10.0 Noise and Vibration

10.1 Introduction

10.1.1 This Chapter of the ES has been prepared by WYG and considers the impact of the development on noise with regards to the proposed mixed-use development on land located between the B3081 (Shaftesbury Road) and the B3092, to the south of Gillingham, Dorset.

10.1.2 The Chapter sets out the methodology followed in undertaking the assessment and provides a review of the baseline features and resources of the proposed site and surrounding area. Within this Chapter, an assessment of road traffic changes resulting from the development both within and off site plus an assessment of on-site construction noise has been undertaken.

10.1.3 The Chapter focuses on the likely significant effects of the proposed development on existing identified sensitive receptors. The impact of road traffic noise attributable to the proposed development on baseline sensitive receptors, in order to determine the magnitude of impact and significance of effects is presented. For the purpose of this ES, the effects of such elements have been established based on whether adopted criteria are exceeded or not with the results presented in this Chapter.

10.1.4 A separate technical report is presented in Appendix 10.1 which considers sleep disturbance and amenity with regard to future proposed residents from surrounding noise sources such as off-site road traffic noise.

10.1.5 The extent of the study area for the site is comparable to that assessed within the Transport and Access Chapter. With regard to the impact of noise sources on proposed residential receptors, the assessment is based on the overall study area although, in reality, only localised noise sources will have an influence on the assessment presented in the technical report (Appendix 10.1).

10.2 Methodology and Scope

Policy Background

10.2.1 The National Planning Policy Framework specifies in Section 123 that planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their businesses should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- Identify and protect areas of tranquillity which have remained undisturbed by noise and are prized for their recreational amenity value for this reason.

Noise Policy Statement for England

10.2.2 The Noise Policy Statement for England (NPSE) was published on 15 March 2010. It sets out the long-term vision of government noise policy, to "promote good health and a good quality of life through the management of noise within the context of Government policy on sustainable development".

10.2.3 The aims of the NSPE are:

10.2.4 "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."

10.2.5 Since the publication of the NPSE, this document and the accompanying Explanatory Note forms the basis for noise consideration within the National Planning Policy Framework (NPPF) and the national Planning Practice Guidance (PPG). The content of these documents are explained in more detail in the Noise Technical Report. This includes further reference to the following concepts introduced within the NPSE:

NOEL – No Observed Effect level

This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

LOAEL – Lowest Observable Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur

10.2.6 However, specific noise measures such as limits or thresholds are not presented and it states that:

10.2.7 *"It is not possible to have a single objective based measure that defines 'significant effect levels' that is applicable to all sources of noise in all situations."* as such there remains the requirement to establish relevant criteria based on currently available guidance documents and standards such as the WHO Guidelines and DMRB.

National Planning Practice Guidance

10.2.8 The National Planning Practice Guidance web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6th March 2014 to support the National Planning Policy Framework and make it more accessible. With respect to noise, the national Planning Practice Guidance (PPG) provides the following summary of the effects of noise exposure: For the purpose of this assessment the relating target noise level criteria are found in the noise technical report.

10.2.9 With respect to Government policy for noise, the national Planning Practice Guidance (PPG: Noise) provides the following summary (Table 10.1) of the effects of noise exposure that gives more definition to the terms used in the Noise Policy Statement for England (and NPPF). These definitions help to confirm that the change in noise levels in the magnitude of impact table (Table 10.3) and noise levels based on World Health Organisation and BS8233 levels used in the technical report remain appropriate:

Table 10.1 Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No Specific Measures Required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. 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
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Observed Adverse Effect	Prevent

North Dorset Local Plan Part 1

10.2.10 A new local plan that sets out the strategic planning policies for North Dorset was adopted by the Council on 15th January 2016. The policies detailed below are considered to be relevant in terms of the residential aspects of the development:

- Policy 25 – Amenity

  In the case of noise and/or vibration causing development, development would be permitted provided that the levels of noise and/or vibration would not cause an unacceptable level of disturbance (that is, exceed adopted or appropriate national standards) to the occupants of nearby properties

  In the case of noise and/or vibration sensitive development, development would be permitted provided that the intended users would not be subject to unacceptable levels of noise and/or vibration from existing noise and/or vibration producing uses (that is, exceeding adopted or appropriate national standards) having taken account of any proposed attenuation or other measures.

  Where the Council considers that noise and/or vibration may be an issue, developers may be required to submit a noise and/or vibration impact assessment, having regards to best practice and relevant British Standards.

  Where noise and/or vibration is likely to result from a proposed development, appropriate attenuation, mitigation and control measures should be agreed with the Council (including the use of planning conditions) such that the levels of noise and/or vibration would not cause an unacceptable level of disturbance (i.e. exceed adopted or appropriate national standards) to the occupants of nearby properties.

Scoping Assessment Stage

10.2.11 A request for a scoping opinion was sent to North Dorset District Council in October 2014, with a response received from the Council in December of the same year. The proposed outline assessment methodology as detailed below was accepted without amendment.

"It is considered that an ES chapter would be required to assess the effects of the development on air/noise in conjunction with the transportation chapter. This would include construction and development scenarios"

Assessment Methodology

10.2.12 The EIA Regulations require the description of the forecasting methods used to assess the effect on the environment. Therefore, the EIA has been based on a widely used and accepted 'significance matrix assessment approach' which is based on the characteristics of the impact (magnitude and nature) and the sensitivity of the receptor. This allows the relative significance of effects to be determined on a scale and ultimately the significant effects determined, as explained in the following sub sections. Where a deviation from the approach has been undertaken, reference has been made in the appropriate sections.

Noise Assessment

10.2.13 In order to enable the assessment of the proposed development in terms of the Lowest Observed Adverse Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL), Tables 10.3 – 10.5 present equivalent noise levels and associated actions with the target noise level criteria identified. The noise level criteria detailed below have been derived from standards and design guidance:

- IEMA (Institute for Environmental Management and Assessment) 'Guidelines for Environmental Noise Impact Assessment October 2014'i; and,
- Table 3.2 of HD213/11 published in November 2011 (Design Manual for Roads and Bridges)
- BS 8233: 2014 'Guidance on sound insulation and noise reduction for buildings'
- Building Bulletin 93: acoustic design of schools - performance standards (February 2015)
- BS 5228: 2009 +A1:2014 'Code of Practice for noise and vibration control on construction and open sites – Part 1 Noise'

10.2.14 This report considers a worst-case scenario with respect to traffic noise from the site.

Construction Assessment

Table 10.2 Noise Level Criteria and Actions (Construction Noise Assessment)

Effect Level	Assessment	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level	Construction Noise Assessment	Fixed Limits In rural areas noise levels exceed 50dB In urban areas noise levels exceed 55dB	No Action Required Complaints Relating to Plant Noise Unlikely
Lowest Observed Adverse Effect Level	Construction Noise Assessment	Fixed Limits In rural areas noise levels exceed 60dB In urban areas noise levels exceed 65dB	Mitigate to achieve total noise levels below relevant category threshold
Significant Observed Adverse Effect	Construction Noise Assessment	Fixed Limits In rural areas noise levels exceed 70dB In urban areas noise levels exceed 75dB	Mitigate to achieve total noise levels below relevant category threshold
Unacceptable Observed Adverse Effect	Construction Noise Assessment	Fixed Limits In rural areas noise levels exceed 80dB In urban areas noise levels exceed 85dB	Mitigate to achieve total noise levels below relevant category threshold

Noise Intrusion Assessment

Table 10.3 Noise Level Criteria and Actions (Noise Intrusion)

Effect Level	Assessment	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level	Internal Noise intrusion assessment for proposed residential properties and school	Noise levels below: Bedrooms – 30 $dBL_{Aeq,8hours}$ / 45 dB L_{Amax} Living Rooms – 35 $dBL_{Aeq,16hours}$ External Amenity Space – 50 dB $L_{Aeq,16hours}$ Classrooms (daytime) – 35 dBL_{Aeq}	Score of zero or lower is an indication of the sound source having a low impact Within BS8233 / WHO / BB93
Lowest Observed Adverse Effect Level	Internal Noise intrusion assessment for proposed residential properties and school	Noise levels exceed: Bedrooms – 30 $dBL_{Aeq,8hours}$ / 45 dBL_{Amax} Living Rooms – 35 $dBL_{Aeq,16hours}$ External Amenity Space – 55 $dBL_{Aeq,16hours}$ Classrooms (daytime) – 35 $dBL_{Aeq,16hours}$	*Bedrooms – 30 $dBL_{Aeq,8hours}$ / 45 dBL_{Amax}* *Living Rooms – 35 $dBL_{Aeq,16hours}$* *External Amenity Space – 55 $dBL_{Aeq,16hours}$* Open Plan Office (daytime) – 45 $dBL_{Aeq,16hours}$ Classrooms (daytime) – 35 $dBL_{Aeq,16hours}$ Within BS8233 / WHO / BB93
Significant Observed Adverse Effect	Internal Noise intrusion assessment for proposed residential properties and school	Noise levels exceed: Bedrooms – 30 $dBL_{Aeq,8hours}$ Living Rooms – 35 $dBL_{Aeq,16hours}$ External Amenity Space – 55 $dBL_{Aeq,16hours}$ Classrooms (daytime) – 35 $dBL_{Aeq,16hours}$	Mitigate to achieve: *Bedrooms – 30 $dBL_{Aeq,8hours}$ / 45 dBL_{Amax} Living Rooms – 35 $dBL_{Aeq,16hours}$* *External Amenity Space – 55 $dBL_{Aeq,16hours}$* Within BS8233 / WHO criteria
Unacceptable Observed Adverse Effect	Internal Noise intrusion assessment for proposed residential properties and school	Noise levels with mitigation exceed: Bedrooms – 35 $dBL_{Aeq,8hours}$ Living Rooms – 40 $dBL_{Aeq,16hours}$ External Amenity Space – 60 $dBL_{Aeq,16hours}$ Classrooms (daytime) – 45 $dBL_{Aeq,16hours}$	Prevent

Traffic Assessment

Table 10.4 Traffic Noise Receptors (Noise Level Criteria and Actions)

Effect Level	Assessment	Noise Level Criteria	Justification
No Observed Adverse Effect Level	Change in Road Traffic Noise Levels	Short Term Change in noise is: 0.0 – 0.9 dB $L_{A10,18h}$ Long Term Change in noise is: 0.0 – 2.9 dB $L_{A10,18h}$	No Action Required
Lowest Observed Adverse Effect Level		Short Term Change in noise is: 1.0 – 2.9 dB $L_{A10,18h}$ Long Term Change in noise is: 3.0 – 4.9 dB $L_{A10,18h}$	Mitigate to achieve: Short Term Change in noise is: <1.0 dB $L_{A10,18h}$ Long Term Change in noise is: <3.0 dB $L_{A10,18h}$
Significant Observed Adverse Effect Level		Short Term Change in noise is: 3.0 – 4.9 dB $L_{A10,18h}$ Long Term Change in noise is: 5.0 – 9.9 dB $L_{A10,18h}$	Mitigate and reduce as far as practicable
Unacceptable Observed Adverse Effect Level		Short Term Depending on context, change in noise is: >5.0 dB $L_{A10,18h}$ Long Term Change in noise is: >10.0 dB $L_{A10,18h}$	Mitigate and reduce as far as practicable

Vibration Assessment

Table 10.5 Vibration Level Criteria and Actions (Transient Vibration Guide Values for Building Damage)

Effect Level	Assessment	Peak Component Particle Velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
No Observed Adverse Effect Level	Building Vibration Damage	<LOAEL	<LOAEL

Effect Level	Assessment	Peak Component Particle Velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
Lowest Observed Adverse Effect Level	Building Vibration Damage (Cosmetic)	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 50 Hz and above
Significant Observed Adverse Effect	Building Vibration Damage (Minor Structural)	30 mm/s at 4 Hz increasing to 40 mm/s at 15 Hz	40 mm/s at 15 Hz increasing to 100 mm/s at 50 Hz and above
Unacceptable Observed Adverse Effect	Building Vibration Damage (Major Structural)	60 mm/s at 4 Hz increasing to 80 mm/s at 15 Hz	80 mm/s at 15 Hz increasing to 200 mm/s at 50 Hz and above

Table 10.6 Vibration Level Criteria and Actions (Human Exposure)

Effect Level	Assessment	Location	
		Residential Buildings (16 hour DAY 07.00 – 23.00)	Residential Buildings (8 hour NIGHT 23.00 – 07.00)
No Observed Adverse Effect Level	Human Exposure to Vibration (Within Residential Buildings)	<LOAEL	<LOAEL
Lowest Observed Adverse Effect Level	Human Exposure to Vibration (Within Residential Buildings) (Low probability of Adverse Comment)	0.2 to 0.4 $ms^{-1.75}$	0.1 to 0.2 $ms^{-1.75}$
Significant Observed Adverse Effect	Human Exposure to Vibration (Within Residential Buildings) (Adverse Comment Possible)	0.4 to 0.8 $ms^{-1.75}$	0.2 to 0.4 $ms^{-1.75}$
Unacceptable Observed Adverse Effect	Human Exposure to Vibration (Within Residential Buildings) (Adverse Comment Probable)	0.8 to 1.6 $ms^{-1.75}$	0.8 $ms^{-1.75}$

Receptor Sensitivity

10.2.15 Key receptors to noise generally include individual or groups of residential properties, hospitals and schools. Table 10.7 provides examples of the difference sensitivities which can be assigned to different receptors according to WYG's assessment methodology

Table 10.7 Methodology for Assessing Sensitivity of Noise and Vibration

Sensitivity	Example of Receptor
High	Residential properties (Permanent tenants) and schools and hospitals CPRE rated tranquillity (Zones 8 - 10)
Medium	Transient residential receptors such as users of hotels* CPRE rated tranquillity (Zones 4 – 7)
Low	Commercial premises CPRE rated tranquillity (Zones 1 - 3)

*Financially involved properties are considered as medium sensitivity receptors

Effect Magnitude

10.2.16 Guidance with regard to assessing the magnitude of noise effect is available within the Guidelines for Environmental Noise Impact Assessment, published by IEMA in 2014. The guidance indicates broad parameters with respect to categorising the significance of the basic noise change. For the purpose of this ES, the categories outlined in Table 10.8 below form a basis to present the impact magnitude.

Table 10.8 Method for Assessing the Magnitude of the Impact

Impact Classification	Assessed Effect Level
Negligible	No Observed Adverse Effect Level
Minor	Lowest Observed Adverse Effect Level
Moderate	Significant Observed Adverse Effect Level
Major	Unacceptable Observed Adverse Effect Level

Effect Significance

10.2.17 The level of significance of each effect is determined by combining the impact risk with the sensitivity of the receptor. Table 10.9 shows how the interaction of magnitude and sensitivity can be combined to determine the significance of an environmental effect.

10.2.18 If an impact magnitude is negative, then the resulting effect is described as being adverse; if an impact magnitude is positive the resulting effect is classed as being beneficial.

Table 10.9 Significance of Effects Matrix

		Sensitivity of Receptor			
		High	Medium	Low	Negligible
Magnitude/Scale of Change	Major	Major	Major-Moderate	Moderate	Minor
	Moderate	Major-Moderate	Moderate	Minor	Neutral
	Minor	Moderate	Minor	Neutral	Neutral
	Negligible	Minor	Neutral	Neutral	Neutral

10.2.19 For the purposes of this EIA, an Operational effect identified as being of Moderate significance or greater is considered to be significant in EIA terms. This equates to an increase in noise level of 5 dB(A) at residential receptor locations as a result of the proposals. A Construction effect identified as being of Major-Moderate significance equates to a noise level above 70 dB(A) at existing residential receptor locations as a result of the proposals. The assessment follows this approach.

Limitations of the Assessment

10.2.20 There is no fixed layout associated with the development as of the date of this assessment. Therefore, the all assessments were undertaken using an indicative layout plan (see drawing ref: 01050_PP02_Land Use Plan_D3).

10.2.21 The study area of the traffic assessment was defined by the road traffic data received from iTransport LLP. Road traffic flows were not provided for Cole Street Lane located to the south of the proposed development site and therefore this road and the existing properties along it, do not form part of the road traffic assessment.

10.3 Baseline Environment

Existing baseline

10.3.1 Full details of the noise baseline monitoring survey including grid references to monitoring locations and meteorological conditions are provided in Appendix 10.1.

10.3.2 A baseline monitoring survey was undertaken at 13 locations as showing in Section 4.0 of Appendix 10.1, from Thursday 24th November 2016 to Thursday 1st December 2016. Attended short-term measurements undertaken at 13 locations during the day, evening and night-time with 5 additional locations being measured unattended over a 160-hour period.

10.3.3 Existing ambient noise levels around the site are dominated by road traffic noise from the B3081 and B3092, with occasional additional contributions also noted from the nearby railway.

10.3.4 Vibration levels of the existing B3081 were measured in the bus lay-by opposite the proposed development site.

Sensitive Receptors

10.3.5 A number of existing key receptors have been selected to enable an assessment to be undertaken of the potential noise effect of the proposed development

10.3.6 For this assessment, all receptors are classed as being of **high** sensitivity.

10.3.7 Table 10.10 below summarises the closest of the existing sensitive receptor locations. These receptors have been selected to represent the worst-case residential receptors with respect to changes in road traffic noise. Full details of the traffic assessment in context of all assessed receptors is given in the noise technical report (Appendix 10.1)

Table 10.10 Sensitive Receptor Locations (Traffic & Construction Noise Assessment)

Ref.	Description	Closest Source	Approximate Distance To Source (m)	Height (m)
Traffic Noise Assessment				
T01	Lien Seng, Madjeston	B3092	20.0	1.5/4.0
T02	Madjeston House, Majeston	B3092	16.0	1.5/4.0
T03	11 Meadowcroft, New Road	B3092	13.0	1.5/4.0
T04	4 Shaftesbury View, New Road	B3092	5.0	1.5/4.0
T05	The Old Manse, New Road	B3081	12.0	1.5/4.0
T06	Keston, Newbury	B3081	10.0	1.5/4.0
T07	53 Church View	B3081	26.5	1.5/4.0
T08	2 Wyke Street	Wyke Street	8.2	1.5/4.0
T09	The Clough, Wyke Road	Wyke Road	10.5	1.5/4.0
T10	5 St. Marys Court, St. Marys Place	B3081	10.0	1.5/4.0
T11	4 Octave Terrace, Queen Street	B3081	21.9	1.5/4.0
T12	4 Harwood Cottages, Newbury	Newbury	8.2	1.5/4.0
T13	Mountain Ash, Lodden	Shaftesbury Road	10.0	1.5/4.0
T14	2 Ham Court, Shaftesbury Road	Shaftesbury Road	14.6	1.5/4.0
T15	Stonecroft, Shaftesbury Road	Shaftesbury Road	9.6	1.5/4.0
T16	1 Ham Cottages, Shaftesbury Road	Shaftesbury Road	8.4	1.5/4.0
T17	Park Cottage Shaftesbury Road	Shaftesbury Road	7.7	1.5/4.0
T18	Ham Cottage, Cole Street Lane	Shaftesbury Road	9.2	1.5/4.0
Construction Noise Assessment				
C01	Dairy House, Cole Street Lane	South West of Site	108.0	1.5
C02	St. Mary the Virgin C.E Primary School, Pheasant Way	North of Site	75.0	1.5
C03	6 Pheasant Way	North of Site	170.0	1.5
C04	4 Woodpecker Meadow	North of Site	246.0	1.5
C05	Copper Coin, Shaftesbury Road	North of Site	372.0	1.5
C06	Lockwood Farm, Shaftesbury Road	West of Site	161.0	1.5
C07	2 Higher Ham House, Shaftesbury Road	West of Site	116.0	1.5
C08	Foyers Lodge, Shaftesbury Road	West of Site	102.0	1.5
C09	Schiehallion, Cole Street Lane	South of Site	160.0	1.5
C10	Meadow Brook Farm, Cole Street Lane	South of Site	55.0	1.5
C11	Duckpond, Cole Street Farm, Cole Street Lane	South of Site	52.0	1.5

Future baseline

10.3.8 It is considered that the future baseline at the identified receptors will be broadly similar to the existing baseline given their locality to the local road network. An assessment has been made of the change in road traffic noise during the 2021 opening year (DMOY) and the 2031 future assessment year (DSDY) at identified sensitive receptors in Table 10.10.

10.4 Mitigation within the Submitted Design

10.4.1 Based on an indicative layout as used in the Noise Technical Report (Appendix 10.1) a glazing and ventilation strategy gives detail of likely requirements for facades facing existing noise sources (such as the B3081, B3092, Cole Street Lane or the new Principle Road through the site). Once finalised building locations have been decided within each of the zones this can be confirmed.

10.4.2 For the opening year scenario, the road traffic assessment incorporates an option with a sustainable travel plan and without, the results of this are detailed in the section below.

10.5 Likely Significant Environmental Effects of the Scheme

Construction Phase Effects

10.5.1 Due to the nature of the development and the distance from existing buildings, vibration effects from construction of the site are unlikely to have an adverse impact. Therefore construction vibration is not considered further in this assessment.

10.5.2 Noise levels from potential construction activity associated with the development of the Site have been assessed in accordance with BS 5228-1+ A1 2014 criteria which indicate if a significant effect is likely to occur at noise sensitive properties. Point sources representing all likely items of plant have been represented in the model and in the case of mobile plant these have been placed in worst case locations with respect to nearby noise sensitive receptors. Table 10.11 shows predicted levels of construction noise at existing and proposed receptors for comparison with the recommended fixed noise limit criteria of 70dB(A), i.e. Significant Observed Adverse Effect level (as defined in Table 10.3).

Table 10.11 Construction Phase Noise Assessment Results (Fixed Limits Method) Existing Receptors

Ref	Construction Noise Level (dB(A))	Criteria (dB(A))	Within Recommended fixed noise limit
C01	44.7	70.0	Yes
C02	40.4	70.0	Yes
C03	34.9	70.0	Yes
C04	32.4	70.0	Yes
C05	27.0	70.0	Yes
C06	28.6	70.0	Yes
C07	39.6	70.0	Yes
C08	42.6	70.0	Yes
C09	39.9	70.0	Yes
C10	48.1	70.0	Yes
C11	44.9	70.0	Yes

10.5.3 The results show the predicted construction noise levels at all receptors are within the 70 dB(A) noise level limit. None of the assessed receptors will therefore exceed NOEAL (defined in Table 10.3). The magnitude of impact is assessed as **Negligible**, and the sensitivity of the receptors have been assessed as high, therefore the effect will be **Minor Adverse** and therefore **Not Significant**.

10.5.4 Construction works may be subject to control by suitably worded planning conditions. Given the absence of detailed information at this outline stage in relation to construction methods and programmes, it is recommended that 'Best Practicable Means' should be employed to minimise any effects. A summary of the measures are given below, however this should not be regarded as an exhaustive list.

- When phasing of the works is known, detailed construction noise assessment to be undertaken to identify potential effects during the construction of the Proposed Development at receptors. If required, specific viable mitigation measures such as the positioning of hoarding to act as a noise barrier will then be developed,
- Where construction activities could give rise to significant levels of noise, noise levels should be monitored regularly by a suitably qualified person. The methodology of any surveys, as well as the requirement for any detailed noise level predictions prior to commencement, should be agreed with the Local Authority;
- Leaflet drops at all existing houses likely to be affected by noisy construction activities notifying them of works in advance and detailing the nature and their likely duration works;
- Careful selection of working methods and programme;
- Selection of quietest working equipment available (e.g. electric/battery powered equipment which is generally quieter than petrol/diesel powered equipment);
- Positioning equipment behind physical barriers, i.e. existing features, hoarding, etc., or provision of lined and sealed acoustic covers for equipment that could potentially contribute to a noise nuisance;
- Positioning of noise generating equipment, such as any blending plant in areas which minimise noise as far as practicable;
- Directing noise emissions away from plant including exhausts or engines away from sensitive locations;
- Ensuring that regularly maintained and appropriately silenced equipment is used;
- Shutting down equipment when not in use, i.e. maintain a 'no idling policy';
- Handling all materials in a manner which minimises noise;
- Switch all audible warning systems to the minimum setting required by the Health and Safety Executive;
- Restricting hours of site operation in agreement with the Local Authority. If there is the requirement to undertake work outside of the agreed hours, further consultation should be undertaken with the Local Authority;
- Employ best practices and follow guidance of British Standard 5228 – Parts 1 and 2.

Operational Phase Effects

Road Traffic Noise Assessment

10.5.5 In terms of road traffic noise, relatively sizeable changes in traffic levels are required to cause perceptible increases in noise levels. DMRB states that a change in noise level of 1 dB(A), which represents the lowest change perceptible to the human ear, would be produced by an increase in traffic flow of approximately 25%. This assumes that other factors remain broadly unchanged (i.e. average speed and % HGVs using the road).

10.5.6 Traffic data has been provided by iTransport LLP traffic consultants in 18hr Annual Average Weekday Traffic (AAWT) format for the years 2020. HGV percentages have also been provided. The 'with development' flows are presented as the 'Do Something' (DS) and the 'without development' flows presented as the 'Do Minimum' (DM).

10.5.7 The following scenarios have been assessed in the following combinations

10.5.8 Scenarios

- 2021 with committed development (DMOY)
- 2021 with committed development, plus development (no mitigation)
- 2021 with committed development, plus development and implementation of mitigation measures (DSOY)
- 2031 (DMDY)
- 2031 with local plan development, plus development and implementation of mitigation measures (DSDY)

10.5.9 Assessment Conditions

1. DMOY and DSOY (Short Term Noise Change) – No Mitigation
2. DMOY and DSOY (Short Term Noise Change) – With Mitigation
3. DMOY and DSDY (Long Term Noise Change)
4. DMOY and DMDY (Without Scheme Change)

10.5.10 The noise modelling undertaken to assess the effect of changes in traffic has been undertaken using the Cadna-A software in accordance with the guidance provided with CTRN. A summary of the findings and associated effects of the proposals in EIA terms is presented below.

10.5.11 The traffic assessment presented below incorporates cumulative impacts from the committed developments which are outlined in Chapter 2 of this ES.

10.5.12 Visual representations of the 2021 DMOY and 2031 DSDY noise contour plots are provided in the associated noise technical appendix.

Table 10.12 Change in Road Traffic Noise Assessment (DMOY and DSOY (No Mitigation))

Location	Traffic Noise Without Development 2020 ($L_{A10,18hr}$ dB(A))	Traffic Noise With Development 2031 ($L_{A10,18hr}$ dB(A))	Difference
T01	62.9	63.4	0.5
T02	61.7	62.2	0.5
T03	64.9	65.2	0.3
T04	67.6	67.9	0.3
T05	67.0	67.0	0.0
T06	68.6	68.3	-0.3
T07	65.6	65.5	-0.1
T08	68.5	68.8	0.3
T09	67.3	67.6	0.3
T10	70.3	70.4	0.1
T11	65.8	65.9	0.1
T12	64.3	64.2	-0.1
T13	69.1	68.8	-0.3
T14	67.6	67.3	-0.3
T15	69.6	69.2	-0.4
T16	70.0	69.6	-0.4
T17	70.7	70.1	-0.6
T18	70.6	69.9	-0.7

10.5.13 Table 10.12 shows that traffic noise levels will increase at properties around the site by up to 0.3 dB and is classed as have a **Negligible** magnitude and it is considered that the overall effect will be **Minor Adverse** and therefore **Not Significant.**

Table 10.13 Change in Road Traffic Noise Assessment Condition 2 (DMOY and DSOY (with Mitigation))

Location	Traffic Noise Without Development 2020 ($L_{A10,18hr}$ dB(A))	Traffic Noise With Development 2031 ($L_{A10,18hr}$ dB(A))	Difference
T01	62.9	63.2	0.3
T02	61.7	62.0	0.3
T03	64.9	65.1	0.2
T04	67.6	67.8	0.2
T05	67.0	67.3	0.3
T06	68.6	69.0	0.4
T07	65.6	65.6	0.0
T08	68.5	68.8	0.3
T09	67.3	67.6	0.3
T10	70.3	70.4	0.1
T11	65.8	65.9	0.1
T12	64.3	64.7	0.4
T13	69.1	69.4	0.3
T14	67.6	67.9	0.3
T15	69.6	69.9	0.3

Location	Traffic Noise Without Development 2020 ($L_{A10,18hr}$ dB(A))	Traffic Noise With Development 2031 ($L_{A10,18hr}$ dB(A))	Difference
T16	70.0	70.3	0.3
T17	70.7	71.5	0.8
T18	70.6	71.4	0.8

10.5.14 Table 10.13 shows that traffic noise levels will increase at properties around the site by up to 0.8 dB and is classed as have a **Negligible** magnitude and it is considered that the overall effect will be **Minor Adverse** and therefore **Not Significant**.

Table 10.14 Change in Road Traffic Noise Assessment Condition 3 (DMOY and DSDY)

Location	Traffic Noise Without Development 2020 ($L_{A10,18hr}$ dB(A))	Traffic Noise With Development 2031 ($L_{A10,18hr}$ dB(A))	Difference
T01	62.9	63.9	1.0
T02	61.7	62.7	1.0
T03	64.9	66.2	1.3
T04	67.6	69.0	1.4
T05	67.0	67.9	0.9
T06	68.6	69.1	0.5
T07	65.6	66.8	1.2
T08	68.5	69.2	0.7
T09	67.3	67.9	0.6
T10	70.3	71.1	0.8
T11	65.8	66.6	0.8
T12	64.3	63.5	-0.8
T13	69.1	69.6	0.5
T14	67.6	68.1	0.5
T15	69.6	70.1	0.5
T16	70.0	70.5	0.5
T17	70.7	72.1	1.4
T18	70.6	72.0	1.4

10.5.15 Table 10.14 shows that traffic noise levels will increase at properties around the site by up to 1.4 dB and is classed as have a **Negligible** magnitude and it is considered that the overall effect will be **Minor Adverse** and therefore **Not Significant**.

Table 10.15 Change in Road Traffic Noise Assessment Condition 4 (DMOY and DMDY)

Location	Traffic Noise Without Development 2020 ($L_{A10,18hr}$ dB(A))	Traffic Noise With Development 2031 ($L_{A10,18hr}$ dB(A))	Difference
T01	62.9	63.0	0.1
T02	61.7	61.8	0.1
T03	64.9	65.1	0.2
T04	67.6	67.8	0.2
T05	67.0	67.2	0.2
T06	68.6	68.7	0.1
T07	65.6	65.6	0.0
T08	68.5	68.7	0.2
T09	67.3	67.5	0.2
T10	70.3	70.5	0.2
T11	65.8	66.0	0.2
T12	64.3	64.5	0.2
T13	69.1	69.3	0.2
T14	67.6	67.8	0.2
T15	69.6	69.7	0.1
T16	70.0	70.1	0.1
T17	70.7	73.1	2.4
T18	70.6	73.0	2.4

10.5.16 Table 10.15 shows that traffic noise levels without the scheme will increase at properties around the site by up to 2.4 dB and is classed as have a **Negligible** magnitude and it is considered that the overall effect will be **Minor Adverse** and therefore **Not Significant**.

Operational Vibration Assessment

10.5.17 The results of the assessment for potential building damage show that the peak particle velocity (PPV) measured at a location representative of the worst-case (closest) distance to the properties proposed to be built as part of the Proposed Development was measured at 0.275 mm/s. This is a positive indication that there is unlikely to be any building damage associated with vibration from the adjacent road.

10.5.18 The results of the vibration assessment for human response show that the daytime eVDV calculated at a representative location of the worst-case (closest) distance to the properties proposed to be built as part of the Proposed Development was 0.012ms$^{-1.75}$ and night time eVDV calculated at the same location 0.008ms$^{-1.75}$. This indicates that there is a 'low probability of adverse comment' possible when compared to the BS 6472 criteria. However, it should be noted that no damping effects of the building and associated foundations/earthworks have been incorporated into these calculations, thus making them worst case.

10.5.19 Therefore, the vibration assessment considers the impact from existing sources of vibration within the Proposed Development site as having a **Minor Adverse** impact and as such considered to be **Not Significant** for both transient building damage and human exposure.

Tranquillity

10.5.20 An assessment of existing tranquillity level of the site has been base on the mapping data published by Campaign to Protect Rural England (CPRE). This uses a colour coded system and a 500m assessment grid

for the whole of England, and a tranquillity rating of between 1 and 10 is assigned (1 being least tranquil and 10 being most). By reference to these maps the scheme is assessed as falling into Zone 2-3

10.5.21 With regard to tranquillity, as the study area is of **low** sensitivity, the effect will be less than that in relation to the residential receptors assessed above. An assessment with respect to access to areas of great tranquillity value has been undertaken within the noise technical report which show that access to such areas will not be negatively affected by the development. As such the effect of the proposals will not be significant.

10.5.22 There are three public footpaths which cross through the site. The indicative plans show the current footpath routes are altered slightly, however they are still present along with additional new footpaths. Due to the multiple indicative footpath routes, the tranquillity value is not considered to be negatively affected by the scheme.

10.6 Additional Mitigation, Compensation and Enhancement Measures

10.6.1 Mitigation measures currently proposed to be considered within the finalised design of the Proposed Development have been detailed in Section 10.4 above. Until a finalised design, and therefore the potential impact of any change in noise levels is known (at this stage no significant effects are identified) then no additional measures above those previously detailed are required.

Construction Phase

10.6.2 No additional measures identified at this time.

Operational Phase

10.6.3 No additional measures identified at this time.

10.7 Assessment Summary and Likely Significant Residual Environmental Effects

Construction Phase

10.7.1 In terms of construction noise levels, the results of the assessment indicate that will be a **Minor Adverse** effect on the noise levels at existing receptors, as previously defined this is considered to be **Not Significant**

Operational Phase

10.7.2 In terms of Proposed Development generated road traffic noise from the operational phase of the development predicted impacts indicate a **Minor Adverse** change in noise levels at existing receptors. Therefore, the impact of the development is considered **Not Significant**.

10.7.3 As demonstrated within the Noise Technical Report (Appendix 10.1), with regard to proposed receptors, significant can be avoided through the use of good design principles and standard mitigation measures.

10.8 Cumulative Impacts

10.8.1 Within the assessments presented above, the effect of other consented developments such as Park Farm have been taken into account at the following development stages

Design

10.8.2 No cumulative impacts taken into account at this stage

Construction

10.8.3 No cumulative impacts taken into account at this stage; a further assessment of construction noise will be required once the phasing of the development is known.

Operation

10.8.4 The cumulative effects of other committed developments in the area have been taken into account within the data provided by iTransport LLP for the road traffic assessment. As such the road traffic assessment includes the effect on traffic across the Development Site. Additional details of the committed developments can be found within the transport assessment accompanying this Environmental Statement.

Table 6.16 Assessment Summary and Residual Environmental Effects (Noise and Vibration)

Summary description of the identified impact	Sensitivity of Receptor	Impact Magnitude	Significance and Nature of Effect	Additional Mitigation	Residual Impact Magnitude	Residual Significance and Nature of Effect	Confidence Level
Construction							
Construction Noise	High	Negligible	Minor Adverse Not Significant	Best Practice Measures as detailed in the CEMP	Negligible	Minor Adverse Not Significant	High
Operation							
Road Traffic Noise	High	Negligible	Minor Adverse Not Significant	None Required	Negligible	Minor Adverse Not Significant	High
Vibration (Building Damage)	High	Negligible	Minor Adverse Not Significant	None Required	Negligible	Minor Adverse Not Significant	High
Vibration (Human Exposure)	High	Negligible	Minor Adverse Not Significant	None Required	Negligible	Minor Adverse Not Significant	High

10.9 References

National Planning Policy Framework (NPPF) and Technical Guidance, March 2012

Noise Policy Statement for England (Department for the Environment, Food and Rural Affairs), May 2010.

Noise Assessment (2017)

National Planning Practice Guidance, March 2014

HMSO (2011), The Town and Country Planning (Environmental Impact Assessment) Regulations 2011

BS 4142 (2014) – 'Methods for rating and assessing industrial and commercial sound'

Table 3.2 of HD213/11 published in November 2011 (Design Manual for Roads and Bridges)

Guidelines for Environmental Noise Impact Assessment – IEMA (Institute of Environmental Management & Assessment) October 2014

10.10 Glossary

Term	Definition
CADNA	Computer Aided Noise Abatement
DMRB	Design Manual for Roads and Bridges
HGV	Heavy Goods Vehicle
LOAEL	Lowest Observed Adverse Effect Level
PPG	Planning Practice Guidance
SOAEL	Significant Observed Adverse Effect Level
UKAS	United Kingdom Accreditation Service