

Noise Impact Assessment (v4)

Air Source Heat Pump Installation

St Luke's Church, St Lukes Close, Hedge End, Southampton SO30 2US

Prepared on 16/09/2026 by Christopher Hibbert on behalf of St Luke's Church to satisfy Local List Item 25 (Noise Assessment, including vibration) — Eastleigh Borough Council Local List for Validation of Planning Applications

1. Introduction

This Noise Impact Assessment has been prepared in support of a planning application for the installation of a low carbon heating system to replace a failed gas boiler system.

This assessment addresses Eastleigh Borough Council's Local List requirement (Item 25 – Noise Assessment) and has regard to National Planning Policy Framework (NPPF) (2026) Part 3.2 and Eastleigh Borough Local Plan (2016–2036) Policies DM8 and DM11.

2. Site and Proposal Description

Application site	St Luke's Church, St Lukes Cl, Hedge End, Southampton SO30 2US
Nature of premises	Church consisting of main hall and various smaller rooms used for worship and by a variety of community users
Proposed development	Replacement of 2 x 30kW gas boilers with a low carbon heating system consisting of: Outdoor units: 2 x Mitsubishi Electric Ecodan R290 Monobloc Air Source Heat Pump (ASHP) PUZ-WZ120VAA 12kW 2 x Mitsubishi Electric PUZ-ZM140VDA Air Conditioner - to be used for heating and cooling. The PUZ-WZ120VAA ASHP units will be used in a cascaded connection to an existing wet heating system feeding radiators throughout the building. Each PUZ-ZM140VDA Air Conditioner will be connected to a separate PCA-M140KA2 indoor unit providing blown air heating and cooling.
Proposed location of unit(s)	North West elevation: 1 x Mitsubishi Electric PUZ-ZM140VDA Air Conditioner ground mounted South East elevation: 1 x Mitsubishi Electric PUZ-ZM140VDA Air Conditioner (wall mounted) 2 x Mitsubishi Electric PUZ-WZ120VAA ASHP (ground mounted)
Existing heating system replaced	2 x 30kW Ideal gas boilers

3. Description of the Noise Source

The following table sets out the technical specification of the proposed ASHP unit(s), taken from the manufacturer's data sheet.

Unit reference / location	Make and model	Rated heat output (kW)	Sound power level, LWA (dB)
Unit 1	Mitsubishi Electric PUZ-ZM140VDA Air Conditioner	14kW	68 dBA
Unit 2	Mitsubishi Electric PUZ-WZ120VAA ASHP	12kW	55 dBA
Unit 3	Mitsubishi Electric PUZ-WZ120VAA ASHP	12kW	55 dBA
Unit 4	Mitsubishi Electric PUZ-ZM140VDA Air Conditioner	14kW	68 dBA

Manufacturer's technical datasheet(s) are appended to this assessment at Appendix A.

4. Existing Noise Baseline

The application site is located within an area of mixed character, consisting of residential, industrial estate, GP surgery, commercial premises.

Shamblehurst Lane South which borders the Eastern boundary of the site is a suburban road carrying a mix of residential traffic together with periodic commercial/light-industrial vehicle movements associated with the adjoining commercial parade of shops in St. Luke's Close, heavier goods vehicles visiting the Solent Industrial Estate and a mix of vehicles visiting the Hedge End Household Waste Recycling Centre, with through-traffic increasing near its junction with Grange Road (A334).

No existing significant noise-generating plant is present at the site.

Given the small scale of the proposed plant and the proportionate approach to validation set out at paragraphs 6–7 of the Council's Local List, this assessment will show that the proposed units are within the permitted development threshold of 37dBA.

5. Identification of Noise-Sensitive Receptors

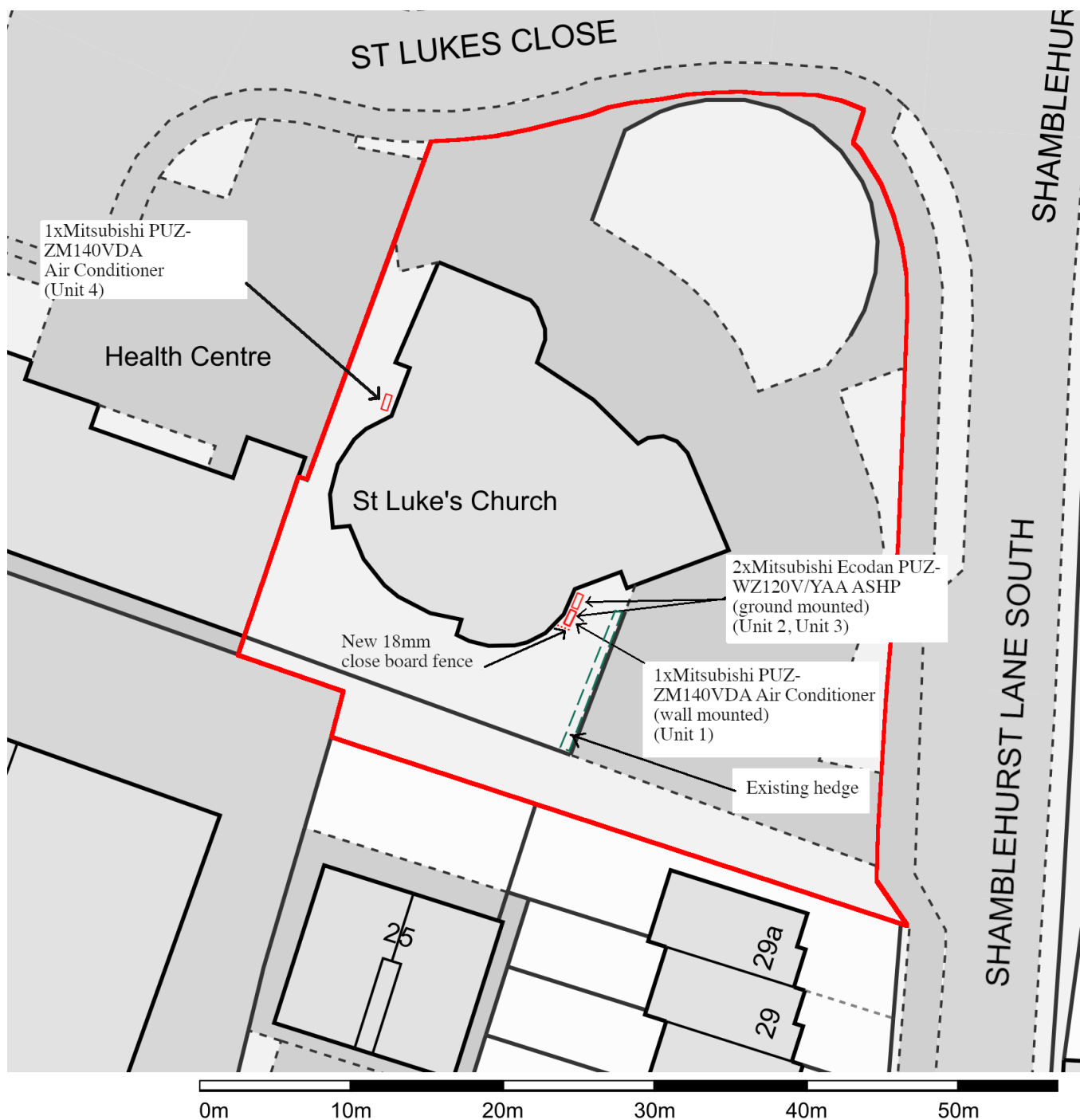
The following receptors have been identified as potentially sensitive to noise from the proposed installation:

Receptor	Description	Distance from nearest unit (m)	Direction
Receptor 1	Residential window - 29a Shamblehurst Lane South	17	South East
Receptor 2	Residential window - 25 Shamblehurst Lane South	19	South West
Receptor 3	Residential window - 75 Haileybury Gardens	42	North West
Receptor 4	Residential window - 79 Haileybury Gardens	43	West
Receptor 5	Healthcare window - St Luke's Surgery, St Luke's Close	14	West
Receptor 6	Healthcare door - St Luke's Surgery, St Luke's Close	10	West

A site location plan showing the position of the proposed unit(s) and the receptors listed above is provided at Appendix B.

6. Mitigations

To ensure levels at noise-sensitive receptors is minimised, the design incorporates a short section of 18mm close board fencing shown below as fine-dashed red line which will be within the garden of the site. which reduces noise levels at 29a Shamblehurst Lane South by 4.2dB(A), and 25 Shamblehurst Lane South by 8.6dB(A).



7. MCS Planning Standards (MCS 020) Noise Calculation

The predicted noise level at each identified receptor has been calculated using the MCS Planning Standards MCS 020 a noise assessment tool, in accordance with the Microgeneration Certification Scheme's methodology for assessing the noise impact of air source heat pumps. The output of the calculation is reproduced below and the full calculation output is in Appendix C.

Receptor	Description	Predicted rated level, dB(A)	MCS 37dB(A) benchmark met? (Y/N)
Receptor 1	Residential window - 29a Shamblehurst Lane South	32.0	Y
Receptor 2	Residential window - 25 Shamblehurst Lane South	26.4	Y
Receptor 3	Residential window - 75 Haileybury Gardens	25.5	Y
Receptor 4	Residential window - 79 Haileybury Gardens	25.3	Y
Receptor 5	Healthcare window - St Luke's Surgery, St Luke's Close	35.0	Y
Receptor 6	Healthcare door - St Luke's Surgery, St Luke's Close	31.3	Y

The predicted noise levels are the worst case combined noise level with all 4 units running at full output – most of the time the units will be running at lower output and therefore lower noise levels will be experienced.

Note: the MCS 020 a tool applies the standard 37 dB(A) rated level benchmark used for permitted development air source heat pump installations. Where the calculated level at the nearest receptor is at or below this benchmark, the installation is considered to represent an acceptable noise impact.

8. Assessment of Impact

- Significant sources of noise: the proposed outside units identified in Section 3.
- Noise-sensitive receptors potentially affected: as identified in Section 5.
- Mitigations: introduction of 18mm close board fencing within the garden of the site to minimise noise.
- Predicted impact: predicted noise levels are all within the 37dB(A) MCS 020 a benchmark showing an acceptable noise impact on neighbouring residential and healthcare receptors, with the highest residential noise level at 32.0dB(A)
- Time of operation: 24x7 depending on heating and cooling load of the site.

9. Good Acoustic Design and Mitigation Measures

Units with good acoustic performance have been selected (commercial units have been ruled out to minimise the noise impact on neighbours).

Standard good practice will be followed when fitting the units to minimise transmitted/vibrations from units.

The arrangement of the units has been selected to minimise the noise impact on neighbours, and a new section of 18mm close board fencing has been included to further mitigate noise.

10. Conclusion

Based on the assessment set out above, the proposed air source heat pump installation is predicted to result in a maximum noise level of 32.0dB(A) at the nearest residential noise-sensitive receptor (29a Shamblehurst Lane South) – significantly better than the 37 dB(A) benchmark applied to domestic-scale installations.

Additionally at the nearest noise-sensitive receptor at St Luke's Surgery, the design achieves a maximum noise level of 35.0dB, again better than the 37 dB(A) benchmark applied to domestic-scale installations.

The predicted noise levels are the worst case when all 4 units are running at full output – most of the time the units will be running at lower output and therefore lower noise levels will be present.

On this basis, the proposal is considered to represent an acceptable noise impact in accordance with NPPF (2026) Part 3.2, Eastleigh Borough Local Plan (2016-2036) policies DM1, DM8, DM11 and DM13.

Appendices

- Appendix A – Manufacturer's technical datasheets for the proposed units
- Appendix B – Site location showing unit locations and receptors
- Appendix C – MCS 020 calculation tool output

Appendix A – Manufacturer's technical datasheet(s) for the proposed unit(s)

Mitsubishi Electric Ecodan R290 Monobloc Air Source Heat Pump (ASHP) PUZ-WZ120VAA 12kW Data Sheet:

Heating Product Information

Ecodan R290
Monobloc Air Source Heat Pump

OUTDOOR UNIT		PUZ-WZ85V/YAA	PUZ-WZ100V/YAA	PUZ-WZ120V/YAA
HEAT PUMP SPACE HEATER - 55°C	ErP Rating	A++	A++	A++
	η_s	143%	141%	142%
	SCOP (MCS)	3.51	3.48	3.51
HEAT PUMP SPACE HEATER - 35°C	ErP Rating	A+++	A+++	A+++
	η_s	183%	189%	192%
	SCOP (MCS)	4.47	4.62	4.71
HEAT PUMP COMBINATION HEATER - Large Profile ^{*1}	ErP Rating	A+	A+	A+
	η_{wh}	137%	129%	129%
	Capacity (kW)	8.5	10.0	11.5
HEATING ^{*2} (A-7/W35)	COP	2.60	2.70	2.45
OPERATING AMBIENT TEMPERATURE (°C DB)		-25 ~ +46	-25 ~ +46	-25 ~ +46
MAXIMUM WATER OUTLET TEMPERATURE (°C)		75	75	75
SOUND DATA ^{*3}	Pressure Level at 1m (dBA)	40	40	40
	Power Level (dBA) ^{*4}	54	55	55
	Pipework Size (mm)	28	28	28
WATER DATA	Flow Rate (l/min)	27	34	34
	Width	1050	1050	1050
	Depth	480	480	480
DIMENSIONS (mm)	Height	1040	1040	1040
	Weight (kg)	103/117	120/131	120/131
ELECTRICAL DATA	Electrical Supply	220-240v, 50Hz / 400v	220-240v, 50Hz / 400v	220-240v, 50Hz / 400v
	Phase	Single / Three	Single / Three	Single / Three
	Nominal Running Current [MAX] (A) ^{*5}	21/12	28/12	35/12
	Fuse Rating - MCB Sizes (A) ^{*6}	25/16	32/16	40/16
REFRIGERANT CHARGE (kg) / CO ₂ EQUIVALENT (t)		R290 (GWP 0.02)	0.60 / 0.000012	0.82 / 0.0000164

NOTES:

*1 Combination with EHPT20X-MEHEW Cylinder

*2 Under normal heating conditions at outdoor temp: -7°CDB / -8°CWB, outlet water temp 35°C, inlet water temp 30°C.

*3 Under normal heating conditions at outdoor temp: 7°CDB / 6°CWB, outlet water temp 55°C, inlet water temp 47°C as tested to BS EN14511.

*4 Sound power level tested to BS EN12102.

*5 Under nominal heating conditions at outdoor temp: 7°C, outlet water temp: 35°C.

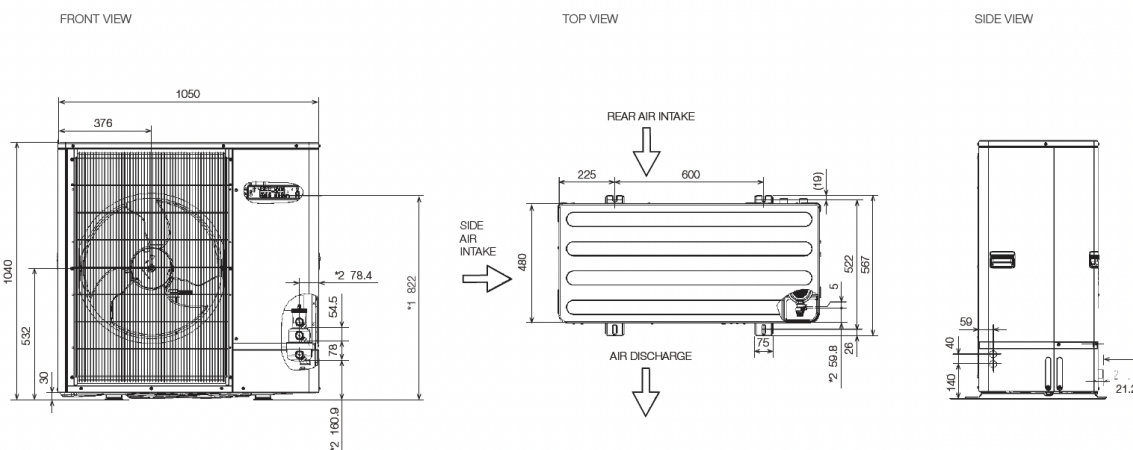
*6 MCB Sizes BS EN60898-2 & BS EN60947-2.

η_s is the seasonal space heating energy efficiency (SSHEE)

η_{wh} is the water heating energy efficiency

PUZ-WZ85/100/120V/YAA DIMENSIONS

All dimensions (mm)



Mitsubishi Electric PUZ-ZM140VDA Air Conditioner Data Sheet:

Air Conditioning Product Information

PCA-M R32 Ceiling Suspended System Power Inverter Heat Pump (Single Phase)

R32



PCA-M INDOOR UNITS		PCA-M50KA2	PCA-M60KA2	PCA-M71KA2	PCA-M100KA2	PCA-M125KA2	PCA-M140KA2
CAPACITY (kW)	Heating (nominal)	5.5 (2.5-6.6)	7.0 (2.8-8.2)	8.0 (3.5-10.2)	11.2 (2.7-14.0)	14.0 (3.2-16.0)	16.0 (3.7-18.0)
	Cooling (nominal)	5.0 (2.3-5.6)	6.1 (2.7-6.7)	7.1 (3.3-8.1)	9.5 (4.9-11.4)	12.5 (5.1-14.0)	13.4 (5.4-15.0)
	Heating (UK)	4.7 (2.15-5.6)	5.95 (2.4-6.95)	6.8 (3.0-8.65)	8.06 (1.94-10.08)	10.08 (2.30-11.52)	11.52 (2.66-12.96)
	Cooling (UK)	4.6 (2.1-5.15)	5.5 (2.5-6.15)	6.55 (3.05-7.45)	8.74 (4.51-10.49)	11.50 (4.69-12.88)	12.33 (4.97-13.80)
SHF (nominal)		0.79	0.81	0.76	0.77	0.72	0.72
COP / EER (nominal)		4.04 / 4.00	4.01 / 4.01	3.71 / 3.88	3.60 / 4.00	3.30 / 3.30	3.40 / 3.40
SCOP (η _{sh}) / SEER (η _{sc}) (BS EN14825)		4.20 / 6.70	4.10 / 6.50	4.20 / 6.70	4.30 / 6.40	4.34 (170.5%) / 6.39 (252.6%)	4.44 (174.7%) / 6.35 (250.9%)
ErP ENERGY EFFICIENCY CLASS	Heating/Cooling	A+ / A++	A+ / A++	A+ / A++	A+ / A++	-	-
AIRFLOW (l/s)	Lo-Mi1 - Mi2-Hi	167-183-217-250	250-267-283-317	267-283-300-333	220-240-260-280	230-250-270-290	240-260-290-320
PIPE SIZE mm (in)	Gas/ Liquid	12.7 (1/2") / 6.35 (1/4")	15.88 (5/8") / 9.52 (3/8")	15.88 (5/8") / 9.52 (3/8")	15.88 (5/8") / 9.52 (3/8")	15.88 (5/8") / 9.52 (3/8")	15.88 (5/8") / 9.52 (3/8")
SOUND PRESSURE LEVEL (dBA)	Lo-Mi1 - Mi2-Hi	32-34-37-40	33-35-37-40	35-37-39-41	37-39-41-43	39-41-43-45	41-43-45-48
SOUND POWER LEVEL (dBA)		60	60	62	63	65	68
DIMENSIONS (mm)	Width x Depth x Height	960 x 680 x 230	1280 x 680 x 230	1280 x 680 x 230	1600 x 680 x 230	1600 x 680 x 230	1600 x 680 x 230
WEIGHT (kg)		26	32	32	37	38	40
ELECTRICAL SUPPLY		Fed by Outdoor Unit	Fed by Outdoor Unit	Fed by Outdoor Unit	Fed by Outdoor	Fed by Outdoor	Fed by Outdoor
FUSE RATING (BS88) - HRC (A)		6	6	6	6	6	6
INTERCONNECTING CABLE No. CORES		4	4	4	4	4	4
WIRED REMOTE CONTROLLER REFERENCE		PAR-41MAA	PAR-41MAA	PAR-41MAA	PAR-41MAA	PAR-41MAA	PAR-41MAA
WIRELESS REMOTE CONTROLLER REFERENCE		PAR-SL94B	PAR-SL94B	PAR-SL94B	PAR-SL94B	PAR-SL94B	PAR-SL94B

PUZ-ZM OUTDOOR UNITS		PUZ-ZM50VKA2	PUZ-ZM60VHA2	PUZ-ZM71VHA2	PUZ-ZM100VDA	PUZ-ZM125VDA	PUZ-ZM140VDA
SOUND PRESSURE LEVEL (dBA)	Heating/Cooling	46 / 44	49 / 47	49 / 47	48 / 44	50 / 47	51 / 49
	Cooling	65	67	67	63	66	68
SOUND POWER LEVEL (dBA)		46	67	67	107	107	107
WEIGHT (kg)		46	67	67	107	107	107
DIMENSIONS (mm)	Width x Depth x Height	809 x 300 x 630	950 x 330 + 25 x 943	950 x 330 + 25 x 943	1100 x 460 + 45 x 870	1100 x 460 + 45 x 870	1100 x 460 + 45 x 870
ELECTRICAL SUPPLY		220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz	220-240V, 50Hz
PHASE		Single	Single	Single	Single	Single	Single
SYSTEM POWER INPUT (kW)	Heating/Cooling (nominal)	1.361 / 1.25	1.745 / 1.521	2.156 / 1.829	3.112 / 2.375	4.243 / 3.788	4.706 / 3.942
	Heating/Cooling (UK)	1.21 / 1.06	1.55 / 1.29	1.92 / 1.55	2.55 / 2.02	3.48 / 3.22	3.86 / 3.35
STARTING CURRENT (A)		4.3	5.3	5.3	11.9	11.9	11.9
SYSTEM RUNNING CURRENT (A)	Heating/Cooling [MAX]	5.95 / 5.37 [13.4]	7.43 / 6.48 [19.4]	9.23 / 7.81 [19.4]	14.39 / 10.99 [27.2]	19.63 / 17.52 [27.3]	21.77 / 18.23 [30.9]
FUSE RATING (BS88) - HRC (A)		16	25	25	32	32	40
MAINS CABLE No. CORES		3	3	3	3	3	3
MAX PIPE LENGTH (m)		50	55	55	100	100	100
MAX HEIGHT DIFFERENCE (m)		30	30	30	30	30	30
CHARGE REFRIGERANT (kg) / CO ₂ EQUIVALENT (t) - R32 (GWP 675)		2.00 / 1.35 (30m)	2.80 / 1.89 (30m)	2.80 / 1.89 (30m)	3.60 / 2.43 (40m)	3.60 / 2.43 (40m)	3.60 / 2.43 (40m)
MAX ADDITIONAL REFRIGERANT (kg) / CO ₂ EQUIVALENT (t) - R32 (GWP 675)		0.30 / 0.20	0.80 / 0.54	0.80 / 0.54	2.40 / 1.62	2.40 / 1.62	2.40 / 1.62

PCA-M50KA2 DIMENSIONS		PCA-M60/71KA2 DIMENSIONS		PCA-M100/125/140KA2 DIMENSIONS	
LOWER VIEW	SIDE VIEW	LOWER VIEW	SIDE VIEW	LOWER VIEW	SIDE VIEW
FRONT VIEW		FRONT VIEW		FRONT VIEW	



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Note: The fuse rating is for guidance only and please refer to the relevant databook for detailed specification. It is the responsibility of a qualified electrician/electrical engineer to select the correct cable size and fuse rating based on current regulation and site specific conditions. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a fluorinated greenhouse gas, R410A (GWP:2088), R32 (GWP:675), R407C (GWP:1774), R134a (GWP:1430), R513A (GWP:631), R454B (GWP:466), R515B (GWP:292), R454C (GWP:148), R1234ze (GWP:7) or R1234yf (GWP:4). *These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a hydrocarbon, R290 (GWP:0.02). *These GWP values are based on IPCC 6th edition.

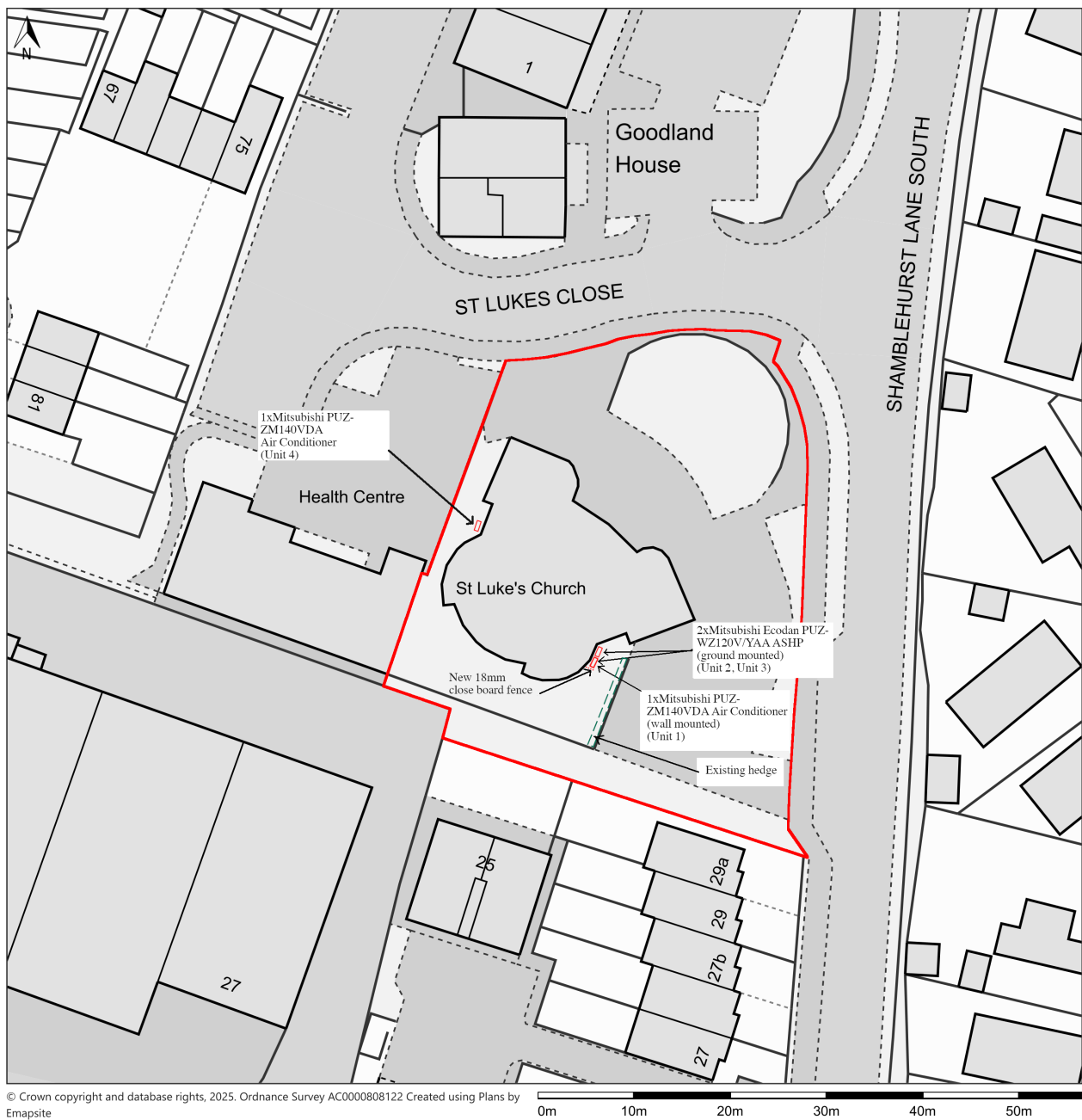
Effective as of April 2025



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Appendix B – Site location plan showing unit locations and receptors

ST. LUKES CHURCH, ST LUKES CLOSE, HEDGE END, HAMPSHIRE, SO30 2US



Appendix C – MCS 020 calculation tool output

Please note that more than two heat pumps is outside the scope of MCS 020 a).

Project Details (optional)	
Installation address	St Luke's Church, St Lukes Close, Hedge End, Southampton SO30 2US
First heat pump make & model	Mitsubishi Electric PUZ-ZM140VDA
First heat pump installation location	Wall mounted against South East wall
Second heat pump make & model	Mitsubishi Electric PUZ-WZ120VAA
Second heat pump installation location	Ground mounted against South East wall
Third heat pump make & model	Mitsubishi Electric PUZ-WZ120VAA
Third heat pump installation location	Stacked on Unit 1 against South East wall
Fourth heat pump make & model	Mitsubishi Electric PUZ-ZM140VDA
Fourth heat pump installation location	Ground mounted against North West wall

Step		Assessment Position 1	Assessment Position 2	Assessment Position 3	Assessment Position 4
1	Date calculation undertaken	10/09/2026.	10/09/2026.	10/09/2026.	10/09/2026.
2	Description of assessment position	Residential window 29a Shamblehurst Lane South	Residential window 25 Shamblehurst Lane South	Residential window 75 Haileybury Gardens	Residential - 79 Haileybury Gardens
3	First heat pump	A-weighted sound power level, dB(A)	68	68	68
4		Determination of directivity (Q) - select number of reflective surfaces	one reflective surface	one reflective surface	one reflective surface
5		Distance from heat pump to assessment positions, in m	17	19	60
6		Determination of barrier correction - select barrier type	close board fence (>=18mm thick boards)	close board fence (>=18mm thick boards)	solid wall (mass >=10kg/m2)
		Determination of barrier correction - select line of sight	partial view	no view	no view
3	Second heat pump	A-weighted sound power level, dB(A)	55	55	55
4		Determination of directivity (Q) - select number of reflective surfaces	two reflective surfaces	two reflective surfaces	two reflective surfaces
5		Distance from heat pump to assessment positions, in m	17	19	60
6		Determination of barrier correction - select barrier type	close board fence (>=18mm thick boards)	close board fence (>=18mm thick boards)	solid wall (mass >=10kg/m2)
		Determination of barrier correction - select line of sight	partial view	no view	no view
3	Third heat pump	A-weighted sound power level, dB(A)	55	55	55
4		Determination of directivity (Q) - select number of reflective surfaces	two reflective surfaces	two reflective surfaces	two reflective surfaces
5		Distance from heat pump to assessment positions, in m	18	20	60
6		Determination of barrier correction - select barrier type	no barrier	close board fence (>=18mm thick boards)	solid wall (mass >=10kg/m2)
		Determination of barrier correction - select line of sight	full view	no view	no view
3	Fourth heat pump	A-weighted sound power level, dB(A)	68	68	68
4		Determination of directivity (Q) - select number of reflective surfaces	one reflective surface	one reflective surface	one reflective surface
5		Distance from heat pump to assessment positions, in m	36	31	42
6		Determination of barrier correction - select barrier type	solid wall (mass >=10kg/m2)	solid wall (mass >=10kg/m2)	close board fence (<18mm thick boards)
		Determination of barrier correction - select line of sight	no view	no view	partial view
7		Calculate sound pressure level (total from all heat pumps)	32.0	26.4	25.3
8		Pass/fail noise limit of 37.0 dB(A)	pass	pass	pass

Please note that more than two heat pumps is outside the scope of MCS 020 a).

Project Details (optional)

Installation address	St Luke's Church, St Lukes Close, Hedge End, Southampton SO30 2US
First heat pump make & model	Mitsubishi Electric PUZ-ZM140VDA
First heat pump installation location	Wall mounted against South East wall
Second heat pump make & model	Mitsubishi Electric PUZ-WZ120VAA
Second heat pump installation location	Ground mounted against South East wall
Third heat pump make & model	Mitsubishi Electric PUZ-WZ120VAA
Third heat pump installation location	Stacked on Unit 1 against South East wall
Fourth heat pump make & model	Mitsubishi Electric PUZ-ZM140VDA
Fourth heat pump installation location	Ground mounted against North West wall

Step		Assessment Position 5	Assessment Position 6	
1	Date calculation undertaken	07/09/2026.	07/09/2026.	
2	Description of assessment position	Window St Luke's Surgery, St Luke's Close	Window St Luke's Surgery, St Luke's Close	
3	First heat pump	A-weighted sound power level, dB(A)	68	
4		Determination of directivity (Q) - select number of reflective surfaces	two reflective surfaces	
5		Distance from heat pump to assessment positions, in m	29	
6		Determination of barrier correction - select barrier type	solid wall (mass >=10kg/m2)	
		Determination of barrier correction - select line of sight	no view	
3	Second heat pump	A-weighted sound power level, dB(A)	55	
4		Determination of directivity (Q) - select number of reflective surfaces	two reflective surfaces	
5		Distance from heat pump to assessment positions, in m	29	
6		Determination of barrier correction - select barrier type	solid wall (mass >=10kg/m2)	
		Determination of barrier correction - select line of sight	no view	
3	Third heat pump	A-weighted sound power level, dB(A)	55	
4		Determination of directivity (Q) - select number of reflective surfaces	one reflective surface	
5		Distance from heat pump to assessment positions, in m	29	
6		Determination of barrier correction - select barrier type	solid wall (mass >=10kg/m2)	
		Determination of barrier correction - select line of sight	no view	
3	Fourth heat pump	A-weighted sound power level, dB(A)	68	
4		Determination of directivity (Q) - select number of reflective surfaces	one reflective surface	
5		Distance from heat pump to assessment positions, in m	14	
6		Determination of barrier correction - select barrier type	close board fence (<18mm thick boards)	
		Determination of barrier correction - select line of sight	partial view	
7	Calculate sound pressure level (total from all heat pumps)	35.0	31.3	#NUM!
8	Pass/fail noise limit of 37.0 dB(A)	pass	pass	#NUM!