

## **9 NOISE**

### **9.1 INTRODUCTION**

- 9.1.1** This chapter assesses the effects of changes in noise and vibration associated with the proposed development on the surrounding area. As detailed in chapter 1 of the ES, the proposals comprise two areas: the New Settlement Area and the Flying Field Area. The residential zone uses a combination of retained and redeveloped buildings combined with new build.
- 9.1.2** The Flying Field Area relates predominantly to the application for permanent commercial use instead of the temporary commercial use that is currently granted. Within the application there will be a number of changes in use, however, these are changes of type of commercial use which from an acoustic perspective are not expected to be significant, albeit they may potentially require the introduction of some ancillary operational plant in relation to the commercial operations.
- 9.1.3** Initial impacts associated with the development would predominantly relate to the residential development within the New Settlement Area and would arise from demolition and construction work, although these effects would be temporary. Permanent changes to the noise climate could arise from the operation of both zones of the development. The suitability of the noise climate for occupation of the site is discussed herein.

### **9.2 REVIEW OF DEVELOPMENT PROPOSALS**

- 9.2.1** For the purposes of this Chapter, the existing characteristics of the area and the proposed development are described in relation to the noise climate.
- 9.2.2** The study area has been concentrated immediately around the development at noise sensitive locations external to the site to the west, north, east, and south of the site and at site boundaries. Beyond these areas, noise impacts would be less significant due to distance from the development.
- 9.2.3** Four noise sensitive receivers were identified external to the development site to represent noise at the nearest premises. In addition to the identified receivers, site noise measurements have also been conducted on the existing site perimeter to assess the current noise climate. This will provide baseline data for future development plans to be assessed against. Details of the noise monitoring survey are provided in section 9.7.
- 9.2.4** The following potential noise issues are considered in this assessment:

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**Heyford Park Environmental Statement**

- 9.2.5** Construction noise from the New Settlement Area, the change of use in the Flying Field Area is not anticipated to require any construction activities of significance.
- 9.2.6** Traffic noise associated with the New Settlement Area which is considered likely to introduce more traffic to the area, the Flying Field Area is already in operation under temporary permit and not expected to generate a significant change in traffic movements with permanent use.
- 9.2.7** Additional plant noise associated with the development such as ventilation fans, air-conditioning plant, etc may potentially be generated from the proposed development.
- 9.2.8** Suitability of the existing noise climate for residential development is considered applicable to the New Settlement Area only.

**Site Location**

- 9.2.9** The site location is described in Chapter 1.

**9.3 METHODOLOGY / APPROACH**

- 9.3.1** Potential noise issues relating to the proposed development have been set out in Section 9.2 above. The assessment of noise effects has focussed on the closest noise sensitive receivers surrounding the proposed development as described above. A methodology has been adopted to compare the predicted / measured noise levels against relevant Planning Policy of British Standards as appropriate.
- 9.3.2** For traffic noise a comparison is made between the expected noise levels and what the noise levels would be if the new noise source were not introduced. The assessment is then made according to the predicted change in noise level, in relation to an appropriate assessment criterion, as defined by local or national policy, or by established practice. Specific noise requirements and assessment criteria are described in the section on Policies and Guidance (Section 9.9).
- 9.3.3** Suitability of the site for residential occupation has been assessed based on existing measured noise levels, in accordance with Planning Policy Guidance 24 (PPG24), described in Section 9.9.

### **Baseline Noise Survey – New Settlement Area**

- 9.3.4** Immediately before and after each series of measurements was carried out, the sound level meter calibration was checked using a sound pressure level calibrator. No significant variation was recorded during the survey periods.
- 9.3.5** Noise measurements were taken at approximately 1.2 metres above ground level and well away from any building facades and are considered representative of freefield measurements. A windshield was placed over the microphones at all times during the survey period to reduce any potential effect of wind-induced noise. Corresponding statistical analysis of the measured noise was then carried out, and the following parameters recorded: LAeq, LAm<sub>ax</sub> and percentiles La<sub>90</sub> to LA<sub>10</sub>.
- 9.3.6** All noise measurement instrumentation owned and used by Arup Acoustics is checked for correct calibration to traceable national and international standards on an annual basis. Routine 'in-house' spot checks are also carried out at regular intervals as part of Arup Acoustics Quality Assurance policy, to provide additional confidence in measured noise data.

#### **Survey Instrumentation**

Noise Equipment:

Brüel & Kjær 2260 Type 1 precision integrating Sound level Analyser;

Brüel & Kjær Type 1 4231 SPL Calibrator;

Kestral Anemometer.

Personnel:

Philip Mudge & Caroline McKelvey, Arup Acoustics.

### **Baseline Noise Survey – Flying Field**

#### **Survey Instrumentation**

Noise Equipment:

6 x Norsonic 116 Precision Sound Analyser

Norsonic 1251 Precision Sound Calibrator

Personnel:

Oliver Bewes and Andy Carter, Arup Acoustics.

## Approach

- 9.3.7** The various methodologies to predict noise effects are described below:
- 9.3.8** Construction activities have been identified as a potential, if temporary, source of noise and vibration. The assessment the potential construction impact will be qualitative based on the types of operation anticipated and best practicable means controls normally applied. Although there is an established methodology for predicting construction noise and vibration levels, there is insufficient information on the construction methodology at this stage of the development planning to attempt a meaningful prediction of noise levels at nearby sensitive receivers.
- 9.3.9** For traffic noise effects, prescribed prediction methodologies have been used to predict the likely noise changes based on forecast vehicle movements. The noise exposure arising from new or altered roads associated with the proposed development can be calculated using the Calculation of Road Traffic (CRTN) method [Department Of Transport Welsh Office, 1988]. The method creates a spatial model of the area between the road and the noise sensitive receiver. The noise source levels generated by the road are based on the volume, average speed and composition of the traffic. For the purposes of this assessment traffic noise predictions have been undertaken for a constant distance from the road that is representative of the closest approximate distance that a property may be located to a road. Given that there are no new roads proposed on the approach to the development site this assessment methodology will accurately reflect the change in traffic noise levels associated with the development and provide a basis for assessment. For the purpose of this study, the changes in traffic noise resulting from the proposed development were forecast using the CRTN methodology to relate traffic noise change to forecast changes in traffic flow provided by the transport consultant and described in a separate chapter of this environmental impact assessment. (Chapter 6)
- 9.3.10** For plant machinery associated with buildings, or noise from entertainment venues it is very difficult to predict noise levels given the uncertainty as to the exact locations of the sources or the intensity of operation. However for these sources it is possible to establish target noise criteria or operational constraints to ensure these sources do not have an adverse impact as described in BS 4142.

## 9.4 DIRECT / INDIRECT EFFECTS

- 9.4.1** For the purposes of the noise and vibration assessment, direct effects are considered to be those arising from construction or operation within 300m of the proposed development.

Indirect effects are considered to be those arising at greater distance. Any such effects are likely to be as a result of changes in traffic flow on roads around the proposed development.

## **9.5 LIMITATIONS, CONSTRAINTS AND ASSUMPTIONS**

- 9.5.1** The only limitations in relation to this assessment is the detail of information available for the construction methods and potential new plant. The assessment of construction noise effects has been based on a qualitative evaluation of the processes and durations likely to take place from the information available. Detailed construction noise assessments will be undertaken and agreed with Cherwell District Council once the detailed construction methodology is defined and prior to commencement of construction. The relevant measures to control disturbance are considered and the likely residual impact identified.
- 9.5.2** The assessment of plant noise has been based on the baseline noise levels and identifies appropriate cumulative plant noise limits at the site boundary.

## **9.6 BASELINE**

### **Study Area**

- 9.6.1** Any noise or vibration effects associated with the proposed development are likely to be greatest at positions immediately surrounding the site perimeter. The study area has therefore been concentrated inside and around the development at noise sensitive locations identified in Section 9.7. Beyond these areas noise impacts would be less significant due to distance from the development, the masking effect of other noise sources and screening by buildings.
- 9.6.2** Three measurement locations were selected to be representative of the nearest noise sensitive properties to the site. In order to assess the suitability of the site for residential purposes, eleven locations on the site were selected to be representative of the noise environment over the development area.

### **Monitoring Survey - New Settlement Area**

- 9.6.3** The measurement of baseline noise levels has been split into two areas, one covering the New Settlement Area and one covering the Flying Field Area
- 9.6.4** A site visit was conducted around the New Settlement Area site during the day and night of Tuesday 13th and Wednesday 14th March, 2007. The purpose of the visit was to measure existing noise levels, identify existing noise sources and provide an impression of the overall

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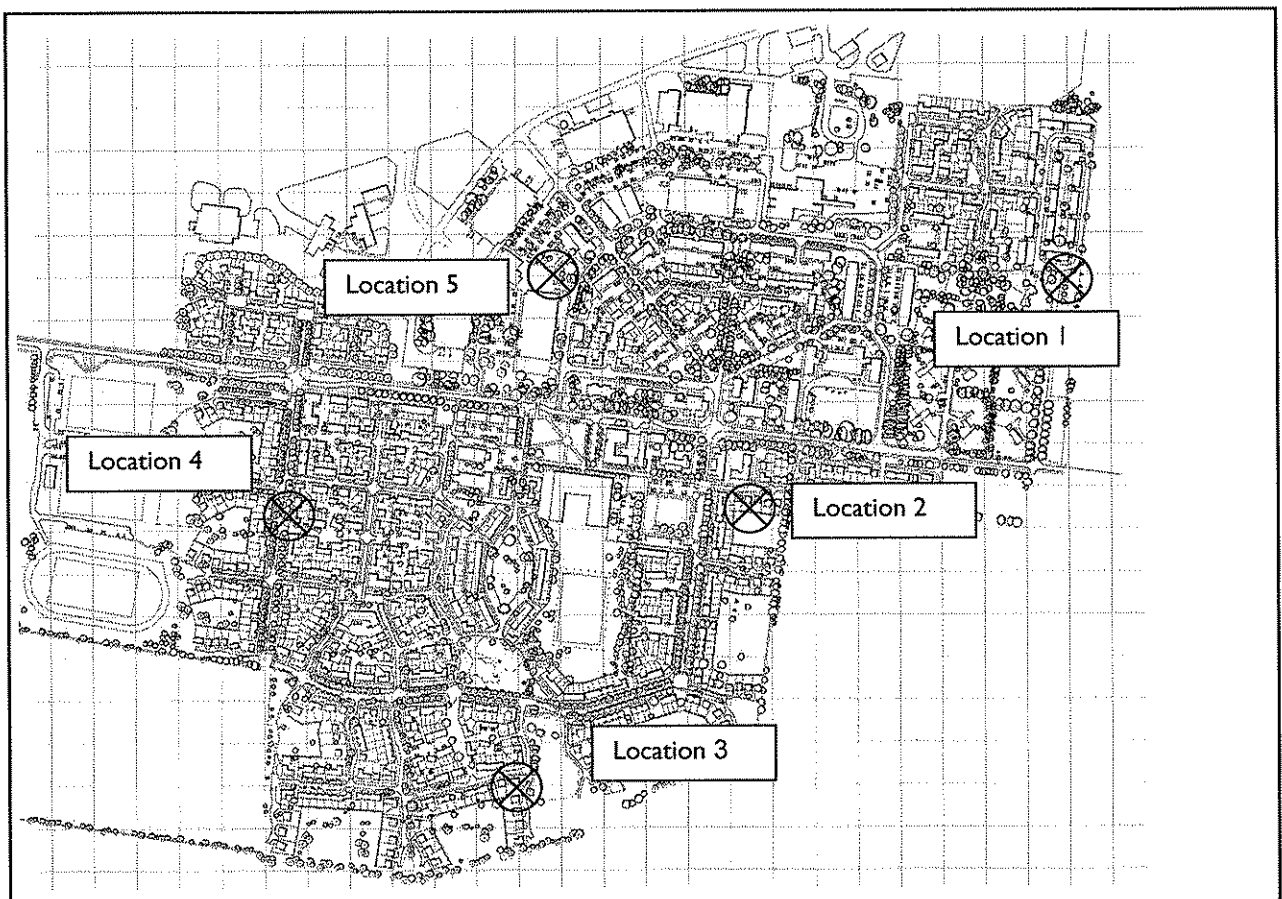
**Heyford Park Environmental Statement**

noise climate in each area of the site. Weather conditions were favourable for the duration of the survey, with no precipitation and light winds.

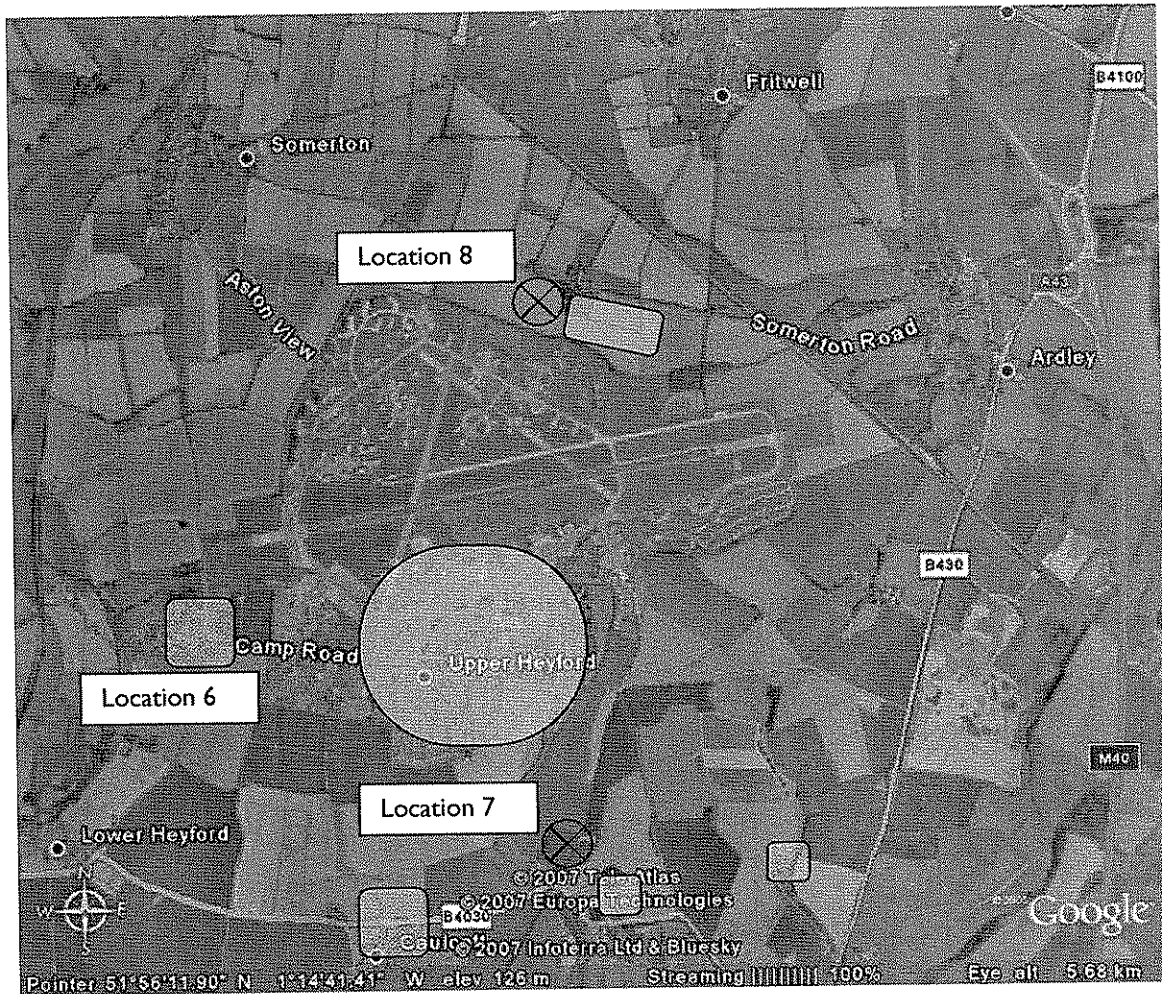
- 9.6.5** The measurement period was considered to cover typical noise levels during the daytime, evening and night-time periods as well the highest noise levels during the evening rush hour period and the quietest period in the early hours of the morning.
- 9.6.6** Full details of the measurement periods and results are provided in the Appendices. The general noise methodology followed was that described in BS 4142:1997 [British Standards Institution, 1997].

**Measurement Location Description**

- 9.6.7** The measurement locations are described below and are identified in Figure N.1 and Figure N.2.



**Figure N1** Site plan showing measurement locations for PPG24 Assessment



**Figure N2** Site plan showing external measurement locations used for setting noise emissions. Blue areas indicate identified residences.

### Location 1

- 9.6.8** On the east perimeter, north of Camp Road. This location was close to some existing light industrial units. Some were in operation, others appeared to be empty. To the north was the main car park for the vehicle leasing company.
- 9.6.9** Noise levels measured were dominated by some low level plant noise from one of the nearby commercial units. There was also influence from distant traffic noise, birdsong, vehicle movements on the runway and occasional jet aircraft movements overhead.

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**Heyford Park Environmental Statement****Location 2**

**9.6.10** Location 2 was on the eastern edge of the unused residential buildings previously occupied by military personnel. The area is currently ring fenced and not in use, therefore the noise climate is quiet and dominated by distant noise sources.

**9.6.11** The noise levels measured were typically from distant traffic noise, vehicles on Camp Road were not clearly distinguished from the general traffic hum. Birdsong was a significant contributor to the noise climate, particularly at dusk.

**Location 3**

**9.6.12** This location was on the southern edge of the site, again within the ring fenced area mentioned above. The housing here was very similar that of location 2 and also unoccupied.

**9.6.13** Noise levels here were very similar to those of location 2, dominated by traffic noise and birdsong.

**Location 4**

**9.6.14** Location 4 was situated opposite the rear of the occupied residential dwellings on Eday Road to the Western edge of the site, located at the edge of a disused car park on Dacey Drive.

**9.6.15** Noise levels at this location were typical of a quiet residential location. Distant traffic noise and local traffic on Camp Road dominated the noise climate, there was also the occasional car movement on Dacey Drive. Other sources included birdsong, and overhead aircraft.

**Location 5**

**9.6.16** Location 5 was situated closer to the taxiways south of the main runway and between 2 large industrial units. This was an area of considerable activity. There were various vehicles movements on the taxiway, including private cars and HGV's. There was the influence of distant traffic noise. The industrial units around the location were clearly occupied and active at all times of day. There was considerable sawing/grinding noises emanating from one of the units during the very early hours of the morning. There was also constant plant noise from many sources throughout the 24hour period. However, with all the activity the measured noise levels were still no higher than 55dBLAeq (48dBLA90) during the daytime.



### Location 6

**9.6.17** Location 6 was located outside a house at the western corner of Camp Road where it meets Somerton Road. This location was chosen to assess current noise conditions at the village of Upper Heyford, identified as one of the closest noise sensitive receivers.

**9.6.18** Noise levels were dominated by distant and local traffic noise, birdsong, and overhead aircraft. Noise from the activities on the development site was not subjectively audible at this location.

### Location 7

**9.6.19** This location was chosen to be representative of the village of Calcott and some occupied farm buildings close to the B4030 east of Calcott. The chosen location was on a bend of the B4030 approximately equidistant between the two identified receivers at the entrance to a field.

**9.6.20** Noise levels were dominated by road traffic on the B4030, traffic flows were counted at 16 vehicles per minute during the rush-hour peak. Other sources were birdsong and activities associated with the nearby farms.

### Location 8

**9.6.21** Location 8 was just west of some residential and farm buildings on Somerton Road, north of the development site. This road was a typical quiet country lane with very few traffic movements. However, vehicles that use the road tended to travel quite fast. Other than the noise of vehicle pass-bys the only other noise sources identified were distant traffic noise and birdsong.

**9.6.22** Table N.1 below presents details of noise levels measured during the survey periods at measurement locations 1 to 8.

**Table N1** Measured Sound Pressure Levels at Locations 1 through to 8

Description	Date	Start	End	Statistical Noise Levels (dB(A))				
				L <sub>Amin</sub>	L <sub>A10</sub>	L <sub>A90</sub>	L <sub>Aeq</sub>	L <sub>Amax</sub>
Location 1	2007 Mar 13	14:22	14:32	45	53	47	52	64
	2007 Mar 13	16:55	17:05	45	51	47	49	66
	2007 Mar 13	22:08	22:18	43	46	44	45	55
	2007 Mar 14	2:07	2:12	42	44	42	43	52

## Heyford Park Environmental Statement

Location 2	2007 Mar 14	7:10	7:20	46	53	48	51	63
	2007 Mar 13	14:44	14:54	32	47	36	43	57
	2007 Mar 13	17:14	17:24	30	44	35	41	55
	2007 Mar 13	22:28	22:38	30	39	32	36	54
	2007 Mar 14	2:22	2:27	29	36	30	34	56
	2007 Mar 14	7:28	7:38	42	47	43	46	60
Location 3	2007 Mar 13	15:02	15:12	32	46	35	42	55
	2007 Mar 13	17:28	17:38	29	56	39	52	64
	2007 Mar 13	22:42	22:52	27	36	29	34	55
	2007 Mar 14	2:31	2:36	27	32	29	31	49
	2007 Mar 14	7:42	7:52	41	52	43	50	64
Location 4	2007 Mar 13	15:19	15:29	39	56	46	56	82
	2007 Mar 13	17:46	17:56	39	59	43	61	81
	2007 Mar 13	22:59	23:09	32	46	35	43	59
	2007 Mar 14	2:42	2:47	30	40	32	39	54
	2007 Mar 14	7:58	8:08	40	54	44	61	84
Location 5	2007 Mar 13	15:38	15:48	45	58	48	54	65
	2007 Mar 13	18:02	18:12	39	56	42	52	69
	2007 Mar 13	23:15	23:25	31	48	34	46	61
	2007 Mar 14	2:52	2:57	36	51	38	46	56
	2007 Mar 14	8:14	8:24	41	54	44	52	68
Location 6	2007 Mar 13	15:56	16:06	37	66	42	62	78
	2007 Mar 13	18:18	18:28	37	65	40	62	80
	2007 Mar 13	23:31	23:41	25	38	27	50	75
	2007 Mar 14	3:03	3:08	32	50	33	54	75
	2007 Mar 14	8:29	8:39	37	70	44	68	90
Location 7	2007 Mar 13	16:12	16:22	37	65	43	62	85
	2007 Mar 13	18:34	18:44	43	65	49	61	75
	2007 Mar 13	23:47	23:57	25	36	27	35	61

Location 8	2007 Mar 14	3:14	3:19	30	49	32	46	66
	2007 Mar 14	8:45	8:55	38	63	41	60	74
	2007 Mar 13	16:33	16:43	34	57	38	59	83
	2007 Mar 13	19:02	19:12	36	49	37	55	79
	2007 Mar 14	0:08	0:18	28	45	31	40	54
	2007 Mar 14	3:30	3:35	36	42	38	40	58
	2007 Mar 14	9:05	9:15	40	59	42	58	79

### Monitoring Survey - Flying Field Area

**9.6.23** A second noise survey was carried out over a longer period between 22nd September and 5th October. The six monitoring locations were situated near the perimeter road surrounding the main runway area of the site. The survey was carried out across a series of 24 hour periods distributed over two weeks using continuous logging sound level meters to establish a more accurate picture of the noise climate near the runway to the north, which had previously not been covered. There were some periods of adverse weather encountered during the survey, mainly rainfall and medium to high wind speeds, and data taken during these periods has been excluded from the analysis and results summary to ensure noise levels are representative of the site only.

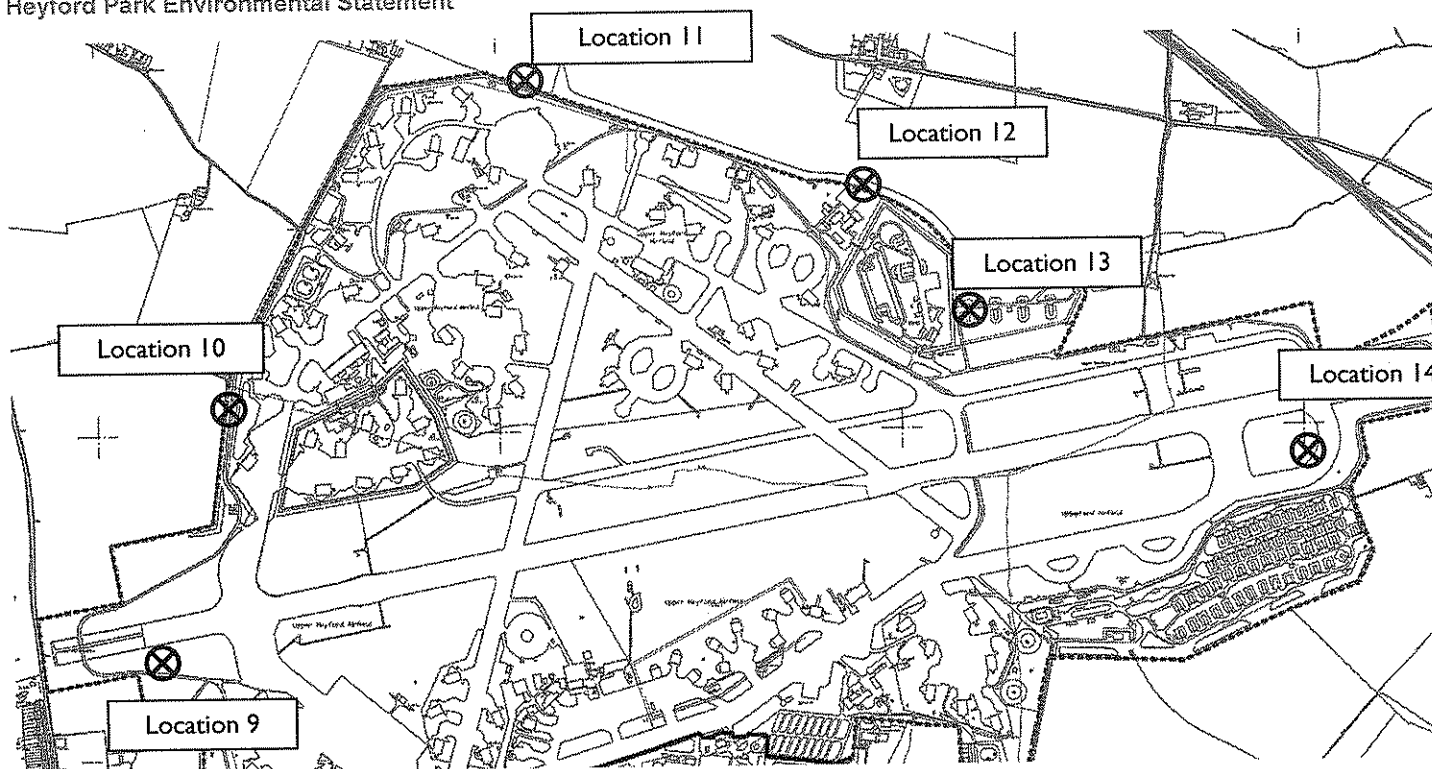
**9.6.24** The majority of noise on site was due to traffic on the perimeter road, and also farming machinery operating in the adjacent fields. Measurements and analysis were performed in the same manner as previously described in Section 1.7.2.

**9.6.25** Detailed noise time histories from the logged noise data at each location are presented Figures N.A02 to N.A48 in Appendix A3

### Measurement Location Description

**9.6.26** The measurement locations are described below and are identified in Figure N3.

## Keyford Park Environmental Statement



**Figure N3** Site plan showing external measurement locations used for setting noise emissions. Blue areas indicate identified residences.

### Location 9

**9.6.27** This measurement location was just off the south western end of the runway a short distance from the perimeter road and on the perimeter fence line. The noise climate at this location was predominantly due to distant road traffic, although local traffic on the perimeter road was the cause of peaks in noise level.

### Location 10

**9.6.28** This measurement location was to the north of the western end of the runway at a location where the perimeter road runs adjacent to the perimeter fence. Noise at this location was generally attributable to distant traffic, although vehicular movements on the perimeter road gave rise to peaks in noise levels.

### Location 11

**9.6.29** This measurement location was at the edge of a large hardstanding area. Distant traffic is considered the prevailing source of noise at this location.

### **Location 12**

**9.6.30** This measurement location was located to the rear of some small buildings that appeared to be unused away from the perimeter road. The prevailing noise climate resulted from distant traffic noise.

### **Location 13**

**9.6.31** This measurement location was located near the site perimeter off the perimeter road. The prevailing background noise at this location was from distant traffic. Peaks in noise level are attributable to localised on site activities.

### **Location 14**

**9.6.32** This measurement location was adjacent to the perimeter road on the fence line to some grass covered bunkers that it is understood are used for storage. The bunkers were noted to produce some just audible ventilation / air extraction noise and movements around the bunkers were observed.

**9.6.33** Noise levels measured during the survey of the Flying Field are presented graphically in Figures NA02 to NA48 in the appendices.

### **Noise Climate Overview**

**9.6.34** In summary, the noise climate over the site was predominantly low level distant traffic noise. In areas close to roads both within and outside of the site vehicular movements gave rise to peak noise levels and in areas close to some of the commercial units in the Flying Field area low level plant noise was just audible.

**9.6.35** It is understood that on occasions the runway is used for "Red Letter Day" style driving experiences in high performance cars on occasions, it is likely that during the staging of these events that the vehicles would generate noise audible over a large part of the site. Additionally, the police use the site for pursuit driver training and weapons training during which either vehicular movements or gunshots maybe audible across a significant area of the site. Events of this nature are considered likely to be the cause of higher noise levels on occasions in the unattended 24hr logged noise data.

## **9.7 CONSULTATION**

**9.7.1** Consultation with Oxfordshire's environmental health department has confirmed that plant noise limits should be set at the site boundary in accordance with recommendations in BS4142 and based on measured background noise levels; the suitability of the site for

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 Heyford Park Environmental Statement

residential purposes should be assessed in accordance with PPG24 and construction noise should be assessed in accordance with BS 5228.

## 9.8 POLICIES AND GUIDANCE

**9.8.1** As part of the assessment procedure for an environmental statement, there is a requirement that significant effects should be described and mitigation measures to control any significant adverse effects identified. The relevant methods adopted for the assessment of each source of noise and vibration are summarised in the following sections. Some of these describe specific requirements or thresholds for amelioration.

### Traffic Noise

**9.8.2** An approach to assessing noise and vibration effects from roads is described in The Design Manual for Roads and Bridges (DMRB), Volume 11, Environmental Assessment [Department of Transport, 1994]. The DMRB approach to assessing noise impact is to compare the noise levels for the Do Something scenario (with scheme) against noise levels for the Do Minimum scenario (without scheme).

**9.8.3** The criterion for acceptability of road traffic noise exposure at residential properties is contained in the Noise Insulation Regulations [HMSO, 1988], which enact part of the provisions of the Land Compensation Act [HMSO, 1973]. This provides an entitlement for noise insulation measures if noise levels are equal to or exceed 68 dB LA10,18hr at the building façade. The Land Compensation Act also provides a mechanism by which owners of homes affected by increased noise levels can claim compensation for any loss in value of the property on the open market that might occur.

**Table N2** Traffic Noise Significance Criteria

Change in Noise Level, dB	Significance
Decrease of 3dB	Beneficial
Decrease < 3dB	No significance
Increase of <3dB	No significance
Increase of 3 – 5 dB	Minor significance
Increase of 5 -10 dB	Moderate significance
Increase > 10 dB	Major Significance

### **Construction Noise**

**9.8.4** Construction noise and vibration is temporary and cannot be assessed in the same way as more permanent operational impacts. Potential noise and vibration impact from construction must also be weighed against other factors such as the benefits that the completed development (or road scheme) will bring to the local community. The national guidance and policy does not propose any specific criteria for the setting of noise limits or criteria for construction works as it is recognised that this must be judged against local needs and conditions. The impact of construction noise and vibration is usually assessed with reference to the following guidance and statutes:

**9.8.5** BS 5228 Noise and Vibration Control on Construction and Open Sites [British Standards Institution, 1997]

**9.8.6** BS 5228 provides guidance on the assessment and control of noise from construction operations. The Standard contains detailed information on noise reduction measures and promotes the 'best practicable means' approach to control noise and minimise the impact on local residents and construction workers.

#### ***Environmental Protection Act [HMSO, 1990]***

**9.8.7** The Environmental Protection Act describes the duty of the Local Authority to take steps to abate any noise impact, including that from a construction site, deemed to be causing a statutory nuisance.

#### ***Control of Pollution Act [HMSO, 1974]***

**9.8.8** The Control of Pollution Act gives the Local Authority powers to serve a notice to the developer requiring the control of site noise under Section 60 of the Act. This may include specific controls to restrict certain activities identified as causing particular problems. Conditions regarding hours of operation will generally be specified and noise and vibration limits at certain locations may be applied in some cases. All requirements must adhere to established guidance and be consistent with best practicable means to control noise only as far as is necessary to prevent undue disturbance.

#### **Building Services Plant Noise**

**9.8.9** To ensure that the proposed development does not have an unacceptable impact on the surrounding area, appropriate noise targets would be specified based on the existing noise climate. BS 4142:1997 Rating industrial noise affecting mixed residential and industrial areas [British Standards Institution, 1997] (the 'Standard') gives a method for determining the likelihood of complaint from a new industrial development. Although the title of the

## Heyford Park Environmental Statement

Standard implies a limited application to just industrial situations, the assessment methods it recommends are often used to assess noise from building services plant from commercial premises. Fixed plant of this nature is included within the scope of the Standard.

**9.8.10** The Standard specifies a survey method to measure 'the specific noise level' (the introduced noise) in terms of  $L_{Aeq,T}$ , and 'the background noise level' (the noise existing in the absence of the specific noise level at the receiver location) expressed in terms of  $L_{A90,T}$ . Corrections are then made if the specific noise has a distinctive character, i.e. tonality or impulsivity. The corrected specific noise level is described as 'the rating level' ( $L_{Ar,T}$ ). To assess the likelihood of complaints the background level is subtracted from the rating level and the following criteria applied:

- if the difference is around +10 dB or more then complaints are likely;
- if the difference is around +5 dB then this is of marginal significance;
- if the rating level is more than 10 dB below the measured background level then this is a positive indication that complaints are unlikely.

### Suitability of Site for Residential Development

**9.8.11** The highest level noise guidance document from which most other relevant documents stem is Planning Policy Guidance: Planning and Noise (PPG 24) [Department of the Environment, 1994]. This document offers guidance on the development of residential areas near to new or existing noise sources. It also defines noise exposure categories (NECs) for day and night-time to assess whether or not it is appropriate to allow the development of residential properties for a given noise climate. The categories relate to different noise bands depending on the source of noise, i.e. road, rail, air, or mixed noise sources. The noise exposure categories given in the PPG 24 for road traffic are reproduced in Table N3. The associated advice provided in PPG 24 relating to the granting of planning permission for residential use is shown in Table N4.

**Table N3** Noise Exposure Categories for new dwellings near existing traffic and mixed noise sources

Noise Levels <sup>0</sup> Corresponding to the Noise Exposure Categories for New Dwellings $L_{Aeq,T}$ dB				
Noise Exposure Category (NEC)				
Noise source	A	B	C	D
Road traffic	< 55	55-63	63-72	>72
0700-2300	< 45	45-57	57-66	>66
2300-0700				



<b>Mixed Source<sup>1</sup></b>				
0700-2300	< 55	55-63	63-72	>72
2300-0700	< 45	45-57	57-66	>66

<sup>0</sup>Noise Levels: the noise level(s) ( $L_{Aeq,T}$ ) used when deciding the NEC of a site should be representative of typical conditions.

<sup>1</sup>Mixed sources: this refers to any combination of road, rail, air and industrial noise sources. The 'mixed source' values are based on the lowest numerical values of the single source limits in the table. The 'mixed source' NECs should only be used where no individual noise source is dominant.

**Table N4** Definitions of Noise Exposure Categories for new dwellings near existing noise sources

NEC 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.
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.
NEC 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.
NEC D	Planning permission should normally be refused

## 9.9 ASSESSMENT

**9.9.1** The following sections describe the approach used to estimate changes in noise level for each type of noise source associated with the development. Where appropriate, the changes in noise levels have been predicted at the closest noise sensitive facades surrounding the proposed development.

### Construction Noise and Vibration

**9.9.2** The following qualitative construction noise assessment relates predominantly to the New Settlement Area as there is no construction planned in the Flying Field Area. There is however demolition of 5 bomb proof aircraft shelters in the north-west corner of the site planned within the Flying Field area as well as scarifying of the runway nibs. There are also a further 7 bomb proof aircraft shelters that are to be demolished in the christmas tree area on the New Settlement Zone.

**9.9.3** Scarifying of the runway nibs is considered likely to give rise to high levels of noise within the site, however, given the central location of the runway on the site these works would be at

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**Heyford Park Environmental Statement**

considerable distance from the nearest noise sensitive property outside of the site and is therefore considered unlikely to give rise to noise impacts. Nevertheless, it is likely that the activity would be just audible above background noise levels from external areas of the nearest properties. The activity is likely to be undertaken during daytime hours to minimise perceived noise, furthermore, the activity is unlikely to last for more than a week or two in duration and can therefore be considered temporary.

- 9.9.4** Demolition of the bomb proof aircraft shelters will require special techniques of demolition given that the walls are 1 metre thick and bomb proof, the method for demolition has not been determined as yet and therefore it is not possible to define the likely noise produced from the activity, in the event that explosives were used it maybe be a loud impulsive noise that maybe audible of a relatively large difference, alternatively it maybe a longer quieter process using water jets to cut. There is also the possibility that impact breakers may be required to demolish the buildings in which case high levels of noise maybe generated over a more sustained period. Control of construction noise for this activity is best agreed for this activity with local Authorities prior to commencement of the works to ensure that best practicable means are employed to minimise potential noise disturbance to properties outside of the site.
- 9.9.5** A detailed study of construction methods at this outline application stage of the project provides little of meaning as detailed construction methodology, phasing and programme are not known. Whilst typical construction methodologies for residential development are defined in BS 5228, they are founded on plant and techniques ten years in age, modern construction processes and machinery has evolved considerably over the past ten years. This results in significant inaccuracies in predictions of construction noise levels until detailed construction information is available.
- 9.9.6** Therefore, as the project progresses, the 'Best Practicable Means' of carrying out the work will be identified in accordance with the procedures given in BS 5228 [British Standards Institution, 1997]and the Control of Pollution Act. As each parcel of land approaches development final detailed construction method statements will be prepared, dependent on the particular construction used. Where these methods are considered likely to cause increased noise at the surrounding residential areas, best practicable means would be used to control noise and specific details will be discussed and agreed with the local planning authority and an appropriate construction code of practice will be produced. This code of practice would be included in the contract documents.
- 9.9.7** The New Settlement Area is likely to be phased in development and therefore construction activities will not take place across the entire site simultaneously. Work on each

building/group of buildings is likely to take place in four general stages: Demolition, Foundations, Superstructure construction and Fit-out/landscaping.

- 9.9.8** During all stages of construction it is likely that there will be a static generator and compressor running whenever the site is in operation. Fork lift trucks will be used throughout construction to move materials.

### **Demolition**

- 9.9.9** During demolition pneumatic breakers, bull-dozers, dumper trucks and tipper lorries will be used to demolish existing buildings and collect and remove material from site. Noise is likely to be greatest where demolition is taking place although this will move around the site and will thus be relatively short-term in nature.
- 9.9.10** There will be a number of tipper lorries removing material from site, these movements would take place during normal working hours.
- 9.9.11** Demolition activities are likely to be the noisiest activity undertaken during the construction of the New Settlement area, these activities are likely to be audible above background noise in external areas of the nearest properties outside of the site when they are closest. It may also be possible to just detect noise from demolition when inside a property with opened windows.

### **Foundations**

- 9.9.12** The majority of the buildings will require strip foundations, although it is possible some piled foundations maybe required. Where piling is required, the choice of piling method will affect the noise produced substantially. Use of concrete piles dug using a Rotary auger is likely to be less intrusive than impact piling. However both methods will need materials delivered by HGV/ cement lorry.
- 9.9.13** The laying of foundations will not generally require the use of piled foundations at the majority of the properties will be constructed using standard house building techniques i.e. strip foundations. The noisiest aspect of this activity is the excavation for footings with a mechanical digger. Noise during this aspect of foundation construction maybe just audible above background noise in external areas of the nearest properties outside of the site, however, it is unlikely to be audible within properties.
- 9.9.14** If piled foundations are required, the technique of piling will affect the amount of noise perceived at the nearest properties to the site. In terms of noise generation, the most intrusive form of piling is driven piling, if this were required it is likely to be audible above

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**Heyford Park Environmental Statement**

background noise levels in external areas of the nearest properties. It may also be just audible within the properties if windows were open.

**9.9.15** Other forms of piling are less likely to be audible within properties outside of the site.

**Superstructure construction**

**9.9.16** Noise from superstructure construction will depend on the method chosen e.g. Brick / Block, concrete or steel framed. Whichever construction is used; cranes (either fixed, wheeled or tracked), pneumatic hand tools, back hoe excavators may be used along with concrete pumps or mixers. The amount of concrete to be pumped will increase if the building is constructed using a concrete frame or floors.

**9.9.17** It is not anticipated that these activities would generally be audible at the nearest properties outside of the site as they are relatively quiet in operation.

**Landscaping and fit-out**

**9.9.18** Landscaping, fit-out and infrastructure will take place as the site is progressively developed. Hand tools, back hoe excavators, bull-dozers and road rollers may be required at various times and depending on the amount of earth movement required; tippers or dumper trucks will be required.

**9.9.19** Ground modelling activities, and any other particularly noisy construction methods, can be restricted to agreed hours of the day. Similarly, times for haulage on and off the site may also be restricted.

**9.9.20** Ground modelling activities may be quite audible at the nearest properties to the site when they are closest if earth moving equipment is utilised, however, these would be a short term transient activity.

**9.9.21** Experience has shown that problems associated with construction noise can be, to a large extent, mitigated by conducting a sensitive public consultation exercise, which must start before the works on site commence. A named person who can be contacted in the event of query or concern is also beneficial. Continued public liaison throughout the works will alleviate many potential problems. Although it has not been possible to calculate noise levels from construction works it is considered that, effects are unlikely to be significant as a consequence of distance between the development and the nearest potentially occupied residences.

## Road Traffic Noise

**9.9.22** Detailed traffic noise predictions have been undertaken using traffic flow data as follows:

- Baseline year – current existing traffic flows inclusive of all current traffic associated with the existing site operations;
- Future prediction years – as defined in the Transport Chapter.

**9.9.23** From the traffic noise data provided it has been observed that the majority of traffic will travel across the site using Camp Road, access to the site is fairly evenly distributed from the major arterial roads leading from various directions to the site.

**9.9.24** The proposed residential development at Heyford Park would attract additional traffic to the area. The Flying Field Area is currently used under temporary permit, the application for permanent commercial use is considered unlikely to give rise to significant increases in traffic. The assessment has been undertaken on the basis of traffic flows provided by the traffic consultant. In most locations, the proportionate change in traffic is insufficient to cause any perceptible increase in noise level (i.e. typically less than 3dB(A)). The greatest increases in noise levels, which are expected to have a minor to significant impact, are likely to occur in the following areas:

- between North Aston Road and Water Street, toward the north -west corner of the site (minor impact, with an increase in the noise level of 4-5dB(A) between 2006 and 2013),
- along parts of Camp Road (minor to moderate impact, with some parts predicted to experience a noise level increase of 2-6dB(A), while the noise levels in other areas will decrease by 3-8dB(A) between 2006 and 2013), and
- Port Way, between Lower Heyford road and Heyford Road (positive moderate to minor negative impact, with changes between -6 to +3dB(A) between 2006 and 2013).

**9.9.25** The traffic flow at one section of Ardley Road (B430), between Hereford Road and Heyford Road, is expected to decrease proportionately, resulting in approximately a halving of loudness (decrease of 7dB(A) between 2006 and 2013).

**9.9.26** It is understood that Middleton Stoney Junction is currently a busy junction that is nearing capacity, consequentially predicted increase in traffic flow is not sufficient to increase traffic noise levels by more than 2dB(A) on any of the approach roads to the junction and is therefore considered of No Significance in terms of noise.

**9.9.27** Detailed road traffic noise prediction results based upon the future year traffic flow scenarios defined in the Transport Chapter are shown in Figure N.A01 in Appendix A3.

### Plant / Machinery Noise

- 9.9.28** Both the New Settlement Area and Flying Field Area of the proposed development may introduce items of plant and equipment associated with the various buildings and utilities. This could be plant associated with ventilation, heating or cooling requirements. The opportunity would be taken at the design stage to limit the noise output from such equipment to a level that would ensure that there would not be an adverse reaction from local residents surrounding the development.
- 9.9.29** The mechanism for control would be by specifying the noise performance of such equipment when considering its suitability for use at this location, this may require incorporation of mitigation such as attenuators or noise screens for particularly noise devices. The proposed target cumulative noise limits for plant installed on the site should be that the rating level (as defined in BS 4142 [British Standards Institution, 1997]) are 5dB(A) below the existing background noise level currently at the nearest noise sensitive locations. The background noise levels taken at the positions surrounding the site have been used to define the design noise limits in Table N5 below. By implementing these cumulative noise limits the effects of plant noise associated with the proposed development would comply with the requirements of BS 4142.

**Table N5** Cumulative plant noise limits

Location	Cumulative Plant Noise Limits	
	Daytime	Night time
Location 6	57	45
Location 7	55	30
Location 8	50	35
Location 9*	23	17
Location 10*	28	21
Location 11*	23	20
Location 12*	21	16
Location 13*	25	22
Location 14*	24	22

\*Wherever possible within the commercial zone, plant noise should be 5dB(A) below the background noise ( $L_{A90}$ ) at the nearest receptor. However, due to the extremely low noise climate of this area of the site and low levels of site activity, such limits may be impractical in many cases. Therefore, to preserve the NEC A rating of potential dwellings outside of the site boundary, an alternative noise limit of 50dB(A) at the site boundary of the site could be applied to cumulative plant noise levels.

### Suitability of Site for Residential Development

**9.9.30** The suitability of the site for residential development has been assessed according to PPG24 described in Section 9.9. Locations 1 to 5 are considered representative of the New Settlement Area. Additionally, locations 9 to 14 of the Flying Field Area have been included in this assessment to provide an indication of the noise environment this zone. Predominantly, the site is reasonably typical of quiet rural locations with the exception of location 4 which during the daytime period is slightly noisier and maybe compared with noise levels that would be associated with a reasonably busy main road. Table N6 below identifies the Noise Exposure Category associated with each location.

**Table N6** Predicted Noise Exposure Categories from measured noise levels

Location	Daytime Noise level (0700-2300) $L_{Aeq,16h}$ dB	Night time Noise Level (2300-0700) $L_{Aeq,8h}$ dB	Noise Exposure Category
1	50	43	A
2	42	34	A
3	44	31	A
4	59	41	B
5	53	46	A
9	40	40	A
10	48	36	A
11	43	39	A
12	42	40	A
13	46	41	A
14	48	42	A

**9.9.31** By comparison of the measured daytime and night time period noise levels identified above and the guidance identified in PPG 24 (see above), it can be seen that planning permission would normally be granted. In the vicinity of Location 4 the site is currently identified as NEC B in which noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise. It is considered that the noise levels in this area are predominantly created by traffic movement on Camp Road currently, traffic noise on Camp Road is expected to increase with the development by 3dB(A) which would not change the NEC rating for the area. Adequate protection against noise could be provided through mitigation measures such as provision of appropriately selected sound insulating building façade elements or noise screening. It should be noted that there will be a mixture of 2 storey and 3 storey buildings

located along camp road with heights of either 5 metres or 8 metres. In order to mitigate noise at these properties using noise screening these would have to be constructed to a height of 2.5 metres or 2.8 metres above road height respectively. Therefore, in order to maintain the open aspect of the site, mitigation will be achieved through orientation of buildings and provision of suitable sound insulating glazing.

## **9.10 MITIGATION**

- 9.10.1** General principles of construction site noise control would be followed according to the guidance given in BS 5228: Part 1 [British Standards Institution, 1997]. This requires that noise control measures would be adopted according to 'Best Practicable Means' (BPM) which includes measures such as specification of plant equipment, hours of operation and HGV access routes. Specific noise control practices could be agreed between the Contractor and the Cherwell District Council if appropriate according to local requirements.
- 9.10.2** Hoarding will be erected around the relevant construction activities on the site if identified as an appropriate form of mitigation in the pre-construction detailed noise assessment. If identified as necessary to be effective at screening noise, this hoarding would have a mass per unit of surface area in excess of 7 kg/m<sup>2</sup>. Plywood sheets attached to a suitable scaffold frame are often used to create temporary screening for this purpose. If appropriate further screening will also be used to provide additional screening around long-term static plant (e.g. generators).
- 9.10.3** Plant machinery such as generators or compressors should be positioned as far from noise sensitive locations as possible and ideally in naturally screened positions. All plant equipment should be adequately maintained to minimise noise emission. With appropriate assessment to identify mitigation measures required and incorporation of the appropriate mitigation prior to commencement of construction activities the residual effects would be not significant.
- 9.10.4** Given that the traffic noise impacts associated with the new development are not considered to be significant in the majority of areas, traffic noise mitigation would be minimal. The only area that is affected by traffic noise and requires the implementation of mitigation is the residential properties facing Camp Road which would otherwise be categorised as NEC B. Appropriately designed acoustic screening, building orientation to locate the gable ends towards the road and glazing selected to provide a suitable level of sound insulation can provide adequate levels of noise mitigation.
- 9.10.5** Refer to Figure N.A01 in Appendix A3



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**Heyford Park Environmental Statement**

**9.10.6** Provided that the specification of any building plant and machinery results in target noise criteria specified in Section 9.9 there will be no requirement for additional mitigation of any mechanical plant associated with the development.

**9.11 RESIDUAL EFFECTS**

**9.11.1** It is considered that there will be no residual noise provided the appropriate noise mitigation measures described above are put in place.