auricl
acoustic consulting

Mount Vernon Hospital

Plant Noise Assessment Report

1 May 2025

For:

Hillingdon Hospital

London

UB8 3NN

Contents

SUMMARY

New items of building services plant are proposed at the Ophthalmology building at Mount Vernon Hospital in London, noise emissions from which will be subject to London Borough of Hillingdon's requirements.

auricl has been instructed to carry out an environmental noise survey at the site to determine background noise levels at the nearest noise sensitive properties and to undertake an acoustic assessment of the proposed plant in relation to London Borough of Hillingdon's noise requirements.

The assessment shows that the predicted plant noise levels at the nearest noise sensitive properties achieve the London Borough of Hillingdon's requirements.

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1.0 Introduction

New items of building services plant are proposed at the Ophthalmology building at Mount Vernon Hospital in London, noise emissions from which will be subject to London Borough of Hillingdon's requirements.

auricl has been appointed to undertake an environmental noise survey to determine background noise levels at the nearest noise sensitive properties and to undertake an acoustic assessment of the proposed plant in relation to London Borough of Hillingdon's noise requirements.

This report presents the methodology and results of the noise survey and our acoustic assessment of the proposed plant.

2.0 Description of Site

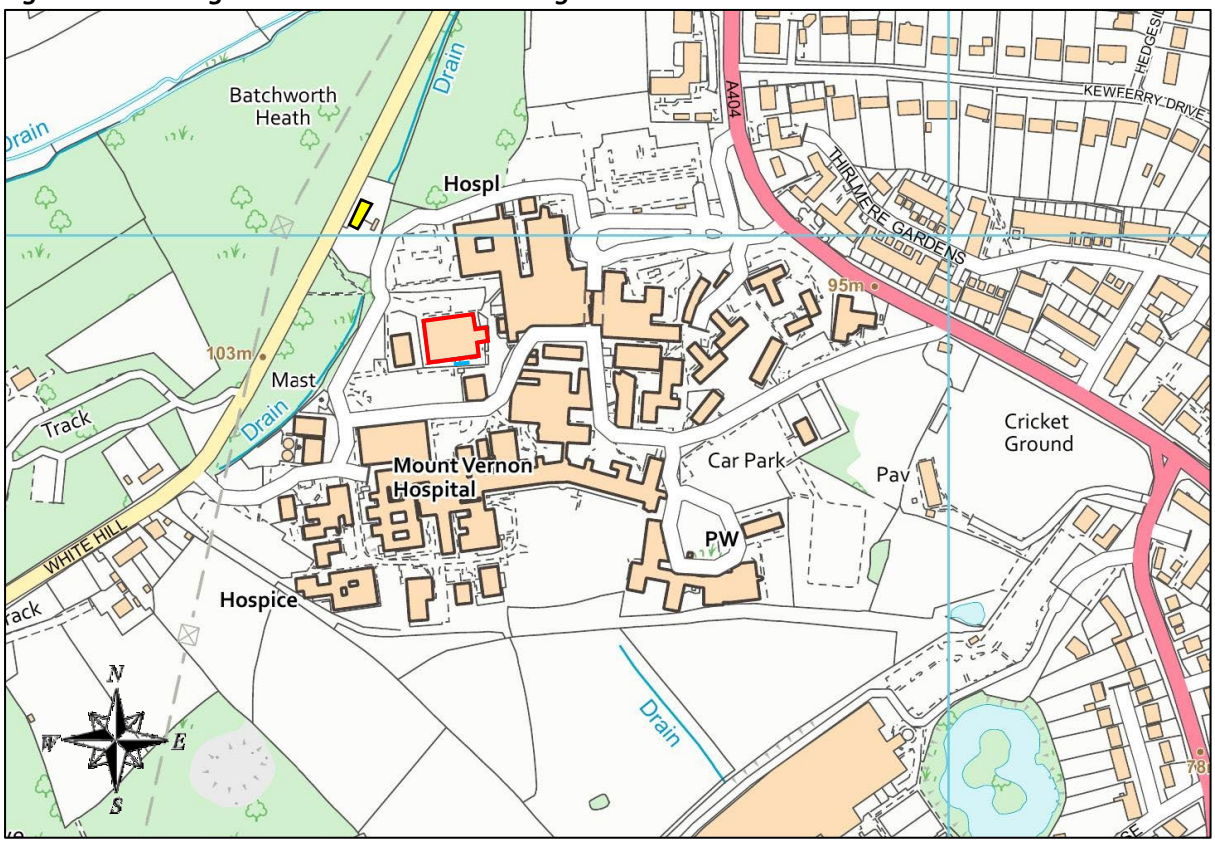
The Mount Vernon site is located to the north west of Northwood with the main site entrances located on Rickmansworth Road to the east of the site. The Ophthalmology building is located towards the west of the site.

An air handling unit and associated condenser unit are proposed to the south of the Ophthalmology building at ground floor level.

The nearest noise sensitive properties to the proposed plant are noted to be the residential properties located to the north west of the site, fronting onto White Hill.

Figure 2.1 shows the building extent in **red**, the approximate plant location in **blue** and the nearest noise sensitive properties indicated in **yellow**.

Figure 2.1 Existing Site Extent and Surroundings



3.0 London Borough of Hillingdon Requirements

London Borough of Hillingdon's Supplementary Planning Document "*Development Control for Noise Generating and Noise Sensitive Development*" (July 2014) states it would normally be acceptable for the Rating Level ($L_{Ar,Tr}$) due to sounds of an industrial and/or commercial nature to be at least 5 dB(A) below the Background Level L_{A90}, based on the terms specified in BS 4142.

British Standard (BS) 4142: 2014+A1: 2019 "*Methods for rating and assessing industrial and commercial*" provides a procedure for the measurement and rating of noise levels form industrial and commercial noise sources. BS 4142: 2014 is the current industry standard for predicting the likelihood of adverse impact due to these sources.

The rating level ($L_{Ar,Tr}$) is defined in BS 4142: 2014+A1: 2019 and is used to rate the source (known as the specific noise source) at the assessment location. This level is obtained by adding a correction for tonal and/or impulsive noise sources. Additionally, corrections can be made for other sound characteristics and intermittency of the noise source.

The method for predicting the likelihood of complaints is based on differences between the rating level and the background $L_{A90,T}$ noise level. The standard states that:

a) "Typically, the greater this difference, the greater the magnitude of the impact.
b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on 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 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."

4.0 Noise Survey

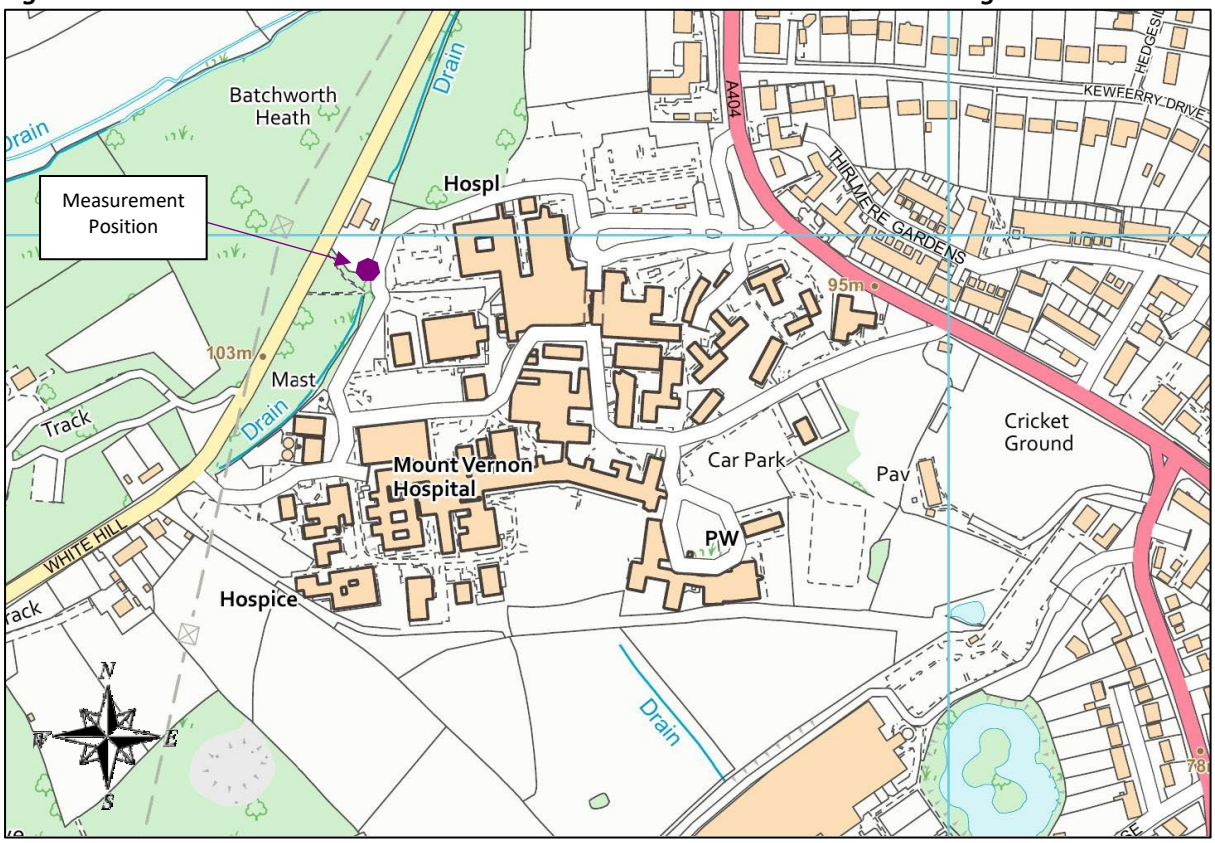
4.1 Methodology

An unmanned environmental noise survey was undertaken between Monday 28 April 2025 and Tuesday 29 April 2025.

The noise survey period was selected to determine background noise levels during periods when the plant items are proposed to be operational (08:00 – 18:00 hours on weekdays).

The measurement position was located in the north western corner of the site with the measurement microphone mounted on a pipe in free-field, as indicated in **purple** on Figure 4.1.

Figure 4.1 Noise Measurement Position in Relation to Site Extent and Surroundings



The measurement position was selected as being representative of background noise levels at the nearest noise sensitive properties to the proposed plant (noted to be the residential properties located to the north west of the site, fronting onto White Hill).

Due to the nature of the noise survey, i.e. unmanned, we are unable to comment on the exact weather conditions throughout the entire noise survey period, however at the beginning and end of the survey period, weather conditions were dry with partial cloud coverage and only light wind. Conditions throughout the survey period were considered to be appropriate for undertaking environmental noise measurements.

4.2 Noise Survey Equipment

The equipment used for the noise survey is summarised in Table 4.1.

Table 4.1 Description of Equipment used for Noise Survey

Item	Make & Model	Serial Number
Type 1 automated logging sound level meter	Norsonic 140	1406015
Type 1 ½" microphone	Norsonic 1225	168230
Calibrator	CIRRUS CR515	105381

L_{Aeq} and L_{A90} sound pressure levels were measured throughout the noise survey over contiguous 15-minute intervals.

The noise monitoring equipment was calibrated before and after the noise survey period. No significant change was found. Laboratory equipment calibration certificates can be provided upon request.

4.3 Survey Results & Observations

Appendix B presents a time history graph showing the L_{Aeq} and L_{A90} sound pressure levels measured throughout the noise survey (shown as 15-minute periods).

The typical (modal) measured (L_{A90}) background noise level during the proposed plant operating period (08:00 – 18:00 hours on weekdays) was **47 dB $L_{A90\ (1\ hour)}$**.

We would consider the measured levels to be reasonable, taking into account the location of the measurement position and the dominant nearby noise sources.

Due to the nature of the unmanned noise survey, we are unable to comment on the exact noise climate throughout the entire survey period, however at the beginning and end of the survey period, the typical daytime noise climate at the measurement position was noted to be affected by distant road traffic and activities on the hospital site (car parking etc.). We would expect the same to be apparent during night-time periods.

5.0 Building Services Plant Noise Emissions

5.1 Plant Noise Limits

Based on London Borough of Hillingdon's requirements and the results of the noise survey, the plant noise limit to be achieved at the nearest noise sensitive properties during the proposed plant operating period (08:00 – 18:00 hours on weekdays) is **42 dB $L_{A90\ (1\ hour)}$**.

The noise limits are to be achieved at a distance of 1m external to the nearest noise sensitive property and apply to the total cumulative noise level with all relevant plant operating simultaneously.

5.2 Proposed Plant

An air handling unit and associated condenser unit are proposed to the south of the Ophthalmology building at ground floor level, in the approximate location indicated on Figure 2.1.

The manufacturer's stated noise levels for the proposed air handling unit are shown in Table 5.1.

Table 5.1 Air Handling Unit Noise Data

Source	Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Supply Intake	85	97	85	83	80	77	76	71
Extract Exhaust	84	90	80	82	84	82	78	70

The air handling unit is proposed to be fitted with atmospheric attenuators, the insertion losses for which are shown in Table 5.2.

Table 5.2 Air Handling Unit Attenuator Insertion Loss Performance

Side	Dynamic Insertion Loss (dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Supply Intake	7	14	17	28	38	30	23	18
Extract Exhaust	7	14	17	28	38	30	23	18

The proposed condenser unit is a Toshiba GM2801AT8-E operating at a sound power level of 80 dB L_{wA}, according to the manufacturer's published noise data.

These types of plant items are not usually tonal or impulsive and are not expected to operate intermittently.

5.3 Noise Predictions

Our plant noise calculations are presented in Tables 5.3 and 5.4 for the air handling unit (supply and extract respectively) and in Table 5.5 for the proposed condenser unit, with the total cumulative levels presented in Table 5.6.

Table 5.3 Air Handling Unit Noise Calculations – Supply Intake

Element	Level (dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
In-Duct Sound Power Level	85	97	85	83	80	77	76	71
Attenuator Insertion Loss	-7	-14	-17	-28	-38	-30	-23	-18
Grille End Reflection	-2	-1	0	0	0	0	0	0
Distance Attenuation	-49	-49	-49	-49	-49	-49	-49	-49
Directivity	+1.5	+2	+2	+3	+3	+3	+3	+3
Screening Attenuation	-10	-10	-10	-10	-10	-10	-10	-10
Predicted Sound Pressure Level at Receptor	**19**	**25**	**11**	**<0**	**<0**	**<0**	**<0**	**<0**
	11 dB L_{pA}							

Table 5.4 Air Handling Unit Noise Calculations – Extract Exhaust

Element	Level (dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
In-Duct Sound Power Level	84	90	80	82	84	82	78	70
Attenuator Insertion Loss	-7	-14	-17	-28	-38	-30	-23	-18
Grille End Reflection	-2	-1	0	0	0	0	0	0
Distance Attenuation	-49	-49	-49	-49	-49	-49	-49	-49
Directivity	+1.5	+2	+2	+3	+3	+3	+3	+3
Screening Attenuation	-10	-10	-10	-10	-10	-10	-10	-10
Predicted Sound Pressure Level at Receptor	**18**	**8**	**6**	**<0**	**<0**	**<0**	**<0**	**<)**
	7 dB L_{pA}							

Table 5.5 Condenser Unit Noise Calculations

Element	Level (dB)
Condenser Unit Sound Power Level L_{wA}	80
Acoustic Reflections	+3
Screening Attenuation	-10
Distance Attenuation	-50
Predicted Sound Pressure Level (L_p) at Nearest Residential Property	23

Table 5.6 Total Noise Calculations

Element	Predicted Sound Pressure Level (L_p) at Receptor (dB)
Supply Intake	11
Extract Exhaust	7
Condenser Unit	23
TOTAL Predicted Sound Pressure Level (L_p) at Receptor	**23**
Noise Limit	**42**

It can be seen that the total predicted building services plant noise level at the nearest noise sensitive properties does not exceed the proposed plant noise limit and should therefore be considered acceptable in relation to London Borough of Hillingdon's noise requirements.

Appendix A – Acoustic Terminology

Parameter	Description
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing ($20x10^{-6}$ Pascals).
Sound Pressure Level (L_p)	The sound pressure level is the sound pressure fluctuation caused by vibrating objects relative to the threshold of hearing.
A-weighting (L_A or dBA)	The sound level in dB with a filter applied to increase certain frequencies and decrease others to correspond with the average human response to sound.
$L_{Aeq,T}$	The A-weighted equivalent continuous noise level over the time period T (typically T= 16 hours for daytime periods, T = 8 hours for night-time periods). This is the sound level that is equivalent to the average energy of noise recorded over a given period.
R_w	The weighted (w) sound reduction index (R), a single figure rating of the **laboratory** airborne sound insulation performance of a construction, usually measured across the frequency range 100-3150Hz. The higher the value, the greater the sound insulation, and the more onerous the requirement.

Appendix B – Time History Graph