BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting;
- ISO 9613-2:2024 Acoustics – Attenuation of sound during propagation outdoors part 2: Engineering method for the prediction of sound pressure levels outdoors;
- World Health Organisation, Guidelines for Community Noise (1999);
- IEMA Guidelines for Environmental Noise Impact Assessment (2014).

5.4 BASELINE CONDITIONS

Current Baseline

Noise

5.4.1 To characterise and quantify the existing baseline sound environment around the Proposed Development, a set of baseline sound surveys were undertaken between 11th March 2025 and 8th April 2025. As agreed with CDC, these completely supersede the surveys undertaken in mid-2021, which have been disregarded due to the age of the data and that it may have been affected by the ongoing COVID-19 pandemic at that time.

5.4.2 The surveys comprised 14 static monitoring locations left unattended for the duration of the monitoring and 9 locations where short-term attended measurements were undertaken. The locations were selected to be representative of existing noise sensitive receivers around the Proposed Development. At all measurement positions the microphones were on the acoustic free field and at a height of 1.5 to 2.0m above local ground level.

5.4.3 A summary of the survey dates and observations of the main noise sources at each location are given in Table 5.28 for the unattended measurements and Table 5.29 for the attended measurements. The measurement locations are also illustrated in **ES Appendix 5.3**.

Table 5.28 Unattended survey locations, dates and main observations

Unattended Survey Location	Survey Dates		Observations of Main Noise Sources
	Start	End	
N1 Crossroads Farm	11/03/25	01/04/25	Distant, continuous road traffic noise from motorway (M40), occasional vehicle pass from adjacent road (Somerton Road), train pass-bys audible as well.
N2 Quarry Cottages	24/03/25	08/04/25	Distant, continuous road traffic noise from motorway (M40), birdsong, train pass-bys audible.
N3 Castle Fields	11/03/25	01/04/25	Distant, continuous road traffic noise from motorway (M40), wind in trees, birdsong.
N4 Church Road	11/03/25	01/04/25	Distant continuous road traffic noise from motorway (M40), occasional overhead aircraft, birdsong
N5 Upland Cottage	11/03/25	01/04/25	Dominant, near continuous road traffic noise from adjacent road (B430), distant, continuous road traffic noise from motorway (M40), birdsong.
N6 The Crossway	11/03/25	01/04/25	Road traffic from adjacent road (B430) dominant, road traffic noise from distant motorway (M40) occasionally audible in between vehicle passes.
N7 Grooms Cottage	11/03/25	01/04/25	Continuous, distant road traffic noise from motorway (M40), occasional vehicle passes from adjacent roads (Ardley Road/B430).
N8 Ardley Kennels	11/03/25	24/03/25	Dominant, continuous road traffic noise from motorway (M40) which is approx. 100m to rear of property. Occasional vehicle passes along Ardley Road
N9 Upper Heyford	11/03/25	01/04/25	Distant, continuous road traffic noise from motorway (M40), occasional aircraft overhead, intermittent birdsong.
N10 75 Trenchard Close	11/03/25	01/04/25	Occasional overhead aircraft Occasional passing vehicle on adjacent road (Camp Road), Birdsong
N11 Ashgrove Cottages	11/03/25	01/04/25	Road traffic noise from B430 and M40 dominant and continuous, occasional vehicle (jeep/coach) passing at low speed.
N12 Manor Farm	11/03/25	01/04/25	Continuous distant road traffic noise from motorway (M40), birdsong and geese.
N13 Dewars Farm	11/03/25	01/04/25	Dominant road traffic noise from adjacent road (Ardley Road). Near continuous birdsong.
N14 Near Copse Cottage	11/03/25	24/03/25	Continuous, distant road traffic noise from motorway (M40), road traffic noise from adjacent roads (B4030, Ardley Road),occasional overhead plane.

Notes
N4 Equipment suffered power failure 17/03/25 to 23/03/25
N6 Equipment suffered power failure 17/03/25 to 23/03/25
N13 Equipment suffered power failure 13/03/25 to 23/03/25

Table 5.29 Attended survey locations, dates and main observations

Attended Survey Location	Survey Dates		Observations of Main Noise Sources
	Date	Start/End time	
S1 Upper Heyford	11/03/25	15:30 – 16:15	Distant motorway (M40) noise continuous, birdsong intermittent occasional distant engine revs and close vehicle passing
S2 Ardley Woods	24/03/25	14:45 – 15:30	Distant motorway (M40) noise continuous, near continuous birdsong
S2a Quarry Cottages (south)	01/04/25	10:30 – 11:15	Continuous road traffic noise from M40, near continuous birdsong, wind in trees
S3 Ardley Playing Fields	24/03/25	16:00 – 16:45	M40 motorway continuous in distance birdsong throughout
S4 Baynard's Green	24/03/25	15:45 – 16:30	Motorway (M40) noise dominant and continuous, birdsong
S5 Middleton Stoney Allotments	25/03/25	10:15 – 13:15	Dominated by road traffic noise on Ardley Road (B430)
S6 Bicester Road Middleton Stoney	25/03/25	13:15 – 16:15	Main source was M40 Motorway and local vehicle movements.
S7 Middleton Road	25/03/25	11:00 – 14:00	Distant motorway (M40) noise continuous, occasional vehicle pass, some large HGV from commercial premises down the road. Occasional distant drilling noise from quarry site to west. Low traffic flow
S8 Chilgrove Drive	12/03/25 – 13/03/25	16:15 – 08:45	(Partially Attended, left in place overnight) Road traffic noise (Camp Road and M40) wind in trees, birds squawking

5.4.4 A field sensitivity check was undertaken prior to and following each set of survey measurements and no significant drift in sensitivity was identified for any measurement at any location. All the sound level meters (SLMs) and field calibrators used for the surveys were Class 1 specification. All SLMs were within 2 years of their last laboratory calibration, and all calibrators within 1 year. Further details of the monitoring equipment used are given in **ES Appendix 5.4**.

5.4.5 The results of the surveys are presented in **ES Appendix 5.5**. Time history graphs have been produced for the long-term unattended survey locations, and tables have been provided summarising the measured noise levels at the short-term attended locations.

5.4.6 A weather station was installed close to survey location N9 to record precipitation rate, wind speed and wind direction data from 11th March 2025 until midday on 24th March 2025. For weather information following this,

publicly accessible weather data from nearby weather stations (ICHIPP29[38] and IBICESTE12[39]) has been referenced.

Noise - Important Areas

5.4.7 The NPS states that applicants should consider opportunities to address existing noise issues associated with Important Areas as identified by Defra.

5.4.8 At the time of writing, the Important Areas are based on the third round of strategic noise mapping, the results of which were published in 2019. The fourth round of strategic noise mapping was published in October 2024 and the datasets for important areas based on this data have not yet been published and it is not known when these will be published.

5.4.9 The following Important Areas for road traffic noise have been identified in the vicinity of the Proposed Development:

- Properties adjacent to the M40 in the proximity of Foxfield Farm (represented by receptor R21); and
- Properties adjacent to the A43 in proximity to the junction with the B4100 represented by receptor R9).

5.4.10 The locations of these Important Areas are shown in **ES Appendix 5.6**.

Characterisation of the background sound levels for the assessment of SRFI operational activities

5.4.11 As mentioned in the assessment methodology section, the assessment of potential impacts from the sound of operational activities at OxSRFI are based on BS 4142:2014+A1:2019 which requires, as part of the process, determining the background sound level ($L_{A90, T}$).

5.4.12 BS 4142:2014+A1:2019 states that it is important to ensure that the background sound levels used in the assessment are reliable and represent the particular circumstances and periods of interest. The objective is to quantify what is typical during the periods when the noise sources would be operational, rather than ascertaining the lowest background sound level.

[38] https://www.wunderground.com/dashboard/pws/ICHIPP29/
[39] https://www.wunderground.com/dashboard/pws/IBICESTE12/

5.4.13 To characterise the baseline sound environment, the survey results and weather data were reviewed and any measured sound levels that were likely to have been contaminated by high wind speeds, precipitation, the dawn chorus and other such events were excluded.

5.4.14 Wind direction can have a significant effect on measured noise levels. This can be particularly apparent when the background noise levels are affected by a dominant, static steady source of noise, such as road traffic noise on the M40. The effect of the wind is greater as distance from the source increases. Noise levels will generally increase downwind of the source and decrease upwind of the source, although the effect is not symmetrical, i.e., decreases due to upwind conditions are usually greater than increases caused by being downwind.

5.4.15 The effect of different wind directions will affect some noise indices used to describe the noise environment more than others. At locations which experience distant road traffic noise from the M40, the background level ($L_{A90, T}$), which is a measure indicating the constant, underlying level of noise, may vary significantly with wind direction. However, if there is local road traffic or railway noise at the same location, it is these sources that will usually dominate the ambient noise level ($L_{Aeq, T}$). Furthermore, as the local sources are typically closer to the receptors, the results will tend to show less variation with wind direction.

5.4.16 Because of the strong influence of the wind direction on the measured sound levels in the area around the Proposed Development, the results of the baseline survey have been split into two data sets based on the wind direction at the time of measurement, as follows:

- Broadly westerly winds (i.e. sound levels measured when the wind direction was from north northwest, northwest, west northwest, west, west southwest, southwest, south southwest and the south).
- Broadly easterly winds (i.e. sound levels measured when the wind direction was from north, north northeast, northeast, east northeast, east, east southeast, southeast and south southeast.

5.4.17 As all the monitoring positions are located west of the M40 motorway, broadly easterly winds (i.e. blowing from the east) will result in higher background sound levels due to the motorway noise, while broadly westerly winds (i.e.

blowing from the west) will cause generally lower background sound levels from the motorway noise.

5.4.18 After filtering the measurement data according to wind direction, the frequency of occurrence of the measured background sound levels (rounded to the nearest integer) was examined. The modal value, i.e., the most frequently occurring value, was identified for both the day and night-time periods for each monitoring location. Generally, the modal value is a good indicator of the typical background sound level when there is broadly a normal statistical distribution within these periods.

5.4.19 However, in some situations, the background sound level is not evenly spread about the modal value, i.e., the distribution is not statistically normal and there can be quite a few occasions when a lower value occurs.

5.4.20 To explore whether this feature existed, the following process was adopted. For the measurements made at each monitoring location, the value of the result was identified for which 75% of the all the measured values were higher. This value is known as the lower quartile and was determined for both the day and night-time periods. When the lower quartile value was at least 3 dB(A) below the modal value, this was considered to be an indication that there was unevenness in the distribution of the background sound level. In those cases, the lower quartile value was used as a sensitivity test in the operational sound assessment, in addition to the modal value. This means that a robust approach to the consideration of typical background sound levels in the assessment has been followed.

5.4.21 Based on this analysis, the indicative background sound levels ($L_{A90,15min}$) for each monitoring position have been identified for the daytime (07.00 – 23.00) and night-time (23:00 – 07:00) periods for both westerly and easterly winds. These values are presented in **ES Appendix 5.7**. The appendix also identifies the representative monitoring position for each receptor location along with any required correction to relate the levels from the monitoring location to the relevant receptor location.

Baseline Vibration Survey

5.4.22 As previously discussed, receptors close to the Chiltern Main Line, on which freight trains serving OxSRFI will be travelling, are already exposed to frequent passenger train passes. At the time of writing, it is understood from the Rail Consultant (Intermodality) that there is no regular pattern of freight train activity on this section of the line. However, there are some freight trains

which use the line associated with High Speed 2 construction works and movements to and from the military deport at Bicester. This use is understood to be sporadic, often scheduled at short notice and currently only amounts to no more than 2 trains per day. At the closest receptors to the line, ground borne vibration resulting from the train passes may be experienced.

5.4.23 To characterise and quantify the existing levels of vibration resulting passenger trains using the line, Vibration Dose Value (VDV) measurements of passenger train passes were undertaken at two of the closest receptors to the Chiltern Main Line and the proposed Rail Terminal. These are shown as locations V1 and V2 on the monitoring location plan in **ES Appendix 5.3**. Due to the sporadic nature of the freight train activity, it was not possible to capture any vibration measurements of freight train movements during the baseline vibration survey.

5.4.24 Vibration measurements were carried out following the principles of BS 6472-1:2008. A triaxial accelerometer was attached to a mounting plate conforming to the German standard DIN 45669-2:2005-06. At location V1, the mounting plate was placed in the ground with spikes penetrating the earth in absence of any accessible solid floor bases. At V2 it was placed on a concrete slab at the rear of a property. Both positions were considered representative of the ground floor vibration experienced inside the properties.

5.4.25 Location V1 was approximately 85 m to the south-west of the railway, and so closer to the northbound line and location V2 was approximately 195 m north of the railway, closer to the southbound line.

5.4.26 Both monitors were installed and left unattended for a period of over 19 hours (from 14:00 on the 12th March 2025). Observations of train passes were made from a bridge with line of sight to the passing trains for over an hour from 14:00 on the 12th March 2025.

5.4.27 The number of measured train passes together with the average and maximum VDV levels are summarised in Table 5.30 for north and southbound train passes.

Table 5.30 Summary of Measured VDV levels for northbound and southbound train passes

Monitoring Location	Train Length	Z Axis values					
		No. of samples	NB/Near		No. of samples	SB/Far	
			Average	Maximum		Average	Maximum
V1	4-6 Cars	6	0.003	0.006	7	0.005	0.006
The data from Monitoring Location V2 showed no correlation with known train passes							

5.4.28 The measured vibration levels at monitoring location V2 showed no correlation with train passes due to the large distance to the rail line, and were instead influenced from other local vibration sources. As a result, the data from this location (195m from the rail line) has not been used in the assessment.

5.4.29 During the survey, it was observed that vibration from the trains was not perceptible at the measurement locations. The low levels of recorded vibration reinforce this observation.

5.4.30 As previously discussed, there are currently no more than two scheduled freight train movements along the Chiltern Main Line per day[40]. These freight movements are scheduled but are only operated sporadically, as there is no certainty when these services will run, it has not been possible to obtain any vibration measurements of freight trains. The Rail Consultant (Intermodality) have advised there are occasional ad hoc Network Rail maintenance trains that operate on this line, with some employed in a seasonable basis (i.e., where tracks require cleaning during autumn). In the absence of obtaining measured vibration data for freight trains at this location, data obtained for the Northampton Gateway DCO application has been used to predict and assess the vibration impact to the receptors closest to the Rail Line. Measured data from that vibration survey undertaken in 2016 was undertaken at a similar location and distance as R42 is relative to the rail line and so is considered representative. This is summarised in Table 5.31 below.

[40] Information accessed from Real Time Trains Database https://www.realtimetrains.co.uk/

Table 5.31 Baseline Vibration Data from Northampton Gateway DCO

Train Type	Z Axis (Vertical) Nearest Track			Z Axis (Vertical) Furthest Track		
	No. of Passes	Average, VDV_b ($m/s^{1.75}$)	Maximum, VDV ($m/s^{1.75}$)	No. of passes	Average, VDV_b ($m/s^{1.75}$)	Maximum, VDV ($m/s^{1.75}$)
Freight	4	0.016	0.019	3	0.008	0.011

Future Baseline

5.4.31 In the absence of the Proposed Development, the future noise and vibration environment is likely to continue to be governed by changes in the current dominant sources of noise and vibration at the sensitive receptors, i.e., road and rail traffic.

5.4.32 The change in the baseline road traffic conditions has been determined through a review of road traffic forecasts for the future baseline assessment years and the inclusion of the relevant contribution from other committed developments. For further information refer to ES Chapter 3 (Transport).

5.4.33 Both Bicester and Upper Heyford are undergoing considerable development/ redevelopment which will affect baseline conditions. Of particular relevance is the Heyford Park development which is adjacent to the boundary of the Main Site. One of the main operational phase accesses for this development is Chilgrove Drive, which is currently blocked part way up the road preventing vehicle access and therefore currently has limited use. The ES Noise Chapter (Chapter 12) and supporting Appendices for the latest Heyford Park planning application (ref. 25/02190/Hybrid[41]) indicates that in the vicinity of the Main Site boundary, the future road traffic noise levels on the proposed residential facades are predicted to be around 50-55 dB $L_{Aeq,16h}$ during the day and 40-45 dB $L_{Aeq,8h}$ at night. It is also noted that an alternative ventilation strategy is recommended in these areas to mitigate against the road traffic noise produced by the traffic associated with the proposed Heyford Park development itself.

5.4.34 With regard to rail traffic, the Rail Consultant has advised that there would not be any growth from the existing baseline, and therefore the future baseline

[41] Note: at the time of writing the Heyford Park planning application (ref. Ref. 25/02190/Hybrid) has not been determined by the local planning authority.

would mirror the current baseline situation. This is a considered a worst-case scenario, as if baseline rail traffic does in fact increase, the impacts of the additional trains associated with the Proposed Development may be reduced.

5.5 ASSESSMENT OF LIKELY EFFECTS

Embedded Mitigation

Construction Phase

5.5.1 During construction of the Proposed Development, noise and vibration mitigation measures that can be used to demonstrate that BPM have been applied will be identified. These are included in the CEMP (ES Appendix 2.3) that will be submitted as part of the application and may include but not be limited to:

- Selection of appropriate equipment and construction methods;
- Plant to be located as far away as is reasonably practicable from noise and vibration sensitive receptors;
- Static plant/equipment fitted with suitable enclosures or screening where practicable;
- Temporary hoardings/screens around the site boundary or specific activities as appropriate;
- Site personnel instructed on BPM to reduce noise and vibration as part of their induction training and as required prior to specific work activities;
- Appropriate management of working hours for noisier tasks and those likely to cause higher levels of vibration;
- Liaison with residents in advance of works commencing to provide information regarding the programme; and
- Routing of construction related road traffic.

Operational Phase

5.5.2 To mitigate the potential vibration impact of the future operation of vehicles using the access roads into the Main Site, the responsibility of the ongoing maintenance will be adopted by the relevant highway authority. Furthermore, the operator would be responsible to maintain the private internal roads from the Proposed Development, these actions will help to mitigate potential vibration impacts at source minimising future potential adverse effects.

5.5.3 With regard to the operational phase of the Proposed Development the design of the Main Site and Ardley Bypass have been developed through an iterative process, as set out in the Design Approach Document (Document 5.5A), which has sought to maximise the mitigation of operational noise provided by the inherent design of the scheme. This has included:

- Maximising the height of the mitigation measures provided between the Rail Terminal and the village of Ardley as much as practicable within the constraints of engineering solutions. It is proposed that this will comprise of an engineered earth bund achieving a height of up to 127m AOD as indicated in the Parameters Plan (Document 2.5), with an 3m high acoustic barrier on top achieving a total height of up to 130m AOD. The detail of the acoustic barrier will be secured via the DCO requirements as part of the detailed approval;
- Setting the Rail Terminal at a plateau that is as low as practicable within the site 110m AOD (in part to maximise the benefit of the bunding to the north);
- The mitigation provided by the bunding around the boundary of the rest of the site which offers up to a 10 m high bund when compared to the land outside the site, and up to around 15-16 m when compared to the proposed development plateau levels (i.e., within the site);
- Provision of bunding along the western edge of the Proposed Ardley Bypass and on the eastern side of the bypass in proximity to R19 (Ardley Kennels); and
- A low noise road surface on the Ardley Bypass.

5.5.4 Inherent mitigation has also been included in the design of the MSRR including the associated bunding to minimise operational noise impacts at the surrounding receptors.

5.5.5 Consideration has also been given to the noise generating operational equipment employed at the site. Embedded mitigation within the scheme includes:

- Use of low noise reach stackers with a sound power level of 108 dBA, which is typically 5 dB lower than the noise emission of traditional reach stacker. This is secured by a requirement in the DCO; and
- Limiting the height of the gantry crane components that generate significant levels of noise to a maximum of 18.5m, to assist in minimising the noise propagation to nearby noise sensitive receptors (note that this applies only to the height of the noise generating

elements, not the overall height of the cranes themselves which may be greater than 18.5m). This is secured via the DCO through the Parameters Plan (Document 2.5) which limits the overall height of the gantry cranes to a relative height of 20m (130m AOD). Typically, the noise generating sources at the top of a gantry crane are 1.5m below the overall height of the gantry crane.

5.5.6 The Framework Travel Plan (ES Appendix 3.2) is also embedded mitigation during the operational phase of the development, encouraging modal shift to reduce light vehicle traffic associated with the Proposed Development.

Construction Phase Effects

Construction Traffic Noise

5.5.7 The potential significance of construction road traffic has been assessed by predicting the BNLs for the road links with and without the construction traffic for the following scenarios:

- Year 2 – prior to Ardley Bypass with construction traffic still using the B430;
- Year 3 – prior to the opening of the Ardley Bypass (with construction traffic still using the B430); and
- Year 3 – post completion of the Ardley Bypass (with construction traffic then travelling along the Ardley Bypass instead of the B430).

5.5.8 Table 5.32 sets out the predicted BNLs for the relevant links under each scenario, identifies the increase in the BNL arising from construction traffic and the magnitude of impact in accordance with the criteria in Table 5.12.

Table 5.32 Predicted BNLs for Construction Traffic

Scenario	Link	BNL without construction traffic $L_{A10,18hr}$ (dB)	BNL with construction traffic $L_{A10,18hr}$ (dB)	Change (dB)	Magnitude of Impact
Year 2	B430	66.9	67.8	+0.9	Negligible
	A43 to A421	79.6	79.7	+0.1	Negligible
	M40 J10 to J9	84.3	84.4	+0.1	Negligible
	M40 South J9	82.8	82.9	+0.1	Negligible
Year 3 pre Ardley Bypass	B430	66.9	67.9	+1.0	Minor
	A43 to A421	79.6	79.7	+0.1	Negligible
	M40 J10 to J9	84.3	84.4	+0.1	Negligible

Scenario	Link	BNL without construction traffic $L_{A10,18hr}$ (dB)	BNL with construction traffic $L_{A10,18hr}$ (dB)	Change (dB)	Magnitude of Impact
	M40 South J9	82.8	82.9	+0.1	Negligible
Year 3 post Ardley Bypass	B430	66.9	66.9	0.0	Negligible
	Ardley Bypass	74.6	75.1	+0.5	Negligible
	A43 to A421	79.6	79.7	+0.1	Negligible
	M40 J10 to J9	84.3	84.4	+0.1	Negligible
	M40 South J9	82.8	82.9	+0.1	Negligible

5.5.9 It can be seen from the table that the construction traffic generally results in a change of less than 1 dB to the predicted BNL for the road link, which is categorised as a negligible magnitude of impact. On the B430 in Year 3 prior to the Ardley Bypass being open only, the increase in the BNL due to construction traffic would be 1 dB, which results in a minor magnitude of impact. Given that construction traffic is predicted to give rise to negligible and minor impacts only, there would be no significant adverse effects.

Construction Noise

5.5.10 This section deals with the assessment of the potential temporary noise effects at nearby sensitive receptors resulting from construction works associated with the Proposed Development

5.5.11 Predicted noise levels for the activities likely to be used in the construction of the Main Site, Ardley Bypass, M40 Junction 10 Highways works, Heyford Park Link Road (HPLR) and Middleton Stoney Relief Road (MSRR) are presented in **ES Appendix 5.9** for the relevant receptors.

5.5.12 The values represent the $L_{Aeq,12hr}$ noise levels to be expected on a typical working day for each construction activity. The noise sources for each activity are then summed and predicted at locations in relatively close proximity to the receptors across the areas where they will take place. The maximum level from the predictions to each receptor distributed around the area (e.g., Main Site / HPLR etc) is then presented as the predicted noise impact. The tables are colour coded to indicate how the predicted noise levels correspond to the thresholds of potential effects stated in **Error! Reference source not found.**.

5.5.13 To account for the potential crossover of individual construction activities taking place between construction phases, all activities from all Works have been predicted to take place concurrently at each receptor with the noise predictions presented in **ES Appendix 5.9.** This ensures a worst-case set of assumptions about potential noise impacts. In this scenario there are no significant construction noise impacts predicted at any receptor.

5.5.14 On occasion, there may be days when the predicted noise levels could be slightly higher than those presented, when activities are taking place at closest possible point to the receptor. However, this would be very much a worst case, atypical occurrence.

5.5.15 Construction working hours are to be controlled through the DCO requirements which are set to the following timings (unless otherwise agreed in writing by the local planning authority):

- 07:00 – 19:00 hours: Monday to Friday;
- 07:00 – 16:00 hours: Saturdays; and
- No works on Sundays or public holidays, unless in exceptional circumstances only and with prior notification to the Local Planning Authority.

5.5.16 On occasion, and in accordance with the DCO requirements, out of hours works may be required where it is not practicable to complete them within the hours stated above. Such activities may include long concrete pours, which cannot be interrupted once started, and power floating of the rail terminal which must be undertaken when the concrete has cured to a certain level. Any such works would be appropriately managed and mitigated to minimise any potential adverse noise effects as far as practicable.

5.5.17 In addition, some activities taking place around the outside of the Main Site, associated with the Highway Works will require out of hours working, including during the night-time period, to comply with the requirements of National Highways. As above, these works would be appropriately managed and mitigated to minimise any potential adverse noise effects as far as practicable.

Main Site

5.5.18 Table 1 of **ES Appendix 5.9** indicates that the vast majority of activities involved in the construction of the Main Site would result in daily construction noise levels below the LOAEL, even when they are in relatively close proximity

to the receptors. No activities are predicted to cause an impact which exceeds the SOAEL. Therefore, no significant adverse noise effects are expected.

5.5.19 There are some exceedances of the LOAEL, primarily during the bulk earthworks activities, which indicate that some temporary adverse effects may occur at the relevant receptors.

5.5.20 The construction noise levels will vary considerably throughout the works programme depending on the different activities being undertaken during each phase, and how they are distributed across the site.

5.5.21 The Indicative Master Programme for development (Appendix 01 of the CEMP (ES Appendix 2.3)) indicates that much of the enabling works for the Main Site (bulk earthworks, landscaping) is expected to be carried out over a period of approximately one and a half years. During this period, initial works at the Rail Terminal are also planned to be completed. A separate Works schedule to complete the Rail Terminal extends for approximately a year and half following completion of the enabling works. Then, depending on the rate of take-up of development plots, work on constructing the warehouse buildings could extend for around a further four years. Further details of the construction phasing can be found in ES Chapter 2 (Description of Development and Alternatives) and the CEMP (ES Appendix 2.3).

5.5.22 Given that the bulk earthworks activity may take up to one and half years to prepare the entire Main Site, the time spent in relatively close proximity to any one receptor is expected to be minimal, and therefore the daily construction noise levels would typically be lower during than those shown in Table 1 of **ES Appendix 5.9** (due to greater distance).

5.5.23 While it is possible that more than one activity may take place concurrently, the predicted noise levels shown in Table 1 of **ES Appendix 5.9** are based on the activities being in relatively close proximity to the receptors. Therefore, it is unlikely that any other activities taking place at the same time would be close enough to a particular receptor to cause a material increase in construction noise levels over those shown. Furthermore, even if all activities were assumed to be operating in locations close to each receptor at the same time, the SOAEL value would still not be exceeded as shown in Table 6 of **ES Appendix 5.9**.

5.5.24 It is expected that all construction related deliveries would also take place during the expected work hours, except for large items of plant which usually have to be transported on the road network at other times when there is

minimal traffic. Site personnel would typically be permitted to access the Main Site shortly before and after these hours.

Ardley Bypass

5.5.25 Table 2 of **ES Appendix 5.9** indicates that all activities taking place on the Ardley Bypass would result in daily construction noise levels below the LOAEL and therefore no adverse effects are expected. It is noted that the Ardley bypass construction noise predictions do not include the improvements along the B430 into Ardley; however, no significant Works associated with this are expected.

Heyford Park Link Road (HPLR)

5.5.26 Table 3 of **ES Appendix 5.9** indicates that all activities taking place on the HPLR would result in daily construction noise levels below the LOAEL at all receptors considered and therefore no adverse effects are expected. This is largely due to the distances between the HPLR and the nearest receptors.

Middleton Stoney Relief Road (MSRR)

5.5.27 Table 4 of **ES Appendix 5.9** indicates that all activities taking place on the MSRR would result in daily construction noise levels below the LOAEL at all receptors considered and therefore no adverse effects are expected. This is largely due to the distances between the anticipated works areas and the receptors.

Junction 10 of the M40 Highways works

5.5.28 For the Highway Works associated with the realignment of Junction 10 of the M40, predictions have been undertaken based on daily construction timings along the full extent of the works area.

5.5.29 Table 5 of **ES Appendix 5.9** indicates that all activities taking place on the J10 M40 Highways Works will result in daily construction noise levels below the LOAEL at all receptors considered and therefore no adverse effects are expected. This is largely due to the distances between the anticipated works areas and the receptors.

5.5.30 Due to operational highway constraints, it is likely that out of hours and night working may be required at this location due, but due to the level of detail required, it is not possible to undertake detailed predictions of the likely night-

time effects at this time. As an indication for the potential effects of the night-time works, if the predicted construction noise levels for daytime hours as presented in Table 5 of **ES Appendix 5.9** were also assumed for the night-time as a worst-case, the SOAEL threshold for night-time (see Table 5.13) would not be exceeded. Any out of hours works will be agreed in advance with CDC and addressed in the relevant P-CEMP along with the measures to mitigate and manage the effects at the surrounding sensitive receptors.

Work No 35 Foul Sewer Outfall to Bicester

5.5.31 Where construction activities associated with the provision of the foul sewer outfall to Bicester take place within 50 metres of the receptors, some adverse effects are likely to occur, which may result in levels above the SOAEL threshold. However, due to the nature of the works and the brief duration they are expected to remain close to any one receptor as they progress, it is considered unlikely that noise levels above the SOAEL would persist long enough to result in a significant adverse effect.

Construction Vibration

5.5.32 Of the construction activities listed in the Indicative Master Programme for development (Appendix 01 of the CEMP (ES Appendix 2.3)), only piling (only to create the bunding to the north of the Rail Terminal) has been identified as having the potential to give rise to vibration that may cause adverse effects at nearby receptors.

5.5.33 It is understood that the only element of the Proposed Development for which piling may be required is the construction of foundations for the bridge over the railway and for the retaining wall between the rail terminal and the railway. The location of the bridge over the railway is over 300 m from the nearest sensitive receptor, which is R27 located off the B430 in Ardley.

5.5.34 With regard to the piling works for the retaining wall, the nearest receptor to the north of these works is R00 Property in the Woods, which is located over 115 m from where these activities will occur. There is also topographical separation as the levels decrease substantially between the works area and the railway lines (which is in-cutting) and then increase again up to the receptor.

5.5.35 The propagation of vibration from the activity to the receptor will depend upon the piling method, the equipment used, and the intervening soil and geology type. Consequently, it is difficult to predict the likely effects with a sufficient

level of certainty at this stage. However, it has been found previously that, in general, no material adverse effects are likely to occur when the distance to the nearest receptor is over 100 m[42]. Consequently, no significant adverse vibration effects from construction activities are expected.

Operational Phase Effects

Operational Road Traffic Noise Core ES Scenarios

5.5.36 Road traffic noise levels have been predicted at the relevant receptors (listed in Table 5.10) for the 2031 and 2034 DM and DS scenarios. Table 1 of **ES Appendix 5.12** presents the predicted daytime road traffic noise levels ($L_{Aeq,16hour}$ over 07:00-23:00), with the night-time values (L_{night} equivalent to $L_{Aeq,8hour}$ over 23:00-07:00) set out in Table 2 of **ES Appendix 5.12**. The tables show the assessment of any expected significant adverse effects and the relevant impact magnitudes in accordance with Table 5.16 for the daytime period and Table 5.17 for the night-time.

2031 Opening Year

5.5.37 This scenario reflects the effects of phase 1 of the Proposed Development and phase 1 of the highways mitigation being operational including the Ardley Bypass, but not the Heyford Park Link Road or Middleton Stoney Relief Road[43].

5.5.38 The results in Table 1 (daytime) and Table 2 (night-time) of **ES Appendix 5.12** indicate that most receptors are not expected to experience any material adverse impacts due to the change in road traffic noise in the opening year of the Proposed Development. The impact magnitudes are expected to be largely negligible.

5.5.39 Minor adverse impacts are predicted at receptors R05 (Crossroads Farm) and R28 (Ardley Fields Farm Cottages) during the night-time period only, and at T04 (Rosebank) during both the day and night periods. These are discussed in turn below:

- At R05 the predicted night-time Do Something exposure level is below the SOAEL, therefore this would not equate to a significant effect;

[42] DMRB LA 111 indicates in the notes to paragraph 3.29 that a study area of 100m from the closest construction activity with the potential to generate vibration is normally sufficient.
[43] Please refer to Indicative Master Programme for development (Appendix 01 of the CEMP (Appendix 2.3))

- At R28 the predicted night-time Do Something exposure level is above the SOAEL. However, given this receptor's current use as an office, which is of lower sensitivity and that it would not be occupied during the night-time period, in practice a significant adverse effect would not occur; and
- At location T04, both the predicted daytime and night-time Do Something exposure levels exceed the Significant Observed Adverse Effect Level (SOAEL). However, this exceedance is not attributable to development-related traffic. Instead, it results from the strategic transport model reassigning existing traffic onto Middleton Road and Ardley Road—a scenario that would not realistically occur, as Phase 1 highways mitigation measures are specifically designed to prevent such rerouting. Further details regarding this effect can be found in ES Chapter 3 (Transport) and in ES Appendix 3.1 (Transport Assessment). Consequently, a significant adverse effect would not occur in practice.

5.5.40 Moderate and major beneficial impacts are predicted at several receptors (R16-S, R16-W, R17, R18, R23, R24-W, R26, R27 W, O1 and O2) due to the Ardley Bypass and stopping up of the B430 reducing the traffic flow along the B430. The strategic transport model presumes that no vehicles use the B430 south of Church Road in the Do Something scenarios. As a result, the projected reductions in traffic may be overestimated, since in reality a limited amount of traffic would likely remain. Nonetheless, the model indicates that, overall, traffic volumes would be substantially lower compared to the Do Minimum situation.

2034 Completion Year

5.5.41 This scenario reflects the effects of the completed Proposed Development and associated Highway Works i.e. including the HPLR and MSRR.

5.5.42 The results in Table 1 (daytime) and Table 2 (night-time) of **ES Appendix 5.12** indicate that most receptors are not expected to experience any material adverse impacts due to the change in road traffic noise in the completion year (2034). The impact magnitudes are expected to be largely negligible.

5.5.43 Minor adverse impacts are anticipated at R05 (Crossroads Farm) during daytime period, while at R13 (Manor Farm), R28 (Ardley Fields Farm Cottages) and T01 (Fewcott Road), such impacts are expected only during the night-time period. However, no significant adverse effects would occur at these locations as explained below :

- At R05 the predicted daytime Do Something exposure level is below the SOAEL, therefore this would not equate to a significant effect;
- At R13 and T01 the predicted night-time Do Something exposure level is below the SOAEL, therefore this would not equate to a significant effect. and
- At R28 the predicted night-time Do Something exposure level is above the SOAEL. However, given this receptor's current use as an office, which is of lower sensitivity and that it would not be occupied during the night-time period, in practice a significant adverse effect would not occur.

5.5.44 No significant adverse effects are expected during the day; however, as can be seen in Table 2 of **ES Appendix 5.12**, significant adverse effects are predicted to occur during the night-time at R35 (Duvall Park), T06 (Lovelynch House), T10 (Isis Avenue), and T11 (Camp Road). In all cases, these are a result of minor adverse impacts and the Do Something exposure level being above the SOAEL. At R05 a major adverse effect is predicted at night but as the Do Something exposure level is below the SOAEL it would not be significant.

5.5.45 As can be seen in Table 5 of **ES Appendix 5.12**, when the effects of the Framework Travel Plan (ES Appendix 3.2) are considered, significant adverse effects are no longer predicted at R35, T06 or T11. However, even with the effect of the Framework Travel Plan (ES Appendix 3.2), a significant adverse effect is expected to remain at T10 during the night only. This is partly due to the reassignment of existing traffic to utilise the HPLR, MSRR, and Ardley Bypass, and partly due to additional trips to/from Bicester generated by the Proposed Development. As the effect occurs at night, when most people would typically be sleeping, noise levels within bedrooms are the primary issue.

5.5.46 Whilst the predictions are made at a single receptor in this area (i.e., T10), analysis shows that this result would likely be the case at all properties north of this section of Middleton Stoney Road, which have façades located within approximately 36m of the edge of the eastbound carriageway. Whilst properties located at a similar distance south of this section of Middleton Stoney Road would experience a similar level of noise exposure and change, these properties would not experience a significant adverse effect as they were designed to mitigate against road traffic noise, with the noise assessment submitted as part of the relevant planning application (13/00847/OUT) identifying that an alternative means of ventilation should be

provided. Therefore, these properties wouldn't experience a significant adverse effect as the SOAEL value is based on dwellings having standard methods of glazing and ventilation through an open window. In line with policy, mitigation will be considered to minimise this impact.

5.5.47 The presence of the HPLR and MSRR results in a reduction in traffic travelling through Middleton Stoney along the B430/B4030. This gives rise to beneficial reductions in road traffic noise levels at the receptors in that area (R38, R39, R40 West, R41, R46W, R49, R52).

Noise Insulation Regulations (Roads)

5.5.48 No receptors have been identified as being likely to be eligible for an offer of mitigation under the terms of the Noise Insulation Regulations.

Non-Residential Receptors

5.5.49 From Tables 1 and 2 of **ES Appendix 5.12**, it can be seen that there would be a small change in road traffic noise with the Proposed Development at receptor O4 Ardley Woods. Based on the assessment criteria for residential receptors (which would be of higher sensitivity than a recreation space), no adverse impacts or effects would arise as a result.

5.5.50 The impact and effect of the changes in road traffic noise on ecological receptors is discussed in ES Chapter 6 (Ecology). Tables 1 and 2 of **ES Appendix 5.12** present the results of the operational traffic noise predictions at these receptors. In general, relatively small changes in road traffic noise are predicted at the ecological receptors. The largest change is anticipated at receptor O7 (The Heath pDWS), where up to a 3.2 dB increase is predicted at night in the 2034 Completion year. This is due to the traffic travelling along the HPLR.

Noise Important Areas

5.5.51 Regarding the impact on Noise Important Areas, receptor R21 (Foxfield Farm) represents the Important Area identified in **Figure 1** of **ES Appendix 5.6**. The predicted road traffic noise levels indicate that with the Proposed Development there would be a negligible impact and therefore no adverse impacts or significant adverse effects would occur at this receptor. As the noise exposure at this receptor is dominated by the M40 motorway, there are not considered to be any practicable options for road traffic noise to be mitigated under the Proposed Development.

5.5.52 Receptor R9 (The Cottages) can be considered representative of the Important Area identified in **Figure 2** of **ES Appendix 5.6**. The predicted road traffic noise levels indicate negligible reductions in road traffic noise of up to 0.8 dB during the day and 0.4 dB during the night when comparing the DM and DS scenarios.

Summary of Main Road Traffic Assessments

5.5.53 The achievement of the beneficial outcomes associated with the reduction in traffic along the B430 through Ardley and Middleton Stoney and the reduction on the B4030 between Middleton Stoney and the junction with the MSRR means that the requirement of Government Policy as set out in the 3rd bullet point of paragraph 5.241 of the NPS is met, i.e., contributing to improvements in health and quality of life.

5.5.54 The potential adverse effects of the proposed highways works have been mitigated and minimised through design, avoiding significant impacts from health and quality of life at all except one receptor (T10 Isis Avenue during the night in the completion year). This receptor is subject to a significant adverse effect, arising from both the reassignment of existing traffic due to the Highway Improvement works as well as additional trips to/from Bicester generated by the Proposed Development.

Operational Road Traffic Noise Sensitivity Test Scenarios[44]

2034 Completion Year Sensitivity Test with Tritax scheme

5.5.55 The results predicted in Tables 3 and 4 of **ES Appendix 5.12** for the 2034 Completion Year with the Tritax scheme show a similar pattern of results when compared to the 2034 Completion Year scenario, with most receptors having a negligible magnitude of change. During the day, no significant adverse effects are expected and during the night a significant adverse effect is predicted at R28, R35, T06, T10 and T11.

2042 Sensitivity Test

5.5.56 The results presented in Tables 3 and 4 of **ES Appendix 5.12** for the 2042 Sensitivity Test are broadly similar in outcome when compared to the 2034 Completion Year. There are some slight increases in traffic noise at the

[44] As discussed, these are not the core scenarios for assessment but are provided for information only.

receptors where beneficial impacts arose from the HPLR and MSRR. However, whilst the magnitude of the reductions has decreased, beneficial impacts are still expected to prevail at the relevant receptors. This is likely to be due to the additional traffic growth expected up to 2042.

5.5.57 The highest magnitude of change at a residential receptor is at R05 where a 2.8 dB increase is predicted during the day (negligible impact) and a 4.5 dB increase is predicted at night (moderate adverse) impact; in both cases, the predicted increases are lower than in the 2034 completion year scenario.

5.5.58 During the day, the only significant adverse effect anticipated to occur is at T10 Isis Avenue, as can be seen from Table 5 of **ES Appendix 5.12** this would remain even with the effects of the Framework Travel Plan (ES Appendix 3.2).

5.5.59 The night-time assessment (Table 4 of **ES Appendix 5.12**) indicates that significant adverse effects are predicted at R28, R35, T06, T10, T11 and T12. As discussed above, in practice, a significant adverse effect wouldn't be expected to occur at R28 as these are currently used as offices. Table 5 of **ES Appendix 5.12** shows that with the effects of the Framework Travel Plan (ES Appendix 3.2), the significant adverse effect would be avoided at T06; however, it would remain for the other residential receptors.

5.5.60 The apparent significant adverse effect observed at T12 arises from a substantial increase in the proportion of HGVs between the DM and DS scenarios, rising from 8.5% to 17.4%. The transport consultant has confirmed that, under all other modelled scenarios except this one, development-related traffic gravitates towards the M40/J9 to A41 corridor, an area expected to accommodate considerable growth due to allocated employment sites. During the PM peak period, this corridor experiences congestion, prompting the model to divert development traffic via Bicester's ring road and the B4100 instead as this becomes the most efficient route. It is important to note that the noise assessment relies on traffic data from these peak periods, which then influences predictions for the day and night-time periods. In reality, the congestion at M40/J9 is unlikely to occur at night and in practice the traffic would not be diverted through Bicester's ring road and the B4100. Therefore, a significant effect would not occur at T12.

Additional Highways Mitigation at Vendee Drive

5.5.61 It is proposed to provide a S106 Agreement contribution to a mitigation scheme which would improve the performance of the B4030 Middleton Stoney Road/Howes Lane/Vendee Drive roundabout (Junction 11). The proposed

scheme is for the roundabout to be upgraded to a fully traffic signal controlled gyratory with toucan crossing facilities on each arm.

5.5.62 Given the multiple developments that are likely to have an impact at this junction and uncertainty over the timing and road layout of other improvements including the Middleton Stoney Active Road Travel Scheme (see ES Appendix 3.1 (Transport Assessment)) and the Bicester Strategic Link Road (Ref: 14/01968/F), the noise impacts associated with this improvement cannot be determined in detail.

5.5.63 The receptors most likely to be affected by these proposals are those located immediately north and south of Middleton Stoney Road to the east of the junction. These receptors are a minimum of 24m away from the edge of the carriageway. The current proposals indicate the edge of the road carriageway will move south by around 3.5m to make space for the cycle way, and the southern boundary of the eastbound carriageway will move approximately 2m southwards. Based on the difference in distances from the edge of the carriageway, this would equate to a decrease in noise levels of up to 0.5 dB at receptors to the north and an increase in noise levels of up to 0.3 dB at receptors to the south.

Operational Railway Noise (Mainline)

5.5.64 The information provided that informs the assessment and the predicted noise levels from the Proposed Development with rail freight introduced to the existing Chiltern Main Line is presented in **ES Appendix 5.11** for the relevant receptors.

5.5.65 No significant adverse effects are predicted as a result of the additional rail movements associated with the Proposed Development. Tables 3 and 4 of **ES Appendix 5.11** indicate that, during the day, there would only be small changes in the noise levels experienced at the receptors, and for most receptors, the Do Something effect level is below the LOAEL.

5.5.66 Table 5 of **ES Appendix 5.11** indicates that there are two receptors (R05 and R42) within the study area where a potentially adverse impact has been predicted at night because of the increase in railway noise (of up to 5.0 dB). At these receptors, major and moderate adverse impacts are identified, but as the absolute level is below SOAEL, this does not result in a significant effect. Policy requires that, where practicable, reasonable steps be taken to mitigate and minimise adverse noise impacts. The context of these effects and

consideration of further mitigation is considered in Section 5.6 Additional Mitigation and Residual Effects.

5.5.67 Table 5 of **ES Appendix 5.11** also indicates that while a moderate adverse impact is predicted at R42, the impact at O5 (Ardley Fields Quarry) is negligible. This is because the freight trains serving the Proposed Development pass R42, but split off the mainline to enter the Proposed Development before reaching receptor O5, following which they are considered as part of the operational noise assessment from the Main Site.

5.5.68 It can also be seen from Tables 3, 4 and 5 of **ES Appendix 5.11** that whilst some increases in noise during the night-time period are expected at receptors in Fritwell (R2 and R3), the Do Something effect levels are considerably below the LOAEL and therefore no adverse effects would be expected.

Noise Insulation Regulations (Railways)

5.5.69 No receptors have been identified as being likely to be eligible for an offer of mitigation under the terms of Noise Insultation Regulations (Railways).

Wildlife Sites – Non residential receptors

5.5.70 The results in **ES Appendix 5.11** indicate there is not expected to be any material adverse impacts or effects from the change in railway noise exposure from additional trains travelling along the Chiltern Main Line with the Proposed Development.

Operational Noise from Main Site

5.5.71 As discussed in the approach to the assessment section above, there are three main scenarios that are considered regarding the operational noise impact arising from activities at the Main Site:

- Night-time impacts – inside bedrooms;
- Daytime impacts – inside habitable rooms; and
- Daytime impacts – in external amenity spaces.

5.5.72 These have been considered with respect to the methodology set out in the sections above, the results of which are presented in **ES Appendix 5.13.**

Opening Year

5.5.73 When considering the night-time impacts, once context has been taken into account (with reference to Table 5.23), during the peak 15 minutes of activity at night, there are no anticipated significant adverse effects at any receptors, as the external rating levels do not exceed 51 dB. It is unlikely there would be adverse impacts inside bedrooms at most receptors, unless R28 is converted back to residential use. A 'possible adverse impact' is also predicted at receptor R00. As required by policy, consideration will be given to what further reasonable steps can be taken to mitigate and minimise the adverse effects. The mitigation and residual effects section of this Chapter provides an evaluation of practicable mitigation.

5.5.74 With regard to daytime impacts, inside the habitable rooms of dwellings, once context has been considered (in accordance with Table 5.24), no adverse impacts are predicted at any of the receptors. In line with policy, no specific measures are required.

5.5.75 With regard to the daytime impacts in external amenity spaces, the current assessment indicates that at the majority of receptors, the external rating level is predicted to be below the background sound level and does not exceed 50 dB. According to the criteria set out in Tables 5.22 and Table 5.25, no adverse effects are likely on this basis. The rating level exceeds the modal background level under westerly wind conditions at receptors R06-E and R06-S by up to 5 dB, and at receptors R30-E and R30-S it exceeds the lower westerly sensitivity test backgrounds by up to 3 dB. According to Table 5.22 this would equate to an adverse impact at R06-E and R06-S and a possible adverse impact at R30-E and R30-S. However, in accordance with Table 5.25, the absolute levels are below the threshold where an adverse impact is likely (LOAEL). That means that although noise from the site may be audible from time to time, it would not be at a level which would interfere with the use of the external amenity areas, such as disrupting normal conversation outside. According to the guidance in Government policy, this impact would be expected to mean that the acoustic character of area may be slightly affected but not such there is a change in quality of life.

Completion Year

5.5.76 When considering the night-time impacts, once context has been taken into account (with reference to Table 5.23), during the peak 15 minutes of activity at night, no significant adverse effects are likely unless R28 is converted back to residential use. A 'possible adverse impact' is also predicted at receptors

R00, R06-E, R06-S and R27-S. As required by policy, consideration will be given to what further reasonable steps can be taken to mitigate and minimise the adverse effects. The mitigation and residual effects section of this Chapter provides an evaluation of practicable mitigation.

5.5.77 With regard to daytime impacts, inside the habitable rooms of dwellings, once context has been considered (in accordance with Table 5.24), no adverse impacts are predicted at any of the receptors. In line with policy, no specific measures are required.

5.5.78 With regard to the daytime impacts in external amenity spaces, the current assessment indicates that at the majority of receptors, the external rating level is predicted to be below the background sound level and does not exceed 50 dB. According to the criteria set out in Tables 5.22 and Table 5.25, no adverse effects are likely. The rating level exceeds the modal background under westerly wind conditions at receptors R06-E and R06-S by up to 6 dB, and at receptors R30-E and R30-S it exceeds the lower westerly sensitivity test backgrounds by up to 4 dB. According to Table 5.22, this would equate to an adverse impact at R06-E and R06-S and a possible adverse impact at R30-E and R30-S. However, in accordance with Table 5.25, the absolute levels are below the threshold where an adverse impact is likely (LOAEL). That means that although noise from the Main Site may be audible from time to time, it would not be at a level which would interfere with the use of the external amenity areas, such as disrupting normal conversation outside. According to the guidance in Government policy, this impact would be expected to mean that the acoustic character of area may be slightly affected but not such there is a change in quality of life.

Non Residential Receptors

5.5.79 Taking the worst-case Future Year scenario in terms of operational noise from the Main Site during the day, Table 2 of **ES Appendix 5.13,** indicates that at receptor O4 Ardley Woods the highest predicted rating level from the Main Site would be 42 dB, this is 6 dB above the modal background under westerly winds (as measured at N2). According to Table 5.22 this would indicate an adverse impact, however once context is considered, in accordance with Table 5.25, the external level would be below the LOAEL and therefore no adverse effects would be expected. While noise from the Main Site may be audible it would not be at a level which would interfere with the use of the area from a recreational perspective.

5.5.80 It is not considered that receptor O4 (Ardley Woods) would be used for recreational purposes during the night-time period.

5.5.81 The impacts and effects of Main Site operational noise on ecological receptors is discussed in ES Chapter 6 (Ecology)**.** The predicted noise levels at the ecological receptors are presented in Table 9 of **ES Appendix 5.13**.

Assessment of Operational Noise Impacts – Maximum Noise Levels at Night

5.5.82 As discussed in Section 5.2, the potential impact of maximum noise levels from operational activities taking place at the Main Site and Rail Terminal during the night-time has also been considered.

5.5.83 Maximum noise levels from operational activities taking have been predicted at the relevant operational receptors, are listed in **ES Appendix 5.13**.

5.5.84 It can be seen from Table 10 of **ES Appendix 5.13** that no predicted maximum noise levels are expected to exceed the 60 dB L_{AFmax} at the outside façade of any relevant receptor.

5.5.85 In summary, no significant adverse effects or adverse impacts are expected as result of maximum noise levels from operational activities taking place at the Proposed Development during the night-time period.

Operational Railway Vibration

5.5.86 This section deals with the assessment of the potential change in railway induced vibration as a result of the Proposed Development. Main Site operations will mean that freight trains will be added to the rail network, entering and exiting the site via the Chiltern line that runs along the eastern boundary of the Main Site. Freight trains travelling on surface railways are considered a potential source of ground borne vibration.

5.5.87 Only receptor R42 falls within the scope of the railway ground borne vibration assessment which is defined as 85 m lateral distance from mainline and up to 2,300m along the track from the Proposed connection. Given that correlated baseline data was recorded at receptor R05, this receptor has also been included in the assessment.

5.5.88 Receptor R42 is around 25m from the centre of the southbound track, falling within the scope. In the most favourable conditions, significant levels of

vibration would not be expected to propagate beyond 100m from the track. The locations of these receptors are shown in **ES Appendix 5.2**.

5.5.89 The predictions assume typical rail operations with no engineering works taking place. Details of the number and type of trains used for each scenario are presented in **ES Appendix 5.11**. The vibration levels used in the predictions are the highest measured values for each representative train type taken during the baseline survey and from the reference freight train data used.

5.5.90 The table below presents the predicted daytime vibration dose values (VDVs) from railway induced vibration. These are considered representative of the levels that could occur inside the properties at the receptor locations. Table 5. presents the predicted VDVs for the night-time period.

Table 5.33 Predicted railway VDV levels for daytime period

Receptor	Baseline	DM Opening year	DS Opening Year	DM Future year	DS Future Year
R42	0.02	0.02	0.02	0.02	0.03
R05	0.02	0.02	0.02	0.02	0.04

Table 5.34 Predicted railway VDV levels for night period

Receptor	Baseline	DM Opening year	DS Opening Year	DM Future year	DS Future Year
R42	0.01	0.01	0.02	0.01	0.02
R05	0.01	0.01	0.02	0.01	0.02

5.5.91 It can be seen from Table 5.33 and Table 5.34 that no exceedances of the LOAEL, as described in Table 5.26, have been predicted at the two receptors as a result of the change in railway induced vibration associated with the Proposed Development for any of the future year scenarios in either the day or night-time periods. A negligible increase in ground borne vibration is predicted and no significant or adverse effects are likely.

Operational Noise from Fixed Plant

5.5.92 It is proposed that, prior to installation, details of the fixed plant will be submitted to the relevant planning authority for approval. As part of this process, sound from the proposed plant installations will be assessed following the principles of BS 4142:2014+A1:2019 in relation to the background sound levels for each relevant receptor (see **ES Appendix 5.7**) together with consideration of sound from other relevant operational sources

and, if required, details of any mitigation provided to demonstrate compliance with Government and Local policy.

Summary of effects

5.5.93 Table 5.35 presents a summary of the adverse noise and vibration impacts highlighted from this section. However, there are potentially adverse effects which could arise in advance of any additional potential mitigation measures to ensure these effects are minimised or avoided.

Table 5.35 Summary of potential adverse impacts and effects predicted

Issue	Receptors affected	Impact	Significant
Construction noise from Main Site	R00, R28, R30(E), R30(S), R34A, 05 & 06	Potential adverse. Above LOAEL but below SOAEL	No
Out of hours construction noise from M40/J10 Highways work	R09, R10, R50, R51 & 03	Potential adverse. Above LOAEL but below SOAEL	No
Construction noise from foul drainage works to west of Bicester	Receptors within 50m	Potential adverse.	No
Road traffic noise 2031 Opening Year Assessment – night-time	R05	Minor adverse Below SOAEL	No
	R28	Minor adverse Above SOAEL	No*
Road traffic noise 2034 Completion Year Assessment – night-time	R05	Major adverse Below SOAEL	No
	R28	Minor Adverse Above SOAEL	No*
	R13 and T01	Minor adverse Below SOAEL	No
	T10	Minor adverse Above SOAEL	Yes
Operational Railway Noise 2031 Opening Year 2034 Completion Year Assessment – night-time	R05 - North	Major adverse impacts. Below SOAEL	No
	R42	Moderate adverse impacts. Below SOAEL	No
Main Site – operational noise 2031 Opening Year night-time noise impact in bedrooms	R00	Possible adverse Above LOAEL but below SOAEL	No
	R28	Adverse	No*
Main Site – operational noise 2034 Completion Year night-time noise impact in bedrooms	R00, R06 – East & South & R27 – South	Possible adverse Above LOAEL but below SOAEL	No
	R28	Adverse	No*

Issue	Receptors affected	Impact	Significant
Notes: * Would only be significant if property was returned to residential use.			

5.6 ADDITIONAL MITIGATION AND RESIDUAL EFFECTS

Additional Mitigation

Construction Noise

5.6.1 As stated, the predictions undertaken show that no significant adverse effects are anticipated from construction noise activities from the Proposed Development. When considering potential short-term temporary adverse noise effects, the predictions indicate the Earthworks construction activity from the Main Site as the activity most likely to generate these temporary adverse effects.

5.6.2 On this basis, no additional mitigation is required, although general mitigation measures will be implemented based on the concept of best practicable means (BPM), as listed above and in the overarching CEMP (ES Appendix 2.3). Opportunities to implement further, more specific measures to mitigate and minimise any residual adverse (non-significant) construction noise and vibration effects will be explored as part of the production of the P-CEMP for each phase of the Proposed Development, when more detailed information is available about how the works will be undertaken and the programme.

Operational Road Traffic Noise

5.6.3 Significant adverse effects are only anticipated from road traffic at receptor T10, unless R28 is converted back to residential use. If this were to occur, there are limited opportunities to mitigate the potential effect at R28 given the highway constraints and the speed of vehicles as they travel south along the B430. Therefore, it is not considered that there are any practicable opportunities to reduce this effect.

5.6.4 During the night, a significant adverse effect is expected at receptor T10 (and other properties to the north of Middleton Stoney Road which have facades located within approximately 36m of the edge of the eastbound carriageway). This is due to a combination of additional trips due to the Proposed Development and reassignment of existing traffic. The Local Transport

Connectivity Plan (LTCP) was adopted by OCC on 12 July 2022 and forms the strategy for the Local Transport Plan. The LTCP targets include that by 2030 OCC will *"replace or remove 1 out of every 4 current car trips in Oxfordshire"* and *"Increase the number of cycle trips in Oxfordshire from 600,000 to 1 million cycle trips per week",* and by 2040 to *"Replace or remove an additional 1 out of 3 car trips in Oxfordshire".* These targets are not represented in the transport modelling scenarios, but should they be realised they would reduce background traffic flows, particularly in urban areas where there is more opportunity for modal shift away from the car. Middleton Stoney Road on which receptor T10 is adjacent, is subject to an Active Travel Improvement scheme to be delivered by OCC. The scheme extends the length of Middleton Stoney Road, from the A4095/B4030 Roundabout to the Oxford Road/Kings Road roundabout. The Active Travel Scheme is consistent with OCC's LTCP targets to reduce car trips by 25% by 2030 and increase cycling trips. Should OCC achieve this target, the significant adverse effect may not occur, however this is not certain.

5.6.5 In terms of other additional mitigation, a roadside barrier would not be practicable due to spatial constraints, a low noise road surface would not be appropriate due to the 30-mph speed limit being too low for this to be effective. Therefore, the only practicable option for mitigation is the provision of enhanced sound insulation to affected bedrooms. This would typically comprise secondary glazing and alternative means of ventilation to openable windows. This would be secured under the S106 Agreement, an agreed sum would be available to each eligible property for enhanced glazing (if required) and alternative ventilation for bedrooms only (as the effect is limited to the night time period).

Operational Railway Noise (Mainline)

5.6.6 With regards to mainline rail noise sources and the introduction of regular freight onto the Chiltern Main Line serving the Main Site rail terminal, there are no significant adverse impacts anticipated. However, there are some adverse noise impacts predicted at two sensitive receptors (R05 and R42). As discussed, policy requires reasonable steps are made to mitigate and minimise adverse impacts.

5.6.7 For further context, when considering the absolute level of railway noise at night predicted with the Proposed Development, the highest external noise levels is 45.6 dB. Assuming the bedrooms of these properties would have a partially open window, providing a 12 dB reduction, the internal noise level would be 33.6 dB. In accordance with Table 5.21 this is within the range of

desirable sound levels for bedrooms at night, and the internal noise level would be considered reasonable with reference to BS 8233[45]. Table 5.23 indicates at this level there would be a possible adverse impact.

5.6.8 Potential mitigation options have been considered but are not considered practicable (e.g. a barrier) nor effective at reducing the potential noise effect from this source to these receptors. Therefore, on the basis that internal levels of railway noise do not exceed the reasonable threshold at both receptors and the potential mitigation options are considered to be impracticable, the requirements of the NPS and NPSE have been complied with.

Operational Noise from Main Site

5.6.9 No significant adverse effects are anticipated unless R28 is reverted to residential use, in which case a significant adverse effect is predicted during the night-time period. Potential adverse impacts have also been identified at R00, R06, and R27 during the night, specifically relating to noise within bedrooms. The dominant source of predicted noise at these receptors is the Rail Terminal, particularly the operation of plant and equipment such as reach stackers, gantry cranes, and container handlers used for moving intermodal containers.

5.6.10 As shown on the Parameters Plan (Document 2.5) the embedded mitigation of the Main Site includes landscape bunds around the perimeter of the Main Site, with heights optimised to provide maximum environmental mitigation while remaining practicable from a buildability perspective. The bunding adjacent to the rail terminal, would be up to approximately 17m above the level of the rail terminal ground surface. A 3m high acoustic barrier will also be included along the top of the bunding between the rail terminal and Ardley, with the detail confirmed through DCO requirements at the detailed stage of design. This will create an equivalent barrier height of 20m above the level of the rail terminal ground surface.

5.6.11 An assessment of the potential benefits of increasing the bund height (within practicable means) to further reduce operational noise levels from the rail terminal at the affected receptors has shown that any such improvement would be negligible. Consequently, the combination of bunding and barriers currently proposed is regarded as the most effective and practicable solution for mitigating noise impacts.

Residual Effects

Construction Phase

5.6.12 **No significant effects** from noise or vibration associated with the construction of the Proposed Development have been predicted.

5.6.13 During construction, with the implementation of BPM through a phase specific P-CEMP to identify specific mitigation measures, it is anticipated that temporary adverse effects from the works during the daytime work hours and potential night period working with respect to the Highway Works would occur less often and the resulting noise and vibration levels would be reduced compared to what is currently predicted. However, it is difficult to quantify the reduction that would be achieved at this stage of the development. Therefore, it is considered possible that although some temporary adverse effects would remain, though they will have been mitigated and minimised to comply with national policy.

Operational Phase

5.6.14 **No significant adverse effects from noise or vibration** associated with the operation of the Proposed Development have been predicted with respect to:

- Railway noise or vibration from additional trains travelling on the Chiltern Main Line.
- Operational noise from the Main Site at all receptors unless R28 is converted back to a residential receptor. Whilst some exceedances of the background sound levels are predicted at other receptors, the absolute levels are below the relevant threshold.
- Daytime road traffic noise (all receptors).
- Night-time road traffic noise at all receptors except T10.

5.6.15 Where potentially adverse operational noise effects are predicted, mitigation options have been considered where practicable to mitigate and minimise potential effects as per policy and guidance.

5.6.16 The **only significant adverse effect identified, is with respect to night-time road traffic noise** at receptor T10 – this is a result of anticipated changes in traffic patterns on the improved road network following the OxSRFI mitigation (re-assigned traffic effects). At receptor T10 there is a chance that the measures being taken by Oxfordshire County

Council (OCC) under the Local Transport Connectivity Plan may reduce the magnitude of this effect which, in combination with the Framework Travel Plan (ES Appendix 3.2), may avoid the significant adverse effect, however this is not certain. The only practicable option for mitigation is the provision of enhanced sound insulation to affected bedrooms (i.e., enhanced glazing and an alternative means of ventilation) - this would be secured under the S106 Agreement, an agreed sum would be available to each eligible property for enhanced glazing (if required) and alternative ventilation for bedrooms only (as the effect is limited to the night time period). At properties within receptor T10 where this mitigation is employed, the significant adverse effect would be avoided. However, it would be down to the occupants to decide whether or not to take up the offer and install the proposed mitigation. Significant adverse effects could remain at any properties which do not install the proposed mitigation.

5.6.17 The Highway Works associated with the Proposed Development have been designed to mitigate and minimise any adverse effects and have contributed to beneficial effects for several receptors particularly in Ardley and Middleton Stoney.

5.6.18 Note that the significant adverse effects that might arise at R28 would only occur if this receptor was returned to residential use, as its currently used as an office which has a lower sensitivity and is not expected to be occupied at night.

Statutory Nuisance

5.6.19 Following the implementation of the proposed mitigation measures, it is not anticipated there would be any nuisance related to noise or vibration from the construction or operation of the Proposed Development. As indicated earlier traffic noise is excluded from the consideration of statutory nuisance.

Climate Change

5.6.20 There are not anticipated to be any particular direct links between climate change and noise.

5.6.21 Climate change is generally associated with more variable weather conditions which could have an effect on the noise assessment. The dominant wind direction in England is south westerly; however, there can be prolonged periods of easterly winds associated with areas of high pressure and, in winter,

colder weather. Both wind directions were captured during the baseline noise surveys and the assessment of operational noise effects from the Main Site have been considered under both wind directions.

5.6.22 Climate change also has the potential to intensify heat in the summer. Therefore, potentially noise sensitive receptors could have their windows open for longer durations than at present. However, the operational assessment considers the internal noise levels through a partially open window which would be the worst-case scenario.

Human Health

5.6.23 The assessment methodology set out in this ES Chapter has been based on, in part, the World Health Organisations guidelines, which are based on evidence of the early onset of environmental noise impacts on human health.

5.6.24 The guideline limits set out by the WHO largely align with British Standards regarding environmental noise, with direct links to the levels stated in BS 8233:2014 reproduced in Table 5.21.

Mitigation Summary

5.6.25 Table 5.36 presents the mitigation applied to minimise any adverse effects at a number of receptors.

Table 5.36 Mitigation to address predicted adverse noise effects at relevant receptors

Issue	Receptors	Impact	Mitigation	Effect
Construction noise from Main Site	R00, R28, R30(E), R30(S), R34A, 05 & 06	Temporary adverse	Implementation of BPM through a P-CEMP	Adverse Non-significant
Out of hours Construction noise from M40/J10 Highways work	R09, R10, R50, R51 & 03	Temporary adverse	Implementation of BPM through a P-CEMP	Adverse Non-significant
Construction noise from foul drainage works west of Bicester	Receptors within 50m	Temporary adverse	Implementation of BPM through a P-CEMP	Adverse Non-significant
Road traffic noise	R05	Minor adverse (below SOAEL)	Framework Travel Plan	Adverse Non-significant*
	R28*	Minor adverse (above SOAEL)	None – not practical	

2031 Opening Year – night-time				
Road traffic noise 2034 Completion Year Assessment – night-time	R05	Major adverse (below SOAEL)	Framework Travel Plan	Adverse Non-significant*
	R28*	Minor adverse (above SOAEL)		
	R13 and T01	Minor adverse (below SOAEL		
	T10	Minor adverse above SOAEL		Adverse Significant
Operational Railway Noise 2034 Completion Year Assessment – night-time	R05 and R42	Moderate (R42) and major (R05) adverse	None – see para 5.6.8	Adverse Non-significant
Main Site – operational noise 2031 Opening Year night-time noise impact in bedrooms	R00	Possible adverse (above LOAEL but below SOAEL)	Combination of significant bunding/ barriers and reducing source levels	Possible adverse Non-significant*
	R28*	Adverse		
Main Site – operational noise 2034 Completion Year night-time noise impact in bedrooms	R00, R06 – East & South & R27 – South	Possible adverse (above LOAEL but below SOAEL)		
	R28*	Adverse		
Notes: *R28 would only be significant effect if property returned to residential use.				

5.7 CUMULATIVE EFFECTS

5.7.1 Consideration has been given to schemes of varying size and designation in relative proximity to the Proposed Development (details of which are provided in ES Chapter 16 (Cumulative Effects). These have been reviewed and, where relevant, the potential construction noise and operation noise impacts in combination with the Proposed Development have been considered.

5.7.2 Cumulative construction noise impacts may occur when concurrent construction activities are undertaken at nearby sites. There are three

schemes with residential elements adjacent to the Proposed Development, both of which have been included in the construction assessment.

5.7.3 With regard to cumulative increases in road traffic, the traffic data provided takes account of all cumulative schemes in the vicinity of the Proposed Development as agreed with the Transport Working Group (see ES Chapter 3 (Transport)). Therefore, the traffic data and subsequent assessments inherently consider the cumulative effects of those schemes.

Richborough Estates

5.7.4 With regard to committed developments, the Richborough Estates scheme (21/04289/OUT) includes up to 230 homes on the western boundary of the Main Site of the Proposed Development. This Scheme has been considered in the assessment as receptor R34A for construction noise, operational noise from the Main Site, and operational road traffic noise.

5.7.5 While it is not possible to compare the specific alignment of construction phasing between this scheme and the Proposed Development, it is unlikely any receptors would experience a cumulative impact above that already accounted for from the Proposed Development alone. It is anticipated there would not be any cumulative operational noise impacts related to the Richborough Estates scheme and the Proposed Development.

5.7.6 Therefore overall, no significant adverse effects are anticipated at this receptor as a result of the cumulative effects from the Richborough Estates scheme and the Proposed Development.

David Wilson Homes (former Pye Homes)

5.7.7 The former PYE homes scheme (15/01357/F and 21/03523/OUT) is now being brought forward under a new application by David Wilson Homes (22/03063/F) for 123 homes and is located approximately 250m from the western boundary of the Proposed Development. This scheme has been considered in the assessment as receptor R34 for operational noise from the Main Site.

5.7.8 The construction of this residential development has already commenced, given this and the distance from the Main Site, it is unlikely there would be any cumulative effects from the construction both developments. Furthermore, given the residential nature of the development it is unlikely there would be any cumulative operational noise impacts with the Proposed Development

(OxSRFI). Overall, no adverse or significant adverse cumulative effects are expected.

Heyford Park

5.7.9 Planning consent has been granted for up to 1,175 homes at Heyford Park (18/00825/HYBRID), which is treated as a committed development in this assessment (and is included within the traffic data used in the assessment. More recently an application has been submitted (25/02190/HYBRID) to deliver a new town settlement including 9,000 dwellings, alongside new commercial and employment uses, and several new schools. As this is not yet consented, it is not treated as a committed development in this assessment or in the traffic data.

5.7.10 The schemes at Heyford Park, are located in proximity to the northwestern edge of the Main Site. To consider the effects of the Proposed Development on the 2018 consented application, three separate sensitive receptors (R30-S/E/W) were included in the assessment of construction noise and operational noise from the Main Site . Following the submission of the 2025 application, an additional receptor (R30A) has been included in the operational assessment to further consider the operational noise effects that might arise from the Main Site of the Proposed Development.

5.7.11 Once again, while it is not possible to compare the specific alignment of construction phasing between this Heyford Park scheme(s) and the Proposed Development, it is considered unlikely receptors would experience a cumulative impact that causes a significant adverse effect or any effect above that already predicted to arise from the Proposed Development alone. The predictions are predominantly based on the robust worst-case assumptions that focus all activity into a single location near the receptor; in practice this will be unlikely to happen.

5.7.12 With regard to potential cumulative operational effects of noise from the Main Site of the Proposed Development and Heyford Park, under the 2018 application the Heyford Park development only comprises 1,175 dwellings. Therefore, it is not considered there would be any potential cumulative effects with both developments that are greater than those identified from the Proposed Development alone.

5.7.13 Under the 2025 Heyford Park application, in addition to the proposed 9,000 dwellings there are also employment uses and wind turbines which may generate noise during the operational phase. The effects of noise from these

sources are considered as part of the site suitability assessment for Heyford Park[46] and should their development be granted consent, any mitigation for onsite or offsite receptors required in their assessment should be secured via planning conditions. Therefore, it is not expected that during the operational phase of the Proposed Development, any cumulative effects would arise greater than those identified from the Proposed Development alone.

5.7.14 Regarding potential cumulative road traffic noise effects with the 2025 Heyford Park application, their Transport Assessment indicates that there would be a high proportion of internal trips as the 'new town' would be reasonably self-sufficient given the educational, commercial and employment use alongside the residential dwellings. There is also a strong focus on modal shift to encourage sustainable transport options and reduce trip generation. The greatest changes in traffic flows and therefore road traffic noise are expected to the west of their development and travelling onto the A4260. Conversely, the greatest impacts from traffic associated with OxSRFI is predominantly to the east. However, it is noted that the Highway Works associated with OxSRFI do result in some reassignment of traffic going eastbound and westbound from Upper Heyford to Bicester and vice versa.

5.7.15 Therefore, there may be cumulative effects at common receptors particularly along Camp Road and the HPLR, resulting from an increase the overall quantum of traffic along this route, although as the volume of traffic associated with OxSRFI would remain consistent, the magnitude of change would not be anticipated to be worse than is currently predicted, although the Do Something (DS) effect level may increase. This could result in significant effects along Camp Road at night in the 2034 scenario as the DS effect level is currently just below the SOAEL threshold, but it would depend on the volume of additional traffic.

5.7.16 Overall, no significant adverse effects are anticipated as a result of the cumulative effects from the construction of the Heyford Park scheme and the Proposed Development, or operational noise from the Main Site and the Heyford Park Development. It is possible that a significant adverse effect could occur along Camp Road if the additional traffic increases the predicted noise level above the nighttime SOAEL.

Puy du Fou

[46] See Chapter 12 of the Heyford Park Application ES, ref. 25/02190/HYBRID

5.7.17 The application for this proposed tourist attraction (Ref: 25/02232/OUT) is not yet consented and therefore is not a committed development in this assessment or the supporting traffic data.

5.7.18 As the Puy du Fou site is approximately 2km to the east of the Main Site, there would not be any common receptors in terms of cumulative effects from construction noise or operational noise from the Main Site of the Proposed Development.

5.7.19 Therefore, the only potential cumulative effect would be from operational road traffic noise, noting that the attraction would only be open from April to October. The noise chapter from their ES, indicates that during the daytime assessment period, the worst affected roads (Middleton Road and Bainton Road) have an increase of up to 0.6 dB. Therefore, with both schemes, it is not anticipated there would be any cumulative effects which are greater than those already identified.

5.8 SUMMARY AND CONCLUSIONS

5.8.1 The potential noise and vibration impacts and effects that may arise as a result of the construction and operation of the Proposed Development have been assessed in accordance with relevant Government and Local Policy. This has included consideration of the Main Site and associated new road infrastructure, in particular, the Ardley Bypass, Heyford Park Link Road, M40 J10 Highways works and the Middleton Stoney Relief Road.

5.8.2 Baseline conditions were established through extensive sound and vibration surveys undertaken in 2025, superseding earlier data to ensure it remained representative. Surveys included both unattended and attended monitoring at key locations, capturing prevailing noise sources and environmental factors. Baseline vibration measurements targeted properties closest to the Chiltern Main Line, with additional reference data used where direct measurements were not feasible.

5.8.3 The assessment results in this ES Chapter indicate that construction noise and vibration impacts are generally below the thresholds of significant effects, with temporary adverse effects predicted for certain receptors during specific activities. Construction traffic is expected to have negligible or, at worst, minor impacts, and construction vibration effects are not anticipated to be significant due to the distance between the relevant activities and receptors.

5.8.4 The operational phase assessments show that most receptors experience negligible or minor changes in noise exposure from road and rail traffic. Significant adverse effects are limited to a single location (T10 and surrounding properties with similar noise exposure) due to night-time road traffic conditions; this effect is influenced by traffic reassignment and may be mitigated by local transport policies and planned modal shifts, although this is not certain at this time. After consideration of various mitigation measures, the only practicable option is to offer a sum to install enhanced sound insulation and alternative ventilation to affected bedrooms. This would be secured through the S106 Agreement, and would be down to the owner whether to take up the offer. With the proposed mitigation, the significant adverse effect would be avoided.

5.8.5 No significant adverse effects have been predicted from operational rail noise or vibration, nor from main site activities, except for one receptor (R28) if it is reverted to residential use (it is currently in use as an office).

5.8.6 Mitigation measures are embedded throughout the project design, including extensive bunding and acoustic barriers, selection of low-noise plant and equipment, and use of best practicable means (BPM) during construction.

5.8.7 Cumulative effects have been considered with respect to adjacent developments, notably the Heyford Park, Richborough Estates and Puy du Fou schemes. The assessment demonstrates that cumulative construction and operational impacts from the Main Site do not result in additional significant effects, or increased effects beyond those already identified. Traffic modelling incorporates committed developments (i.e., Richborough Estates and the 2018 Heyford Park application), ensuring cumulative road traffic noise has been inherently accounted for in the overall analysis of effects. For Puy Du Fou, it is not anticipated there would be any cumulative traffic effects that are greater than those already identified. Regarding the 2025 Heyford Park application, it is possible that a significant adverse effect could occur along Camp Road if the additional traffic increases the predicted noise level above the night-time SOAEL.

5.8.8 It is concluded the Proposed Development complies with the requirements set out in the NPS and other relevant national and local planning policy with respect to noise and vibration. Within the context of Government policy on sustainable development:

- significant adverse effects have been avoided where practicable (i.e. through embedded mitigation and provision of a contribution towards sound insulation improvements;
- adverse effects have been mitigated and minimised (i.e., implementation of the bunding around the Main Site and design of new highways incorporating earth bunding and low noise road surfaces); and
- improvements to health and quality of life have been achieved (e.g., the Ardley Bypass and Middleton Stoney Relief Road have resulted in beneficial reductions in road traffic noise at several receptors due to rerouting of traffic onto the new roads).