

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

20270-R05-A

25 June 2024

58-66 King Street, Manchester

Planning condition 10 discharge report

London, Manchester, Edinburgh, Birmingham, Belfast, Leeds, Bristol

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Version	Date	Comments	Author	Reviewer
A	25 Jun 24		JMG	MR

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Summary

Sandy Brown has been commissioned by Recom to provide acoustic advice in relation to the proposed development at 58-66 King Street, Manchester.

Internal noise measurements have been carried out in the bedrooms and living rooms of the following apartments:

- Apartment 1
- Apartment 14
- Apartment 22.

This report sets out relevant information to discharge Planning Condition 10 imposed by Manchester City Council as per planning references 122835 P30PA 2019 and 122836 P30PA 2019.

The internal noise criteria are met in apartments 1 and 14 during the day and at night.

The internal noise criterion are met in apartment 22 during the night, extraneous noise during the day caused the day internal noise levels to exceed the day criterion.

Based on the measurements that were not impacted by extraneous noise Planning Condition 10 can be discharged.

Appropriate operational noise limits have been set out between commercial space and apartment 3 above in line with Manchester City Council. The measured floor sound insulation performance between the commercial space at ground floor achieved the minimum sound insulation requirements. On this basis, Planning Condition 10 can be discharged.

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1 Introduction

Sandy Brown has been commissioned by Recom to provide acoustic advice in relation to the proposed development at 58-66 King Street, Manchester.

This report sets out relevant information to discharge Planning Condition 10 imposed by Manchester City Council as per planning references 122835 P30PA 2019 and 122836 P30PA 2019.

Internal noise measurements have been carried out in bedrooms and living rooms of apartments 1, 14 and 22.

The measured floor sound insulation performance between the commercial space at ground floor and apartment above achieved the minimum sound insulation requirements.

Mark-ups of the internal noise survey locations are presented in Appendix B.

2 Planning Condition 10

Planning Condition 10 states the following:

'a) The development shall be implemented in accordance with the noise levels and attenuation targets as set out in Sections 8 (Facade Sound Insulation - Noise Ingress) & 9 (Operational Noise Limits) of the Noise and Vibration Planning Report prepared by Sandy Brown Associates (Reference 20270-R02-F dated 08 October 2021). The approved noise insulation scheme/s and vibration and reradiated noise mitigation measures as required shall be completed prior to any of the dwelling units hereby approved are occupied. The following noise criterion will be required to be achieved:

Bedrooms (night time - 2300-0700) 30 dB LAeq (individual noise events shall not exceed 45dB LAmax, F by more than 15 times)

Living Rooms (daytime 0700-2300) 35dB LAeq

Where entertainment noise is a factor in the noise climate the sound insulation scheme/s 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, respectively.

b) Prior to occupation of the development a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that acceptable criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.'

3 Basis of the review

The review has been based on the following documents.

- 20270-R02-F *Noise and vibration planning report*, dated 8 October 2021
- 20270-R03-A *Stage 4 acoustic design report*, dated 8 August 2021
- 20270-M012-A *Review of roof constructions*, dated 18 April 2023
- 129850_FO_2021-DECISION_NOTICE-1856613
- Stage 4 architectural drawing package.

4 Acoustic design requirements – Part (a)

Planning condition 10 part (a) is in relation to the residential section of the scheme. The acoustic design requirements of this element are defined by Manchester City Council (MCC) internal noise criteria set out in the Planning and noise Technical Guidance document (2015) and the external noise level predicted at each facade.

4.1 External noise

The external noise levels predicted at the facade of the development are set out in Sandy Brown 20270-R02-F Noise and vibration planning report.

The external noise levels were based on measured noise survey data. From this the facade sound insulation requirements were assessed to meet the MCC internal noise criteria.

4.2 Local authority criteria

4.2.1 Environmental noise ingress

The internal noise criteria for the development has been set in line with MCC guidance for internal noise. This is presented in Sandy Brown 20270-R02-F Noise and vibration planning report and is reproduced in Table 1.

Table 1 Manchester City Council internal noise criteria for residential developments

Internal space	Internal noise limit, L_{Aeq} (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Living rooms	35	35
Bedrooms	35	30

It is also stipulated that individual noise events in bedrooms should not exceed L_{AFmax} 45 dB by more than 15 times.

It is understood from discussion with Manchester City Council that the above noise criteria do not apply during purge ventilation (ie, when windows are open to get rid of cooking /paint smells, etc) and that during rapid ventilation.

4.2.2 Apartment internal noise criteria from

Where entertainment noise is a factor in the noise climate operational noise transfer level should be controlled to meet the following criteria set out in Sandy Brown 20270-R02-F Noise and vibration planning report dated 8 October 2021 which are reproduced below:

‘Music noise levels in the 63 Hz and 125 Hz octave centre frequency bands (L_{eq}) 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).

4.3 Operational noise limits in commercial units

The maximum operational noise levels (L_{eq}) from amplified sound within the proposed commercial unit at ground level are set out in Sandy Brown 20270-R02-F Noise and vibration planning report. Limits were set out to control both operational noise transfer within the building as well as noise breakout from the commercial unit.

A sound insulation performance of $D_{nT,w}+C_{tr}$ 50 dB is required to control noise vertical transfer to residential apartment above.

Based on the above maximum operational limits are reproduced in Table 2.

Table 2 Maximum operational noise limits in commercial units

	Octave-band centre frequency (Hz)							L_{Aeq} (dB)
	63	125	250	500	1000	2000	4000	
Guideline maximum operational noise limits in one of the ground floor commercial units, L_{eq} (dB)	76	74	68	68	68	64	62	72

The above limits would be suitable for low level amplified background music.

4.4 Assessment

4.4.1 Facade sound insulation performance

The overall facade sound insulation performance requirements are set out in Sandy Brown 20270-R03-A *Stage 4 acoustic design report*.

The most onerous facade sound insulation performance requirement is $R_w + C_{tr}$ 35 dB.

Based on the external wall information, glazing information and ventilation strategy as set out in the following Section, the most onerous facade sound insulation performance requirements can be achieved.

4.4.2 External wall constructions

The external walls comprise a minimum of 100 mm thick solid masonry with a minimum density of 1600 kg/m³, it is expected that external walls will provide a minimum sound insulation performance $R'_w + C_{tr}$ 42 dB.

4.4.3 External glazing configuration

The existing windows have been made good and secondary glazing provided. The overall construction is comprised of existing 6 mm glass/80 mm cavity/6.8 mm laminate secondary glass. This is expected to achieve the relevant sound insulation performance requirements.

4.4.4 Roof

The roof sound insulation performance shall provide a minimum sound insulation performance at least 5 dB greater than the minimum overall facade sound insulation performance, these have been simplified to be:

- Living rooms: $R'_w + C_{tr}$ 38 dB
- Bedrooms: $R'_w + C_{tr}$ 40 dB.

The proposed roof construction are summarised in Table 3.

Table 3 Roof constructions

Roof type	Construction
New flat roof	140 mm flatboard insulation with suspended ceiling below comprising 1 x 12.5 mm plasterboard be provided beneath the flat roof construction. A resiliently suspended sound insulating ceiling should then be provided beneath this comprising of 2 x 12.5 mm standard plasterboard supported on an MF grid suspended on discrete resilient isolation hangers, a minimum ceiling cavity of 100 mm with 50 mm mineral fibre insulation provided within the cavity.
Existing/ refurbishes pitched roof	Slate pitched roof on timber battens with suspended ceiling below comprising 2 x 12.5 mm standard plasterboard suspended on discrete resilient isolation hangers. Minimum ceiling cavity of 100 mm, with 50 mm mineral fibre insulation provided within it as a minimum.

The above are capable of providing the required roof sound insulation performance for living rooms and bedrooms.

4.4.5 Ventilation strategy

Natural ventilation is not relied upon to provide background ventilation. The minimum overall sound insulation requirements should be able to be achieved with the windows closed.

5 Internal noise measurements – Part (b)

Internal noise measurements have been carried out in bedrooms between 20 June 2024 and 21 June 2024.

For living rooms, internal noise measurements have been carried out between 21 June 2024 and 24 June 2024.

Mark-ups of the measurement locations are set out in appendix C. In all cases, the building services were understood to be in operation and running at design duty.

5.1 Methodology

5.1.1 *Unattended noise monitoring*

Unattended noise monitoring was carried out in the bedroom and living room in three apartments.

The measurements in bedrooms were carried out during the night (23:00- 07:00) during a period of 8 hours. The measurements in living room were carried out during the day (07:00 – 23:00) during a period of 16 hours.

Measurements were obtained at least 1.2 m above each apartment floor level and at least 1 m from the nearest wall in bedrooms, and at least 1.5 m from the nearest wall in living rooms.

In all cases, building services were understood to be operating at design duty during the measurements.

5.1.2 *Equipment*

Rion NL-52 sound level meters were used to carry out internal ambient noise level measurements. Details of these are provided in Appendix A.

5.1.3 *Locations*

Testing locations have been chosen to be representative of the variety of locations within the development. The apartment numbers are given below. For each apartment, measurements are carried out in both living rooms and bedrooms. Mark-ups of the testing locations are presented in Appendix B.

- Apartment 1
- Apartment 14
- Apartment 22.

5.1.4 *Reverberation time correction*

All measurements have been corrected for the measured reverberation time to 0.5 s to account for furnishings as will be in practice.

5.2 Measurement results

The results of the unattended noise monitoring measurements are summarised in Table 4

Based on observations made on site and analysis of the measurement data, unattended noise measurements were not affected by extraneous noise. The dominant noise source noted when on site were a combination of building services and environmental noise ingress.

The presented measurement results have been corrected for the measured reverberation time in each living room and bedroom.

Table 4 Unattended noise monitoring results

Location	Date	Measured internal noise level, L_{Aeq} (dB) ^[1]		Number of night time L_{AFmax} events over 45 dB
		Day (07:00-23:00)	Night (23:00-07:00)	
Apartment 1				
Bedroom	20 June 24	-	27	0
Living room	23 June 24	31	-	-
Apartment 14				
Bedroom	20 June 24	-	24	0
Living room	23 June 24	29	-	-
Apartment 22				
Bedroom	20 June 24	-	24	0
Living room	23 June 24	50	-	-

^[1] Measurement results for the measured reverberation time to 0.5 s to account for furnishings rooms as will be in practice.

5.3 Discussion of results

Based on the results presented above, the night internal noise criterion are met in all instances.

In all bedrooms, there were no events that caused the internal maximum ambient noise levels being exceeded. As such this is considered in line with the requirements of Planning Condition 10.

The internal noise criteria are met in apartment 1 and 14 during the day, however extraneous noise from works being carried out on site caused the daytime internal noise levels to exceed the day criterion in apartment 22.

Based on the measurement that were not impacted by extraneous noise Planning Condition 10 can be discharged.

6 Noise transfer

The operational noise limits and minimum sound insulation performance requirements between commercial space and apartment above ($D_{nT,w}+C_{tr}$ 50 dB) are set out in Section 3.3.

Floor sound insulation acoustic testing was carried out between the commercial space at ground level and apartment 3 bedroom and living room. In both cases the measured airborne sound insulation performance was $D_{nT,w}+C_{tr}$ 56 dB.

Based on the above, and on the basis that maximum operational limits reproduced in Table 2 are met, this is in line with Planning Condition 10, and can be discharged.

Appendix A

Survey details

Equipment

The unattended noise measurements were taken using three Rion NL-52 sound level meters.

Calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	NL-52/00932326	Rion	24 Apr 26	TCRT23/1806
Microphone	UC-59/09251	Rion	24 Apr 26	TCRT23/1806
Pre-amp	NH-25/32354	Rion	24 Apr 26	TCRT23/1806
Calibrator	NC-74/34536129	Rion	24 Apr 26	TCRT23/1576
Sound level meter	NL-52/01143564	Rion	15 Dec 24	TCRT22/1766
Microphone	UC-59/10153	Rion	15 Dec 24	TCRT22/1766
Pre-amp	NH-25/43581	Rion	15 Dec 24	TCRT22/1766
Calibrator	NC-74/34257023	Rion	15 Dec 24	TCRT22/1765
Sound level meter	NL-52/01010788	Rion	20 Sep 25	TCRT23/1666
Microphone	UC-59/20416	Rion	20 Sep 25	TCRT23/1666
Pre-amp	NH-25/11436	Rion	20 Sep 25	TCRT23/1666
Calibrator	SV30A/10559	Svantek	20 Sep 25	TCRT23/1665

Calibration of the meters used for the measurements is traceable to national standards. Calibration certificates for the sound level meters used in this survey are available upon request.

Calibration checks were carried out on the meters and their measurement chains at the beginning and end of the survey. No significant calibration deviation occurred.

Noise indices

Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a fast time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg, L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS 7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures*.

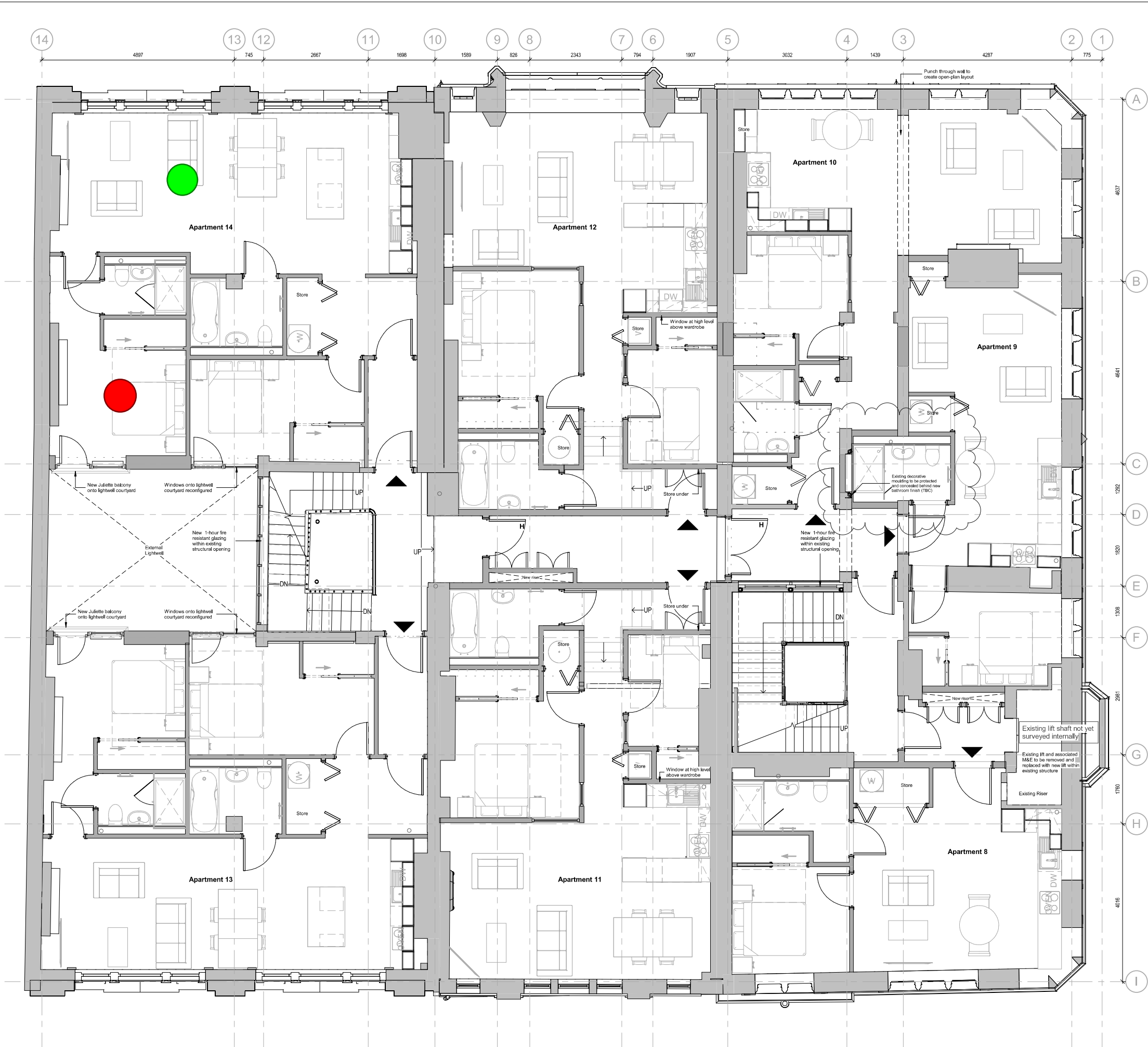
Appendix B

Measurement locations



Scale @ 1 : 50

date 23/04/2021 drawn MH
scale @ A1 1 : 50 checked BL



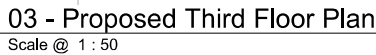
Title	Internal noise measurement locations
Project	58-66 King Street, Manchester
Project no.	20270
Version	A
Marked-up by	Jose M. Goznalez
Reviewed by	Matthew Robinson
Date	25 June 2024
Key	Internal noise measurement night time (23:00 - 07:00) Internal noise measurement day time (07:00 - 23:00) Internal noise measurements were not carried out on Level 3
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Key	
H	New door with electronic hold-open device linked to fire alarm system
W	Washing machine
•	Hot water cylinder
○	SVP locations - refer to drainage layouts (subject to review)

P04	13/09/21	Kitchen layouts revised, proposed SVP locations (from drainage layout) indicated, apartment 10 shower room layout revised. Minor amendments to furniture layout.	OSI	BL
P03	21/07/21	Apartment kitchen layouts and store arrangements amended, bathroom door positions to apartments 11 & 12 amended, Juliette balcony door to apartment 13 amended, apartment 10 kitchen store omitted, small store added.	MH	BL
P02	21/05/21	GA Layouts updated	MH	BL
P01	23/04/21	Initial Issue	MH	BL
Rev	Date	Description	Drawn by	Checked By
S2		For Information		
drawing stage Stage 4				
client				
Glasgow City Council as Trustees of Strathclyde Pension Fund				
project				
Manchester, King Street				
drawing title				
Proposed GA Second Floor Plan				
date 23/04/2021 drawn MH				
scale @ A1 1: 50 checked BL				

02 - Proposed Second Floor Plan
Scale @ 1 : 50



date 23/04/2021 drawn MH
scale @ A1 1 : 50 checked BL



date	23/04/2021	drawn	MH
scale @ A1	1 : 50	checked	BL