

Phase 2 Newton Heath Manchester

Acoustic Assessment Report:
- *Planning Condition 17 (Plant Noise)*

Client:

Casey Group Limited
Rydings Road, Rochdale
OL12 9PS

Date:

9 March 2026

Our Ref:

22042-RP-2-R0



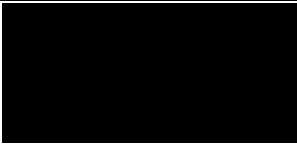
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noise and vibration

Document Control

Revision	Date	Author	Description
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1.0 Introduction

Jameson Acoustics Limited has been commissioned by Casy Group Limited to survey and assess plant noise emissions associated with air source heat pump installations at the recently constructed Phase 2 residential development on land off Oldham Road in Newton Heath. The aim is to assist in the discharge of Planning Condition 17, which states:

No	Wording
17	<p>(a) Prior to the first occupation of each phase of the development, details of any externally mounted ancillary plant, equipment and servicing for the relevant phase shall be submitted for approval in writing by the City Council, as Local Planning Authority. For the avoidance of doubt, externally mounted plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 db (Laeq) below the typical background (La90) level at the nearest noise sensitive location.</p> <p>(b) Prior to the first occupation of each phase of the development, a verification report for the relevant phase will be required to validate that the work undertaken conforms to the recommendations and requirements approved as part of part (a) of this planning condition. The verification report shall include post completion testing to confirm the noise criteria has been met. In instances of non-conformity, these shall be detailed along with mitigation measures required to ensure compliance with the noise criteria. Any mitigation measures shall be implemented in accordance with a timescale to be agreed with the City Council, as Local Planning Authority, and thereafter retained and maintained in situ.</p> <p><i>Reason - To minimise the impact of plant on the occupants of the development pursuant to policies SP1 and DM1 of the Manchester Core Strategy (2012) and saved policy DC26 of the Unitary Development Plan for the City of Manchester (1995).</i></p>

2.0 Plant Installations

The development's external plant comprises an air source heat pump (ASHP) to the rear garden of each residential house. NB The apartment block does not contain any such external plant.

There are 28nr properties in total, as shown on the below Site Layout.



Site Layout (ASHP installed in the rear garden of each house, shown in green)

Each ASHP (28nr in total) are of the same model and specification. The unit is the Daikin EDLA04-E2V3. Based on manufacturer's technical data sheets, the unit produces the following noise levels at 100% duty (heating).

- Sound pressure level at 1 m : 44 dB(A)
measured free-field hemi-spherical, at 1m from the front face (discharge)

Based on site survey measurements, presented later in this report, this unit does not exhibit any tonal noise characteristics. The units are new and operate without impulsivity (i.e. smooth ramp up/down operation) or irregularity/intermittency.

3.0 Nearest Noise Sensitive Receptors

The nearest and most exposed noise sensitive receptors are the residential windows of the proposed development itself.

We have considered a single worst-case property; Plot number 12, as highlighted below. We believe this property is exposed to the highest concentration of heat pumps (highlighted green) in close proximity.



Noise Sensitive Receptor (NSR) A – Plot 12

4.0 Assessment Method & Criteria

4.1 Local Authority Requirements

Manchester City Council (MCC) advises a BS 4142 assessment that demonstrates that:

‘Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location’.

4.2 BS 4142: 2014+A1: 2019

British Standard BS 4142 looks at the assessment of noise of a commercial / industrial nature. It describes methods for rating and assessing outdoor sound of an industrial and/or commercial nature “on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident”. In relation to this development, this includes sound from fixed installations, comprising M&E plant and equipment.

The assessment method is based on the difference between the measured ‘background sound level’ without the influence of any industrial noise source, and the ‘rating level’ of the industrial source, at the receiver location. The rating level is the specific noise level, plus any acoustic feature corrections applied. The standard states that:

- “a difference of around +10 dB or more is likely to be an indication of a significant adverse impact”;
- “a difference of around +5 dB is of marginal significance is likely to be an indication of an adverse impact”;
- “where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact”.

5.0 Plant Noise Limits

5.1 Baseline Noise Survey

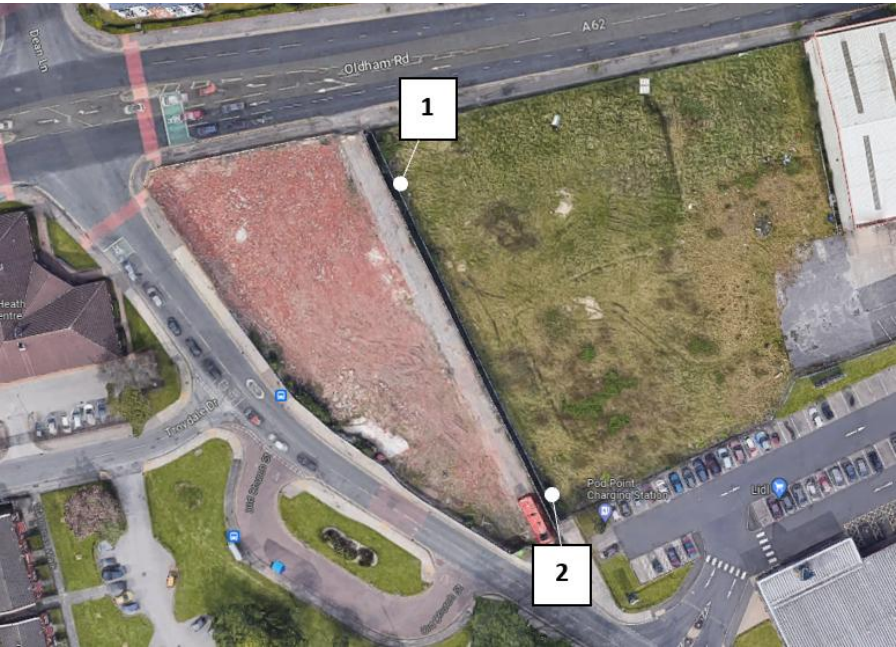
A baseline noise survey was conducted by Jameson Acoustics. The full methodology and results of the survey are presented in our Noise Impact Assessment Report 22042-RP-1-R1 dated 4 August 2023.

The following table summarises the measured representative background noise levels.

L_{A90} Background Noise Levels

The representative background determined through statistical analysis to BS 4142

Position	Free-Field Background Noise Level (dB)	
	Daytime L _{A90,1hr} (07:00-23:00)	Night-time L _{A90,15min} (23:00-07:00)
1	54	42
2	54	42



Site Plan showing measurement positions (© maps.google.co.uk)

5.2 Plant Noise Limits

Based on the MCC requirement and above background noise levels, the following plant noise limits were set to be achieved by all normal plant operating concurrently as an incident free-field noise level at 1m from the nearest noise sensitive residential windows.

Receptor Location	Plant Noise Rating Limit, $L_{A,r,Tr}$ ref. BS 4142 (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Any Noise Sensitive Receptor	49	37

6.0 Plant Noise Assessment (PC17 – Part A)

Calculations of cumulative noise levels from the simultaneous operation of all heat pumps operating at full duty are presented in Appendix B. These calculations consider industry standard acoustic corrections for distance, screening, reflections and directionality.

The calculations are performed to the centre of the NSR's first-floor bedroom window, at a height of circa 4.0 metres above ground level. Screening loss is occasionally afforded by intervening houses, but more commonly by solid 1.6 m high timber fencing erected around each rear garden. A simplified (and conservative) screening loss has been applied: 0 dB for no screening, 5 dB if the unit is just visible, 8 dB if the unit is partially screened, and 10 dB if the unit is fully screened.

For reflections, the heat pumps are mounted close the rear wall of each dwelling, meaning the Q-factor is 3 (versus a reference of 2) and the reflection correction is +3 dB.

For directionality, front discharge heat pumps are known to be loudest on their frontage (fan face). Measurements of three different specification front discharge heat pumps by Jameson Acoustics demonstrate that noise levels are consistently 5 to 7 dB lower when measured at 60 to 90 degrees off-axis from the front discharge fan. Hence, where the heat pump orientation is such that the front face is more than 60 degrees is off-axis from the receptor location (e.g. heat pump directly below the first floor window directly above the unit), the conservative end of the correction (5 dB) has been applied. A 30-50 degree offset shall be subject to 3 dB attenuation. Less than 30 degrees will have no correction.

The following tables summarise the results of our BS 4142 plant noise calculations to NSR A (Plot 12) and evaluates the results against the above night-time plant noise limit.

Receptor	Noise Rating Level, $L_{A,r,Tr}$ (dB)	Night-time Plant Noise Limit, $L_{A,r,Tr}$ (dB)	Compliance/ Exceedance
NSR A – Plot 07	31	37	✓

The assessment demonstrates that the cumulative noise rating level at the two identified worst-case receptors achieves the night-time plant noise emissions limit.

7.0 Post-Completion Testing (PC17 – Part B)

Part B of Planning Condition 15 requires a verification report to validate that the works undertaken conform to Part A of the condition. Part of this verification report requests post-completion noise testing, which has been carried out by Jameson Acoustics.

Our site test visit was carried out on Monday 23 February 2026 between 06:30-07:30hr using the following equipment.

Description	Equipment	Serial Nr	Lab Calibration Expiry	Lab Calibration Certificate Nr
Class 1 sound level meter	Cirrus CR:171B (with MK:224 mic)	G056718 (204055A)	11 Nov 2026	1190853
Class 1 sound calibrator	Cirrus CR:515	57570	11 Nov 2026	1190855

The equipment was calibrated before and after the survey, with no notable drifts in level noted.

During the survey, weather conditions were suitable for obtaining representative readings. The sky was overcast and wind speeds were low.

Measurements were taken with heat pumps operational and non-operational. In order to induce a load on the heat pumps, internal controllers were set to increase internal temperatures within the dwelling to 30 degrees, forcing the heat pump to operate at full duty.

2nr dwellings were selected for the survey. NB The heat pumps were in the process of being commissioned during our visit, which limited the availability of testable units. The three units selected were to Plots 11 and 12, with no light of sight to the main perimeter roads with the aim of minimising the influence of road traffic noise.

Measurements were taken at a distance of 1 metre from the front (discharge) face of the units. It should be noted, however, that even at this close distance, the influence of road traffic noise could not be eliminated.

At this time of the morning, traffic flows were sporadic meaning they unduly influenced L_{Aeq} levels. However, the L_{A90} levels, which represent the noise level recorded over 90% of the measurement period, were largely unaffected. Given that the noise generated by heat pumps is constant (steady state), the L_{A90} values was deemed to be the most suitable parameter to use (i.e. it excludes peak rises in noise levels during the measurement period, and gives a true reflection of the steady state noise floor).

In order to further minimise traffic noise effects, measurements were taken over shortened 1-minute periods.

The results of the 'cleanest' measurements (i.e. those where the traffic influence was minimised as best as possible) are summarised below. These are the lowest recorded L_{A90} values with and without the heat pump operational at each plot. The corresponding full raw results are presented in Appendix B.

Measurement	Measured Noise Level at 1m from front discharge face (dB)
Plot 11 – ASHP on	48
Plot 12 – ASHP on	47
Background	44

The following table presents our calculation of the equivalent free-field source noise level at 1m from the face discharge for comparison against the product specification of 44 dBA at 1m, presented in Section 2.0.

Receptor	ASHP
Measured source noise level, dBA	48
Residual (background) noise level, dBA	44
Source noise level corrected for background, dB : $10 \times \log_{10}(10^{(L1/10)} - 10^{(L2/10)})$	46
Reflection correction to free-field (Q factor = 3 to 2)	-3
ASHP noise level at 1m (free-field), dBA	43

The results indicate a good correlation between the measured and published noise data for the heat pump (within 1 dB), which demonstrates with reasonable confidence that the heat pumps are performing as specified.

The following photographs were taken during our survey, showing the label on the heat pump and a typical heat pump installation within a rear garden.



Photographs of typical heat pump install & model specification

8.0 Conclusion

Jameson Acoustics Limited has been commissioned by Casy Group Limited to survey and assess plant noise emissions associated with air source heat pump installations at the recently constructed Phase 2 housing development on land off Oldham Road in Newton Heath. The aim is to assist in the discharge of Planning Condition 17.

The assessment demonstrates that plant noise emission levels satisfy the local planning authority noise requirements (as calculated and installed).

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 – Plant Noise Data/Calculations

Raw data:

General Time	General Duration	General Overload	General Instrument	General Measurement	Note	Leq LAeq (dB)	Statistical LAF90 (dB)	1:1 Leq 63 Hz (dB)	1:1 Leq 125 Hz (dB)	1:1 Leq 250 Hz (dB)	1:1 Leq 500 Hz (dB)	1:1 Leq 1 kHz (dB)	1:1 Leq 2 kHz (dB)	1:1 Leq 4 kHz (dB)
06:42	00:00:30	No	G056718	1001 Plot 11		52.8	47.8	61.2	52.4	47.7	48.8	47.2	45.2	39.4
06:50	00:00:30	No	G056718	1002 Plot 12		51.6	46.9	59.3	50.8	46.2	48.2	46.7	44.6	34.6
07:04	00:01:47	No	G056718	1004 BGD		50.9	44.4	59.1	50.4	45.4	47.7	44.6	40.8	32.5

Calculation:

NSR A - Plot 12										
Description	Plot Nr	9	10	11	13	14	15	23	22	21
Sound Pressure Level, L _{Aeq} (dB)		44	44	44	44	44	44	44	44	44
Distance (m)		16	8	7	4	8	12.5	11.5	11.5	13
Distance Loss (dB)		-24	-18	-16	-11	-18	-22	-21	-21	-22
Reflection (Q factor)		2	2	2	2	2	2	2	2	2
Reflection Correction (dB)		3	3	3	3	3	3	3	3	3
Screening?	Partial screen	Full	None	Just visible	Partial screen	Full	Just visible	Just visible	Just visible	Full
Screening Loss (dB)		-8	-10	0	-5	-8	-10	-5	-5	-10
Directionality	<30° off-axis	>60° off-axis	30-60° off-axis	>60° off-axis	>60° off-axis	>60° off-axis	>60° off-axis	>60° off-axis	>60° off-axis	>60° off-axis
Directionality Correction (dB)		0	-5	-3	-5	-5	-5	-5	-5	-5
Specific Noise Level at Window, L _{Aeq} (dB)		15	14	28	26	16	10	16	16	10
Acoustic Feature Correction, re. BS 4142 (dB)		0	0	0	0	0	0	0	0	0
Noise Rating Level at Window, L _{A_r,Tr} (dB)		15	14	28	26	16	10	16	16	10
10^(dB/10)		32	25	631	398	40	10	40	40	10
Cumulative Noise Rating Level, L _{A_r,Tr} (dB)	31									