

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

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Mindel House & 11 Bloom St, Manchester

*Planning condition 6 discharge report – Plant noise
egress assessment*

London, Manchester, Edinburgh, Birmingham, Belfast

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Version	Date	Comments	Author	Reviewer
A	28 Jun 21		Daniel Shaw	Matthew Robinson
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Summary

Sandy Brown have been commissioned by Beech Holdings Ltd to carry out an assessment of noise egress from rooftop plant to surrounding sensitive receptors in accordance with Planning Condition 6 associated with the development at Mindel House and 11 Bloom Street in Manchester.

Based on 16044-R01-B *Planning noise report* by Sandy Brown, the representative background sound levels were as follows:

- During the day (07:00 – 23:00) – $L_{A90,5min}$ 51 dB
- During the night (23:00 – 07:00):
 - $L_{A90,5min}$ 47 dB at the nearby sensitive premises on Bloom Street and Minshull Street
 - $L_{A90,5min}$ 51 dB at the nearby sensitive premises on Richmond Street

On the basis of the requirements of the Manchester City Council (MCC), the relevant plant noise limits at the worst affected existing noise sensitive premises must not exceed 5 dB below these representative background sound levels. These limits are cumulative, and apply with all plant operating under normal conditions. If plant items contain tonal or attention catching features, a penalty is to be applied.

Based on the data provided for the rooftop AHUs on each building, mitigation measures are required to meet the noise egress criteria. These are set out in this report, which is to be based around in-duct attenuation of the AHU extract fans in particular.

Provided these mitigation measures are incorporated, the proposed plant is expected to meet the noise egress criteria.

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1 Introduction

Sandy Brown have been commissioned by Beech Holdings Ltd to carry out an assessment of noise egress from rooftop plant to surrounding sensitive receptors in accordance with Planning Condition 6 associated with the development at Mindel House and 11 Bloom Street in Manchester.

This report sets out the basis for this assessment, predicted noise levels at the nearby noise sensitive facade, and presents mitigation measures to comply with the criteria.

2 Planning Condition 6

Planning condition 6 is set out below

6) Prior to occupation of the development a scheme for the acoustic insulation of any externally mounted ancillary equipment associated with the residential development shall be Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location. The approved scheme shall be completed before the premises is occupied and a verification report submitted for approval by the City Council as local planning authority and any non compliance suitably mitigated in accordance with an agreed scheme prior to occupation. The approved scheme shall remain operational thereafter.

Reason - To secure a reduction in noise in order to protect future residents from noise nuisance, pursuant to policies SP1, H1 and DM1 of the Core Strategy.

3 Basis of review

The review has been based on the following documents:

- Sand Brown report 16044-R01-B *Planning noise report*
- Architectural and MEP tender drawing package received 7 June 2021
- Plant data received from Parker Wilson via email June 2021

4 Site description

4.1 The site and its surroundings

The scheme comprises two adjacent existing grade II listed buildings, Mindel House and 11 Bloom Street, both of which are five storeys tall. The former night club located in the basement, Madison Lounge, is now vacated and is proposed to be converted into dwellings as part of the scheme.

The site is bounded by Minshull Street to the north east, Richmond Street to the south east, Bloom Street to the north west and a car park to the south west.

The site is located in the Village area, with a high concentration of restaurants, bars and night clubs in its proximity.

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

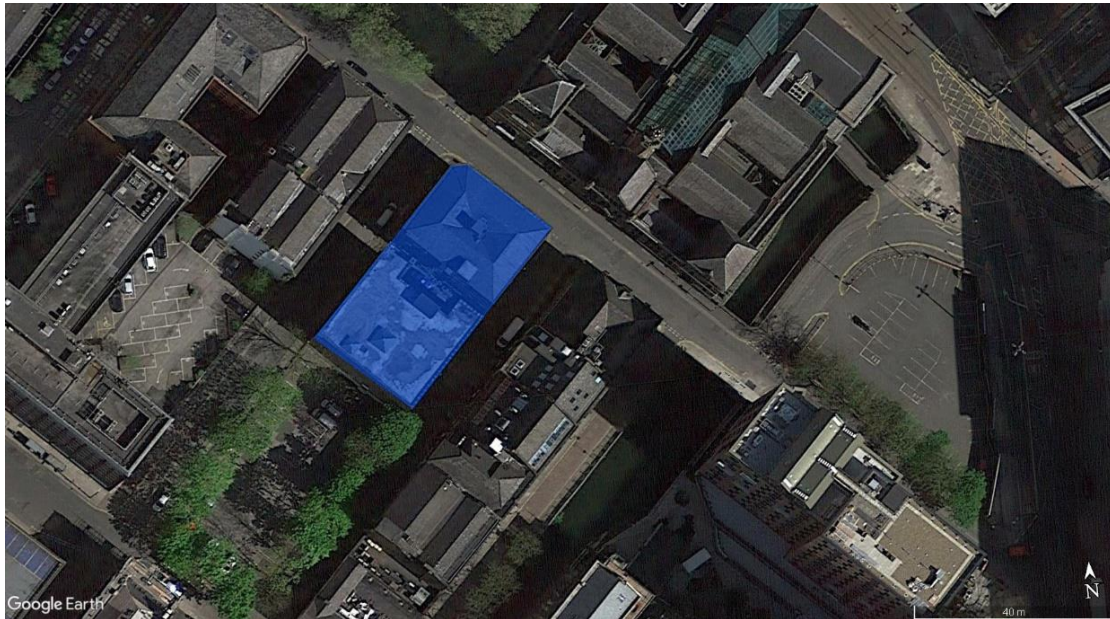


Figure 1 Site map (courtesy of Google Earth Pro)

The nearest noise sensitive receivers are the hotels on Richmond/Canal Street, and the office/hotel buildings on Bloom Street.

5 External noise limits

Based on 16044-R01-B *Planning noise report* by Sandy Brown, the representative background sound levels were as follows:

- During the day (07:00 – 23:00) – $L_{A90,5min}$ 51 dB
- During the night (23:00 – 07:00):
 - $L_{A90,5min}$ 47 dB at the nearby sensitive premises on Bloom Street and Minshall Street
 - $L_{A90,5min}$ 51 dB at the nearby sensitive premises on Richmond Street

As such, the maximum permitted noise levels from all plant associated with the development, as measured 1 m from the facades of the nearest noise sensitive receptors are set out in Table 1.

Table 1 Plant noise egress criteria

Period	Plant noise egress criteria, L_{Aeq} (dB)	
	Bloom/Minshull Street	Richmond Street
Day (07:00 – 23:00)	46	46
Night (23:00 – 07:00)	42	46

The limits set out in Table 1 do not include any attention catching features. The penalties for attention catching features may be significant, and will need to be considered as the building services design progresses. This is set out in Appendix A

6 Plant information

6.1 Layouts

Rooftop plant layouts are set out in Figure 2 below. In each instance there is a rooftop mounted AHU to provide ventilation to the apartments. These are to run continuously.

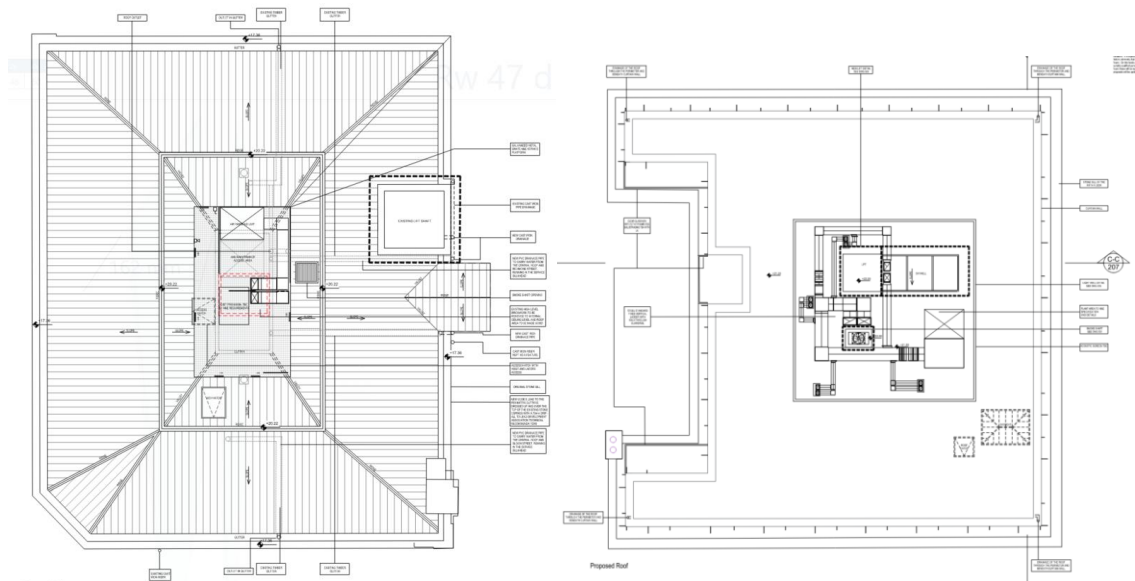


Figure 2 Outline rooftop plant layout for Mindel House and 11 Bloom Street

6.2 Plant noise levels

Indicative sound power levels for the proposed AHUs are set out in Table 2 below. These are based on units of a similar size and duty.

Table 2 Sound power levels for the proposed AHUs

Source	Sound power level, L_w (dB)							
	Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Supply fan	68	78	74	65	60	56	52	51
Extract fan	69	79	81	80	77	71	67	65

Noise breakout from the casing of each proposed AHU is L_{wA} 66 dB, as stated by the manufacturer.

7 Assessment

7.1 Noise levels at receptors

Noise levels at receptors have been calculated taking into account attenuation with distance, reflections from buildings, and screening where applicable.

The noise levels at the worst affected noise sensitive premises on both Bloom St and Richmond Street, which overlook the plant areas, are L_{Aeq} 52 dB. This exceeds the most onerous night-time requirement on Bloom Street by 10 dB, and the most onerous Richmond Street and daytime requirement by 6 dB.

This is driven by the noise from the AHU extract fans, with a smaller contribution from the AHU supply fans.

7.2 Mitigation measures

In order to meet the plant noise egress criteria, the following attenuation measures would be required. This is expected to be provided in the form of in-duct attenuators to the AHU atmospheric terminations.

Table 3 Minimum attenuation measures

Plant item	Minimum in-duct attenuator insertion loss (dB)							
	Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
AHU supply fan	0	0	2	2	2	2	0	0
AHU extract fan	3	5	10	15	15	15	13	5

Typically, these insertion losses can be provided by 900 mm low pressure drop attenuators. Attenuators are to be selected to minimise pressure drops such that regenerated noise from turbulent airflow does not cause the resultant noise levels to increase.

8 Conclusion

The proposed rooftop ventilation plant has been assessed at the nearest noise sensitive premises on Bloom Street and Richmond Street.

Mitigation measures in the form of in-duct attenuators are required to meet the plant noise egress limits in line with MCC Planning Condition 6.

Appendix A

BS4142:2014-A1 2019 Attention catching features

If the proposed plant noise contains attention catching features (such as tonal elements, whines, whistles, bangs etc), the plant should be designed to achieve a limit below those set out above, based on the type and impact of the features.

If appropriate, a subjective assessment of the plant features can be adopted. Where the plant noise contains tonal elements, the following corrections can be made depending on how perceptible the tone is at the noise receptor:

- 0 dB where the tone is not perceptible
- 2 dB where the tone is just perceptible
- 4 dB where the tone is clearly perceptible
- 6 dB where the tone is highly perceptible

Where the plant noise is impulsive, the following corrections can be made depending on how perceptible the impulsivity is at the noise receptor:

- 0 dB where the impulse is not perceptible
- 3 dB where the impulse is just perceptible
- 6 dB where the impulse is clearly perceptible
- 9 dB where the impulse is highly perceptible

For noise which is equally both impulsive and tonal, then both features can be taken into account by linearly summing the corrections for both characteristics.

If the plant has other distinctive characteristics, such as intermittency, then a 3 dB correction can be made.

If a subjective assessment is not appropriate then an objective assessment can be made. A noise source is deemed to be tonal if the time averaged sound pressure level in a one-third octave band exceeds the level in adjacent one-third octave bands by the level differences given below:

- 15 dB in the low frequency one-third octave bands (25 Hz to 125 Hz)
- 8 dB in the mid frequency one-third octave bands (160 Hz to 400 Hz)
- 5 dB in the high frequency one-third octave bands (500 Hz to 10000 Hz)

If an objective assessment identifies the plant noise to be tonal then a 6 dB correction must be made.