

SALDEN CHASE  
OUTLINE PLANNING APPLICATION

# Chapter 12: Noise

## 12.0 NOISE AND VIBRATION

### Introduction

12.01 This chapter assesses the potential impact of noise on nearby existing sensitive receptors that may be affected by the proposed development. It also assesses the potential impact of transportation noise on future residents of the proposed development.

12.02 Noise impacts have been assessed using measured existing levels (where appropriate), and prediction of future levels (using accepted calculation procedures) by comparison with accepted guideline values.

12.03 This chapter has been prepared by Peter Brett Associates LLP (PBA).

### Scope

12.04 The following potential noise and vibration impacts have been identified:

- the impact of noise from earthworks and construction of the built development, on existing residential properties;
- the impact of additional noise from traffic generated by the development on the existing road network on existing residential properties;
- the impact of noise from the increased traffic flows along the existing road network, new internal links and the proposed east-west railway line on future residents of the proposed development; and
- the impact of groundborne vibration generated by potential rolling-stock using the nearby railway line on proposed dwellings close to this railway.

## Planning Policy Guidance

National Planning Policy and British Standards

### Planning Policy Guidance 24

12.05 Planning Policy Guidance PPG24: “Planning and Noise” sets out the Government’s policy and gives advice to local authorities in England on the use of their planning powers to minimise the adverse impact of noise. The main guidance contained within the document is outlined below:

- it outlines the considerations to be taken into account in determining planning applications both for noise sensitive developments and for those activities that will generate noise;
- it introduces the concept of Noise Exposure Categories (NECs) for residential development, encourages their use and recommends appropriate levels for different sources of noise; and
- it advises on the use of conditions to minimise the impact of noise.
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12.06 The NEC noise levels and advice are given in Tables 12.1 and 12.2.

Noise Level Corresponding to the Noise Exposure Categories for New Dwellings $L_{Aeq,T}$ (dB)				
Noise Exposure Category				
Road Traffic	A	B	C	D
07:00-23:00	<55	55-63	63-72	>72
23:00-07:00 <sup>1</sup>	<45	45-57	57-66	>66
Rail Traffic	A	B	C	D
07:00-23:00	<55	55-66	66-74	>74
23:00-07:00 <sup>1</sup>	<45	45-59	59-66	>66
Mixed Sources	A	B	C	D
07:00-23:00	<55	55-63	63-72	>72
23:00-07:00 <sup>1</sup>	<45	45-57	57-66	>66

Night-time noise levels (23:00 – 07:00): sites where individual noise events regularly exceed 82 dB  $L_{Amax}$  (S time weighting) several times in any hour should be treated as being in NEC C, regardless of the  $L_{Aeq,8hr}$  (except where the  $L_{Aeq,8hr}$  already puts the site in NEC D)

**Table 12.1: Noise Exposure Category Levels**

NEC	Advice
A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level.
B	Noise should be taken into account when determining planning applications and, where appropriate conditions imposed to ensure an adequate level of protection against noise.
C	Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Planning permission should normally be refused.

**Table 12.2: Noise Exposure Category Advice**

12.07 Annex 6 of PPG 24 advises that for non-residential noise sensitive developments the internal levels should be determined according to their use, having regard to the general guidance in BS 8233:1987.

BS 8233: 1999 “Sound Insulation and Noise Reduction for Buildings – Code of Practice”

12.08 BS 8233:1987 has been superseded by BS 8233:1999 “*Sound Insulation and Noise Reduction for Buildings – Code of Practice*”. This sets out the recommended internal ambient noise levels. These are presented in Table 12.3.

Criterion	Typical Situations	Design Range $L_{Aeq,T}$ dB	
		Good	Reasonable
Reasonable	Living rooms	30	40

Resting / Sleeping Conditions	Bedrooms <sup>1</sup>	30	35
Reasonable conditions for study and work requiring concentration	Cellular office	40	50
	Meeting room, executive office	35	40
<b>Reasonable Acoustic Privacy in Shared Spaces</b>	Open Plan Office	45-50	
<sup>1</sup> For a reasonable standard in bedrooms at night, individual noise events (measured with F time-weighting) should not normally exceed 45 dB L <sub>Amax</sub>			

**Table 12.3: BS 8233: 1999 Recommended Internal Ambient Noise Levels**

BS 4142:1997 “Method for Rating Industrial Noise Affecting Mixed Industrial and Residential Areas”

12.09 For the assessment of industrial noise, PPG24 refers to the use of BS 4142:1990, which has been superseded by BS 4142:1997 “*Method For Rating Industrial Noise Affecting Mixed Industrial and Residential Areas*”. This sets out a method for determining the level of noise of an industrial nature, together with procedures for assessing whether the noise is likely to give rise to complaints from people living nearby.

12.10 The method subtracts the background level ( $L_{A90,T}$ ) from the “rating level”, ( $L_{Ar,Tr}$ ) which is calculated by adjusting the noise source for a character correction if appropriate. Table 12.4 presents the standard’s assessment levels in relation to the likelihood of complaints.

$L_{Ar,Tr} - L_{A90,T}$ (dB)	Advice
+ 10	Complaints likely
+ 5	Marginal significance
- 10	Complaints unlikely

**Table 12.4: BS 4142 Assessment for the likelihood of Complaints**

12.11 The rating method in BS 4142 indicates that the higher the result of  $L_{Ar,Tr} - L_{A90,T}$  calculation, the greater the likelihood of complaints.

#### Calculation of Road Traffic Noise, 1988

12.12 For the assessment of noise levels from road traffic, PPG24 refers to the "Calculation of Road Traffic Noise" (CRTN). CRTN is a memorandum that describes the procedure for calculating noise from road traffic. The methodology has been used in this chapter to determine the alteration in the noise levels from road traffic resulting from additional vehicles accessing the development.

Building Bulletin 93: Acoustic Design of Schools

12.13 Within Section 2.2 of BB93 it gives an upper  $L_{Aeq, 30min}$  limit of 60 dB for external noise at the boundary of external premises used for formal and informal outdoor teaching and recreational areas. BB93 also says that noise levels in unoccupied playgrounds, playing fields and other outdoor areas should not exceed 55 dB  $L_{Aeq, 30min}$  and that there should be one area suitable for outdoor teaching activities with a  $L_{Aeq, 30min}$  limit of 50 dB for example, for teaching sport on playing fields.

BS 5228:2009 Part 1 “Code of Practice for Noise and Vibration Control On Construction and Open Sites – Noise”

12.14 BS 5228:2009 “Code of Practice for Noise and Vibration Control On Construction and Open Sites” provides recommendations for methods of noise and vibration control relating to construction and open sites where work activities/operations generate significant noise and/or vibration levels.

12.15 The 2009 Code of Practice provides new advice on the significance of construction noise in Annex E. Although Annex E is an Informative it provides useful guidance on the significance of noise effects and examples of thresholds of significant effects at dwellings. Table 12.5 is a replication of Table E.1. To use the table the ambient noise levels are rounded to the nearest 5 dB. The threshold value is then determined through the guidance provided below:

- Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than the values in Category A;
- Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are equal to the noise levels in Category A; and

- Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than the noise levels in Category A.

Assessment Category and threshold period ( $L_{Aeq,T}$ )	Threshold Value (dB)		
	Category A	Category B	Category C
Night time (23:00 - 07:00 hrs)	45	50	55
Evenings and weekends (19:00 – 23:00 hrs weekdays, 13:00 – 23:00 hrs Saturdays, 07:00 – 23:00 hrs Sundays)	55	60	65
Daytime (07:00 – 19:00 hrs weekdays and 07:00 – 13:00 hrs Saturdays)	65	70	75

**Table 12.5: BS 5228 Example Threshold of Significance Effect at Dwellings**

Method for Converting the UK Road Traffic Noise Index  $L_{A10,18h}$  to the EU Noise Indices for Road Noise Mapping 2006

12.16 The Defra, TRL and Casella Stanger “*Method for Converting the UK Road Traffic Noise Index  $L_{A10,18h}$  to the EU Noise Indices for Road Noise Mapping*” guidance describes a method for converting the CRTN predictions, provided in  $L_{A10,18hr}$  to  $L_{Aeq,16hr}$ , to allow presentation of data in PPG 24 NECs.

#### Calculation of Railway Noise 1995

12.17 “*Calculation of Railway Noise*” (CRN) is a Department of Transport (DoT) memorandum that describes the procedure for calculating the noise from moving railway vehicles at a given location. CRN calculates the noise level at a receiver using either the measured or predicted Sound Exposure Level (SEL or  $L_{AE}$ ). The SEL contains the same amount of sound energy as an event, such as a train pass-by, in one second compared with the total event time.

#### BS 6472:2008 Part 1 “Guide to Evaluation of Human Exposure to Vibration in Buildings. Vibration Sources Other than Blasting”

12.18 BS 6472:Part 1:2008 “*Guide To Evaluation Of Human Exposure To Vibration In Buildings. Vibration Sources Other than Blasting*” is used to assess vibration levels experienced by people in buildings from a human comfort perspective.

12.19 Human exposure to vibration in buildings can be assessed in terms of Vibration Dose Value (VDV), velocity or weighted RMS acceleration. BS 6472:Part 1 indicates that VDVs can be used to assess the human exposure to vibration when the vibrations are of impulsive or intermittent type and can be used to assess vibration in both magnitude and duration.

12.20 BS 6472:Part 1 outlines recommended VDV criteria for daytime (07:00-23:00hrs) and night-time (23:00-07:00hrs) for residential properties. The criteria are presented in Table 12.6 below.

**Table 12.6: Daytime and Night-time VDV Criteria for Residential Properties**

<b>Place and time</b>	<b>Low probability of adverse comment <math>ms^{-1.75}</math> <sup>(9)</sup></b>	<b>Adverse comment possible <math>ms^{-1.75}</math></b>	<b>Adverse comment probable <math>ms^{-1.75}</math> <sup>(10)</sup></b>
Residential buildings <sup>11</sup> 16hr day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8hr night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

BS 7445:2003 Part 1

12.21 BS 7445-1 describes methods and procedures for measuring noise from all sources which contribute to the total noise climate of a community environment, individually and in combination. The results are expressed as equivalent continuous A-weighted sound pressure levels,  $L_{Aeq,T}$ .

12.22 BS 7445-1 states that sound level meters that are used should conform to Type 1 (or Type 2 as a minimum) as described in BS EN 61672 and should be calibrated according to the instructions of the manufacturer and field calibration should be undertaken at least before and after each series of measurements.

<sup>9</sup> Below these ranges adverse comment is not expected

<sup>10</sup> Above these ranges adverse comment is very likely

<sup>11</sup> For offices and workshops, multiply by factors of 2 and 4 respectively for a 16 hr day

### **Local Planning Policy**

12.23 Page 88 of the 'Aylesbury Vale District Local Plan' states that: "PPG24: Planning & Noise provides detailed guidance on the subject of noise impact on various use types".

12.24 Jane Heywood, District Environmental Health Officer of Aylesbury Vale District Council, approved the noise assessment methodology in an email dated 18<sup>th</sup> September 2006. Jane Heywood re-confirmed acceptance of the methodology in a telephone conversation on 22<sup>nd</sup> June 2009.

12.25 In a telephone conversation on 3<sup>rd</sup> October 2008 Sean Dunn advised of the BS 4142 criteria adopted by AVDC.

### **Methodology**

#### Introduction

12.26 The assessment of the noise impacts associated with the proposed development are divided into three key areas:

- the suitability of the current noise climate for the proposed development,
- noise effects during the demolition and construction phase at existing sensitive receptors; and
- noise effects during the operational phase at existing and proposed sensitive receptors.

### Baseline Data Collection

#### 2006 Baseline Noise Survey

12.27 A baseline noise survey was performed on 5<sup>th</sup> and 6<sup>th</sup> June 2006. The survey consisted of three 15-minute daytime measurements at the locations shown in Figure 12.1 between (10:02 – 14:00). Table 12.7 details the measurement locations.

Measurement Location	Description
1	15m south of the A421, approximately 180m to the south west of the roundabout junction with B4034 Buckingham Road
2	10m west of Whaddon Road, approximately 650m to the south of the A421
3	20m east of Whaddon Road, approximately 70m north of the railway line

**Table 12.7: Details of the Measurement Locations for June 2006 Survey**

12.28 The surveying was carried out in general accordance with BS 7445: Part 1:2003 'Description and Measurement of Environmental Noise, Guide to Quantities and Procedures'.

12.29 Two 5-minute measurements were also taken at each of the three locations between 23:00hrs to 00:11hrs and 05:55 to 07:00.

12.30 On-site calibration checks were made before and after the measurements with no significant drift recorded.

12.35 The measurements close to Whaddon Road were taken at a distance of 8m from the nearest carriageway.

12.36 On-site calibration checks were made before and after the measurements with no significant drift recorded.

12.37 Weather conditions were dry and warm with negligible wind and temperatures of approximately 30°C.

12.38 Table 12.9 details the instrumentation used to undertake the noise measurements.

Item	Type	Manufacturer	Serial Number	Laboratory Calibration Date
<b>A421 Measurement</b>				
<b>B&amp;K Sound Calibrator</b>	4231	Brüel & Kjær	2619374	28-Jan-09
<b>Hand-Held Analyzer</b>	2238	Brüel & Kjær	2626232	28-Feb-09
<b>1/2" Microphone</b>	4188	Brüel & Kjær	2621211	28-Feb-09
<b>Whaddon Road Measurement</b>				
<b>B&amp;K Sound Calibrator</b>	4231	Brüel & Kjær	2619374	28-Jan-09
<b>Hand-Held Analyzer</b>	2238	Brüel & Kjær	2626233	25-Feb-09
<b>1/2" Microphone</b>	4188	Brüel & Kjær	2621212	25-Feb-09

**Table 12.9: Instrumentation Used During the 2009 Survey**

2006 Baseline Vibration

12.39 The railway line situated to the south of the Environmental Impact Assessment Study Area is not currently in use and there are no nearby sources of vibration; therefore a vibration survey was not considered appropriate.

Noise Model

12.40 A baseline situation in 2008 has been modelled using the existing road layout and the SoundPLAN v 6.5 software.

12.41 In addition, the future year 2026 has been modelled for the without and with development situations.

12.42 The “2026 without development” model has been based on the existing road layout without the development while the “2026 with development” model is based on the road changes with the proposed development including internal spine roads within the Environmental Impact Assessment Study Area.

Significance Criteria

12.43 The significance of an effect is determined by the sensitivity of the receptor and the magnitude of the effect.

12.44 Tables 12.10 – 12.12 below illustrates how the sensitivity of the receptor and the magnitude of the effect determines the significance level.

12.45 The significance criteria have regard to the definitions of significance given in the earlier chapters.

Sensitivity:

<b>Sensitivity</b>	<b>Description</b> <sup>12, 13</sup>
<b>Very High</b>	Internationally or nationally protected endangered species which is also known to be noise sensitive (i.e noise may change breeding habits or threaten species in some other way)
<b>High</b>	Dwellings, Habitats supporting locally important wildlife communities that are sensitive to noise
<b>Medium</b>	Schools, hospitals, quiet recreation areas
<b>Low</b>	Offices, cafes/bars with external areas
<b>Non Sensitive</b>	Industrial, retail

**Table 12.10: Sensitivity of Receptors**

Magnitude:

<b>Magnitude</b>	<b>dB change compared with baseline or guideline level</b>	<b>Description</b> <sup>14, 15</sup>
<b>Low</b>	<3dB	Not perceptible to human ear within margins of error of

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<sup>12</sup> PPG 24 paragraph 20

<sup>13</sup> WHO Guidelines for Community Noise

<sup>14</sup> References to industrial noise based on BS4142:1997

<sup>15</sup> Perception descriptors from PPG24:Planning and Noise 1994 (Glossary)

12.31 Weather conditions were dry and warm with negligible wind and temperatures well above 3°C.

12.32 Table 12.8 details the instrumentation used to undertake the noise measurements.

Item	Type	Manufacturer	Serial Number
B&K Sound Calibrator	4231	Brüel & Kjær	2389171
Hand-Held Analyzer	2238	Brüel & Kjær	239484
½ " Microphone	4188	Brüel & Kjær	2379694

**Table 12.8: Instrumentation Used During the Baseline Noise Survey**

2009 Road Traffic Noise Survey

12.33 A second noise survey was performed on 1<sup>st</sup> July 2009, adjacent the A421 and Whaddon Road and are labelled as A and B respectively on Figure 12.1.

12.34 A 3-hour consecutive measurement was taken in each location between 12:22hrs and 15:22hrs adjacent the A421 and between 12:39hrs and 15:39hrs adjacent Whaddon Road. The shortened Calculation of Road Traffic Noise (CRTN) procedure has been used. The measurement was undertaken approximately 30m from the nearside carriageway of the A421. CTRN recommends that the measurement be taken within 4-15m of the nearest carriageway, but this was not possible due to existing heavy vegetation and brambles – which it is proposed to retain.

		measurement.
<b>Medium</b>	3 - 5.9 dB	Perceptible but less than a doubling/halving of sound energy.
<b>High</b>	6 - 9.9 dB	Up to a doubling/halving of loudness.
<b>Very High</b>	>10dB	Over a doubling of loudness.

**Table 12.11: Magnitude of Receptors**

Sensitivity/Magnitude Matrix:

		<b>Sensitivity</b>				
		Non sensitive	Low	Medium	High	Very High
<b>Magnitude</b>	Low	Not significant	Not significant	Not significant	Not significant	Minor
	Medium	Not significant	Minor	Minor	Minor	Moderate
	High	Minor	Minor	Moderate	Moderate	Major
	V high	Moderate	Moderate	Moderate	Major	Severe

1.2 **Table 12.12: Sensitivity/Magnitude Matrix**

12.46 An increase in noise level is described as 'adverse' and a decrease in noise level as 'beneficial'.

## Baseline Conditions

### Noise Climate

- 12.47 The dominant source of noise in the Environmental Impact Assessment Study Area is road traffic noise from the A421 dual carriageway. To the south and west of the area, Whaddon Road also contributes to the ambient noise levels. Noise from overhead aircraft and birdsong was also audible during the survey.
- 12.48 The disused East West Rail line lies directly to the south of the Environmental Impact Assessment Study Area. Although this railway line is currently unused, there are proposals to reopen it between 2012 and 2015. The predicted movements along the railway line have been included in the noise model 2026 Do Something.

### 2006 Noise Survey

- 12.49 A summary of the statistical noise parameters acquired, and considered to be the most relevant in the context of planning and noise:  $L_{Aeq,15min}$ ,  $L_{A10,15min}$  and  $L_{A90,15min}$  are presented in Table 12.13.
- 12.50 The arithmetic average of the  $L_{Aeq}$  and  $L_{A10}$  values have been calculated for each measurement position. The maximum noise level,  $L_{AFmax}$  has been presented along with the lowest measured background noise level,  $L_{A90}$ .

Location	L <sub>Aeq,T</sub> (dB)	L <sub>AFmax,T</sub> (dB)	L <sub>A10,T</sub> (dB)	L <sub>A90,T</sub> (dB)
<b>Daytime</b>				
1	61.6	77.8	65.2	49.0
2	54.5	70.8	58.5	37.0
3	51.1	74.5	55.0	33.0
<b>Night time</b>				
1	60.3	74.0	64.1	46.0
2	50.5	69.0	53.3	32.0
3	45.8	68.7	45.0	29.0

**Table 12.13: 2006 Noise Survey Measurements – Daytime and Night-time**

12.51 A summary of the NEC of each location is presented in Table 7.14 and 7.15.

Location	Period	L <sub>Aeq,T</sub> (dB)	NEC
1	Day	61.6	B
2	Day	54.5	A
3	Day	51.1	A

**Table 12.14: Daytime Noise Exposure Category of Each Measurement Location**

Location	Period	L <sub>Aeq,T</sub> (dB)	NEC
1	Night	60.3	C
2	Night	50.5	B
3	Night	45.8	B

**Table 12.15: Night-time Noise Exposure Category of Each Measurement Location**

#### 2009 Noise Survey

12.52 The results of the two CRTN measurements undertaken on 1<sup>st</sup> July 2009 are provided in Table 12.16.

Location	L <sub>A10, 3h</sub> (dB)	L <sub>A10, 18h</sub> (dB)	L <sub>Aeq, 16h</sub> (dB)	NEC
A421	60.9	59.9	57.8	B
Whaddon Rd	65.3	64.3	61.9	B

**Table 12.16: Results of the 2009 Noise Survey Measurements**

12.53 The  $L_{Aeq,16h}$  has been calculated according to the Defra “Method for Converting the UK Road Traffic Noise Index  $L_{A10,18h}$  to the EU Noise Indices for Road Noise Mapping”. The A421 measurement was taken approximately 28m from the carriageway and the Whaddon Road measurement was taken approximately 8m from the roadside.

#### **Likely Significant Effects - Construction**

12.54 Construction noise can be of concern to occupants of buildings and dwellings. Sources of noise include demolition activities, piling, and general construction activities and equipment. BS 5228 addresses the best practice means of controlling construction noise. Calculations of construction noise can be made when the detailed construction programme is known and it is therefore recommended that hours of operation, noise limits and mitigation methods are addressed in a Construction Environmental Management Plan (CEMP) for each phase when more details are available.

12.55 Construction noise is assessed differently to noise from permanent installations as it is recognised that construction works are of temporary to short-term duration.

12.56 BS 5228:2009 Annex E (Informative) provides useful guidance for the limit of construction noise. The current ambient noise level of the development area along with the construction noise threshold value are summarised in Table 12.17 below.

#### **Table 12.17: Thresholds of significant effect at dwellings**

Measurement Location	Ambient noise level (to the nearest 5 (dB))	Construction noise threshold at noise sensitive receptors (dB)
<b>Daytime</b>		
1	60	65
2	55	65
3	50	65
<b>Night time</b>		
1	60	55
2	50	55
3	45	50

### Construction Noise Receptors

12.57 Receptors within the development site and those bordering the site identified below in Table 12.18 may be affected by noise and as the development progresses, any newly occupied residential dwellings will become noise sensitive receptors to further construction work. The CEMP for each phase should therefore consider how to mitigate the levels in the relevant area in line with the recommendations of BS 5228 and Table 12.17 above.

Potential Construction Noise Receptors Inside of Environmental Impact Assessment Study Area	Potential Construction Noise Receptors outside of Environmental Impact Assessment Study Area
<b>The Leys,</b>	<b>Lower Salden Farm,</b>
<b>Bletchley Leys Farm</b>	<b>Chase Farm,</b>
	<b>Crabtree Farm,</b>
	<b>Woodpond Farm (north of the A421 carriageway),</b>
	<b>Stearthill House (west of Whaddon Road);</b>
	<b>Manor Farm (south-west of the Environmental Impact Assessment Study Area, on Whaddon Road)</b>
	<b>properties directly adjacent the eastern boundary of the Environmental Impact Assessment Study Area</b>

**Table 12.18: Potential Construction Noise Receptors**

### Construction Works

12.58 The construction programme will not be confirmed until the detailed stage of the application. However, the potential sources of noise are anticipated to include:

- earthworks including stripping and relaying topsoil; excavation and digging foundations; and landscaping;

- operation of heavy plant machinery;
- piling for large structures;
- the construction of internal roads;
- material handling including storage of material in stockpiles;
- movement of vehicles to and from, and within the site; and
- construction of buildings.

12.59 BS 5228 Part 1 provides general best practice guidance to minimise construction noise levels; these are considered in more detail in the mitigation section of this chapter.

#### Construction Traffic

12.60 The impact of noise from construction traffic associated with the development will be assessed upon receipt of relevant details at the detailed application stage.

#### Construction Vibration Assessment

12.61 Groundborne vibration is often a cause for concern for occupants of buildings, particularly in relation to demolition and construction. Sources of vibration may include some demolition activities such as breaking concrete and piling activities if these are necessary. Any construction phases that include driven piling should be considered to be the most likely to produce perceptible levels of vibration and therefore the most likely to cause concern to nearby residents.

12.62 Vibration transmitted from construction activities through the ground to the receiver cannot be reliably calculated. Many factors such as rock/soil type, water content, solid damping, etc, greatly influence the way in which vibration travels through the ground. Therefore, monitoring of vibration levels as a result of construction / demolition will be considered in the CEMP for each phase for periods where piling is necessary.

#### **Likely Significant Effects - Vibration**

12.63 The railway to the south of the Environmental Impact Assessment Study Area which could be re-opened before occupation of the site would be a potential source of vibration. However, as the timetable for the use of the line and its funding have yet to be secured it will be up to the potential operator to take into account, in accordance with BS 6472:2008, the likelihood of adverse comment from occupants not only within Salden Chase but also within Far Bletchley.

#### **Likely Significant Effects – Operational Noise**

##### Existing Conditions

12.64 The baseline noise survey demonstrates that the majority of the measurement locations currently fall within NEC A for the daytime and B for the night time. However, these measurements were taken close to the main transport sources, ie A421 and Whaddon Road, and are just a small sample of the noise climate. A baseline model was therefore constructed for 2008 providing noise contours across the Environmental Impact Assessment Study Area and is presented in Figures 12.2 and 12.3.

12.65 Figure 12.2 presents the daytime noise contours in the Noise Exposure Categories (NECs) and Figure 12.3 presents the night-time contours. It can be seen that for the baseline situation the majority of the site falls within NEC A where noise would not be a determining factor in the planning permission. Some parts of the Environmental Impact Assessment Study Area directly adjacent the A421 and Whaddon Road fall within NEC B.

12.66 For proposed residential development in NEC B PPG 24 states that:

*“Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.”*

12.67 These noise contours are for the baseline situation in 2008. However, a future year 2026 has also been assessed to take account of the East-West Railway line which will be in operation in the future. Furthermore, this model has been used to outline mitigation measures for the site taking account of additional development traffic on existing roads and on the new internal primary streets.

#### Design Year - 2026

12.68 As discussed previously a noise model was constructed for the design year 2026 with the railway in operation and including the development traffic. It was used to provide the NECs across the site with the internal roads included. The daytime NECs are presented in Figure 12.4 and the night-time contours in Figure 12.5.

- 12.69 It can be seen that both the daytime and night-time noise levels across the Environmental Impact Assessment Study Area mainly fall within NEC A or B. For dwellings within NEC A PPG24 advises that *“noise need not be considered as a determining factor in granting planning permission”*. Properties within these areas would not require the installation of specific noise mitigation. For properties within NEC B PPG24 advises that: *“Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise”*. For these properties, limited mitigation measures would be required to ensure satisfactory noise levels for residential properties in these locations.
- 12.70 Some areas within the Environmental Impact Assessment Study Area, near to the internal spine roads and narrow strips of land directly adjacent the A421 are predicted to experience higher noise levels.
- 12.71 The employment areas within the proposed Development Framework Plan are situated to the north of the site directly adjacent the A421. However, as employment uses are not as noise sensitive as dwellings the exposure to elevated noise levels from the A421 is not considered to be a significant effect. Noise mitigation measures are outlined later in this chapter in order to achieve acceptable internal noise levels. The noise model predicts external noise levels up to 61 dB(A).

12.72 Educational areas identified within the Development Framework Plan have also been assessed. The majority of the sites chosen for educational purposes would experience noise levels of below 55 dB(A). However, three of the schools directly front the internal spine roads within the development. These include SP4, PS1 and SS1. These parts of the schools sites would experience noise levels above 55 dB(A). However, it should be noted that the model does not include any proposed buildings which would offer shielding effects from the main roads. Therefore, an assessment of acceptable noise levels for schools should be assessed at the detailed design stage with all proposed buildings included.

2026 - Operational Noise from Employment and Mixed Use Centres  
(including sites for possible Energy Centres)

12.73 Areas of commercial, retail and employment use are likely to include fixed plant for ventilation and possibly refrigeration. Fixed plant of this nature is most appropriately assessed with reference to BS 4142 "*Method for Rating Industrial Noise Affecting Mixed Industrial and Residential Areas*."

12.74 With proposed employment and mixed use areas in close vicinity to proposed residential areas, positioning of any proposed noisy plant must be carefully managed at the detailed design stage. This could include fixed plant associated with the employment area to the north of the site facing the A421 away from the residential units and have the employment buildings acting as a barrier to limit noise exposure to the proposed residents.

12.75 At the detailed design stage any fixed plant associated with the employment or mixed use centres, including sites for possible Energy Centres, should be assessed against BS 4142 such that the rating level does not exceed the background noise level by 5 dB. This was specified by Sean Dunn, EHO of Aylesbury Vale District Council, during a telephone conversation on 3<sup>rd</sup> October 2008.

#### Increased Road Traffic Noise at Existing Receptors

12.76 This assessment considers the impact of the proposed development on existing noise sensitive receptors close to the Environmental Impact Assessment Study Area. The nearest existing noise sensitive receptors to the Environmental Impact Assessment Study Area are presented in Figure 12.6 and are:

- farms and retained dwellings within the development area: The Leys, Bletchley Leys Farm, New Leys and Dagnall House; and
- farms and isolated dwellings close to the development area: Lower Salden Farm, Chase Farm, Crabtree Farm, Woodpond Farm (north of the A421 carriageway), Stearhill House (west of Whaddon Road); Manor Farm (south-west of the Environmental Impact Assessment Study Area, on Whaddon Road) and properties on Coddimore Lane and Haydock Close.

12.77 Operational noise of the development will predominantly consist of increased traffic on the local road network. This has been assessed by creating a SoundPLAN model.

12.78 The difference between the “Without development” and “With development” scenarios for 2026 has been assessed for the daytime and night-time for both the ground and first floor levels. The absolute noise levels for the 2026 With development situations and Without development situations are presented in Appendix B. The traffic data used within the models are provided in Appendix C.

12.79 Table 12.19 provides a summary of the significance of the impact.

Receptor	Floor Assessed	Daytime Road Traffic Impact (2026 with development – 2026 no development)	Night-time Road Traffic Impact (2026 with development – 2026 no development)
<b>Onsite</b>			
Bletchley Leys Farm	Ground	Not significant	Not significant
	First	Not significant	Not significant
Bletchley Leys Farm	Ground	Not significant	Not significant
	First	Not significant	Not significant
The Leys	Ground	Not significant	Not significant
	First	Not significant	Not significant
<b>Offsite</b>			
Haydock Close	Ground	Not significant	Not significant
	First	Not significant	Not significant
Chase Fm	Ground	Not significant	Not significant
	First	Not significant	Not significant
Chase Fm Cottages	Ground	Not significant	Not significant
	First	Not significant	Not significant
Crabtree Fm	Ground	Not significant	Not significant
	First	Not significant	Not significant
Lower Salden Farm	Ground	Not significant	Not significant
	First	Not significant	Not significant
Stearthill House	Ground	Not significant	Not significant
	First	Not significant	Not significant
Woodpond Farm	Ground	Not significant	Not significant
	First	Not significant	Not significant
Manor Farm	Ground	Not significant	Not significant
	First	Not significant	Not significant
Coddimore Lane	Ground	Not significant	Not significant
	First	Not significant	Not significant

**Table 12.19: Road traffic Impact for Existing Noise Sensitive Receptors**

12.80 The table shows that all receptors would not experience a significant impact.

12.81 The traffic flows were provided by PBA LLP transport division and are provided in Appendix C. Receptors on or in close vicinity to the Environmental Impact Assessment Study Area have been assessed as they are likely to have the largest impact. However, the traffic assessment and flows also cover the junctions within Buckingham, Newton Longville and Milton Keynes. The traffic flows for the “with” and “without” situations were assessed for these roads and it was calculated that none of the roads show a noise level increase of above 3 dB which is considered to be not significant.

## **Mitigation**

### Construction Phase

12.82 Details of the mitigation measures can be determined when details of plant sound power level and position during the works is known. This will be in a Construction Environmental Management Plan (CEMP) to be completed at the detailed or reserved matters application stage.

12.83 A CEMPs for each phase will identify and address any mitigation requirements based on guidance given in BS 5228 and the following:

- controlling hours of work having regard to the surrounding noise sensitive receptors;
- possible solutions for plant and/or machinery to reduce noise effects which will include only using plant conforming to relevant standards and directives on noise emissions;
- the maintenance of all equipment to reduce noise effects;

- opportunities for fitting equipment with appropriate silencers, mufflers or acoustic covers where applicable;
- locating stationary noise sources away from noise-sensitive receptors and possible methods to shield them;
- management of activities e.g. the opportunity to shut down any machinery in intermittent use in intervening periods of non-use or where this impractical, it should be throttled back to a minimum; and
- education and supervision of employees to ensure compliance with measures outlined in the CEMP.

12.84 Contractors and associated sub-contractors should comply with all legislation relevant to noise and vibration emissions from construction activities. These include, but are not limited to:

- The Control of Pollution Act 1974;
- The Environmental Protection Act 1990;
- Control of Noise at Work Regulations 2005;
- Health and Safety at Work Act 1974; and
- Control of Noise at Work Regulations 2005.

#### Operational Phase

##### Residential Areas

12.85 Mitigation for proposed dwellings should be designed having regard to the “Do Something” model for 2026.

- 12.86 The majority of the Environmental Impact Assessment Study Area falls within NEC A or B. For land falling within NEC A *“noise need not be consider as a determining factor in granting planning permission”* and no specific mitigation measures would be required.
- 12.87 PPG 24 states that for NEC B “Noise should be taken into account when determining planning applications and, where appropriate conditions imposed to ensure an adequate level of protection against noise.” In these areas, careful selection of glazing is recommended to ensure acceptable internal noise levels.
- 12.88 The design target for the “good” internal level recommended in BS 8233 is 30 dB(A). Assuming the highest external noise level within NEC B of 63 dB, the level of sound insulation ( $R_w(C_{tr})$ ) required would be 33 dB. Mitigation of this magnitude can be achieved with a glazing configuration of 10/12/6 glass/cavity width/glass (mm).
- 12.89 On the proposed Development Framework Plan residential areas are proposed to the north of the site, where narrow strips of land adjacent to the A421 fall within NEC C. Therefore during the detailed design stage dwellings within land labelled R14 and R15 on the Development Framework Plan Drawing Number SWMK01\064 Revision B would need to be set back such that they do not fall within NEC C. Alternatively, glazing with a weighted sound reduction index ( $R_w$ ) of at least 36 dB would need to be used for façades facing the A421. This could be achieved with specialist glazing such as a ‘secondary’ window or a double or triple glazed acoustic laminate.

12.90 For the strips of land adjacent to the internal roads that fall within NEC C it is not anticipated that dwellings would be positioned directly adjacent these roads but be set-back and could fall within NEC B. Therefore during the detailed design stage detailed noise mitigation methods can be outlined following finalisation of site layout.

12.91 At the same time consideration would also be required for garden areas to ensure that they meet the recommended external noise levels of  $L_{Aeq,16hr}$  50 - 55 dB. This can be achieved through use of screening from buildings and fences to reduce the noise levels in gardens and open spaces.

#### Employment Areas

12.92 Fixed plant should be designed such that the noise rating level does not exceed 5 dB(A) above the existing background levels at the nearest dwelling.

12.93 For internal noise levels within offices in the employment area to meet the good criteria as specified in BS 8233 it is recommended that mitigation in the form of window glazing with a weighted sound reduction index of  $R_w = 30dB$  should be installed on the office facades facing the A421. This could be achieved using 4mm glass 12mm air and 4mm glass glazing.

#### Educational Areas

- 12.94 For proposed schools directly adjacent the internal primary streets consideration should be given to the detailed layout such that non- acoustic sensitive aspects of the school, directly face the road with the more acoustically sensitive areas of the buildings and outdoor areas being set back.

#### **Residual Effects** Construction Phase

- 12.95 Noise levels as a result of the construction works will be minimised by implementing the mitigation methods advised in BS 5228 via the Construction Environmental Management Plans (CEMP).
- 12.96 With mitigation the impact of the construction phase of the proposed development would *not be significant*.

#### Operational

- 12.97 If the residential properties are constructed with appropriate mitigation the effect of road traffic noise would be considered to be *not significant*.
- 12.98 Operational noise will be minimised to a level of *not significant* through selection and mitigation of plant associated with employment uses.
- 12.99 The increase in road traffic has been assessed at existing dwellings in close vicinity to the Environmental Impact Assessment Study Area. The receptors would have an impact defined as 'not significant'

### Cumulative Effects Summary Table

Potential effect	Significance of effect	Mitigation	Residual effect and significance
Construction noise and vibration	Dependant on plant selection, number of items and processes used	Implementation of good working practise and CEMP	Not significant
Road traffic noise to existing dwellings	Minor adverse for one property and not significant for the others	None required	Minor adverse for one property and not significant for the others
Road traffic noise to new dwellings	Various depending on proximity to road	Glazing, building orientation, buffer zone adjacent to A421 dual carriageway.	Not significant
Plant noise from Local Centres and Employment Area.	Dependant on plant selection and number of items	Limiting sound emission levels to below 5dB above background at nearby receptors	Not significant

Table 12.20: Summary Table

### References

- Department for Education and Skills, 2003. Building Bulletin 93: Acoustic design of schools a design guide. London: The Stationery Office.
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## Abbreviations

The following abbreviations have been used within this chapter:

- $L_{Aeq,T}$  Equivalent noise level: the A-weighted steady sound pressure level that would contain the same amount of acoustical energy as the actual, fluctuating sound measured over a period, T.
- $L_{A10}$  The A-weighted sound pressure level exceeded for 10% of the time. It is used to describe road traffic noise
- $L_{A90}$  The A-weighted sound pressure level exceeded for 90% of the time. It is used to describe the background noise level
- $L_{AFmax}$  The maximum A-weighted sound pressure level recorded over the measurement period. The F denotes a fast time-weighting has been used.
- NEC Noise Exposure Category, as set out in Planning Policy Guidance 24 *“Planning and Noise”*
- VDV Vibration Dose Value a measure of assessing the human exposure to vibration