ADNITT ACOUSTICS
Renaissance House
32 Upper High Street
Epsom, Surrey
KT17 4QJ

T: +44 (0)20 7099 9735
F: +44 (0)845 127 5121
E: enquiry@adnitt.com
W: www.adnitt.com

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Project **Unit 4 Heathgate, Agincourt Road**
London, NW3 2NU

Title **Environmental Noise Survey**

Sub Title

Client WS Planning and Architecture
Europe House
Bancroft Road
Reigate
Surrey, RH2 7RP

Case No

Author Juan L. Rioperez BEng(Hons) AMIOA

Checked Chris Turner BSc(Hons) MSc MIOA MInstP

Revision	Reason	Checked	Signature

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1. INTRODUCTION

1.1 Adnitt Acoustics have been commissioned by WS Planning and Architecture to carry out an environmental noise survey and assessment in support of the proposal for the installation of an air conditioning unit at the site of Unit 4 Heathgate, Agincourt Road, NW3 2NU.

1.2 The work has been requested to support a pre-planning application for the installation of a new air conditioning unit for an existing office to ensure that the proposal complies with the local planning policy for Camden.

1.3 An assessment was carried out to determine the most appropriate location for the new air conditioning unit to be located from three possible options.

1.4 The new air conditioning unit that has been proposed to the client is Fujitsu Model No. AUYG24L.

1.5 As this is a technical report it will be necessary to use some technical terms. To assist the reader, a glossary has been included in Appendix A.

2. NATIONAL AND LOCAL PLANNING POLICY

2.1 Since March 2012 national planning policy has been governed by the National Planning Policy Framework (NPPF). Paragraph 123 of the NPPF gives generic advice with regard to noise and vibration.

"Planning policies and decisions should aim to:

(i) *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of the new development;*
(ii) *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from the new development, including through the use of conditions;*
(iii) *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 uses since they were established; and*
(iv) *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."*

2.2 Further guidance with regard to the phases and "significant adverse impacts" and "adverse impacts" is given in the Noise Policy Statement for England (NPSE) which provides the following guidance.

"There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur."

2.3 The NPSE further clarifies that due to the complex and subjective nature at which noise impacts are perceived by individuals or groups of individuals that:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE

provides the necessary policy flexibility until further evidence and suitable guidance is available."

2.4 A hierarchy of noise impacts has recently been published by the Department for Communities and Local Government as part of the National Planning Practice Guidance (NPPG). This hierarchy is presented as a table and has been reproduced below.

Perception	*Examples of Outcomes*	*Increasing Effect Level*	*Action*
Not Noticeable	*No Effect*	*No Observed Effect*	*No specific measures required*
Noticeable and not intrusive	*Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life*	*No Observed Adverse Effect Level (NOAEL)*	*No specific measures required*
		Lowest Observes Adverse Effect Level	
Noticeable and intrusive	*Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.*	*Observed Adverse Effect*	*Mitigate and reduce to a minimum*
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	*The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.*	*Significant Observed Adverse Effect*	*Avoid*

Perception	*Examples of Outcomes*	*Increasing Effect Level*	*Action*
Noticeable and very disruptive	*Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory*	*Significant Observed Adverse Effect*	*Prevent*

Table 1790/T1 – National Planning Practice Guidance with regard to Noise

Local Planning Policy – Camden Council

2.5 Camden Council published the Camden Development Policies document in 2010 as part of the Council's Local Development Framework (LDF), the group of documents setting out the planning strategy and policies.

2.6 Development Policy DP28 – Noise and Vibration aims to achieve a number of Core Strategy Policies including CS5 – Managing the Impact of Growth and Development, CS9 – Achieving a Successful Central London, CS11 – Promoting Sustainable and Efficient Travel and CS16 – Improving Camden's Health and Wellbeing. Policy DP28 – Noise and Vibration, states that the Council will seek to ensure that noise and vibration is controlled and managed; and in order to achieve this it pledges that it will not grant planning permission for:

- "development likely to generate noise pollution"; or
- "development sensitive to noise in locations with noise pollution, unless appropriate attenuation measures are provided".

2.7 The policy further states that:

"Development that exceeds Camden's Noise and Vibration Thresholds will not be permitted. The Council will only grant permission for plant or machinery if it can be operated without causing harm to amenity and does not exceed our noise thresholds.

The Council will seek to minimise the impact on local amenity from the demolition and construction phases of development. Where these phases are likely to cause harm, conditions and planning obligations may be used to minimise the impact."

"The effect of noise and vibration can be minimised by separating uses sensitive to noise from development that generates noise and by taking measures to reduce any impact. Noise sensitive development includes housing, schools and hospitals as well as offices, workshops and open spaces, while noise is generated by rail, road and air traffic, industry, entertainment (e.g. nightclubs, restaurants and bars) and other uses."

2.8 Table 1790/T2 below shows the policy guidelines for plant and machinery noise levels at which planning permission will not be granted (from: Table E "Local Development Framework – Camden Development Policies 2010-2025").

Noise description and location of measurement	Period	Time	Noise Level
Noise at 1m external to a sensitive façade.	Day, evening & night	0000-2400	5dB(A) $<L_{A90}$
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1m external to a sensitive façade.	Day, evening & night	0000-2400	10dB(A) $<L_{A90}$
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1m external to a sensitive façade.	Day, evening & night	0000-2400	10dB(A) $<L_{A90}$
Noise at 1m external to sensitive façade where LA90 > 60dB	Day, evening & night	0000-2400	55dBL_{Aeq}

Table 1790/T2 – Policy Guidelines for Noise Levels from Plant and Machinery

3. SITE DESCRIPTION

3.1 The site (Unit 4) comprises a property occupied for use as an office located adjacent to the B518 Agincourt Road, a one-way two-laned road approximately 290m South of Hampstead Heath.

3.2 The existing office is an end of terrace property adjoining offices which extend North from Agincourt Road.

3.3 The nearest noise sensitive receptor for Option 1 is Heathgate Unit 7 located to North of the existing office. The main noise source thereby being traffic related noise associated with Agincourt Road and the adjacent car park.

3.4 The nearest noise sensitive receptor for Option 2 is Heathgate Unit 5 located immediately to North of the existing office.

3.5 The nearest noise sensitive receptor for Option 3 is Heathgate Unit 4.

3.6 The main noise source is traffic related noise associated with Agincourt Road. A bus stop is located just to the South of the fence boundary next to Unit 4.

3.7 An air conditioning unit servicing Unit 5 is currently located at the rear of Unit 7.

4. MEASUREMENT METHODOLOGY

Automated Noise Measurements

4.1 An unattended noise survey was undertaken between Friday 29th April 2016 and Wednesday 4th May 2016.

4.2 The microphone was positioned at 1.5m from the ground, approximately 1m from the façade of the existing office and 1m from the adjacent fence (which is approximately 2m high). The microphone was not able to be positioned such that it was at the façade of the nearest noise sensitive receptor and therefore no corrections for reflections have been made for this position. This location has been shown on the attached site plan Figure 1790/SP1.

4.3 The purpose of the unattended measurement was to ascertain typical daytime and night time ambient noise levels.

4.4 The acoustic parameters LAeq, LA90 and LAFMax were measured automatically every 15-minutes during the survey.

4.5 The sensitivity of the microphone was checked prior to and following the survey, and the levels were found to be within the tolerances of British Standard BS EN IEC 61672:2003 and British Standard BS 4142:2014.

Equipment and Weather Conditions

4.6 The equipment used is detailed below in Table 1790/T3. The microphone was fitted with a protective windshield and calibration certificates are available on request.

Equipment			Calibration	
Description	**Manufacturer & Type Number**	**Serial Number**	**Last Date**	**Certificate Number**
Integrating sound level meter	Cirrus CR:171A	G061850	Sept 2015	221866
Acoustic Calibrator	Cirrus CR:515	64548	Oct 2014	100287
Weather Station	Davis Vantage Vue	-	-	-

Table 1790/T3 – Noise Survey Equipment

4.7 The weather was predominantly settled throughout the measurement period. Winds were mainly from the South South-West and were generally below 5m/s (BS 4142:2014). The days were warm but cool by night however, not cold enough for frost to develop. A small amount of precipitation was recorded throughout the duration of the assessment (less than 2mm total) but it is believed that the meteorological conditions did not adversely affect the measurements. Weather information was collected using an onsite weather logging station as shown in the attached Figure 1790/F1.

Automated Noise Survey Results

4.8 Table 1790/T4 below presents the results for the unattended noise measurements. To assist the reader the results have been summarised in terms of daytime and night-time periods.

Time Period	Measured Noise Levels	
	Ambient Noise Level $L_{Aeq,T}$ (dB)	Typical Background Noise Level $L_{A90,15min}$ (dB)
Daytime 07:00 – 23:00	62	54
Night-time 23:00 – 07:00	56	39

Table 1790/T4 - Summary of Long-term Noise Monitoring

4.9 These are the measured values and have not been corrected for reflections.

4.10 A time history of the automated noise measurements is given in Figure 1790/TH 1 which is appended to this report.

5. PLANT NOISE ASSESSMENT

Automated Noise Measurements

5.1 The new air conditioning unit that has been proposed to the client is Fujitsu Model No. AUYG24L

5.2 It is assumed that the unit will operate exclusively during the daytime period as it services a commercial office.

5.3 The Client has provided three possible locations to install the new air conditioning unit. These can be seen in the attached plans provided by WS Planning and Architecture and included in Appendix C at the end of this report.

Option 1

5.4 The first option is to locate the new unit adjacent to an existing one on the outside of Unit 5 approximately 34m to the North of the boundary fence of the existing office (Unit 4) adjacent to Agincourt Road at its nearest point. The nearest noise sensitive receptor here is the commercial office at Heathgate, Unit 7 located to North of Unit 4.

Option 2

5.5 The second option is to locate the new unit on the flat roof at the boundary of Unit 4 and Unit 5 approximately 5m to the North of the boundary fence adjacent to the road at its nearest point. The nearest noise sensitive receptor here is the commercial office located at Heathgate, Unit 5 located to North of Unit 4.

Option 3

5.6 The third option is to locate the unit on the side of the building of Unit 4 approximately 3m from the boundary fence at its nearest point. The nearest noise sensitive receptor here is the actual commercial office located at Heathgate, Unit 4.

5.7 Based on the information provided by the air conditioning unit manufacturer, the Sound Pressure Levels at 1m from the external façade of the nearest noise sensitive receptor for each location are summarised in the table below. Note that appropriate corrections for distance attenuation and barrier attenuation have been applied.

	Sound Pressure Level (dB)		
	Option 1	**Option 2**	**Option 3**
Sound Pressure Level (dB) @ 1m from the external façade of the nearest noise sensitive receptor	62	48	62

Table 1790/T5 – Sound Pressure Levels at 1m from the façade of the nearest noise sensitive receptor

5.8 It must be noted that the values presented in Table 1790/T5 above do not take account of any reflections from the façade or the nearby boundary fence.

5.9 Therefore, based on this assessment, we would recommend that the best option for locating the new proposed air conditioning unit would be Option 2.

5.10 Provided that the unit operates exclusively during the daytime period, this meets the Local Planning Authority requirement for the noise level to be 5dB below the LA90 at 1m from the external façade of the nearest sensitive receptor.

6. CONCLUSION

6.1 Adnitt Acoustics have been commissioned by WS Planning and Architecture to carry out an environmental noise survey and assessment in support of the proposal for the installation of an air conditioning unit at the site of Unit 4 Heathgate, Agincourt Road, NW3 2NU.

6.2 The work has been requested to support a pre-planning application for the installation of a new air conditioning unit for an existing office to ensure that the proposal complies with the local planning policy for Camden.

6.3 An assessment was carried out to determine the most appropriate location for the new air conditioning unit to be located from three possible options.

6.4 The main noise source at this location is from road traffic associated with the nearby Agincourt Road.

6.5 The assessment demonstrated that in order to comply with the Local Planning Authority Policy "DP28 – Noise and Vibration" the most suitable option for locating the new air conditioning unit would be Option 2. This option would mean positioning the unit on the rooftop on the boundary of Unit 4 and Unit 5.

6.6 The unit that has been proposed to the client meets the Local Planning Authority requirement for the noise level to be 5dB below the LA90 at 1m from the external façade of the nearest noise sensitive receptor provided that the unit operates exclusively during the daytime period.

Juan L. Rioperez BEng(Hons) AMIOA

for ADNITT ACOUSTICS

APPENDIX A: GLOSSARY OF ACOUSTIC TERMS

Ambient Noise	The noise climate heard over a period of time due to all normal sources, in the absence of extraneous or atypical sounds. Used to describe noise in the absence of the introduced sound, generally.	
Ambient Noise Level	Describes the average noise level of the ambient noise over a stated period of time, e.g. hourly noise	
	Parameter: A-weighted Continuous Equivalent Sound Pressure Level determined over the time period T.	$L_{eq,T}$ or $L_{Aeq,T}$
	Expressed in decibels / A-weighted decibels	dB(A) or dB
Decibel scale dB	A linear numbering scale used to define a logarithmic amplitude scale, thereby compressing a wide range of amplitude values to a small set of numbers	
dB(A)	An electronic filter in a sound level meter, which approximates under defined conditions the frequency response of the human ear.	
$L_{Aeq,T}$	The equivalent continuous sound level. The steady dB(A) level which would produce the same A-weighted sound energy over a stated period of time as the measured sound pressure level.	
L_{Amax}	The maximum dB(A) level measured during a survey period.	
L_{A10}	The dB(A) level exceeded for 10% of the survey period, often used as a quantifier of traffic noise level.	
L_{A90}	The dB(A) level exceeded for 90% of the survey period. Used in BS 4142:1997as being representative of the background noise level.	
Acoustic screening	Physical barrier to sound formed by fence, wall, building or other structure, which has the effect of reducing the sound transmitted.	
Individual Event Noise	The noise of a distinctive event with the varying noise climate, usually a transient activity, such as a vehicle pass-by, aircraft flyover or similar, rather than an isolated impulsive noise.	
Individual Event Noise Level	Describes the highest noise level during the event as measured under particular conditions of time-weighting	
	Parameter: A-weighted Maximum Sound Pressure Level with FAST or SLOW time weighting	$L_{Amax,FAST}$ or $L_{Amax,F}$ $L_{Amax,SLOW}$ or $L_{Amax,S}$
	Expressed in decibels / A-weighted decibels	dB(A) or dB
Sound Reduction Index R_w	Single number rating used to describe the sound insulation of building elements as defined in BS EN ISO 717 1997.	
Weighted element-normalized level difference $D_{n,e,w}$	Single number rating used to describe the sound insulation of building elements as defined in BS EN ISO 717 1997.	

APPENDIX B: WEATHER STATION WIND SPEED VERIFICATION

B.1 Davis Vantage Vue

Our weather data is measured locally on site using a Davis Vantage Vue weather station (pictured below). The weather data is logged and stored every 15 minutes, this includes among others: mean and max temperature, total rainfall and mean and max wind speeds.

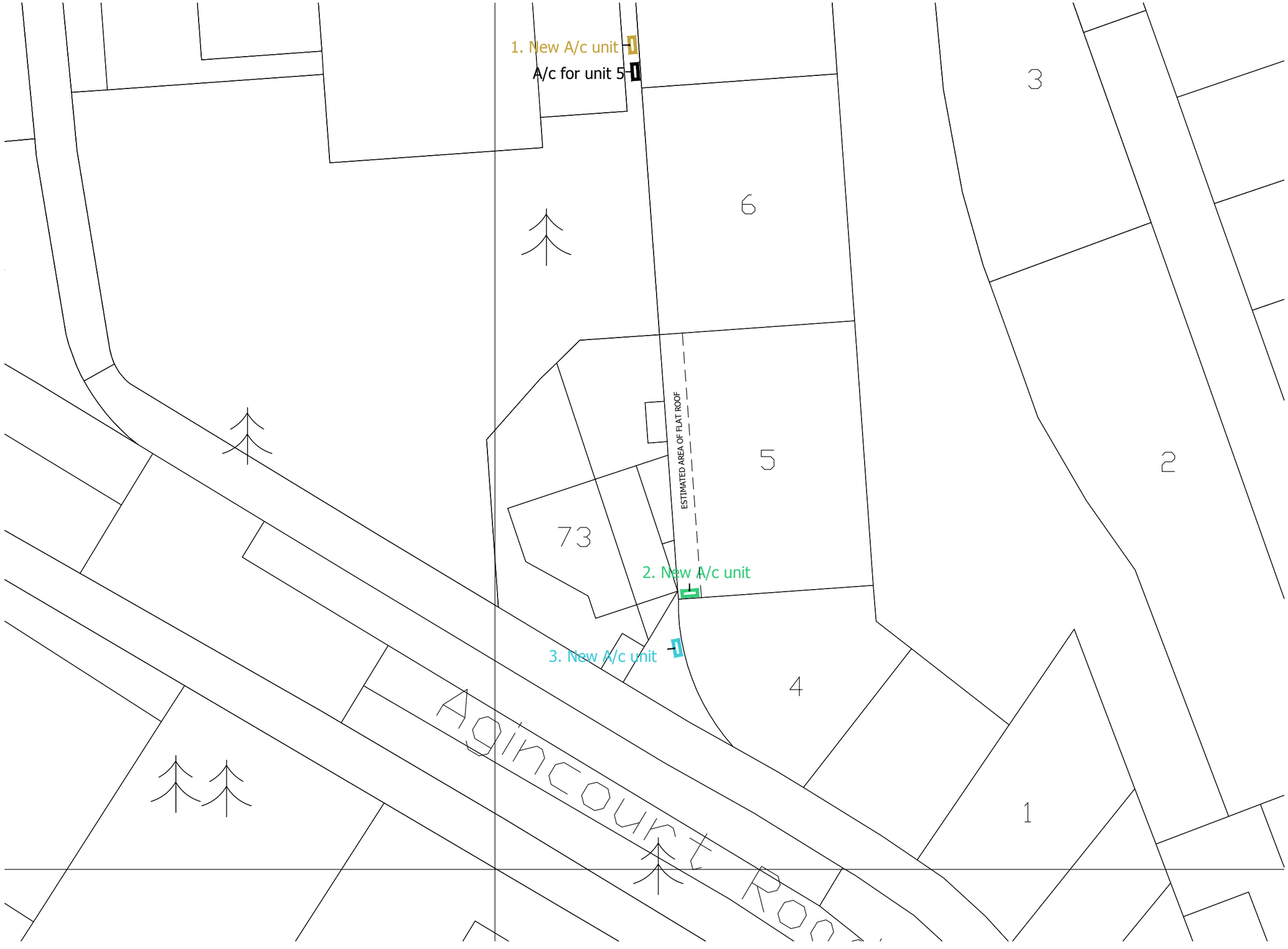
From our experience wind speed generally has the greatest impact on measured noise results when compared to temperature, rain fall and other meteorological factors.

Therefore the wind speed measurements of the Davis Vantage Vue have been verified within the last six months using a calibrated anemometer (Kaindl Electronic Windtronic 2) and a calibrated fan to generate a constant air flow over the wind cups.

The measurements found that the Davis Vantage Vue was in good agreement (±0.5ms-1) with the calibrated anemometer. Therefore we would consider that our Davis Vantage Vue is adequate for use with the measurement procedure outlined in BS 4142:2014.

Figure 1790/ F 1 : Davis Vantage Vue Weather Station

APPENDIX C: PROPOSED PLANS



N

Possible Locations for A/c Unit:

- Option 1: Next to Existing A/c for Unit 5
- Option 2: On small flat roof area
- Option 3: Next to window at Ground Floor Level

Ground Floor Plan As Proposed 1:200

0 2 4 6 8 10 12 14 16 18 20m

SCALE 1:200

Rev	Date	Description

WS PLANNING & ARCHITECTURE
Reigate Place
43 London Road, Reigate
Surrey. RH2 9PW
T. 01737 225711
F. 01737 226311
www.wsplanning.co.uk

Date	Drawn By
April 2016	JJ
Scale: 1/200@A3	Checked

Client: Ms M Shurrmer

Project: 4 Heathgate, Agincourt Road NW3 2NU

Title: As Proposed Ground Floor Plan

Drawing. No.: J002411-DD-04

Figure 1790/ SP 1 : Site Plan showing Noise Measurement Location

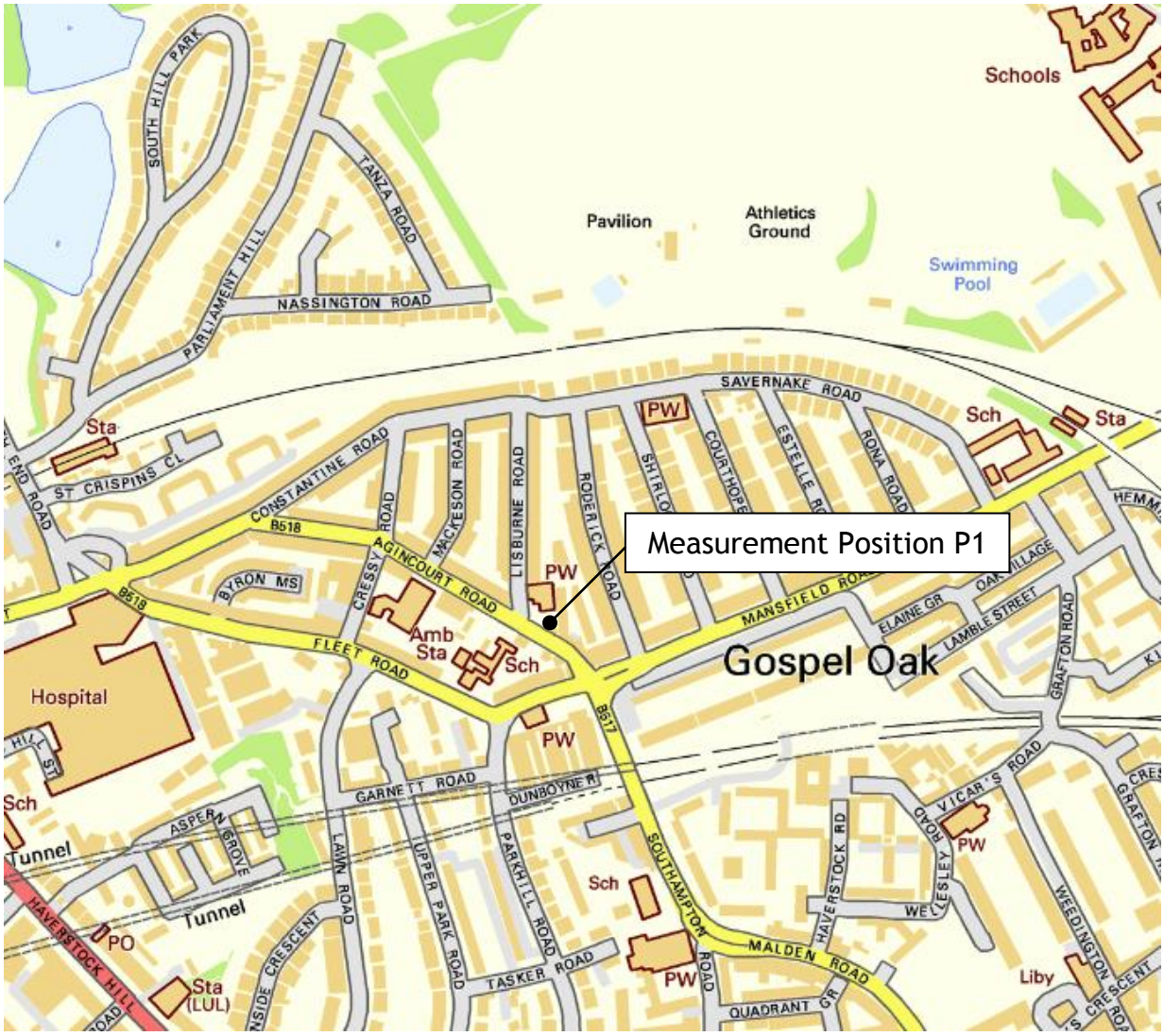


Figure 1790/ TH 1 : Time History of Automated Noise Monitoring (Position P1)