

DDN-AC-025

TO	CRUK, MCC	FROM	R Marriner – WSP Acoustics
DATE	10 November 2022	CONFIDENTIALITY	Public
SUBJECT	Meadowside –Noise Assessment for Commercial Units in Response to MCC Comments		

Introduction

Manchester City Council's Planning team has requested (email 5 October 2022) that "*commercial noise transfer/breakout to be assessed under Condition 3.*"

Based on previous correspondence, we understand that this comment from MCC should refer to condition 31, which relates to management of patrons and external areas, but does not mention 'noise' or 'sound' within it. The specific details requested are '*dispersal policy*' and '*mechanism for ensuring windows and doors remain closed after 9pm*'. It is not possible to comment on either of these aspects from an acoustic perspective, as they are related to the management of the commercial units.

In order to assist in this matter, sound insulation tests have been carried out in both plots, and the results have been used to set appropriate noise limits to be achieved in the commercial units. The suitability of these limits, and any implications to the types of businesses in these units are appraised.

It is noted that the building has a concierge who would deal with any noise complaints in the event that they arise from residents. As such, it is unlikely that any noise complaints would need to be addressed by MCC's Environmental Health team.

Criteria

This memo is based on MCC's *Planning and Noise Technical Guidance* document dated October 2022, using the guidance in section 3.7.1.2 (Entertainment Venues) as this contains the most appropriate and detailed criteria.

This guidance states that a suitable criterion would be '*Music noise levels in the 63Hz and 125Hz octave centre frequency bands (Leq) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (Leq,5min), respectively*'.

The following criterion curve has been adopted herein, based on a combination of the above requirement (for low frequencies), and the NR15 curve (for mid and high frequencies).

Suitable noise limits have been determined below, based on this criterion and the results of sound insulation tests that have now been carried out.

Table 1: Criterion curve adopted for assessment

Sound level in octave bands, dB $L_{eq,5min}$							
63	125	250	500	1000	2000	4000	8000
47	41	26	19	15	12	9	7

Tests

The following tests have been undertaken:

- Airborne sound insulation test from the plot 2 commercial unit (B2.00.08) to an apartment directly above (B2.01.05)
- Airborne sound insulation test from the plot 3 commercial unit (B3.00.06) to an apartment directly above (B3.01.05)

Airborne sound insulation tests were carried out using BS EN ISO 140-4:1998¹ and rated in accordance with BS EN ISO 717-1:1997². Tests were carried out by Robert Marriner MIOA and Chris Clayden AMIOA of WSP. The equipment used to carry out these measurements is summarised below.

Table 2: Equipment details

Equipment Description	Manufacturer & Type No.	Serial No.	Calibration Due Date
Sound Level Meter	Brüel & Kjær Type 2250	3023998	04 February 2024
Pre-amplifier	Brüel & Kjær ZC 0032	26900	
Microphone	Brüel & Kjær 4189	3130582	
Calibrator	Brüel & Kjær 4231	2524534	03 February 2023

Sound Insulation Test Results

The results of the sound insulation tests are summarised in Table 3.

Table 3: Summary of sound insulation test results

Source room	Receive room	Test result in octave bands, dB D								
		63	125	250	500	1000	2000	4000	8000	D_w
Plot 2 commercial unit	B2.01.05	37	41	46	52	56	55	60	59	55
Plot 3 commercial unit	B3.01.05	39	41	46	62	69	72	73	74	61

¹ ISO 140-4:1998 Acoustics – Measurement of sound insulation in buildings and of building elements – Part 4: Field measurements of airborne sound insulation between rooms. International Organization for Standardization

² BS EN ISO 717-1:1997 Acoustics - ratings of sound insulation in buildings and of building elements. Airborne sound insulation. British Standards Institute.

The plot 3 test result is 6 dB higher than plot 2, and the performance difference is especially noticeable above 500 Hz. The floor constructions are of the same design, but the plot 2 test location includes a large area of shared façade, which is not present on plot 3 due to the level 1 façade being set back relative to the ground floor façade.

Limiting Noise Levels

Based on the adopted criterion curve, the following limiting noise levels have been calculated.

Table 4: Calculation of limiting sound level in gym

Calculation step	Sound level in octave bands								Broadband
	63	125	250	500	1000	2000	4000	8000	
Criterion curve	47	41	26	19	15	12	9	7	-
Plot 2 sound insulation test result, dB D	37	41	46	52	56	55	60	59	55 D _w
Limiting sound level in plot 2 commercial unit, dB L _{Aeq,5min}	84	82	72	71	71	67	69	66	77 L _{Aeq,5min} / NR 73 L _{Aeq,5min}
Plot 3 sound insulation test result, dB D	39	41	46	62	69	72	73	74	61 D _w
Limiting sound level in plot 3 commercial unit, dB L _{Aeq,5min}	86	82	72	81	84	84	82	81	90 L _{Aeq,5min} / NR 87 L _{Aeq,5min}

Discussion

The construction as built would permit sound levels of 77 dB L_{Aeq,5min} / NR 73 L_{Aeq,5min} in the plot 2 commercial unit, and 90 L_{Aeq,5min} / NR 87 L_{Aeq,5min} in the plot 3 commercial unit, whilst complying with the MCC criterion curve limit in the apartments above.

It is considered that these noise limits would permit a wide range of activities to take place, whilst meeting MCC's criteria.

Conclusion

WSP's Acoustics team has carried out sound insulation testing of the commercial units in plots 2 and 3, Meadowside. Limiting sound levels have been set for activities that may take place in the commercial units, based on Manchester City Council guidance for entertainment sound, and the sound insulation tests.

Limiting sound levels are calculated to be 77 dB L_{Aeq,5min} / NR 73 L_{Aeq,5min} in the plot 2 commercial unit, and 90 L_{Aeq,5min} / NR 87 L_{Aeq,5min} in the plot 3 commercial unit, whilst complying with the MCC criterion curve limit in the apartments above. It is considered that these noise limits would permit a wide range of activities to take place, whilst meeting MCC's recommended criteria.