

Noise Impact Assessment

Cotton Hill, Rochdale

21072-RP-NIA-01

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PIC Homes

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Table of Contents

1.0 Introduction	3
2.0 Assessment Methodology	4
2.1 Assessment Standard	4
2.2 Scope of Assessment	4
2.3 Assessment Position	4
2.4 Source Position	5
2.5 Source Data	5
2.6 Directivity	5
2.7 Barrier Attenuation	5
3.0 MCS 020 Part A Noise Assessment	6
3.1 Overview	6
3.2 Summary of Results	6
4.0 Response to Specific Acoustic Concerns Raised	7
4.1 Overview	7
4.2 Cumulative Impact of All Units Operating Simultaneously	7
4.3 Influence on Prevailing Background Noise Environment	7
4.4 Wall-Mounted Position at First-Floor Window Height	7
4.5 Night-Time Noise Disturbance	7
4.6 Structure-Borne Noise and Vibration Within the Host Dwelling	8
4.7 Use of Sound Power Level in Place of Near-Field Sound Pressure Level	8
4.8 Calculation-Based Methodology and Use of Drawing Measurements	8
5.0 Conclusion	9
Appendix A – Manufacturer Product Data	10
Appendix B – Assessment Positions & ASHP Positions	11
Appendix C – MCS 020 Calculation per Assessment Position	16
Plot 1-1	16
Plot 2-1	17
Plot 2-2	18
Plot 3-1	19
Plot 3-2	20
Plot 4-1	21
Plot 5-1	22
Plot 6-1	23
Plot 6-2	24
Plot 7-1	25
Plot 8-1	26

1.0 Introduction

Murray Acoustics Ltd has been commissioned by PIC Homes to undertake an MCS 020 a) air source heat pump noise assessment in support of planning application PL/2026/0246, relating to the retrospective regularisation of ASHP installations at Cotton Hill, Rochdale (formerly Dobfield Road, OL16 3AW). The original planning permission was granted under reference 20/01093/FUL.

The application has attracted formal representations from occupiers of Plots 3 and 4, a number of which raise concerns regarding noise from the ASHP installations and specifically request an acoustic assessment to MCS 020 standards including cumulative assessment of multiple units operating simultaneously. This document directly addresses those requests.

This report sets out the assessment methodology and findings. The assessment is based on the proposed repositioned locations as shown on the submitted drawings.

This report follows 2No reports that were produced previously (ref. 21072-DDN-01 & 21072-DDN-02) which addressed Plot 03 & Plot 04 in isolation, this report has been prepared to expand the scope to the entire site.

2.0 Assessment Methodology

2.1 Assessment Standard

This assessment has been undertaken with reference to MCS 020 a) Issue 1.0, Air Source Heat Pump Sound Calculation (For Permitted Development Installations), published by the MCS Charitable Foundation in March 2025.

MCS 020 a) is formally scoped to permitted development installations. The present application (PL/2026/0246) is for express planning permission under Section 73 of the Town and Country Planning Act 1990. In the absence of a published standard specifically addressing ASHP noise in a non-permitted development planning context, MCS 020 a) has been adopted as the most appropriate available methodology for the following reasons:

- MCS 020 a) provides the established regulatory threshold for domestic ASHP noise in residential environments. The 37 dB(A) limit reflects World Health Organization guidance on community noise and has been adopted across the ASHP regulatory framework, including within the Class G permitted development conditions under the Town and Country Planning (General Permitted Development) (England) Order 2015.
- The formal representations received in respect of this application specifically request an acoustic assessment demonstrating compliance with MCS 020 planning standards. Adopting MCS 020 a) directly addresses the benchmark called for by the most technically detailed objections on the planning file.
- No alternative published standard provides a specific methodology for domestic ASHP noise in an express planning context. BS 4142:2014+A1:2019 is not considered appropriate, it is designed for industrial and commercial sources and its impact thresholds are calibrated for commercial source-receptor relationships rather than domestic plant.

The 37 dB $L_{Aeq,5min}$ criterion is adopted as the assessment threshold throughout this document.

MCS 020 a) is a deterministic calculation methodology; the assessment inputs (sound power level, source-to-receiver distance, directivity, and barrier correction) are determined from the manufacturer's published data and the submitted drawings.

2.2 Scope of Assessment

MCS 020 a) requires assessment at the nearest habitable room window of neighbouring properties only; noise at the dwelling served by its own ASHP unit is not assessed under the standard. However, given the nature of the planning objections received, and for robustness, this assessment includes the noise contribution of both the host plot's own ASHP unit and the opposing unit on the adjacent plot at each assessment position. This represents a conservative approach.

2.3 Assessment Position

The assessment position is defined in MCS 020 a) as a point 1 m external to the centre point of any door or window to a habitable room of a neighbouring property, measured perpendicular to the plane of that door or window. The assessment positions adopted in

this document are shown on the plan extracts in Appendix B and generally correspond to the first-floor habitable room window identified as the nearest noise-sensitive receptor. For some plots, 2No assessment positions are considered appropriate, to consider noise from both the western and eastern boundaries.

2.4 Source Position

In accordance with MCS 020 a) Step 5, the source position is taken as the centre point of the heat pump unit. The distance used in the calculation is the straight-line distance between this centre point and the assessment position, measured to the nearest 0.1 m. The centre point of each unit has been identified from the submitted drawings showing the proposed ASHP positions, and the distances to the relevant assessment positions have been measured accordingly.

2.5 Source Data

The installed units are Mitsubishi Ecodan UZ-WM85VAA(-BS) R32 Monobloc Air Source Heat Pumps. The manufacturer's declared A-weighted sound power level (L_w) is 58 dB(A), as confirmed from the manufacturer's product data sheet reproduced in Appendix A.

It is noted that the planning application documents reference a figure of 45 dB(A) at 1 m. This is a near-field sound pressure level and is not the same quantity as the sound power level. The sound power level is the correct input for the MCS 020 a) calculation and has been used throughout.

2.6 Directivity

Each unit is wall-mounted on the side elevation of the dwelling at approximately 2.5 m above ground level. At this height the unit is fixed to a single wall with no ground reflection. In accordance with MCS 020 a) Step 4, a directivity factor of $Q = 2$ is applied, representing one reflecting surface.

2.7 Barrier Attenuation

In accordance with MCS 020 a) Step 6, barrier attenuation is determined by reference to both the construction of any barrier between the heat pump and the assessment position, and the line of sight between the unit and the assessment position:

- **Clear line of sight** = 0 dB correction
- **Partial view** = -5 dB correction
- **No line of sight** = -10 dB correction

It is noted that the assessment position of 1 m perpendicular to the window face may, depending on the geometry, have a less favourable line of sight to the source than the window itself. The applied corrections are therefore considered to represent a cautious assessment of the barrier attenuation.

3.0 MCS 020 Part A Noise Assessment

3.1 Overview

This section presents the cumulative MCS 020 a) calculated sound pressure levels at each assessment position. In line with the conservative approach set out in Section 2.2, the contribution of all eight ASHP units operating simultaneously has been summed at each position, including the host plot's own unit. The full step-by-step MCS 020 a) calculation for each assessment position is provided in Appendix C.

3.2 Summary of Results

Table 3.1 sets out the cumulative A-weighted sound pressure level at each assessment position, compared against the 37.0 dB(A) threshold adopted in Section 2.1.

Table 3.1 MCS 020 a) Cumulative Assessment Results

Assessment Position	Cumulative Noise Level (dB L _{Aeq})	Threshold (dB L _{Aeq})	Compliant
Plot 1-1	29.1	≤ 37.0	Yes
Plot 2-1	34.0	≤ 37.0	Yes
Plot 2-2	29.5	≤ 37.0	Yes
Plot 3-1	33.3	≤ 37.0	Yes
Plot 3-2	33.5	≤ 37.0	Yes
Plot 4-1	31.3	≤ 37.0	Yes
Plot 5-1	33.5	≤ 37.0	Yes
Plot 6-1	31.6	≤ 37.0	Yes
Plot 6-2	27.4	≤ 37.0	Yes
Plot 7-1	30.3	≤ 37.0	Yes
Plot 8-1	28.1	≤ 37.0	Yes

The cumulative MCS 020 a) sound pressure level at every assessment position is below the 37.0 dB(A) threshold. The highest predicted level is 34.0 dB(A) at Plot 2 (Position 1), which sits 3.0 dB below the threshold. On this basis, the proposed ASHP positions comply with the MCS 020 a) noise criterion adopted for this assessment, including under cumulative operation of all eight units simultaneously.

4.0 Response to Specific Acoustic Concerns Raised

4.1 Overview

This section directly addresses the specific acoustic concerns raised in the formal representations received in respect of the application, and in the consultation comments from the Rochdale Borough Council Environmental Protection Team. Concerns falling outside the scope of a planning acoustic assessment are identified at Section 4.9 for completeness.

4.2 Cumulative Impact of All Units Operating Simultaneously

The Environmental Protection Team and objectors raise concerns regarding the cumulative noise impact of multiple ASHP units operating simultaneously across the site. This concern is directly addressed in Section 3.0 and Appendix C. At each assessment position the contribution from all eight ASHP units has been included, including the unit on the host dwelling itself. The highest predicted cumulative sound pressure level across the site is 34.0 dB(A) at Plot 2 (Position 1), which sits 3.0 dB below the 37 dB(A) threshold.

4.3 Influence on Prevailing Background Noise Environment

The Environmental Protection Team queried how the simultaneous operation of multiple ASHP units may influence the prevailing background noise environment. The 37 dB(A) threshold adopted in this assessment derives from World Health Organization Community Noise guidance and is set at a level intended to protect residential amenity, including at night-time. The highest cumulative level predicted across all assessment positions is 34.0 dB(A), which is below the WHO *Night Noise Guidelines for Europe* (2009) interim target of 40 dB $L_{night,outside}$, set for the protection of sleep. Given the absolute levels predicted, the contribution of the ASHP installations to the residential background noise environment is anticipated to be low, and a separate background noise comparison under BS 4142:2014+A1:2019 is not considered warranted for domestic plant of this type and scale.

4.4 Wall-Mounted Position at First-Floor Window Height

Objectors note that the units are wall-mounted at approximately 2.5 m above ground level, placing them in line with first-floor habitable room windows on adjacent dwellings. The assessment position adopted under MCS 020 a), and used throughout this assessment, is 1 m external to the centre of the nearest habitable room window of the adjacent dwelling, which in each case has been taken at first-floor level. The relative height of the source and receiver is therefore inherently captured in the straight-line source-to-receiver distance used in the calculation.

4.5 Night-Time Noise Disturbance

Objectors report that ASHP noise is audible inside their properties during night-time heating cycles when demand is highest and prevailing background noise is lowest. While reports of audibility are noted, the quantitative thresholds adopted in this assessment, the 37 dB(A) MCS 020 a) criterion and the WHO night noise guideline of 40 dB $L_{night,outside}$, are both calibrated for the protection of sleep at night. The cumulative predicted level at every assessment position sits below both criteria.

4.6 Structure-Borne Noise and Vibration Within the Host Dwelling

The counter-representation submitted in respect of Plot 4 raises structure-borne noise and vibration transmitted through the masonry of the host dwelling as a specific concern. Planning control is concerned with the amenity of third-party neighbouring occupiers; the host occupier is the beneficiary of the installation and is not a third party for planning purposes.

Internal noise and vibration within the dwelling served by its own ASHP is analogous in planning terms to internal noise from other domestic building services within that same dwelling, for example, a gas boiler firing during a heating cycle, a bathroom or kitchen extract fan in operation, or a domestic appliance such as a washing machine or dishwasher. Such internal noise is not a material planning consideration in respect of the dwelling generating it. It is properly a matter for the installer under the relevant MCS installation standards (MIS 3005 series), the manufacturer's installation instructions, and Building Regulations.

Structure-borne transmission into the host dwelling accordingly falls outside the scope of a planning acoustic assessment.

4.7 Use of Sound Power Level in Place of Near-Field Sound Pressure Level

The counter-representation observes that the original planning application referenced a figure of 45 dB(A) at 1 m. As set out in Section 2.5, this is a near-field A-weighted sound pressure level and represents a different acoustic quantity to the A-weighted sound power level. Both are valid manufacturer-declared values for the unit, but the sound power level is the correct input quantity for the MCS 020 a) calculation. The 58 dB(A) sound power level confirmed by the manufacturer's product data sheet at Appendix A has been used throughout this assessment.

4.8 Calculation-Based Methodology and Use of Drawing Measurements

The counter-representation notes that the assessment is based on drawing measurements rather than on-site survey. As set out in Section 2.2, MCS 020 a) is a deterministic calculation methodology and the assessment inputs (sound power level, distance, directivity factor, barrier correction) are not altered by site attendance.

Source-to-receiver distances have been scaled from the submitted drawings to the nearest 0.1 m, in accordance with Step 5 of the published method. The assessment has been carried out in full accordance with MCS 020 a) Issue 1.0.

5.0 Conclusion

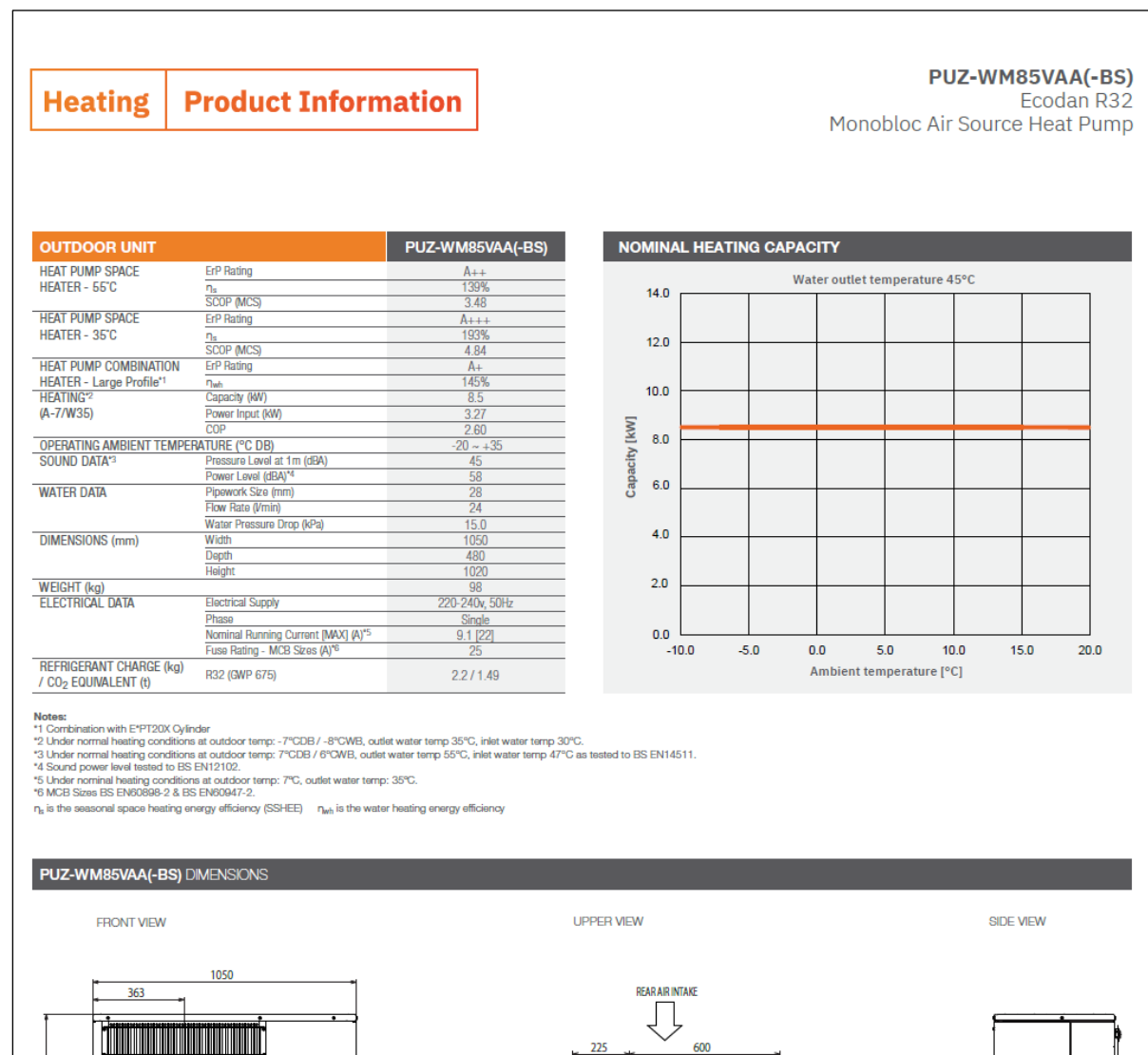
Murray Acoustics Ltd has undertaken an MCS 020 a) noise assessment of the proposed ASHP positions at Cotton Hill, Rochdale. The assessment has been carried out with reference to MCS 020 a) Issue 1.0, adopted as the most appropriate available methodology for this express planning application in the absence of a published standard specifically addressing ASHP noise in a non-permitted development context.

The assessment covers assessment positions at each plot. At all assessment positions, the cumulative noise level from all ASHP units operating simultaneously is predicted to be below the MCS 020 a) threshold of 37.0 dB(A).

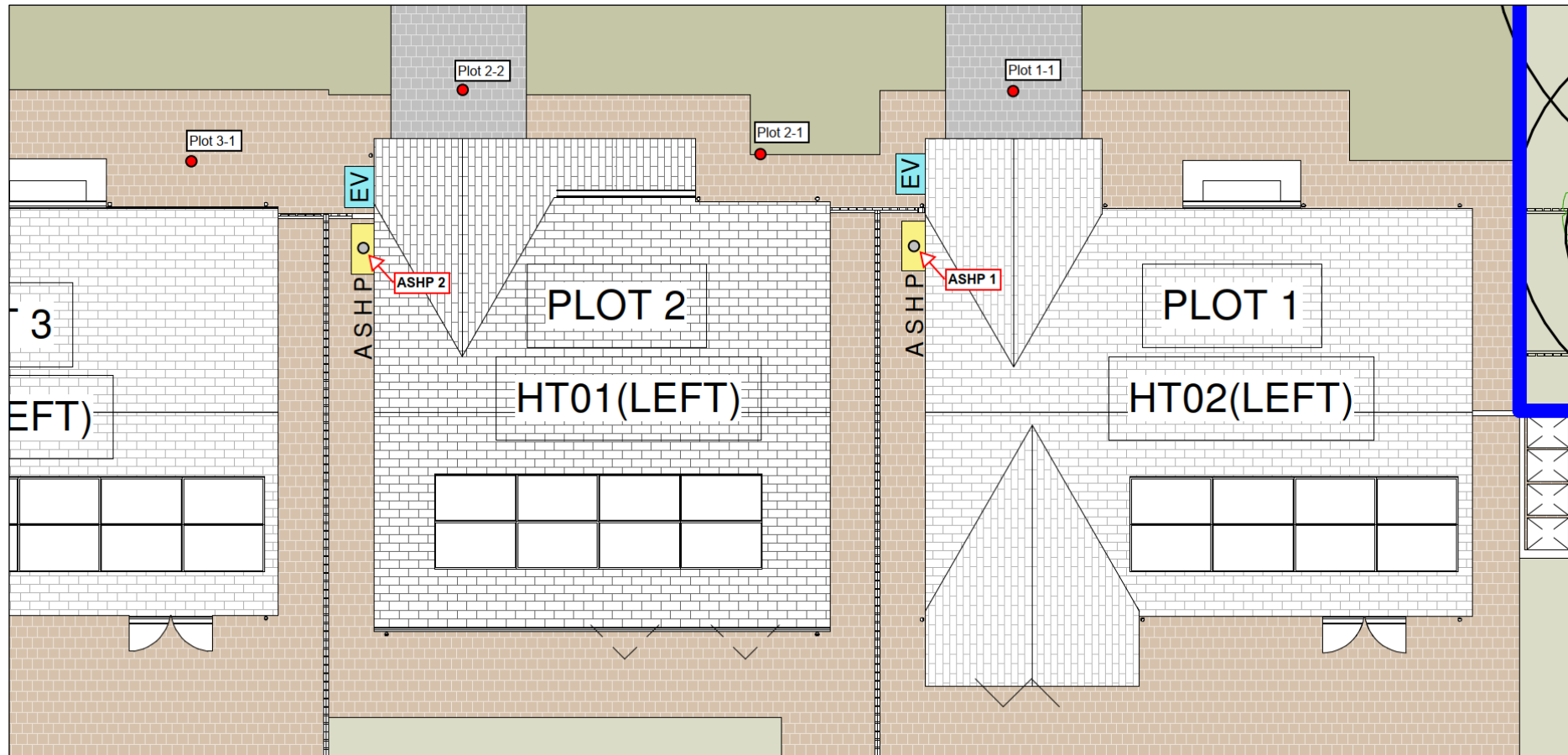
It is noted that the assessment has been undertaken conservatively, including the noise contribution of the host plot's own ASHP unit at each position, and applying barrier corrections based on line of sight from the top edge of each unit to the assessment position that is 1 m from the window itself (and therefore in a greater line of sight). The results demonstrate compliance under these conservative assumptions.

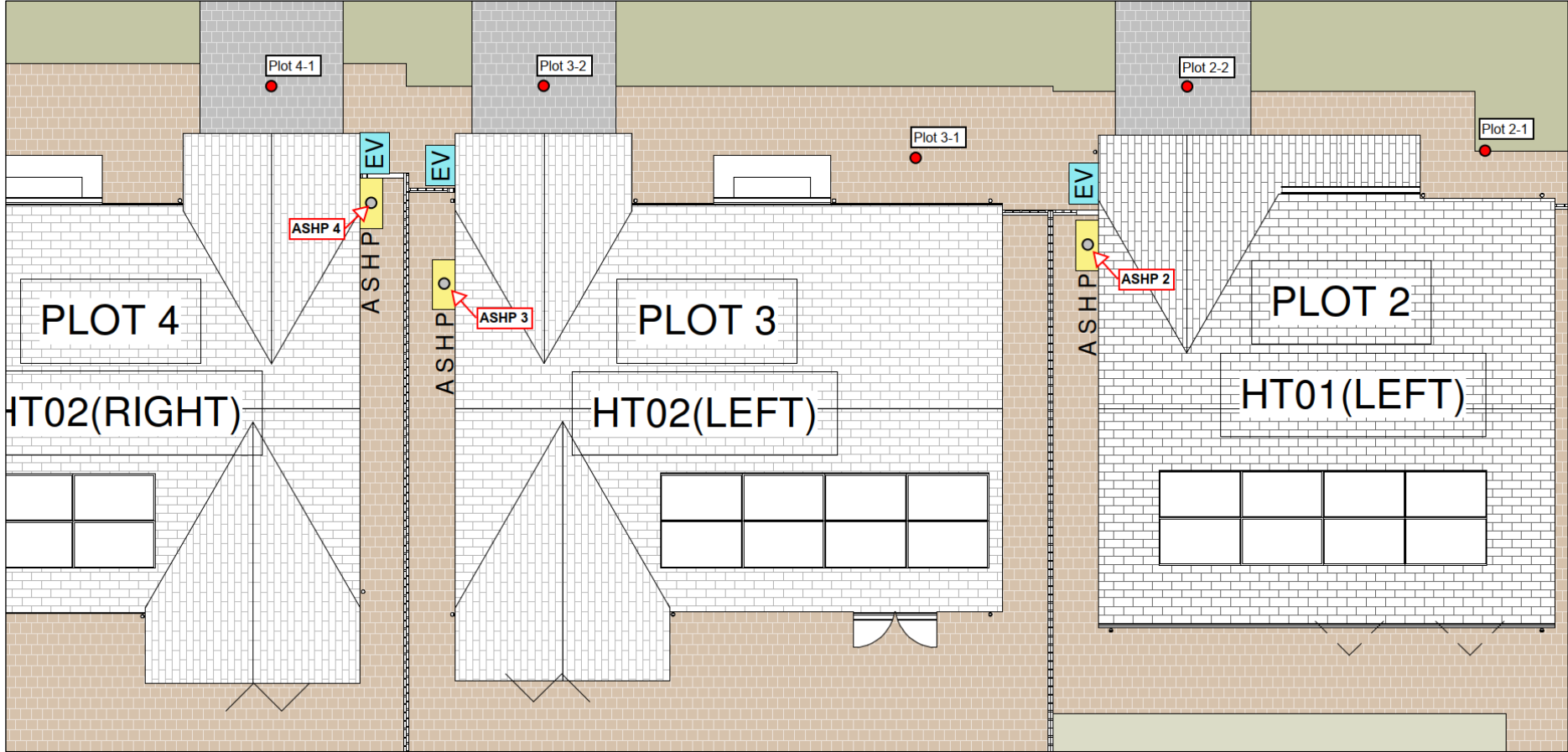
Appendix A – Manufacturer Product Data

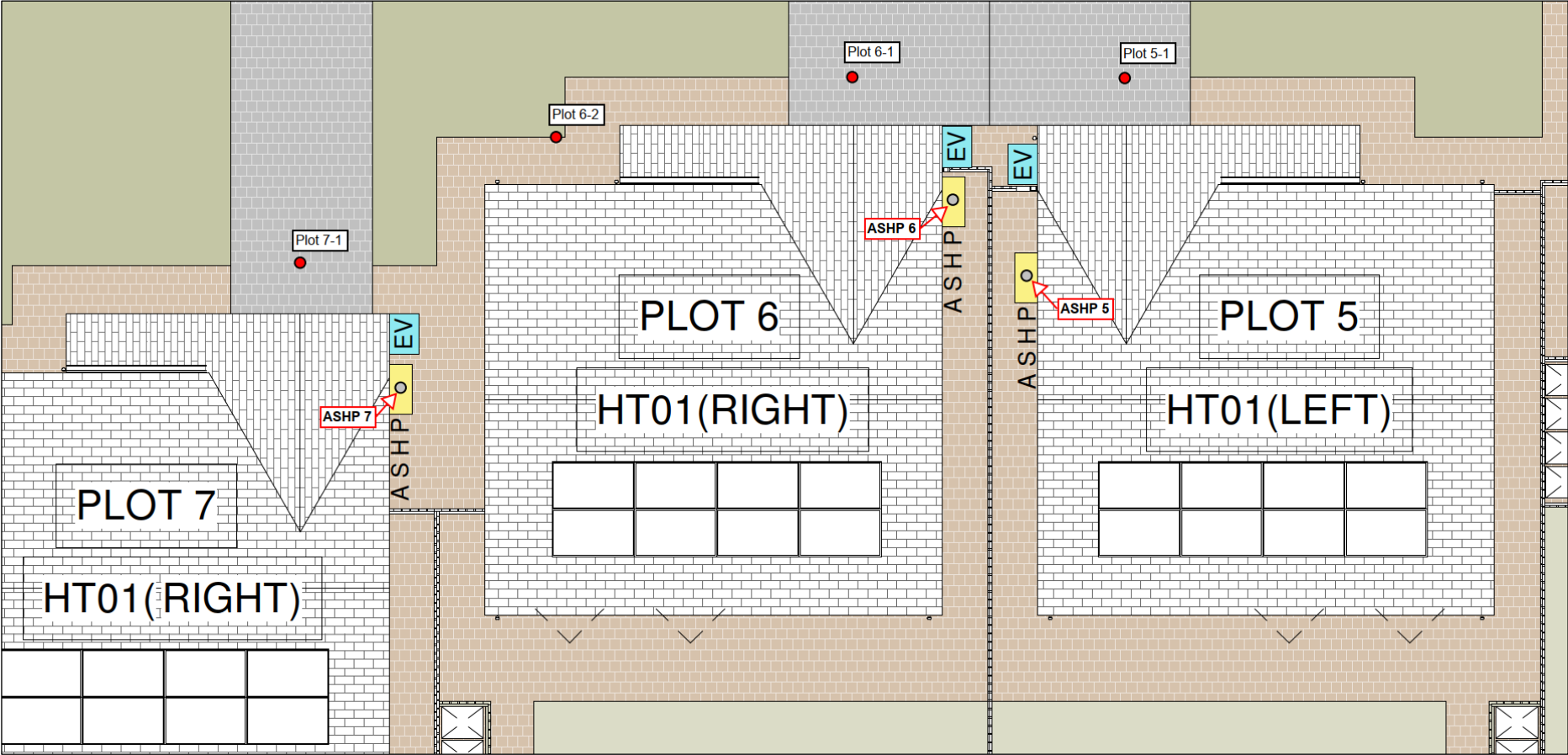
The manufacturer's product data for the Mitsubishi Ecodan UZ-WM85VAA(-BS) R32 Monobloc Air Source Heat Pump, confirming the declared A-weighted sound power level of 58 dB(A), is provided below.

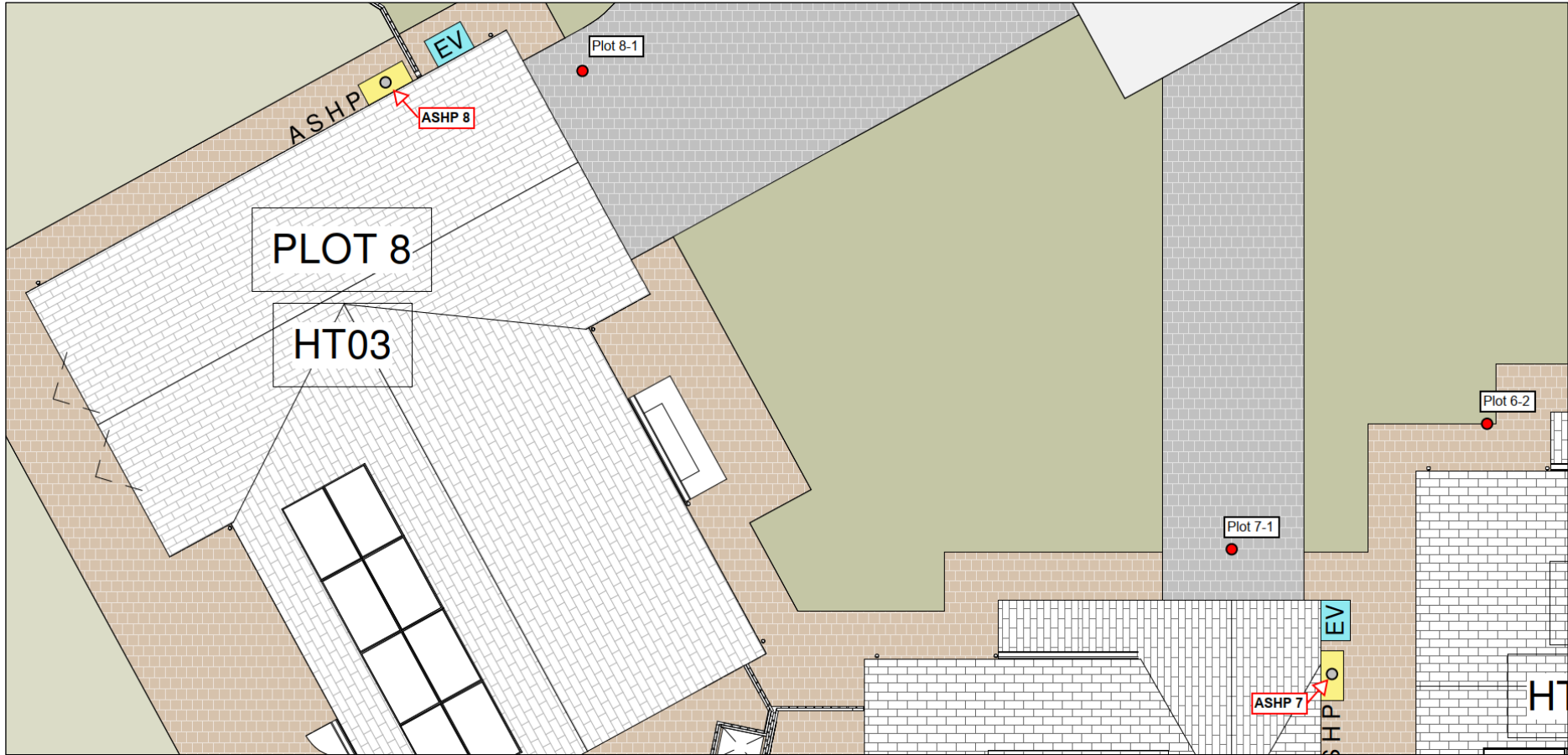


Appendix B – Assessment Positions & ASHP Positions









Appendix C – MCS 020 Calculation per Assessment Position

Plot 1-1

Step	Instructions	ASHP							
		1	2	3	4	5	6	7	8
1	Date calculation undertaken	19 May 2026							
2	Description of assessment position	Plot 1, Cotton Hill, Rochdale, first-floor habitable room window, Assessment Position 1							
3	From manufacturer's data, obtain the A-weighted sound power level of the heat pump.	58	58	58	58	58	58	58	58
4	Determine the directivity 'Q' of the heat pump noise.	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2
5	Measure the distance from the heat pump to the assessment position in metres (m)	3.7	14	27.4	28.7	53.7	54.9	67	85
6	Determine any barrier corrections between the heat pump and the assessment position (dB)	-10	-10	-10	-10	-10	-10	-10	-10
7a	Calculate the sound pressure level from the heat pump at the assessment position (dBA)	28.7	17.1	11.3	10.9	5.4	5.2	3.5	1.4
7b	Calculate the total sound pressure level from the heat pump at the assessment position	29.1 dBA							
8	Is the calculated sound pressure level at the assessment position equal to or lower than the permitted development noise limit of 37.0 dB(A)?	Yes							

Plot 2-1

Step	Instructions	ASHP							
		1	2	3	4	5	6	7	8
1	Date calculation undertaken	19 May 2026							
2	Description of assessment position	Plot 2, Cotton Hill, Rochdale, first-floor habitable room window, Assessment Position 1							
3	From manufacturer's data, obtain the A-weighted sound power level of the heat pump.	58	58	58	58	58	58	58	58
4	Determine the directivity 'Q' of the heat pump noise.	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2
5	Measure the distance from the heat pump to the assessment position in metres (m)	3.7	8.5	22	23.4	58	49	61	79
6	Determine any barrier corrections between the heat pump and the assessment position (dB)	-5	-10	-10	-10	-10	-10	-10	-10
7a	Calculate the sound pressure level from the heat pump at the assessment position (dBA)	33.7	21.4	13.2	12.6	4.7	6.2	4.3	2.1
7b	Calculate the total sound pressure level from the heat pump at the assessment position	34.0 dBA							
8	Is the calculated sound pressure level at the assessment position equal to or lower than the permitted development noise limit of 37.0 dB(A)?	Yes							

Plot 2-2

Step	Instructions	ASHP							
		1	2	3	4	5	6	7	8
1	Date calculation undertaken	19 May 2026							
2	Description of assessment position	Plot 2, Cotton Hill, Rochdale, first-floor habitable room window, Assessment Position 2							
3	From manufacturer's data, obtain the A-weighted sound power level of the heat pump.	58	58	58	58	58	58	58	58
4	Determine the directivity 'Q' of the heat pump noise.	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2
5	Measure the distance from the heat pump to the assessment position in metres (m)	10	3.8	16	17	42	43.6	55.7	73.4
6	Determine any barrier corrections between the heat pump and the assessment position (dB)	-10	-10	-10	-10	-10	-10	-10	-10
7a	Calculate the sound pressure level from the heat pump at the assessment position (dBA)	20.0	28.4	15.9	15.4	7.6	7.2	5.1	2.7
7b	Calculate the total sound pressure level from the heat pump at the assessment position	29.5 dBA							
8	Is the calculated sound pressure level at the assessment position equal to or lower than the permitted development noise limit of 37.0 dB(A)?	Yes							

Plot 3-1

Step	Instructions	ASHP							
		1	2	3	4	5	6	7	8
1	Date calculation undertaken	19 May 2026							
2	Description of assessment position	Plot 3, Cotton Hill, Rochdale, first-floor habitable room window, Assessment Position 1							
3	From manufacturer's data, obtain the A-weighted sound power level of the heat pump.	58	58	58	58	58	58	58	58
4	Determine the directivity 'Q' of the heat pump noise.	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2
5	Measure the distance from the heat pump to the assessment position in metres (m)	15.2	4.1	10.2	11.5	36.6	37.6	49.8	68
6	Determine any barrier corrections between the heat pump and the assessment position (dB)	-10	-5	-10	-10	-10	-10	-10	-10
7a	Calculate the sound pressure level from the heat pump at the assessment position (dBA)	16.4	32.8	19.8	18.8	8.7	8.5	6.1	3.4
7b	Calculate the total sound pressure level from the heat pump at the assessment position	33.3 dBA							
8	Is the calculated sound pressure level at the assessment position equal to or lower than the permitted development noise limit of 37.0 dB(A)?	Yes							

Plot 3-2

Step	Instructions	ASHP							
		1	2	3	4	5	6	7	8
1	Date calculation undertaken	19 May 2026							
2	Description of assessment position	Plot 3, Cotton Hill, Rochdale, first-floor habitable room window, Assessment Position 2							
3	From manufacturer's data, obtain the A-weighted sound power level of the heat pump.	58	58	58	58	58	58	58	58
4	Determine the directivity 'Q' of the heat pump noise.	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2
5	Measure the distance from the heat pump to the assessment position in metres (m)	23.1	11.8	4.6	4.4	29.7	30.5	42	61
6	Determine any barrier corrections between the heat pump and the assessment position (dB)	-10	-10	-10	-5	-10	-10	-10	-10
7a	Calculate the sound pressure level from the heat pump at the assessment position (dBA)	12.7	18.6	26.8	32.1	10.6	10.3	7.6	4.3
7b	Calculate the total sound pressure level from the heat pump at the assessment position	33.5 dBA							
8	Is the calculated sound pressure level at the assessment position equal to or lower than the permitted development noise limit of 37.0 dB(A)?	Yes							

Plot 4-1

Step	Instructions	ASHP							
		1	2	3	4	5	6	7	8
1	Date calculation undertaken	19 May 2026							
2	Description of assessment position	Plot 4, Cotton Hill, Rochdale, first-floor habitable room window, Assessment Position 1							
3	From manufacturer's data, obtain the A-weighted sound power level of the heat pump.	58	58	58	58	58	58	58	58
4	Determine the directivity 'Q' of the heat pump noise.	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2
5	Measure the distance from the heat pump to the assessment position in metres (m)	28.8	17.5	5.5	3.3	24.9	25.4	37.8	54
6	Determine any barrier corrections between the heat pump and the assessment position (dB)	-10	-10	-10	-10	-10	-10	-10	-10
7a	Calculate the sound pressure level from the heat pump at the assessment position (dBA)	10.8	15.2	25.2	29.6	12.1	11.9	8.5	5.4
7b	Calculate the total sound pressure level from the heat pump at the assessment position	31.3 dBA							
8	Is the calculated sound pressure level at the assessment position equal to or lower than the permitted development noise limit of 37.0 dB(A)?	Yes							

Plot 5-1

Step	Instructions	ASHP							
		1	2	3	4	5	6	7	8
1	Date calculation undertaken	19 May 2026							
2	Description of assessment position	Plot 5, Cotton Hill, Rochdale, first-floor habitable room window, Assessment Position 1							
3	From manufacturer's data, obtain the A-weighted sound power level of the heat pump.	58	58	58	58	58	58	58	58
4	Determine the directivity 'Q' of the heat pump noise.	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2
5	Measure the distance from the heat pump to the assessment position in metres (m)	48.2	36.8	23.1	22.2	4.5	4.4	16.4	35.5
6	Determine any barrier corrections between the heat pump and the assessment position (dB)	-10	-10	-10	-10	-10	-5	-10	-10
7a	Calculate the sound pressure level from the heat pump at the assessment position (dBA)	6.4	8.7	12.7	13.1	27.0	32.1	15.7	9.0
7b	Calculate the total sound pressure level from the heat pump at the assessment position	33.5 dBA							
8	Is the calculated sound pressure level at the assessment position equal to or lower than the permitted development noise limit of 37.0 dB(A)?	Yes							

Plot 6-1

Step	Instructions	ASHP							
		1	2	3	4	5	6	7	8
1	Date calculation undertaken	19 May 2026							
2	Description of assessment position	Plot 6, Cotton Hill, Rochdale, first-floor habitable room window, Assessment Position 1							
3	From manufacturer's data, obtain the A-weighted sound power level of the heat pump.	58	58	58	58	58	58	58	58
4	Determine the directivity 'Q' of the heat pump noise.	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2
5	Measure the distance from the heat pump to the assessment position in metres (m)	53.9	42.4	29	28	5.4	3.2	11.7	29
6	Determine any barrier corrections between the heat pump and the assessment position (dB)	-10	-10	-10	-10	-10	-10	-10	-10
7a	Calculate the sound pressure level from the heat pump at the assessment position (dBA)	5.4	7.5	10.8	11.1	25.4	29.9	18.7	10.8
7b	Calculate the total sound pressure level from the heat pump at the assessment position	31.6 dBA							
8	Is the calculated sound pressure level at the assessment position equal to or lower than the permitted development noise limit of 37.0 dB(A)?	Yes							

Plot 6-2

Step	Instructions	ASHP							
		1	2	3	4	5	6	7	8
1	Date calculation undertaken	19 May 2026							
2	Description of assessment position	Plot 6, Cotton Hill, Rochdale, first-floor habitable room window, Assessment Position 2							
3	From manufacturer's data, obtain the A-weighted sound power level of the heat pump.	58	58	58	58	58	58	58	58
4	Determine the directivity 'Q' of the heat pump noise.	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2
5	Measure the distance from the heat pump to the assessment position in metres (m)	60	49	35	34	10.2	8.4	6.1	24
6	Determine any barrier corrections between the heat pump and the assessment position (dB)	-10	-10	-10	-10	-10	-10	-10	-10
7a	Calculate the sound pressure level from the heat pump at the assessment position (dBA)	4.5	6.2	9.1	9.4	19.8	21.5	24.3	12.4
7b	Calculate the total sound pressure level from the heat pump at the assessment position	27.4 dBA							
8	Is the calculated sound pressure level at the assessment position equal to or lower than the permitted development noise limit of 37.0 dB(A)?	Yes							

Plot 7-1

Step	Instructions	ASHP							
		1	2	3	4	5	6	7	8
1	Date calculation undertaken	19 May 2026							
2	Description of assessment position	Plot 7, Cotton Hill, Rochdale, first-floor habitable room window, Assessment Position 1							
3	From manufacturer's data, obtain the A-weighted sound power level of the heat pump.	58	58	58	58	58	58	58	58
4	Determine the directivity 'Q' of the heat pump noise.	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2
5	Measure the distance from the heat pump to the assessment position in metres (m)	66	54.5	41	40	15.2	13.7	3.3	20.1
6	Determine any barrier corrections between the heat pump and the assessment position (dB)	-10	-10	-10	-10	-10	-10	-10	-10
7a	Calculate the sound pressure level from the heat pump at the assessment position (dBA)	3.6	5.3	7.8	8.0	16.4	17.3	29.6	14.0
7b	Calculate the total sound pressure level from the heat pump at the assessment position	30.3 dBA							
8	Is the calculated sound pressure level at the assessment position equal to or lower than the permitted development noise limit of 37.0 dB(A)?	Yes							

Plot 8-1

Step	Instructions	ASHP							
		1	2	3	4	5	6	7	8
1	Date calculation undertaken	19 May 2026							
2	Description of assessment position	Plot 8, Cotton Hill, Rochdale, first-floor habitable room window, Assessment Position 1							
3	From manufacturer's data, obtain the A-weighted sound power level of the heat pump.	58	58	58	58	58	58	58	58
4	Determine the directivity 'Q' of the heat pump noise.	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2	Q = 2
5	Measure the distance from the heat pump to the assessment position in metres (m)	79	67	53	52	30.8	28.7	30.4	4.1
6	Determine any barrier corrections between the heat pump and the assessment position (dB)	-10	-10	-10	-10	-10	-10	-10	-10
7a	Calculate the sound pressure level from the heat pump at the assessment position (dBA)	2.1	3.5	5.5	5.7	10.2	10.9	10.4	27.8
7b	Calculate the total sound pressure level from the heat pump at the assessment position	28.1 dBA							
8	Is the calculated sound pressure level at the assessment position equal to or lower than the permitted development noise limit of 37.0 dB(A)?	Yes							