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CRF, Level 8, Southwood Building
Great Ormond Street Hospital

Plant Noise Assessment Report

16 March 2023

For

Great Ormond Street Hospital for Children NHS Foundation Trust

Mezzanine Floor

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London

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Contents

SUMMARY

New items of external building services plant are proposed for a new a new clinical research facility on level 8 of the Southwood building at Great Ormond Street Hospital.

The plant is subject to Camden Council's plant noise emission criteria.

An environmental noise survey has been carried out at the site to determine background noise levels at the nearest noise sensitive properties and plant noise emission limits have been set based on the survey results and Camden Council's criteria.

An assessment has been carried out to predict plant noise levels at the nearest noise sensitive receptors.

The results of the assessment show that the Camden Council requirements should be achieved.

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1.0 Introduction

New items of external building services plant are proposed for a new clinical research facility (CRF) unit on level 8 of the Southwood building at Great Ormond Street Hospital.

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 set plant noise emission limits based on the survey results and Camden Council's requirements.

This report presents the methodology and results of the noise survey, determination of noise limits and the assessment of plant noise emissions to the nearest noise sensitive receptors.

The report is technical in nature, and as such, a summary of noise units and acoustic terminology have been included in Appendix A for reference.

2.0 Description of Site

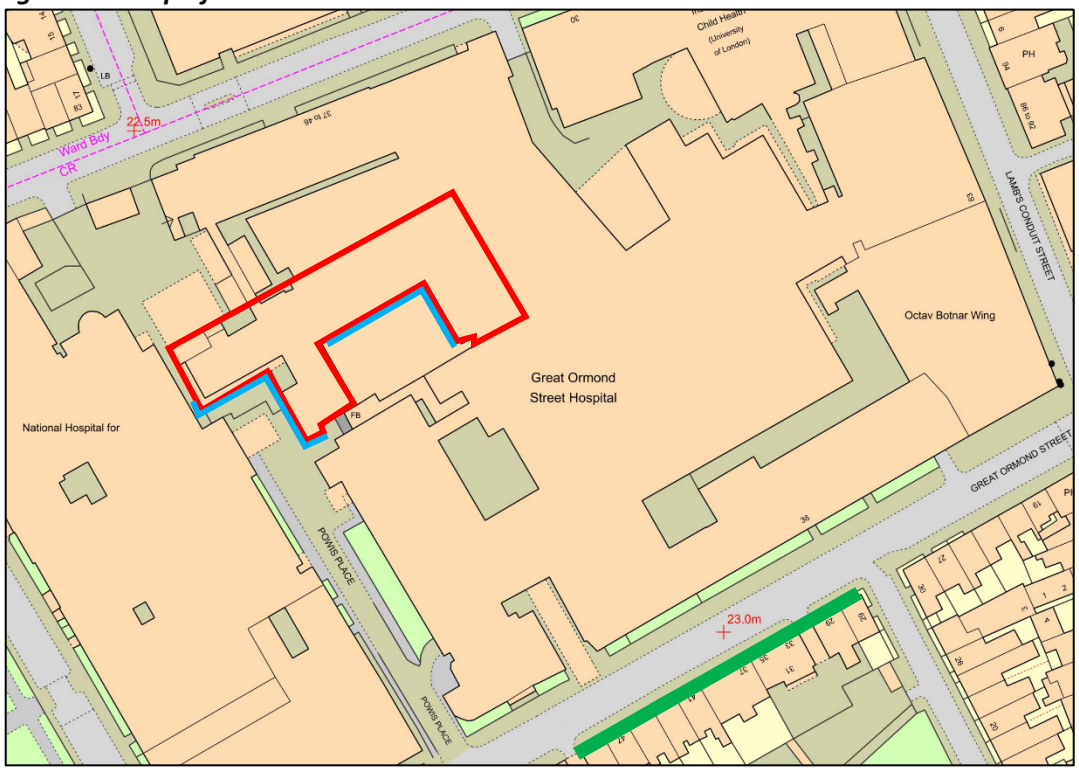
Great Ormond Street Hospital (GOSH) is located in Central London, to the north of Great Ormond Street and to the south of Guildford Street. The area surrounding the hospital is a mix of commercial and residential premises, with retail outlets at street level.

The CRF unit where the new plant is proposed is located on level 8 of the Southwood building which is located towards the northwest of the GOSH site. The proposed external condenser units are proposed across various façade locations on level 8 of the building.

The nearest noise sensitive receptors are understood to be the residential properties to the southeast on Great Ormond Street.

Figure 2.1 shows the Southwood building site extent in **red**, the nearest noise sensitive receptor location in **green** and the approximate locations of the proposed condenser units in **blue**.

Figure 2.1 Map of Site Extent



3.0 Camden Council Requirments

Camden Council require that the noise emissions from proposed plant, including any character corrections for tonality, impulsivity etc, are controlled to a level at least 10 dB less than the lowest measured L_{A90} background noise level at a distance of 1m external to nearest noise sensitive premises.

4.0 Noise Survey Methodology and Results

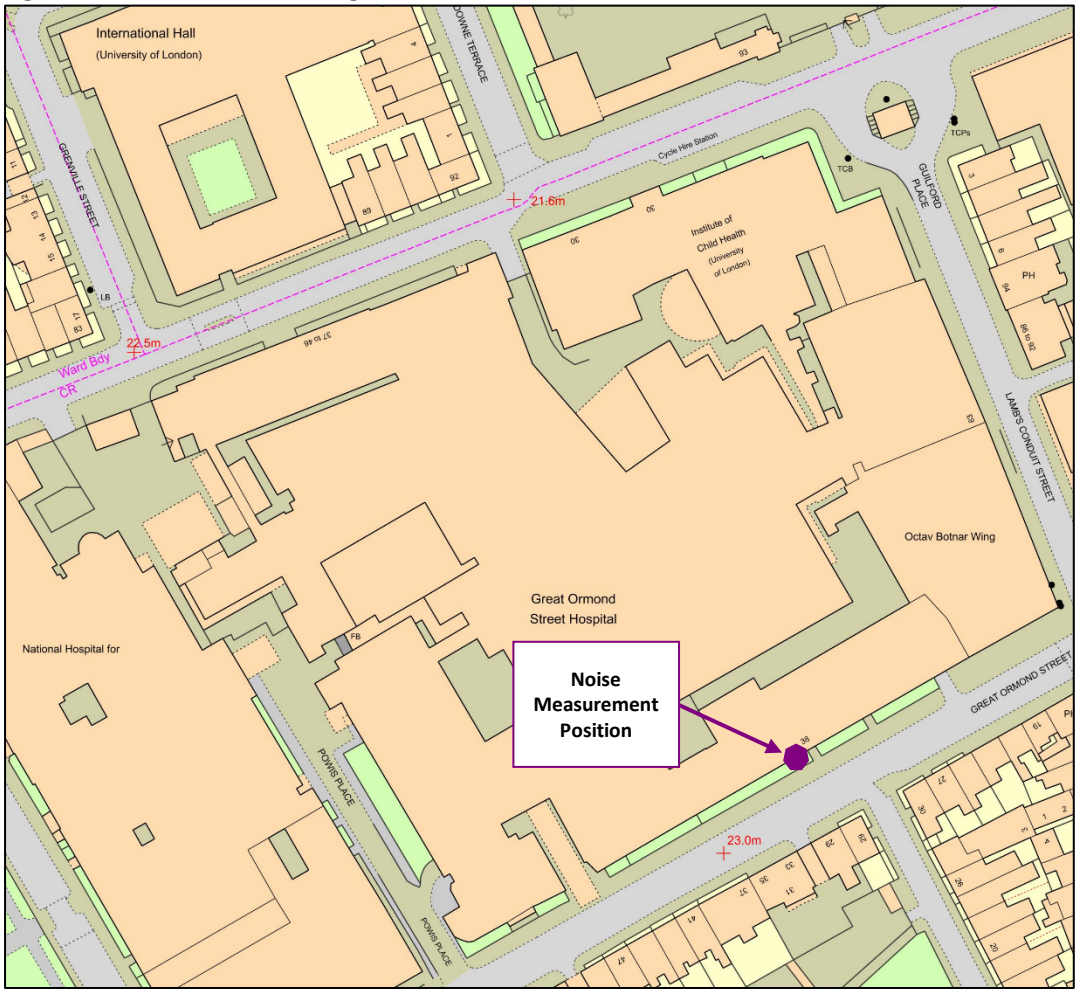
4.1 Methodology

An unattended environmental noise survey was carried out over a five-day period from Thursday 7 October to Tuesday 12 October 2021.

Noise levels were captured in a free field measurement position at a height of approximately 2m above the fourth-floor roof level on a balcony overlooking Great Ormand Street.

The measurement position is shown in Figure 4.1.

Figure 4.1 Site Plan Indicating Measurement Position



The measurement position and period were chosen to establish background noise levels representative of those at the closest residential noise sensitive receptors on Great Ormond Street.

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

Table 4.1 Description of Equipment used for Noise Survey

Item	Manufacturer	Model	Serial Number
Type 1 Integrating Sound Level Meter	01dB	FUSION	12032
Microphone	GRAS	40 CE	330829
Calibrator	01 dB	CAL31	87267

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

Due to the nature of the noise survey, i.e. unmanned, we are unable to comment on the weather conditions throughout the entire noise survey period, however at the beginning and end of the survey period, there was noted to be no rainfall, a clear sky and only light wind. These conditions are understood to be representative of the majority of the survey period and are considered appropriate for undertaking environmental noise measurements.

4.2 Noise Survey Results & Observations

The results of the continuous noise survey are presented in graphical form in Appendix B.

During our site visits, the noise climate was noted to dominated by noise from road traffic movements along Great Ormond Street, and noise from distant existing mechanical services plant.

The proposed plant is understood to have the potential to operate at all times of the day, seven days a week. The lowest background noise level captured throughout the survey was **44 dB** $L_{A90\ 15min}$, which has been used to establish the noise limit used in this assessment.

5.0 Plant Noise Assessment

5.1 Plant Noise Limit

Considering Camden Council's criteria and the lowest measured background noise level, the plant noise limit at 1m from the nearest noise sensitive premises is **34 dB** $L_{Aeq,T}$.

5.2 Proposed Plant

The following plant items are proposed:

- 3 x Toshiba RAV-GM301ATP-E — 62 dB L_{wA} sound power level
- 8 x Toshiba RAV-GM401ATP-E — 65 dB L_{wA} sound power level
- 1 x Toshiba RAV-GM801ATP-E — 69 dB L_{wA} sound power level
- 2 x Mitsubishi SLZ-M35FA — 59 dB L_{wA} sound power level
- 3 x Mitsubishi PUMY-SP112YKM — 72 dB L_{wA} sound power level
- 1 x Mitsubishi PUMY-SP125YKM — 73 dB L_{wA} sound power level

The plant will be located on the south-eastern side of the building as indicated on Figure 2.1. The plant will benefit from considerable screening from the nearest noise sensitive receptors by intervening GOSH buildings.

5.3 Nearest Noise Sensitive Receptors

The nearest noise sensitive receptors are understood to be the residential properties to the southeast on Great Ormond Street, as indicated on Figure 2.1, at a distance of approximately 100m from the proposed condenser units.

5.4 Assessment

We have undertaken calculations to predict noise emissions associated with the proposed plant at the nearest noise sensitive receptors.

The manufacturer's noise data presented in these calculations indicate that none of the proposed units are tonal in character. Plant units of this nature also operate continuously and are therefore unlikely to include any impulsive or intermittent characteristics. Therefore, no character corrections have been applied in the calculations.

The plant noise calculation results are summarised in Table 5.1.

Table 5.1 Plant Noise Calculations

Unit Reference	Level (dB)				
	Sound Power Level	Acoustic Reflections	Distance Attenuation	Screening Attenuation	Predicted Level at Receptor
CU801	65	+3	-48	-15	5
CU802	65	+3	-48	-15	5
CU803	65	+3	-48	-15	5
CU804	62	+3	-48	-15	2
CU805	62	+3	-48	-15	2
CU806	65	+3	-48	-15	5
CU807	65	+3	-48	-15	5
CU808	65	+3	-48	-15	5
CU809	65	+3	-48	-15	5
CU810	65	+3	-48	-15	5
CU811	62	+3	-48	-15	2
CU812	65	+3	-48	-15	5
CU813	69	+3	-48	-15	9
CU814	59	+3	-48	-15	<0
CU815	72	+3	-48	-15	12
CU816	73	+3	-48	-15	13
CU817	72	+3	-48	-15	12
CU818	72	+3	-48	-15	12
CU819	59	+3	-48	-15	<0
Total Plant Noise Level at Nearest Noise Sensitive Receptor					**20**
Noise Limit					**34**

The calculations indicate that the Camden Council requirements should be achieved.

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_{Amax}	The A-weighted maximum noise level measured during the measurement period.
$L_{Aeq,T}$	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.
$L_{A90\ (15\ min)}$	The noise level exceeded for 90% of the time (also referred to as the background noise level), measured over a 15-minute period

Appendix B – Noise Survey Results