

REPORT



5 Alexandra Gardens

BS41 42 Noise Impact Assessment

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1.0 Introduction

Clear Acoustic Design has been appointed to carry out a noise impact assessment in relation to the proposed AC installation at a residential property at 5 Alexandra Gardens, N10 3RN.

The local planning authority will likely request a noise impact assessment in order to safeguard the amenity of the surrounding receptors. The required noise impact assessment will be in line with BS 4142: 2014+ A1: 2019 *Methods for Rating and Assessing Industrial and Commercial Sound*. These criteria are seen to be appropriate in assessing and mitigating noise impact from this source.

2.0 Performance Standards

2.1 Local Authority Requirements

Specific requirements are unknown at this stage. The following is therefore assumed as a planning requirement.

A noise impact assessment is carried out by a suitably qualified acoustic consultant covering the current acoustic environment and how predicted noise from the proposed development, including all proposed plant and machinery, will affect nearby noise sensitive receptors.

Plant/Machinery to be attenuated:

All plant, machinery and equipment installed or operated should be so enclosed and/or attenuated that noise therefrom does not exceed, at any time, the existing background noise level when measured in accordance with BS4142:2014 at a point one metre external to the nearest residential or noise sensitive property.

2.2 BS 4142: 2014 + A1: 2019

BS 4142: 2014 + A1: 2019 *Methods for Rating and Assessing Industrial and Commercial Sound* has formed the basis of the assessment in this report. In this case, the rating level requirement for the proposed plant should not exceed the existing background noise level.

BS 4142 states that this indicates a "low" noise impact. This is therefore seen to equate to the *No Observed Adverse Effect Level* (NOAEL) under national planning policy.

3.0 Environmental Noise Survey

In order to assess the noise impact of the proposed mechanical plant installation, an environmental noise survey has been undertaken by Clear Acoustic Design at a location representative of the nearest noise sensitive receptor(s).

The closest receptor locations are taken to be the adjacent houses to the North of the site. The microphone was located on the rear metal staircase of 5 Alexandra Gardens, to represent noise levels at these receptors.

Dominant noise sources are from distant road traffic noise and birdsong. The Microphone was located 1 m from nearest facade, 1.5m above ground level.

The environmental noise survey has provided background noise levels, which will form the basis of the assessment in line with BS 4142:2014. Ambient and background noise levels were measured between 18/04/23 and 19/04/23 using a single fixed noise monitor (referred to as F1).

3.1 Measurement Equipment and Environmental Conditions

The weather was witnessed to be overcast and dry for the duration of the survey with light wind speeds. The following measurement equipment was used for the survey.

Equipment	Serial Number	Calibration Date
Casella CEL-633C Type 1 Sound Level Meter	2145374	18/02/22
Casella CEL-495 Preamplifier	002436	18/02/22
B&K 4189 Microphone	2529821	18/02/22
Casella CEL-120-1 Calibrator	113251	18/02/22

Table 3.1 Measuring Equipment used for Survey



Figure 3.1 Site Location and measurement position

The windows highlighted in blue are understood to be windows into 5 Alexandra Gardens and therefore not a receptor. The AC unit is proposed to be located in the location highlighted in yellow.

3.2 Fixed Noise Monitoring Graph

Figure 3.2 below provides a graph of the measured noise levels at Location F1. The ambient (L_{Aeq}) and background (L_{A90}) noise levels are shown.

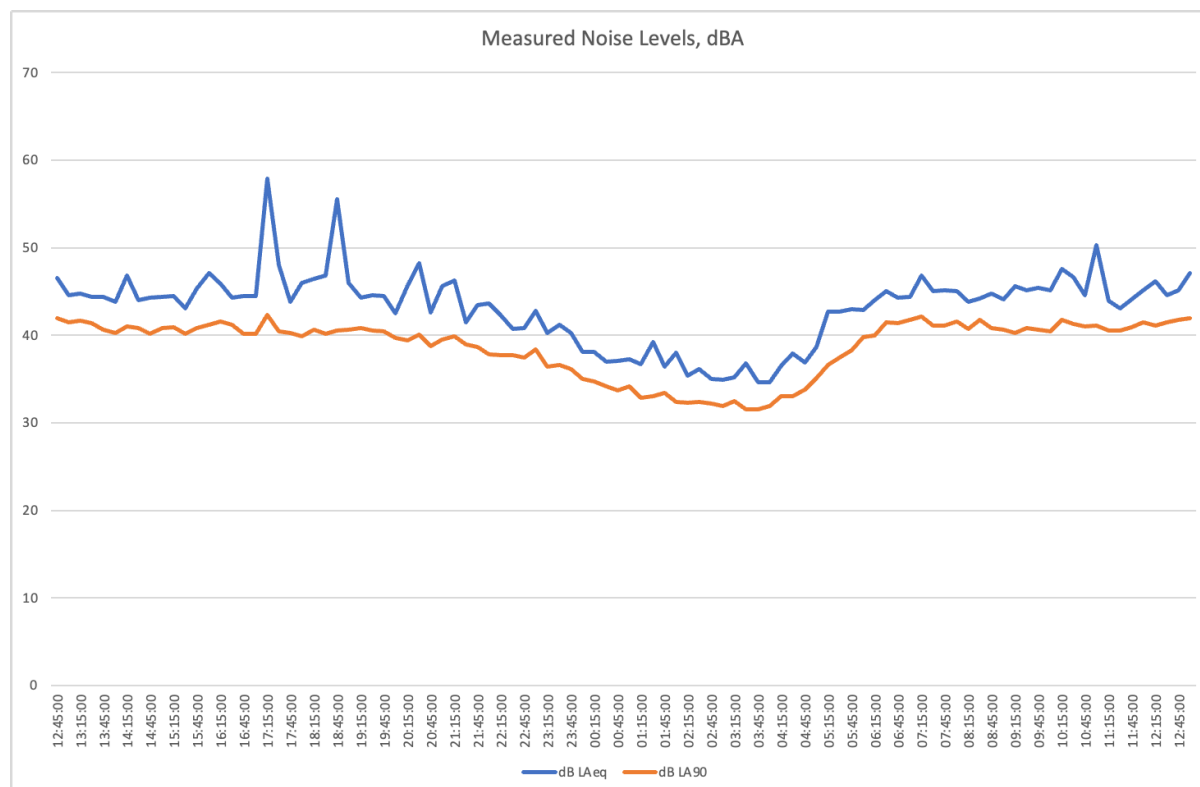


Figure 3.2 Long Term Measurement Graph – F1

3.2.1 Assessment Background Noise Level

In order to conduct an assessment in line with BS 4142: 2014, it is necessary to extrapolate representative background noise levels from the long-term survey data.

The proposed AC unit will likely operate during the night, and therefore the background noise levels during this time will be applicable.

As stated in BS4142:2014, the representative background noise level should not necessarily be the minimum sample value measured and should suitably represent the full assessment dataset. The published example in BS4142:2014 uses the modal value. In this instance Clear Acoustic Design have also used the average of the mean, median and modal value.

The background noise level which will form the basis of the assessment is presented in Table 3.2 below.

Time period	Assessment Background Noise Level, L_{A90} dB
Night (2300-0700)	34

Table 3.2: Assessment Background Noise Level

4.0 Noise Impact Assessment

4.1 Noise Sources

The proposals for this site are for 1 external AC unit. The proposed location of this unit is shown below by the yellow box.

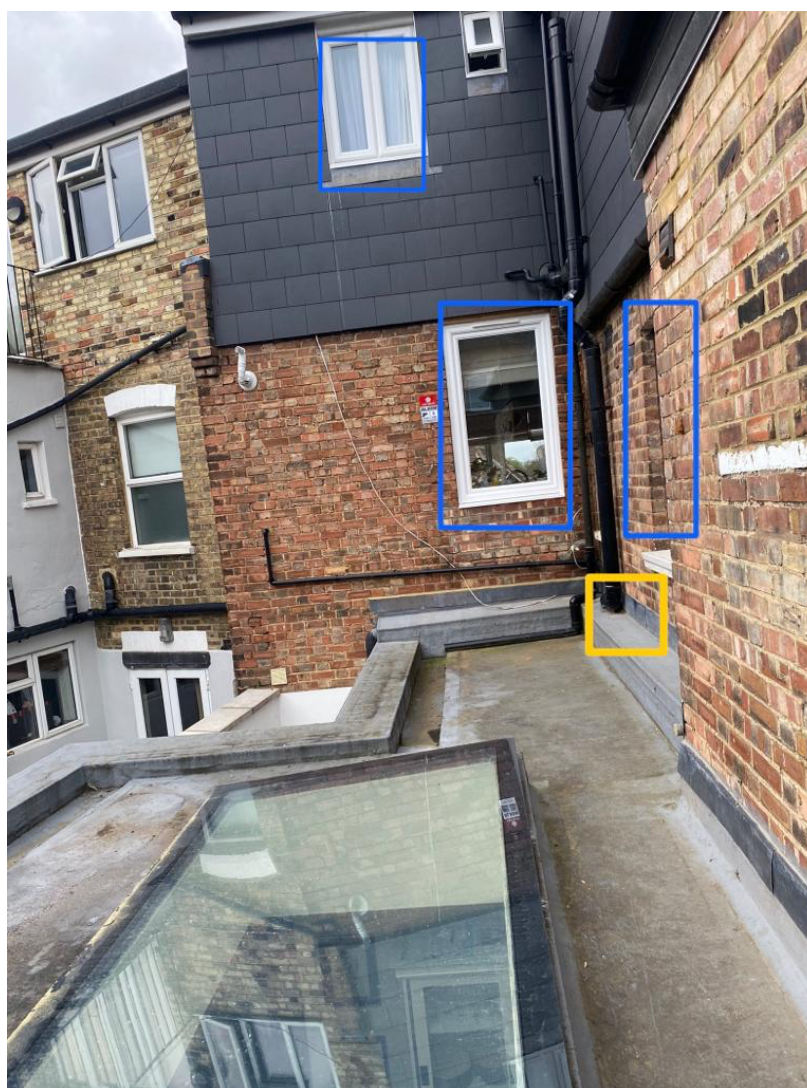


Figure 4.1: Location of proposed AC unit

The currently proposed AC unit is from Mitsubishi Electric. The sound pressure levels which have formed the basis of the assessment are presented in Table 4.1 below and are based on the manufacturer datasheets.

The proposed units are not seen to be tonal nor impulsive in nature. Noise emissions are also deemed unlikely to be distinctive against the residual acoustic environment. As such no feature corrections will be applied when forming the cumulative rating level of this source, in line with BS 4142: 2014.

Type	No of Units	Sound pressure level at 1m, dB L _{Aeq}
MXZ-2F53VF3	1	51 dBA (Heating)

Table 4.1: Noise Sources, Sound Pressure Levels, dBA



Figure 4.2: Location of proposed AC unit and nearest receptor

4.2 Assessment Outcome

In order to demonstrate compliance with likely local authority rating level requirements, Table 4.2 below provides an assessment in line with BS 4142: 2014 + A1: 2019.

As can be seen, the rating noise level does not exceed the background noise level at the closest receptor. This would therefore indicate that the noise impact is low, in line with BS4142:2014.

Time Period	Combined Sound pressure level at 1 metre	Distance to receptor	Distance/Barrier attenuation	Rating Noise Level at receptor, L_{Aeq} dBA	Assessment Outcome Against Background Noise
Night	51 dBA	7m	17dB	34dBA	+0 dB

Table 4.2: BS 4142 Assessment – Outcome

4.3 Noise Mitigation

Based on the above calculations, plant location, and currently assumed noise targets, it will not be necessary to introduce further noise mitigation to comply with the noise requirements during the night.

If a more onerous noise target of 5dB or 10dB below the background noise level is imposed, then further mitigation would be required to further reduced noise levels.

However, it should be noted that the predicted rating noise level of 34dBA is a very low noise level in terms of the absolute level and it may not be beneficial to design the night-time rating noise to a level lower than this, other than in special circumstances.

As the highest noise impact will be at night, the external noise levels in the gardens are not relevant, and the noise levels inside the building are more of the concern. With a partially open window at night this would relate to an internal noise level of between 19-24 dBA, well below

the BS8233:2014 internal noise requirement of 30 dBA for a bedroom at night. The noise should therefore not cause an adverse noise impact inside the neighbouring dwellings, even with open window ventilation.

5.0 Conclusion

Clear Acoustic Design has been appointed to carry out a noise impact assessment in relation to the proposed mechanical plant installation at 5 Alexandra Gardens.

The noise impact assessment is in line with BS 4142: 2014 + A1: 2019 *Methods for Rating and Assessing Industrial and Commercial Sound*. These criteria are seen to be appropriate in assessing and mitigating noise impact from this source. A noise level target of equal to background noise at night has been assumed at this stage.

As can be seen in Table 4.2 above, the predicted noise level of the mechanical plant installation will be compliant with the assumed noise requirements.

BS4142:2014 states that the context of a noise source and assessment must be considered, not just the predicted relative noise level, which includes the absolute noise level. The predicted absolute noise level of 34dB L_{Aeq} , which is a low external noise level, would result in a bedroom internal noise level, with an open window, of approximately 19-24 dBA. This further demonstrates that the likely noise impact of the proposed installation is low.

Appendix A - Noise Data

Air Conditioning Product Information

MXZ-F Multi-Split System R32 Inverter Heat Pump

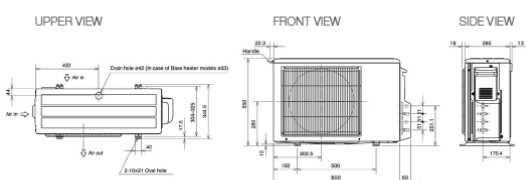
R32



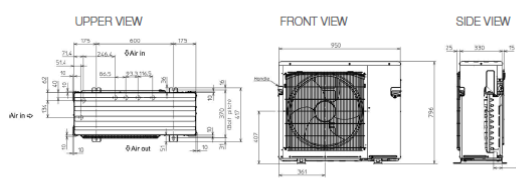
MXZ-F OUTDOOR UNITS	MXZ-2F33VF3	MXZ-2F42VF3	MXZ-2F53VF3	MXZ-3F54VF3	MXZ-3F68VF3	MXZ-4F72VF3	MXZ-4F83VF	MXZ-5F102VF	MXZ-6F122VF
NUMBER OF CONNECTABLE INDOOR UNITS	2	2	2	2-3	2-3	2-4	2-4	2-5	2-6
CAPACITY (kW)									
Heating (nominal)	4.0 (1.0-4.1)	4.5 (1.0-4.8)	6.4 (1.1-7.0)	7.0 (2.6-9.0)	8.6 (2.6-10.6)	8.6 (3.4-10.7)	9.3 (3.4-11.6)	10.5 (4.1-14.0)	14.0 (3.5-16.5)
Cooling (nominal)	3.3 (1.1-3.8)	4.2 (1.1-4.4)	5.3 (1.1-5.6)	5.4 (2.9-6.8)	6.8 (2.9-8.4)	7.2 (3.7-8.8)	8.3 (3.7-9.2)	10.2 (3.9-11.0)	12.2 (3.5-13.5)
Heating (UK)	3.32 (0.83-3.40)	3.74 (0.84-3.99)	5.38 (0.92-5.88)	5.81 (2.16-7.47)	7.14 (2.16-8.80)	7.14 (2.82-8.99)	7.8 (2.82-9.63)	8.7 (3.40-11.63)	11.6 (2.90-13.71)
Cooling (UK)	3.23 (0.87-3.72)	4.12 (1.08-4.32)	5.30 (1.10-5.60)	5.32 (2.85-6.67)	6.66 (2.84-8.23)	7.0 (3.59-8.56)	8.2 (3.67-9.12)	10.1 (3.86-10.90)	12.1 (3.47-13.39)
COP / EER (nominal)*	4.40 / 3.90	5.10 / 4.30	4.10 / 3.79	4.60 / 4.10	4.50 / 3.70	4.60 / 3.90	4.65 / 4.21	4.60 / 3.64	4.23 / 3.33
SEER (nominal) / SCOP (nominal) (BS EN14825)	4.16 / 6.13	4.60 / 6.69	4.67 / 6.6	4.61 / 6.52	4.12 / 7.96	4.07 / 8.13	4.02 (10.0%) / 8.51 (10.0%)	4.05 (10.0%) / 8.21 (10.0%)	4.05 (10.0%) / 7.85 (10.0%)
EP ENERGY EFFICIENCY CLASS	A+ / A++	A++ / A+++	A++ / A+++	A++ / A+++	A+ / A++	A+ / A++	A+ / A++	A++ / A+++	A++ / A+++
MAX AIRFLOW (m³/min)	33.7 / 32.9	33.3 / 27.7	34.7 / 32.7	43.0 / 42.1	43.0 / 42.1	43.0 / 42.1	71 / 55	74 / 62	77 / 63
SOUND PRESSURE LEVEL (dBA)	Heating/Cooling	50 / 49	50 / 44	51 / 46	50 / 46	53 / 48	54 / 48	51 / 49	56 / 52
SOUND POWER LEVEL (dBa)	Cooling	60	59	61	59	63	63	61	65
DIMENSIONS (mm)	Width x Depth x Height	800 x 285 x 550	800 x 285 x 550	800 x 285 x 550	840 x 330 x 710	840 x 330 x 710	840 x 330 x 710	950 x 330 x 796	950 x 330 x 1048
WEIGHT (kg)		33	37	37	58	58	59	62	87
ELECTRICAL SUPPLY		220-240V, 50Hz	220-240V, 50Hz	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	Single	Single
POWER INPUT (kW)	Heating/Cooling (nominal)	0.909 / 0.846	0.88 / 0.98	1.56 / 1.40	1.52 / 1.32	1.91 / 1.84	1.87 / 1.85	2.00 / 1.97	2.28 / 2.80
	Heating/Cooling (UK)	0.82 / 0.68	0.90 / 0.78	1.40 / 1.20	1.38 / 1.06	1.73 / 1.47	1.69 / 1.48	1.80 / 1.57	2.09 / 2.66
STARTING CURRENT (A)		4.6	4.2	7.6	7.0	10.5	10.0	8.8	12.3
RUNNING CURRENT (A)	Heating/Cooling (MAX)	4.6 / 4.3 [10.0]	4.2 / 4.5 [12.2]	7.1 / 6.2 [10.2]	7.0 / 5.9 [18.0]	10.5 / 9.6 [18.0]	10.0 / 9.5 [18.0]	8.8 / 8.7 [21.4]	10.0 / 12.3 [21.4]
INTERCONNECTING CABLE NO. CORES		4 Core	4 Core	4 Core	4 Core	4 Core	4 Core	4 Core	4 Core
TOTAL PIPE LENGTH (m)		20	30	30	50	60	60	70	80
MAX PIPE LENGTH PER INDOOR UNIT (m)		15	20	20	25	25	25	25	25
MAX HEIGHT DIFFERENCE (m)		10	15 (10 if 0 or higher than 10)	15 (10 if 0 or higher than 10)	15 (10 if 0 or higher than 10)	15 (10 if 0 or higher than 10)	15 (10 if 0 or higher than 10)	15	15
CHARGE REFRIGERANT (kg / CO ₂ EQUIVALENT (t) - R32 (GWP 675))		1.00 / 0.68 (20m)	1.20 / 0.81 (30m)	1.0 / 0.68 (30m)	1.40 / 0.95 (60m)	1.40 / 0.95 (60m)	1.40 / 0.95 (60m)	2.4 / 1.62 (70m)	2.4 / 1.62 (80m)
FUSE RATING (BS88) - HRC (A)		16	16	16	25	25	25	25	32

Notes: *1 System COP / EER when connected to MSZ-LN / MSZ-AP x Indoor unit connections. Combined max running current of all indoors on system must not exceed 3A. The SEZ-M25DA cannot be used when the total indoor capacity is equal to the outdoor capacity, i.e. when the capacity ratio is 1.

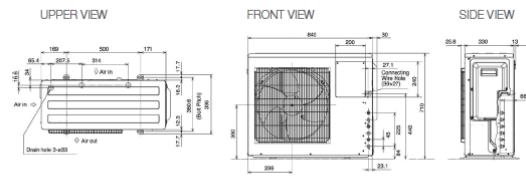
MXZ-2F33VF3, MXZ-2F42VF3, MXZ-2F53VF3 DIMENSIONS



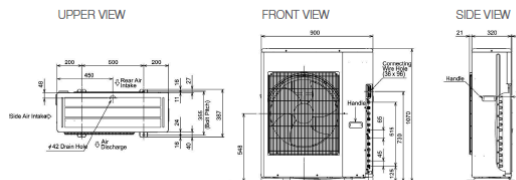
MXZ-4F83VF, MXZ-5F102VF DIMENSIONS



MXZ-3F54VF3, MXZ-3F68VF3, MXZ-4F72VF3 DIMENSIONS



MXZ-6F122VF DIMENSIONS



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Notes: The fuse rating is for guidance only. 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), R613A (GWP:631), R454B (GWP:466), R1234ze (GWP:7) or R1234yf (GWP:4). These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. In case of Regulation (EU) No 625/2011 from IPCC 3rd edition, these are as follows: R410A (GWP:1975), R32 (GWP:550), R407C (GWP:1650) or R134a (GWP:1300).

Effective as of May 2020



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