

MILLER GOODALL

ACOUSTICS - AIR QUALITY - LIGHTING

Planning Condition Discharge Report

on behalf of

BOWMER AND KIRKLAND LIMITED

for the site at

ECHO STREET, MANCHESTER

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Summary

This report details the results of testing undertaken for the purpose of discharging two planning conditions (Condition 17b and 18b) associeated with the permission granted for a residential-led development at Echo Street, Manchester (planning ref: *136874/FO/2023*).This report specifically covers only Condition 17b and 18b, as all other noise related conditions have been discharged prior to the writing of this report.

Criteria set out in part A of the two planning conditions have been reproduced within this report for clarity, along with details of the works undertaken for the purpose of discharging part B of the Conditions. The assessment concludes that Condition 17b and 18b can both be discharged.

Record of changes

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1 Introduction

1.1 Miller Goodall Ltd has, on behalf of Bowmer and Kirkland Limited, undertaken works required for the discharge of two Planning Conditions associated with the development.

1.2 This document summarises the criteria set out in the Conditions, and provides full details of works undertaken at the site to demonstrate compliance with the criteria.

1.3 A glossary of acoustic terminology is also provided.

2 Site Description

2.1 The site is located at Echo Street, Manchester, at the former site of Chandos Hall.

2.2 The site is bounded to the south by the trainline, running between Manchester Piccadilly and Manchester Oxford Road, beyond which are university buildings and the Mancunian Way (A57(M)) overpass approximately 250 m away. To the east, the site is directly bounded by Echo Street and an office building with the A6 and Piccadilly train station beyond.

2.3 North of the site, across Granby Row, is the existing iQ student accommodation, with Fairfield Street and offices beyond. To the west of the site are Vimto Park and University of Manchester buildings.

2.4 The primary noise sources in the area are the A6 and Fairfield Street, with anonymous traffic noise from other surrounding roads and intermittent noise from the train line.

2.5 The development is three residential towers of approximately 94 m, 112 m and 130 m height, from west to east. The three towers comprises a mix of studio apartments and multi-room flats with shared kitchens, all of which are rooms for residential use for students. The ground floor of the development is a mixture of study, recreation and ancillary uses e.g. study rooms, gaming room and parcel stores.

2.6 Parts of the ground floor are double-height to accommodate the entrance atrium, as well as a gym/studio area, various study areas, leisure areas and cooking/dining facilities. Additionally, there are two multi-bed flats and a single studio bedroom on the ground floor.

2.7 Externally there are two amenity areas, an east and west courtyard, which are bounded by the building itself. The west courtyard is proposed as a quieter study area, while the larger east courtyard will have open space which may be used for hosting fitness classes and social events. There are no balconies, roof-top or other external amenity areas proposed at the development.

2.8 Emergency mechanical services plant is located primarily in basement plantrooms beneath the development, but the bulk of the plant is on the roofs of the three residential towers. This is in addition to MVHR units proposed for each bedroom/studio and kitchen in the development.

3 Manchester City Council Planning Conditions

3.1 Planning permission has been granted for the site (ref: *136874/FO/2023*) subject to conditions, a number of which relate to noise. The two conditions which are the focus of this report are reproduced below:

"17) Prior to any above ground works, a scheme of acoustic insulation for the non residential areas (gym, lounges, cinema room, karaoke room) shall be submitted for approval in writing by the City Council, as Local Planning Authority.

Where entertainment noise is proposed the LAeq (entertainment noise) shall be controlled to 5dB below the LA90 (without entertainment noise) in each octave band at the façade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63Hz and 125Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (Leq,5min), respectively

(b) Prior to the first use of those spaces within a relevant phase of the development, a verification report will be required to validate that the work undertaken conforms to the recommendations and requirements approved as part of (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met. In instances of non-conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. A verification report and measures shall be agreed until such a time as the development complies with part (a) of this planning condition.

Any mitigation measures shall be implemented in accordance with a timescale to be agreed with the City Council, as Local Planning Authority. Any measures shall thereafter retained and maintained in situ. [sic]

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).

18) (a) Prior to any above ground works, a scheme for acoustically insulating the proposed student accommodation against noise from Granby Row and any other noise sources shall be submitted for approval in writing by the City Council as Local Planning Authority.

There may be other actual or potential sources of noise which require consideration on or near the site, including any local commercial/industrial premises such as Manchester Central and bars/music venues within the Great Northern complex and surrounding roads.

The potential for overheating shall also be assessed and the noise insulation scheme shall take this into account.

Noise survey data shall include measurements taken during a rush-hour period and night time to determine the appropriate sound insulation measures necessary. The following noise criteria shall be required to be achieved when providing adequate ventilation as defined in Approved Document F of the Building Regulations (whole dwelling ventilation):

Bedrooms (night time – 23.00 – 07.00 30 dB LAeq (individual noise events shall not exceed 45 dB LAmax,F by more than 15 times)

Living Rooms (daytime – 07.00 – 23.00) 35 dB LAeq

Gardens and terraces (daytime) 55 dB LAeq

Higher internal noise levels than those specified above may be allowed when higher rates of ventilation are required in relation to the overheating condition.

Additionally, where entertainment noise is a factor in the noise climate the sound insulation scheme shall be designed to achieve internal noise levels in the 63Hz and 125Hz octave centre frequency bands so as not to exceed (in habitable rooms) 47dB and 41dB (Leq,5min), respectively.

The approved noise insulation and ventilation scheme shall be completed before the first occupation of the residential accommodation within phase B/C of this development.

(b) Prior to the first occupation of the residential accommodation within phase B/C, a verification report shall be required to validate the work undertaken conforms to the recommendations and requirements approved as part of part (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met with windows and purge vent doors closed. In instances of non-conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. A verification report and measures shall be agreed until such a time as the development complies with part (a) of this planning condition.

Any mitigation measures shall be implemented in accordance with a timescale to be agreed with the City Council, as Local Planning Authority. Any measures shall thereafter retained and maintained in situ. [sic]

Reason: *To secure a reduction in noise from traffic or other sources in order to protect future residents from noise disturbance pursuant to policies SP1, H1 and DM1 of the Core Strategy (2007) and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995)."*

3.2 Condition 17a has been discharged through a standalone technical letter dated 27 October 2023. In summary, an assessment of entertainment noise based on floorplans, floor constructions, client-proposed source room noise levels and worst-case assumptions has shown the criteria from Condition 17a will be achieved in the worst-affected spaces. Condition 17b is discussed within this report.

3.3 Condition 18a suggests that IANL targets are for the combined contributions from environmental noise break-in and mechanical services noise. However, it is within this report assumed , that the internal ambient noise limits are independent of mechanical services noise. This approach is in accordance with the methodology and limits in Miller Goodall Ltd report ref: *NA_101531 – RIBA Stage 3 Acoustic Report* which was used to discharge Condition 18a originally and aligns with the email agreement on 1 August 2023 with an Environmental Protection Officer at Manchester City Council. Condition 18b is discussed within this report.

4 Internal Ambient Noise Levels

4.1 Criteria

4.1.1 **Table 1** sets out the proposed internal noise limits for the residential dwellings within the development. The noise limits must be achieved with the rooms unoccupied, but finished and normally furnished.

Table 1: Proposed Internal Noise Level Criteria within Apartment Dwellings

Room	Internal Noise Level from Environmental Sources	Mechanical Service Noise Level
Any bedroom or room for residential purpose	• ≤ 30 dB $L_{Aeq,8hr}$ at night (23:00 – 07:00) • Not exceed 45 dB $L_{AF,max}$ more than 15 times during the night (23:00 – 07:00). • ≤ 35 dB $L_{Aeq,16hr}$ during day (07:00 – 23:00)	≤ NR 24
Any residential living room/lounge/area for quiet rest or study	• ≤ 35 dB $L_{Aeq,16hr}$ during day (07:00 – 23:00)	≤ NR 29

4.1.2 On 1st August 2023, Laura Miller (Environmental Protection Officer) at Manchester City Council confirmed by email that these limits are reasonable. Since then, condition 18a, which addresses the appropriate noise limits for the development, was formally discharged by MCC on the basis that the criteria in **Table 1**, and as previously included in our Stage 3 report, have been considered and are acceptable.

4.2 Validation for MCC condition discharge

Condition 17

4.2.1 Sound insulation testing was also undertaken between the ground- and first-floor to ensure that the construction achieves the appropriate degree of sound insulation performance as designed. The noise source levels shown in **Table 2** were used in the design process for each space.

Table 2: Design noise levels of ground floor entertainment space

Source Room	Source Room Predicted Noise Level, L_{eq} (dB) at Octave Band Centre Frequency (Hz)								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Cinema	95	85	85	85	85	80	80	75	90
Gym / Yoga (Background Music)	49	52	54	54	49	45	44	38	58
Gym / Yoga (Exercise Class)	67	72	68	84	84	81	72	72	88
Gaming Room	49	52	54	54	49	45	44	38	58
Karaoke	95	85	85	85	85	80	80	75	90

4.2.2 These levels could not be accurately recreated using sound insulation testing equipment, so pink noise was used and compared with the levels in **Table 2** to determine a conversion factor between the different sources to assess the sound insulation performance of the separating floor. Due to the small volume of the Karaoke and Gaming Rooms, combined with the alignment of the rooms above, it was not possible to undertake accurate sound insulation testing of these rooms.

4.2.3 The average source levels recorded in the Cinema and Gym during the sound insulation testing are shown in **Table 3**. Due to proximity between the Cinema and the Karaoke and Gaming Rooms, the performance of the separating floors should not be significantly different, so results of the assessment of the cinema are considered to be also applicable to the other two spaces.

Table 3: Recorded noise levels of ground floor entertainment space

Source Room	Source Room Recorded Noise Level, L_{eq} (dB) at Octave Band Centre Frequency (Hz)								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Cinema	88	96	99	97	96	94	93	80	101
Yoga Studio	84	93	96	95	95	92	91	79	100
Gym	81	95	97	95	94	92	90	79	99

4.2.4 The differences between the recorded noise levels and assessed / predicted noise levels during the design stage gives a "correction" factor for each separate space and frequency band such that the predicted resultant levels can be determined. These correction factors are laid out in **Table 4** and should be arithmetically added to the criteria for comparison with the receive room results. While figures are provided in all octave bands, only the 63 Hz and 125 Hz bands have criteria, so only those are considered moving forwards.

Table 4: Recorded noise level correction factors

Source Room	Source Room correction factors, L_{eq} (dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Cinema	-7	11	14	12	11	14	13	5
Yoga Studio	17	21	28	11	11	11	19	7
Gym	14	23	29	11	10	11	18	7

4.2.5 The adopted noise criteria for rooms adjacent to to these spaces are as shown in **Table 5**.

Table 5: "Corrected" noise limits

Adjacent Source Room	63 Hz adopted limit (dB)	125 Hz adopted limit (dB)
Cinema	40	52
Yoga Studio	64	62
Gym	61	64

4.2.6 The results of testing between these three spaces and vertically adjacent spaces are shown in **Table 6**.

Table 6: "Corrected" noise limits and recorded levels comparison

Source Room	Receive Room	63 Hz adopted upper limit (dB)	63 Hz Recorded Level (dB)	125 Hz adopted upper limit (dB)	125 Hz Recorded Level (dB)
Cinema	BC-01-02 Studio	40	37	52	43
Cinema	BC-01-03 Studio	40	35	52	42
Yoga Studio	A-01-08 Studio	64	42	62	47
Gym	A-01-09 Studio	61	42	64	46

4.2.7 As can be seen from the results in **Table 6**, the recorded levels are below the limits which have been derived by comparing the assessment noise levels and the actual noise levels. Consequently, absolute sound levels in the ground floor entertainment spaces may be up to 3 dB louder than those used in the assessment before reaching the noise limits. As this would result in exceptionally high noise levels, it is anticipated that the noise criteria will not be exceeded in "normal" use of these spaces.

4.2.8 With respect to non-structurally connected noise sensitive receptors, Lambert House (across Granby Row) is the nearest receptor. The representative background sound level at this location during the day (when noisy exercise classes may be ongoing) is 53 dB and and ambient sound level of 61 dB.

4.2.9 With standard thermal double glazing in the gym and yoga studio, and assuming the full area is used for simultaneous exercise classes with music (defined in **Table 2**), the predicted level of broadband noise at Lambert House is 38 dB. The octave band results are presented and compared with criteria in **Table 7**.

Table 7: Entertainment noise emissions assessment

Type	63	125	250	500	1k	2k	4k	8k	dB(A)
L90	59	55	53	53	50	43	32	21	54
Criteria (L90 – 5)	54	50	48	48	45	38	27	16	49
Predicted	30	29	29	40	30	24	17	16	38

4.2.10 As can be seen from the results presented in **Table 7**, despite the 8 kHz octave band level approaching the limit of measurement, the predicted noise level due to "entertainment" noise from the gym / yoga studio. This is significantly quieter than levels that could be directly measured at the site due to the combination of construction at the site, and the general levels of ambient noise at the site.

4.2.11 We would therefore consider that, on the basis of the results provided in this section, Condition 17b can be discharged.

Condition 18

4.2.12 The internal ambient noise levels have been measured by a compliant test body (Miller Goodall Ltd) to demonstrate compliance with these criteria, as required by MCC. All windows and purge vent doors were closed at the time of testing.

4.2.13 Measurements of ambient sound levels were made in 162 separate rooms across 17 separate days at the site as part of sound insulation testing. Details of recorded sound levels by room are provided in **Appendix A: Recorded Internal Ambient Noise Levels**. The highest recorded ambient sound level in any room was 34 dB, which, as testing was undertaken during the daytime period, is compliant with the 35 dB L_{Aeq} criteria for habitable spaces. Entertainment noise has been discussed and considered discharged in the previous section under Condition 17. Condition 18b can therefore also be discharged.

5 Conclusions

5.1 Measurement and assessment works have been undertaken with respect to discharging two planning conditions associated with the development at Echo Street, Manchester. This report has provided details of the testing undertaken, along with the results and assessment of them against criteria laid out in the relevant Planning Conditions.

5.2 The report concludes that both Condition 17b and 18b may now be discharged.

APPENDICES

Appendix A: Recorded Internal Ambient Noise Levels

Room	IANL (dB)
C-02-03 Studio	23
C-01-02 Studio	23
C-01-02 Studio	23
C-02-08-D Bedroom	23
C-02-08-D Bedroom	23
C-03-07 Kitchen	24
C-02-08 Kitchen	29
C-02-08 Kitchen	29
C-06-07 Kitchen	27
C-06-03 Studio	23
C-06-03 Studio	23
B-04-03 Studio	23
B-04-03 Studio	23
AB-05-07 Studio	24
B-04-07 Studio	22
B-04-07 Studio	22
BC-05-01 Studio	23
C-03-06 Studio	21
C-03-06 Studio	21
C-04-07-E Bedroom	25
B-03-01 Kitchen	22
B-03-01 Kitchen	22
B-04-02 Kitchen	26
B-03-01-A Bedroom	23
B-03-01-A Bedroom	23
B-03-05 Studio	21
B-03-05 Studio	21
B-04-05 Studio	19
AB-03-08 Studio	19
AB-03-08 Studio	19
B-02-04 Studio	25

Room	IANL (dB)
B-02-04 Studio	25
B-03-05 Studio	21
C-26-08 Kitchen	25
C-25-07-E Bedroom	25
C-25-07-E Bedroom	25
C-25-07 Kitchen	26
C-25-07 Kitchen	26
AB-02-06 Studio	23
AB-03-08 Studio	25
A-02-05 Studio	18
A-03-04 Studio	25
B-01-02-E Bedroom	21
AB-01-04 Studio	23
A-01-08 Studio	21
A-02-09 Studio	21
A-02-04 Studio	23
A-01-03 Studio	21
C-26-04 Studio	23
C-27-03 Studio	24
C-26-08-E Bedroom	21
C-26-08 Kitchen	23
C-27-07 Kitchen	28
AB-02-06 Studio	23
A-02-05 Studio	18
B-01-02-E Bedroom	21
AB-01-08 Studio	23
A-01-08 Studio	21
A-01-03 Studio	21
C-26-04 Studio	23
C-26-08-E Bedroom	21
C-26-08 Kitchen	23
C-22-05 Studio	25
C-22-02 Studio	21

Room	IANL (dB)
C-21-05 Studio	25
C-21-02 Studio	24
C-19-03 Studio	21
C-16-03 Studio	23
C-22-05 Studio	25
C-23 -07-E Bedroom	21
C-22-02 Studio	21
C-23-01 Studio	23
C-21-05 Studio	25
C-22-07-E Bedroom	21
C-21-02 Studio	24
C-22-03 Studio	28
A-11-09 Studio	20
A-11-11 Studio	19
A-10-11 Studio	21
BC-11-08 Studio	18
BC-10-06 Studio	19
A-09-11 Studio	22
A-08-09 Studio	23
A-08-09 Studio	23
BC-10-06 Studio	19
A-09-11 Studio	22
A-10-11 Studio	21
AB-10-01 Studio	18
A-10-03 Studio	19
A-09-04 Studio	20
A-09-10 Studio	18
B-08-06 Studio	24
B-07-05 Studio	18
A-07-08 Studio	20
A-08-09 Studio	26
A-08-09 Studio	26
A-07-10 Studio	19

Room	IANL (dB)
B-07-05 Studio	18
A-07-08 Studio	20
A-07-10 Studio	19
A-13-07 Studio	25
A-13-07 Studio	25
A-14-06 Studio	22
A-12-08 Studio	22
A-12-08 Studio	22
A-13-09 Studio	26
A-12-01 Kitchen	27
A-12-01 Kitchen	27
A-13-02 Studio	26
A-12-01-E Bedroom	26
A-12-01-E Bedroom	26
A-11-07 Studio	22
A-11-07 Studio	22
A-12-06 Studio	22
A-11-06 Studio	22
A-11-06 Studio	22
A-12-05 Studio	26
B-20-05 Studio	21
A-03-04 Studio	20
C-19-03 Studio	21
C-20-02 Studio	21
C-17-02 Studio	18
C-16-03 Studio	23
A-01-08 Studio	21
A-01-09 Studio	20
A-01-07 Studio	24
A-01-02 Studio	19
A-01-01-E Bedroom	25
B-00-01-D Bedroom	21
B-00 Staff Welfare	23

Room	IANL (dB)
B-01-01 Kitchen	29
C-00-08-D Bedroom	26
C-00-08-D Bedroom	26
C-00-08 Kitchen	24
C-00-08 Kitchen	24
C-01-07 Kitchen	20
AB-09-08 Studio	26
B-09-02-F Bedroom	19
B-08-02-F Bedroom	18
B-08 Student Hub	30
A-01-03 Studio	20
A-01-02 Studio	20
A-00 Group Focus	21
BC-01-02 Studio	17
BC-01-03 Studio	27
C-08-02 Studio	34
C-08-02 Studio	34
C-09-01 Studio	25
C-09-03 Studio	25
C-08-06 Bedroom E	24
C-08-06 Bedroom E	24
C-08-06 Kitchen	26
C-08-06 Kitchen	26
C-09-07 Kitchen	24
C-10-7 Kitchen	29
C-10-7 Kitchen	30
C-16-05 Studio	24
C-16-05 Studio	22
C-16-07 Studio	24
C-16-07 Kitchen	26
C-12-07-D Bedroom	22
C-12-07-D Bedroom	22

Glossary of Terms

Decibel (dB) The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 μPa, the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is usually only perceptible under controlled conditions.

dB L_A Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB L_A broadly agree with an individual's assessment of loudness. A change of 3 dB L_A is the minimum perceptible under normal conditions, and a change of 10 dB L_A corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB L_A; normal conversation about 60 dB L_A at 1 meter; heavy road traffic about 80 dB L_A at 10 meters; the level near a pneumatic drill about 100 dB L_A.

$L_{A90,T}$ The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142:2014+A1:2019 it is used to define background noise level.

$L_{Aeq,T}$ The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

L_{Amax} The highest A weighted noise level recorded during the time period. It is usually used to describe the highest noise level that occurred during the event.

R_w Single number rating used to describe the sound insulation of building elements and is defined in BS EN ISO 10140-2:2010 (formerly BS EN ISO 140-3:1995). It is derived by measurement under laboratory conditions and does not take into account the effects of flanking transmissions.

$D_{nT,w}$ The weighted standardized level difference is a single figure rating used to describe the sound insulation of a construction separating two rooms, for example a wall or floor, and is defined in BS EN ISO 16283-1:2014 (formerly BS EN ISO 140-4:1998). It is derived by

measurement of an in-situ construction and therefore takes into account the effects of flanking transmissions, workmanship etc.

C_{tr} A single-number spectrum adaptation term used to characterise the sound insulation rating with respect to urban traffic. It is defined in ISO 717-1:2013.

NR curves Noise Rating – or NR - curves were developed by the International Organization for Standardization (ISO) to determine the acceptable indoor acoustic environment for hearing preservation, speech communication and annoyance. They are most often used to quantify noise within a building from mechanical and electrical (M&E) systems.


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