PLANT NOISE ASSESSMENT

SAFFRON HOUSE, LONDON

BLACKROCK LTD

SEPTEMBER 2022

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1 INTRODUCTION

Anderson Acoustics Ltd was commissioned by Blackrock Ltd to undertake a plant noise assessment for the proposed development at Saffron House, 6-10 Kirby Street, London

Saffron House is an existing office use building in the London Borough of Camden. The scope of the development includes the fit-out of the lower ground floor level to provide high quality office space.

The London Borough of Camden requires an assessment to be undertaken of atmospheric noise emissions from any proposed new building services equipment to the nearest noise sensitive property. An assessment is also carried out to ensure compliance with BREEAM credit Pol 05.

2 DESIGN CRITERIA AND NOISE POLICY

2.1 Camden Local Plan, 2017

The Camden Local Plan 2017 set out strategy and policies to manage and mitigate noise exposure within the borough. Relevant to this development, it makes specific reference to the control of noise from mechanical plant and other equipment used for providing building services.

Appendix 3 of the Camden Local Plan presents noise thresholds to evaluate the impact of various noise sources. It states that British Standard 4142:2014 should be used when assessing industrial and commercial noise sources with reference to the thresholds given in Table 2.1.

Table 2.1: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10dB* below background	'Rating level' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57dB L_{Amax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L_{Amax}	'Rating level' greater than 5dB above background and/or events exceeding 88dB L_{Amax}

It also states that the rating level should be 15dB below background noise if tonal components are present.

2.2 BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

In keeping with the requirements of BREEAM and the London Borough of Camden, an assessment is required in compliance with BS 4142. This Standard describes methods for determining the 'rating level' ($L_{Ar,Tr}$) of the sound source being assessed (known as the 'specific sound source') outside premises used for residential purposes. On the basis of the 'subjective method', the rating level is obtained by applying, where applicable, a correction of between 0 and +6 dB for tonal sources and a correction of 0 to +9 dB for impulsive sources. Additional corrections of +3 dB can be made for other characteristics and intermittency. These corrections are made to the 'specific sound level' ($L_{Aeq,Tr}$). Where no corrections are warranted, the specific level is equivalent to the rating level.

2.3 BREEAM (Building Research Establishment's Environmental Assessment Method)

The BREEAM 'UK Refurbishment and Fit-out 2014' has been used in the preparation of this report. A minimum rating of BREEAM 'Excellent' is targeted.

One credit under Pol 05 (reduction of noise pollution is targeted as shown in Table 2.2 below..

This report may be submitted to demonstrate evidence that the credits are achievable at the Design Stage. Pre-Completion Testing carried out by a compliant test body (UKAS/ANC accredited) and in accordance with Association of Noise Consultants (ANC) Good Practice Guide will be required to achieve the credits at the Post Construction Stage.

Table 2.2: BREEAM 'UK Refurbishment and Fit-out 2014' and 'New Construction 2014' credits analysis

Credit	Criteria BREEAM 'UK Refurbishment and Fit-out 2014'	Pre-Completion Testing required? Y/N	Achievable? Y/N
Pol 05 Reduction of noise pollution			
One credit	Noise impact assessment in compliance with BS 7445 to be carried out by a suitably qualified acoustician[a)] to determine that "The noise level from the proposed site/building, as measured in the locality of the nearest or most exposed noise sensitive development, is a difference no greater than +5dB during the day (07:00 to 23:00) and +3dB at night (23:00 to 07:00) compared to the background noise level"	Y	Y

a) The noise impact assessment has been carried out by a suitably qualified acoustician holding a recognised acoustic qualification and membership of the Institute of Acoustics.

3 SITE DESCRIPTION

3.1 Existing Site

Saffron House is located within the London Borough of Camden and comprises five upper levels with a building entrance from Saffron Hill at lower ground floor level and a separate entrance from Kirby Street at upper ground floor level.

The surrounding buildings are a mix of commercial and residential. The nearest noise sensitive receptors (NSR), with respect to the current application, have been identified as the front and rear façade of the second and third floors of The One Tun Public House along Saffron Hill.

Table 3.1 Existing site location (Saffron House in yellow and nearest residential properties in blue)

The existing soundscape varies across the site. To the front of the building (east/Saffron Hill) the environment is dominated by traffic movements on surrounding roads (either Kirby Street or Saffron Hill). Within integral lightwells the noise environment is dominated by HVAC plant serving the Saffron House itself and other surrounding properties.

3.2 Proposal

The proposal is for the refurbishment of the lower ground floor through a Cat A refurbishment, including replacing M&E services and upgrading the façade fronting Saffron Hill.

The proposal includes of an AHU installed internally at lower ground floor level. The fresh air intake and exhaust will be ducted to the stairwell at lower ground floor level. The is expected to operate during office hours only, assumed to be 07:00 to 19:00 hrs.

4 PLANT NOISE ASSESSMENT

4.1 Baseline Noise Levels

To capture baseline noise levels during a typical daytime period, attended measurements were conducted on 19th May 2022 at the second-floor external staircase, representative of front windows of One Tun Public House (see Figure 3.1) using a Norsonic 140 Class 1 sound level meter fixed to a tripod at a height of 1.2 m above floor level, which are described below.

The sound level meter was calibrated at the start and end of the measurement. Equipment details are shown below in Table 4.1. Weather conditions were favourable during the noise survey, being dry with negligible wind.

Table 4.1: Equipment details

Equipment	Make & Model	Serial No	Calibration Item	Calibration Due	Calibration Certification Number
Sound Level Meter (Attended)	Norsonic 140	1403216	BS7580	03/02/2023	U36966
			1/3 Octave	03/02/2023	U36967
			Rev Time	03/02/2023	U36967
Calibrator (Attended)	Norsonic 1251	31428	-	03/02/2023	U36964

The results of the attended survey are presented below in Table 4.2.

Table 4.2: Attended survey results (Façade Levels)

Monitoring Period	Measurement Duration	$L_{Aeq,T}$ dB	$L_{A90,T}$ dB
11:31	15 mins	59	56
11:46		62	58
12:52		58	56
15:46		58	56
16:01		58	56
Overall		**59**	**56**

4.2 London Borough of Camden Criterion

With reference to Section 2.1, in order to meet the LOAEL, plant noise should be controlled such that the rating levels do not exceed 10dB below background noise during the day (external amenity area and outside windows of nearest habitable rooms)

Noise levels due to any new building services plant serving the refurbishment are advised to meet the following noise level criteria shown in Table 4.3, at one metre from the nearest noise sensitive windows, identified as second and third floors of The One Tun Public House along Saffron Hill.

These are based on the background noise levels measured at the relevant positions, for which the minimum (i.e. lowest measured) levels have been adopted, and which are deemed representative of the lowest background levels at the nearest sensitive receptor(s).

It should be noted that the Local Plan does not specify the lowest $L_{A90,T}$ level to be used, whilst BS 4142 advocates the use of "typical" levels, rather than lowest levels. Therefore, use of such lowest levels is considered worst case, ensuring compliance with both the Local Plan and BS 4142.

Table 4.3: Plant noise emission limits

Location	Lowest Measured Background Noise Level $L_{A90,15min}$ dB	Noise Emission Limit $L_{Aeq,T}$ dB
One Tun PH, front windows	56	46

4.3 BREEAM Pol 05 Credit

Meeting the noise emission limits set in Table 4.3 would also ensure compliance with the BREEAM 'UK Refurbishment and Fit-out 2014', whereby the single credit could be awarded.

4.4 Assessment

The proposal includes the installation of an AHU will be ducted to atmosphere at lower ground floor level. The manufacturers published in-duct sound power levels for the fresh air intake and the exhaust are given in Table 4.4.

Table 4.4: Sound Power Level of AHU (dB)

Source	Octave Band Centre Frequency (Hz)								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Fresh Air Intake	74	73	70	64	59	57	56	56	67
Exhaust	79	82	80	79	78	76	74	70	83

Table 4.5 presents the insertion loss of the proposed attenuators to be installed on the intake and exhaust ducts of the AHU.

Table 4.5: Insertion loss of proposed attenuators (dB)

Location	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Intake (ref. ATT/LG/S/02)	9	19	30	46	55	51	50	36
Exhaust (ref. ATT/LG/E/02)	6	14	24	41	55	55	53	42
Exhaust (ref. ATT/LG/E/03)	8	14	20	27	36	23	19	12

The results are given in Table 4.6 while detailed calculations are provided in the Appendix.

Table 4.6: Estimated plant noise levels at the nearest NSRs

Location	Noise Emission Limit $L_{Aeq,T}$ dB	Estimated Plant Noise Level $L_{Aeq,T}$ dB	Criteria met ?
The One Tun PH, front windows	46	11	Yes

5 CONCLUSIONS

Anderson Acoustics Ltd has undertaken a plant noise assessment to assist in a planning application for the installation of fixed plant at Saffron House, London.

An assessment of the noise impact from the operation of the proposed units has been undertaken in accordance with the requirements of the Camden Borough's Local Plan and BS 4142.

Noise levels from the proposed plant are predicted to comply with Camden Borough's criteria on condition that the plant is location in the positions shown in Figures 3.1 and the attenuators detailed in Section 4.4 are installed. Based on the results of the assessment presented in this report, planning permission should not be refused on noise grounds and a single credit for BREEAM Pol 05 should be awarded.

APPENDIX
DETAILED CALCULATIONS

NSR:	The One Tun

Source	Component/Model		Octave Band Centre Frequency (Hz) 63	125	250	500	1k	2k	4k	8k	dB(A)
AHU	Fresh Air Intake	Sound Power Level	74	73	70	64	59	57	56	56	67
		Attenuation due to duct	-2	-1	-1	0	0	0	0	0	
		Attenuator (ATT/LG/S/02)	-9	-19	-30	-46	-55	-51	-50	-36	
		Grille Reflection	-2	0	0	0	0	0	0	0	
		Sound power to atmosphere	61	53	39	18	4	6	6	20	40
		Distance attenuation (7m)	-28	-28	-28	-28	-28	-28	-28	-28	
		Directivity Factor	7	8	8	9	9	9	9	9	
		Shielding	-10	-10	-10	-10	-10	-10	-10	-10	
		Sound pressure level at NSR	30	23	10	-11	-25	-23	-23	-9	10
	Exhaust	Sound Power Level	79	82	80	79	78	76	74	70	83
		Attenuation due to duct	-4	-2	-1	-1	0	0	0	0	
		Attenuator (ATT/LG/E/02)	-6	-14	-24	-41	-55	-55	-53	-42	
		Attenuator (ATT/LG/E/03)	-8	-14	-20	-27	-36	-23	-19	-12	
		Grille Reflection	-2	0	0	0	0	0	0	0	
		Sound power to atmosphere	59	52	35	10	-13	-2	2	16	38
		Distance attenuation (10m)	-31	-31	-31	-31	-31	-31	-31	-31	
		Directivity Factor	7	8	8	9	9	9	9	9	
		Shielding	-10	-10	-10	-10	-10	-10	-10	-10	
		Sound pressure level at NSR	25	19	2	-22	-45	-34	-30	-16	5
Total Sound Pressure Level at NSR			31	25	10	-11	-25	-23	-22	-8	11