

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

Memo: M003-C

Date: 19 September 2023

Project: 21036

Pages: 10

From: Tom Stephenson

Reviewer: James Atha

Burton Place, Manchester

Internal ambient noise measurement results

28 February 2023 + 5 September 2023

This document details the measurement method and results from the visit carried out by Sandy Brown on 28 February 2023 and 5 September 2023. These measurements have been carried out prior to and after the replacement facade works completion to assess the performance of the new facade.

All measurements undertaken after the completion of the facade replacement works were consistent with the Manchester City Council internal ambient noise level criterion.

Introduction

The purpose of the site visit on 28 February 2023 was to undertake internal measurements to establish the existing internal noise levels from environmental noise ingress via the existing facade elements. A visual inspection of the existing facades elements and conditions for each of the rooms proposed was also carried out.

The purpose of the site visit on 5 September 2023 was to undertake internal noise measurements to establish the internal noise levels due to environmental noise ingress via the newly replaced facade elements.

The measurement results are used to carry out a comparison of internal noise levels from environmental noise ingress once the planned facade replacement works are completed.

Test apartments

Acoustic measurements were planned for up to 12 apartments overlooking or with a line of sight to Ellesmere Street, which is the main noise source affecting Burton Place building.

Due to accessibility issues, measurements were carried out in 6 apartments on 28 February 2023 and 4 apartments on 5 September 2023.

Measurement method and room conditions

The measurement locations were recorded in each room with respect to room boundaries for future measurement repeatability once the new facades are installed.

The measurements positions have been marked at the end of the memo. In all cases:

- Measurement position 1 was carried out at approximately 1.5 m above floor level
- Measurement position 2 was carried out at approximately 1.3 m above floor level
- Measurement position 3 was carried out at approximately 1.1 m above floor level

In all cases, the measurement positions were at least 1 m from any room boundary.

The number of measurements in each room were 3 with measurement time interval of 60 seconds. The measurements were carried out in 1/3 octave bands.

All rooms were furnished.

The room conditions were suitable to undertake acoustic measurements and obtain representative environmental noise ingress.

The occupiers of the apartments were not able of switching on/off the building services, therefore measurements were carried out with building services in operation on all apartment except for apartment 206 in which the building services were not in operation during the initial measurements.

The measurements presented below were undertaken between 18:03 and 20:21 on 28 February 2023 (before the facade replacement works) and between 18:12 and 19:12 on 5 September 2023 (after facade replacement works).

Measurement results

The measured noise levels and key sources recorded during the attended measurements are summarised in Table 1.

Table 1 Noise levels and key noise sources from attended measurements

Apartment number, room type and measurement position	Before/after replacement facade works	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,60s}$	$L_{AFmax,60s}$	$L_{A90,60s}$	
104 Living room					
1	Before	36	44	32	Dominated by environmental noise ingress with some contribution from apartment building services in operation
2		38	49	32	
3		36	45	31	
1	After	31	41	29	Dominated by building services noise
2		31	41	29	
3		31	39	29	
104 Bedroom					
1	Before	35	52	31	Dominated by environmental noise ingress with some contribution from apartment building services in operation
2		31	42	29	
3		34	52	31	
1	After	28	43	26	Dominated by building services noise
2		28	39	26	
3		27	39	26	

Apartment number, room type and measurement position	Before/after replacement facade works	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,60s}$	$L_{AFmax,60s}$	$L_{A90,60s}$	
107 Living room					
1	Before	31	45	27	Dominated by environmental noise ingress with less contribution from apartment building services in operation
2		30	40	27	
3		31	44	28	
1	After	28	39	26	No dominant sources noted
2		27	42	25	
3		27	42	23	
107 Bedroom					
1	Before	29	37	27	Dominated by environmental noise ingress with less contributions from apartment building services in operation
2		28	38	25	
3		29	44	27	
1	After	25	36	24	No dominant noise sources noted
2		25	36	23	
3		26	43	24	
204 Living room					
1	Before	36	46	31	Dominated by environmental noise ingress with some contribution from apartment building services in operation
2		32	41	28	
3		38	47	31	
1	After	29	36	28	Dominated by building services noise
2		27	31	26	
3		27	42	26	

Apartment number, room type and measurement position	Before/after replacement facade works	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,60s}$	$L_{AFmax,60s}$	$L_{A90,60s}$	
204 Bedroom					
1	Before	33	48	30	Dominated by environmental noise ingress with some contribution from apartment building services in operation
2		33	41	31	
3		32	42	28	
1	After	33	36	31	Dominated by building services noise
2		33	41	31	
3		33	39	32	
206 Living room					
1	Before	31	43	27	Dominated by environmental noise ingress. No building services in operation
2		31	47	27	
3		33	45	26	
1	After	28	41	25	No dominant noise sources noted
2		30	49	24	
3		26	41	24	
206 Bedroom					
1	Before	28	43	24	Dominated by environmental noise ingress. No building services in operation
2		28	42	24	
3		28	46	23	
1	After	24	35	22	No dominant noise sources noted
2		24	42	22	
3		24	37	21	

It was not possible to test two of the apartments after the facade replacement works had been completed due to accessibility issues. The results of measurements conducted in apartments 202 and 203 on 28 February 2023, prior to facade works, are presented in Table 2 below for reference.

Table 2 Noise levels and key noise sources from attended measurements

Apartment number, room type and measurement position	Before/after replacement facade works	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,60s}$	$L_{AFmax,60s}$	$L_{A90,60s}$	
202 Living room					
1	18:47	39	42	38	Dominated by environmental noise ingress with some contribution from apartment building services in operation
2	18:49	38	46	37	
3	18:52	38	49	36	
203 Living room					
1	18:35	42	53	39	Dominated by environmental noise ingress with some contribution from apartment building services in operation. External balcony door to would not close fully leading to acoustic weakness
2	18:38	41	47	38	
3	18:40	42	49	39	

Discussion

The Manchester City Council criterion for indoor ambient noise levels in apartments is $L_{Aeq,16hr}$ 35 dB during the daytime. Prior to the facade replacement works, the following apartments failed to meet the criteria:

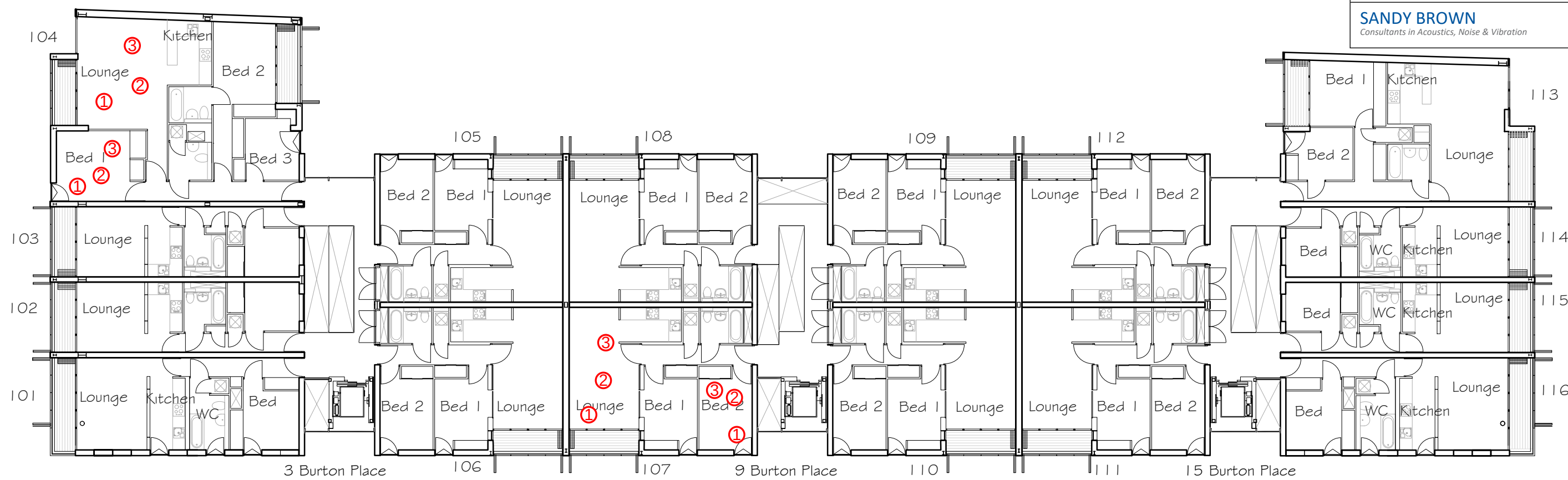
- Apartment 104 living room – up to 3 dB over for an individual measurement
- Apartment 202 living room – up to 4 dB over for an individual measurement
- Apartment 203 living room – up to 7 dB over for an individual measurement
- Apartment 204 living room – up to 3 dB over for an individual measurement.

The criterion applies as an average over a 16 hour daytime period so it is possible that in practice, with measurements over a full period, these rooms could be compliant, particularly for marginal exceedances of around 3 dB. The reason for the 7 dB exceedance in Apartment 203 Living room was due to external balcony door would not close fully leading to acoustic weakness. The door has been replaced as part of the facade works.

In conclusion, the results in Table 1 show that all measurements undertaken after the completion of the facade replacement works were consistent with the Manchester City Council criterion.

Measurement location mark-ups

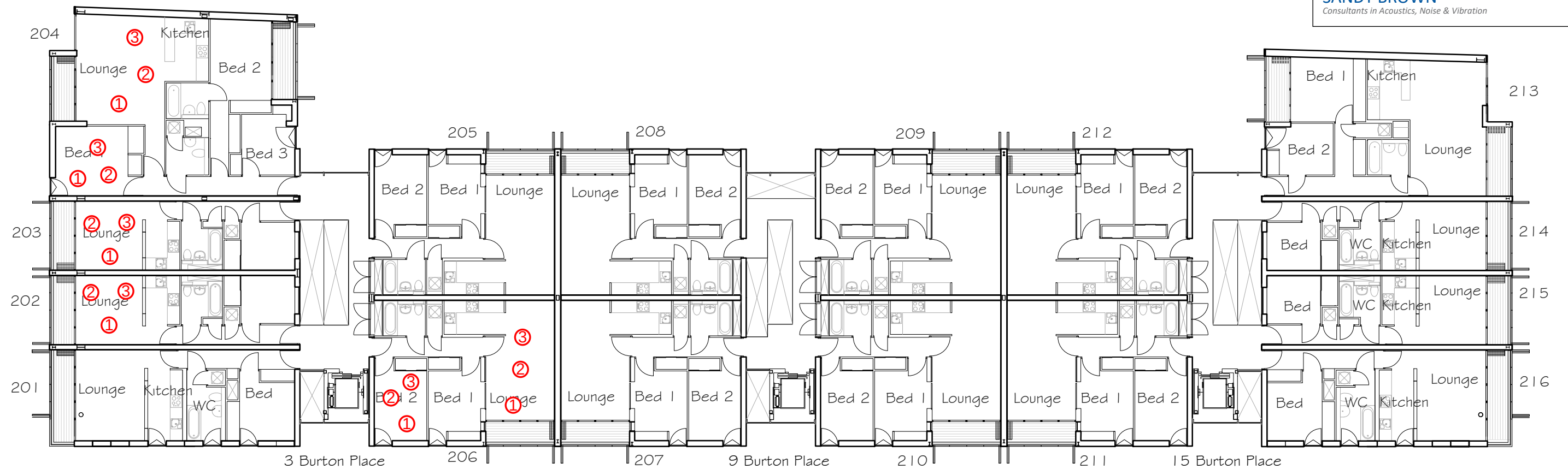
Title	Measurement positions
Project	Burton Place, Manchester
Project no.	21036
Version	A
Marked-up by	Tom Stephenson
Reviewed by	James Atha
Date	19 September 2023
Mark-up key	
①	Measurement position 1.5m above floor level
②	Measurement position 1.3m above floor level
③	Measurement position 1.1m above floor level
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First Floor Plan

Client Mainstay	Rev	Description	Date	By	Chk'd
Project Title Burton Place Manchester M15 4LR	B W P Construction & Property Consultants 6 Hewitt Street Manchester M15 4GB T 0161 236 8133 www.bwpconsultants.co.uk		Job		
Scale @ A3 1:100					
Date 20/11/2020					
By SBR					
Description First Floor Layout		Drg BP-FL-01			
DO NOT SCALE THIS DRAWING. CHECK ALL DIMENSIONS ON SITE		Rev -			

Title	Measurement positions
Project	Burton Place, Manchester
Project no.	21036
Version	A
Marked-up by	Tom Stephenson
Reviewed by	James Atha
Date	19 September 2023
Mark-up key ① Measurement position 1.5m above floor level ② Measurement position 1.3m above floor level ③ Measurement position 1.1m above floor level	
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Second Floor Plan

Client Mainstay		Rev		Description		Date	By	Chck'd
Project Title Burton Place Manchester M15 4LR				Construction & Property Consultants		G Hewitt Street Manchester M15 4GB T 0161 236 8133 www.bwpconsultants.co.uk		
Scale @ A3 1:100								
Date 20/11/2020		Description Second Floor Layout		Job		Drg BP-FL-02		Rev -
By SBR								

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