

AIRO



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**ENVIRONMENTAL NOISE SURVEY
AT
61 - 65 NIGHTINGALE ROAD,
RICKMANSWORTH,
HERTFORDSHIRE**

RECEIVED

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ENVIRONMENTAL NOISE SURVEY**AT****61 - 65 NIGHTINGALE ROAD,
RICKMANSWORTH,
HERTFORDSHIRE****1. INTRODUCTION**

AIRO is retained by Henry Homes Plc to provide independent specialist advice and measurement services in respect of a proposed residential development of four houses at 61 - 65 Nightingale Road, Rickmansworth, Hertfordshire.

This report presents the results of noise level measurements made in the front and rear gardens of No. 63 Nightingale Road, together with an environmental noise assessment to determine the expected road traffic noise levels if the development were to proceed and the likely impact this would have on both the existing neighbouring properties and the proposed dwellings.

2. DESCRIPTION OF THE SITE

The proposed site is formed by varying proportions of the rear gardens of No. 61 to No. 65 Nightingale Road. Access would be provided by the demolition of No. 63 Nightingale Road to make way for a new no-through road to join Nightingale Road.

The proposed road will lead to three detached houses at the rear of the site, with one further detached house to be built to the side of the road (approximately at the current location of No. 63 Nightingale Road).

The site is bounded to the west by Nightingale Road and to the east by a cemetery with the A404 road beyond. It is adjacent to existing private residential gardens on all other sides. A London Underground and mainline railway is located approximately 150 metres behind Nightingale Road, to the west of the site.

Accordingly, the main potential noise sources currently affecting the site are road traffic from Nightingale Road (particularly in the front gardens of the existing properties) and A404 (mainly in the rear gardens of the existing properties), aircraft flyovers and birdsong. In addition, noise could arise from train passbys and powered tools (e.g. lawnmowers) in adjacent gardens.

3. NOISE MEASUREMENT UNITS

3.1 A-Weighted Equivalent Continuous Sound Level - $L_{Aeq,T}$

Noise levels quoted in the report are, in the main, A-weighted Equivalent Continuous Sound Levels or $L_{Aeq,T}$ in dB.

As its name suggests, the $L_{Aeq,T}$ is a measure of the acoustic energy of a fluctuating noise climate over a given period T expressed as the single continuous noise level having the same energy as the time varying signal.

The 'A' within the descriptor means A-weighted, an internationally agreed frequency response generally similar to that of the human ear so that A-weighted sound levels in dB correspond reasonably well with what is heard.

For assessment purposes, the day is typically divided into a 16-hour daytime period (07:00 to 23:00) and an 8-hour night-time period (23:00 to 07:00). The period values may be derived from the logarithmic average of the relevant hourly values.

3.2 Maximum Noise Level - L_{AFmax} , L_{ASmax}

In some circumstances it is useful to quantify the maximum level of fluctuating noise and a commonly used descriptor is L_{Amax} . The L_{Amax} represents the maximum reading given by a sound level meter for a given event or period of time and is usually qualified by F for 'Fast' or S for 'Slow' according to the response time setting of the meter.

3.3 A-weighted Percentile Levels - $L_{An,T}$

Percentile noise levels are a statistical representation of the time varying level. The value is the noise level L exceeded for $n\%$ of the period T .

To measure background environmental noise levels the statistical index L_{A90} is commonly used. The L_{A90} is the Sound Pressure Level that is exceeded for 90% of the measurement period. The L_{A90} therefore discriminates against short duration peaks of noise and is consequently considered to provide a better representation of typical minimum levels compared with, for example, the L_{Aeq} .

4. MEASUREMENT SURVEY

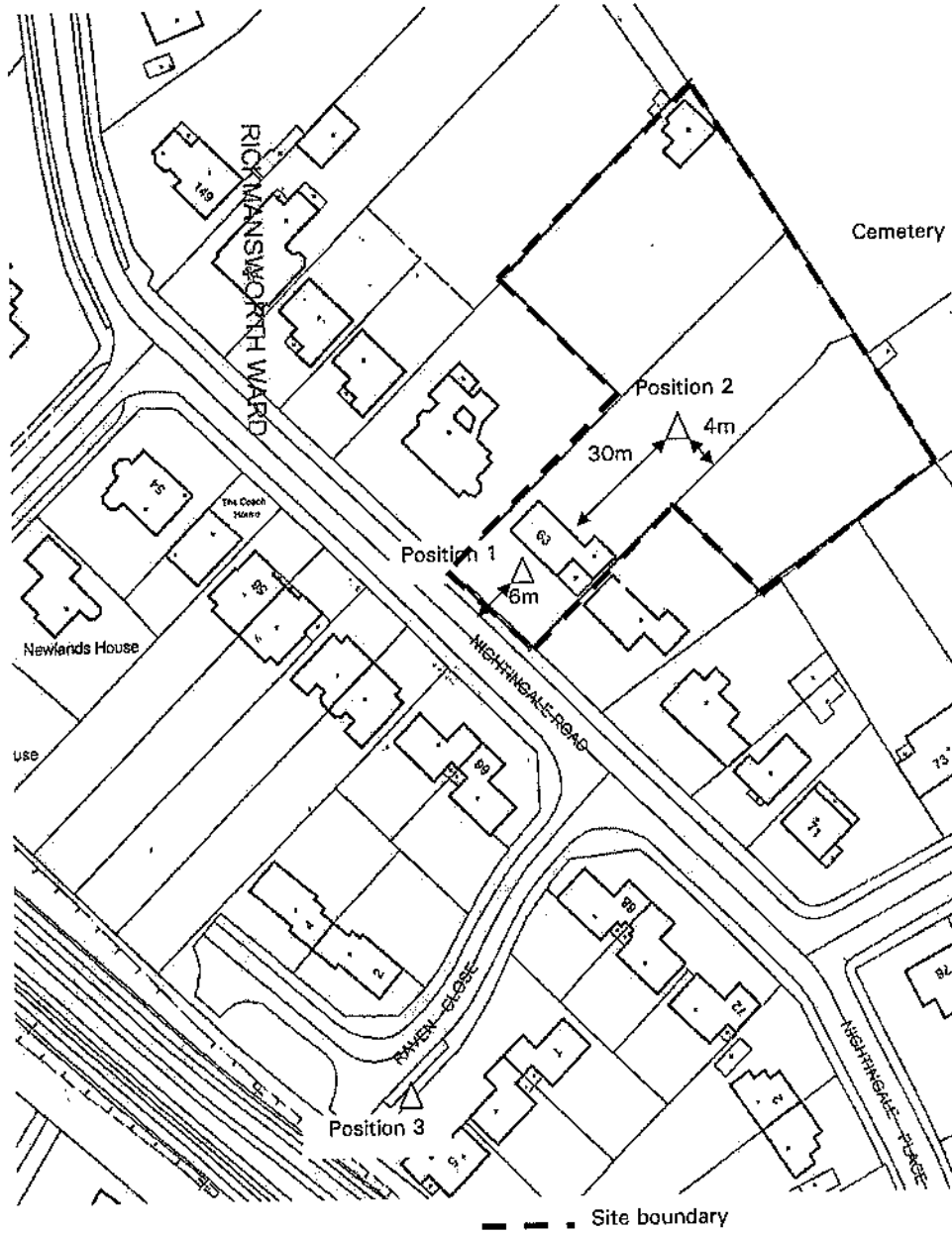
Measurements of the current noise levels were made over a 24-hour period in the front and rear gardens of No. 63 Nightingale Road. Position 1 was located approximately 7 metres from the front of the house and 6 metres from the edge of Nightingale Road. Position 2 was approximately 30 metres from the rear of No. 63 and 4 metres from the boundary to No. 65, near to the location of the front façade of Plot 2 of the proposed development. The measurement period commenced at 13:00 on Monday 2 June 2008 and ended at 13:00 on Tuesday 3 June 2008.

The noise level measurements comprised long-term data logging of the noise level every 2 seconds and the logging of hourly values. At each position, the microphone was located at a height of 1.2 - 1.5 metres above local ground level and at least 3.5 metres from any other reflective surface so that the measured levels can be considered as free-field.

In addition, samples of specific noise events were measured at both positions, as well as at a further location (Position 3), 1 metre from the kerbside in front of No. 5 Raven Close. This is a nearby residential no-through road providing access to five properties and, as such, is likely to have similar types of car movements as the access road for the proposed development (i.e. low speed, accelerating and braking, turning and parking movements). Therefore, noise levels arising from car movements, engines starting and doors shutting measured at Position 3 can be considered representative of the types and levels of noise expected on the proposed road.

The measurement locations can be seen in Figure 1 below and details of the measurement equipment used and the recorded weather conditions are given in Appendix A.

Figure 1 - Measurement Locations



5. RESULTS

5.1 Position 1 - Front garden of No. 63 Nightingale Road

Table 1 - Existing Background Noise Levels, Long-term Data

Period Commencing	Free-Field Noise Levels in dB		
	L_{Aeq}	L_{A90}	L_{AFmax}
<u>02/06/08</u>			
13:00	60	42	85
14:00	60	42	79
15:00	61	44	77
16:00	64	44	93
17:00	62	44	76
18:00	61	43	80
19:00	60	41	84
20:00	58	39	77
21:00	57	37	77
22:00	53	34	73
23:00	48	32	72
<u>03/06/08</u>			
00:00	46	29	72
01:00	44	29	69
02:00	48	34	74
03:00	48	31	65
04:00	50	42	74
05:00	49	39	74
06:00	56	38	77
07:00	66	44	82
08:00	66	53	85
09:00	64	48	82
10:00	63	48	81
11:00	62	44	79
12:00	61	44	78
Daytime (07:00 - 23:00)	62	34 - 53	93
Night-time (23:00 - 07:00)	50	29 - 42	77

Figure 2 - Position 1, Time History

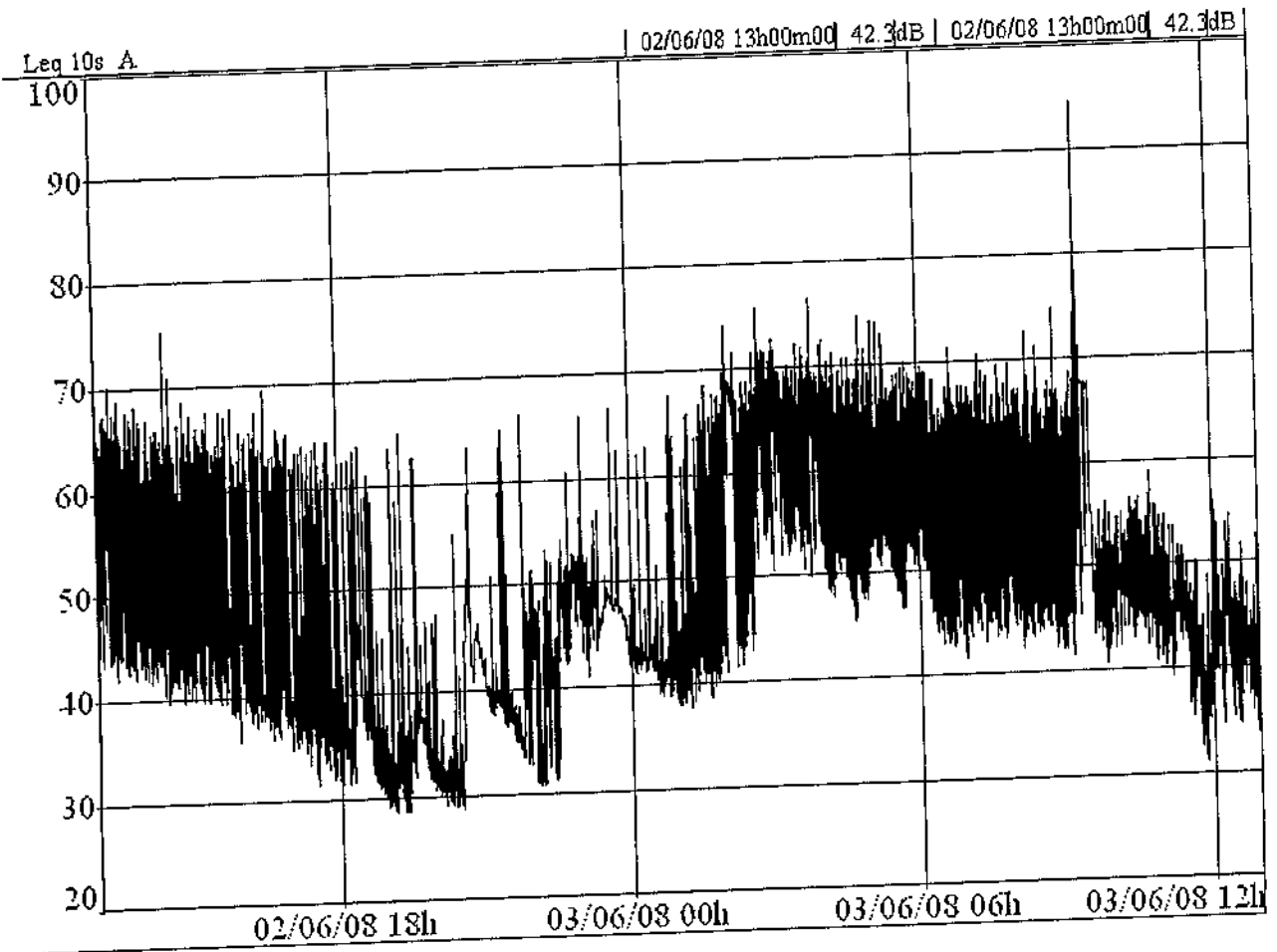


Table 2 - Position 1, Sample Noise Events

Time/Date	Duration, T (mins:secs)	Event Description	Free-Field Noise Levels in dB	
			$L_{Aeq,T}$	L_{AFmax}
<u>02/06/08</u>				
13:13	00:09	Small car drive-past on Nightingale Road	62	72
13:38	00:15	Lorry drive-past (uphill)	71	79
13:38	00:10	Small car drive-past (downhill)	58	70
13:39	00:14	Car with noisy exhaust drive-past	76	88
13:45	00:15	Aircraft flyover	52	57
13:46	00:16	Distant Emergency sirens	49	55
13:46	00:08	Train passby (in distance)	45	50
13:58	00:11	Large car drive-past (uphill)	64	72
14:00	00:34	Aircraft flyover	51	59
<u>03/06/08</u>				
12:15	00:14	Car drive-past (uphill)	63	72
12:17	00:14	Small lorry passby (downhill)	67	76

5.2 Position 2 - Rear Garden of No. 63 Nightingale Road

Table 3 - Existing Background Noise Levels, Long-term Data

Period Commencing	Free-Field Noise Levels in dB		
	L_{Aeq}	L_{A90}	L_{AFmax}
<u>02/06/08</u>			
13:00	49	43	70
14:00	48	44	64
15:00	49	44	62
16:00	53	45	70
17:00	52	46	67
18:00	49	44	70
19:00	47	43	66
20:00	46	41	64
21:00	44	38	59
22:00	41	34	58
23:00	39	31	57
<u>03/06/08</u>			
00:00	37	28	50
01:00	39	28	55
02:00	46	32	70
03:00	39	29	47
04:00	45	39	60
05:00	44	39	60
06:00	48	40	64
07:00	51	45	61
08:00	52	49	63
09:00	52	48	65
10:00	53	48	64
11:00	51	46	66
12:00	50	46	65
Daytime (07:00 - 23:00)	50	34 - 49	70
Night-time (23:00 - 07:00)	44	28 - 40	70

Figure 3 - Position 2, Time History

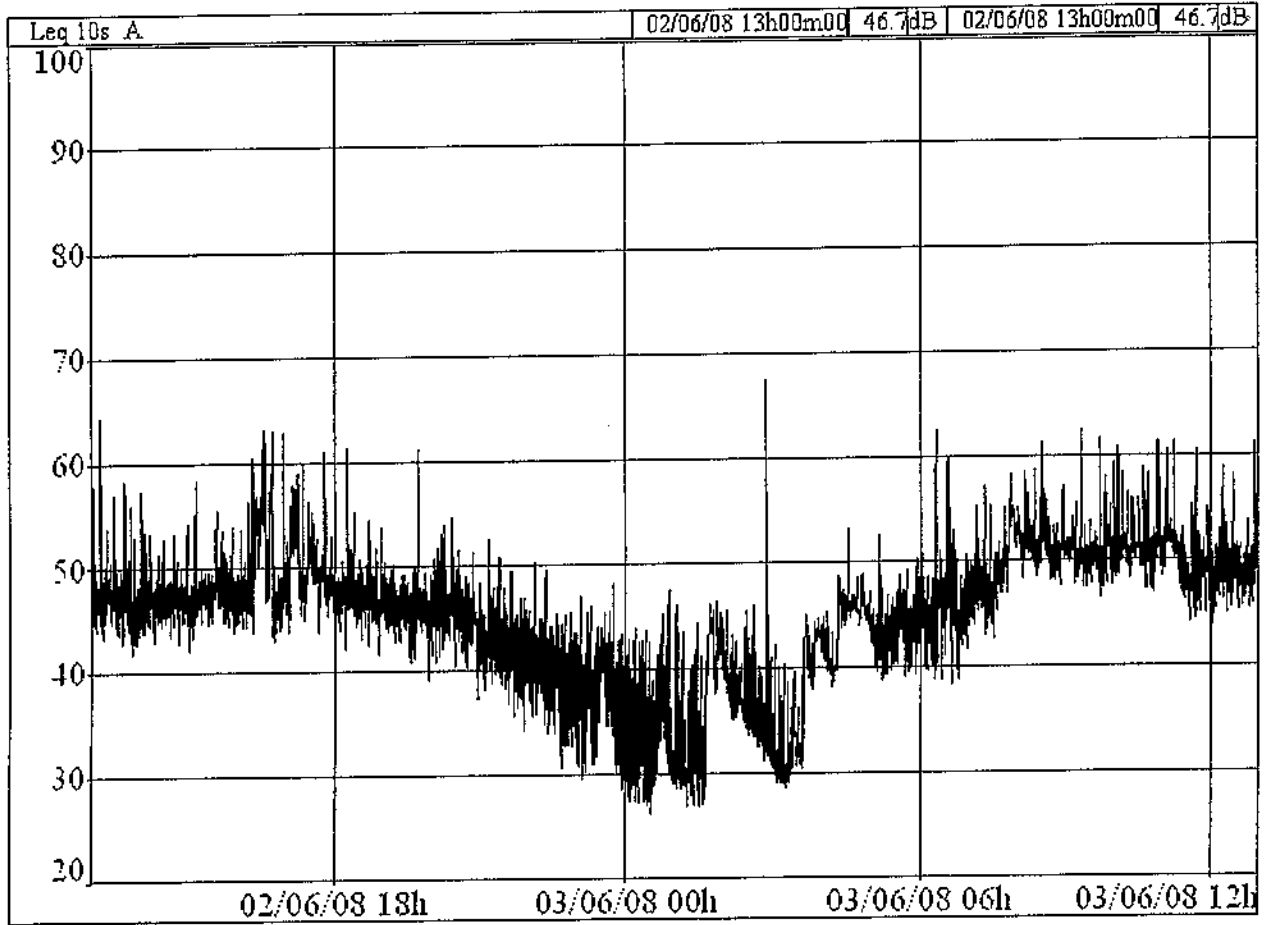


Table 4 - Position 2, Sample Noise Events

Time/Date	Duration, T (mins:secs)	Event Description	Free-Field Noise Levels in dB	
			$L_{Aeq,T}$	L_{AFmax}
<u>02/06/08</u>				
12:30	00:34	Aircraft flyover	47	56
12:31	00:40	Aircraft flyover	48	55
12:36	01:01	Birdsong + distant traffic	47	53
12:44	00:07	Large lorry on Nightingale Road	50	52
13:01	00:49	Low-flying light aircraft	53	63
13:05	01:01	Road traffic on A404	47	49
13:10	00:31	Helicopter flyover	58	69
<u>03/06/08</u>				
13:19	00:28	Aircraft flyover	56	61
13:23	01:01	Lawnmower in nearby garden	49	54
13:26	00:32	Birdsong	49	54
13:28	00:20	Lawnmower in nearby garden	51	56
13:48	00:32	Aircraft flyover	52	57
13:52	00:38	Aircraft flyover	56	62

5.3 Measured Sample Car Movements

A microphone and sound level meter were placed at Position 3 for three separate 30 minute periods (14:20 - 14:50 and 16:00 - 16:30 on Monday 2 June and 12:45 - 13:15 on Tuesday 3 June). However, only one car movement occurred in Raven Close during any of these periods and so, in order to sample a wider range of car movements, other samples were measured at Position 1. All relevant sample data are given overleaf.

Table 5 - Positions 1 and 3, Sample Car Movements

Time/ Date	Measurement Position	Duration, T (mins:secs)	Event Description	Free-field Noise Levels (dB)		
				L_{AFmax}	L_{Aeq}	$L_{Aeq,1h}^*$
<u>02/06/08</u> 13:51	1 (\approx 10m from source)	00:39	Diesel car starts, reverses off drive & then drives off	66	54	34
16:12	3 (\approx 4m from source)	00:52	Car loads up with 3 people, doors shut, engine starts, reverses & then drives off	68	56	38
<u>03/06/08</u> 13:59	Kerbside on Nightingale Road \approx 1m from (source)	00:04	Car door shutting	78	65	35
14:01	Kerbside on Nightingale Road \approx 1m from (source)	00:03	Car door shutting	81	68	37
14:06	Kerbside on Nightingale Road \approx 1m from (source)	00:21	Car engine idling	56	55	33
14:08	Kerbside on Nightingale Road \approx 1m from (source)	00:36	Car reverses, two doors shut and then drives off	74	58	38

* $L_{Aeq,1h}$ is the equivalent sound pressure level over a 1-hour period if no other noises occurred.

6. PLANNING - REASONS FOR REFUSAL DUE TO NOISE

The proposed development was refused planning permission by Three Rivers District Council on 11 September 2007 (ref 1). Among the reasons for refusal was the following clause relating to noise:

"2. The proposed development results in a form of backland development that fails to meet the requirements of Policies H14, GEN3 and Appendix 2 of the Three Rivers Local Plan 1996 - 2011 in that it fails to protect the character and residential amenity of the existing residential properties and new residential occupiers, by reason of invasion of privacy, and increased noise and disturbance, and results in a form of development unable to maintain the particular character of the area in the vicinity of the site in terms of its layout."

In addition, the officer's report (ref 2) expressed concern that:

"The proposed road would be immediately adjacent to the side elevation and rear garden of 65 Nightingale Road and proposed Plot 4. This would lead to loss of privacy from noise and disturbance from traffic using the road." (Paragraph 7.5.3)

7. DESIRABLE NOISE LEVELS

7.1 World Health Organisation Guidelines

Despite identifying a potential problem, the Planning Officer's Report (ref 2) does not specify any guidance as to what level of noise would be considered acceptable. AIRO considers the levels indicated in the World Health Organisation (WHO) document Guidelines for Community Noise 2000 (ref 3) to give a useful comparison.

The WHO document gives guideline values for specific environments, as given in Table 6 below.

Table 6 - WHO Guideline Values for Specific Environments

Specific Environment	Critical Health Effect(s)	L_{Aeq} (dB)	Time Base (hrs)	L_{AFmax} (dB)
Outdoor living area (e.g. garden)	Serious annoyance, daytime	55	16	--
	Moderate annoyance, daytime	50	16	--
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime	35	16	--
Inside bedrooms	Sleep disturbance, night-time	30	8	45

7.2 Noise Exposure Categories

Planning Policy Guidance PPG 24 entitled 'Planning and Noise' (ref 4) is another helpful comparison. This document describes four Noise Exposure Categories (NECs) for new, noise sensitive development as follows:

Noise Exposure Category 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.*

Noise Exposure Category 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.*

Noise Exposure Category 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.*

Noise Exposure Category D: *Planning permission should normally be refused.*

The Noise Exposure Categories are ascribed different day and night-time noise limits according to the nature of the noise source. In the case where road traffic is dominant the noise limits are shown in Table 7 overleaf.

Table 7 - Noise Exposure Category Limits for Road Traffic Noise (dB)

Period	Noise Exposure Category			
	A	B	C	D
Day (07:00 – 23:00)	<55	55 - 63	63 – 72	>72
Night (23:00 – 07:00)	<45	45 - 57	57 - 66	>66

For the night-time period, PPG24 also places the requirement that if in any one hour the L_{ASmax} of several noise events exceeds 82 dB, the site is to be regarded as at least within NEC C.

8. CURRENT NOISE LEVELS

8.1 External Noise Levels

It can be seen from Table 3 that the current noise level, as measured in the rear garden of No. 63 Nightingale Road is 50 dB, L_{Aeq} during the day. However, at the front of the site, the measured levels are much higher (62 dB, L_{Aeq} , see Table 1).

Comparing these values to the WHO Guidelines in Table 6 shows that, under current noise conditions, moderate annoyance can be expected in the rear garden of No. 63, with serious annoyance due to noise likely to occur in the front garden.

The noise levels in the gardens of No. 61 and No. 65 have not been measured but are likely to be very similar.

8.2 Internal Noise Levels

All the noise data given in Tables 1 to 4 were measured at external positions. However, by assuming certain building envelope constructions it is possible to estimate the current internal noise levels within No. 61 to No. 65 Nightingale Road.

In general, windows and ventilators represent the main transmission paths for noise outside to inside dwellings. Conventional masonry wall and tile roof constructions tend to offer significantly higher sound insulation.

Assuming the dwellings are fitted with standard double-glazed windows (4 mm glass either side of a 6 to 16 mm sealed cavity), it can be expected that the external façade would provide around 28 dB(A) attenuation against road traffic noise with the windows closed (ref 5). This would reduce to around 25 dB(A) if ventilators were open.

Applying a mitigation of 28 dB(A) to the day and night-time L_{Aeq} values in Tables 1 and 3, it can be seen that the current internal levels are all below the WHO guideline values likely to cause moderate annoyance or sleep disturbance.

However, the L_{AFmax} criterion inside dwellings at night may be seen to be exceeded at Position 1, allowing for a 28 dB(A) façade mitigation. However, the increased distance from the road of the dwellings, compared with Position 1, reduces the likelihood that the L_{AFmax} limit of 45 dB would be exceeded in the bedrooms of the existing houses, as discussed below.

Table 2 shows that the most dominant noise sources measured at Position 1 were road traffic movements on Nightingale Road. Assuming the maximum value measured at night was due to a source of this nature and that it could be considered as a moving point source, the sound pressure level would decrease by 6 dB per doubling of distance from the vehicle (ref 6).

It can be seen from Figure 1 that the front façade of No. 63 is approximately 13 metres from the edge of Nightingale Road, whereas Position 1 was located 6 metres from the road. Therefore, a reduction of approximately 6 dB could be expected between levels measured at Position 1 and those at the front façade of No. 63.

Nos. 61 and 65 Nightingale Road are also approximately 13 metres from the road and so the same distance corrections can be applied.

Applying both the distance correction and the façade mitigation to the night-time L_{AFmax} value measured at Position 1 gives an expected internal night-time L_{AFmax} in a front facing bedroom of 43 dB.

8.3 Noise Exposure Categorisation

By comparing the values in Table 6 with the day and night-time L_{Aeq} values in Tables 1 and 3, it can be seen that, based on the current noise climate, any plots located near to Position 1 (fronting Nightingale Road) fall within the noise level range for Noise Exposure Category (NEC) B. Any dwellings near to Position 2 fall within the limits for in NEC A.

9. PREDICTED FUTURE NOISE LEVELS WITH DEVELOPMENT

9.1 Expected Traffic Flow along Proposed Road

Any additional noise that will be introduced to the area as a result of the proposed development is likely to originate from car movements along the proposed access road.

It is possible to use the measured noise levels of car movements given in Table 5 to calculate the likely increase in external noise levels if the proposed development were to proceed.

From this, the likely noise levels in the rear gardens of No. 61 and No. 65 Nightingale Road can be assessed, along with the internal noise levels in both the existing dwellings and proposed dwellings.

The total number of car movements along the proposed road can be expected to be similar to that along Raven Close, as they are both no-through access roads, albeit that Raven Close provides access to five dwellings and the proposed road provides access to only four. However, as only one car movement was observed in Raven Close during three separate 30-minute periods of traffic counting, there is insufficient data to use Raven Close as a model.

Instead, Henry Homes Plc have submitted a transport statement to the Local Authority predicting:

"any increases in traffic that would occur as a consequence of the proposed development would be limited, restricted to 1 extra vehicle every 20 - 30 minutes".

Using this information suggests that, as a worst case, 3 car movements are expected along the proposed access road every hour. In reality (and based on observations at Raven Close) there are likely to be considerably fewer movements, particularly at night.

Using the measured data in Table 5 for car movements (i.e. ignoring events where only a shutting car door has been measured) a typical noise level of 36 dB, $L_{Aeq,1hr}$ can be calculated. The highest level measured for any of the car noise events was 81 dB, L_{AFmax} , due to a car door shutting measured about 1 metre away.

Assuming 3 car movements per hour, the expected noise level from the proposed road would be 41 dB, $L_{Aeq,1hr}$, when measured at the kerbside.

9.2 Predicted Noise Levels in Gardens

A decibel addition of the expected noise level from the proposed road (see Section 9.1) to the daytime L_{Aeq} values given in Tables 1 and 3 predicts that the daytime noise levels would be 62 dB, L_{Aeq} in the front gardens and 51 dB, L_{Aeq} in the rear gardens of No. 61, No. 65 and proposed Plot 4 if the proposed road were to be built.

However, this calculation does not account for the potential attenuation provided by a fence. In practice, there will almost certainly be a fence between the proposed access road and the affected gardens. This will act as a noise barrier by extending the effective path length any sound must travel to get from the source (car engine, car tyres on the proposed road) to the receiver (listener in the affected gardens) as well as reflecting some of the sound energy back towards the source (and away from the receiver).

British Standard BS 5228-1:1997 (ref 7) states:

"If there is a barrier or other topographical feature between the sources and the receiving position, assume an approximate attenuation of 5 dB when the top of the [source] is just visible to the receiver over the noise barrier, and of 10 dB when the noise screen completely hides the sources from the receiver."

In the case of a 1.8 metre high close-boarded timber fence located along the boundary of the rear gardens adjacent to the proposed access road, the noise level in the sensitive gardens due to car movements on the proposed road would reduce to no more than 36 dB, $L_{Aeq,1h}$.

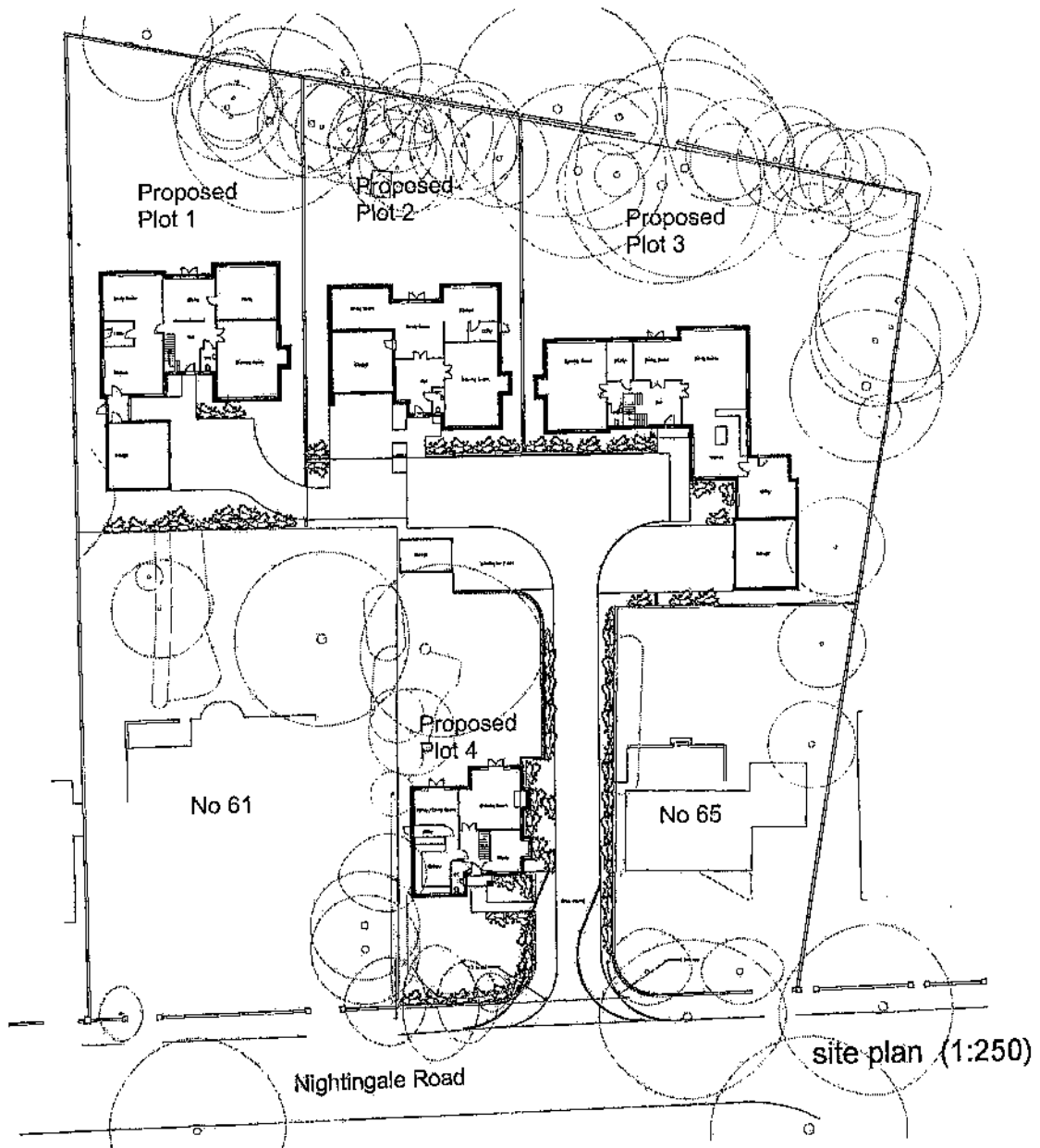
Adding this to the existing daytime noise levels gives a negligible increase, with the front gardens remaining at 62 dB, L_{Aeq} and the rear gardens 50 dB, L_{Aeq} .

Expected night-time noise levels have not been calculated for the gardens as it is unlikely the gardens would be used between 23:00 and 07:00. As such, there are no WHO guidelines for comparison.

9.3 Predicted Internal Noise Levels for Existing Dwellings

Figure 4 below, shows the arrangement of the proposed development.

Figure 4 - Proposed Site Layout



The existing property that is the most likely to be affected by noise from the proposed road is No. 65 Nightingale Road, as it would be the closest to the access way. The nearest façade of this property would be approximately 3 metres from the proposed access road and so any windows located on the nearest façade would be most sensitive to noise from the proposed road.

Assuming a 1.8 metre high close-boarded timber fence is to be retained or erected around the perimeter of the rear garden and access road boundary to No. 65 Nightingale Road, this should provide a 5 dB attenuation to any noise levels at ground floor level (see Section 9.2). However, unless a much higher fence is erected, there is unlikely to be much attenuation other than due to increased distance at first floor level.

Applying the expected façade mitigation with windows shut (see Section 8.2) and the attenuation due to a fence when applicable, the noise level due only to the proposed road can be expected to be around 8 dB, $L_{Aeq,1hr}$ in ground floor rooms and 13 dB, $L_{Aeq,1hr}$ in first floor rooms.

Where these values are added to the existing noise climate (based on Position 1 with a 6 dB reduction for doubling of distance and a 28 dB reduction for façade mitigation - see Section 8.2) the expected internal daytime L_{Aeq} values in ground floor rooms due only to the ingress of external noise are 28 dB. At night, the transmission of external noise into first floor bedrooms can be expected to give rise to noise levels of around 15 dB, L_{Aeq} . These values are both considerably below the WHO guidelines.

The L_{AFmax} criterion for internal noise levels is also likely to be met. As a worst case, if a car door were shut on the nearest part of the proposed access road, an L_{AFmax} of no more than 44 dB would be expected to be measured in a first floor bedroom of No. 65 Nightingale Road (windows closed).

This value can be calculated from the highest L_{AFmax} given in Table 5 (81 dB). This was measured at 1 metre from the source but the nearest first floor window will be at least 3 metres away so, using the distance correction principle in Section 8.2, a correction of -9 dB can be made. With windows closed a façade mitigation of 28 dB(A) can then be applied.

Therefore, there is not expected to be any noticeable change in the noise environment for anybody inside the existing neighbouring properties with the proposed access road, compared with the current situation.

9.4 Predicted Internal Noise Levels for Proposed Dwellings

It can be seen from Figure 4 that proposed Plot 4 is located a similar distance to the proposed access road as No. 65 Nightingale Road. As such, the values calculated in Section 9.3 will apply to this plot as well.

Decibel addition of the measured L_{Aeq} values at Position 2 (see Table 3) and the expected noise level due to the proposed road (see Section 9.1) gives a daytime L_{Aeq} at the rear of the site of 51 dB and a corresponding night-time value of 46 dB, L_{Aeq} , when measured at the kerbside.

With a façade mitigation of 28 dB(A), these correspond to internal noise levels of around 23 dB, L_{Aeq} and 18 dB, L_{Aeq} for daytime and night-time periods respectively. The internal L_{AFmax} can be expected to be the same as calculated in Section 9.3 (no more than 44 dB).

Therefore, the proposed dwellings can be expected to have internal noise levels that satisfy the WHO Guidelines for internal noise during the day and at night.

10. CONCLUSIONS

This report has presented the results of environmental noise measurements in the front and rear gardens of No. 63 Nightingale Road, Rickmansworth, Hertfordshire.

Based on these and measured data of noise levels arising from car movements, an assessment has been undertaken to evaluate the likely impact of the proposed residential development and associated access road on the gardens of No. 61 and No. 65 Nightingale Road and the impact on the internal noise levels at these and the proposed properties.

In addition, a noise exposure assessment has been undertaken, comparing the measurement results with guidance in the Department of the Environment Planning Policy Guidance 24: Planning and Noise (ref 4). This showed that any plots located near to Nightingale Road would fall within the noise limits for Noise Exposure Category (NEC) B. Any dwellings to the rear of the site (near the cemetery) would fall within the limits for NEC A.

It has been calculated that the front gardens of No. 65 and No. 61 Nightingale Road would have an expected with-development external daytime noise level of 62 dB, $L_{Aeq,16h}$. With a standard 1.8 metre high close-boarded timber fence enclosing the rear gardens and access road boundary, the external daytime noise

REFERENCES

1. Refusal of Permission to Development (Ref No: 07/1729/FUL)
Site: land at 63 Nightingale Road and rear of 61 and 65 Nightingale Road,
Rickmansworth, Hertfordshire
Three Rivers District Council, 11 September 2007

2. Planning Officer's Report (Ref No: 07/1729/FUL)
Demolition of existing detached dwelling and erection of four detached
dwellings with access road for Henry Homes Plc
Three Rivers District Council, 2007

3. Guidelines for Community Noise
World Health Organisation, 2000

4. The Department of the Environment
PPG24 Planning Policy Guidance: Planning and Noise
HMSO, September 1994

5. British Standard BS EN 12354
Building acoustics - Estimation of acoustic performance of buildings
from the performance of elements

BS EN 12354-3:2000
Airborne sound insulation against outdoor sound
British Standards Institution, 2000

6. British Standard BS 8233:1999
Sound insulation and noise reduction for buildings – Code of Practice
British Standards Institution, 1999

7. British Standard BS 5228:1997
Noise and Vibration control on construction and open sites

Part 1: Code of Practice for basic information and procedures
for noise and vibration control
British Standards Institution, 1997

level in the rear gardens would be 50 dB, $L_{Aeq,16h}$. These represent a negligible increase from the current measured external noise levels.

The with-development internal noise levels inside No. 65 due to the transmission of external noise, were shown to be 28 dB, $L_{Aeq,16h}$, in ground floor rooms during the day and 15 dB, $L_{Aeq,8h}$ in first floor rooms at night. The maximum sound pressure level measured inside a first floor room at night is unlikely to exceed 44 dB, L_{AFmax} . This represents an insignificant change in the noise environment compared to that currently experienced in the existing properties.

If the proposed development were to go ahead, the noise levels inside proposed Plots 1 to 3 due to the ingress of external noise would be 23 dB, L_{Aeq} and 18 dB, L_{Aeq} for daytime and night-time respectively. Proposed Plot 4 would be likely to experience internal daytime noise levels of approximately 28 dB, $L_{Aeq,16h}$.

With windows closed, all of the calculated with-development internal noise levels are below the World Health Organisation Guideline values (ref 3) regarded as the onset of moderate annoyance or sleep disturbance.

Therefore, it is considered that noise from the proposed access road would not affect the amenity or cause undue disturbance to any adjoining gardens. Furthermore, it would not significantly increase internal noise levels within the surrounding properties or lead to unacceptable noise levels within the proposed dwellings. Accordingly, it is considered that noise arising from the proposed access road is not a reason to refuse permission for the proposed development.

Report Approved by:

Report Author:




A J Jones BSc PhD CSci CPhys MInstP FIOA
Managing Director



R E George BEng MIOA
Consulting Engineer

APPENDIX A

Schedule of Noise Instrumentation

Use	Type	Serial No.
Measuring System	Cirrus CRL 7.02 Unit G	011182
Microphone	Cirrus MK 224 Unit G	89668
Calibrator	Cirrus CRL 511D Unit G	011970
Measuring System	Cirrus CRL 7.02 Unit L	011308
Microphone	Cirrus MK 224 Unit L	901918
Calibrator	Cirrus CRL 511D Unit L	014087
Sound Level Meter	B&K 2260	2341172
Microphone	B&K 4189	2339504
Calibrator	B&K 4231	2342748

Recorded Weather Conditions

	<u>2 June 2008</u>	<u>3 June 2008</u>
Temperature	18°C	15°C
Relative Humidity	82%	95%
Wind Speed	Negligible	Negligible
Wind Direction	--	--