

## **Noise Survey Report**

**DATE OF ISSUE:** 30 JUNE 2015  
**REVISION NUMBER:** 00  
**HM REFERENCE:** 20368-01/A/NS01/00

**PROJECT:**  
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PROJECT NAME: **Maple House**  
 REPORT NAME: **Noise Survey Report**

ISSUE STATUS: **FINAL**  
 HM REFERENCE: **20368-01/A/NS01/00**

DATE OF ISSUE: **30 JUNE 2015**  
 REVISION NUMBER: **00**

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**DOCUMENT HISTORY:**

ISSUE	DATE	DETAILS
00	30/6/2015	DOCUMENT ISSUED EXTERNALLY.

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## Contents

1.	EXECUTIVE SUMMARY.....	1
2.	INTRODUCTION.....	2
3.	SITE DESCRIPTION & NOISE SURVEY METHODOLOGY .....	3
4.	NOISE SURVEY RESULTS & OBSERVATIONS .....	5
4.1.	Noise Survey Results.....	5
4.2.	Observations.....	5
5.	BUILDING SERVICES PLANT NOISE LIMITS.....	6
6.	LIMITING PLANT NOISE LEVEL.....	7
	APPENDIX A – ACOUSTIC TERMINOLOGY .....	8
	APPENDIX B – TIME HISTORY GRAPH OF MEASURED NOISE LEVELS .....	9



## 1. EXECUTIVE SUMMARY

It is proposed to replace items of plant on the rooftop of Maple House at UCLH in London. The plant items are subject to noise limits specified by Camden Borough Council.

Hilson Moran has undertaken an environmental noise survey at the site, in order to determine prevailing background noise levels that are representative of the nearest identified noise sensitive properties located below the proposed plant location.

The results of the noise survey were considered reasonable, considering the location of the measurement position and the existing dominant nearby noise sources.

External plant noise limits have been proposed based on the requirements of Camden Borough Council.

An assessment has been undertaken in order to determine a limiting noise level for the replacement plant in order to achieve Camden Borough Council's plant noise requirements.

The results of the assessment indicate that in order to achieve the atmospheric plant noise limits, each unit must not exceed a limiting sound pressure level of 50dBA at 1m.



## 2. INTRODUCTION

It is proposed to replace items of plant on the rooftop of Maple House at UCLH in London. The plant items are subject to noise limits specified by Camden Borough Council.

Hilson Moran has been appointed to undertake an environmental noise survey at the site in order to determine prevailing background noise levels that are representative of the nearest noise sensitive properties.

The purpose of this report is to use the noise survey results in assessments to predict the noise impact of the building services plant on the nearest noise sensitive receptors.

Following this introductory section, a description of the measured site and environmental noise survey methodology is given in Section 3. The results of the survey are presented in Section 4 and Appendix B. Noise limits are presented in section 5 and the limiting plant noise level is presented in Section 6.

Appendix A presents an explanation of the acoustic terminology used in this report.

### 3. SITE DESCRIPTION & NOISE SURVEY METHODOLOGY

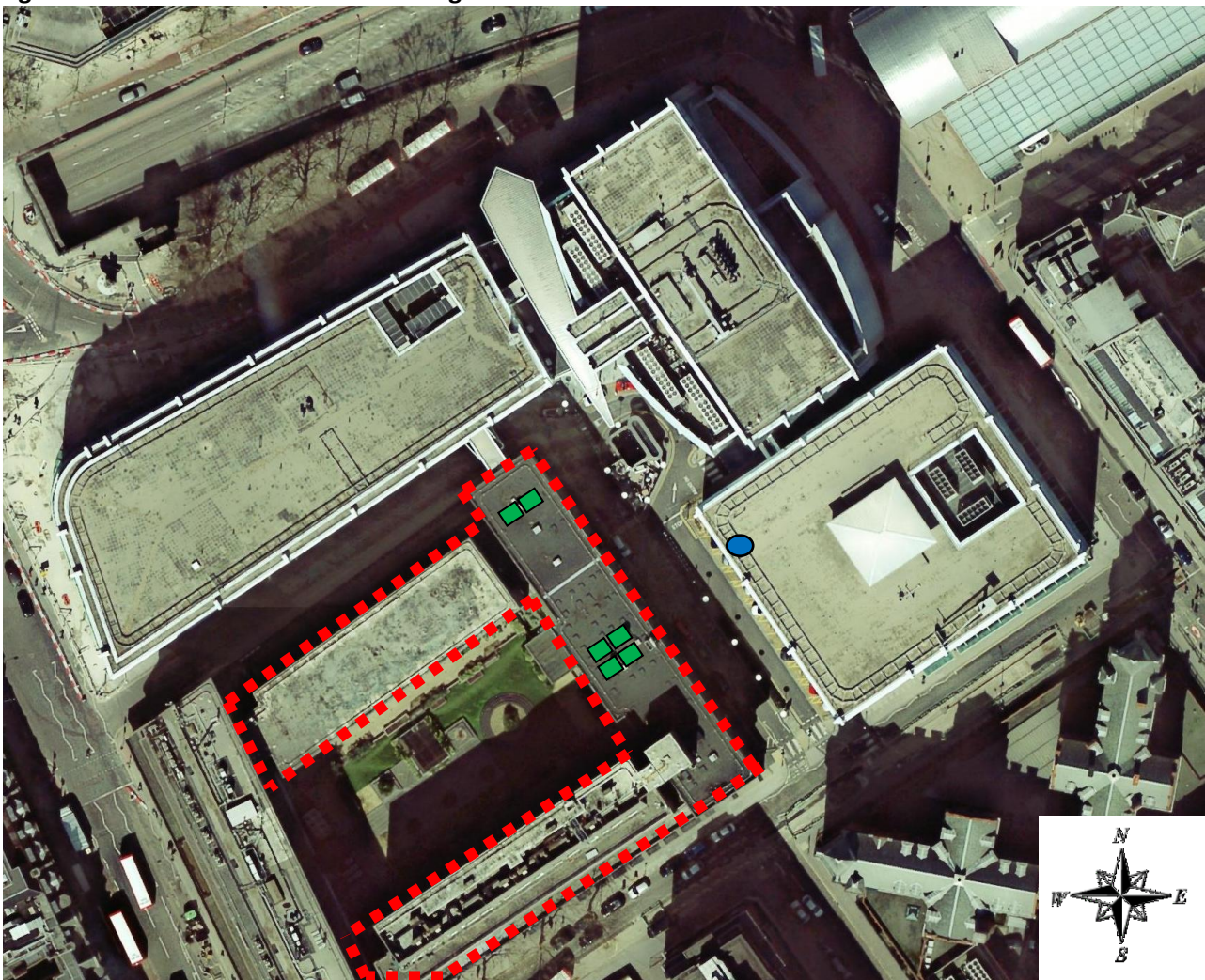
The new plant will be located on the roof of Maple House at UCLH in London. The plant location is bounded by hospital buildings to the north and east, and nurse accommodation to the south and west.

An unmanned environmental noise survey was undertaken at a single measurement location at the site between approximately 13:00 hours on Wednesday 22 October 2014 and 12:45 hours on Thursday 23 October 2014.

$L_{Amax}$ ,  $L_{Aeq}$  and  $L_{A90}$  noise levels were measured throughout the noise survey.

Figure 3.1 shows the nearest identified residential properties highlighted in red, the proposed plant location in green and the measurement position indicated in blue.

**Figure 3.1 Site Location and Surrounding Land Use**



The measurement microphone was attached to a railing at the perimeter of the roof on the western edge, facing towards the nurse accommodation.

The measurement position is considered representative of background noise levels at the nearest noise sensitive properties.



The equipment used for the noise survey is summarised in Table 3.1.

**Table 3.1 Description of Equipment used for Noise Survey**

Equipment	Description	Quantity	Serial Number
01 dB Solo	Type 1 automated logging sound level meter	1	60447
01 dB PRE 21	Type 1 ½" microphone and pre-amplifier	1	13259
01 dB BAP 21	Outdoor microphone casing	1	10935
01 dB CAL 21	Calibrator	1	50441990

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 minimally cloudy sky and only light wind. These conditions are understood to be representative of the whole survey period and are considered appropriate for undertaking environmental noise measurements.

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



## 4. NOISE SURVEY RESULTS & OBSERVATIONS

### 4.1. Noise Survey Results

Appendix B presents a time history graph showing the measured  $L_{Amax}$ ,  $L_{Aeq}$  and  $L_{A90}$  noise levels.

The lowest background noise levels measured during daytime hours (07:00 – 23:00 hours) and night time hours (23:00 – 07:00) are presented in Table 4.1 below.

**Table 4.1 Lowest Measured Background Noise Levels**

Lowest Measured Background Noise Level	
Daytime (07:00 – 23:00 hours) $L_{A90}$ (1 hour) (dB)	Night-time (23:00 – 07:00 hours) $L_{A90}$ (5 minute) (dB)
62	61

### 4.2. Observations

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 daytime noise climate was noted to be affected most by noise from plant located on the roof of Maple House.

We anticipate that plant noise in the general vicinity would also be the dominant source of noise during night-time periods.



## 5. BUILDING SERVICES PLANT NOISE LIMITS

The site lies within the jurisdiction of Camden Borough Council, whose typical requirement is for plant noise to be 10dBA below the background noise level. As such, noise emissions from the proposed plant would normally be limited to a level 10 dB less than the lowest background noise levels.

However, from our observations whilst on site and the time history graph in Appendix B, the background noise climate was mostly affected by plant located on the roof of Maple House. Because of this, we have specified noise limits which we consider to be more appropriate in relation to the actual background noise levels (in the absence of existing plant noise).

Our proposed plant noise limits are shown in Table 5.1, which are to be achieved during the relevant period when measured 1m external to the nearest noise sensitive windows.

**Table 5.1 Proposed External Plant Noise Limits – Noise Sensitive Properties**

External $L_{Aeq}$ Plant Noise Limit during Plant Operating Period (dB)	
Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
42	41

The noise limits in Table 5.1 should be reduced by 5 dB if the plant contains any observable, tonal characteristics.



## 6. LIMITING PLANT NOISE LEVEL

We understand six condenser units are proposed to replace the three existing condenser units (location indicated approximately on Figure 3.1).

We understand the condenser units will operate 24 hours a day.

Therefore, in order to achieve the atmospheric plant noise limits presented in Section 6, our calculations indicate that the total noise level associated with each condenser unit must not exceed a limiting sound pressure level of level of 50dBA at 1m.

So as not to exceed this noise limit, each condenser unit is likely to require an acoustic enclosure e.g. by Messrs Environ, Noise Solutions, etc.



## APPENDIX A – ACOUSTIC TERMINOLOGY

Parameter	Description
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing ( $20 \times 10^{-6}$ 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.
$L_{n,T}$	The noise level exceeded for n% of the time over a given period T.  e.g. $L_{90}$ , the noise level exceeded for 90% of the time (background noise level).
$L_{max}$	The maximum noise level measured.
SEL	The Sound Exposure Level (dB), the $L_{Aeq}$ level normalised to one second.

## APPENDIX B – TIME HISTORY GRAPH OF MEASURED NOISE LEVELS

