

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

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Hilton House, Manchester

Plant noise egress assessment report

London, Manchester, Edinburgh, Birmingham, Belfast

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Summary

Sandy Brown have been appointed by Cert Property Limited to undertake noise measurements of plant relating to the proposed basement gym at Hilton House, Manchester and subsequently undertake an assessment of plant noise egress.

An environmental noise survey has previously been carried out by Peak Acoustics at the site. The noise survey was carried out between 1 October 2018 to 2 October 2018, as well as 27 November 2018 to 28 November 2018.

Background sound levels measured during the survey were $L_{A90,1\text{hour}}$ 49 dB during the daytime and $L_{A90,1\text{hour}}$ 46 dB at night.

Based on the requirements of Manchester City 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} 44 dB during the daytime and L_{Aeq} 41 dB during the night.

Plant noise measurements have been undertaken and a subsequent assessment of plant noise egress carried out.

Based on the measurements undertaken, the level of plant noise egress is calculated to be $\leq L_{Aeq}$ 42 dB at the Dale House residential flat window. This complies with the daytime (07:00-23:00) noise egress criteria but exceeds the night-time (23:00-07:00) noise egress criteria by 1 dB.

The calculated level of plant noise egress was limited due to the residual noise levels in the area at the time of the survey. In addition, a 1 dB exceedance would be considered to be within measurement tolerances. As such, it is expected that the night-time (23:00-07:00) noise egress criteria will be complied with in practice.

As such planning condition 14 should therefore be discharged.

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1 Introduction

Sandy Brown have been appointed by Cert Property Limited to undertake noise measurements of plant items relating to the basement gym at Hilton House, Manchester and subsequently undertake an assessment of plant noise egress.

This report sets out the plant noise egress criteria, the proposed plant items, the results of the plant noise measurements and an assessment of noise egress.

2 Site description

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

The nearest and worst affected noise sensitive premises have been identified as the Dale House residential apartments (referred to as The Vaults apartments within the Peak Acoustics report). This is highlighted in blue within Figure 1.

Another nearby noise sensitive premise has been identified as the Hatters Hostel. This is highlighted in yellow within Figure 1.

The approximate location of the new basement gym plant items has been highlighted in green.

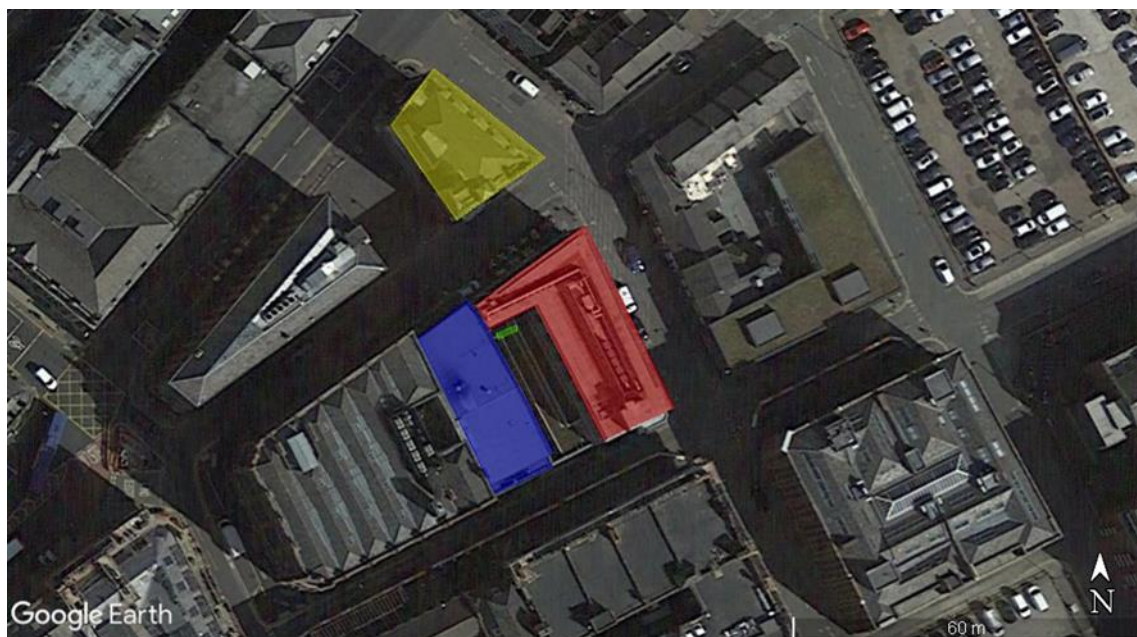


Figure 1 Site plan and surrounding noise sensitive receptors (source: Google Earth)

3 Acoustic criteria

3.1 Planning condition 14

Planning condition 14 imposed by Manchester City Council states the following:

The proposed plant and associated equipment shall be implemented in accordance with the following:

Specification and noise level target compliance levels as set out in Peak Acoustics Noise Impact Assessment, Project No: PA872 Report Ref: 2106191NR Issue Date: 10th July 2019 Hilton House, 26-28 Hilton Street, Manchester, M1 2EH; and

The approved noise targets and insulation scheme for the plant and equipment shall be met / completed before each of the basement gym and ground floor A3 uses commence. Prior to occupation a post completion report to verify that all of the target noise attenuation levels have been met and any potential adverse noise impacts in adjacent residential accommodation arising directly from the plant and equipment proposed development have been adequately mitigated, shall be submitted and agreed in writing by the City Council as local planning authority. Prior to occupation any non compliance shall be suitably mitigated in accordance with an agreed scheme.

Reason - To secure a reduction in noise in order to protect future residents from noise nuisance, pursuant to policies SP1 and DM1 of the Core Strategy and saved UDP Policy DC26.

3.2 Peak Acoustics noise impact assessment criteria

An environmental noise survey has previously been carried out by Peak Acoustics at the site. The noise survey was carried out between 1 October 2018 to 2 October 2018, as well as 27 November 2018 to 28 November 2018.

The Peak Acoustics noise impact assessment report PA872-2106191NR dated 10 July 2019 referenced in Section 3.1 sets out daytime (07:00-23:00) and night-time (23:00-07:00) plant noise egress limits based on the background noise levels measured. These are set out in Table 1.

Table 1 Plant noise egress limits

Location	Plant noise limit at 1 m from noise sensitive receiver, L_{Aeq} (dB)	
	Daytime (07:00 – 23:00)	Night (23:00 – 07:00)
Dale House residential apartments (The Vault)	44	41

4 Installed plant items

A photograph of the installed plant items associated with the basement gym is provided in Figure 2. This comprises of the following:

- 3 x new condenser units which can be seen within Figure 2
- An MVHR has been installed within the basement gym which intakes and exhausts via atmospheric connections ducted to the rear of the louvre circled in red within Figure 2.



Figure 2 Photograph of installed plant items

The basement gym and associated plant will be able to operate during the daytime (07:00-23:00) and between (06:00-07:00) during the night-time.

5 Plant noise measurements

The following section sets out the basement gym plant noise measurements undertaken. During the measurements, the basement gym plant items were operating at maximum design duty.

Measurements 1-6 were undertaken at approximately 1 m from the nearest Dale House residential apartment window, approximately 3 m from the condensers and 5 m from the MVHR atmospheric terminations. Each measurement was undertaken for a 5 minute duration.

Measurements 7-12 were undertaken within the loading bay, approximately 3 m from the condenser units and 1 m from the MVHR atmospheric terminations. Each measurement was undertaken for a 1 minute duration.

Weather conditions during the survey are described in Appendix A.

When the basement gym plant was switched off, the main noise sources included traffic noise and noise from other building services plant. Less significant noise sources included pedestrians, bird song and faint construction noise.

Table 2 Results of plant noise measurements

Measurement ref	Measured sound level, L_{Aeq} (dB)
<u><i>Plant measurements undertaken at residential flat window</i></u>	
<i>Basement gym plant items operating</i>	
1	52
2	51
3	53
<i>Average</i>	52
<i>Basement gym plant items switched off</i>	
4	52
5	52
6	52
<i>Average</i>	52
<u><i>Plant measurements undertaken within loading bay</i></u>	
<i>Basement gym plant items operating</i>	
7	51
8	51
9	50
<i>Average</i>	51

Measurement ref	Measured sound level, L_{Aeq} (dB)
<i>Basement gym plant items switched off</i>	
10	50
11	50
12	51
<i>Average</i>	50

6 Assessment

As can be seen from Table 2, the average noise levels at the residential flat window did not increase when the plant was switched on compared to the residual noise levels when the plant was switched off. On this basis, the level of plant noise egress is calculated to be $\leq L_{Aeq}$ 42 dB.

This complies with the daytime plant noise egress criteria as per Table 1 however exceeds the night-time criteria by 1 dB. The calculated level of plant noise egress was limited due to the residual noise levels in the area at the time of the survey. In addition, a 1 dB exceedance would be considered to be within measurement tolerances.

In addition to the above, it is expected that whilst the plant items operate during the night-time between 06:00-07:00, they will not be operating at maximum design duty and so plant noise egress will be lower than when the measurements were undertaken. As such, it is expected that the night-time (23:00-07:00) noise egress criteria will be complied with in practice.

Subjectively, the plant items were not audible at any point during the measurements.

The noise from the plant contained no attention catching features. When the items plant started / stopped operating, they did not produce any distinctive noises. As such, no penalties for attention catching features have been applied.

7 Conclusion

Plant noise measurements have been undertaken and a subsequent assessment of plant noise egress carried out.

Based on the measurements undertaken, the level of plant noise egress is calculated to be $\leq L_{Aeq}$ 42 dB at the Dale House residential flat window. This complies with the daytime (07:00-23:00) noise egress criteria but exceeds the night-time (23:00-07:00) noise egress criteria by 1 dB.

The calculated level of plant noise egress was limited due to the residual noise levels in the area. In addition, a 1 dB exceedance would be considered to be within measurement tolerances. As such, it is expected that the night-time (23:00-07:00) noise egress criteria will be complied with in practice.

As such planning condition 14 should therefore be discharged.

Appendix A

Survey details

Equipment

A BK 2250 sound level meter was used to undertake the noise measurements. The calibration details for the sound level meter are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	2250/3011964	Brüel & Kjær	4 Sep 21	UCRT19/1970, UTRC19/1976
Microphone	4189/3100176	Brüel & Kjær	4 Sep 21	UCRT19/1970, UTRC19/1976
Pre-amp	ZC0032/26376	Brüel & Kjær	4 Sep 21	UCRT19/1970, UTRC19/1976
Calibrator	4231/3019123	Brüel & Kjær	3 Sep 21	UCRT19/1969

Calibration of the sound level meter 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 meter and microphone were calibrated at the beginning and end of the measurements using their respective sound level calibrator. No significant deviation in calibration occurred.

Noise indices

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, T, 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 sound level.

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 attended noise measurements, the weather was generally clear and dry and no rain occurred. Wind speeds were measured and varied between 0 m/s and 2 m/s.