SANDY BROWN

Consultants in Acoustics, Noise & Vibration

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30 Lincoln's Inn Field
Plant noise assessment

Introduction

Sandy Brown has been commissioned by The Honourable Society of Lincoln's Inn to provide acoustic advice in relation to the proposed refurbishment works at 30 Lincoln's Inn Field, London.

The works include the installation of new building services plant. This memo summarises a plant noise assessment that has been carried out to demonstrate compliance with the environmental noise egress requirements of the Local Authority. The assessment presented herein is provided in support of the planning application for the refurbishment works.

Environmental noise survey

An environmental noise survey has been carried out to determine the existing sound levels in the area. The noise survey was carried out between 27 January 2022 and 3 February 2022.

The representative background sound levels measured during the survey were $L_{A90,5min}$ 51 dB during the daytime and $L_{A90,5min}$ 47 dB at night.

Full details of the noise survey can be found in Sandy Brown report 22008-R01-A *Noise survey and plant noise egress limits report*, dated 11 February 2022.

Site description

The site and its surrounding

The site location in relation to its surroundings is shown in Figure 1.

The site is located on the corner of two roads (Newman's Row and Whetstone Park) and one pedestrian passage (Great Turnstile).

Figure 1 Aerial view of site (courtesy of Google Earth Pro)

Adjacent premises

The nearest non-residential uses (highlighted in red) are Queen's Court Law at 29 Lincoln's Inn Fields to the west and The English Studio (language school) at 10 Great Turnstile to the north.

The nearest residential uses (highlighted in blue) are apartments located within 13 Great Turnstile to the north.

For the purposes of this assessment, the residences at 13 Great Turnstile and the English Studio are considered the nearest and noise sensitive premises.

Building services noise egress criteria

Standard guidance

BS 4142:2014:+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS 4142) provides a method for assessing noise from items such as building services plant against the existing background sound levels at nearby noise sensitive premises.

BS 4142 suggests that if the noise level is 10 dB or more higher than the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background level, it is an indication of having a low impact.

If the noise contains 'attention catching features' such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

Local Authority criteria

The site is located within the jurisdiction of the London Borough of Camden (LBC), which considers residential spaces, schools and hospitals to be noise sensitive. Appendix 3 of London Borough of Camden Local Plan (2017) states that:

"Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15 dB if tonal components are present) should be considered as the design criterion."

Noise egress limits

Based on the above criteria and noise survey results, the cumulative noise level from the operation of all new plant should not exceed the limits set out in Table 1.

The limits apply at 1 m from the worst affected windows of the nearest noise sensitive premises and are presented as facade levels.

Table 1 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, $L_{Aeq,5min}$ (dB)
Daytime (07:00-23:00)	41
Night-time (23:00-07:00)	37

The limits set out in Table 1 do not include any for attention catching features. As per LBC's typical policy, a 5 dB penalty is applicable if the plant noise has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses (bangs, clicks, clatters, thumps).

Plant noise assessment

Schedule of plant items

The proposed plant installation comprises the following:

- 4 No. condensing units, located externally at ground floor level within louvred enclosure
- 2 No. condensing units, located internally within roof with air inlet and outlet louvres
- 4 No Mechanical Ventilation Heat Recovery (MVHR) units, located internally with atmospheric inlet discharge facade connections at ground, first, second and third floor levels.

Details of the plant items and manufacturers' noise data are summarised in Table 2.

Table 2 Manufacturers' plant noise data

Plant item	Octave band centre frequency (Hz) Sound pressure level (dB)								
	63	125	250	500	1k	2k	4k	8k	dBA
Condenser[1] Mitsubishi PURY P200Y	77	61	61	58	51	47	44	42	59
MVHR[2] Mitsubishi LGH200RVX-Z	57	53	42	37	33	32	20	10	42

[1] Measured at 1 m from unit.

[2] Measured at 1.5 m from unit, including contribution from open inlet / outlet.

All condensing units and MVHR connections are very well screened from the nearest noise sensitive receptor (13 Great Turnstile). Drawings indicating the proposed plant locations are given in Figure 2 to Figure 8.

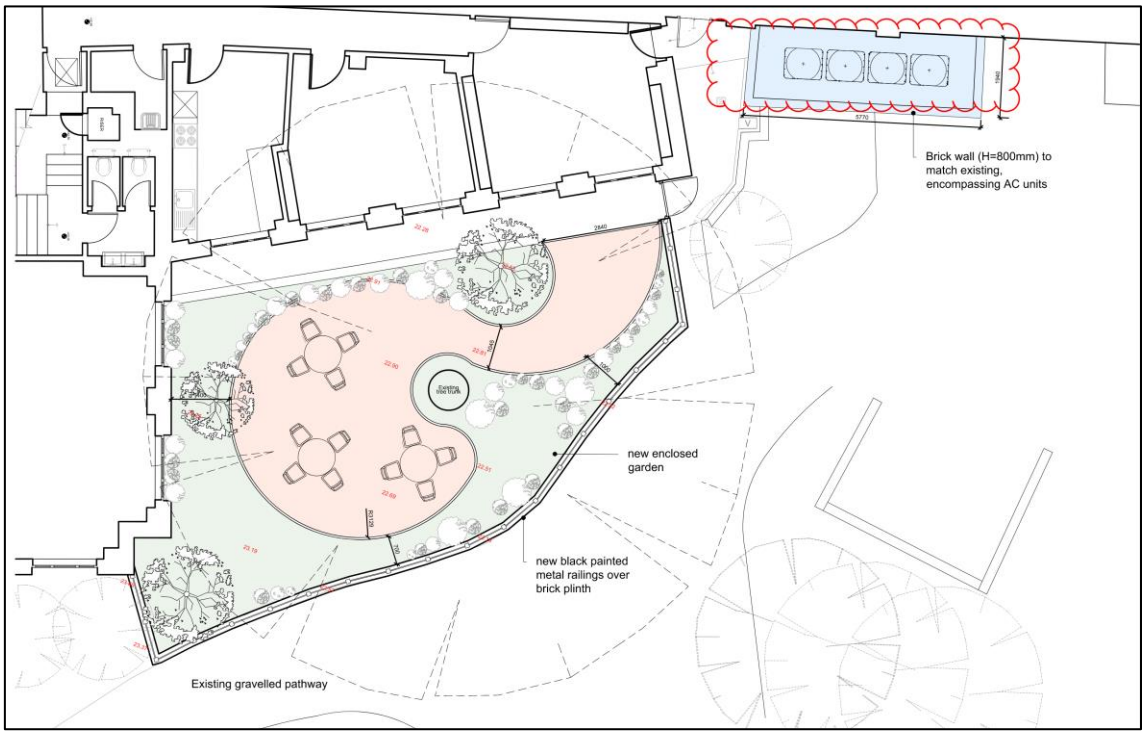

Figure 2 Ground level plan indicating 4 No. external condensing units

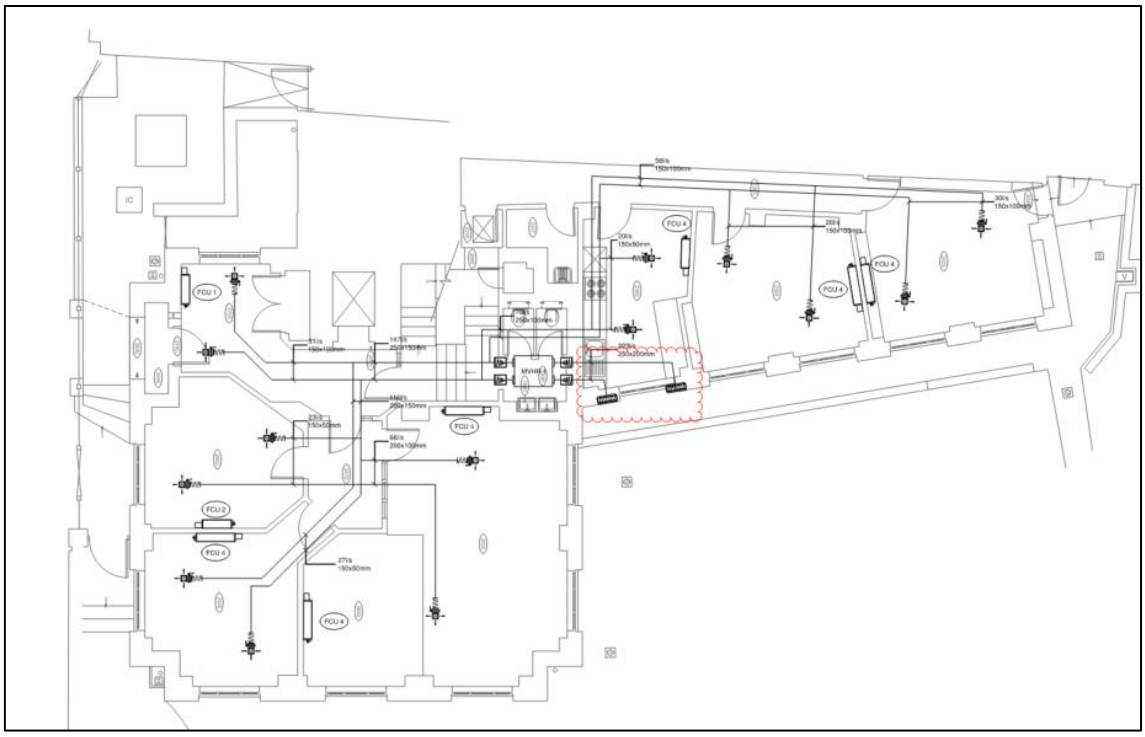

Figure 3 Ground floor plan indicating MVHR inlet & discharge connections

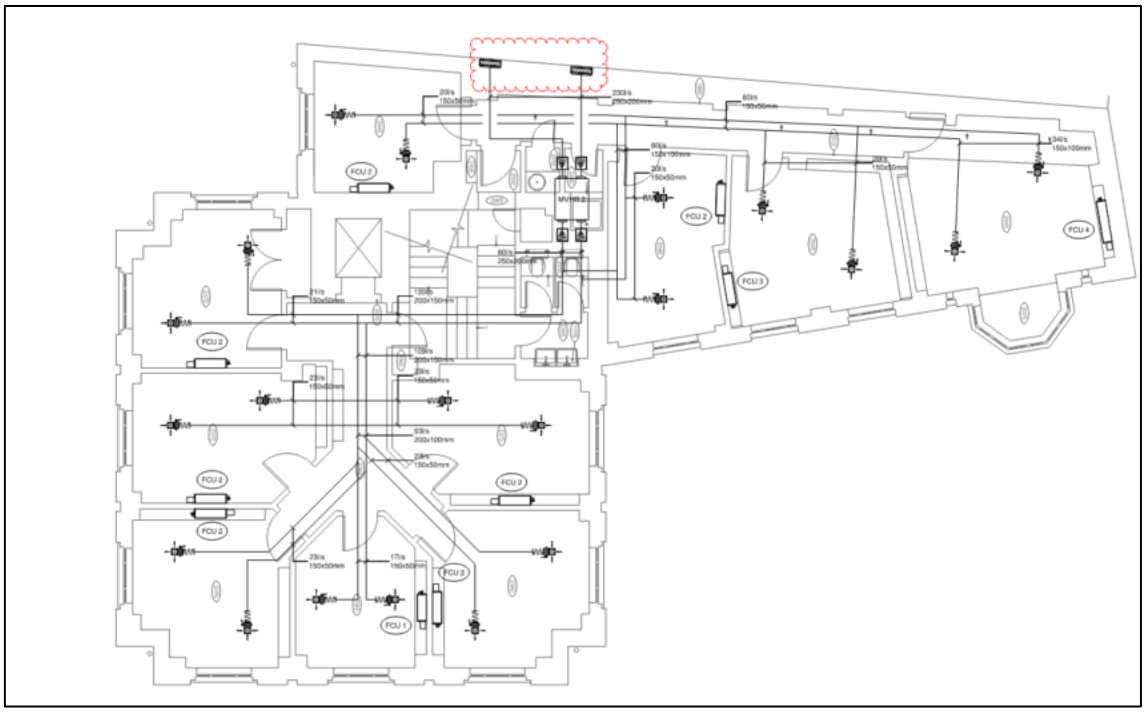

Figure 4 First floor plan indicating MVHR inlet & discharge connections

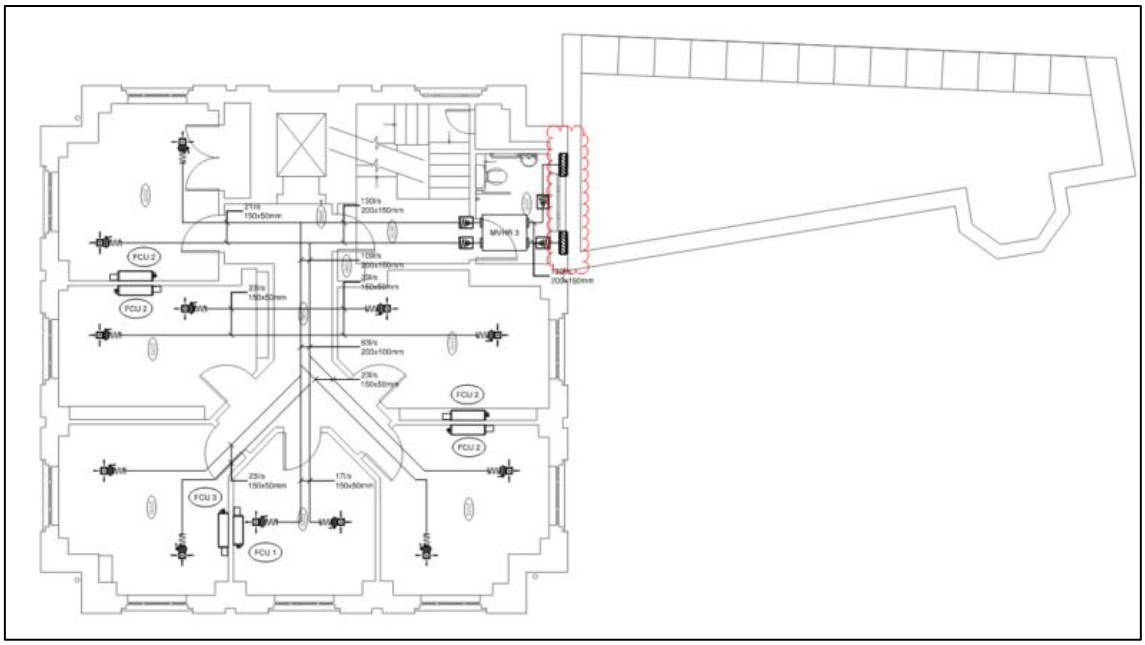

Figure 5 Second floor plan indicating MVHR inlet & discharge connections

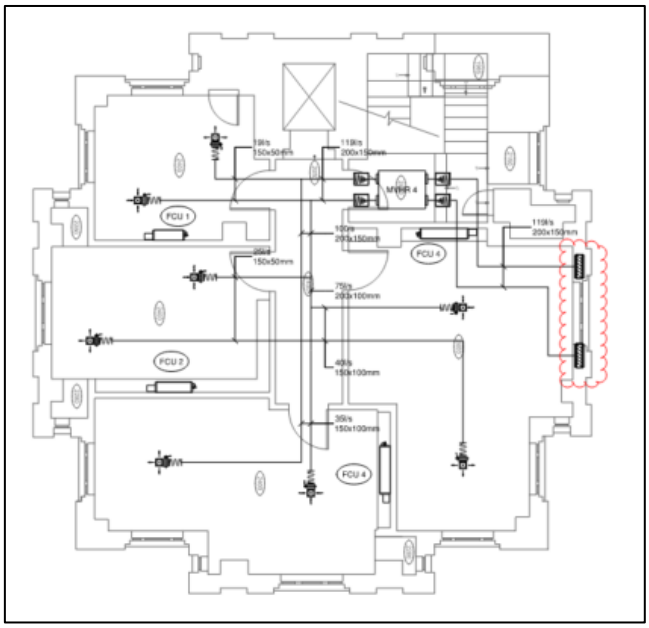

Figure 6 Third floor plan indicating MVHR inlet & discharge connections

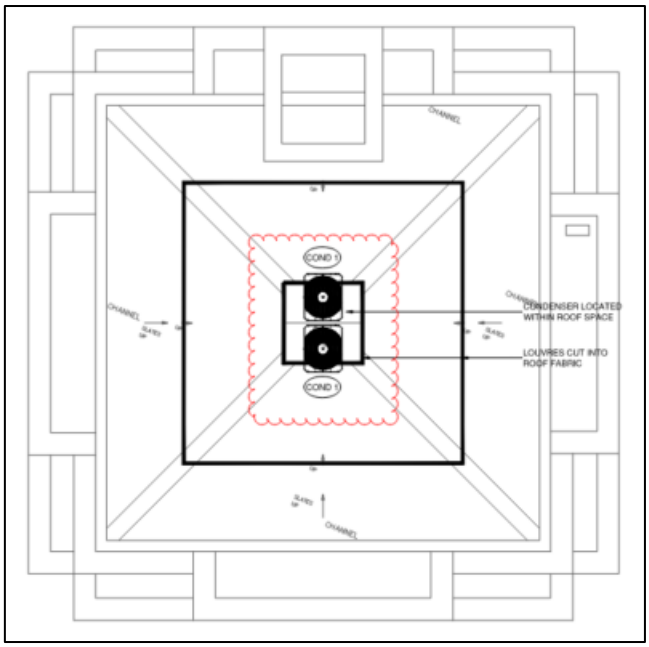

Figure 7 Roof plan indicating 2 No. internal condensing units

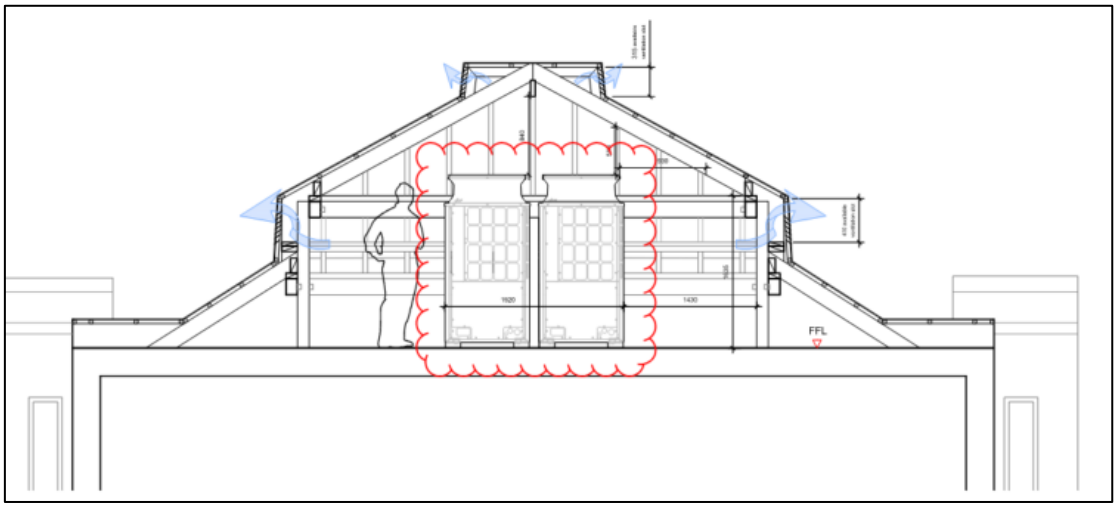

Figure 8 Section through roof indicating 2 No. internal condensing units and air inlet / discharge louvres

Attenuation proposals

The air inlet and outlet louvres to the roof plant enclosure are to be of a sound attenuating type, providing the insertion losses set out in Table 3.

Table 3 Acoustic louvre performance requirements

	O band centre frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Insertion loss (dB)	6	6	8	10	14	18	16	6

Egress to noise sensitive receptor

The calculated noise levels at the nearest noise sensitive receptors are presented in Table 4. A summary of the calculations is available upon request.

Table 4 Calculated noise levels at 1 m from the nearest noise sensitive receptor

Receptor	Predicted noise level	Noise limit	
		Day (07:00-23:00)	Night (23:00-07:00)
13 Great Turnstile (residential)	L_{Aeq} 26 dB	L_{Aeq} 41 dB	L_{Aeq} 37 dB
The English Studio (education)	L_{Aeq} 40 dB	L_{Aeq} 41 dB	N/A[1]

[1] Building not in use during time period.

The calculated noise levels are below the noise limits at the nearest noise sensitive receptors. As such, noise egress from the proposed plant installation is compliant with LBC's typical planning requirements.