

Acoustic Consultancy Report

Ref: 11762-1

Noise Impact Assessment

Acoustic assessment concerning plant noise levels for the proposed women's refuge development at the Garage Compound, Whitsbury Road, Havant, PO9 5SP.

Report Prepared For

Stop Domestic Abuse
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3rd October 2024

Report Author

A handwritten signature in black ink, appearing to read 'Andy Keane'.

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SECTION 1: INTRODUCTION

MSAFE Technologies have been appointed by the registered charity Stop Domestic Abuse to carry out an acoustic assessment regarding the potential noise impact on nearby residential properties following the proposed development to create a new Women's Refuge, Whitsbury Road, Havant, PO9 5SP.

The combined noise level provided by the proposed ASHP's & any kitchen extract should not exceed L_{Aeq} 60 dB, so that the resulting noise level at the nearest NSP's will be significantly below the existing background noise level of L_{A90} 41 dB ensuring that nearby noise sensitive properties are not disturbed during both daytime & night-time hours.

The proposed ASHP's are ECODAN R32 Ultra Quiet PUZ Monobloc with a noise level of 45 dBA @ 1m (see Appendix). It is proposed to install 3 No. ASHP's with a combined noise level of 50 dB @ 1m. This will result in a noise level of approx. 26 dB at the nearest NSP, significantly lower than the existing background noise level of L_{A90} 41 dB

A list of acoustic terminology used in this report is presented in the Appendix.

SECTION 2: SITE DETAILS

2.1 Site Description

The existing site comprises of a garage compound and parking located adjacent to the rear gardens of existing residential properties on Whitsbury Road, Nursling Crescent and Prospect Lane. See Appendix.

2.2 Area Description

The surrounding area comprises of residential accommodation with the rear gardens adjacent to the garage compound. Sharps Copse Primary School & playing field is located approx. 100 metres away.

2.3 Proposed Scheme

The proposed two-storey building would provide nine bedrooms with en-suite facilities and communal facilities including lounge/kitchen/dining space, storage, laundry playroom & staff facilities. To the side and rear of the building a secluded amenity space will be formed with a patio, green space and an area dedicated as a children's playground.

SECTION 3: NOISE GUIDANCE

3.1 Noise Policy Statement for England

The overarching framework for national noise policy is the Noise Policy Statement for England (NPSE). The long-term vision identified in the policy is to:

'Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.'

The aims of the policy are:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.*

3.2 National Planning Policy Framework

The concepts outlined in the NPSE are incorporated into the National Planning Policy Framework (NPPF). Paragraph 123 relates to noise:

Planning policies and decisions should aim to:

- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

3.3 National Planning Practice Guidance

Practical guidance on how the NPPF should be applied is contained within the National Planning Practice Guidance (NPPG).

The NPPG guidance on design states:

'Good quality design is an integral part of sustainable development. The National Planning Policy Framework recognises that design quality matters and that planning should drive up standards across all forms of development. As a core planning principle, plan-makers and decision takers should always seek to secure high quality design.'

'Local planning authorities are required to take design into consideration and should refuse permission for development of poor design.'

It is therefore essential that developments use good acoustic design to achieve internal sound standards as far as is reasonably practicable. In order to do this successfully noise and vibration must always be considered at the initial design stage. If noise and vibration are only considered after site and building plans have been finalised (for example when specifying performance requirements of the building envelope), then the development is very unlikely to comply with the requirements of planning policy.

Good acoustic design will include:

- Location of buildings on the site to minimise noise exposure (this will include maximising separation of noise sources and sensitive receptors and use of buildings or topography to screen noise)
- Layout of habitable rooms within buildings to reduce noise exposure to more noise-sensitive rooms
- Ensuring dwellings exposed to high noise levels are dual aspect to provide each unit with access to a relatively quiet façade when possible
- Access to relatively quiet external amenity space
- Measures to reduce noise at source and/or on the transmission path where possible
- Design and insulation of the building envelope

3.4 BS 4142: 2014

'BS 4142 (2014) Methods for rating and assessing industrial and commercial sound' compares the proposed source levels against the underlying background noise levels and gives an indication on the likelihood of complaints. Background Noise Levels are established as the underlying noise levels against which the assessment of the specific source can be made. The background noise levels are measured at the assessment position which is located externally at the nearest noise sensitive façades (See Appendix).

The rating noise level is calculated at the assessment position using the source sound pressure levels and includes where necessary a character correction of up to 18 dB comprising:

Tonality: 0 - 6 dB

For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and + 6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.

Impulsivity: 0 – 9 dB

A correction of up to + 9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.

Other Sound Characteristics 0 – 3 dB

Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Intermittency: 0 – 3 dB

If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

This rating level of the noise source is compared to the existing background noise level at the property. Typically, the greater the difference, the greater the magnitude of the impact:

A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant 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, depending on the context.

SECTION 4: SURVEY DETAILS

Due to equipment security concerns, an attended noise survey was carried out over a 4-hour period between 07:51 - 12:29 hrs on Tuesday 21st November 2023. Measurements were carried out within the garage compound area towards the rear of the gardens for the existing residential properties.

NTi Audio: XL2 Audio & Acoustic Sound Level Meter (Serial Number: A2A-12469-E0)

Calibration Due: 15/02/2025

NTi Audio: M2230 Measurement Microphone consisting:

MA220 (Serial Number: 6429) Capsule (Serial Number: 9573)

Calibration Due: 15/02/2025

NTi CAL 200 Class 1 Acoustic Calibrator (Serial Number: 13394)

Calibration Due: 15/02/2024

Noise levels were measured by a competent person for environmental noise monitoring, in accordance with BS 7445: 1991 (Description & Measurement of Environmental Noise).

Survey carried out by Andy Keane BSc (Hons) AMIOA.

The sound level meter was programmed to record the A-weighted L_{eq} , L_{90} , L_{10} , and L_{max} for the duration of the survey with appropriate reference time intervals of 5 mins.

The sound level meter was calibrated to 94 dB before and after the survey. No significant change (± 0.1 dB) in the calibration was noted.

Weather Conditions

Significant cloud cover; temperature variable 9 - 11 °C.

Wind: Slight breeze, northerly direction.

No precipitation.

4.1 Measured Noise Levels

Time	Duration	L_{Aeq} (dB)	L_{AFmax} (dB)	L_{A90} (dB)
07:51 – 12:29	04:38:15	49.7	75.1	41.0

The existing ambient noise climate included bird song, dogs barking, road traffic noise, airplanes and residents in gardens. Train horns could be heard sounding from the nearby train line located approximately 500 metres away along with a constant road traffic noise from the nearby B2149 Petersfield Road.

4.2 Conclusion

The proposed scheme has Air Source Heat Pumps (ASHP's) located externally on the west-facing façade of the building. This part of the building is approx. 17.3 metres from the nearest Noise Sensitive Property (NSP) located at 26 Nursling Crescent. The distance attenuation provided by this 17 metres will be a minimum of 24 dB, not taking into account any additional barrier attenuation provided by the existing boundary walls.

Based on the above calculations and on-site measurements, the combined noise level provided by the proposed ASHP's & any kitchen extract should not exceed L_{Aeq} 60 dB, so that the resulting noise level at the nearest NSP's will be significantly below the existing background noise level of L_{A90} 41 dB ensuring that nearby noise sensitive properties are not disturbed during both daytime & night-time hours.

The proposed ASHP's are ECODAN R32 Ultra Quiet PUZ Monobloc with a noise level of 45 dBA @ 1m (see Appendix). It is proposed to install 3 No. ASHP's with a combined noise level of 50 dB @ 1m. This will result in a noise level of approx. 26 dB at the nearest NSP, significantly lower than the existing background noise level of L_{A90} 41 dB

Regarding the children's low-level play area on the south-facing elevation, this space will only be in use during day-time hours and backs on to numerous existing residential gardens where young children can already be heard playing outside of school hours. The play area will be located approx. 14 metres from the nearest residential property and surrounded by a wall with pleached boundary trees.

SECTION 5: ACOUSTIC TERMINOLOGY

Decibel (dB): a unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 Pa, the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.

dB(A): decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).

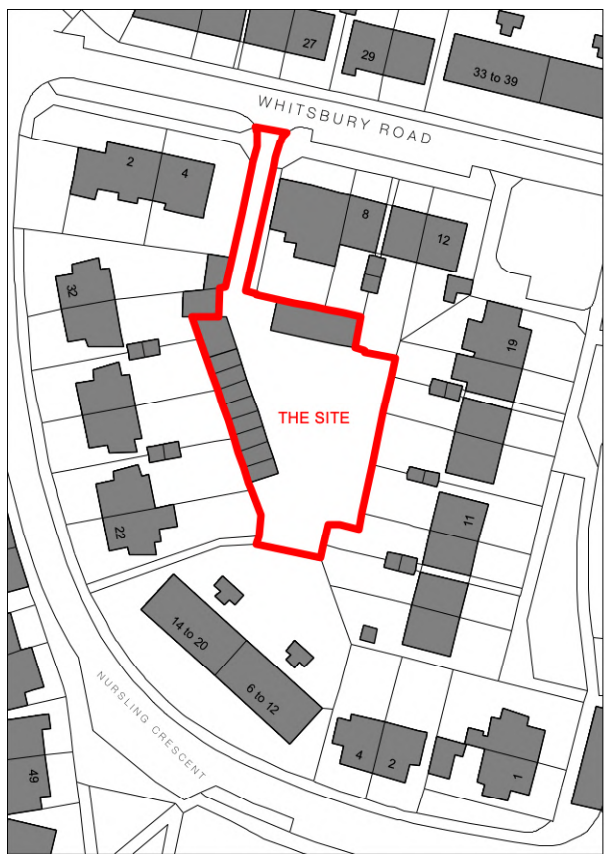
$L_{Aeq,T}$: the equivalent continuous sound level -the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

R_w : The single figure rating method is the rating used for laboratory airborne sound insulation tests. The figure indicates the amount of sound energy being stopped by a separating building element when tested in isolation in the absence of any flanking paths. (The higher the figure the better the sound insulation).

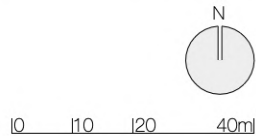
L_{AFmax} : A-weighted, fast, maximum sound level

SECTION 6: APPENDIX

This report has been prepared by MSAFE Technologies Limited (MSAFE) with all reasonable skill, care and diligence in accordance with generally accepted acoustic consultancy principles and the purposes and terms agreed between MSAFE and our Client. Any information provided by third parties and referred to herein may not have been checked or verified by MSAFE unless expressly stated otherwise. This document contains confidential and commercially sensitive information and shall not be disclosed to third parties. Any third party relies upon this document at their own risk.



LOCATION PLAN
SCALE 1:1250 @ A3



BLOCK PLAN
SCALE 1:500 @ A3

- Outline of existing garages to be demolished
- Outline of existing buttresses to be demolished
- Outline of proposed building, bike & bins

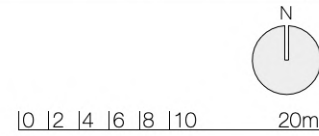


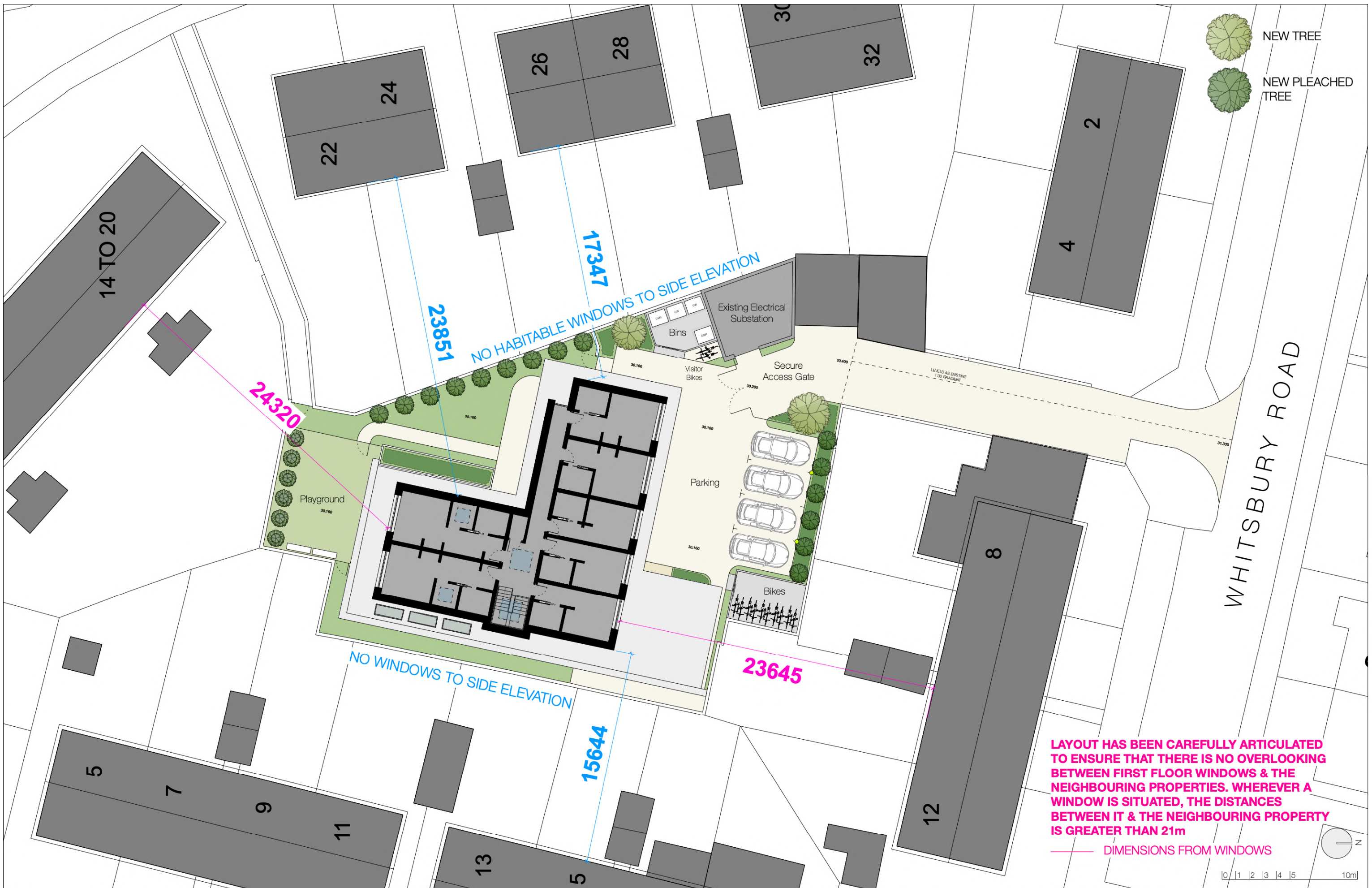
Image Source : Google Maps Data



Image Source : Google Maps Data



Image Source : Google Maps Data



LAYOUT HAS BEEN CAREFULLY ARTICULATED TO ENSURE THAT THERE IS NO OVERLOOKING BETWEEN FIRST FLOOR WINDOWS & THE NEIGHBOURING PROPERTIES. WHEREVER A WINDOW IS SITUATED, THE DISTANCES BETWEEN IT & THE NEIGHBOURING PROPERTY IS GREATER THAN 21m

— DIMENSIONS FROM WINDOWS



OG : OBSCURE GLAZING
 AOV : AUTOMATIC OPENING VENT / WINDOW
 0 1 2 3 4 5

10m



PUZ-WM60VAA(-BS)

Ecodan R32

Monobloc Air Source Heat Pump

R32

Key Features:

- A+++ high efficiency system
- Ultra quiet noise levels
- Maintains full heating capacity at low temperatures
- Zero carbon solution
- MELCloud enabled

Key Benefits:

- Ultra low running cost
- Flexible product placement
- Confident and quick product selection
- Help to tackle the climate crisis
- Remote control, monitoring, maintenance and technical support



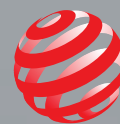
MELCloud



Manufactured in the UK



037-0033-20-01



ecodan[®]
Renewable Heating Technology

OUTDOOR UNIT		PUZ-WM60VAA(-BS)
HEAT PUMP SPACE HEATER - 55°C	ErP Rating	A++
	η_s	142%
	SCOP (MCS)	3.57
HEAT PUMP SPACE HEATER - 35°C	ErP Rating	A+++
	η_s	190%
	SCOP (MCS)	4.81
HEAT PUMP COMBINATION HEATER - Large Profile ^{*1}	ErP Rating	A+
	η_{wh}	145%
	Capacity (kW)	6.0
	Power Input (kW)	1.88
	COP	3.20
OPERATING AMBIENT TEMPERATURE (°C DB)		-20 ~ +35
SOUND DATA ^{*3}	Pressure Level at 1m (dBA)	45
	Power Level (dBA) ^{*4}	58
WATER DATA	Pipework Size (mm)	22
	Flow Rate (l/min)	17
	Water Pressure Drop (kPa)	8.0
DIMENSIONS (mm)	Width	1050
	Depth	480
	Height	1020
WEIGHT (kg)		98
ELECTRICAL DATA	Electrical Supply	220-240v, 50Hz
	Phase	Single
	Nominal Running Current [MAX] (A) ^{*5}	5.68 [13]
	Fuse Rating - MCB Sizes (A) ^{*6}	16
REFRIGERANT CHARGE (kg) / CO ₂ EQUIVALENT (t)		R32 (GWP 675) 2.2 / 1.49

Notes:

*1 Combination with E*PT20X 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.

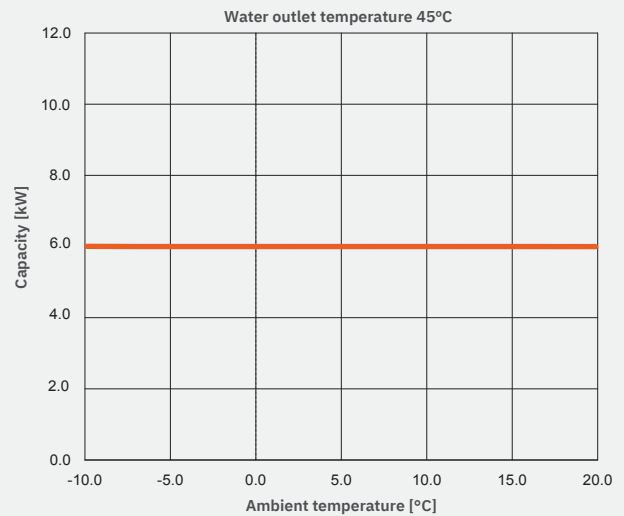
*4 Sound power level tested to BS EN12102.

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

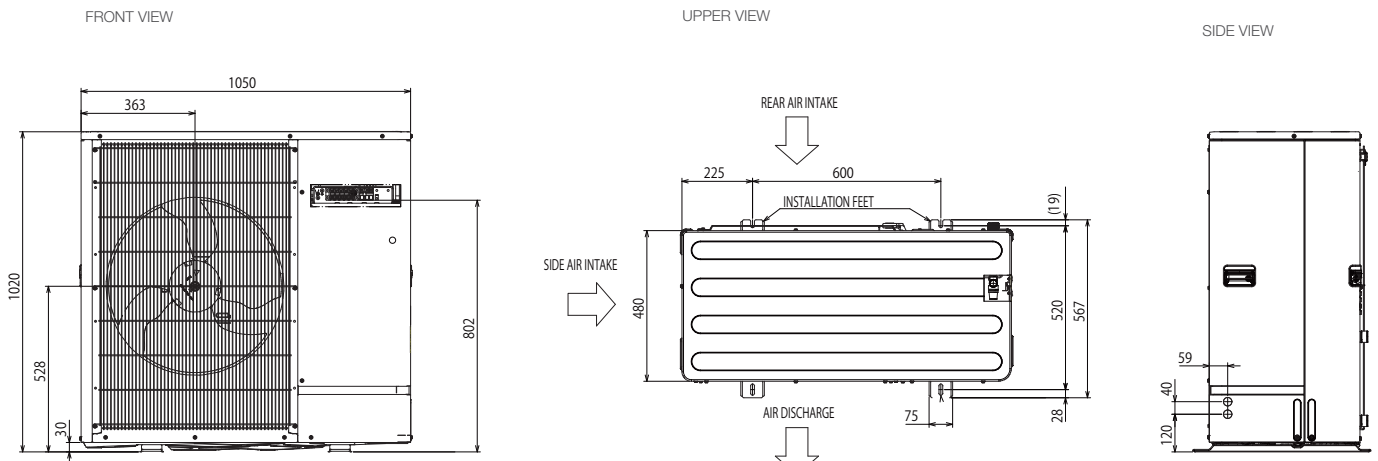
*6 MCB Sizes BS EN60898-2 & BS EN60947-2.

η_s is the seasonal space heating energy efficiency (SSHEE) η_{wh} is the water heating energy efficiency

NOMINAL HEATING CAPACITY



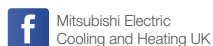
PUZ-WM60VAA(-BS) DIMENSIONS



All dimensions (mm)



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Note: Refer to 'Installation Manual' and 'Instruction Book' for further 'Technical Information'. 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), 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.626/2011 from IPCC 3rd edition, these are as follows. R410A (GWP:1975), R32 (GWP:550), R407C (GWP:1650) or R134a (GWP:1300).

Effective as of August 2020







Start		Stop		LAFmax	LAeq	LAF90.0%
Date	Time	Date	Time			
[YYYY-MM-DD]	[hh:mm:ss]	[YYYY-MM-DD]	[hh:mm:ss]	[dB]	[dB]	[dB]
21/11/2023	07:51:40	21/11/2023	08:00:00	68.1	48.7	45.0
21/11/2023	08:00:00	21/11/2023	08:15:00	53.4	46.5	44.1
21/11/2023	08:15:00	21/11/2023	08:30:00	66.4	48.1	44.3
21/11/2023	08:30:00	21/11/2023	08:45:00	70.4	50.2	43.5
21/11/2023	08:45:00	21/11/2023	09:00:00	62.0	46.3	43.1
21/11/2023	09:00:00	21/11/2023	09:15:00	69.9	47.8	43.4
21/11/2023	09:15:00	21/11/2023	09:30:00	62.6	44.6	42.6
21/11/2023	09:30:00	21/11/2023	09:45:00	64.9	46.1	42.1
21/11/2023	09:45:00	21/11/2023	10:00:00	63.8	44.9	41.7
21/11/2023	10:00:00	21/11/2023	10:15:00	70.3	49.9	40.8
21/11/2023	10:15:00	21/11/2023	10:30:00	75.1	50.2	41.1
21/11/2023	10:30:00	21/11/2023	10:45:00	70.5	46.4	39.9
21/11/2023	10:45:00	21/11/2023	11:00:00	69.2	57.0	39.6
21/11/2023	11:00:00	21/11/2023	11:15:00	70.4	51.4	40.4
21/11/2023	11:15:00	21/11/2023	11:30:00	65.4	44.6	39.7
21/11/2023	11:30:00	21/11/2023	11:45:00	60.9	47.5	40.8
21/11/2023	11:45:00	21/11/2023	12:00:00	64.2	45.0	39.7
21/11/2023	12:00:00	21/11/2023	12:15:00	70.7	53.2	41.2
21/11/2023	12:15:00	21/11/2023	12:29:55	72.4	47.3	41.3