

Northwood College for Girls Hillingdon London

Environmental Noise Survey and Plant Noise Assessment Report

28564/PNA1

12 February 2021

For:
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Document Control

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1.0 Introduction

Northwood College for Girls in Northwood, London has proposed the installation of a new kitchen extract fan.

Hann Tucker Associates have therefore been commissioned to undertake an environmental noise survey and plant noise impact assessment with reference to the requirements of the Local Authority.

The report presents the methodology and findings of our environmental noise survey and plant noise emissions criteria.

2.0 Objectives

To inspect the site to familiarise ourselves with its layout and surroundings in order to identify suitable accessible locations for environmental noise measurements.

To establish by means of an unmanned 24 hour survey the existing L_{Amax} , L_{Aeq} and L_{A90} environmental road, rail and air traffic noise levels at up to two secure and accessible on-site positions using fully computerised noise monitoring equipment.

The survey will enable noise emission limits from the development to be identified with reference to the requirements of the Local Authority and/or the application of BS 4142: 2014 and to minimise the possibility of noise nuisance to neighbours.

To assess the noise emissions from the proposed kitchen extract plant, based upon data with which we are provided, and comment upon the acceptability.

To advise on noise control measures if required with reference to the requirements of the Local Authority.

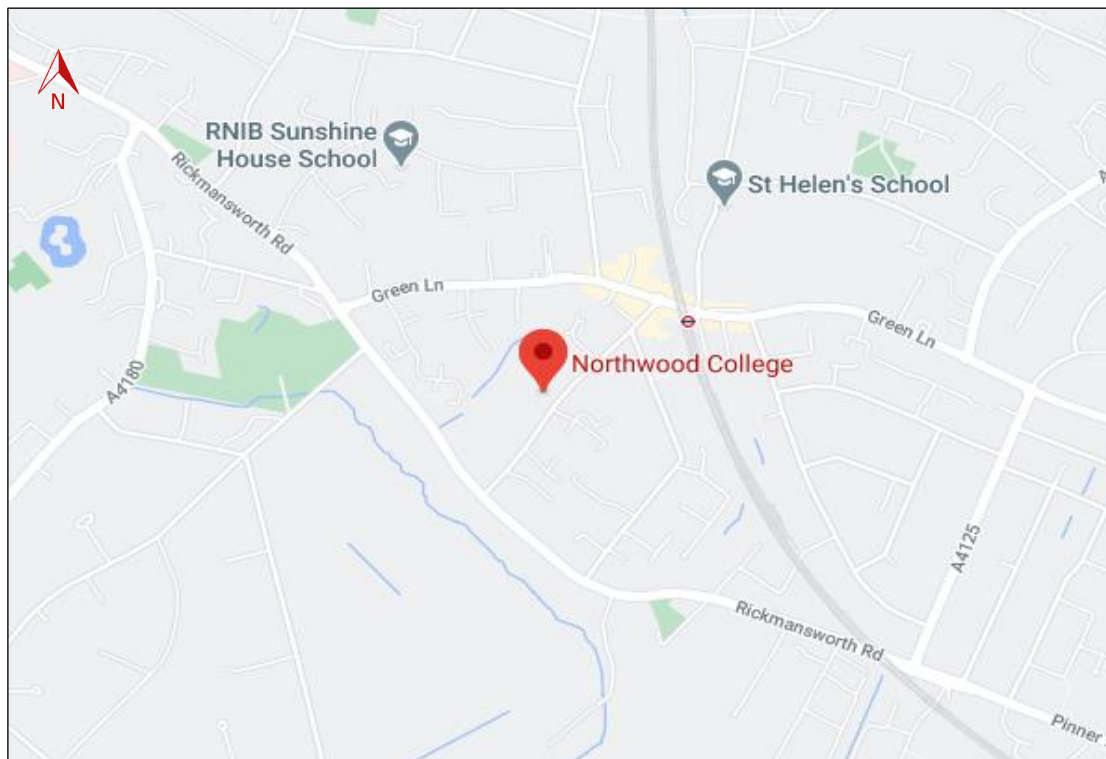
To present our methodology and findings in a detailed Environmental Noise Survey and Plant Noise Impact Assessment Report to accompany the planning application.



3.0 Site Description

3.1 Location

The site is Northwood College for Girls, Northwood. The location is shown in the Location Map below.



Location Map (Imagery & Map data ©2021 Google, The GeoInformation Group)

The site falls within the jurisdiction of London Borough of Hillingdon.

3.2 Description

The existing site is Northwood College for girls in Northwood, London. It is bound by Maxwell Road to the south east and Rickmansworth Road to the south west. It is situated within a residential area.

The site is shown in the Site Plan on the following page.



Site Plan (Imagery & Map data ©2021 Google, The GeoInformation Group)

4.0 Acoustic Terminology

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

5.0 Acoustic Standards and Guidelines

5.1 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010 (i.e. before the NPPF). The NPSE is the overarching statement of noise policy for England and applies to all forms of noise other than occupational noise, setting out the long term vision of Government noise policy which is to:

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”

“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.”*

The Explanatory Note to the NPSE has three concepts for the assessment of noise in this country:

NOEL – No Observed Effect Level

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

LOAEL – Lowest Observable Adverse Effect Level

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

SOAEL – Significant Observed Adverse Effect Level

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

None of these three levels are defined numerically and for the SOAEL the NPSE makes it clear that the noise level is likely to vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research to investigate what may represent an SOAEL for noise is acknowledged in the NPSE and the NPSE asserts that not stating specific SOAEL levels provides policy flexibility in the period until there is further evidence and guidance.

The NPSE concludes by explaining in a little more detail how the LOAEL and SOAEL relate to the three NPSE noise policy aims listed above. It starts with the aim of avoiding significant adverse effects on health and quality of life, then addresses the situation where the noise impact falls between the LOAEL and the SOAEL when “*all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development.*” The final aim envisages pro-active management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development which include the need to minimise travel distance between housing and employment uses in an area.

5.2 National Planning Policy Framework (NPPF)

The following paragraphs are from the NPPF (revised February 2019):

“180. Planning policies and decisions should also ensure that new development is appropriate



for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

182. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

Paragraph 180 also references the Noise Policy Statement for England. This document does not refer to specific noise levels but instead sets out three aims:

“Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.”

5.3 Planning Practice Guidance on Noise

Planning Practice Guidance (PPG) under the NPPF has been published by the Government as a web based resource at <http://planningguidance.planningportal.gov.uk/blog/guidance/>. This includes specific guidance on Noise although, like the NPPF and NPSE the PPG does not



provide any quantitative advice. It seeks to illustrate a range of effect levels in terms of examples of outcomes as set out in the following table:

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	No specific measures required
		Lowest Observed 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.	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
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 hard, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

5.4 Local Authority Requirements

The site lies within the jurisdiction of London Borough of Hillingdon. Their advice regarding criteria for atmospheric noise emissions from building service plant is as follows:

“British Standard 4142:1997 gives advice on measuring and assessing the noise from machinery or plant, and is relevant if the surrounding residential areas might be affected. Developments with a BS4142 assessment of marginal significance or above would not ordinarily be permitted. Consequently, the development should be controlled such that the rating level of the noise from the proposed development determined according to the BS4142



is at least 5dB below the background noise level $L_{A90,T}$. Ideally, the assessment of noise should give a positive indication that complaints are unlikely.”

5.5 BS 4142:2014

When setting plant noise emission criteria reference is commonly made to BS 4142: 2014 *“Methods for rating and assessing industrial and commercial sound”*.

The procedure contained in BS 4142:2014 provides an assessment of the likely effects of sound on people when comparing the specific noise levels from the source with representative background noise levels. Where the noise contains “a tone, impulse or other characteristic” then various corrections can be added to the specific (source) noise level to obtain the “rating level”.

BS 4142 states that: *“The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs”. An estimation of the impact of the specific noise can be obtained by the difference of the rating noise level and the background noise level and considering the following:*

- *“Typically, the greater this difference, the greater the magnitude of the impact.”*
- *“A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.”*
- *“A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.”*
- *“The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.”*

The determination of the “rating level” and the “background level” are both open to interpretation, depending on the context.

In summary it is not possible to set plant noise emission criteria purely on the basis of BS 4142:2014. It is reasonable to infer from the above, however, that a difference of around -5dB corresponds to “No Observed Effect Level” as defined in the Noise Policy Statement for



England. It is also reasonable to infer from the above that if the plant noise rating level does not exceed the existing background noise level outside any noise sensitive residential window then the plant noise is of “low impact”.

5.6 Building Regulations & Building Bulletin 93

The development is an Academy school facility and therefore needs to comply with Building Regulation E4 which is detailed in Approved Document E: 2003 Edition; incorporating 2010 amendments (ADE). Regulation E4 states:

“In the Secretary of State’s view the normal way of satisfying Requirement E4 will be to meet the values for sound insulation, reverberation time and internal ambient noise which are given in Section 1 of Building Bulletin 93. Acoustic design of Schools. A design guide, DfES 2003. ISBN: 0 11271 105 7.”

In 2014, Building Bulletin 93: 2003 was superseded by ‘Acoustic design of schools: performance standards’ Building Bulletin 93. The latest version of this document (BB93, February 2015) provides design targets for indoor ambient noise levels, sound insulation and reverberation times which shall form the basis for the acoustic design criteria.

Part E of the Building Regulations is not intended to cover the acoustic conditions in administration and ancillary spaces not used for teaching and learning except in as far as they affect conditions in neighbouring teaching and learning spaces. The performance standards given in the tables for administration and ancillary spaces are for guidance only.

5.6.1 Acoustic Performance Standards

Table 1 specifies upper limits for indoor ambient noise levels in terms of $L_{Aeq, 30mins}$ during normal teaching hours. Values for refurbishment are also the minimum acceptable standards for alternative performance standards in new buildings.

Where a type of room is not listed, the nearest approximation should be used. Where a room is used for more than one purpose, the most onerous condition should be used.

**Table 1: Noise activity and sensitivity levels and upper limits for indoor ambient noise level**

Type of Room	Upper Limit for indoor ambient noise levels	
	New Build	Refurbishment
Nursery school rooms Primary school: classroom, class base, general teaching area, small group room Secondary school: classroom, general teaching area, seminar room, tutorial room, language laboratory	35	40
Open plan: Teaching area Resource/breakout area	40	45

5.7 World Health Organisation Guidelines on Community Noise

BS8233:2014 is based upon the current World Health Organisation (WHO) guidance “*Guidelines on Community Noise*”. A summary of the noise guidelines relevant to the proposed scheme is presented in the table below.

Residential Environment	Critical Health Effect(s)	L _{Aeq}	L _{AFmax}	Time Base
Outdoor living area	Serious annoyance, daytime and evening	55	-	07:00-23:00
	Moderate annoyance, daytime and evening	50	-	07:00-23:00
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	-	07:00-23:00
Inside bedrooms	Sleep disturbance, night-time	30	45	23:00-07:00
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	60	23:00-07:00

These WHO guidelines are based, in almost all cases, on the lower threshold below which the occurrence rates of any particular effect can be assumed to be negligible.

5.8 British Standard BS8233: 2014

British Standard 8233: 2014 “Guidance on sound insulation and noise reduction for buildings” provides guidance for the control of noise in and around buildings.

BS8233:2014 Section 7.7.2 titled “Internal ambient noise levels for dwellings” states:



"In general for steady external noise sources, it is desirable that internal ambient noise levels do not exceed the following guideline values:

Activity	Location	Desirable Internal Ambient Criteria	
		07:00 - 23:00	23:00 - 07:00
Resting	Living Rooms	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 $L_{Aeq,8hour}$

5.9 Statutory Noise Nuisance

There is no quantitative definition of statutory noise nuisance. It is generally accepted however, that if the plant noise level is at least 5dB (or 10dB if tonal) below the minimum background $L_{90(15minutes)}$ at 1m from the nearest noise sensitive residential window, then the risk of a statutory noise nuisance is avoided. By adopting this as a design criterion the guidance contained in BS 4142:2014 should also be complied with.

6.0 Survey Methodology

The survey was undertaken by Sandy Wilson BSc(Hons), AMIOA.

6.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 11:00 hours on Tuesday 2nd February 2021 to 13:30 hours on Wednesday 3rd February 2021.

During the periods we were on site the wind conditions were light and the sky was generally clear. We understand that generally throughout the survey period the weather conditions were calm. These conditions are considered suitable for obtaining representative measurement results.

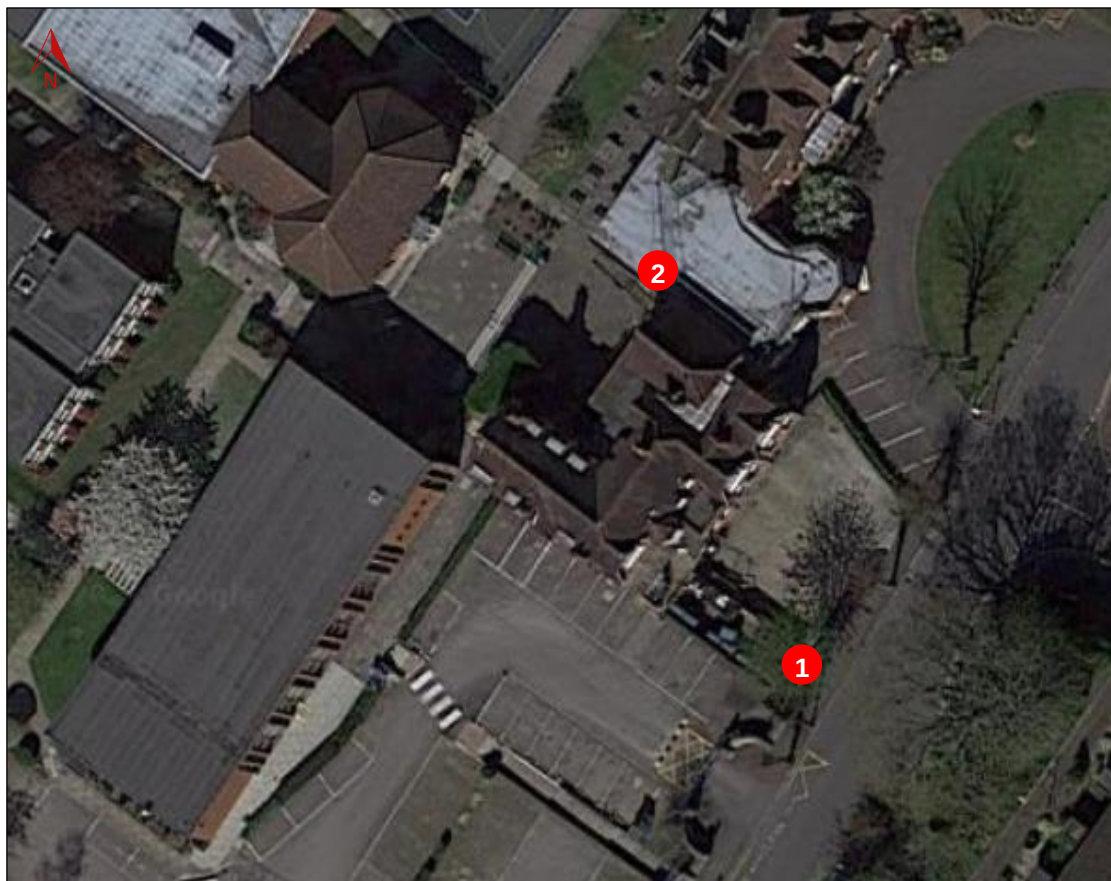
Measurements were taken continuously of the A-weighted (dBA) L_{90} , L_{eq} and L_{max} sound pressure levels over 15 minute periods.

6.2 Measurement Positions

The noise level measurements were undertaken at 2No. positions as described in the table below.



Position No	Description
1	The microphone was attached to a pole approximately 1 metre above ground level. The microphone was attached and positioned approximately 1 metre from the railings. The microphone was at the perimeter of the grounds overlooking Maxwell Road.
2	The microphone was attached to a pole approximately 1 metre above ground level. The microphone was attached and positioned approximately 1 metre from the railings overlooking the courtyard near the school canteen.



Plan Showing Measurement Positions (Imagery 2020 © Bluesky, Getmapping plc, Infoterra Ltd & Bluesky, Maxar Technologies, The Geoinformation, Map Data © 2021 Google)



6.3 Instrumentation

The instrumentation used during the survey is presented in the Table below:

Description	Manufacturer	Type	Serial Number	Calibration
Type 1 ½" Condenser Microphone	PCB	377B02	107842	Calibration on 28/07/2020
Preamp	Larson Davis	PRM902	4199	Calibration on 28/07/2020
Type 1 Data Logging Sound Level Meter	Larson Davis	824	3541	Calibration on 28/07/2020
Type 1 ½" Condenser Microphone	PCB	377B02	107427	Calibration on 28/07/2020
Preamp	Larson Davis	PRM902	4154	Calibration on 28/07/2020
Type 1 Data Logging Sound Level Meter	Larson Davis	824	3155	Calibration on 28/07/2020

Each sound level meter, including the extension cable, was calibrated prior to and on completion of the surveys. No significant changes were found to have occurred (no more than 0.1dB).

Each sound level meter was located in an environmental case with the microphone connected to the sound level meter via an extension cable.

Each microphone was fitted with a windshield.

7.0 Results

The results have been plotted on Time History Graphs 28564/TH1 and 28564/TH2 enclosed, presenting the 15 minute A-weighted (dBA) L_{90} and L_{eq} noise levels at each measurement position throughout the duration of the survey.



The lowest L_{A90} (15 min) measurements recorded during the survey are presented in the table below:

Position	Minimum Measured $L_{A90(15min)}$ Background Noise Level (dB re 2×10^{-5} Pa)		
	Daytime (07:00 – 19:00 hours)	Evening (19:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
1	42	38	36
2	39	35	33

8.0 Discussion Of Noise Climate

During the periods we were on site the dominant noise sources were noted to be construction noise from the school and road traffic noise from Maxwell Road. Once the construction works are finished the dominant noise source will be road traffic.

Our monitoring equipment was running whilst construction works were taking pace however the works stopped at 16:00 and the plant noise emission criteria presented is based upon the lowest 15 minute period after these hours.

9.0 Plant Noise Emission Criteria

Building services plant external noise emission levels will need to comply with Local Authority's requirements and statutory noise nuisance legislation.

We understand that the requirements imposed by the London Borough of Hillingdon states as follows:

"British Standard 4142:1997 gives advice on measuring and assessing the noise from machinery or plant, and is relevant if the surrounding residential areas might be affected. Developments with a BS4142 assessment of marginal significance or above would not ordinarily be permitted. Consequently, the development should be controlled such that the rating level of the noise from the proposed development determined according to the BS4142 is at least 5dB below the background noise level $L_{A90,T}$. Ideally, the assessment of noise should give a positive indication that complaints are unlikely".

On the basis of the above and the results of the environmental noise survey, we propose that



the following plant noise emission criteria be achieved at 1 metre from the nearest noise sensitive residential window.

Period	Plant Noise Emission Limit, L _{Aeq}
Daytime (07:00-19:00)	37 dB
Evening (19:00-23:00)	33 dB
Night-time (23:00-07:00)	31 dB
At nearest school openable window *	50 dB

* To meet BB93 internal noise requirements of ≤ 35 dBA inside classrooms via a slightly open window

The above criteria are to be achieved with all plant operating simultaneously.

If plant contains tonal or impulsive characteristics the external design criteria should be reduced by 5dBA.

It should be noted that the above are subject to the final approval of the Local Authority.

10.0 Plant Noise Impact Assessment

We understand the proposed plant comprises the following:

Plant Description	Qty	Plant Make	Model Number
Extract Fan	1	Systemair	MUB/T 100 630D4-K2-L IE3

10.1 Drawings

Our acoustic analyses is based on the following drawings provided by KB Wilde Consulting.

Reference	Title	Date
NWC-EWA-ZZ-ZZ-DR-A-0622_T1	XREF- NORTHWOOD	Jan 21
20031.MS.E02	Mechanical Services Car Park Elevations & Rear Courtyard	Feb 21



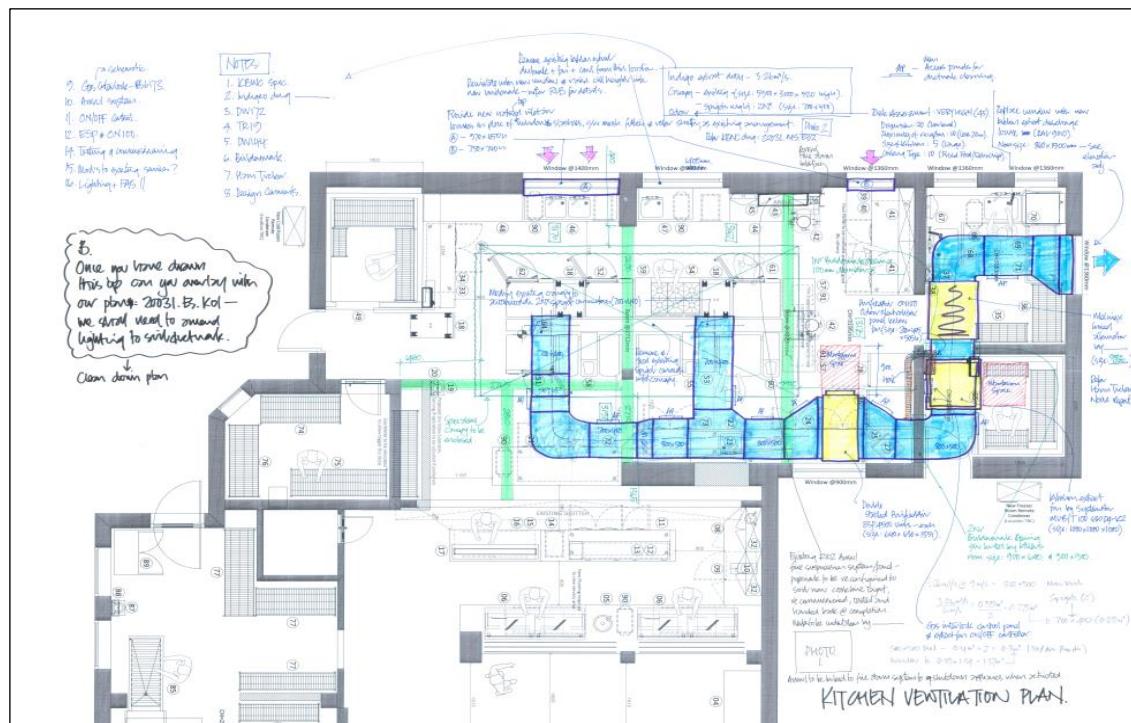
10.2 Plant Noise Data

We understand the manufacturer's noise data for the equipment to be as follows:

Plant Description	Sound Pressure Level (dB re 2×10^{-5} Pa) at 1 metre at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Inlet	43	63	63	67	68	66	62	55	72
Outlet	44	64	65	68	69	68	64	56	74
Surrounding	41	56	53	51	53	53	55	48	60

10.3 Location of Plant

The approximate plant locations are presented in the following site plans:



Annotated Site Plan (KB Wilde Consulting; Dated February 2021)



10.4 Mitigation Measures

In order to control plant noise emissions in line with the proposed criterion, we recommend installing an attenuator to the kitchen extract fan. The attenuator must be melinex and capable of achieving the following insertion losses:

Plant Unit	Minimum Insertion Loss (dB) for Attenuators at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Extract Fan	7	13	14	13	16	18	18	22

The above could typically be achieved using a melinex lined attenuator that is 1200mm long with 30% free area although the minimum insertion losses are the overriding design consideration.

10.5 Plant Noise Impact Assessment

We understand that the proposed units will be operational during daytime hours.

An assessment was undertaken separately for the requirements of the Local Authority and also purposes of general compliance with the principals of BB93.

10.5.1 Local Authority Assessment

The following table summarises our predictions of atmospheric noise emissions from the louvre to the nearest noise sensitive residential window.

Description	Sound Pressure Level (dB re 2×10^{-5} Pa) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Manufacturer's Data (L_p at 1m)	70	80	74	71	69	68	63	57	75
Proposed Attenuator	-7	-13	-14	-13	-16	-18	-18	-22	
Ductwork Losses	-1	-2	-2	-2	-3	-3	-3	-3	
Distance Correction (Approx. 60m)	-33	-33	-33	-33	-33	-33	-33	-33	
Calculated Noise Level at Receptor	29	32	25	23	17	14	9	<0	24

Our calculations indicate that the proposed plant, in conjunction with the proposed mitigation measures should be capable of achieving the requirements of the Local Authority outlined in Section 9.0.



10.5.2 BB93 Assessment

The following table summarises our predictions of atmospheric noise emissions from the louvre to the nearest school openable window:

Description	Sound Pressure Level (dB re 2×10^{-5} Pa) at Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Manufacturer's Data (L_p at 1m)	70	80	74	71	69	68	63	57	75
Proposed Attenuator	-7	-13	-14	-13	-16	-18	-18	-22	
Ductwork Losses	-1	-2	-2	-2	-3	-3	-3	-3	
Distance Loss Correction (Approx. 4m)	-9	-9	-9	-9	-9	-9	-9	-9	
Calculated Noise Level at Receptor	53	56	49	47	41	38	33	23	48

Our calculations indicate that the proposed plant, in conjunction with the proposed mitigation measures should be in line with the general principles of BB93, as outlined in Section 9.0.

11.0 Conclusions

An environmental noise survey has been undertaken in order to establish the currently prevailing noise levels.

Plant noise emission criteria have been recommended based on the results of the noise survey and with reference to the Local Authority's requirements.

An assessment has been carried out to determine the plant noise emissions at the nearest noise sensitive window.

Mitigation measures have been proposed in order to control plant noise emissions in line with the requirements of the Local Authority.

The assessment indicates that the proposed plant, in conjunction with the proposed attenuation, should be capable of achieving the proposed environmental noise criteria at the nearest noise sensitive window.

Appendix A

The acoustic terms used in this report are defined as follows:

dB Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).

dBA The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The _A subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted

It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

L_{90,T} L₉₀ is the noise level exceeded for 90% of the period *T* (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.

L_{eq,T} L_{eq,T} is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, *T*.

L_{max} L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

Sound Pressure Level (L_p) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).

Sound Power Level (SWL or L_w) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

SUITABLE SUPPLIERS of ATTENUATORS (H & V)

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Caice Riverside House 3 Winnersh Fields Gazelle Close Winnersh Wokingham RG41 5QS	0118 918 6470	Mike Jackson

Northwood College

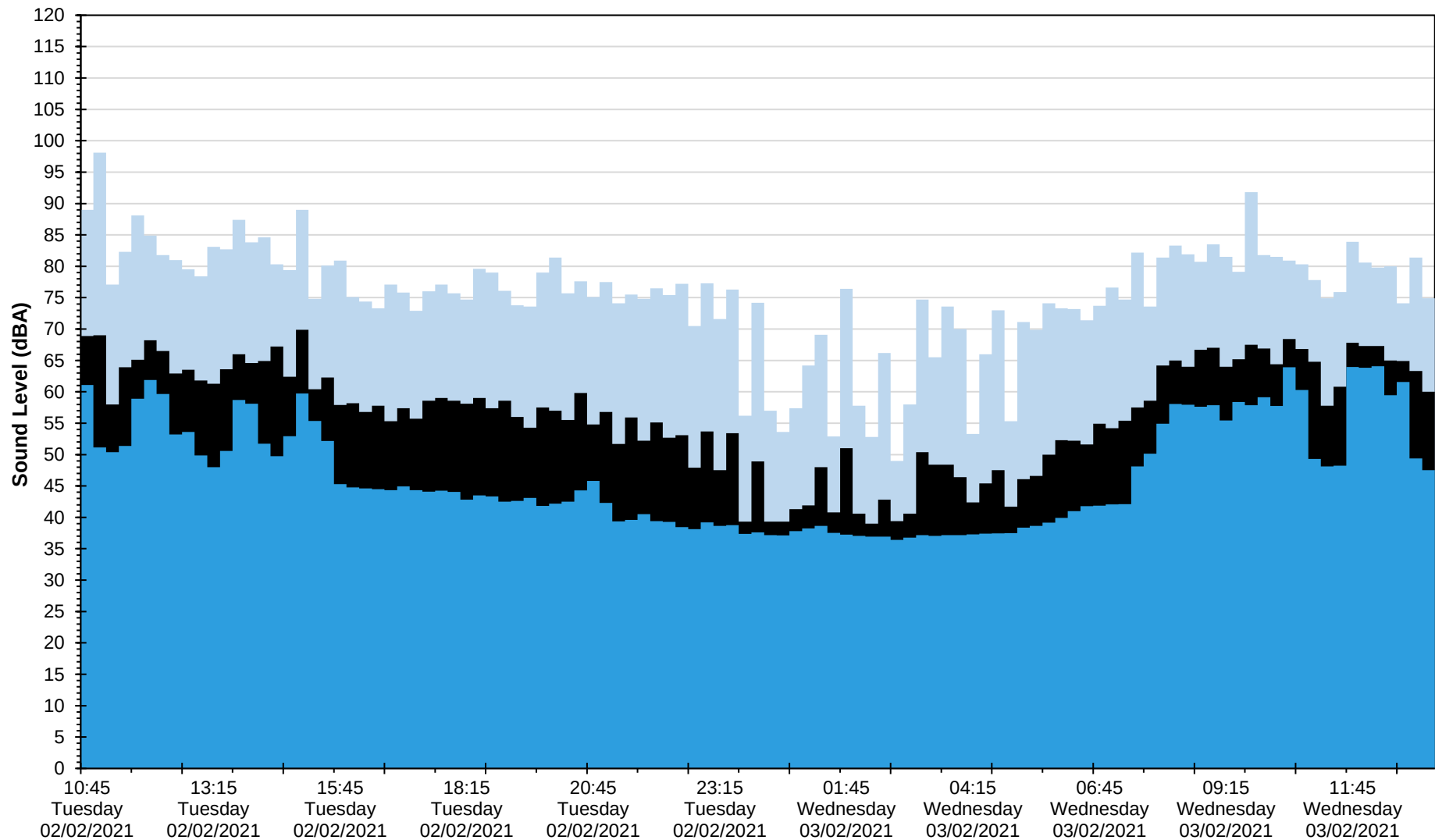
Position 1

L_{eq} , L_{max} and L_{90} Noise Levels

Tuesday 2 February 2021 to Wednesday 3 February 2021

L_{max} L_{eq}

L_{90}



Date and Time

28564/TH1

Northwood College

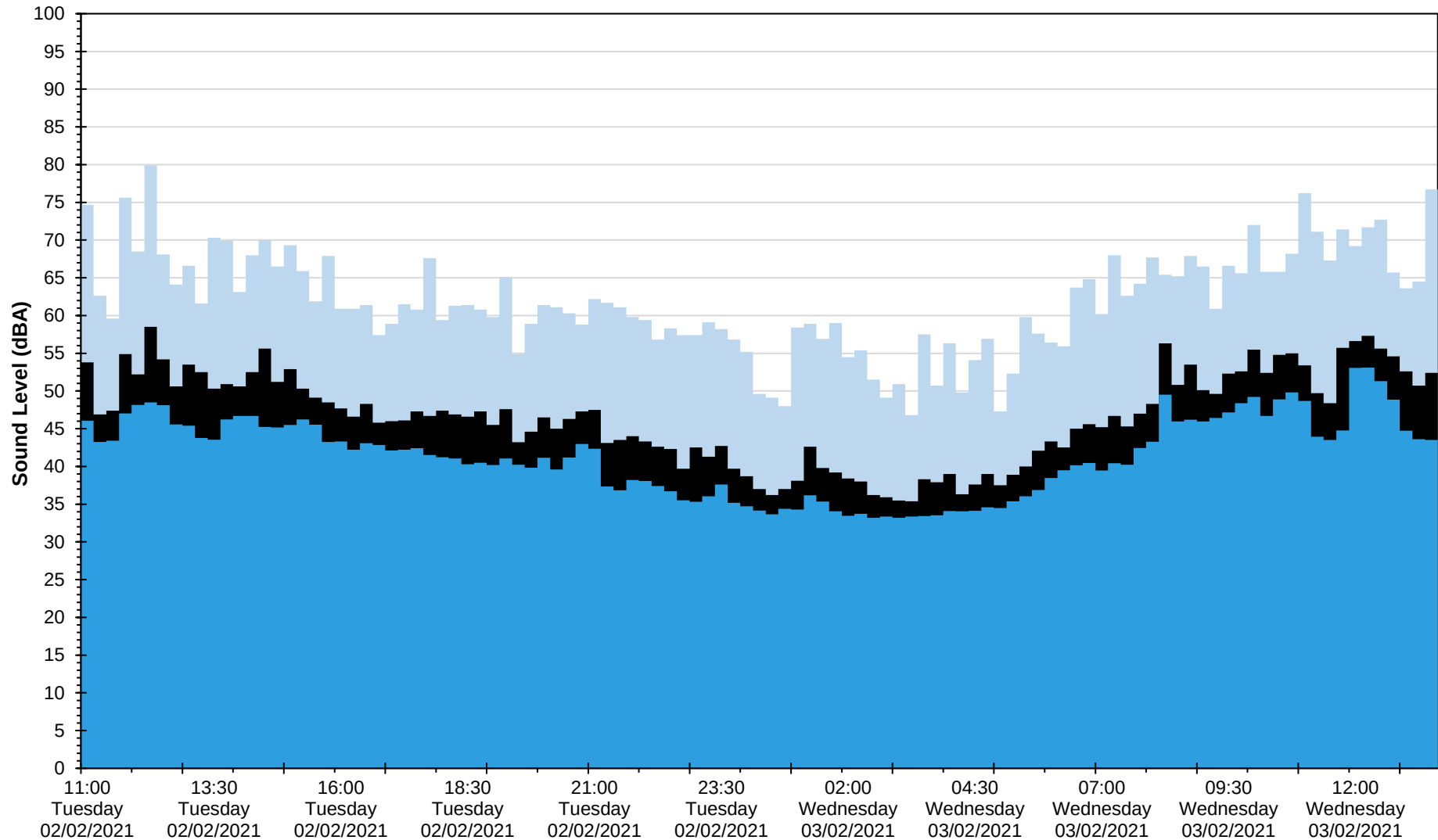
Position 2

L_{eq} , L_{max} and L_{90} Noise Levels

Tuesday 2 February 2021 to Wednesday 3 February 2021

L_{max} L_{eq}

L_{90}



Date and Time

28564/TH2