MURRAY ACOUSTICS

57 Kenyon Lane, Manchester

Noise Impact Assessment

21229-RP-NIA-01

25 September 2026

JB Property Rent and Maintenance

Murray Acoustics Ltd
Beehive Lofts, Beehive Mill, Jersey Street, Manchester, M4 6JG

Registered Company No. 17009191

Document Ref.	Rev.	Date	Author	Comments
21229-RP-NIA-01	-	25 September 2026	**Jamie Murray MIOA** Director	-

Disclaimer

This report has been prepared by Murray Acoustics Ltd for the sole benefit of the named client and may not be relied upon by any third party without the prior written consent of Murray Acoustics Ltd.

The conclusions and recommendations contained in this report are based on the information available at the time of writing, including any data, drawings, or specifications provided by the client or other parties. Murray Acoustics Ltd accepts no responsibility for any inaccuracies in information provided by others.

The assessment is based on the specific conditions, equipment selections, and site layouts described herein. Any changes to these may require the assessment to be reviewed and updated.

This report does not purport to provide legal advice. The findings represent the professional opinion of Murray Acoustics Ltd and do not constitute a guarantee of compliance with any statutory or regulatory requirements.

Murray Acoustics Ltd 2026. All rights reserved.

Table of Contents

1.0 Introduction 4
1.1 Overview 4
1.2 Site Description 4
1.3 Development Proposals 5
1.4 Assessment Scope 6
2.0 Assessment Guidance and Requirements 8
2.1 Local Authority Requirements 8
2.2 BS 8233:2014 9
2.3 BS 4142:2014+A1:2019 9
2.4 Approved Document O 9
2.5 Approved Document E 10
3.0 Environmental Noise Survey 11
3.1 Procedure 11
3.2 Noise Climate 11
3.3 Measurement Positions 12
3.4 Equipment 12
3.5 Results 13
4.0 Residential Noise Impact Assessment 15
4.1 Criteria 15
4.2 Assessment Approach 15
4.3 Non-Glazed Elements 15
4.4 Glazed Elements 16
4.5 Predicted Internal Noise Levels 17
4.6 Ventilation 17
4.6.1 Normal Ventilation 17
4.6.2 Overheating (Approved Document O) 19
4.7 External Amenity 19
5.0 Kitchen Extract Noise Assessment 20
5.1 Criteria 20
5.2 Source Noise Data 21
5.3 Assessment Parameters and Assumptions 21

5.4 Assessment 22
5.5 Mitigation 23
5.5.1 In-Duct Silencer 23
5.5.2 Operation and Installation 25
5.6 Casing Breakout and Operation 25
6.0 Commercial Noise Transfer Assessment 26
6.1 Assessment Criteria 26
6.2 Source Sound Levels 27
6.3 Floor Specification 27
6.4 Party Wall Specification 28
6.5 Predicted Internal Levels in the Apartment 29
6.6 Approved Document E and Testing 31
7.0 Conclusion 32
Appendix A – Environmental Noise Survey Results 34
Appendix B – Kitchen Extract Fan Datasheet 37

1.0 Introduction

1.1 Overview

Murray Acoustics Ltd has been commissioned by JB Property Rent and Maintenance to undertake a noise impact assessment of the development at 57 Kenyon Lane, Moston, Manchester, M40 9JG, comprising a ground floor restaurant (Use Class E(b)) with a self-contained two-bedroom apartment (Use Class C3) at first floor level.

Planning permission was granted by Manchester City Council on 19 August 2026 under reference 144649/FO/2025, subject to conditions. This assessment has been prepared to support the discharge of Condition 5 (noise insulation and ventilation scheme for the residential accommodation, against external and internal noise sources) and Condition 6 (external plant and equipment), and to inform the extraction scheme required by Condition 7 in respect of noise.

The assessment covers three matters: noise from external sources, principally road traffic on Kenyon Lane, affecting the apartment; noise from the restaurant kitchen extract system affecting the apartment and the neighbouring dwellings; and the transfer of noise from the restaurant through the separating floor to the apartment above. This report sets out the assessment methodology, findings, and recommended mitigation measures where relevant.

1.2 Site Description

The site is a two-storey mid-terrace property on the eastern side of Kenyon Lane in Moston, north Manchester, a short distance north of the junction with Whittaker Street and Winnie Street. The frontage faces directly onto Kenyon Lane, which carries general traffic, with a mix of commercial units at ground floor and residential accommodation along the road. To the rear, the terrace backs onto a rear access passage, with residential streets beyond. The site location is shown in Figure 1.1.



Figure 1.1 Site location plan (extract from drawing S10, Intellect Civil & Construction Ltd)

1.3 Development Proposals

The permitted development comprises the retention of a two-storey rear extension providing additional floorspace to the ground floor restaurant and first floor residential accommodation, elevational alterations to the front including a separate entrance to the first floor apartment, the insertion of roof windows, and the installation of two flues to the rear elevation. The proposed ground and first floor plans are shown in Figure 1.2.

At ground floor the restaurant dining area occupies the front and centre of the plan, with an accessible WC, a kitchen at the rear (between grid lines B and C) and a rear lobby with commercial and residential waste stores. The restaurant kitchen extract is shown rising from the kitchen and discharging via a flue on the rear elevation, terminating just above the eaves of the rear extension. At first floor, the apartment comprises Bedroom 2 at the front overlooking Kenyon Lane, a living room and bathroom at the centre of the plan lit by a roof window in the front roof slope, a kitchen lit by a roof window in the rear roof slope, and Bedroom 1 at the rear, directly above the restaurant kitchen, with a window in the rear elevation to be obscure glazed under Condition 13.



Figure 1.2 Proposed ground and first floor plans (extract from drawing S06 Rev A, Intellect Civil & Construction Ltd)

Under Condition 11 of the permission, the restaurant may not be open later than 22:00. The kitchen extract fan will be switched off by 23:00 at the latest, so that it operates during the daytime period only.

1.4 Assessment Scope

The following elements have been considered in this assessment:

- **Noise from external sources affecting the apartment**, assessed against the internal ambient noise criteria of Condition 5 and BS 8233:2014, including the specification of glazing and ventilation, and the implications for overheating under Approved Document O;
- **Noise from the restaurant kitchen extract system** at the nearest noise sensitive receptors, assessed against the criterion of Condition 6 with reference to BS 4142:2014+A1:2019; and

- **Noise transfer from the restaurant to the apartment** through the separating floor and the party wall to the apartment's entrance corridor/staircase, assessed against octave band internal criteria (NR 20 with low-frequency limits in habitable rooms, NR 25 in the corridor/staircase) and Approved Document E of the Building Regulations.

2.0 Assessment Guidance and Requirements

2.1 Local Authority Requirements

The development falls within the jurisdiction of Manchester City Council. Condition 5 of planning permission 144649/FO/2025 states:

> *a) Within three months of the date of the planning permission hereby granted, a noise insulation and ventilation scheme for acoustically insulating the residential accommodation against and external and internal noise sources, together with details of the performance of any glazing, shall be submitted to and approved in writing by the City Council as local planning authority. The noise insulation and ventilation scheme shall take the potential for overheating 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 achieved when providing adequate ventilation as defined by Approved Document F of the Building Regulations (whole dwelling ventilation): Bedrooms (night time - 23.00 - 07.00) 30 dB L_{Aeq} (individual noise events shall not exceed 45 dB $L_{Amax,F}$ by more than 15 times); Living Rooms (daytime - 07.00 - 23.00) 35 dB L_{Aeq}.*

Parts b) and c) of Condition 5 require a completion and verification report to be submitted and approved prior to first occupation. Condition 6 states:

> *a) Prior to the installation of any external plant and equipment required as part of the authorised development, either a scheme that demonstrates that the plant and equipment will achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level in each octave band at the nearest noise sensitive location, or a scheme showing a method to acoustically treat/insulate the plant and equipment to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level in each octave band at the nearest noise sensitive location, shall be submitted to and approved in writing by the Local Planning Authority.*

Condition 6 refers to octave band levels. Manchester City Council's published Planning and Noise Technical Guidance (October 2022) sets the equivalent criterion for externally mounted plant as a rating level 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location, assessed in accordance with BS 4142 on an overall A-weighted basis, and the octave band reference in the condition is understood to derive from the Council's criteria for entertainment noise. This assessment has therefore been undertaken in accordance with the published guidance, comparing the overall A-weighted rating level against the overall background sound level [approach to be confirmed with the Environmental Protection officer].

Parts b) and c) of Condition 6 require a verification report, including post-completion testing, prior to the first operation of the plant. Condition 7 requires a scheme for the

extraction of fumes, vapours and odours to be submitted and approved notwithstanding the detail of the approved drawings.

2.2 BS 8233:2014

BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' (herein BS 8233) provides guidance on suitable internal ambient noise levels within residential buildings, along with recommended external amenity noise levels. The guidance draws on the World Health Organization (WHO) 'Guidelines for Community Noise' (1999) and 'Night Noise Guidelines for Europe' (2009). BS 8233 recommends 35 dB $L_{Aeq,16h}$ in living rooms and bedrooms during the daytime and 30 dB $L_{Aeq,8h}$ in bedrooms at night, consistent with the criteria of Condition 5.

2.3 BS 4142:2014+A1:2019

BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' (herein BS 4142) provides a method for assessing the likelihood of adverse impact from industrial and commercial sound sources at nearby noise-sensitive receptors.

The assessment compares the rating level of the source in question against the prevailing background sound level at the receptor location. The rating level is derived from the measured or predicted specific sound level, with corrections applied where the sound has distinctive characteristics such as tonality, impulsivity, or intermittency.

The difference between the rating level and the background sound level provides an initial estimate of impact. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on context. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on context. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on context. Condition 6 and the Council's guidance set a more onerous design criterion, with the rating level required to be at least 5 dB below the typical background sound level.

2.4 Approved Document O

Approved Document O 'Overheating' (herein ADO) of the Building Regulations came into force in June 2022 and applies to new residential buildings in England, including those formed by a material change of use. It sets out requirements to limit unwanted solar gains and provide an adequate means of removing heat from indoor environments. Where the removal of excess heat relies on opening windows, ADO requires that windows in bedrooms are likely to be closed during sleeping hours (23:00 to 07:00) where the internal noise level would exceed 40 dB $L_{Aeq,8h}$ or 55 dB L_{AFmax} more than 10 times per night.

2.5 Approved Document E

Approved Document E 'Resistance to the passage of sound' (herein ADE) of the Building Regulations sets performance standards for separating walls and floors between dwellings and other parts of the same building. For rooms for residential purposes formed by a material change of use, the separating floor between the apartment and the restaurant must achieve a minimum airborne sound insulation of 43 dB DnT,w + Ctr. As the space below the separating floor is a restaurant and not a dwelling, the impact sound insulation standard is not applicable. Compliance is normally demonstrated by pre-completion testing. The ADE standards are minimum values intended for domestic neighbours and do not account for the higher noise levels generated by commercial uses, and the performance required for this floor has therefore been derived from the source levels in Section 6.

3.0 Environmental Noise Survey

3.1 Procedure

Attended noise measurements were undertaken at 2No measurement positions on site during three periods selected to capture the conditions relevant to the assessment:

- **Late evening, 21:00 to 23:00 on 02 September 2026**, to determine the background sound level at the end of the restaurant's operating period, which is the most sensitive period for the kitchen extract plant;
- **Night-time, 23:00 on 02 September to 02:00 on 03 September 2026**, to determine the night-time noise climate affecting the bedrooms of the apartment; and
- **Morning rush hour, 07:00 to 10:00 on 03 September 2026**, to capture the peak road traffic noise affecting the apartment. The morning rush hour was selected in preference to the evening rush hour as it coincides with the period when residents are more likely to be at home and sleeping or resting, and is therefore the more sensitive of the two, in accordance with the requirement of Condition 5 for measurements during a rush-hour period.

During each period, measurements were made in consecutive 15-minute samples, alternating between the two positions: a 15-minute sample was taken at MP1, followed immediately by a 15-minute sample at MP2, and so on throughout the period. This provided 4No samples at each position during the late evening period and 6No samples at each position during each of the night-time and morning periods. The L_{Aeq}, L_{A90}, L_{A10} and L_{AFmax} parameters, together with the octave band spectra, were logged for each sample.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure complied with ISO 1996-2:2017 'Acoustics – Description, measurement and assessment of environmental noise – Part 2: Determination of sound pressure levels' and, for the background sound level, BS 4142.

3.2 Noise Climate

The noise climate at the front of the building (MP1) was dominated by road traffic on Kenyon Lane throughout the survey, with vehicle pass-bys and occasional heavier vehicles responsible for the highest L_{AFmax} levels. Traffic flows were heaviest during the morning rush hour, reduced through the late evening and remained intermittent through the night-time measurement period.

At the rear of the building (MP2) the terrace screens the site from Kenyon Lane, and the noise climate was characterised by distant road traffic, activity to the rear of the terrace and general activity of the area, at levels below those at the front.

3.3 Measurement Positions

The measurement positions are shown in Figure 3.1. MP1 was located at ground floor, overlooking Kenyon Lane and representative of the exposure of Bedroom 2; the microphone was mounted approximately 1 m from the façade, and the measured levels have been corrected by -3 dB to free-field conditions. MP2 was located at ground floor level to the rear of the building, representative of Bedroom 1 and of the rear windows of the neighbouring properties nearest the proposed kitchen extract discharge; the microphone was positioned in free-field conditions, at least 3.5 m from any reflecting surface other than the ground, and no correction has been applied.

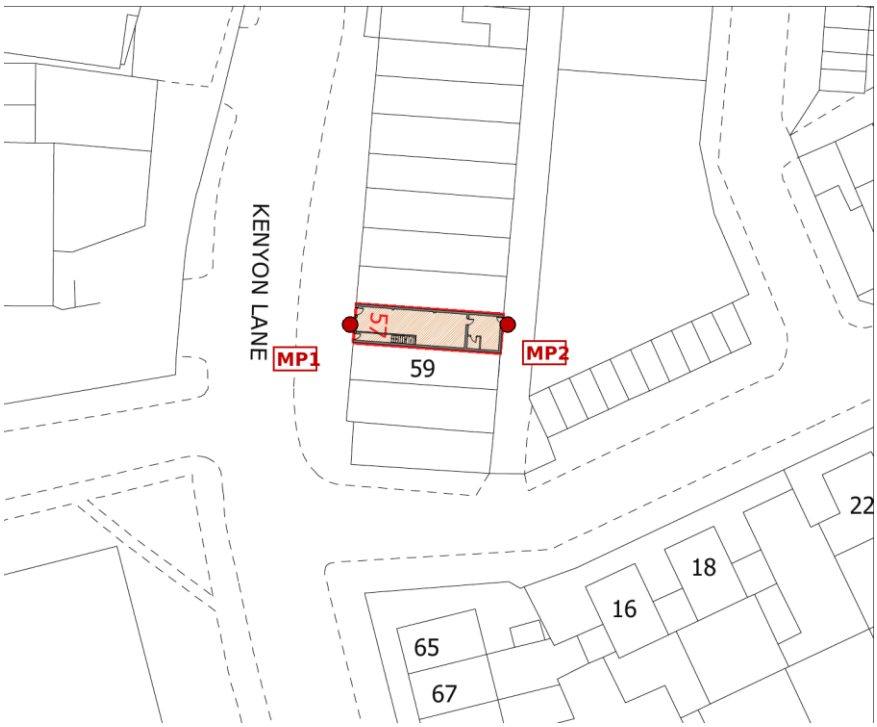


Figure 3.1 Environmental noise survey measurement positions (base: drawing S12, Intellect Civil & Construction Ltd)

3.4 Equipment

The equipment used during the survey is summarised in Table 3.1. The equipment calibration was verified before and after use and no abnormalities were observed.

Table 3.1 Environmental noise survey equipment

Equipment	Serial No.	Calibration Date	Certificate Ref.
Class 1 Sound Level Meter, Svantek Type 971A	173136	19 Jan 2026	1516680-1
Preamplifier, Svantek SV18A	163637	19 Jan 2026	1516680-1
Free-field Microphone, ACO 7152	96767	19 Jan 2026	1516680-1
Class 1 Sound Level Meter, Svantek Type 971A	173141	19 Jan 2026	1516680-2
Preamplifier, Svantek SV18A	163626	19 Jan 2026	1516680-2
Free-field Microphone, ACO 7152	96756	19 Jan 2026	1516680-2
Class 1 Acoustic Calibrator, Svantek SV33B	182123	30 Jan 2026	C182123-1

3.5 Results

The results of the attended measurements are summarised in Table 3.2 as free-field levels (MP1 corrected by -3 dB from the measured façade levels). The L_{Aeq} for each period is the logarithmic average of the 15-minute samples at each position, and, in accordance with the method set out in Manchester City Council's Planning and Noise Technical Guidance, the background sound level has been taken as the minimum of the 15-minute L_{A90} samples measured in each period at each position. This is more conservative than the typical value used in BS 4142. The individual 15-minute results are presented in Appendix A.

Table 3.2 Summary of attended noise survey results (free-field, dB)

Period	Position	$L_{Aeq,T}$	Min. $L_{A90,15min}$	Highest L_{AFmax}
Morning rush hour 07:00 to 10:00	MP1	61	51	79
	MP2	55	49	72
Late evening 21:00 to 23:00	MP1	58	49	76
	MP2	53	48	69
Night-time 23:00 to 02:00	MP1	52	43	76
	MP2	47	42	62

The levels adopted for the assessment are summarised in Table 3.3. On a conservative basis, the daytime L_{Aeq} has been taken as the level measured during the morning rush hour, the most onerous daytime period, and the night-time L_{Aeq} as the level measured between 23:00 and 02:00, which is typically the noisiest part of the night-time period. For the night-time maximum levels, the highest 15-minute L_{AFmax} measured at each position has been adopted, which provides a robust basis for the Condition 5 criterion, which permits up to 15 events per night above 45 dB L_{AFmax}.

Table 3.3 Sound levels adopted for assessment (free-field, dB)

Parameter	MP1 (front)	MP2 (rear)	Basis
Daytime $L_{Aeq,16h}$	61	55	Morning rush hour, 07:00 to 10:00
Night-time $L_{Aeq,8h}$	52	47	Night-time, 23:00 to 02:00
Night-time L_{AFmax}	76	62	Highest night-time 15-minute sample
Late evening background $L_{A90,15min}$	49	48	Minimum, 21:00 to 23:00 (kitchen extract), MCC method
Night-time background $L_{A90,15min}$	43	42	Minimum, 23:00 to 02:00, MCC method

As the kitchen extract will be switched off by 23:00 at the latest, it has been assessed against the minimum late evening background sound level at MP2 of 48 dB $L_{A90,15min}$, measured at the end of the restaurant's operating period, giving a design criterion of 43 dB $L_{Ar,1h}$ (Section 5.1).

4.0 Residential Noise Impact Assessment

4.1 Criteria

Based on Condition 5 and the guidance of BS 8233, the criteria in Table 4.1 have been adopted for the apartment. They apply with the rooms ventilated to Approved Document F whole dwelling ventilation rates.

Table 4.1 Internal noise criteria for the apartment

Room	Daytime (07:00 to 23:00)	Night-time (23:00 to 07:00)
Bedrooms	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$ 45 dB L_{AFmax} (not exceeded more than 15 times)
Living room	35 dB $L_{Aeq,16h}$	-

4.2 Assessment Approach

The required sound insulation of the glazed elements has been derived from the measured noise levels and the internal criteria, following the guidance of BS 8233:2014. The rooms and their exposure are:

- **Bedroom 2** (front, 2.10 x 3.27 m): window of approximately 1.41 m² in the front elevation, exposed to the levels at MP1;
- **Living room** (centre, 2.91 x 2.79 m): roof window of approximately 2.16 m² in the front roof slope, which faces Kenyon Lane and has a direct view of the road; and
- **Bedroom 1** (rear, 3.90 x 1.92 m): window of approximately 1.97 m² in the rear elevation, exposed to the levels at MP2.

4.3 Non-Glazed Elements

The minimum sound insulation performance assumed for the non-glazed elements of the façade and roof is set out in Table 4.2. These are pessimistic values for the constructions indicated on the drawings and in the information provided by the client. All external constructions should be free of gaps and unsealed penetrations.

Table 4.2 Assumed sound insulation performance of non-glazed elements

Element	Construction	$R_w + C_{tr}$ (dB)
Front wall, Bedroom 2	Existing solid masonry	50

Element	Construction	$R_w + C_{tr}$ (dB)
Roof over Bedroom 2	Tiled pitched roof, insulated loft void, plasterboard ceiling	45
Roof over living room	Tiled pitched roof, insulation between rafters, plasterboard lining	40
Rear wall, Bedroom 1	Timber frame with brick slip finish, insulation and plasterboard lining	40
Roof over Bedroom 1	Flat roof of rear extension, insulated, plasterboard ceiling	40

4.4 Glazed Elements

The minimum sound insulation performance required of the glazed elements is set out in Table 4.3. At the front of the building, the night-time L_{AFmax} governs the specification for Bedroom 2, requiring a minimum $R_w + C_{tr}$ of 35 dB; a window unit of $R_w + C_{tr}$ 35 dB is specified, with 2No acoustic trickle ventilators of $D_{n,e,w} + C_{tr}$ 41 dB. The roof window to the living room requires $R_w + C_{tr}$ 29 dB. At the rear, $R_w + C_{tr}$ 26 dB is sufficient for Bedroom 1, which is achievable with standard thermal double glazing; the obscure glazing required by Condition 13 does not reduce the acoustic performance provided the specified unit is achieved.

Table 4.3 Sound reduction performance requirements for glazed elements

Room / element	Sound Reduction Performance (R dB) at Octave Band Centre Frequency (Hz)						$R_w + C_{tr}$ (dB)
	125	250	500	1k	2k	4k	
Bedroom 2, front window	29	33	40	44	47	54	35
Living room	23	27	34	38	41	48	29
Bedroom 1, rear window	20	24	31	35	38	45	26
Kitchen roof window (rear slope)	20	24	31	35	38	45	26

The performance is specified for the whole window unit, including the frame and seals, as installed. A performance of $R_w + C_{tr}$ 35 dB is typical of an acoustic double glazed unit in a well-sealed frame. For the roof window, manufacturers' standard or acoustic glazing options achieving $R_w + C_{tr}$ 29 dB are widely available. The nominated glazing supplier should verify that their proposed window system meets the performance figures shown

at each centre frequency band as shown above; achieving the overall $R_w + C_{tr}$ figure alone is not evidence of compliance with the specification.

4.5 Predicted Internal Noise Levels

The predicted internal noise levels with the glazing specified in Table 4.3, the non-glazed elements of Table 4.2 and the ventilation strategy of Section 4.6 are summarised in Table 4.4.

Table 4.4 Predicted internal noise levels with windows closed (dB)

Room	Daytime $L_{Aeq,16h}$	Night-time $L_{Aeq,8h}$	Night-time L_{AFmax}	Outcome
Bedroom 2 (front)	30 (35)	21 (30)	45 (45)	Complies
Living room	35 (35)	-	-	Complies
Bedroom 1 (rear)	33 (35)	25 (30)	40 (45)	Complies

Criteria are shown in brackets. The internal criteria of Condition 5 are achieved in all habitable rooms with windows closed.

4.6 Ventilation

4.6.1 Normal Ventilation

Based on the noise levels measured on site, appropriate ventilation systems (ref. Approved Document F, ADF) are outlined in Table 4.5 in order that the internal noise criteria are not compromised.

Table 4.5 Ventilation strategy

Ventilation System (ADF)	Whole Dwelling Ventilation	Extract Ventilation
System 1	Trickle ventilators providing a minimum performance as described below	Intermittent extract fans
System 3	Continuous mechanical extract (low rate) and trickle ventilators for supply providing a minimum performance as described below	Continuous mechanical extract (high rate) with trickle ventilators providing inlet air
System 4	Continuous mechanical supply and extract (low rate)	Continuous mechanical supply and extract (high rate)

Where trickle ventilators are proposed, a total of 2No ventilators per room has been assumed, and the ventilators should achieve a minimum performance of $D_{n,e,w}$ + C_{tr} 41 dB in Bedroom 2, $D_{n,e,w}$ + C_{tr} 35 dB in the living room and $D_{n,e,w}$ + C_{tr} 32 dB in Bedroom 1, which are available from a range of acoustic trickle ventilators. Increasing the number of ventilators will reduce the composite performance of the façade; if more ventilators are required, the required insulation should be increased by 10·log(N/2) where N is the number of ventilators proposed. Alternatively, and in view of the findings in respect of overheating below, mechanical supply and extract ventilation (System 4, for example mechanical ventilation with heat recovery, MVHR) may be preferred for the whole apartment, in which case trickle ventilators would not be required. Any mechanical ventilation intake and exhaust terminals should be located away from the kitchen extract discharge.

Table 4.6 Minimum sound insulation performance requirements for trickle ventilators (element-normalised level difference Dn,e, dB)

Room / element	Element-normalised Level Difference ($D_{n,e}$ dB) at Octave Band Centre Frequency (Hz)						Dn,e,w + C_{tr} (dB)
	125	250	500	1k	2k	4k	
Bedroom 2, front window	35	39	45	49	51	53	41
Living room	29	33	39	43	45	48	35
Bedroom 1, rear window	26	31	36	40	42	45	32

The performance is specified for each ventilator as installed, in the open position. The nominated ventilator supplier should verify that the proposed product meets the performance at each octave band centre frequency as shown above; achieving the overall $D_{n,e,w}$ + C_{tr} figure alone is not evidence of compliance with the specification.

Mechanical ventilation systems should be designed to meet the internal noise levels as defined in CIBSE Guide A (2015), as shown in Table 4.7. In all cases, purge ventilation may be provided by openable windows; the internal noise level requirement would not be applicable during purge conditions as this would only occur occasionally.

Table 4.7 Mechanical building services noise level requirements

Room Type	L_{Aeq}, dB	NR
Bedrooms	30	25
Living room	35	30
Kitchen	45-50	40-45

4.6.2 Overheating (Approved Document O)

A partially open window provides a level difference of the order of 13 dB between the external free-field level and the internal level. With windows open, Bedroom 2 would experience approximately 39 dB $L_{Aeq,8h}$ and 63 dB L_{AFmax} for night-time events. The L_{Aeq} is within the ADO criterion of 40 dB $L_{Aeq,8h}$, but the L_{AFmax} exceeds the ADO criterion of 55 dB L_{AFmax}. Bedroom 2 cannot therefore rely on open windows for the removal of excess heat at night, and the overheating strategy should demonstrate compliance with the front windows closed or provide an alternative means of removing excess heat, such as MVHR with summer bypass and boost, or comfort cooling.

With windows open, Bedroom 1 at the rear would experience approximately 34 dB $L_{Aeq,8h}$ and 49 dB L_{AFmax} at night, both within the ADO criteria, so the openable section of the rear window may be relied upon for night-time cooling. The kitchen extract does not operate during the night-time period. The overheating assessment itself should be led by an overheating specialist.

4.7 External Amenity

The apartment has no private external amenity space, and external amenity has not therefore been assessed.

5.0 Kitchen Extract Noise Assessment

5.1 Criteria

In accordance with Condition 6 and the Council's Planning and Noise Technical Guidance, the rating level of the kitchen extract system should be at least 5 dB below the typical background sound level at the nearest noise sensitive location. The resulting limits, based on the background sound levels measured at MP2 (Table 3.3), are set out in Table 5.1.

Table 5.1 Kitchen extract noise limits at the nearest noise sensitive location (free-field, dB)

Period	Background $L_{A90,15min}$ (minimum)	Rating level limit
Daytime, up to 23:00 (late evening background, 21:00 to 23:00)	48	43 dB $L_{Ar,1h}$
Night-time, 23:00 to 07:00 (background 23:00 to 02:00)	42	37 dB $L_{Ar,15min}$

The kitchen extract fan will be switched off by 23:00 at the latest and will not operate during the night-time period. The daytime limit of 43 dB $L_{Ar,1h}$ therefore applies.

The nearest noise sensitive location to the discharge is:

- **R1**, the rear window of Bedroom 1 of the apartment at 57 Kenyon Lane, 2 m from the discharge termination.

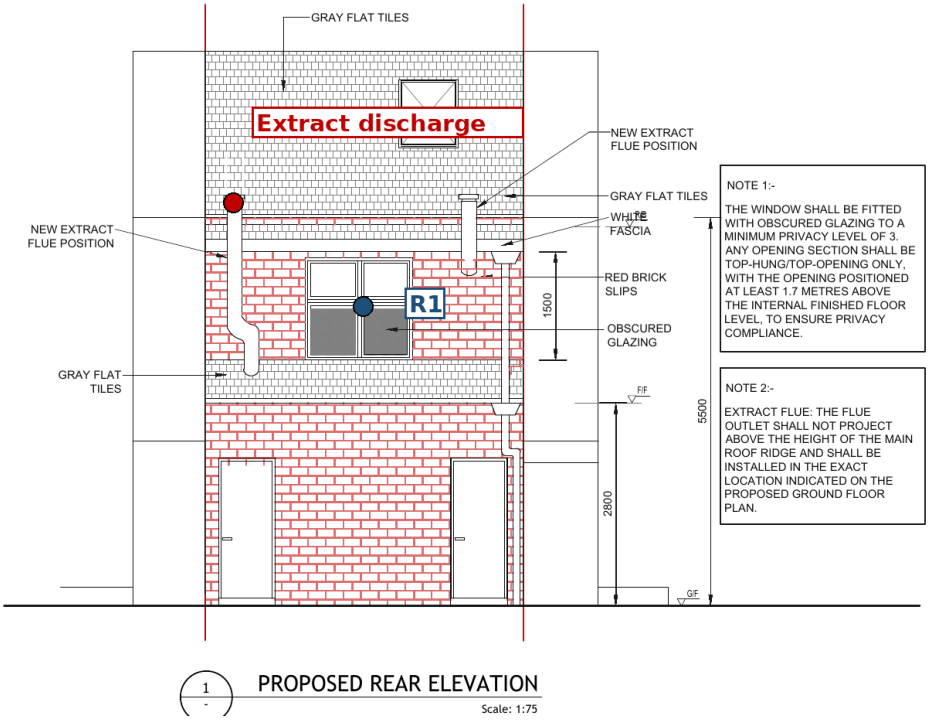


Figure 5.1 Proposed rear elevation showing the extract discharge and R1 (base: drawing S08 Rev A, Intellect Civil & Construction Ltd)

5.2 Source Noise Data

The kitchen extract fan (KEF) is a Helios GigaBox GBD 630/4 T120 box centrifugal fan, designed for hot and grease-laden air, located within the restaurant kitchen, with a CK Direct Type 8 activated carbon filter in the system for odour control. The manufacturer's datasheet is included in Appendix B. The manufacturer publishes the sound power level for the fan at full speed only, as A-weighted octave band levels (L_{wA}) for the intake, exhaust and case breakout, from 125 Hz to 8 kHz.

As the discharge to atmosphere is on the exhaust side of the fan, the exhaust data have been used. For the calculation, the A-weighted band levels have been converted to unweighted in-duct sound power levels (L_w) by removing the A-weighting correction in each octave band.

The 63 Hz octave band is not provided in the manufacturer's data and has been estimated from the 125 Hz level. The fan is assumed to operate at full speed at all times.

Table 5.2 Kitchen extract fan sound power level, Helios GBD 630/4 T120, exhaust side

Parameter	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dB(A)
Manufacturer's LwA (dB(A))	n/p	81	82	84	84	82	77	69	90
A-weighting correction (dB)	-26.2	-16.1	-8.6	-3.2	0	+1.2	+1.0	-1.1	
In-duct Lw, unweighted (dB)	**97 (est.)**	**97**	**91**	**87**	**84**	**81**	**76**	**70**	**90**

n/p: not provided in the manufacturer's data. est.: estimated from the 125 Hz level.

5.3 Assessment Parameters and Assumptions

The extract duct and discharge termination have been measured from the drawings as 250 mm in diameter. The duct diameter, particularly at the discharge termination, has a significant effect on the end reflection loss and hence on the low-frequency noise level at R1. Murray Acoustics Ltd should be notified if the duct or termination diameter differs from 250 mm, so that the assessment can be reviewed.

The noise level at R1 has been calculated in accordance with CIBSE Guide B4:2016 'Noise and vibration control for building services systems'. The parameters and assumptions used in the calculation are set out in Table 5.3; any change to them during the design of the extract system would require the assessment to be reviewed.

Table 5.3 Kitchen extract calculation parameters and assumptions

Parameter	Value adopted	Basis
Fan	Helios GBD 630/4 T120, full speed	Client information; manufacturer's datasheet (Appendix B)
Source data	Exhaust LwA converted to unweighted Lw; 63 Hz estimated from the 125 Hz level	Manufacturer's datasheet; 63 Hz not provided in the manufacturer's data
Carbon filter	No attenuation	No acoustic data published; conservative
Straight duct	5 m, 250 mm diameter, circular, unlined (-0.5 dB per band)	Diameter measured from the drawings; CIBSE Guide B4 Table 4.19
Bends	1No unlined round bend, 250 mm diameter	Measured from the drawings; CIBSE Guide B4 Tables 4.22 to 4.24
End reflection	250 mm diameter termination flush with building face (grille area 0.05 m²)	Measured from the drawings; CIBSE Guide B4 Equation 4.6
Discharge termination	Flush with the rear building face, Q = 2	Approved flue position, drawing S08 Rev A
Receptor R1	Bedroom 1 window, 57 Kenyon Lane, 2 m from the discharge termination	Drawing S08 Rev A
Directivity	Vertical angle 145°, horizontal angle 0° (-1 dB at 63 Hz to -8.5 dB at 2 kHz)	CIBSE Guide B4 directivity for duct terminations
Screening / façade / other corrections	None	Free-field level at the window; no screening between discharge and R1
Acoustic feature correction	0 dB	Broadband fan noise, attenuated to below background; no tonal, impulsive or intermittent character expected
Hours of operation	Switched off by 23:00 at the latest	Operational restriction (Section 5.5)
Background / limit	48 dB $L_{A90,15min}$ / 43 dB $L_{Ar,1h}$	Late evening background at MP2 (Table 3.3); Condition 6 and MCC guidance

5.4 Assessment

The calculation of the specific sound level at R1, without and with a specified in-duct silencer, is set out in Table 5.4, and the resulting rating level is compared with the limit below.

Table 5.4 Calculation of kitchen extract noise level at R1 (dB)

Stage	Octave Band centre Frequency (Hz)								dB(A)
	63	125	250	500	1k	2k	4k	8k	
In-duct Lw	97	97	91	87	84	81	76	70	90
Straight duct, 5 m	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	
Bend, 1No unlined round	0	-1	-2	-3	-3	-3	-3	-3	
End reflection	-13.9	-8.7	-4.4	-1.7	-0.5	-0.2	0	0	
Lw leaving the discharge	83	87	84	82	80	77	73	67	**85**
Distance 2 m, Q = 2	-14	-14	-14	-14	-14	-14	-14	-14	
Directivity (145°)	-1	-1	-1.5	-3	-7	-8.5	-8	-8	
Lp at R1, unattenuated	68	72	69	65	59	55	51	45	**66**
Silencer insertion loss	-7	-15	-28	-45	-50	-45	-35	-22	
Lp at R1, with silencer	61	57	41	20	9	10	16	23	**42**

Without attenuation, the rating level at R1 would be 66 dB $L_{Ar,1h}$, 23 dB above the limit and 18 dB above the typical background sound level. With the in-duct silencer set out in Table 5.5, the rating level at R1 reduces to 42 dB $L_{Ar,1h}$, which meets the limit of 43 dB $L_{Ar,1h}$ with a margin of 1 dB. The residual level is controlled by the 63 Hz and 125 Hz octave bands, and the outcome is therefore dependent on the silencer achieving its low-frequency insertion loss.

5.5 Mitigation

The following measures are required for the kitchen extract system.

5.5.1 In-Duct Silencer

An in-duct silencer achieving the insertion loss set out in Table 5.5 must be installed on the discharge side of the fan, within the kitchen and before the duct leaves the building,

so that noise breaking out of the external ductwork is also controlled. The insertion loss is based on that of a rectangular splitter silencer 2100 mm long with 40% free area.

Table 5.5 Kitchen extract silencer insertion loss (dB)

Parameter	Insertion Loss (dB) at Octave Band centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Silencer insertion loss	7	15	28	45	50	45	35	22

This is an extremely high performance requirement, and it must be checked and confirmed by the silencer supplier before the silencer is selected or ordered. In particular, the insertion loss of 45 to 50 dB between 500 Hz and 2 kHz is at the upper end of published performance for splitter silencers, and the result at R1 depends on the silencer achieving its specified insertion loss in every octave band. The supplier must provide independently tested insertion loss data (to BS EN ISO 7235) for the selected silencer in each octave band from 63 Hz to 8 kHz at the design air volume, together with its regenerated noise and pressure drop, demonstrating careful compliance with Table 5.5. The regenerated noise of the silencer at the design air volume must not add materially to the level at R1. A silencer that achieves the overall dB(A) reduction but not the insertion loss in each octave band in Table 5.5 would not be acceptable. The implications of the silencer for fan duty, pressure drop and space within the kitchen should be considered by the extract designer at the outset.

As the margin against the limit is only 1 dB and the silencer specification is very demanding, it may be sensible for the extract designer to explore the following measures, either of which would reduce the silencer performance required and increase the margin:

- **Lowering the duty of the fan.** The GBD 630/4 T120 is a large fan (up to around 14,200 m^3/h), which is likely to be well in excess of the extract rate required for a kitchen of this size. A fan selected for, or operated at, the actual design duty would have a lower sound power level, particularly at low frequencies. Manufacturer's sound power data for the fan at the selected duty would be required.
- **Relocating the discharge termination further from the residential window.** Increasing the distance from R1, or moving the termination to a position where the building (for example the eaves of the rear extension) screens the Bedroom 1 window, would reduce the level at R1 and the insertion loss required, subject to the requirements of Condition 7 and Note 2 of drawing S08 (the flue outlet not to project above the main roof ridge).

Any such change would require the assessment to be updated with the revised parameters.

5.5.2 Operation and Installation

- **Hours of operation:** the kitchen extract fan must be switched off by 23:00 at the latest, controlled by a timer or interlock so that it cannot run into the night-time period;
- **Isolation:** the fan should be mounted on anti-vibration mounts (for example Helios SDD-U) with flexible connections to the ductwork, and any external ductwork should be fixed to the building with resilient brackets; and
- **Changes:** any change to the fan selection, fan speed, duct route or diameter, discharge position or silencer should be reviewed against the parameters in Table 5.3 and the limit in Table 5.1.

The final design should be submitted as the Condition 6(a) scheme, with post-completion testing at R1 under Condition 6(b) to verify that the rating level does not exceed 43 dB $L_{Ar,1h}$.

5.6 Casing Breakout and Operation

The fan is located in the restaurant kitchen directly below Bedroom 1. The case breakout sound power of 73 dB LwA would produce a reverberant level of around 72 dB L_{Aeq} in the kitchen, below the level of the cooking activity itself; this is well below the restaurant source level assessed in Section 6.2, and its contribution in Bedroom 1 through the upgraded separating floor would be negligible, including during any period of operation after the restaurant has closed. The fan should not be fixed to the ceiling joists of the separating floor, and should be floor or wall mounted on anti-vibration mounts. As set out above, the fan must be switched off by 23:00 at the latest.

The second flue on the rear elevation serves the apartment's own cooker hood. It is a domestic extract used intermittently and is not external plant serving the restaurant for the purposes of Condition 6.

6.0 Commercial Noise Transfer Assessment

6.1 Assessment Criteria

For the assessment of noise transmitted from the ground floor restaurant into the apartment, the following internal noise criteria have been adopted:

- Habitable rooms (living room, bedrooms): 52 dB at 63 Hz and 46 dB at 125 Hz octave bands, with the remainder of the spectrum complying with NR 20;
- Non-habitable rooms (entrance corridor/staircase): NR 25 across all octave bands.

The 63 Hz and 125 Hz octave band limits at the lower frequencies are derived from low-frequency criteria commonly applied for the assessment of music noise transfer in residential settings, and align with the Manchester City Council Planning and Noise Technical Guidance (October 2022).

The restaurant may not be open later than 22:00 under Condition 11, and noise from the restaurant will therefore not occur during the night-time period (23:00 to 07:00) when the apartment's bedrooms are used for sleeping. The criteria for habitable rooms have therefore been set 5 dB above the night-time based criteria commonly applied where commercial uses operate late at night (47 dB at 63 Hz, 41 dB at 125 Hz and NR 15). NR 20 across the remaining spectrum corresponds to an overall A-weighted level of approximately 25 dB L_{Aeq}, which is approximately 10 dB below the BS 8233 daytime target of 35 dB $L_{Aeq,16h}$ for living rooms and bedrooms and the Condition 5 criterion for living rooms. The criterion is therefore substantially stricter than BS 8233 and Condition 5 for the hours during which the restaurant operates, and provides margin to accommodate variation in source character and operational pattern.

The adopted criterion of NR 25 in the non-habitable entrance corridor and staircase is based on achieving a level of around 10 dB below the recommended BS 8233 criteria and reflects the lower noise sensitivity of these spaces. The overall criteria are summarised below.

Table 6.1 Internal noise criteria (dB Leq at octave band centre frequency, Hz)

Room Type	Noise Transfer Limits in Habitable Room (L_{eq} dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Living room / bedroom	52	46	31	24	20	17	14	12
Corridor / staircase	55	44	35	29	25	22	20	18

6.2 Source Sound Levels

The ground floor unit is permitted for use as a restaurant (Use Class E(b)) under Condition 4 of the permission. The source sound level adopted for the assessment represents a busy restaurant operating with background music, applied to both the dining area (below the living room and Bedroom 2, and adjoining the apartment's entrance corridor and staircase) and the kitchen (below Bedroom 1), on a reasonable worst-case basis. The source sound levels are based on library/reference data and are provided below.

The restaurant may not be open later than 22:00 under Condition 11 and will not operate during the night-time period; the source level has therefore been assessed against the daytime-based criteria in Section 6.1.

Table 6.2 Source sound level (dB Leq at octave band centre frequency, Hz)

Description	Source Noise Level (L_{eq} dB) at Octave Band Centre Frequency (Hz)								Overall (dBA)
	63	125	250	500	1k	2k	4k	8k	
Restaurant with background music	65	70	75	75	75	75	70	70	81

Amplified music above background level has not been assessed and should not be permitted without a further assessment.

6.3 Floor Specification

The information provided by the client indicates the following build-up for the separating floor:

- Floating laminate on an acoustic anti-impact underlay, isolated from the skirting
- Plywood subfloor on timber joists
- At least 100 mm acoustic mineral wool (33 to 45 kg/m³) between the joists
- Ceiling to the restaurant of 2 x 12.5 mm acoustic plasterboard with staggered joints (or 1 x 15 mm) on metal resilient bars, perimeter sealed with acoustic intumescent mastic

A resilient bar ceiling fixed directly to the joists provides limited low-frequency sound insulation. The estimated performance of this build-up, set out in Table 6.3, may just about meet the minimum airborne standard of Approved Document E, but, as shown in Section 6.5, would not achieve the adopted criteria in the 250 Hz octave band. **The following upgraded build-up is therefore recommended**:

- Floating laminate on an acoustic anti-impact underlay, isolated from the skirting
- Plywood subfloor on timber joists, with at least 100 mm mineral wool (33 to 45 kg/m³) between the joists
- New suspended ceiling below the joists, with a cavity of at least 300 mm to the floorboards above
- New 2 x 12.5 mm Gyproc SoundBloc (or equivalent high-density acoustic plasterboard) ceiling on a Gypframe MF ceiling grid, suspended from the joists on British Gypsum Gypframe GA1 Acoustic Hangers, with no rigid connection between the ceiling and the floor joists

The upgraded build-up is anticipated to be capable of comfortably achieving the minimum standards for compliance with Approved Document E, with the predicted sound reduction performance set out in the table below. No recessed downlights or other penetrations should be made in the ceiling unless fitted with tested acoustic hoods, and the kitchen extract fan should not be fixed to the floor joists.

Table 6.3 Predicted sound insulation performance of separating floor options (Sound Reduction Index R, dB, at octave band centre frequency, Hz)

Element	Sound Reduction Performance (R dB) at Octave Band Centre Frequency (Hz)								R_w (dB)
	63	125	250	500	1k	2k	4k	8k	
Client proposed floor (resilient bar ceiling)	20	30	43	52	58	62	64	64	52
Upgraded separating floor (ceiling on GA1 acoustic hangers)	22	32	51	62	68	69	70	70	58

6.4 Party Wall Specification

The apartment is accessed from Kenyon Lane by a ground floor entrance corridor and staircase which run alongside the restaurant dining area. The client has indicated that the walls to the restaurant are of timber cavity framing with insulation and plasterboard. It is recommended that the wall separating the restaurant and the corridor/staircase is constructed as a twin stud partition with the following build-up:

- 2 x 12.5 mm SoundBloc
- Independent twin stud frame, with a cavity of no less than 150 mm
- 50 mm mineral wool insulation within the cavity
- 2 x 12.5 mm SoundBloc

The above is anticipated to be capable of comfortably achieving the minimum standards for compliance with Approved Document E, with the predicted sound reduction performance set out in the table below. A door between the restaurant and the corridor should be avoided; the wall should be continuous from floor slab to the underside of the separating floor.

Table 6.4 Predicted sound insulation performance of proposed partition (Sound Reduction Index R, dB, at octave band centre frequency, Hz)

Element	Sound Reduction Performance (R dB) at Octave Band Centre Frequency (Hz)								R_w (dB)
	63	125	250	500	1k	2k	4k	8k	
Twin stud partition	20	32	48	61	69	61	65	65	56

6.5 Predicted Internal Levels in the Apartment

The predicted resultant noise level within the apartment arising from operational noise in the ground floor restaurant has been calculated using the standard reverberant-room-to-reverberant-room formulation:

$SPL_2 = SPL_1 + 10\log_{10}(S/A) - SRI$

where SPL_1 is the sound level in the source room, SPL_2 is the sound level in the receiving room, S is the approximate area of the separating element, A is the equivalent absorption area in the receiving room, and SRI is the sound reduction index of the separating element.

The calculation has been undertaken for each noise-sensitive adjacency: the separating floor to the living room and Bedroom 2 (dining area below, 10log(S/A) of +1 dB), the separating floor to Bedroom 1 (kitchen below, +1 dB), and the party wall to the entrance corridor/staircase (+4 dB, allowing for the hard finishes of the stair enclosure). The results are presented below. Flanking transmission has not been included, and should be controlled by the detailing set out in Section 6.3.

The predicted internal noise levels in the apartment have been compared against the adopted criteria and summarised below.

Table 6.5 Assessment of noise transfer to habitable rooms from restaurant operations (dB Leq at octave band centre frequency, Hz)

Floor option	Description	Octave Band centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Client proposed	Predicted, Bedroom 1	46	41	33	24	18	14	7	7
	Criteria	52	46	31	24	20	17	14	12
	Compliance	✔	✔	✖	✔	✔	✔	✔	✔
Upgraded	Predicted, Bedroom 1	44	39	25	14	8	7	1	1
	Criteria	52	46	31	24	20	17	14	12
	Compliance	✔	✔	✔	✔	✔	✔	✔	✔

Table 6.6 Assessment of noise transfer to non-habitable rooms from restaurant operations (dB Leq at octave band centre frequency, Hz)

Element	Description	Octave Band centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Twin stud partition	Predicted sound level	49	42	31	18	10	18	9	9
	Criteria	55	44	35	29	25	22	20	18
	Compliance	✓	✓	✓	✓	✓	✓	✓	✓

Bedroom 1 is presented as the governing habitable room, as it has the smallest volume relative to the floor area; the levels in the living room and Bedroom 2 are within 1 dB of those in Bedroom 1. With the floor build-up proposed by the client, the predicted levels exceed the criteria in 1No of the eight octave bands (250 Hz), with the greatest exceedance of 2 dB. With the upgraded separating floor, the predicted levels achieve the criteria across the full octave band spectrum, with a margin of at least 6 dB in every band.

The predicted internal noise levels in the corridor/staircase achieve the NR 25 criterion across the full octave band spectrum with the twin stud partition, with comfortable margin throughout.

On this basis, subject to the upgraded separating floor and the twin stud partition, noise from the ground floor restaurant transmitted to the apartment is not considered to give rise to an adverse impact on the future occupiers of the development.

6.6 Approved Document E and Testing

Pre-completion sound insulation testing of the separating floor and the party wall to the corridor/staircase should be undertaken in accordance with Approved Document E and Regulation 41 of the Building Regulations, to demonstrate at least 43 dB $D_{nT,w}$ + Ctr airborne sound insulation, and the results included in the completion report required by Condition 5(b).

7.0 Conclusion

Murray Acoustics Ltd has undertaken a noise impact assessment of the development at 57 Kenyon Lane, Moston, Manchester, comprising a ground floor restaurant with a two-bedroom apartment above, to support the discharge of Conditions 5 and 6 of planning permission 144649/FO/2025.

Attended noise measurements were undertaken on 02 and 03 September 2026 at the front and rear of the building during the late evening (21:00 to 23:00), night-time (23:00 to 02:00) and morning rush hour (07:00 to 10:00). Road traffic on Kenyon Lane dominates the noise climate at the front, at 61 dB L_{Aeq} during the morning rush hour and 52 dB L_{Aeq} at night (free-field), while the rear is screened by the terrace, at 55 dB and 47 dB L_{Aeq} respectively, with a late evening background sound level of 48 dB L_{A90}.

The internal criteria of Condition 5 can be achieved with windows closed with glazing of $R_w + C_{tr}$ 35 dB to the front bedroom, $R_w + C_{tr}$ 29 dB to the living room roof window and $R_w + C_{tr}$ 26 dB to the rear bedroom, together with acoustic trickle ventilators of $D_{n,e,w} + C_{tr}$ 41 dB to the front bedroom, 35 dB to the living room roof window and 32 dB to the rear bedroom (or, alternatively, MVHR throughout). Open windows should not be relied upon for night-time cooling of the front bedroom.

Without attenuation, the kitchen extract fan (Helios GBD 630/4 T120) would give rise to a rating level of 66 dB $L_{Ar,1h}$ at the rear bedroom window of the apartment, above the Condition 6 limit of 43 dB $L_{Ar,1h}$ (5 dB below the late evening background sound level measured at the rear of the building). With an in-duct silencer (2100 mm long, 40% free area) the rating level reduces to 42 dB $L_{Ar,1h}$, meeting the limit, provided the fan is switched off by 23:00 at the latest. This is an extremely high-performance silencer requirement, which must be checked and confirmed by the supplier with tested data in each octave band before selection. Lowering the duty of the fan, or relocating the discharge termination further from the residential window, would reduce the silencer performance required and may be sensible. The final design should be demonstrated in the Condition 6(a) scheme and verified by testing.

The separating floor build-up proposed by the client, with a resilient bar ceiling, is not predicted to achieve the adopted internal criteria for habitable rooms (NR 20, with 52 dB at 63 Hz and 46 dB at 125 Hz, applicable as the restaurant closes by 22:00) with the restaurant operating with background music, exceeding the criterion by 2 dB in the 250 Hz octave band. An upgraded floor with a new 2 x 12.5 mm Gyproc SoundBloc ceiling suspended on British Gypsum Gypframe GA1 Acoustic Hangers, with no rigid connection to the floor joists and a cavity of at least 300 mm, is recommended, which achieves the criteria across the full spectrum with a margin of at least 6 dB in every octave band. A twin stud partition between the restaurant and the apartment's entrance

corridor/staircase is also recommended, which achieves NR 25. Compliance with Approved Document E should be confirmed by pre-completion testing.

On this basis, it is considered that a suitable internal noise environment can be achieved for the future occupiers of the apartment and that the restaurant can operate without unacceptable impact on them or on the neighbouring dwellings, subject to the measures identified in this report.

Appendix A – Environmental Noise Survey Results

Table A.1 Attended survey results, morning rush hour, 07:00 to 10:00 (measured levels, dB; MP1 façade, MP2 free-field)

Date	Start time	Position	$L_{Aeq,15min}$	$L_{A90,15min}$	L_{AFmax}
03/09/2026	07:00	MP1	63.2	54	80.6
03/09/2026	07:15	MP2	54.3	49	72.1
03/09/2026	07:30	MP1	63.8	55	78.8
03/09/2026	07:45	MP2	55.1	50	70.0
03/09/2026	08:00	MP1	64.7	57	80.4
03/09/2026	08:15	MP2	55.6	50	69.6
03/09/2026	08:30	MP1	64.4	56	79.9
03/09/2026	08:45	MP2	54.9	51	69.1
03/09/2026	09:00	MP1	65.4	57	81.8
03/09/2026	09:15	MP2	55.8	51	68.5
03/09/2026	09:30	MP1	64.6	56	78.1
03/09/2026	09:45	MP2	55.2	52	68.3

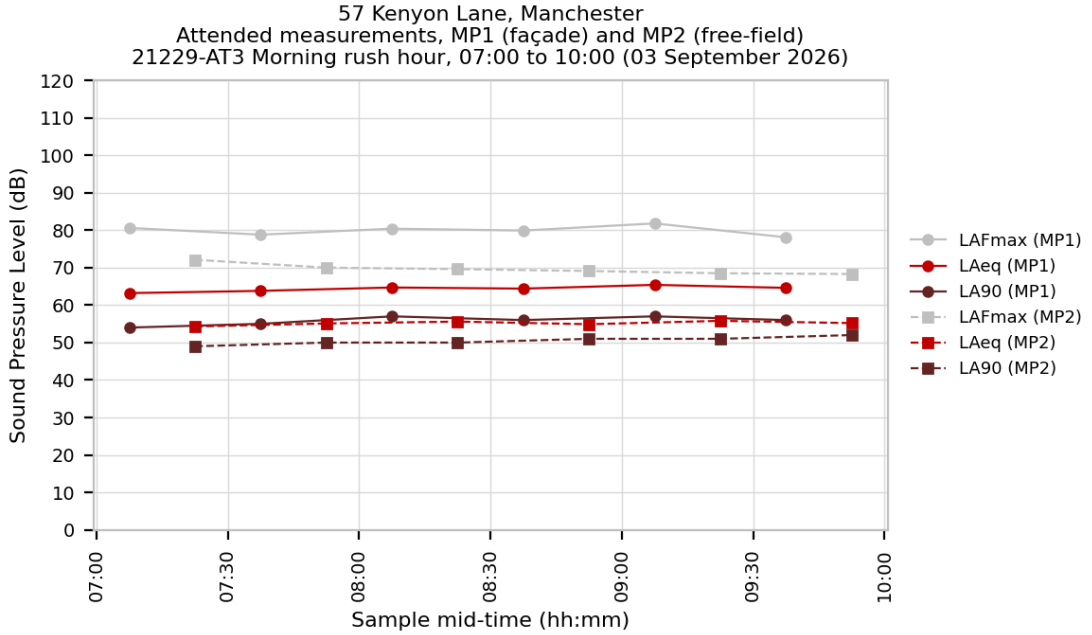


Table A.2 Attended survey results, late evening, 21:00 to 23:00 (measured levels, dB; MP1 façade, MP2 free-field)

Date	Start time	Position	$L_{Aeq,15min}$	$L_{A90,15min}$	L_{AFmax}
02/09/2026	21:00	MP1	61.6	54	79.1
02/09/2026	21:15	MP2	53.9	50	68.8
02/09/2026	21:30	MP1	61.3	53	77.7
02/09/2026	21:45	MP2	53.4	49	66.9
02/09/2026	22:00	MP1	60.7	53	76.8

Date	Start time	Position	$L_{Aeq,15min}$	$L_{A90,15min}$	L_{AFmax}
02/09/2026	22:15	MP2	52.8	48	67.9
02/09/2026	22:30	MP1	60.4	52	75.6
02/09/2026	22:45	MP2	52.6	48	64.6

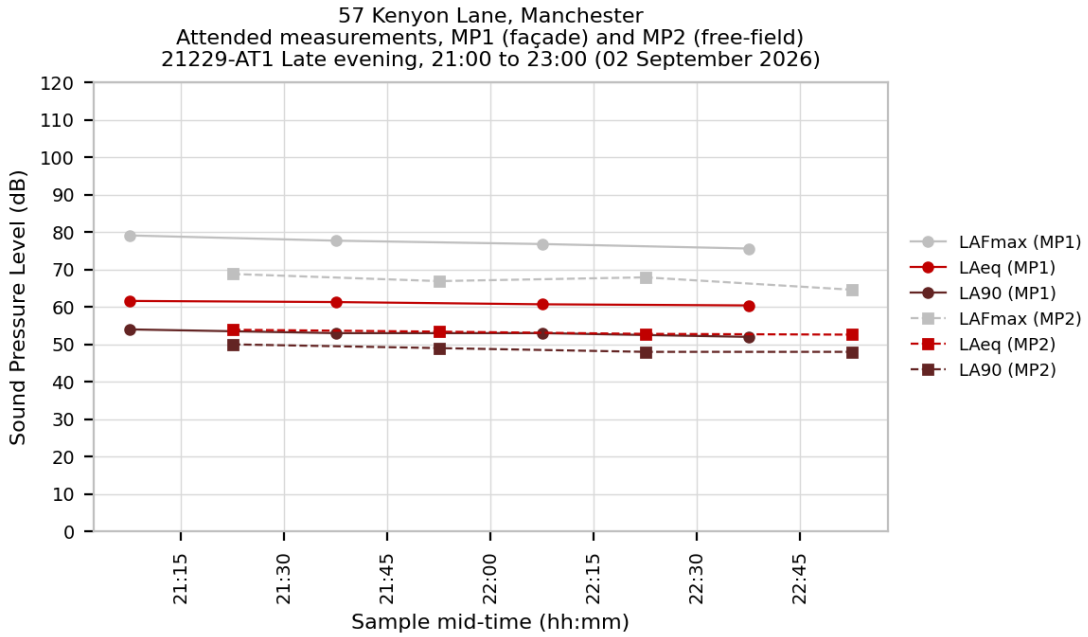
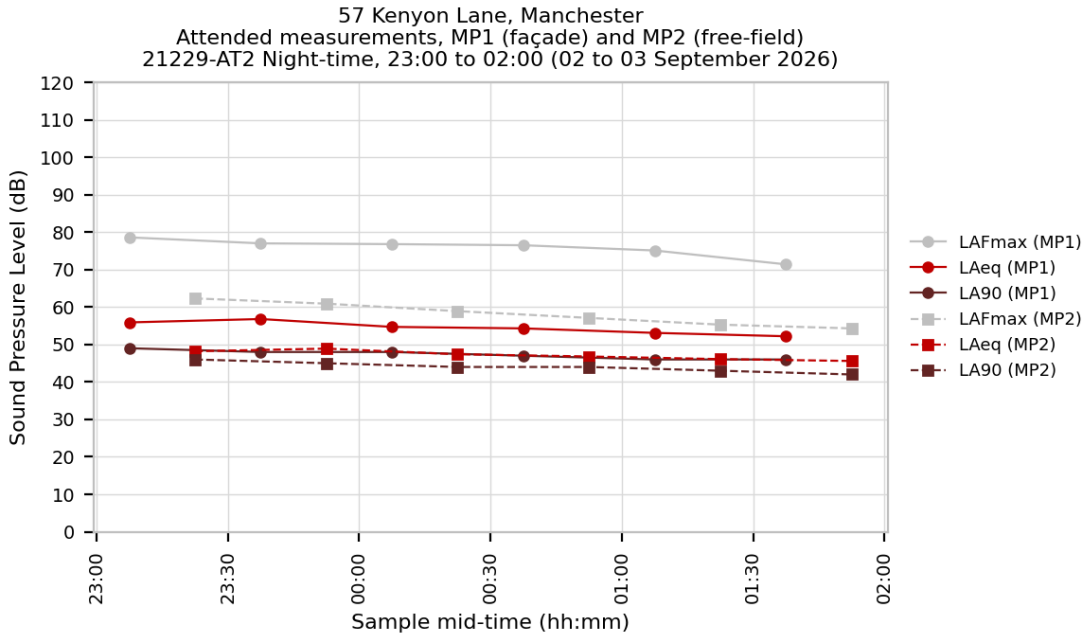


Table A.3 Attended survey results, night-time, 23:00 to 02:00 (measured levels, dB; MP1 façade, MP2 free-field)

Date	Start time	Position	$L_{Aeq,15min}$	$L_{A90,15min}$	L_{AFmax}
02/09/2026	23:00	MP1	55.9	49	78.6
02/09/2026	23:15	MP2	48.2	46	62.3
02/09/2026	23:30	MP1	56.8	48	77.0
02/09/2026	23:45	MP2	48.9	45	60.9
03/09/2026	00:00	MP1	54.7	48	76.8
03/09/2026	00:15	MP2	47.4	44	58.9
03/09/2026	00:30	MP1	54.3	47	76.5
03/09/2026	00:45	MP2	46.8	44	57.1
03/09/2026	01:00	MP1	53.1	46	75.1
03/09/2026	01:15	MP2	46.1	43	55.3
03/09/2026	01:30	MP1	52.2	46	71.4
03/09/2026	01:45	MP2	45.6	42	54.3


57 Kenyon Lane, Manchester
Attended measurements, MP1 (façade) and MP2 (free-field)
21229-AT2 Night-time, 23:00 to 02:00 (02 to 03 September 2026)
Sound Pressure Level (dB)
120
110
100
90
80
70
60
50
40
30
20
10
0
23:00
23:30
00:00
00:30
01:00
01:30
02:00
Sample mid-time (hh:mm)
LAFmax (MP1)
LAeq (MP1)
LA90 (MP1)
LAFmax (MP2)
LAeq (MP2)
LA90 (MP2)

Appendix B – Kitchen Extract Fan Datasheet

630 mm ø GigaBox centrifugal fan

Helios

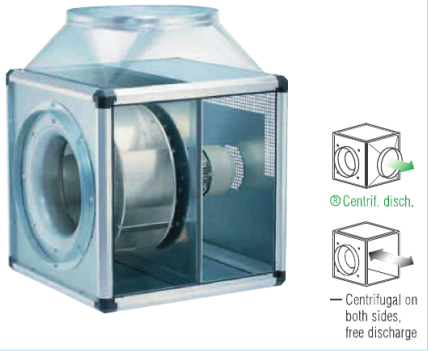
GB

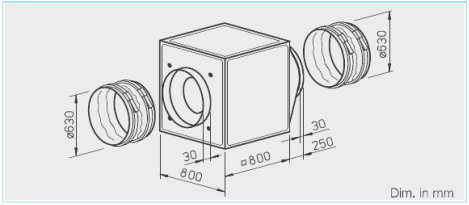
Arbitrary installation position and flexible assembly by five possible discharge directions.

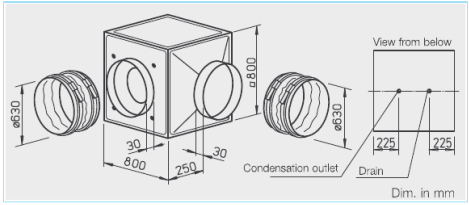


GB T120

Designed for moving dirty, humid and hot air up to max. 120° C.
Motor located outside the air flow.







■ **Special features of types GB T120**
- Designed for moving dirty, humid and hot air volumes up to max. 120° C.
- Motor located outside of air flow.
- Temperature insulated partition panel between motor and impeller, lined with 20 mm thick, flame-retardant mineral wool.
- Easily accessible motor and impeller unit, removable without disassembling the system components.
- Inspection cover with handle, simply remove for cleaning and maintenance.
- Condensate collector with condensate spigot included in delivery. Drill hole for rain drainage (accessories) for outdoor installation is prepared.

□ **Assembly GB T120**
Installation must be carried out with condensation discharge showing downward. Flexible assembly by three possible centrifugal discharge directions via the discharge adapter.
Outdoor installation is possible using outdoor cover hood and external weather louvers (accessories).

■ **Feature**

□ **Assembly of types GB**
Arbitrary installation position and flexible assembly by five possible discharge directions via the discharge adapter.
For wall mounting the wall bracket (accessories) have to be used. Outdoor installation is possible using outdoor cover hood and external weather louvers (accessories).

■ **Specification of both types**

□ **Casing**
Self-supporting frame construction from aluminium hollow profiles. Double-walled side panels from galvanised sheet steel, lined with 20 mm thick temperature insulating and flame-retardant mineral wool. Intake cone for ideal inflow as well as spigot and flexible sleeve (for the respective max. permissible air flow temperature) for duct connection. With discharge adapter (from square to circular) on the pressure side for low-loss discharge and flexible sleeve to reduce vibration transmission. Simple positioning by standard crane hooks.

□ **Impeller**
Smooth running backward curved aluminium centrifugal impeller highly efficient and direct driven. Energy efficient with a low noise development. Dynamically balanced together with the motor to DIN ISO 1940 Pt.1 – class 6.3.

□ **Motor**
Maintenance-free external rotor motor or IEC-standard motor protected to IP 54. With ball bearings and interference-free as standard.

□ **Electrical connection**
Standard terminal box (IP 54) fitted on the motor; with GB T120 fitted on the motor support plate.

Type	Ref. no.	Air flow volume (FID)	R.P.M.	Sound press. case breakout	Motor power (nominal)	Current full load	Current speed controlled	Wiring diagram	Maximum air flow temperature Full load	Maximum air flow temperature controlled	Weight (net) kg	5 step transformer controller with mot. protect. unit Type	Ref. no.	5 step transformer controller without mot. protect. unit Type	Ref. no.	Full motor protection unit using the thermal contacts Type	Ref. no.
		V m³/h	min⁻¹	dB(A) in 4 m	kW	A	A	No.	+°C	+°C	kg	Type	Ref. no.	Type	Ref. no.	Type	Ref. no.
2 speed motor, 3 Phase motor, 400 V / 3 ph. / 50 Hz, Y/△ wiring, protection to IP 54																	
GBD 630/6/6	5524	8600/9990	723/893	42	0.64/0.93	1.08/1.88	2.03	867	60	60	86	**RDS 4**	1316	**TSD 5,5**	1503	**MD**	5849
GBD 630/4/4	5523	12954/14430	1128/1383	51	2.40/3.45	4.10/6.20	7.20	867	75	50	105	**RDS 11**	1332	**TSD 11,0**	1513	**MD**	5849
3 Phase motor, 3~, 400 V, 50 Hz, protection to IP 54																	
GBD 630/4 T120	5779	14200	1445	53	4.40	8.0	—	499	120	—	105	—	—	—	—	**MD**	5849

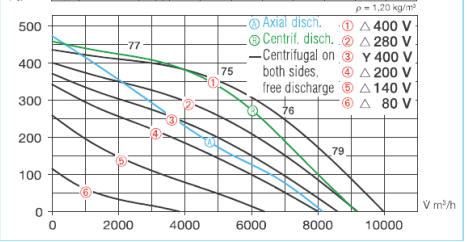
260

Helios

GigaBox centrifugal fan 630 mm ø

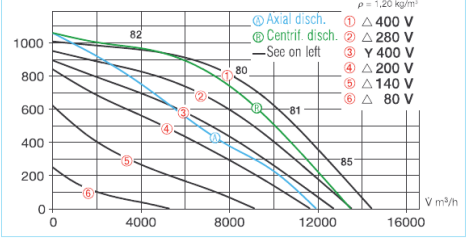
GBD 630/6/6

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Case breakout	dB(A)	62	59	58	48	47	45	41	35
L_{WA}	Intake	dB(A)	73	63	64	67	66	66	63	57
L_{WA}	Exhaust	dB(A)	79	68	72	73	73	71	66	59



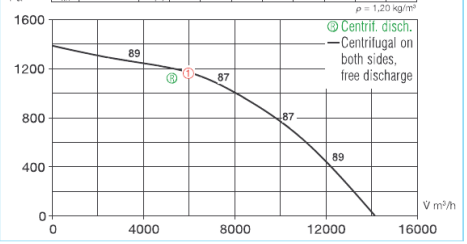
GBD 630/4/4

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Case breakout	dB(A)	71	68	57	57	56	54	50	44
L_{WA}	Intake	dB(A)	82	72	73	76	75	75	72	66
L_{WA}	Exhaust	dB(A)	88	77	81	82	82	80	75	68



GBD 630/4 T120

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Case breakout	dB(A)	73	66	67	65	65	65	61	55
L_{WA}	Intake	dB(A)	87	74	83	80	79	78	75	67
L_{WA}	Exhaust	dB(A)	90	81	82	84	84	82	77	69



Box fans

Motor protection
Types GBD with thermal contacts embedded on the terminal strip, which must be wired with the full motor protection device. Type GBD T120 with PTC thermistor for direct wiring with the full motor protection device or frequency inverter FU-BS (see table below, accessories).

Speed control
All types (except GB T120) are speed controllable by voltage reduction using a transformer controller. The 3-phase models can also be 2 speed controlled by Y/△ switch or full motor protection unit M4; Type GBD T120 is exclusively controllable via frequency inverter with Sine filter. The duties at different speeds are given in the performance curve.

Sound levels
Total sound power levels and the spectrum figures in dB(A) are given for:
- Sound level case breakout
- Sound level intake
- Sound level exhaust

In the table below as well as underneath the performance curve you can find additionally the sound pressure levels at 4 m (free field conditions).

Accessories of both types

Anti vibration mounts for installation indoors. Set of 4.
SDD-U Ref. no. 5627

Wall bracket for wall mounting.
GB-WK 630 Ref. no. 5626

External weather louvers to cover exhaust opening.
GB-WSG 630 Ref. no. 5640

Outdoor cover hood for outdoor installation.
GB-WSD 630 Ref. no. 5749

Specific accessories

for types GB
Condensate collector with condensate spigot for pipe connection.
GB-KW 630 Ref. no. 5645
(Condensate collector with condensate spigot included in delivery with GB T120).

On/Off and 2-speed switch for 3-phase Y/△ motors.
Type DS 2 [1] Ref. no. 1351
1) full motor protection unit recommended: MD Ref. No. 5849

for types GB T120
Rain drainage for outdoor installation (drill holes for rain drainage is already prepared).
GB-RA Ref. no. 9418

Information	Page
Information for planning	10 on
General techn. information, speed control	15 on
Accessory-Details	**Page**
Speed controller and full motor protection unit	525 on