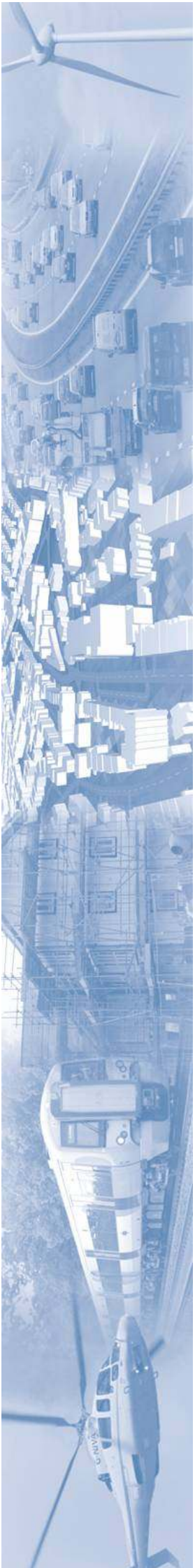

ENVIRONMENTAL CONSULTANTS

Report for

GHL (Eagle Wharf Road) Limited

49-50 Eagle Wharf Road, London, N1 7ED

Noise Impact Assessment

Status: Draft **Date: 09.07.2015**

GHL (Eagle Wharf Road) Limited

Noise Assessment – 49-50 Eagle Wharf Road, London

Author:	**David Yates**
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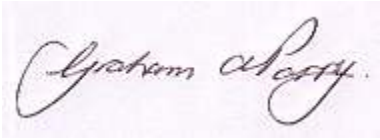
Approved By:	 **Graham Parry** **Managing Director**
Report For:	**GHL Eagle Limited** **c/o Peter Stone** **PSP Consultants** **The Cartshed** **Lower Farm Barns** **Wasing Lane** **Aldermaston** **Reading** **RG7 4NG**
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1. INTRODUCTION

ACCON UK Limited (ACCON) have been commissioned by PSP Consultants on behalf of GHL (Eagle Wharf Road) Limited to carry out a noise assessment, which is to be submitted in support of the planning application for the proposed development of land at 49-50 Eagle Wharf Road, Hackney. The proposal is for a mixed use development comprising of 64 residential dwellings at first to sixth floors and commercial space at basement and ground floors and part of the first and second floors.

The site is located on the northern side of Eagle Wharf Road and is bounded by the southern bank of the Regents Canal to the north.

The purpose of this noise impact assessment is to assess, through on-site noise measurements, the extent to which the existing ambient noise levels will affect the proposed residential development. Recommendations for mitigation are also made where appropriate. An acoustic glossary is provided in **Appendix 1** and the site location is displayed in **Figure 1.1** below.

Figure 1.1: Site Location

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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 characterise 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 (now revoked)

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3. NOISE ASSESSMENT CRITERIA

3.1. National Planning Practice Guidance

The National Planning Policy Framework (NPPF), released in March 2012, replaced the Planning Policy Guidance (PPG) 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.

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3.2. Noise Policy Statement England

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.*

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'*

3.3. London Borough of Hackney

The London Borough of Hackney (LBH) has provided advice on noise in "Core Strategy – Hackney's strategic planning policies for 2010 - 2025" which was adopted in November 2010. LBH aim for all new developments to ensure the highest standard of design in order to protect their communities' well-being. The Core Strategy states that policy EQ41 from LBH's previous Unitary Development Plan (adopted June 1995) has been saved. Policy EQ41 states "*Where development sensitive to noise is to be located close to a permanent source of noise generation the Council will require that measures are taken to minimise the effects on future occupants*".

LBH have not provided any specific guidance with regards to acceptable noise levels for dwellings. ACCON have therefore utilised the guidance provided in British Standard 8233 and the World Health Organization guidelines to consider the measures necessary to achieve an internal noise environment in line with LBH's "Core Strategy" and saved policy EQ41.

3.4. British Standard BS 8233:2014

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 conditions in other rooms and the most appropriate to the residential environment are reproduced in **Table 3.1**.

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Table 3.1: Indoor Ambient Noise Levels for Dwellings

Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

3.5. World Health Organization Guidelines for Community Noise

The World Health Organization (WHO) has developed guidelines designed to minimise the adverse effects of noise. The guidelines relevant to residential noise exposure are detailed in **Table 3.2**. For each specific environment the stated noise levels are the maximum noise levels to avoid the health effect noted.

Table 3.2: 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

The WHO guidelines state that with respect to the L_{Amax} threshold that, '*For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB L_{Amax} more than 10 – 15 times per night*' (Vallet and Vernet 1991).

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4. NOISE MEASUREMENT SURVEY

In order to characterise the existing noise climate, a detailed noise measurement study has been carried out at the proposed development site. Noise measurements were carried out over a full 24-hour period utilising a semi-permanent noise monitor in a façade position. The microphone was attached to a tripod which was at second floor height at the front of the existing property at 49-50 Eagle Wharf Road. The height of the microphone was approximately 7m above the ground. Noise measurements were not carried out at the rear of the building as there are no significant sources of noise affecting that façade. The semi-permanent noise monitoring position is shown on a site layout plan in **Appendix 2.**

The noise measurements utilised a Norsonic 118 Type 1 Precision Sound Level Meter, which has a current certificate of calibration. Before and after the measurement period the equipment was calibrated in order to ensure that the equipment had remained within reasonable calibration limits (+/- 0.5 dB). Measurements were carried out between 1130 hrs on Wednesday 3rd June 2015 and 1150 hrs on Thursday 4th June 2015. The weather was dry and cloudy with some light wind (2 - 3 m/s) with daytime temperatures of up to 16°C, dropping to around 8°C overnight.

At the noise monitoring position the ambient noise climate was dominated by road traffic noise from Eagle Wharf Road, with occasional air traffic noise and light industrial noise.

The measured noise levels from the semi-permanent position are summarised in **Table 4.1** below. A correction of -3 dB has been applied to the measured façade noise levels to determine the equivalent free field noise levels. Detailed noise measurements are displayed in **Appendix 3**.

Table 4.1: Summary of Corrected Noise Levels

Location	Average Ambient Noise Level (L_{Aeq}) dB	Maximum Noise Level (L_{Amax}) dB	Average Background Noise Level (L_{A90}) dB
07:00 – 23:00	59.8	84.0	46.5
23:00 – 07:00	51.0	73.9	34.3

Note: The average levels stated are logarithmic for L_{Aeq} and arithmetic for L_{A90}. The L_{Amax} is the average of the hourly maximum measured sound level during the daytime and night-time periods respectively.

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5. DESIGN REQUIREMENTS

In order for the proposed development at 49-50 Eagle Wharf Road, Hackney to meet the noise assessment criteria set out in the WHO guidelines and BS8233 it is recommended that a primary double glazed window system should be provided for all habitable rooms.

The measured L_{Amax} during the night-time period regularly exceeds 60 dB (the limit quoted by the WHO guidelines for outside a bedroom window at night, as reproduced in **Table 3.2**). This means that the indoor sound pressure level could exceed 45 dB more than 15 times per night, assuming a 13 dB reduction from an open window. Therefore noise mitigation should be provided in order to reduce the maximum noise levels, and an alternative form of ventilation, such as acoustic trickle vents, provided such that windows are not required to be regularly opened at night.

A typical glazing system in a 6/12/6 (with acoustic laminate on the inside pane) formation to give a Sound Reduction Index (SRI) of 32 dB could be used on the first and second floors and a 4/10/6 formation to give an SRI of 28 dB could be used on all of the higher floors. There are no residential units on the ground floor. Acoustic trickle vents should be installed to allow adequate ventilation without the requirement to open windows. To ensure the maximum sound reduction is provided by the glazing, any ventilation system should not compromise the effectiveness of the sound insulation. Carefully designed acoustic trickle vents would minimise any reduction to the sound insulation provided by the glazing system. Additionally, the rest of the façade build-up should be constructed to achieve a SRI of 55 dB.

Tables 5.1 and **5.2** below identify the likely internal L_{Aeq} and L_{Amax} noise levels respectively using the identified primary double glazed window systems on each floor of the proposed development. Noise levels for the individual floors have been calculated utilising the noise measurement data and utilising standard distance attenuation formulae. The SRIs as identified would achieve the indoor ambient and maximum noise level criteria for bedrooms at night and the ambient noise level criteria for living rooms during the daytime, as specified in BS 8233 and WHO guidelines. Achievement of these target noise criteria will ensure that the development is in line with LBH's "Core Strategy" and saved policy EQ41.

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Table 5.1: Predicted Internal Noise Levels - L_{Aeq}

Location	External Noise Levels (dB)		Proposed façade R_w	Internal Noise Levels (dB)		Compliance with Criteria		
	Daytime $L_{Aeq,16hrs}$	Night-time $L_{Aeq,8hrs}$		Daytime $L_{Aeq,16hrs}$	Night-time $L_{Aeq,8hrs}$	BS 8233	WHO	LBH
First Floor	62	53	32	30	21	✓	✓	✓
Second Floor	60	51	32	28	19	✓	✓	✓
Third Floor	58	49	28	30	21	✓	✓	✓
Fourth Floor	57	48	28	29	20	✓	✓	✓
Fifth Floor	56	47	28	28	19	✓	✓	✓
Sixth Floor	56	47	28	28	19	✓	✓	✓

Table 5.2: Predicted Internal Noise Level - L_{Amax}

Location	External Noise Levels (dB)	Proposed façade R_w (dB)	Internal Noise Levels (dB)	Compliance with Criteria		
	Night-time $L_{Amax,8hrs}$		Night-time $L_{Amax,8hrs}$	BS 8233	WHO	LBH
First Floor	76	32	44	✓	✓	✓
Second Floor	74	32	42	✓	✓	✓
Third Floor	72	28	44	✓	✓	✓
Fourth Floor	71	28	43	✓	✓	✓
Fifth Floor	70	28	42	✓	✓	✓
Sixth Floor	70	28	42	✓	✓	✓

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6. CONCLUSION

In order to support a planning application for the redevelopment of 49-50 Eagle Wharf Road, Hackney, a detailed noise assessment has been carried out.

It has been identified that through the provision of double glazed window units with SRIs as stated in **Section 5** and appropriately designed ventilation, that a good internal noise environment can be achieved within the residential units for the proposed development. These measures would achieve compliance with the guidelines of BS8233 and the WHO guidelines for the daytime and night-time periods, which would be in accordance with the LBH's noise policies.

Achievement of the target noise criteria ensures compliance with the overall aims of paragraph 123 of the NPPF in that noise will not result in any adverse affects on health or quality of life for future occupants of the proposed development.

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Appendix 1
Glossary of Acoustic Terms

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Appendix 1: Glossary of Terms

Term	Description
'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. The 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
Noise Monitoring Positions

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Appendix 2: Noise Monitoring Positions

LEGEND

- Semi Permanent Noise Monitoring Position
- Site Boundary

N
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Client: GHL (Eagle Wharf Road) Limited		Description: Site Location with Noise Monitoring Positions		Design	ML	11/06/2015
				Drawn	ML	11/06/2015
Rev: A	Description: FINAL	Project: 49-50 Eagle Wharf Road		Checked	DY	11/06/2015

Appendix Two

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Appendix 3
Summary of Corrected Noise Measurements

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Appendix 3: Summary of Corrected Noise Measurements

Time	$L_{Aeq, 1hr}$ (dB)	$L_{AF(max)}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
07:00-08:00	56.0	77.3	59.7	40.2
08:00-09:00	61.0	86.6	62.0	46.0
09:00-10:00	58.7	81.7	61.8	47.1
10:00-11:00	62.1	86.2	64.1	49.1
11:00-12:00	59.7	87.8	62.2	46.7
12:00-13:00	62.0	94.1	63.8	49.5
13:00-14:00	60.0	81.3	62.5	49.5
14:00-15:00	60.9	88.5	63.3	49.0
15:00-16:00	59.3	83.1	62.5	49.8
16:00-17:00	61.3	81.5	63.9	48.0
17:00-18:00	59.2	82.5	62.4	48.8
18:00-19:00	60.4	89.2	62.8	49.1
19:00-20:00	58.5	79.9	61.7	45.2
20:00-21:00	58.3	88.0	61.0	43.7
21:00-22:00	57.0	83.6	60.7	43.4
22:00-23:00	55.1	73.1	59.2	39.2
23:00-00:00	54.6	74.7	58.6	39.3
00:00-01:00	50.2	70.3	52.3	34.4
01:00-02:00	47.9	71.4	47.7	31.5
02:00-03:00	43.4	71.0	37.5	30.3
03:00-04:00	48.9	71.2	46.9	32.9
04:00-05:00	48.5	75.2	44.9	33.4
05:00-06:00	51.6	73.5	51.2	34.7
06:00-07:00	53.6	84.0	55.7	37.7
07:00-23:00	**59.8**	**84.0**	**62.1**	**46.5**
23:00-07:00	**51.0**	**73.9**	**49.4**	**34.3**

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