SANDY BROWN

Consultants in Acoustics, Noise & Vibration

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Northumberland House, High Holborn

Environmental noise survey report

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Version	Date	Comments	Author	Reviewer
A	19 Mar 15		Jonathan Riley	Jason Swan

Summary

Sandy Brown Associates LLP (SBA) has been commissioned by Workman LLP to provide acoustic advice in relation to the proposed development at Northumberland House, 303-306 High Holborn, London, WC1V 7JZ.

An environmental noise survey has been carried out to determine the existing background noise levels in the area and to set appropriate plant noise limits in line with the requirements of the Camden Council.

The noise survey was performed between 12:30 on 12 February 2015 and 11:00 on 17 February 2015.

The lowest background noise levels measured during the survey were $L_{A90,15\ min}$ 51 dB during the daytime and $L_{A90,15\ min}$ 49 dB at night.

Based on the requirements of the Camden Council and on the results of the noise survey, all plant must be designed such that the cumulative noise level at 1 m from the worst affected windows of the nearby noise sensitive premises does not exceed $L_{Aeq,15min}$ 46 dB during the daytime, and $L_{Aeq,15min}$ 44 dB during the night. These limits are cumulative, and apply with all plant operating under normal conditions. If plant items contain tonal or attention catching features, a penalty of 5 dB will be applied, bringing limits to L_{Aeq} 41 dB during the day and L_{Aeq} 39 dB at night.

An assessment of proposed new and replacement place has been undertaken and the results show that the noise levels will be well within the local authority requirements.

Contents

1 Introduction

Sandy Brown Associates LLP (SBA) has been commissioned by Workman LLP to provide acoustic advice in relation to the proposed development at Northumberland House, 303-306 High Holborn, London WC1V 7JZ.

As part of this, an environmental noise survey is required, the purpose of which is to establish the existing background noise levels in the vicinity of nearby noise sensitive premises and to set appropriate limits for noise egress from building services plant.

This report presents the survey method, results of the environmental noise survey, a discussion of acceptable limits for noise emission from building services plant, and a assessment of proposed plant.

2 Site description

2.1 The site and its surrounding

The site location in relation to its surroundings is shown in Figure 1, highlighted in blue. The site is located in the London Borough of Camden on the south side of High Holborn. Chancery Lane is to the east of the site.

Figure 1 Site map (courtesy of Google Earth Pro)

2.2 Adjacent premises

The nearest noise sensitive premises to the site are highlighted in green in Figure 1 - Lincoln House to the west, and 300 High Holborn to the north. These are both commercial buildings.

3 Method

3.1 Unattended measurements

Unattended noise monitoring was undertaken at the site over 5 days to determine the existing background noise levels in the vicinity of nearby noise sensitive premises.

The unattended measurements were performed over 15 minute periods between 12:30 on 12 February 2015 and 11:00 on 17 February 2015. The equipment was installed and collected by Jonathan Riley.

The measurement position used during the survey is indicated in Figure 1, denoted by the letter 'L'. The microphone was located approximately 1.5 m above the roof (approximately 27 m above ground level) and at least 1 m from any other reflective surface. A photograph showing the measurement location is provided in Figure 2.

Whilst Figure 1 shows mechanical services plant located on the roof near the logger location, the plant nearest the logger was not operating. The plant on the roof was not considered to contaminate the noise measurements. For this reason, this location was chosen to be reasonably representative of the noise levels experienced by the nearest noise sensitive premises.

Figure 2 Photo showing the monitoring location at Northumberland House

4 Measurement results

4.1 Observations

The dominant noise sources observed at the site during the survey consisted of road traffic on High Holborn.

Less significant noise sources included pedestrians on High Holborn and plant noise from mechanical services plant on the roof of Lincoln House.

4.2 Unattended measurement results

The results of the unattended noise measurements are summarised in the following tables. A graph showing the results of the unattended measurements is provided in Appendix B.

The day and night time ambient noise levels measured during the unattended survey are presented in Table 1.

Table 1 Ambient noise levels measured during the survey

Date	Daytime (07:00 – 23:00) $L_{Aeq,16h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
Thursday 12 February 2015	-	63
Friday 13 February 2015	66	65
Saturday 14 February 2015	65	65
Sunday 15 February 2015	64	62
Monday 16 February 2015	67	63
Tuesday 17 February 2015	-	-
Average	65	64

The minimum background noise levels measured during the unattended survey are given in Table 2.

Table 2 Minimum background noise levels measured during the survey

Date	Daytime (07:00 – 23:00) $L_{A90,15min}$ (dB)	Night (23:00 – 07:00) $L_{A90,15min}$ (dB)
Thursday 12 February 2015	58 *	52
Friday 13 February 2015	58	50
Saturday 14 February 2015	55	51
Sunday 15 February 2015	51	49
Monday 16 February 2015	57	52
Tuesday 17 February 2015	60 *	-

* Measurement not made over full period due to monitoring start and end time

The lowest background noise levels measured during the survey were $L_{A90,15min}$ 51 dB during the daytime and $L_{A90,15min}$ 49 dB at night.

5 Building services noise egress limits

5.1 Local Authority criteria

Environmental nose limits for building services plant are set in order to protect the amenity of nearby noise sensitive premises.

These are typically set at a distance of 1 m from the most affected window of the nearest noise sensitive premises to the proposed plant location.

DP28, detailed in Camden Council's *Camden Development Project 2010-2025, Local Development Framework,* provides requirements for controlling noise emissions from building services plant. This document indicates that the noise level measured at 1 m external to a sensitive facade should not exceed 5 dB below the lowest L_{A90}. If the noise contains distinguishable discrete continuous whine, or discrete impulses should not exceed 10 dB below the lowest L_{A90}.

Noise sensitive is defined in DP28 as applying at housing, schools, hospitals, offices, workshops and open spaces.

5.2 Limits

Based on the above criteria and the measurement results, the cumulative noise level resulting from the operation of all new plant at 1 m from the worst affected windows of the nearest noise sensitive premises should not exceed the limits set out in Table 3.

Table 3 Plant noise limits at 1 m from the nearest noise sensitive premises

Time of day	Maximum sound pressure level at 1 m from noise sensitive premises ($L_{Aeq,15min}$ dB)
Daytime (07:00-23:00)	46
Night-time (23:00-07:00)	44

The limits set out in Table 3 do not include any attention catching features such as tones or impulses. The penalty for attention catching features is a further 5 dB reduction in these values.

5.3 Assessment

5.3.1 Proposed plant

The layout of the plant items located on the roof on Northumberland House is shown in Figure 3. Reference numbers are given for those units subject to this assessment. These are explained in Table 4. The hatch markings indicated existing units to be removed.

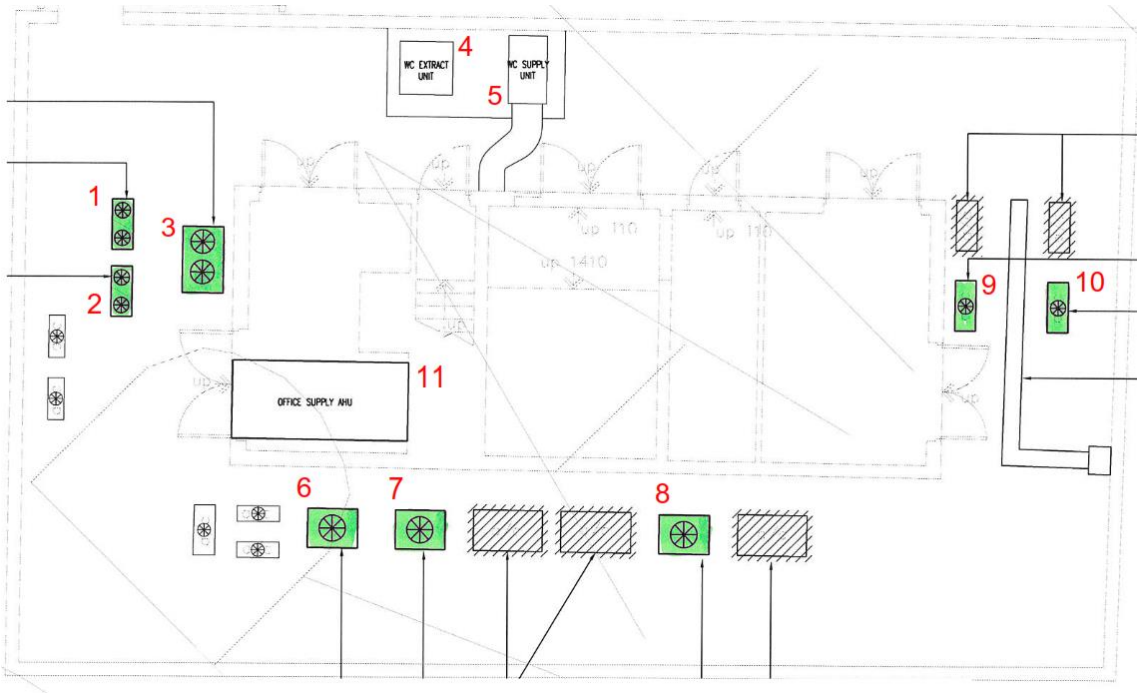


Figure 3 Roof level of Northumberland House showing locations of proposed plant items and respective references

Table 4 Unit type and respective references

Drawing ref.	Unit ref.	Unit type
1	PUHZ-ZRP35VKA	Heat pump
2	PUHZ-ZRP71VHA	Heat pump
3	PURY-P400-YJM-A(-BS)	Chiller
4	EX01	Extract fan
5	SU01	Extract fan
6	PURY-P250-YJM-A(-BS)	Chiller
7	PURY-P250-YJM-A(-BS)	Chiller
8	PURY-P250-YJM-A(-BS)	Chiller
9	PUHZ-ZRP71VHA	Heat pump
10	PUHZ-ZRP71VHA	Heat pump
11	MAX22/A/W/S	AHU

Table 5 shows the noise data of the proposed new plant. This allows for the chillers operating in 'standard' mode.

Table 5 Octave band sound power levels of proposed new plant items

Unit ref.	Sound power level (dB re 1pW) Octave band centre frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
PURY-P250-YJM-A(-BS)*	44	47	45	39	35	31	26	20
PURY-P400-YJM-A(-BS)*	57	50	47	42	39	35	32	25
PUHZ-ZRP35VKA*	42	35	29	28	24	21	16	15
PUHZ-ZRP71VHA*	37	35	36	29	36	22	17	10
MAX22/A/W/S	58	61	64	48	50	41	37	32
SU01	72	67	59	53	43	46	41	39
EX01	70	62	56	51	44	46	41	44

*Sound power level data presented for these units has been calculated from the sound pressure level data provided by the manufacturer.

5.3.2 Noise assessment

An assessment of all plant items has been undertaken to Lincoln House and 300 High Holborn, to the west and north of the site respectively. The expected noise level measured 1 m external to the worst affected window of each premises is L_{Aeq} 26 dB at Lincoln House and L_{Aeq} 21 dB at 300 High Holborn. These levels comply with the criteria set out in Table 3.

6 Conclusion

A noise survey has been carried out to determine the existing background noise levels in the vicinity of the site and surrounding noise sensitive premises. The lowest background noise levels were $L_{A90,15min}$ 51 dB during the day, and $L_{A90,15min}$ 49 dB during the night.

On the basis of the requirements of the Local Authority, the relevant plant noise limits at the worst affected existing noise sensitive premises would be L_{Aeq} 46 dB during the day and L_{Aeq} 44 dB during the night.

These limits are cumulative, and apply with all plant operating under normal conditions. If plant items contain tonal or attention catching features, the limits will be 5 dB more stringent than those set out above. An initial assessment of the proposed plant items associated with the development has been carried out. Noise levels from new plant at the nearest noise sensitive premises are well within the required limits.

Appendix A

Survey details

Equipment

A Svantek SVAN 957 sound level meter was used to undertake the unattended measurements. The calibration data for the equipment used during the survey is provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	SVAN957/12327	Svantek	25 Oct 15	1310490
Microphone	ACO7052H/43273	Svantek	25 Oct 15	1310490
Pre-amp	SV12L/13569	Svantek	25 Oct 15	1310490
Calibrator	SV30A/7451	Svantek	24 Oct 15	1310484

Calibration of the sound level meters used for the tests is traceable to national standards. The calibration certificates for the sound level meter used in this survey are available upon request.

The sound level meters and microphones were calibrated at the beginning and end of the measurements using their respective sound level calibrators. No significant deviation in calibration occurred.

Noise indices

The equipment was set to record a continuous series of broadband sound pressure levels. Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period with a fast time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background noise level.

The L_{A90} is considered most representative of the background noise level for the purposes of complying with any local authority requirements.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures.*

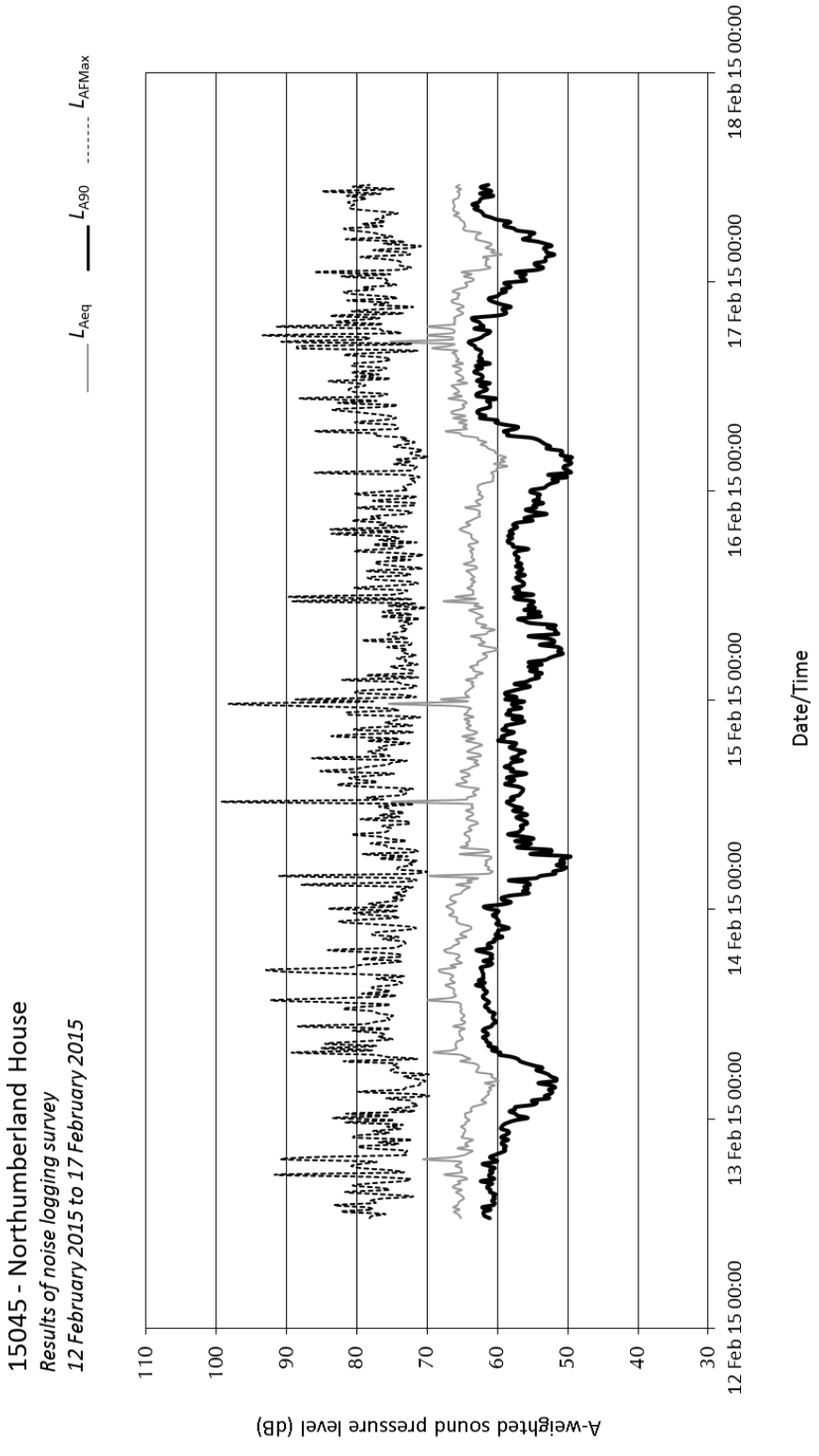
Weather conditions

During the unattended noise measurements between 12 February 2015 and 17 February 2015, weather reports for the area indicated that temperatures varied between 2°C at night and 10°C during the day, and the wind speed was less than 10 m/s.

These weather conditions are considered suitable for obtaining representative measurements.

Appendix B

Results of unattended measurements


15045 - Northumberland House
Results of noise logging survey
12 February 2015 to 17 February 2015
L_{Aeq}
L_{A90}
L_{AFMax}
A-weighted sound pressure level (dB)
110
100
90
80
70
60
50
40
30
12 Feb 15 00:00
13 Feb 15 00:00
14 Feb 15 00:00
15 Feb 15 00:00
16 Feb 15 00:00
17 Feb 15 00:00
18 Feb 15 00:00
Date/Time