

Waterhouse Gardens, Manchester (Block C & D)

Acoustic Assessment Report -
Planning Condition 18 (Commercial/Amenity Noise)
Planning Condition 19 (Residential Noise Insulation)

Client:

Domis Construction Limited
Douglas House, Green St
Wigan, WN3 4DQ

Date:

17 March 2025

Our Ref:

22015-RP-2-R0



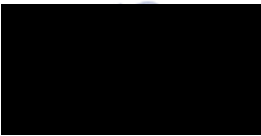
**JAMESON
ACOUSTICS**

Consultants in acoustics,
noise and vibration

Document Control

Revision	Date	Author	Description
0	17-03-2025	AJ	-

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Signature	
Date	17-03-2025

1.0 Introduction

Jameson Acoustics Limited has been commissioned by Domis Construction Limited to provide acoustic design and testing services to assist in the discharge of two planning conditions associated with the Waterhouse Gardens development (Block C & D) in Manchester. The conditions are as follows.

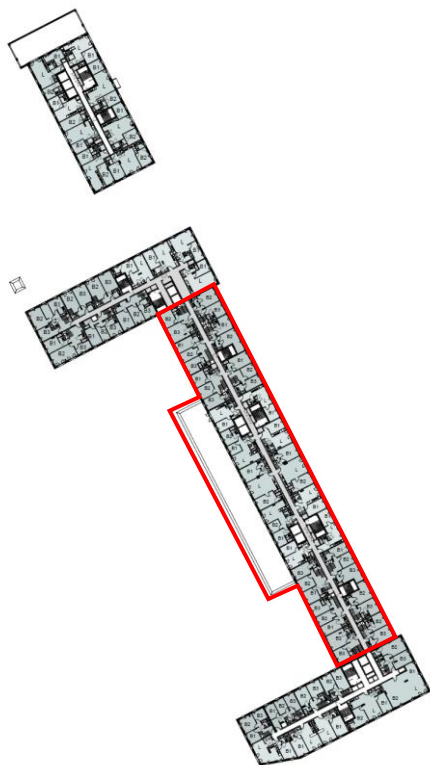
No	Wording
18	Notwithstanding the noise and vibration section of the ES stamped as received by the City Council, as Local Planning Authority, on the 19 January 2018, (a) prior to the first use of each commercial unit and gym area within each phase as indicated on drawings A2942 198 R16, A2943 199 R16 and A2943 200 R16 stamped as received by the City Council, as Local Planning Authority, on the 19 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 within each phase. The measures implemented shall be retained and maintained for as long as the development remains in use. <i>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).</i>
19	Notwithstanding the noise and vibration section of the ES stamped as received by the City Council, as Local Planning Authority, on the 19 January 2018, (a) prior to the first occupation of the residential accommodation within each phase hereby approved, the accommodation shall be insulated in accordance with a scheme 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 occupation of the residential accommodation within each phase. The measures implemented shall be retained and maintained for as long as the development remains in use. <i>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).</i>

2.0 Project & Assessment Overview

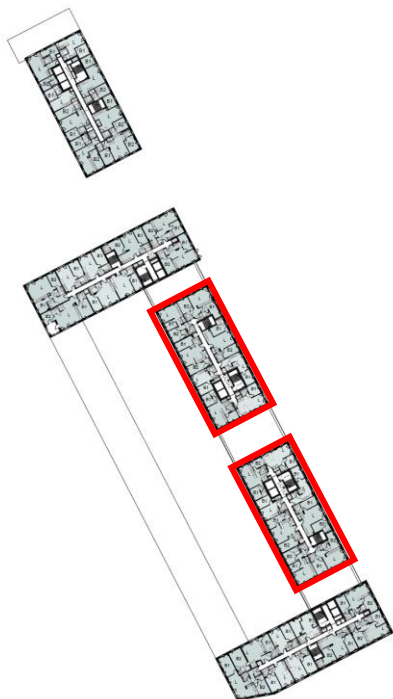
Blocks C & D comprise two residential blocks linked by a common podium containing residential amenity spaces, including a gym, games rooms, private cinema and lounges (all at ground floor). There are no commercial (retail) units in this sector of the project. See below the site wide ground, first and typical upper-level floor plans indicating the locations of Blocks C & D.



Ground floor plan

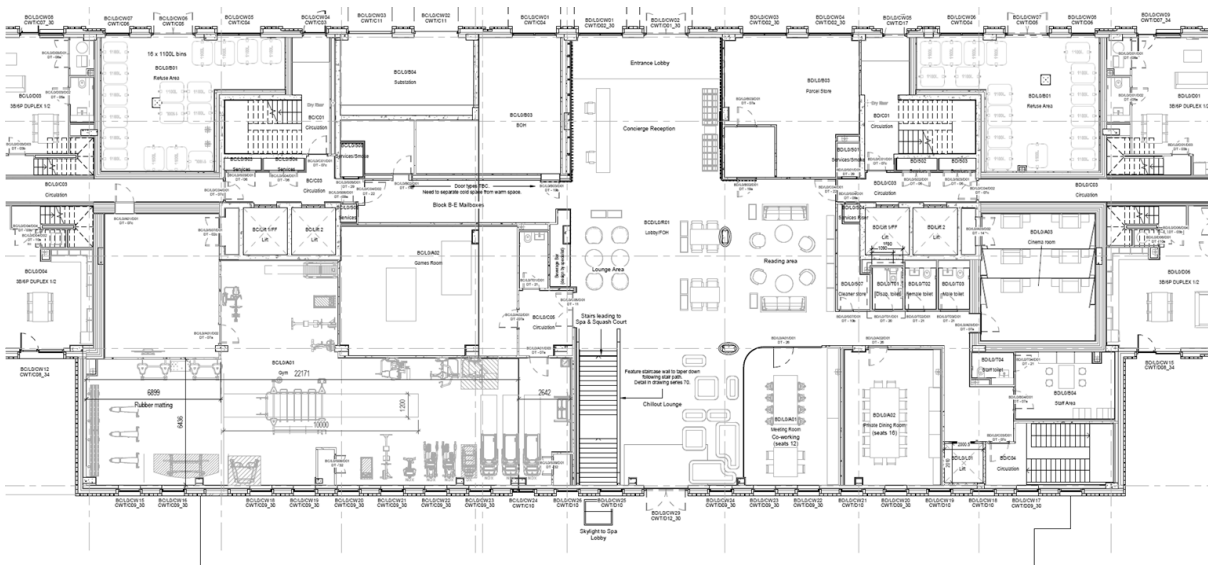


First floor plan



Typical upper floor plan

A more detailed plan of the ground floor amenity floor layout is shown below.



Ground floor amenity plan (Blocks C & D)

The amenity spaces continue into the lower ground floor space of Block F to the side of Blocks C & D. The amenities in Block F will be covered under a separate Report once Block F is completed and ready for testing.

This report shall cover the following in relation to Blocks C & D:

Condition 18: Commercial/Amenity Noise Transfer

Commercial/Amenity Space	Operational noise breakout to externals	Operational noise transfer (horizontal – party wall)	Operational noise transfer (vertical – party floor)
Gym	✓	✓	✓
Games Room	N/A	✓	✓
Private Dining Room	✓	N/A	✓
Cinema Room	N/A	✓	✓

* assessment of noise breakout to externals and party floor noise transfer will be covered under separate Block B Report.

In addition to the above, a structure-borne (impact) noise assessment relating to the gym floor is provided.

Condition 19: Residential Sound Insulation Scheme

- Confirmation of design specifications for façade elements to achieve acceptable internal noise levels within dwellings, along with confirmation of ventilation provisions.
- Pre-completion noise level measurement results in selected apartments confirming acceptable internal noise levels from external traffic noise intrusion have been achieved.
- Pre-completion noise level measurement results in selected apartments confirming acceptable mechanical ventilation noise levels have been achieved.

4.0 PC 19 – Residential Noise Insulation Scheme

4.1 Acoustic Criteria

Facades to the residential accommodation in Block C & D have been designed to achieve the following internal noise levels:

Area	Location	Daytime (07:00-23:00)	Night time (23:00-07:00)
Apartment/Townhouse	Living Room	35 dB $L_{Aeq,16hr}$	-
	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$ 45 dB* $L_{A_{fmax}}$

* Not to be regularly exceeded by scheduled noise events (e.g. trains, buses, etc.).

In addition, the following low frequency noise limits shall be achieved during music events at the Arena.

Area	Location	Desirable Internal Noise Level from Arena Events, $L_{eq,5min}$ at Octave Band Centre Frequency	
		63 Hz	63 Hz
Apartment/Townhouse	Living Room / Bedroom	47 dB	41 dB

All apartments are ventilated with whole-house mechanical ventilation systems (MVHR) which have been designed to maintain the 35 dB L_{Aeq} (daytime bed/liv) and 30 dB L_{Aeq} (night-time bed) noise levels during normal operation. Two boost modes exist, for which relaxations are permitted under the IOA/ANC Guide *Acoustics, Ventilation & Overheating* (AVO), as follows:

- Extract boost – extract rates are increased to remove humid air in bathrooms: noise levels in bedrooms would be unchanged (extract ducts do not serve bedrooms) and noise levels in living rooms should not exceed 35 dB L_{Aeq} .
- Summer boost – manual switch to boost supply/extract air for summer cooling: this condition effectively helps to reduce the reliance on openable windows in the summer. As such, the AVO permits a relaxation of up to +5 dB on the above L_{Aeq} limits in bedrooms and living rooms. NB: As an alternative to having the window open, the +5 dB provides far better acoustic conditions in the apartments than opening the windows.

4.2 Design Specifications

4.2.1 Facades

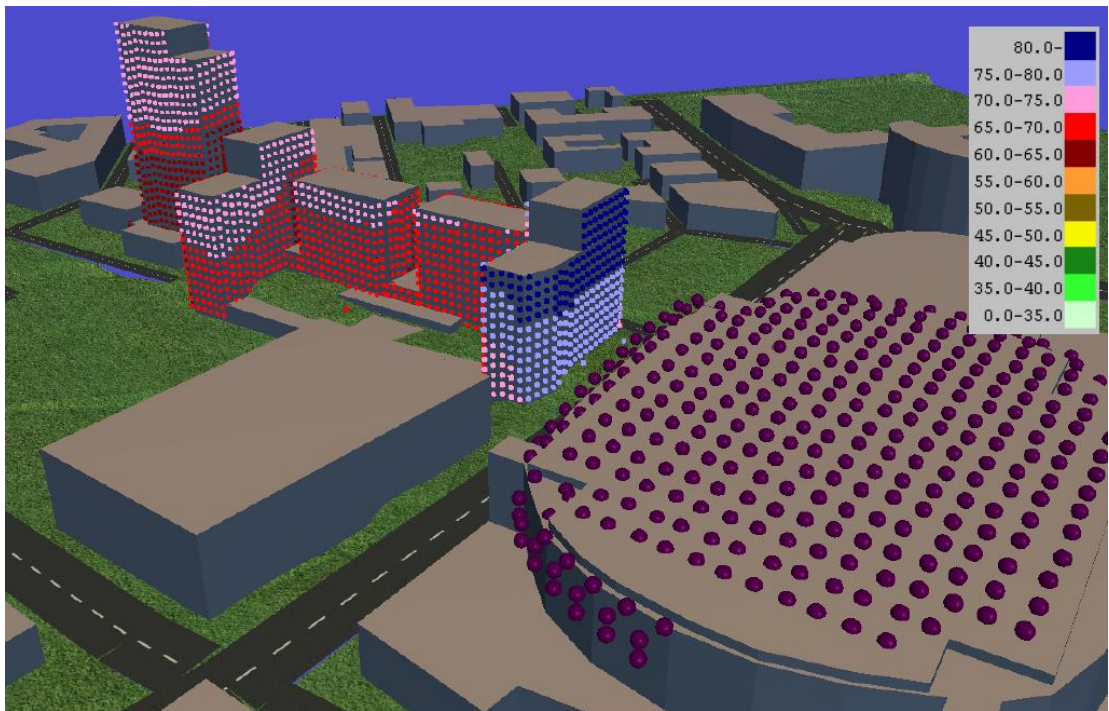
In Blocks C & D, all apartments will have facades formed from brick/SFS external walls with punched in double glazed windows.

For the window systems, the following acoustic specification informed the specification to satisfy the above noise requirements.



Façade Zone (ref. Figure above)	Minimum Sound Reduction, R (dB) at OBCF		Min. Overall $R_w + C_{tr}$ (dB)	Example Glass Configuration (Guidance Only)
	63 Hz	125 Hz		
GOLD	25	16	34	13.5 (lam) / 16 arg / 10 (tough) mm
BLUE	-	-	30	10 / 16 arg / 6 mm

Event (music) noise levels from the Arena were surveyed and reviewed by means of noise modelling to set the above specification, as shown below.

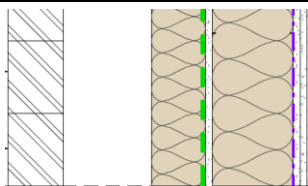


The window systems were supplied by Lancashire Double Glazing, who confirm the specification of the window systems as follows:

Gold: Aluminium frame, 8.8 [acoustic lam.] / 16 / 10 mm configuration, with a certified performance of 37 dB $R_w + C_{tr}$ and low frequency performances achieving/exceeding the low frequency figures.

Blue: Aluminium frame, 6.8 [lam.] / 14 / 8 mm [toughened] configuration, with a certified performance 33 dB $R_w + C_{tr}$.

The specification of the external walls to Block C & D is as follows.

Type	Sketch	Build-Up
Standard Brick/SFS to Residential Areas		• 102.5mm traditional brick. • External cavity (with mineral wool slab). • Weatherboarding. • 100-150mm SFS (full filled with mineral wool). • 2 x 15mm plasterboard.

The sound reduction performance of this construction was estimated to provide a sound reduction performance of 53 dB $R_w + C_{tr}$ with low frequency performance of 40 dB R at 63 Hz and 43 dB R at 125 Hz, which far exceeds the requirements to satisfy the noise limits presented in Section 4.1.

4.2.2 Ventilation Systems

The MVHR units providing ventilation to apartments are by Nuaire (model MRXBOXAB-ECO). Associated noise levels for units to 1-bed, 2-bed and 3-bed dwellings were reviewed at design stage and found to satisfy the noise limits in Section 4.1 under normal and boost conditions.

4.3 Pre-completion Testing

4.3.1 External Noise Intrusion

Automated noise level measurements were taken from 12:00 hours on Wednesday 5 March 2025 to 16:00 hours on Tuesday 11 March 2025 at 4nr positions (habitable rooms) as described below.

The positions were selected to establish the typical prevailing daytime and night-time internal noise levels within living rooms and bedrooms of a range of apartments across the site. The survey also captured Arena event noise levels in apartments during an event on Friday 7 March 2025 (Five, live boy band) to verify low frequency noise levels at 63 Hz and 125 Hz.

Position	Description (<i>Window Spec Zone</i>)
1	Block D – Level 02 – D206 Bedroom (<i>Gold Zone</i>)
2	Block D – Level 02 – D204 Living Room (<i>Gold Zone</i>)
3	Block C – Level 06 – C607 Living Room (<i>Gold Zone</i>)
4	Block C – Level 04 – C402 Bedroom (<i>Blue Zone</i>)

Windows were closed and MVHR units were switched off (to solely measure external noise intrusion).



The microphones were fitted with windshields and mounted in the centre of the rooms, at least 1.4 metres from walls at a height of 1.6-1.7 metres.

The equipment was programme to continuously log all relevant A-weighted broadband (dBA) and linear spectral noise level indices, including L_{eq} , L_{90} , L_{10} and L_{max} , over 5-minute, 15-minute and 1-hour intervals.

The instrumentation used for the survey is summarised below. The sound level meters were hand-calibrated at the beginning and end of the survey periods. No significant deviations in calibration level were noted.

Description	Equipment	Serial Nr	Lab Calibration Expiry	Lab Calibration Certificate Nr
Class 1 sound level meter	Svantek 971A (with Type 7152 microphone)	124663 (82835)	26 Aug 2026	1509611-1
Class 1 sound level meter	Svantek 971A (with Type 7152 microphone)	131635 (85533)	4 Nov 2026	1510429-1

Description	Equipment	Serial Nr	Lab Calibration Expiry	Lab Calibration Certificate Nr
Class 1 sound level meter	Svantek 971A (with Type 7152 microphone)	127647 (84398)	12 Apr 2025	13 Apr 2023
Class 1 sound level meter	Svantek 971A (with Type 7152 microphone)	131642 (85571)	26 July 2025	26 July 2023
Class 1 sound calibrator	Cirrus CR:515	57570	12 Nov 2025	1171319

Due to the nature of the survey, i.e. unmanned, it is not possible to describe the noise climate throughout the duration of the survey period. However, on install and collection, weather conditions were considered suitable for obtaining representative internal readings. Based on internet weather reports for the full duration of the survey, conditions generally remain suitable for representative readings, with mostly clear skies, and no periods of rainfall or unduly adverse weather.

The results of the surveys have been plotted on Time History Graphs 22015-G1 to G4 enclosed in Appendix B. The graphs present the uncorrected 15-minute A-weighted (dBA) L_{eq} and L_{max} levels at each position throughout the duration of the survey. NB: Daytime results during site working hours were unduly affected by construction activity noise. These periods shall be discounted from the assessment.

The L_{Aeq} results are summarised below and compared against the internal noise requirements.

Position 1 – D206 Bedroom

Period Commencement (Day/Night of...) 2025	Ambient Noise Level (dB)	
	Daytime $L_{Aeq,16hr}$ (07:00-23:00)	Night-time $L_{Aeq,8hr}$ (23:00-07:00)
Wed 5 March	22*	21
Thu 6 March	–*	–*
Fri 7 March	22*	20
Sat 8 March	21*	20
Sun 9 March	22	20
Mon 10 March	24*	20
Upper Limit	35	30
Compliance/Exceedance	✓	✓

* excluding periods of construction noise.

Position 2 – D204 Living Room

Period Commencement (Day/Night of...) 2025	Ambient Noise Level (dB)	
	Daytime $L_{Aeq,16hr}$ (07:00-23:00)	Night-time $L_{Aeq,8hr}$ (23:00-07:00)
Wed 5 March	28*	25
Thu 6 March	29*	26
Fri 7 March	28*	25
Sat 8 March	27*	25
Sun 9 March	27	24
Mon 10 March	30*	25
Upper Limit	35	30
Compliance/Exceedance	✓	✓

* excluding periods of construction noise.

Position 3 – C607 Living Room

Period Commencement (Day/Night of...) 2025	Ambient Noise Level (dB)	
	Daytime $L_{Aeq,16hr}$ (07:00-23:00)	Night-time $L_{Aeq,8hr}$ (23:00-07:00)
Wed 5 March	25*	24
Thu 6 March	26*	26
Fri 7 March	24*	22
Sat 8 March	24*	23
Sun 9 March	25	22
Mon 10 March	27*	23
Upper Limit	35	30
Compliance/Exceedance	✓	✓

* excluding periods of construction noise.

Position 4 – C402 Bedroom

Period Commencement (Day/Night of...) 2025	Ambient Noise Level (dB)	
	Daytime $L_{Aeq,16hr}$ (07:00-23:00)	Night-time $L_{Aeq,8hr}$ (23:00-07:00)
Wed 5 March	27*	24
Thu 6 March	28*	26
Fri 7 March	27*	25
Sat 8 March	27*	25
Sun 9 March	28	25
Mon 10 March	-*	-
Upper Limit	35	30
Compliance/Exceedance	✓	✓

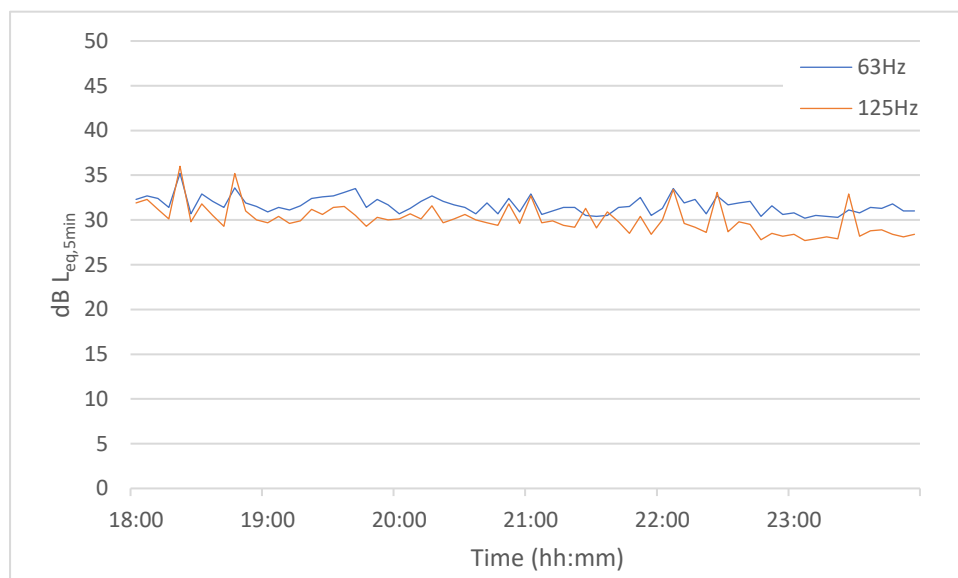
* excluding periods of construction noise.

The following table summarises the measured 10-15th highest internal $L_{Amax,5min}$ (night-time) noise levels in each test apartment. Note, living rooms are not subject to the maximum noise criterion at night, however, we have presented the data regardless, as this provides a good indication of compliance in adjacent bedrooms.

Position	10-15 th Highest Noise Level at Night, dB $L_{Amax,5min}$ (23:00-07:00)	Upper Limit, dB $L_{Amax,5min}$ (23:00-07:00)	Compliance/ Exceedance
1 - D206 Bedroom	35	45	✓
2 - D204 Living Room	39	45	✓
3 - C607 Living Room	38	45	✓
4 - C402 Bedroom	41	45	✓

The results demonstrate that, in all tested apartments, the internal noise levels achieved the upper limits of acceptable internal noise levels (as presented in Section 4.1).

For music noise, the worst affected apartment of the 4nr test is test room 3 (C607 Living Room) as this is most exposed to music noise emitted from the roof of the Arena. Measurements at low sound frequency during the live music concert on Friday 7 March 2025 are summarised below.



The results demonstrate that, in the most exposed/affected apartment to Arena music noise breakout, there were no undue rises in low frequency sound levels within the apartment, with levels falling below the limit of 47 dB $L_{eq,5min}$ at 63 Hz and 41 dB $L_{eq,5min}$ at 125 Hz.

4.3.2 Ventilation System Noise Levels

Internal noise level measurements were taken in 3nr sample apartments with MVHR units operating at trickle (normal) duty and in summer boost mode. The test apartments captured a typical 1-bed and 2-bed apartment. The measurements were taken between 20:00-21:00hr on Tuesday 5 March 2025.

At the time of the survey, there was limited availability/accessibility to apartments with power to operate the MVHR units. Nevertheless, all apartments have the same MVHR unit and operate with the comparable duties (flow rates and static pressures).

The results of the testing are summarised below. These values are the total noise levels in test rooms (i.e. due to traffic noise intrusion and the operation of the MVHR system).

Apartment	Room	Condition	Measured, dB L _{Aeq}	Upper Limit, dB L _{Aeq}	Compliance/ Exceedance
D103 (1 bed)	Living Room	Trickle	23	35	✓
		Summer boost	27	40	✓
	Bedroom	Trickle	22	30	✓
		Summer boost	29	35	✓
D204 (2 bed)	Living Room	Trickle	26	35	✓
		Summer boost	-*	40	-
	Bedroom 1	Trickle	25	30	✓
		Summer boost	-*	35	-
	Bedroom 2	Trickle	25	30	✓
		Summer boost	-*	35	-
D304 (2 bed)	Living Room	Trickle	27	35	✓
		Summer boost	36	40	✓
	Bedroom 1	Trickle	25	30	✓
		Summer boost	34	35	✓
	Bedroom 2	Trickle	26	30	✓
		Summer boost	34	35	✓

* could not be measured due to fault with summer boost switch.

The results demonstrate compliance with the MCC noise requirements for normal conditions and the AVO guidance for summer boost conditions in all test cases.

7.0 Conclusion

Jameson Acoustics Limited has been commissioned by Domis Construction Limited to provide acoustic design and testing services to assist in the discharge of two planning conditions associated with the Waterhouse Gardens development (Block C & D) in Manchester.

The report confirms the design intent/specifications for the control of operational noise from the use of amenity spaces and the noise insulation scheme for residential apartments, and the results of associated pre-completion testing demonstrates compliance with design criteria, set in line with MCC requirements, in all cases.

Appendix A – Acoustic Terminology

dB	Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form.
dB(A)	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The _A subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted (e.g. $L_{Aeq,T}$ in dB). Noise levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is only just perceptible.
$L_{Aeq,T}$	$L_{Aeq,T}$ is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time measurement period, T .
$L_{10,T}$	L_{10} is the noise level exceeded for 10% of the measurement period T (i.e. the quietest 10% of the measurement) and has, for many years, been used in the assessment of road traffic noise.
$L_{90,T}$	L_{90} is the noise level exceeded for 90% of the measurement period T (i.e. the quietest 10% of the measurement) and is often used to describe the 'background' noise level.
L_{max}	L_{max} is the maximum sound pressure level recorded over the measurement period, T . L_{max} is often used in assessing scheduled environmental noise 'events' (such as train passbys), particularly at night where such events may cause sleep disturbance.
R_w	The weighted sound reduction index, R_w , is a single figure description of sound reduction as defined in BS EN ISO 717-1. It is single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. The R_w is calculated from sound insulation measurements taken in an acoustic laboratory. Sound insulation ratings derived from site measurements are invariably lower than the laboratory figures and are referred to as the apparent weighted sound reduction index, R'_w .
$D_{n,e,w}$	The weighted element-normalised level difference, $D_{n,e,w}$, is a single figure description of the sound insulation performance of small building elements, such as a trickle ventilator.
C_{tr}	C_{tr} is correction term applied against the sound insulation single-number values (e.g. R_w) to provide a weighting against low frequency performance. The reference values used within the C_{tr} calculation are based on urban traffic noise.

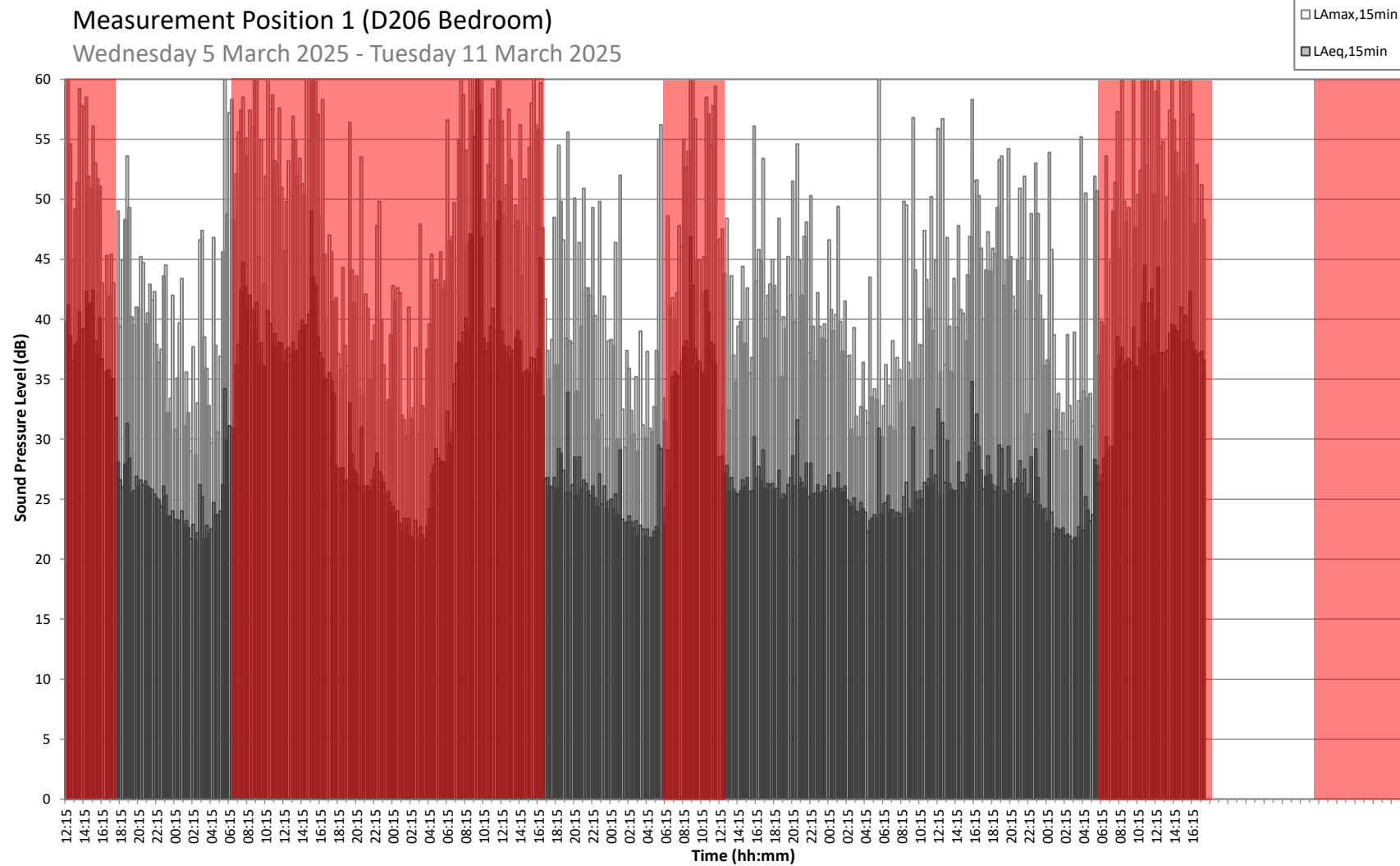
Appendix B – Internal Noise Levels (Time History Graphs)

Waterhouse Gardens, Block C & D

Measurement Position 1 (D206 Bedroom)

Wednesday 5 March 2025 - Tuesday 11 March 2025

22015-G1

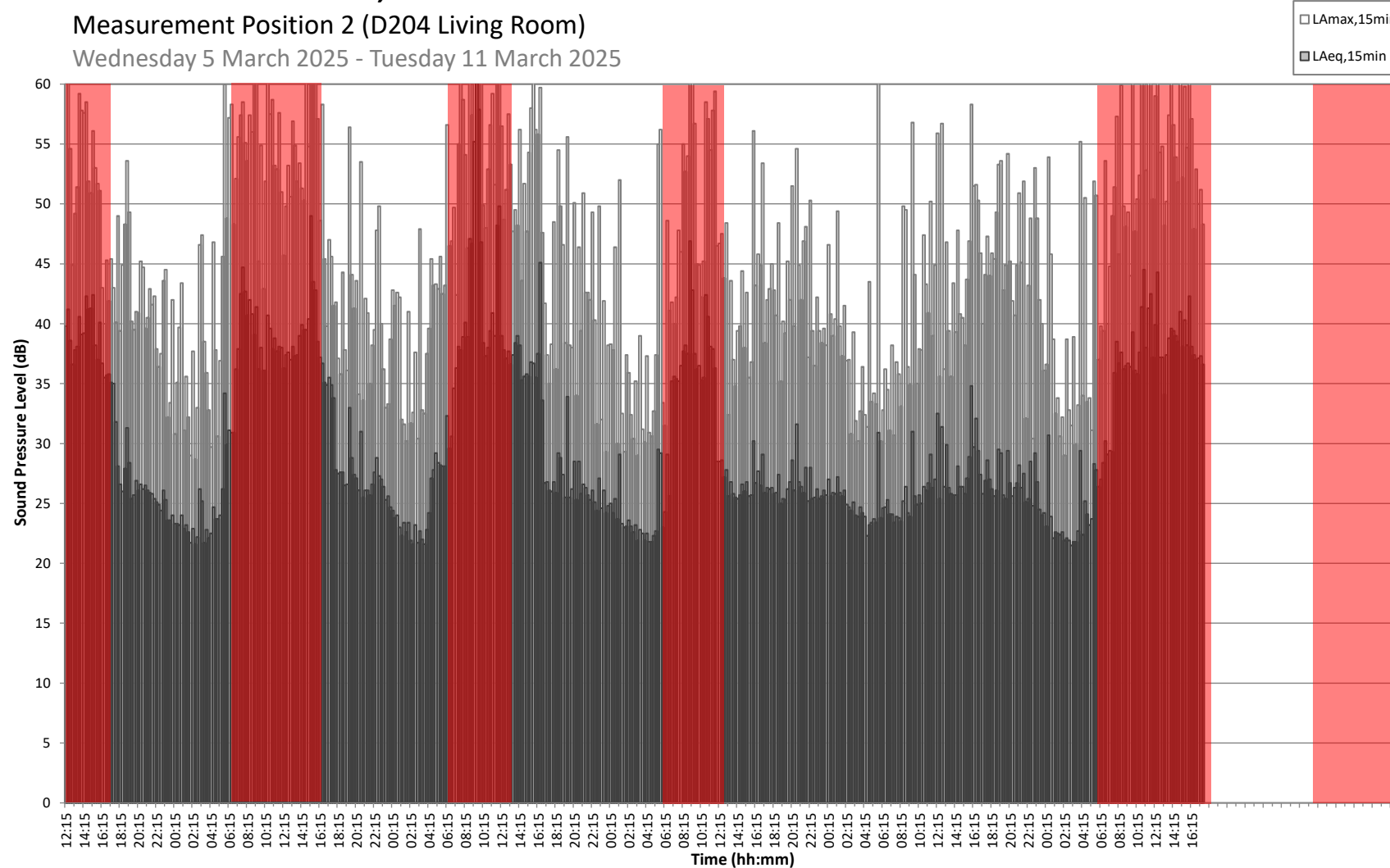


Waterhouse Gardens, Block C & D

Measurement Position 2 (D204 Living Room)

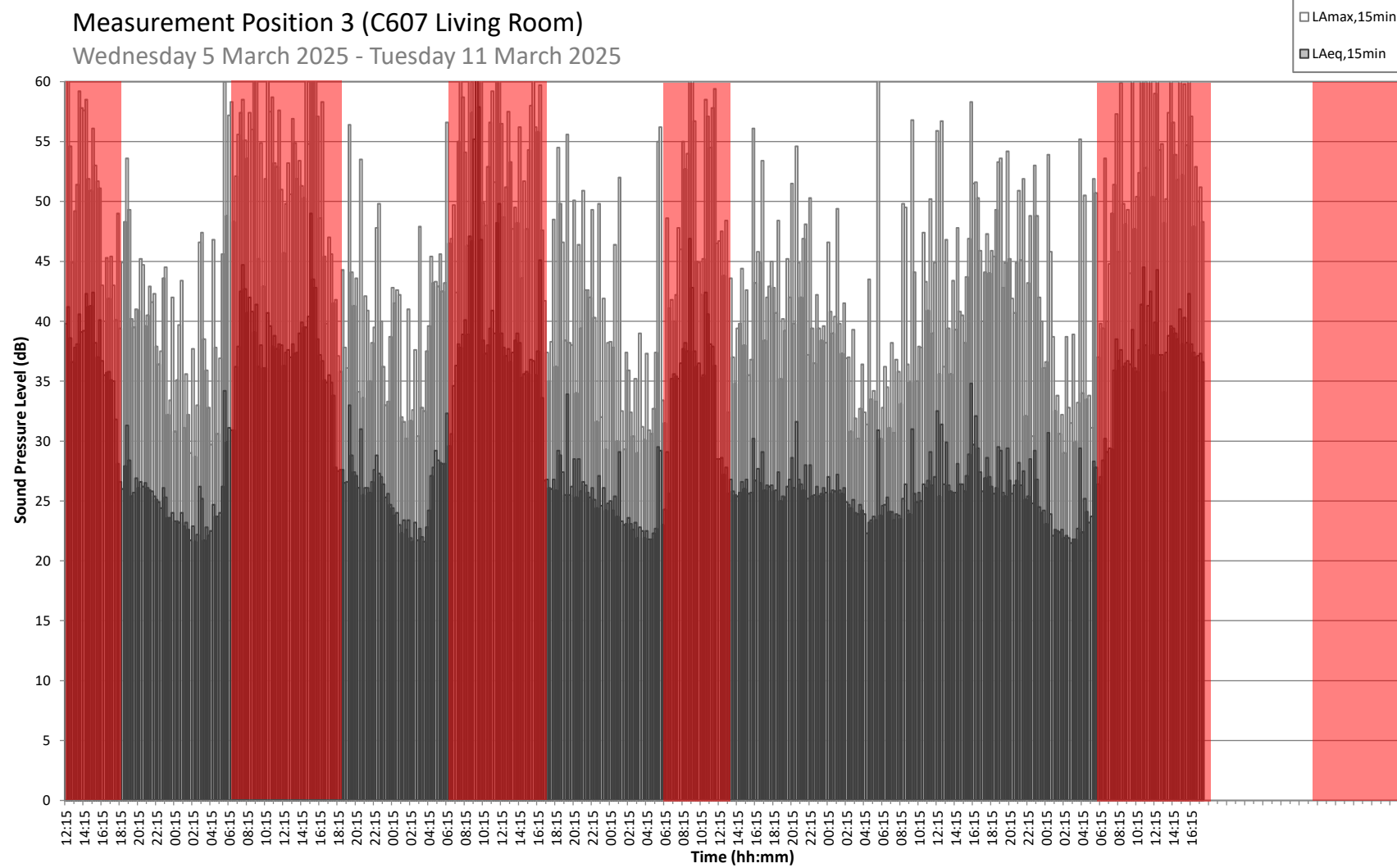
Wednesday 5 March 2025 - Tuesday 11 March 2025

22015-G2



Waterhouse Gardens, Block C & D Measurement Position 3 (C607 Living Room) Wednesday 5 March 2025 - Tuesday 11 March 2025

22015-G3



Waterhouse Gardens, Block C & D

Measurement Position 4 (C402 Bedroom)

Wednesday 5 March 2025 - Tuesday 11 March 2025

22015-G4

