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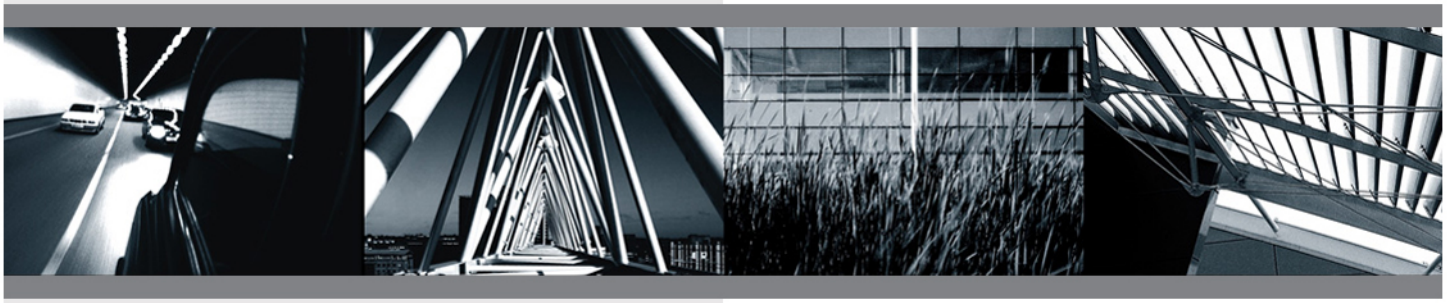
BOURNE ESTATE (SOUTH) REGENERATION

AMBIENT NOISE ASSESSMENT



For

Camden

Project No:

10907

November 2012

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Author	Ruth Jones
Project Partner	David Innes
Project Number	10907
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Contents

1.0 INTRODUCTION

1.1. ACCON UK Limited ('ACCON') was commissioned by Campbell Reith Hill LLP ('CampbellReith') on behalf of the London Borough of Camden to carry out an Ambient Noise Assessment at the Bourne Estate, Holborn, situated in the London Borough of Camden.

1.2. The objective of the Ambient Noise Assessment was to determine the extent to which the site is currently affected by environmental noise and the extent to which the site would be suitable for redevelopment for new residential properties by using a Planning Policy Guidance (PPG) 24 style assessment methodology.

1.3. The report comprises of the following:

- Noise measurement survey;
- Noise assessment criteria; and
- Ambient noise level assessment

1.4. The Ambient Noise Assessment is contained within Appendix A.

2.0 AMBIENT NOISE LEVEL ASSESSMENT

NOISE IMPACT AT THE BOURNE ESTATE

2.1. Table 2.1 provides the free-field noise levels for the Bourne Estate development area for both the daytime and night-time periods and identifies that the measured noise levels at the proposed development site would fall within Noise Exposure Category B for both the daytime and night time periods.

Table 2.1: Noise Levels and the PPG 24 Noise Exposure Categories

Monitoring Location	Daytime Noise Level $L_{Aeq\ 16\ hours}$	NEC	Category Criteria Daytime $L_{Aeq\ 16\ hours}$	Night Time Noise Level $L_{Aeq\ 8\ hours}$	NEC	Category Criteria Night Time $L_{Aeq\ 8\ hours}$
B1	58.7	B	55-63	53.3	B	45-57
B2	61.3	B	55-63	55.9	B	45-57
B3	57.0	B	55-63	51.6	B	45-57

2.2. The results of the noise measurement study have been inputted into the CadnaA noise modelling software in order to generate day and night time noise contours across the site. It can be seen from Figure 5.4 and Figure 5.5 (within Appendix A) that the majority of the site is currently located within NEC A for both the daytime and night time periods. It should however be noted that, should any of the existing buildings surrounding the site in the immediate vicinity of the more heavily trafficked roads be scheduled for demolition, there could be an increase in the number of residents exposed to NEC B or above.

3.0 SUMMARY AND CONCLUSION

3.1. A detailed noise measurement study has been carried out in order to determine the current noise climate affecting Bourne Estates using a PPG24 style assessment methodology.

3.2. The study has shown that for the Bourne Estate the majority of the estate falls within Noise Exposure Category[1] (NEC) A for both the daytime and night time periods, with the exception of the Gooch House which is within NEC B for both periods.

3.3. It should also be noted that the existing buildings surrounding the site are effectively acting as noise barriers and accordingly the shielding effect of the replacement buildings needs to ensure that noise level within the body of the estate should not significantly increase.

[1] Noise Exposure Categories outlined within the Planning Policy Guidance Note 24 'Planning and Noise' (Now Revoked)

APPENDIX A: AMBIENT NOISE ASSESSMENT (ACCON UK)

Report for

The London Borough of Camden

Bourne Estate, London Borough of Camden

Ambient Noise Assessment

Status: Final **Date: 05.11.2012**

The London Borough of Camden

Noise Assessment

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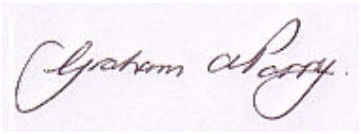
Approved By:	 **Graham Parry** **Managing Director**
Report For:	**The London Borough of Camden**
Date:	**05.11.2012**
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Status:	**Final**

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1. INTRODUCTION

ACCON UK Limited (ACCON) has been commissioned by Ruth Jones of Campbell Reith Ltd on behalf of the London Borough of Camden to carry out an ambient noise assessment for the Bourne Estate, situated in the London Borough of Camden.

This report follows on from work carried out by ACCON for a noise assessment previously carried out for both the Tybalds and Bourne Estates (ACCON Report dated 04.04.2012). This report takes account of the proposed layout for the Bourne Estate which is shown in **Figure 1.1** below.

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Figure 1.1: Proposed Bourne Estate Layout

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The object of this report will be, through on site noise measurements and associated noise modelling, to determine the extent to which the site is currently affected by environmental noise and inter alia the extent to which the site would be suitable for redevelopment for new residential properties.

An acoustic glossary is provided in **Appendix 1** and a location plan is displayed in **Appendix 2**.

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2. THE NATURE, MEASUREMENT AND EFFECT OF NOISE

Noise is often defined as sound that is undesired by the recipient. Whilst it is impossible to measure nuisance caused by noise directly, it is possible to measure the loudness of that noise. 'Loudness' is related to both sound pressure and frequency, both of which can be measured. The human ear is sensitive to a wide range of sound levels. The sound pressure level of the threshold of pain is over a million times that of the quietest audible sound. In order to reduce the relative magnitudes of the numbers involved, a logarithmic scale of decibels (dB) is normally used, based on a reference level of the lowest audible sound.

The response of the human ear is not constant over all frequencies. It is therefore usual to weight the measured frequencies to approximate the human response. The resulting 'A' weighted decibel, dB(A), has been shown to correlate closely to the subjective human response.

When related to changes in noise, a change of ten decibels from say 60 dB(A) to 70 dB(A) would represent a doubling in 'loudness'. Similarly, a decrease in noise from 70 dB(A) to 60 dB(A) would represent a halving in 'loudness'. A change of 3 dB(A) is generally considered to be just perceptible[1]. **Table 2.1** details typical noise levels.

Table 2.1: Typical Noise Levels

Approximate Noise Level (dB(A))	Example
0	Limit of hearing
30	Rural area at night
40	Library
50	Quiet office
60	Normal conversation at 1 m
70	In car noise without radio
80	Household vacuum cleaner at 1 m
100	Pneumatic drill at 1 m
120	Threshold of pain

[1] Communities & Local Government (1994). Planning Policy Guidance 24: Planning & Noise.

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3. NOISE MEASUREMENT SURVEY

In order to determine the extent to which the site is currently affected by environmental noise, a detailed noise measurement study has been carried out at various locations on the two estates. Noise measurements have been carried out in order to determine the overall $L_{Aeq.16hrs}$ and $L_{Aeq.8hrs}$ for the day and night-time periods at a number of measurement positions.

The noise measurements utilised both a Norsonic 118 and Norsonic 116 Type 1 Precision Sound Level Meters, both of which have current certificates of calibration. Before and after the measurement periods the equipment was calibrated in order to ensure that the equipment had remained within reasonable calibration limits (+/- 0.5 dB).

3.1. Noise Measurements at the Bourne Estate

Noise measurements were carried out between Wednesday 21st March 2012 and Thursday 22nd March 2012. The weather was dry with partial cloud and some moderate wind (<5 m/s) with a temperature of up to 19°C, dropping to 5°C overnight. Noise measurements were carried out at both a semi-permanent location for a period of 24 hours, and at two additional satellite positions throughout the daytime period. As the noise climate affecting the site was similar across all three noise measurement locations, the satellite positions noise datasets have been normalised to provide a full 24 hour set of results for each of the measurement positions. The noise measurement positions were chosen to represent the worst effected extremities of the site in order to allow noise contours to be produced. The 24 hour noise monitoring position (B1) was located on a balcony at Gooch House which was located within the vicinity of Grays Inn Road. The measurement positions are identified in **Appendix 2**.

The results of the noise levels for the measured free-field positions are summarised in **Table 3.1** below.

Table 3.1: Summary of Corrected Free Field Noise Levels

Period (hours)	Noise Level (L_{Aeq} dB)		
	Measurement positions		
	B1 (24 hour)	B2	B3
07:00-23:00	58.7	61.3	57.0
23:00-07:00	53.3	55.9	51.6

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Maximum noise levels of 76.1 L_{Amax} were recorded during the period 06:00-07:00 hours, which is below the 82 L_{Amax} for individual noise events during the night time period referenced in PPG24.

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4. NOISE ASSESSMENT CRITERIA

The new National Planning Policy Framework (NPPF) released in March 2012 has replaced the Planning Policy Guidance which previously covered planning and pollution control and new development in England. The purpose of the planning system is to contribute to the achievement of sustainable development. There are three dimensions to sustainable development: economic, social and environmental. The environmental role is to contribute to protecting and enhancing our natural, built and historic environment; and as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate to adapt to climate change including moving to a low carbon economy.

One of the core planning principles is to contribute to conserving and enhancing the natural environment and reducing pollution. Allocations of land for development should prefer land of lesser value, where consistent with other policies in the Framework. The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.

Paragraph 123 of the NPPF states that planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts (see Explanatory Note to the Noise Policy Statement for England (DEFRA)) on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts (see Explanatory Note to the Noise Policy Statement for England (DEFRA)) on health and quality of life arising from noise from new development, including through the use of conditions;
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land use since they were established (Subject to the provisions of the Environmental Protection Act 1990 and other relevant law); and
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

The Noise Policy Statement for England (NPSE) was developed by DEFRA and published in March 2010. The vision of the NPSE is to '*Promote good health and good quality of life through the effective management of noise within the context of Government policy on sustainable development.*

Planning Policy Guidance Note 24 'Planning and Noise' (PPG 24) was previously the main guidance document with respect to acceptable noise levels for dwellings (now revoked by NPPF).

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4.1. Planning Policy Guidance Note 24 'Planning and Noise' (Now Revoked)

In September 1994, the then Department of Environment published the Planning Policy Guidance Note 24 'Planning and Noise'. The document (PPG 24) was intended to be used by Local Planning Authorities as guidelines in determining the acceptability of proposed residential development sites that may be affected by noise.

The PPG 24 stated that:

"Noise Exposure Categories for Dwellings

When assessing a proposal for residential development near a source of noise, local planning authorities should determine into which of the four noise exposure categories (NEC's) the proposed site falls, taking account of both day and night-time noise levels. Local planning authorities should have regard to the advice in the appropriate NEC, as shown in ***Table 4.1*** *below:*

Table 4.1: PPG 24 Noise Exposure Categories

NEC	*Planning Response*
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, conditions should be imposed to ensure a commensurate level of protection against noise.*
D	*Planning permission should normally be refused.*

A recommended range of noise levels is given below for each of the NEC's for dwellings exposed to noise from road, rail, air and 'mixed sources'. Annex 2 (of the PPG) provides a detailed explanation of how the boundaries of each of the NEC's have been derived. Paragraph 9 of the main text explains that in some cases local planning authorities may be able to justify a range of NEC's of up to 3 dBA above or below those recommended."

The recommended noise guideline levels are shown in **Table 4.2** below.

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Table 4.2: Noise Levels Corresponding to the NECs for New Dwellings

Noise Source	Noise Exposure Category			
	A	B	C	D
Road Traffic				
0700-2300	<55	55-63	63-72	>72
2300-0700[2]	<45	45-57	57-66	>66
Rail Traffic				
0700-2300	<55	55-66	66-74	>74
2300-0700[2]	<45	45-59	59-66	>66
Air Traffic				
0700-2300	<57	57-66	66-72	>72
2300-0700[2]	<48	48-57	57-66	>66
Mixed Sources				
0700-2300	<55	55-63	63-72	>72
2300-0700[2]	<45	45-57	57-66	>66

Local Authorities could adopt a flexible approach to the above criteria and could depending on their areas and local requirements adjust the criteria. It should be noted that in line with other Government Policy with respect to residential development and sustainable development, it is now common practice to ensure that a good standard of internal noise climate can be obtained within habitable rooms and appropriate advice on this is provided in BS8233.

4.2. Noise Policy Statement England (NPSE)

The NPSE aims to *'Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life'*

4.3. British Standard BS 8233

BS 8233: *Sound Insulation and Noise Reduction for Buildings – Code of Practice* has a number of design criteria and limits for intrusive external noise. The guidelines are designed to achieve reasonable resting/sleeping conditions in bedrooms and good listening

[2] Night-time noise levels (2300-0700): sites where individual noise events regularly exceed 82 dB L_{Amax} (S time weighting) several times in any one 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).

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conditions in other rooms. Those most appropriate to the residential environment are reproduced in **Table 4.3.**

Table 4.3: Summary of Internal Noise Criteria: BS 8233

Criterion	Typical situations	Good Level $L_{Aeq,T}$	Reasonable Level $L_{Aeq,T}$	Reasonable Peak L_{Amax}
BS 8233 Reasonable resting/sleeping conditions	Living rooms	30	40	-
	Bedrooms	30	35	45

4.4. World Health Organisation Guidelines for Community Noise

The World Health Organisation (WHO) has developed guidelines designed to minimise the adverse effects of noise. The guidelines relevant to residential noise exposure are detailed in **Table 4.4**. For each specific environment the stated noise levels are the maximum noise levels to avoid the health effect noted.

Table 4.4: WHO Community Noise Guideline Values

Specific Environment	Critical health effect(s)	L_{Aeq} dB	Time Base (hours)	L_{Amax} (fast) dB
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor Values	45	8	60

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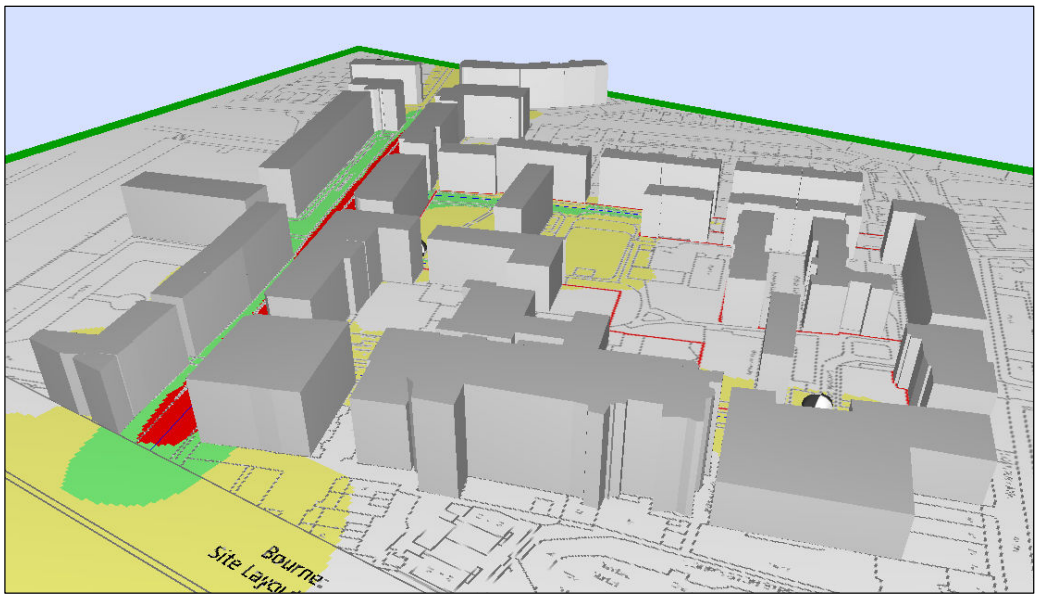
5. AMBIENT NOISE LEVEL ASSESSMENT

Figure 5.1 below provides an example of the 3D model that has been created in CadnaA to analyse the existing noise climate at the Bourne Estate. It also displays the NEC contours for the night time period at the existing residential estate.

Figure 5.1: 3D view of CadnaA Noise Model for Bourne Estate



5.1. Noise Impact at the Bourne Estate

Table 5.1 provides the free-field noise levels for the Bourne Estate development area for both the daytime and night-time periods. **Table 5.1** identifies that the measured noise levels at the proposed development site would fall within Noise Exposure Category B for both the daytime and night time periods.

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Table 5.1: Noise Levels and the PPG 24 Noise Exposure Categories

Monitoring Location	Daytime Noise Level $L_{Aeq\ 16\ hours}$	NEC	Category Criteria Daytime $L_{Aeq\ 16\ hours}$	Night Time Noise Level $L_{Aeq\ 8\ hours}$	NEC	Category Criteria Night Time $L_{Aeq\ 8\ hours}$
B1	58.7	B	55-63	53.3	B	45-57
B2	61.3	B	55-63	55.9	B	45-57
B3	57.0	B	55-63	51.6	B	45-57

We have utilised the results of the noise measurement study into the CadnaA noise modelling software in order to generate day and night time noise contours across the site. It can be seen from **Figure 5.2** and **Figure 5.3** that the majority of the site is currently located within NEC A for both the daytime and night time periods. It should however be noted that, should any of the existing buildings surrounding the site in the immediate vicinity of the more heavily trafficked roads be scheduled for demolition, there could be an increase in the number of residents exposed to NEC B or above.

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Figure 5.2: Bourne Estate PPG 24 Daytime Noise Contours

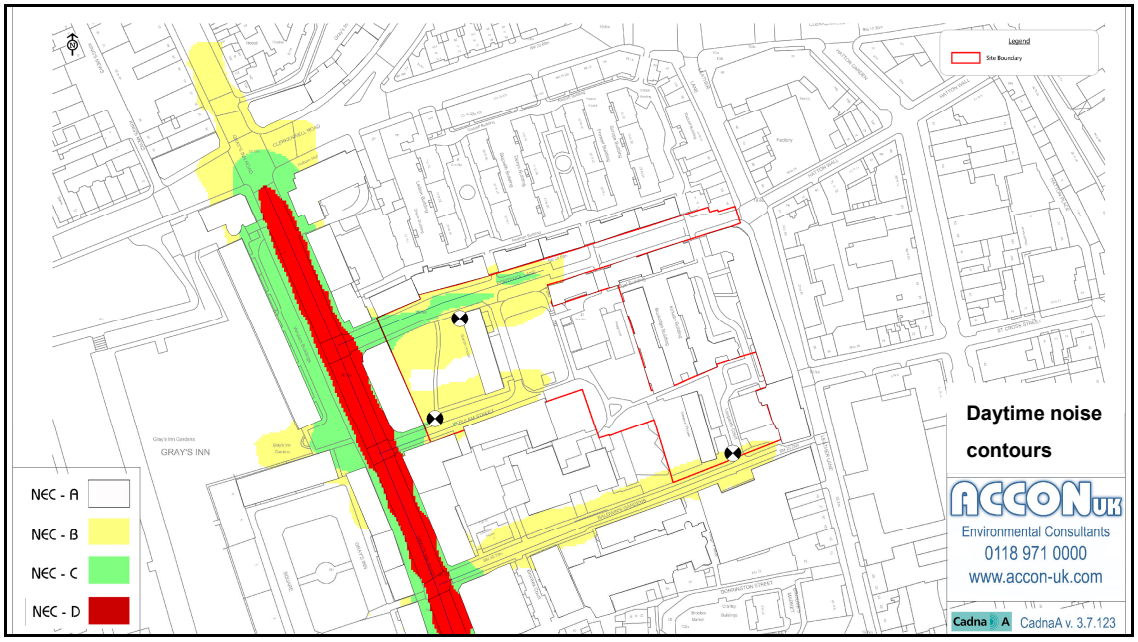

Figure 5.3: Bourne Estate PPG 24 Night Time Noise Contours

Figure 5.4 below provides an example of the 3D model that has been created in CadnaA to analyse the future noise climate at the Bourne Estate.

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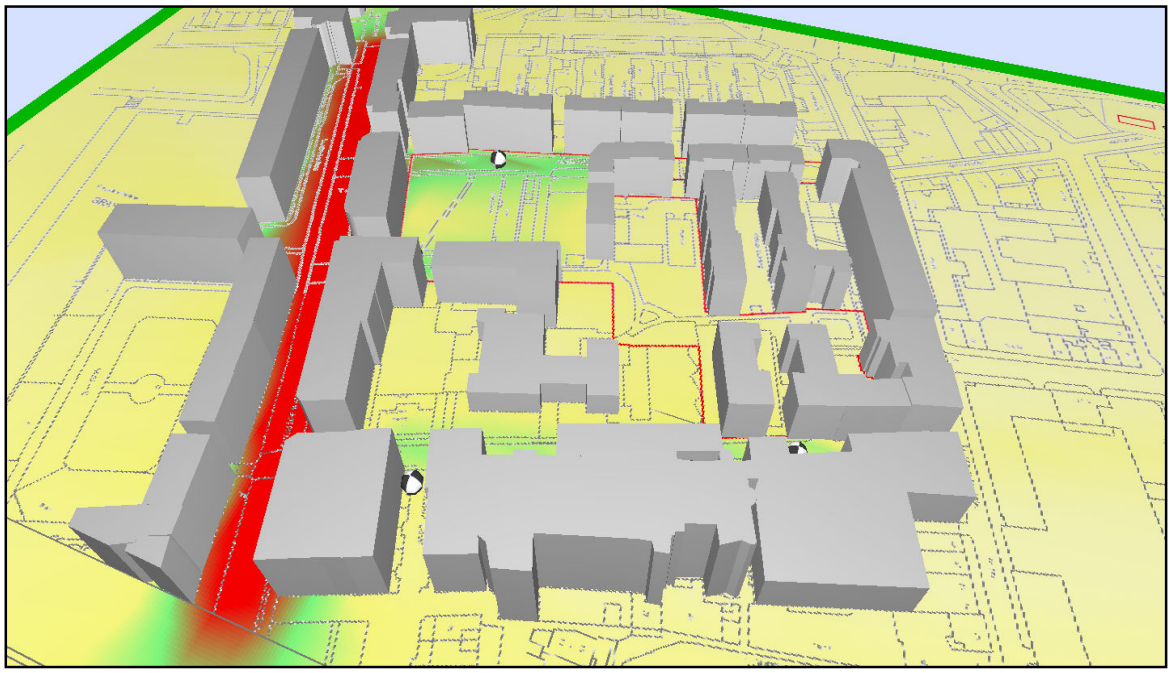
Figure 5.4: 3D view of CadnaA Noise Model for Bourne Estate



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6. CONCLUSION

A detailed noise measurement study has been carried out in order to determine the current noise climate affecting Bourne Estate using a PPG24 style assessment methodology.

For the Bourne Estate the majority of the estate falls within NEC A for the daytime and night time periods, with the exception of the Gooch House which is within NEC B for both periods.

It should also be noted that the existing buildings surrounding the site are effectively acting as noise barriers and accordingly the shielding effects of the replacement buildings needs to ensure that noise levels within the body of the estate should not significantly increase.

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Appendix 1
Glossary of Acoustic Terms

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Appendix 1: Glossary of Acoustic Terms

'A'-Weighting - This is the main way of adjusting measured sound pressure levels to take into account human hearing, and our uneven frequency response.

Decibel (dB) - This is a tenth (deci) of a bel. Decibel can be a measure of the magnitude of sound, changes in sound level and a measure of sound insulation. Decibels are not an absolute unit of measurement but are an expression of ratio between two quantities expressed in logarithmic form.

$L_{Aeq,T}$ - The equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period, T. T may be as short as 1 second when used to describe a single event, or as long as 24 hours when used to describe the noise climate at a specified location. $L_{Aeq,T}$ can be measured directly with an integrating sound level meter.

L_{A10} - The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 10 per cent of a given time and is the L_{A10T}. The L_{A10} is used to describe the levels of road traffic noise at a particular location.

L_{A50} - The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 50 per cent of a given time and is the L_{A50T}.

L_{A90} - The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 90 per cent of a given time and is the L_{A90T}. The L_{A90} is used to describe the background noise levels at a particular location.

L_{Amax} - The 'A'-weighted maximum sound pressure level measured over a measurement period.

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Appendix 2
Site Plan & Monitoring Locations

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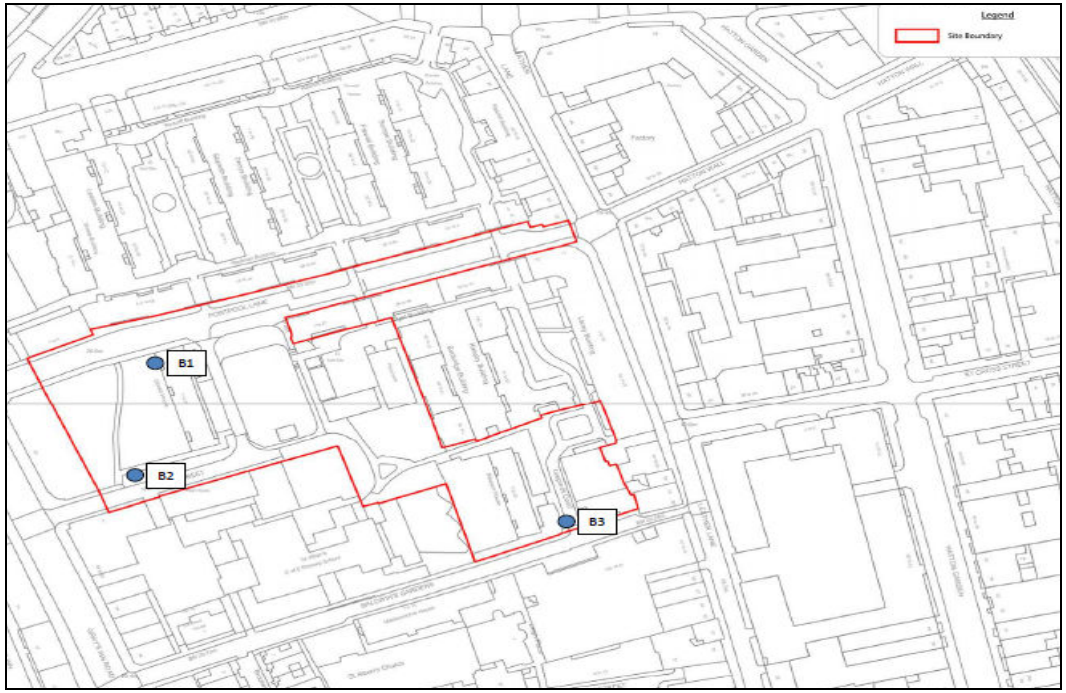
Appendix 2: Site Plan & Monitoring Locations



LEGEND

Noise Monitoring Position

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S

Client: The London Borough of Camden		Description: Location of the Proposed Development with Noise Monitoring Locations		Design	NW	05/11/12	ACCON UK
				Drawn	NW	05/11/12	
Rev:	Description: FINAL	Project: Bourne Estate		Checked	GP	05/11/12	*Appendix Two*
				Approved	GP	05/11/12	Scale: Not to Scale

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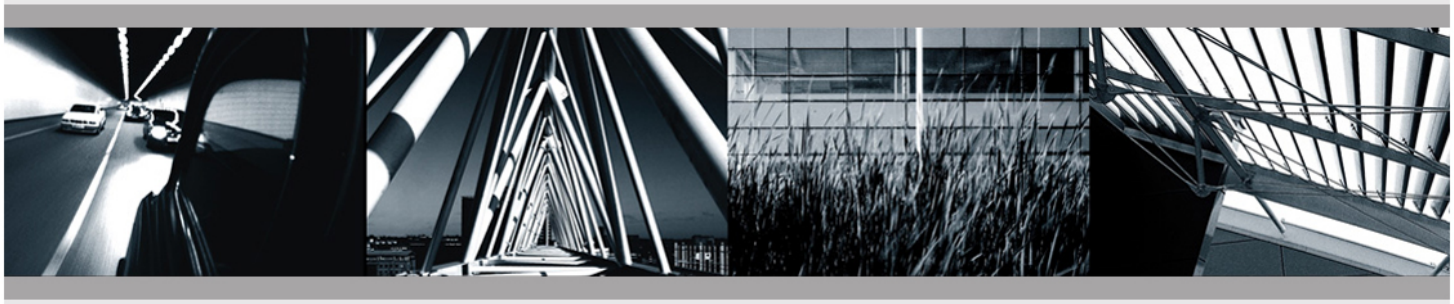

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