

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

17287-R05-B

27 April 2023

Ancoats Gardens, Manchester

Planning condition 14 discharge report

London, Manchester, Edinburgh, Birmingham, Belfast Leeds

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Version	Date	Comments	Author	Reviewer
A	17 Jun 22	Initial issue for comment	Jose M. Gonzalez	Matthew Robinson
B	27 Apr 23	Revised issue following pre-completion testing	Skylar Clark	Matthew Robinson

Disclaimer

This report has been prepared for the sole benefit and use of our client based on their instructions and requirements. Sandy Brown Ltd extends no liability in respect of the information contained in the report to any third party.

Summary

Sandy Brown have been appointed by Beech Design and Build Ltd to provide acoustic consultancy services in relation to Ancoats Gardens, Manchester.

This report sets out relevant information to discharge part Planning condition 14 (of MCC decision notice 123371/JO/2019).

The internal noise limits for the gym and commercial units are based on the sound insulation results for the separating floors following pre-completion sound insulation testing.

There is no clear information in relation to the sound insulation performance of the external glazing facade to the gym and commercial units. In line with our design report a minimum sound insulation performance of R_w+C_{tr} 28 dB has been assumed.

The limits set out in line with MCC requirements for the gym and commercial units would typically be suitable for a cafe/restaurant or gym with background music.

Guidance on work enhancements have been provided in case tenants would like to produce higher noise levels.

Impact noise transfer from gym free-weight drops to Level 1 residential apartments 110 and 111 above can be suitably controlled using a resilient floor build-up comprising: 17 mm Acousticork U71 resilient layer, 25 mm Sylomer (SR 28 or SR 42)

Gym free-weights should be limited to 12 kg unless an enhanced gym mat system is used. It is also recommended that free-weight use is limited to the daytime.

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1 Introduction

Sandy Brown have been appointed by Beech Design and Build Ltd to provide acoustic consultancy services in relation to Ancoats Gardens, Manchester.

This report sets out relevant information to discharge of planning condition 14 for the development (of MCC decision notice 123371/JO/2019).

2 Planning condition 14

Planning condition 14 of Manchester City Council decision notice 123371/JO/2019 the following:

Notwithstanding the noise assessment stamped as received by the City Council, as Local Planning Authority, on the 7 November 2017 and update stamped as received by the City Council, as Local Planning Authority, on the 5 January 2018,

- (a) Prior to the first use of the commercial units and gym area as indicated on drawing 103_101 Rev P6 stamped as received by the City Council, as Local Planning Authority, on the 31 January 2018, a scheme of acoustic insulation shall be submitted for approval in writing by the City Council, as Local Planning Authority.*
- (b) The approved scheme shall then be implemented and a post completion survey submitted for approval in writing by the City Council, as Local Planning Authority, prior to the first use of each of the commercial units and the gym area. The measures implemented shall be retained and maintained for as long as the development remains in use.*

Reason: In order to limit the outbreak of noise from the commercial premises pursuant to policies SP1 and DM1 of the Core Strategy (2007) and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995).

3 Basis of the review

The review has been based on the following documents:

- Sandy Brown acoustic planning report 17287-R01-C
- Sandy Brown acoustic design report 17287-R03-A
- Ancoats CW Technical Submission Pack
- 103-17_002-DRAFT09022022_Level 00 - Ground Floor
- Condition Discharge Schedule - Ancoats Gardens V12 (05.11.2021)

4 Summary of demises

The following units are located at ground floor level and connected to the facade and residential apartments above.

- Gym (outlined in blue in Figure 1)
- Commercial unit 01 (outlined in red in Figure 1) and 02 (outlined in green in Figure 1).

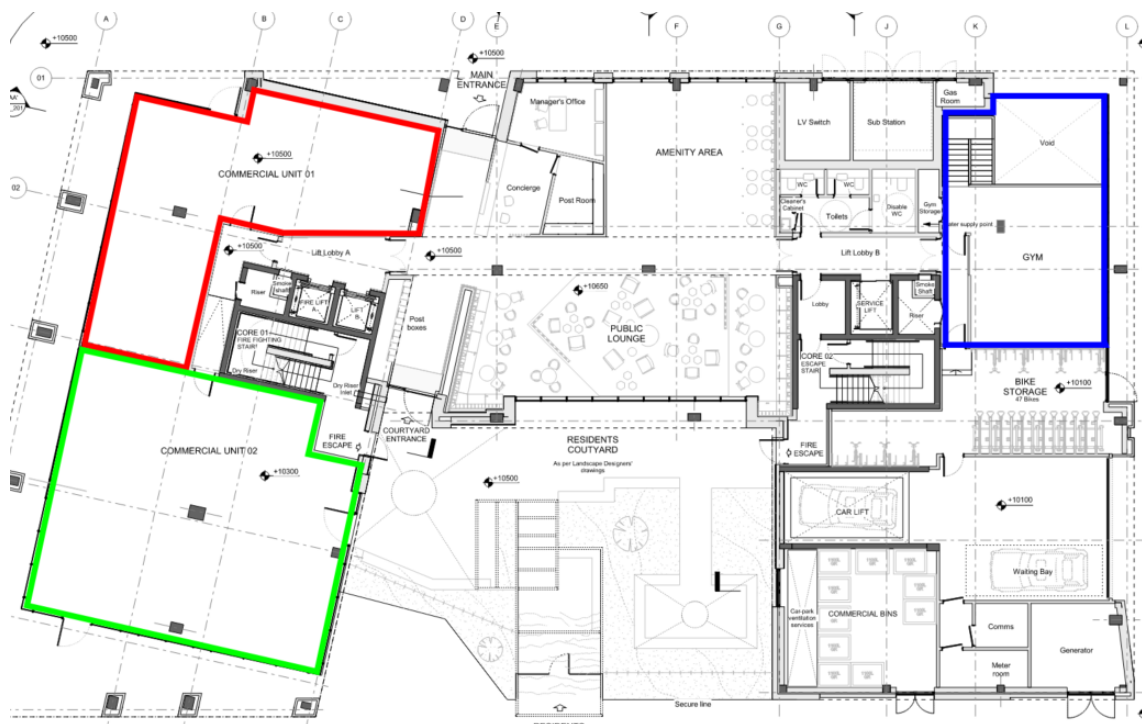


Figure 1 Mark-up showing locations of commercial units and gym

5 Acoustic design requirements

5.1 Local authority criteria

5.1.1 Entertainment noise egress limits

In line with the criteria set out in our acoustic design report, the following applies to this development:

‘Entertainment noise (L_{Aeq}) should be controlled to 10 dB below the background noise level (L_{A90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location.’

The wording of Planning Condition does not explicitly state the above criteria, though this is how MCC would typically assess external noise egress from entertainment noise and is the basis of the acoustic design for this element.

5.1.2 Apartment internal noise criteria

Where entertainment noise is a factor in the noise climate, MCC states the following:

‘These criteria apply to both music noise from existing Music noise levels in the 63 Hz and 125 Hz octave centre frequency bands should be controlled so as not to exceed (in habitable rooms) 47 dB and 41 dB (L_{eq}), respectively.’

From discussions with MCC it is understood that the low frequency noise criteria only applies to living-areas during the daytime (07:00-23:00) and to bedrooms during night-time (23:00-07:00).

The wording of Planning Condition does not explicitly state the above criteria, though this is how MCC would typically assess external noise egress from entertainment noise and is the basis of the acoustic design for this element.

5.2 Development criteria

5.2.1 Facade sound insulation

In line with the acoustic design report a minimum overall facade sound insulation performance of R_w+C_{tr} 28 dB to the commercial units, the gym and amenity area.

The glazing manufacturer will need to provide details demonstrating that the minimum overall sound insulation performance has been achieved.

5.2.2 Impact noise transfer

There are no British Standards or guidance documents that set criteria for structure-borne noise from the impacts of free-weights and weights machines.

It is recommended that structure-borne noise transfer due to the dropping of gym weights on Level 1 of the gym is limited to L_{AFmax} 35 dB in Level 2 residential apartments. This limit is 10 dB below the WHO guidelines which indicate that L_{AFmax} 45 dB is the onset of sleep disturbance. The limit is above the internal noise criterion of (L_{Aeq} 30 dB in bedrooms and L_{Aeq} 35 dB in living areas); however, mitigation measures will be designed so the limit is not exceeded. Operational noise

5.3 Basis of operational noise limits

Airborne sound insulation tests of the floor between the commercial units and apartments above have been carried out. The values measured were between $D_{nT,w}+C_{tr}$ 55 dB and $D_{nT,w}+C_{tr}$ 60 dB for commercial units, and $D_{nT,w}+C_{tr}$ 67 dB between the gym and apartments above. . For the purpose of setting operational noise limits, the measured sound insulation for each adjacency has been used.

5.4 Noise egress to nearby noise sensitive premises

The cumulative noise level resulting from amplified sound egress at 1 m from the most affected windows of the nearest noise sensitive premises shall not exceed 10 dB below the existing background (L_{eq}). These limits are set out in our planning report 17287-R01-C and presented in Table 1 for reference.

Table 1 Amplified music limits at 1m from the nearest noise sensitive premises

Period	Maximum sound pressure level at 1 m from noise sensitive premises, L_{eq} (dB), Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
Daytime (07:00-23:00)	52	43	42	40	42	36	29
Night-time (23:00-07:00)	43	34	34	32	34	29	18

5.5 Operational noise limits

The maximum operational noise levels (L_{eq}) from amplified sound within the proposed commercial and gym units are set out in Table 2.

Maximum internal sound pressure levels (L_{Fmax}) shall be limited to values 5 dB above those set out below.

These limits are based on the following:

- Meeting the noise egress criteria set out in Section 5.3 and the external noise limits in Section 5.4.
- A minimum overall facade sound insulation performance of R_w+C_{tr} 28 dB to the commercial units.
- Meeting the noise transfer criteria set out in Section 5.1.1
- The measured internal sound insulation performances set out in Section 5.3.

Table 2 Maximum operational noise limits in commercial unit and gym areas (for guidance only)

Period	Maximum operational noise limits, L_{eq} (dB) Octave band centre frequency (Hz))							L_{Aeq} (dB)
	63	125	250	500	1k	2k	4k	Overall
<i>Gym</i>								
Daytime (07:00-23:00)	83	90	84	89	87	81	79	91
Night-time (23:00-07:00)	83	81	76	80	87	81	76	89
<i>Commercial unit 01</i>								
Daytime (07:00-23:00)	84	81	81	82	76	75	79	84
Night-time (23:00-07:00)	81	81	76	80	76	75	76	83
<i>Commercial unit 02</i>								
Daytime (07:00-23:00)	84	81	75	80	79	75	74	83
Night-time (23:00-07:00)	84	81	75	80	79	75	74	83

The overall limits outlined in Table 2 would typically be suitable for a cafe/restaurant or gym with background music. It should be noted that if loud amplified music is proposed, Manchester City Council would typically require a door lobby arrangement to be included to control noise breakout.

The amplified noise limits have been set following pre-completion sound insulation testing and

would typically be included in a tenant lease agreement to control noise transfer and minimise disturbance to the residents of the apartments above the commercial units and the gym. Final sound levels should be set during commissioning of electronic sound limiters in the commercial units and the gym to ensure the MCC requirements are met.

5.5.1 Possible tenant enhancement works

If the tenant would like produce noise levels higher than those noted above, they would need to carry out additional enhancement works in order that the MCC criteria are still met. Typical enhancement works would be expected to include:

- Independent lining to the external flanking walls – where it has not been provided
- Independent lining to all internal flanking elements (columns – where it has not been provided, existing walls running between floors)
- Provision of an additional sound insulating ceiling
- Secondary glazing to windows
- Lobbied external doors. This would typically be required for any space with loud amplified music.

6 Impact noise transfer

Impact noise transfer testing was carried out between the ground floor gym and the Level 1 residential apartments on 21 April 2023 by Kane Mitchell and Jose Gonzalez.

6.1 Impact noise transfer testing

Impact noise transfer measurement from gym weight drops have been carried out to determine a suitable resilient floor build-up to the proposed free-weight area of the gym.

The gym layouts are presented in Figure 2 below, while the receiving spaces in apartments 110 and 111 above are shown in Figure 3 with the room references. The apartments above are considered noise sensitive at all times of the day.

All weights were dropped from knee height (approximately 0.5 m) on to the chosen flooring type, which was placed in the middle of the proposed free-weight area, at least 3 m from the slab edge as shown in position 'X'. A 12 kg dumbbell was used for the testing. The test conditions are therefore considered to represent a worst-case scenario where a gym user acts outside of the guidance provided by the operator causing potentially high levels of structure-borne noise transfer. The measurements that form the basis of this assessment are therefore considered to be worst case.

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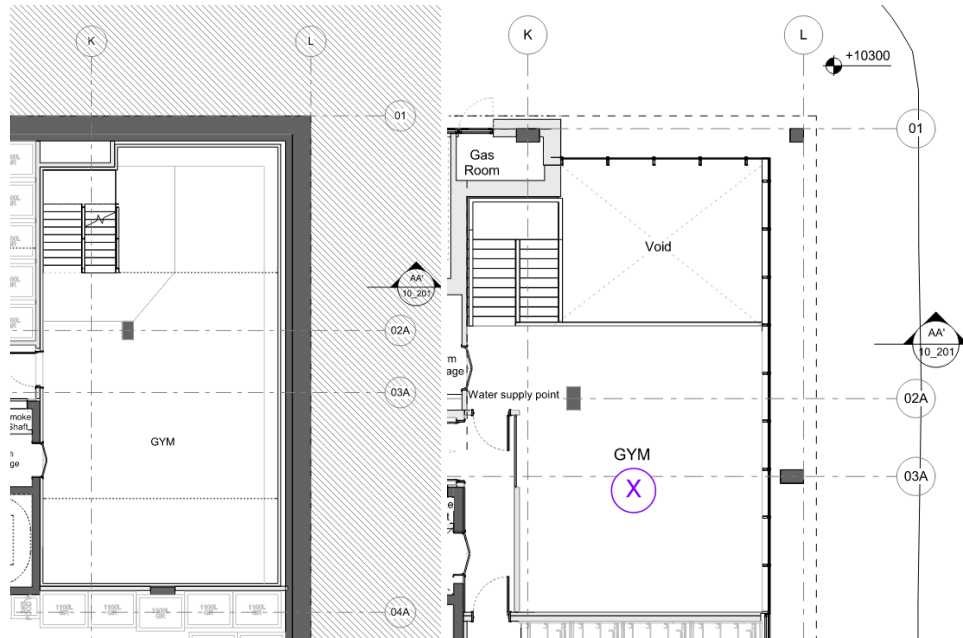


Figure 2 Gym layouts at basement and ground level respectively

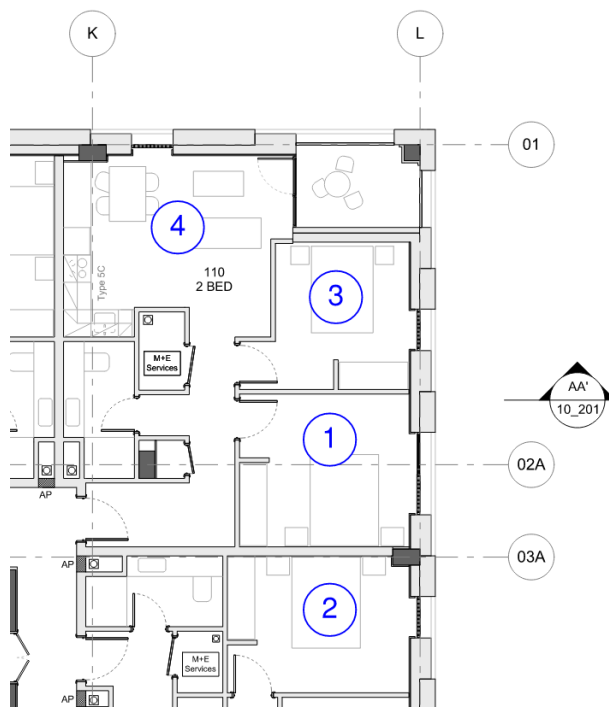


Figure 3 Receiving spaces above the gym

6.1.1 Resilient flooring types

A selection of resilient flooring types were provided and the build-ups are given below (top to bottom). All the flooring configurations were loose laid and provided by Piliteq UK Ltd and Total Vibration Solutions Ltd.

1. 40 mm Sportec gym tile
2. GenieMat FIT70 gym tile (overall depth 70 mm)
3. 17 mm Acousticork U71 resilient layer, 25 mm Sylomer SR28 resilient layer (blue), overall depth 42 mm
4. 17 mm Acousticork U71 resilient layer, 25 mm Sylomer SR42 resilient layer (pink), overall depth 42 mm.

6.1.2 Results

Each gym free-weight drop event was measured over a short period to measure the maximum noise level generated. four repetitions of each gym weight being dropped were measured and the worst case measurement for each case is presented in Table 3.

No tactile vibration was perceptible during any of the measurements.

Table 3 Summary of measurements

Room	Resilient floor type	Maximum sound pressure level, L_{AFmax} (dB)
1 – 110 Bedroom A	1	46
	2	39
	3	33
	4	35
2 – 111 Bedroom A	1	41
	2	42
	3	34
	4	33
3 – 110 Bedroom B	1	40
	2	37
	3	35
	4	35

Room	Resilient floor type	Maximum sound pressure level, L_{AFmax} (dB)
4 – 111 Living room	1	41
	2	37
	3	34
	4	33

The measured background noise levels were L_{Aeq} 26-33 dB.

Extraneous noise sources were also present at the time of testing due to external traffic. Every effort was made to repeat measurements where these affected the results. Any clearly extraneous measurements have been omitted from the assessment. However, given the proximity of the noise criteria to the measured background maximum noise level, there is a risk that elements of the background noise climate may have also affected the measured maxima in some instances.

The measured reverberation times were T_{mf} 0.6-0.7 s for bedrooms and 1.0 s for the living area (with the apartment furnished). As such, no reverberation time correction has been applied.

Resilient floor types 3 or 4 are expected to be capable of achieving the noise transfer criteria to the Level 1 residential apartments when limiting the gym free-weights to 12 kg. For higher weights on the mezzanine level, a more substantial build-up would be required.

There is currently no confirmed operator for the gym. The proposed operator will need to confirm the proposed flooring system and weight limit.