Investland Group plc / PSP Consultants

White Lodge, 252 Finchley Road

Noise Assessment

Status: Final **Date: 26.03.2010**

Investland Group plc / PSP Consultants

Noise Assessment

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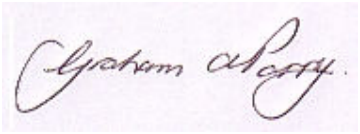
Approved By	 Graham Parry Managing Director
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1. INTRODUCTION

ACCON UK Limited (ACCON) have been commissioned by PSP Consultants on behalf of Investland Group plc to carry out a noise assessment in support of the planning application for the redevelopment of White Lodge, 252 Finchley Road, in the London Borough of Camden (LBC).

The development proposals are for the demolition of the existing substantial residential property, replacing it with a five storey building comprising 14 private apartments, undercroft parking and landscaped gardens.

The development site is located close to the junction of Finchley Road (the A41), West End Lane and Frognal Lane, in the West Hampstead area of London. The area is characterised by dense urban development, mainly consisting of residential developments, with some shops and other commercial premises on Finchley Road. Immediately adjacent to the site to the south-east is St. Andrews Church. **Appendix 1** shows a map of the development site.

Accordingly, a noise measurement survey has been carried out in order to determine the extent to which development of the site is affected by noise. LBC have determined that in general the site should comply with those guidelines laid down in Planning Policy Guidance Note 24 'Planning and Noise'. Accordingly, the guidelines (referred to as PPG24) are addressed in this study, as are the noise thresholds identified in Appendix 1 of the Camden Replacement Unitary Development Plan (Adopted June 2006).

The purpose of the study is primarily to determine, through on-site noise measurements, the noise climate of the site with the proposed layout. Recommendations for mitigation are also made where appropriate, in order to achieve reasonable internal noise levels.

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2. THE NATURE, MEASUREMENT AND EFFECT OF ROAD TRAFFIC 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.

The nature of noise levels from the road will be dependent on the amount of traffic, the speed, the road surface type and the percentage of traffic that is made up of heavy goods vehicles.

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3. NOISE CRITERIA

3.1. Planning Policy Guidance Note 24 'Planning and Noise'

In September 1994 the then Department of Environment published the Planning Policy Guidance Note 24 'Planning and Noise'. The document (PPG24) is intended to be used by Local Planning Authorities as guidelines in determining the acceptability of proposed development sites that may be affected by noise.

The PPG 24 states:

"*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 3.1*** *below:*

Table 3.1: PPG24 Noise Exposure Categories

Noise Exposure Category	*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."

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The recommended noise guidelines are shown in **Table 3.2** below.

Table 3.2: Noise Levels Corresponding to the NECs for New Dwellings

Noise Levels Corresponding To The Noise Exposure Categories For New Dwellings $L_{Aeq\,T}$ dB				
Noise Source	Noise Exposure Category			
	A	B	C	D
Road Traffic 0700-2300 2300-0700[1]	 <55 <45	 55-63 45-57	 63-72 57-66	 >72 >66
Rail Traffic 0700-2300 2300-0700[1]	 <55 <45	 55-66 45-59	 66-74 59-66	 >74 >66
Air Traffic 0700-2300 2300-0700[1]	 <57 <48	 57-66 48-57	 66-72 57-66	 >72 >66
Mixed Sources 0700-2300 2300-0700[1]	 <55 <45	 55-63 45-57	 63-72 57-66	 >72 >66

Notes. 1. 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).

Local Authorities can adopt a flexible approach to the above criteria and can 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.

Guidance on absolute limits for noise inside buildings is provided in BS 8233:1999 'Sound insulation and noise reduction for buildings –Code of practice'. Similar guidance can also be found in the current World Health Organisation (WHO) "Guidelines on Community Noise" and the BRE/CIRIA document "Sound control for homes". A summary of the noise criteria can be seen in **Table 3.3.**

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Table 3.3: Summary of Internal Noise Criteria: BS 8233 & WHO

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
WHO Onset of sleep disturbance	Bedrooms	30	-	45

3.2. London Borough of Camden

LBC has its own criteria, which are published in Appendix 1 of the Camden Replacement Unitary Development Plan (Adopted June 2006), based upon PPG 24, which it uses to assess the suitability of dwellings for residential development. These threshold values are based upon the L_{day}, $L_{evening}$ and L_{night} reporting requirements of the European Noise Directive (END). **Tables 3.4** and **3.5** summarise their criteria.

Table 3.4: LBC's noise levels on residential sites adjoining roads at which planning permission will not be granted

Noise Description and Location of the Measurement	Period	Time	Site Adjoining Roads
Noise at 1 metre external to the sensitive facade	Day	0700-1900	72 dB $L_{Aeq.12h}$
Noise at 1 metre external to the sensitive facade	Evening	1900-2300	72 dB $L_{Aeq.4h}$
Noise at 1 metre external to the sensitive facade	Night	2300-0700	66 dB $L_{Aeq.8h}$

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Table 3.5: LBC's noise levels on residential sites adjoining roads at and above which attenuation measures will be required

Noise Description and Location of the Measurement	Period	Time	Site Adjoining Roads
Noise at 1 metre external to the sensitive facade	Day	0700-1900	62 dB $L_{Aeq.12h}$
Noise at 1 metre external to the sensitive facade	Evening	1900-2300	57 dB $L_{Aeq.4h}$
Noise at 1 metre external to the sensitive facade	Night	2300-0700	52 dB $L_{Aeq.8h}$
Individual noise events several times in one hour	Night	2300-0700	>82 dB L_{Amax} (S time weighting)

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4. NOISE MEASUREMENT STUDY

In order to determine the extent to which the site is affected by road traffic noise a detailed noise measurement study has been carried out on the application site. 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, as wells as the $L_{Aeq.12h}$ and $L_{Aeq.4h}$ for the day and evening.

The noise measurements utilised a Norsonic 116 Type 1 Precision Sound Level Meter, fitted with a GRAS 41AL environmental microphone, all 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).

Measurements were carried out between 1500 hours on Wednesday 7th May 2008 to 1500 hours on Thursday 8th May 2008. The weather was dry and sunny, with some light wind (<4 m/s) and a temperature of approximately 22°C during the day, dropping to approximately 12 °C overnight.

Noise measurements were carried out at the location identified in **Appendix 1**. The measurement position was located on the flat roof of the entrance porch facing Finchley Road. The measurement location is considered to be a facade position, with potential reflections from White Lodge. In line with the measurement requirements of PPG 24, the results have been corrected accordingly for the purpose of PPG 24 evaluation. However, utilising LBC's criteria the noise levels should remain as facade noise levels

The noise measurements were carried out at a distance of 14 metres from the kerbside of Finchley Road. The new proposed development will have a facade at a distance of 10 metres from the kerb of Finchley Road. Therefore, all measurement data must be corrected for the reduced distance in order that it can be truly representative of the proposed development.

The noise measurement data is detailed in **Appendix 2** and summarised in **Table 4.1** below:

Table 4.1: Summary of Noise Level Measurements

Period (hrs)	Facade Noise Level L_{Aeq} dB	Distance Corrected Freefield Noise Level L_{Aeq} dB	Distance Corrected Facade Noise Level L_{Aeq} dB
Description	**Measured**	**PPG 24 Criteria[1]**	**LBC Criteria[2]**
0700-2300	70.8	70.7	73.7
2300-0700	68.4	68.3	71.3

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Notes:

1 = This noise level has been subject to the -3dB(A) correction as described in PPG 24 to convert the measured noise levels from facade noise levels to freefield then is subject to a distance correction of 2.9 dB(A) to account for difference in distance between monitoring location and proposed closest facade to the road.

2 = This noise level has been adjusted by the distance correction of 2.9 dB(A) to account for difference in distance between monitoring location and proposed closest facade to the road.

The monitoring location was subject to near constant traffic passing during the daytime periods and significant traffic flows during the night time period. Period noise levels are generally between 69 and 71 $L_{Aeq.5min}$ during the day. During the night time period, ambient noise levels reduced slightly and were generally around 63-65 $L_{Aeq.5min}$.

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5. EVALUATION OF THE SURVEY RESULTS

5.1. Planning Policy Guidance Note 24 'Planning and Noise'

Table 5.1 shows that for the daytime, the measured noise levels would normally fall within Noise Exposure Category C. For the night time, the measured noise levels would normally fall within Noise Exposure Category D. Therefore, it should be considered that the proposed development would normally fall within Noise Exposure Category D.

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

Noise Source	Measured Daytime Noise Level $L_{Aeq\ 16\ hours}$	Category C Criteria Daytime $L_{Aeq\ 16\ hours}$	Measured Night Time Noise Level $L_{Aeq\ 8\ hours}$	Category D Criteria Night Time $L_{Aeq\ 8\ hours}$
White Lodge	70.7	63-72	68.3	>66

It should be noted that the noise measurement locations were chosen to represent the closest façade of the planned development to the road, and thus represent a 'worse-case' scenario. Other parts of the development further away from Finchley Road, those facades with limited views of Finchley Road and the rear facade of the development will all receive lower noise levels than that at the measurement locations.

5.2. London Borough of Camden]

Table 5.2 shows the measured levels against LBC's noise criteria.

Table 5.2: Measured Noise Levels and LBC's Noise Criteria

Period	Time	Measured Noise Level	Comment
Day	0700-1900	73.7 dB $L_{Aeq.12h}$	Planning permission will not be granted
Evening	1900-2300	73.6 dB $L_{Aeq.4h}$	Planning permission will not be granted
Night	2300-0700	71.3 dB $L_{Aeq.8h}$	Planning permission will not be granted

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6. CONSTRAINTS AND MITIGATION MEASURES

The site falls into Noise Exposure Category D for PPG 24 due to the road traffic noise from Finchley Road. Accordingly, under both PPG 24 and LBC's own noise criteria, planning permission would normally be refused on the basis of noise. However, given that the existing property is currently used for residential purposes and the area comprises mainly of residential properties, providing that there is a commensurate level of protection against noise, noise should not be a constraint on the development of this site.

Discussions with Ian Dixon from the Environmental Protection Team at LBC indicate that whilst they would not normally give permission to developments within Noise Exposure Category D, it is acknowledged that the pressure for housing is great in the area, and provided that there is a commensurate level of protection against noise, LBC agrees with the approach of this study and there should not be a constraint on the development of this site due to its exposure to noise.

Table 6.1 shows that a minimum sound reduction of 42 dB(A) is required to achieve the internal noise levels recommended by WHO. Accordingly, it is recommended that the provision of a primary double or triple glazed window system should be provided for all habitable rooms facing Finchley Road. This will ensure a good standard of internal amenity. Such a system should have an absolute minimum SRI/Rw of 42 dB(A).

A number of companies provide acoustic glazing solutions, including Kestrel Acoustics and Pilkington Glass. Pilkington's *Insulight™ Phon incorporating Pilkington K Glass™* 16/16.8/16 window system has a Rw of 48 dB, whereas Kestrel Acoustics has glazing systems with Rw's in excess of 50 dB.

In order to maintain a good internal sound level, it is recommended that a silenced mechanical ventilation system is fitted so that the future occupiers of the flats do not need to open vents or windows in order to obtain the fresh air that they require.

Table 6.1 identifies the internal noise levels that would occur using a glazed window system with an SRI/Rw of 42 dB, such as some of the glazing solutions offered by Pilkington and Kestrel Acoustics. These noise levels would meet the minimum standard contained within the WHO recommendations, thus ensuring that sleep disturbance is unlikely.

Table 6.1: Predicted Internal Noise Levels

Location	External (Facade) Noise Levels		Internal Noise Levels with glazed windows with an Rw of 42 dB		Compliance with Criteria	
	$L_{Aeq\ 16\ hours}$	$L_{Aeq\ 8\ hours}$	$L_{Aeq\ 16\ hours}$	$L_{Aeq\ 8\ hours}$	BS 8223	WHO
White Lodge	73.7	71.3	31.7	29.3	✓	✓

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7. OVERALL CONCLUSIONS AND RECOMMENDATIONS

A detailed noise measurement study has been carried out at the site in order to determine whether as a result of road traffic noise there are any significant constraints on developing the land for residential purposes.

The study has shown that road traffic noise from Finchley Road results in the proposed development falling within NEC D. However, it has been shown that, through the provision of a good quality primary double or triple glazed high performance window unit, a good internal noise environment can be achieved, which is an approach that has been agreed in principle with LBC. Therefore, the noise environment of the site should not be a constraint on future residential development.

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Appendix 1
Site Plan

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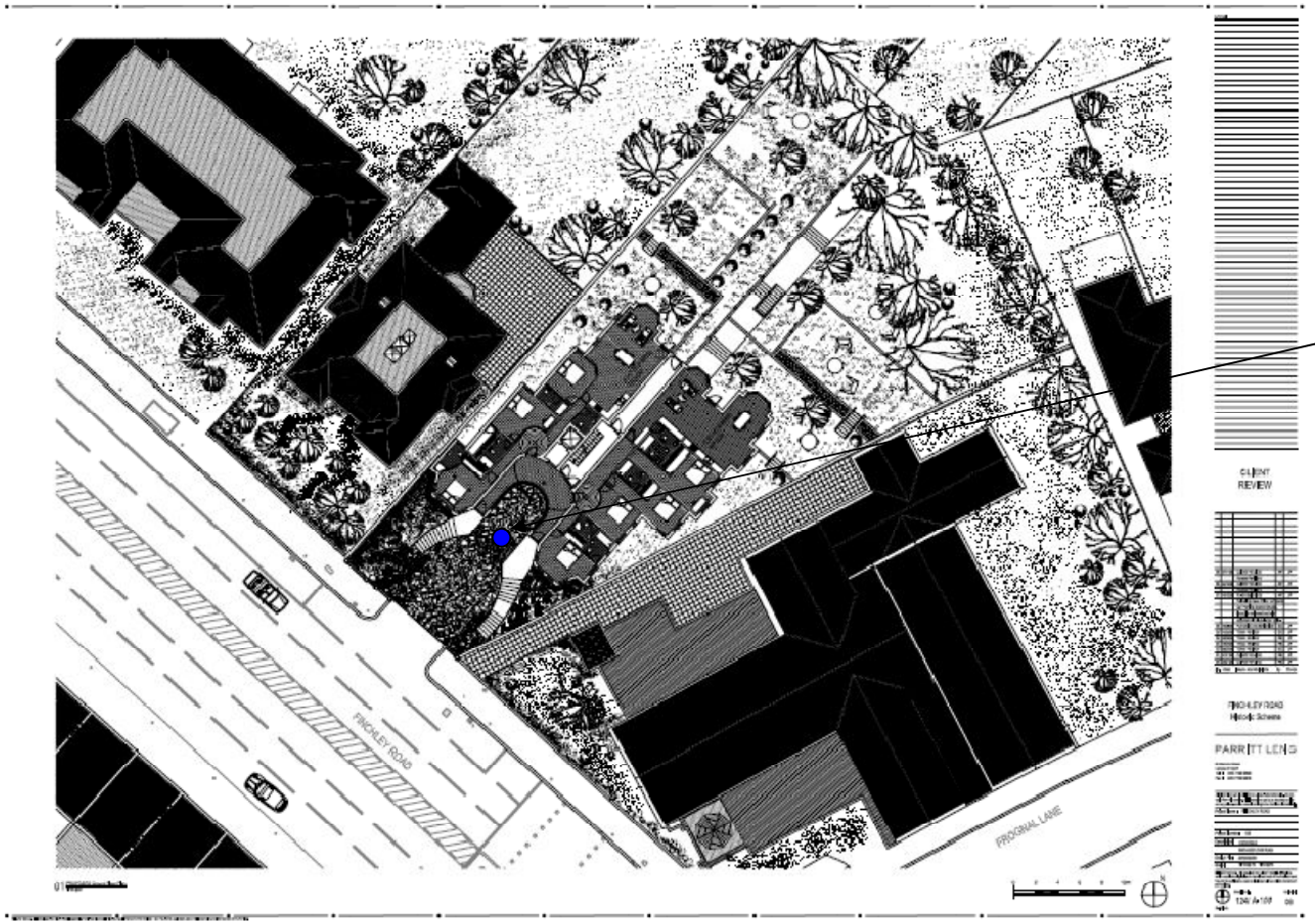
Site Plan



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Appendix 2
Summary of Noise Measurements

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Summary of Facade Noise Measurements

Time	L_{Aeq}	$L_{AF(max)}$	L_{A10}	L_{A50}	L_{A90}
0700-0800	71.0	91.3	74.7	68.4	62.1
0800-0900	71.8	96.2	73.8	68.4	63.0
0900-1000	71.0	91.4	73.7	68.9	62.4
1000-1100	70.0	88.6	73.1	68.2	62.6
1100-1200	70.1	89.5	73.4	68.5	60.3
1200-1300	70.7	92.7	73.6	68.4	61.0
1300-1400	71.5	97.7	73.9	68.3	59.8
1400-1500	69.9	82.0	73.4	68.0	60.6
1500-1600	69.8	82.4	73.2	68.4	60.9
1600-1700	70.6	86.0	74.0	69.4	61.4
1700-1800	71.8	93.4	74.2	69.8	61.1
1800-1900	71.1	92.1	74.4	69.4	61.9
1900-2000	71.1	89.3	74.4	69.3	60.6
2000-2100	71.4	96.4	74.0	67.9	57.8
2100-2200	70.0	88.7	73.7	65.9	55.5
2200-2300	70.3	93.2	73.9	66.2	57.3
2300-0000	69.5	82.6	73.9	64.9	55.3
0000-0100	70.3	98.7	73.8	62.9	51.2
0100-0200	66.6	91.9	71.1	59.6	48.8
0200-0300	66.1	88.1	71.1	57.7	46.9
0300-0400	65.6	91.7	70.3	55.5	45.3
0400-0500	67.4	95.1	71.1	58.6	48.7
0500-0600	68.0	86.7	72.2	62.3	52.6
0600-0700	70.9	88.3	75.1	66.6	57.0
0700-2300	70.8	97.7	73.8	68.3	60.5
2300-0700	68.4	98.7	72.3	61.0	50.7

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