



REPORT

NOISE IMPACT ASSESSMENT OF PROPOSED PLANT

SITE ADDRESS

HILL MEAD PRIMARY SCHOOL, MOORLAND ROAD, LONDON SW9 8UE



REFERENCE

HA/AF442/V1

HEALTHY ABODE ACOUSTICS
BUILDING ACOUSTICIANS & ENVIRONMENTAL NOISE CONSULTANTS

Our Ref HA/AF442/V1
Site Address Hill Mead Primary School, Moorland Road, London SW9 8UE
For Cenergist Energy Limited
Client Address 8 Bede House, Glover Industrial Estate, Washington, Tyne and Wear NE37 2SH
Date of Report 8 September 2023
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This report has been prepared by Healthy Abode Limited t/a HA Acoustics with all reasonable expertise, care and diligence. The survey and report has been undertaken in accordance with accepted acoustic consultancy principles, it takes account of the services and terms and conditions agreed verbally and in writing between HA Acoustics and our client. Any information provided by third parties and referenced is considered to have undergone suitably thorough third-party checks to ensure accuracy. We can accept no liability for errors with a third-party data. This report is confidential to our client and therefore HA Acoustics accepts no responsibility whatsoever to third parties unless formally agreed in writing by HA Acoustics. Any such party relies upon the report at their own risk.

SUMMARY

- Cenergist Energy Limited instructed Healthy Abode Ltd t/a as HA Acoustics to undertake a noise impact assessment for the proposed installation of two (2) Mitsubishi PUZ-HWM140VHA(-BS) Air Source Heat Pumps to the southern façade of the northerly building at Hill Mead Primary School, Moorland Road, London SW9 8UE.
- HA Acoustics has undertaken an environmental noise survey at the site in order to determine prevailing background noise levels that are representative of the nearest noise sensitive receptors (NSR). The nearest NSR to the proposed plant installation is the rear façade of a residential property off Cory Drive located approximately 30 metres from the plant. NSR2 is the façade of a residential property off Clarewood Walk located approximately 45 metres from the plant.
- A baseline noise survey and assessment has been undertaken in line with the guidance contained in BS 4142: 2014 +A1: 2019, measurements being taken over continuous 15-minute periods. The unattended survey was conducted on Tuesday 29th August 2023 – Thursday 31st August 2023, at two fixed monitoring points, located to the east and west of the site.
- The operation of the mechanical plant shall be as required, 06:00 – 18:00 hours Monday to Friday and 08:00-13:00 hours on Saturdays to Sundays.
- The typical background operational noise level has been calculated at 41dB $L_{A90,T}$ at NSR1 and 42dB $L_{A90,T}$ at NSR2. The noise criteria has been set 5 dB below background at 36dB $L_{A,r,T,r}$ in line with the local authority's requirements
- Noise calculations of the proposed plant have been undertaken using all available details and plans provided by the client and obtaining manufacturers' specifications. The resultant rating level has been calculated at the NSR1 at 33 dB(A) and at NSR2 at 29 dB(A).
- In accordance with BS 4142:2014 +A1: 2019 guidance, the noise impact from the operation of the mechanical plant ***"is an indication of the specific sound source having a low impact"*** at the NSR's.

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Appendix C – Plant Manufacturer’s Specification

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1. INTRODUCTION

- 1.1. Cenergist Energy Limited instructed Healthy Abode Ltd t/a HA Acoustics to undertake a noise impact assessment at Hill Mead Primary School, Moorland Road, London SW9 8UE for submission as part of documentation to be provided to the Local Authority, London Borough of Lambeth.

- 1.2. Hill Mead Primary School, Moorland Road, London, is proposing to install two (2) Mitsubishi PUZ-HWM140VHA(-BS) Air Source Heat Pumps to the southern façade of the northerly building to service the commercial property, the noise from which could have the potential to affect existing noise sensitive properties nearby.

- 1.3. The purposes of this report are:
 - 1.3.1. To determine prevailing environmental noise levels affecting surrounding properties due to nearby noise sources (e.g. road traffic, commercial plant etc.);

 - 1.3.2. Based on the above, to present noise emission limits in accordance with the requirements of BS 4142: 2014 +A1: 2019, and

 - 1.3.3. To undertake an assessment to demonstrate compliance with the Local Authority noise requirements.

2. SITE DESCRIPTION

- 2.1. Hill Mead Primary School, Moorland Road, London SW9 8UE (hereafter referred to as 'the site') is a commercial premises located in an urban area. The proposal is to install two (2) Mitsubishi PUZ-HWM140VHA(-BS) Air Source Heat Pumps to the southern façade of the northerly building.
- 2.2. Site plans (SP1-SP4) can be found in appendix A.
- 2.3. The site is situated in a predominantly residential area. Hillmead drive runs to the south o the site. Residential premises border the site in all directions.
- 2.4. The nearest noise sensitive receptor (NSR) located to the proposed plant location is noted to be the rear façade of a residential property off Cory Drive located approximately 30 metres from the plant. NSR2 is the façade of a residential property off Clarewood Walk located approximately 45 metres from the plant. It can be confidently assumed that if the noise impact assessment indicates that the specific sound source has a low impact at this premises then it can be safely assumed it will be met at other properties of equal distance and/or those further away.
- 2.5. At the time of installation and collection of the monitoring equipment, the dominant noise sources emanated from road traffic, overhead airplane movements and some residential activity noise. These noise sources are considered normal to the site location. No significant abnormal noise sources were identifiable. It is considered that the measured noise levels are reasonable given the location of the measurement position.

3. EXTERNAL NOISE EMISSION CRITERIA

3.1. Local Authority

3.2. The proposed site lies within the jurisdiction of the Local Authority, London Borough of Lambeth. An acoustic report is required to support a planning application. The local authority have provided the following wording:

“For larger air source heat pumps, we want to see a maximum noise rating level at least 5dB below the representative background noise level as determined in accordance with BS4142.

The background noise at each location will vary due to the differing locations, proximity of noise sensitive receptors etc and therefore so will the target value for plant and machinery noise.

Any assessment will need to determine the background noise level, distance to sensitive receptors and other weighting factors for each location. An appropriate target limit for each location can then be derived using the methodology in BS4142.

In terms of mitigation:

- *Really big plant like the ones for swimming pools can have three operating levels- the quieter ones are power setbacks- Less power less noise.*
- *The other issue is the hours of operation background noise levels are typically lowest from midnight to 04:30. This varies from site to site but if the building can cope with the installation operating from say 06:00 to 22:00 then the environmental noise levels can be a lot higher and this reduces the scale of the impact.*

Therefore, a combination of power setback and electronic control can mitigate a fair bit of impact without resorting to expensive and tricky mitigation that can create issues with performance of the plant.

As a first step, you are recommended to identify the kit needed and the specifications and then establish what operating hours will be required and then see if you can trim some noise off with a setback on the machine settings. These will all have to be electronically controlled.”

3.3. It is understood that the plant will be operational Monday – Friday 06:00-18:00 hours and Saturday – Sunday 08:00-13:00 hours. The noise criteria will therefore be set 5dB below the typical background

operational hours level. In this case the criteria to be met is a maximum rating noise level of 36dB $L_{Ar,Tr}$ measured at the NSR.

3.4. National Planning Policy Framework (2021)

3.5. In March 2012, the National Planning Policy Framework (NPPF) came into force and was revised in 2019 and 2021. This document replaces a great many planning guidance documents, which previously informed the planning system in England.

3.6. The NPPF (2021) sets out the Government's economic, environmental and social planning policies for England and these policies articulate the Government's vision of sustainable development.

3.7. The Noise Policy Statement for England (NPSE) published 2010 applies to '*all forms of noise, including environmental noise, neighbour noise and neighbourhood noise*'.

3.8. Paragraph 185 of the NPPF (2021) considers noise, stating:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- *a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- *c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."*

3.9. National Planning Policy is guided by the NPPF. With regard to noise, the terms 'significant adverse impact' and 'other adverse impacts' are defined in the explanatory notes of the 'Noise Policy Statement for England' (NPSE). These state that there are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

- ‘NOEL – No Observed Effect Level, this is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise, and
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.

3.10. Extending these concepts for the purpose of this NPSE leads to the concept of SOAEL - significant observed adverse effect level. This is the level above which significant adverse effects on health and quality of life occur’. However, no specific noise limits for LOAEL and SOAEL have been defined. Therefore, guidance from other acoustic standards must be employed to determine suitable levels within the overall principal of the National Planning Policy Framework; such as BS 8233:2014.

3.11. **BS 4142: 2014 +A1: 2019**

3.12. BS 4142: 2014 +A1: 2019 “Methods for Rating and Assessing Industrial and Commercial Sound” presents a method for assessing the significance and possible adverse impact due to an industrial or commercial noise source, based on a comparison of the source noise levels and the background noise levels, both of which are measured or predicted at a noise sensitive receiver e.g. a residential property.

3.13. The specific noise level due to the source is determined, with a series of corrections for tonality, impulsivity, intermittency or any other unusual characteristic. This can result in a maximum total correction of +21dB being added if the new noise source demonstrates all the above characteristics. The background noise level is then subtracted from the rating level and a comparison made.

3.14. The significance of the new noise source and the likelihood of any adverse impact is determined in accordance with the following advice:

“The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs.

- *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.”*

4. ENVIRONMENTAL NOISE SURVEY METHODOLOGY

4.1. Unattended Environmental Noise Survey

4.2. An unmanned environmental noise survey was undertaken at two measurement locations located to the east and west boundary of the site. The survey was undertaken between 10:30 hours on Tuesday 29th August 2023 and 08:30 hours on Thursday 31st August 2023.

4.3. The sound level meters (SLMs) were mounted approximately 1.5 metres above ground level and the positions were considered to be 'free-field'. The positions were considered to be representative of background noise levels at the nearest identified NSR. The monitoring positions are identified in Appendix A.

4.4. The equipment used for the noise survey is summarised in Table 4.1.

Equipment	Description	Quantity	Serial Number
NTi XL2	Class 1 automated logging sound level meter	1	A2A-13627-E0
MA220 microphone	Class 1 ½" microphone	1	7072
Svantek 977	Class 1 automated logging sound level meter	1	46457
ACO Pacific 7052E	Class 1 ½" microphone	1	64237
Svantek SV36	Class 1 Calibrator	1	109944

Table 4.1 Description of Equipment used for Noise Survey

4.5. Ambient, background and maximum noise levels (L_{Aeq} , L_{A10} , L_{A90} and L_{AmaxF} respectively) were measured throughout the noise survey in consecutive 15-minute periods.

4.6. The noise survey and measurements were conducted, wherever possible, in accordance with BS7445-1:2003 '*Description and measurement of environmental noise. Guide to quantities and procedures*'. Measurements were made generally in accordance with ISO 1996-2:2017 '*Acoustics – Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels*'.

4.7. The noise monitoring equipment was calibrated before and after the noise survey period. No significant drift was recorded. Equipment calibration certificates can be provided upon request.

4.8. Weather Conditions

4.9. Weather conditions were noted to be:

4.9.1.during installation - mild (approximately 19° Celsius), dry, with clear skies (approximately 0-30% cloud cover) and a light wind (<5m/s).

4.9.2.during collection - mild (approximately 16° Celsius), dry, with clear skies (approximately 0-30% cloud cover) and a light wind (<5m/s).

4.9.3.throughout the entire noise survey period - mild (approximately 10-21° Celsius), generally dry, with clear to cloudy skies (approximately 0-70% cloud cover) and a light wind (<5m/s).

4.10. These weather conditions were checked against and confirmed by the use of the Met Office . These conditions were maintained throughout the whole survey period and are considered reasonable for undertaking environmental noise measurements.

5. NOISE SURVEY RESULTS

5.1. The ambient and background noise levels at the measurement position as seen in Appendix A are provided below and have been based on an analysis of the monitoring data.

5.2. A summary of the data results is provided in Table 5.1. The time history can be seen in Appendix B (TH1).

	Ambient Noise Level $L_{Aeq,T}$	Typical Background Noise Level $L_{A90,T}$
Position 1		
Day (07:00 – 23:00)	53 dB(A)	41 dB(A)
Night (23:00 – 07:00)	49 dB(A)	32 dB(A)
Operating Hours (Monday – Friday 06:00-18:00 Saturday – Sunday 08:00-13:00)	53 dB(A)	41 dB(A)
Position 2		
Day (07:00 – 23:00)	69 dB(A)	43 dB(A)
Night (23:00 – 07:00)	65 dB(A)	31 dB(A)
Operating Hours (Monday – Friday 06:00-18:00 Saturday – Sunday 08:00-13:00)	69 dB(A)	42 dB(A)

Table 5.1 Summary of typical noise measurement data

5.3. These noise levels are considered normal to the site location. No significant abnormal noise sources were identifiable during installation or collection of the equipment. It is considered that the measured noise levels are reasonable given the location of the measurement position.

5.4. It is understood that the plant will be operational Monday – Friday 06:00-18:00 hours and Saturday – Sunday 08:00-13:00 hours. The noise criteria will therefore be set 5dB below the typical background operational hours level. In this case the criteria to be met is a maximum rating noise level of 36dB $L_{Ar,Tr}$ measured at the NSR.

6. NOISE IMPACT ASSESSMENT

6.1. It is proposed to install two (2) Mitsubishi PUZ-HWM140VHA(-BS) Air Source Heat Pumps to the southern façade of the northerly. Calculations have been undertaken to gain the specific noise level of the plant using information provided by the client and from manufacturer specifications.

6.2. Table 6.1 lists the proposed plant to be installed and its operational maximum sound power level. Manufacturer's specifications are provided in Appendix C.

Plant Make/Model	Reference Sound Power Level	Quantity
Mitsubishi PUZ-HWM140VHA(-BS)	67 dB	2

Table 6.1 Proposed plant

6.3. No spectral data was available from the manufacturer so levels have been extrapolated from a similar unit. Table 6.2 lists the extrapolated sound power spectral data for the plant.

	Frequency Spectral Data (Hz) at 1m							
	LZFeq 63	LZFeq 125	LZFeq 250	LZFeq 500	LZFeq 1000	LZFeq 2000	LZFeq 4000	LZFeq 8000
Mitsubishi PUZ-HWM140VHA(-BS)	41	53	61	65	63	59	57	43

Table 6.2 Extrapolated spectral sound power data

6.4. Detailed calculations to predict the noise level of the plant at 1metre from the NSR are given in Appendix D. The following factors have been taken into account during the assessment and within the calculations:

6.4.1. Mitigation due to the distance between the proposed plant location and NSR's has been taken into account.

6.4.2. There is only a partial line of sight between the plant and the NSR's. This screening is conservatively estimated to provide 5dB noise attenuation. This will be accounted for in the calculations.

6.4.3. A 'penalty' addition has been added to the fans for intermittency as the operation is considered to be such that it could attract attention at the NSR. A 'penalty' addition has been

added to the fans for tonality at the plant could have tonal elements. Penalty additions have not been applied for impulsiveness or any other unusual characteristics as plant of this type generally do not generate such features.

6.5. Detailed calculations to predict the noise level of the plant at the NSR's are given in Appendix D. The calculations show that no further mitigation is needed. The rating noise level at 1m from the NSR is **33dB L_{Ar,Tr}** and **8dB(A) below** the assessed background noise level (41dB L_{A90,T}). The rating noise level at 1m from the NSR2 is **29dB L_{Ar,Tr}** and **12dB(A) below** the assessed background noise level (41dB L_{A90,T}). In accordance with BS 4142:2014 guidance, the rating noise **"is an indication of the specific sound source having a low impact. The lower the rating level is relative to the measured background level, the less likely it is that the specific sound source will have an adverse impact."**

6.6. Vibration from plant is not expected. However, as a precaution, all plant should be installed with anti-vibration isolators. Anti-vibration mounts are widely available from system suppliers/installers and shall need to be installed in accordance with the type, make and model of the mechanical plant specified. Anti-vibration mounts are often in pedestal rubber mountings. Examples of these are MPO and MP1, and ISL Maxi pedestal vibration mounts. These types of anti-vibration and shock isolators are industry standard and commonplace on air conditioning and ventilation systems. They are designed to provide medium to high frequency isolation from vibration and noise via high resilience rubber. Once type, location, manufacturer make and model of proposed mechanical plant is known, the M+E contractor shall be able to advise upon the specific anti-vibration isolators required to ensure no adverse impact occurs.

6.7. As BS 4142:2014 advises, the impact must be considered within the context of the site and the surrounding acoustic environment. The following must, therefore, also be taken into consideration when determining the potential impact that may be experienced:

6.7.1. The assessment is undertaken at the most affected existing residential windows. The impact on all other nearby residential windows will be lower due to screening and distance attenuation.

6.7.2. It should be noted that the above assessment is based on the plant operating simultaneously and at maximum duty. Given that the plant will not operate simultaneously at maximum

capacity all of the time, the above assessment is considered to be representative of the worst case.

6.8. British Standard 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS8233:2014 recommends 30dB(A) as being acceptable internal resting/sleeping conditions during night-time. According to BS8233:2014, the façade of a residential dwelling; with a window partially open for ventilation offers 10-15 dB attenuation. Therefore, taking into account this reduction for a partially open window the internal noise level with the plant operating would be 23dB(A) at NSR1 and 19dB(A) at NSR2 which is lower than the acceptable internal noise level as seen under BS 8233: 2014; and significantly lower than the background.

7. UNCERTAINTY

- 7.1. The levels of uncertainty in the data and calculations are considered to be low given the robust exercise undertaken in noise monitoring and the confidence in the statistical analysis.
- 7.2. All measurements taken on-site by instrumentation are subject to a margin of uncertainty. This is relatively small, with a sound level meter manufacturer's margin of uncertainty at +/-1.1dB. It is due to the tolerances associated with the Class 1 sound level meter and calibrator equipment used to measure background.
- 7.3. The meter and calibrator used have a traceable laboratory calibration and were field calibrated before and after the measurements.
- 7.4. Manufacturers' data for the plant is likely to be robust. Detailed calculations and resultant noise levels at the residential location are considered to be confidently predicted.
- 7.5. Uncertainty in the calculated impact has been reduced by the use of a well-established calculation method.

8. CONCLUSION

- 8.1. A noise assessment has been undertaken at Hill Mead Primary School, Moorland Road, London SW9 8UE. The noise survey was undertaken at two fixed monitoring point, representative of the nearest noise sensitive receptors.
- 8.2. Following on-site measurement of pre-existing noise levels, calculations have been made of the noise rating level of the proposed plant at the NSR. From this assessment, together with information from the plant manufacturer, the potential noise impact has been determined.
- 8.3. Noise levels from the plant at NSR1 are predicted to be **33dB L_{Ar,Tr}** and at NSR2 are predicted to be **29dB L_{Ar,T}**. BS 4142: 2014 +A1: 2019 assessment methodology shows that the rating noise level from the proposed mechanical plant is predicted to be at **8dB(A) below** the typical background of **41dB L_{A90,T}** _{1hour} at NSR1 and to be at **12dB(A) below** the typical background of **41dB L_{A90,T}** _{1hour} at NSR2. In accordance with BS 4142:2014, noise levels from the plant ***“is an indication of the specific sound source having a low impact”***.
- 8.4. Considering the results of the noise survey, the illustrative layouts and the calculations, the predicted resultant noise levels from the proposed plant are predicted to meet appropriate and reasonable guidance and the relevant noise criteria. Therefore, an adequate level of protection against noise for occupants of the nearest noise sensitive receptor is afforded, including when factoring in potential uncertainty.



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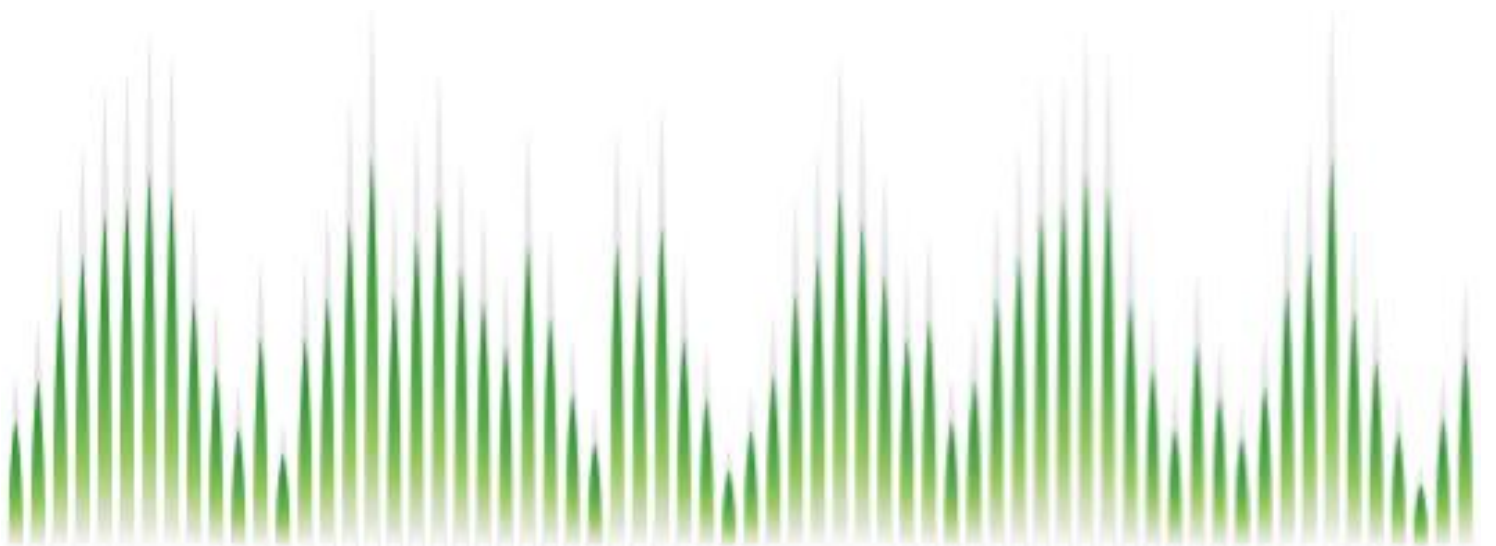


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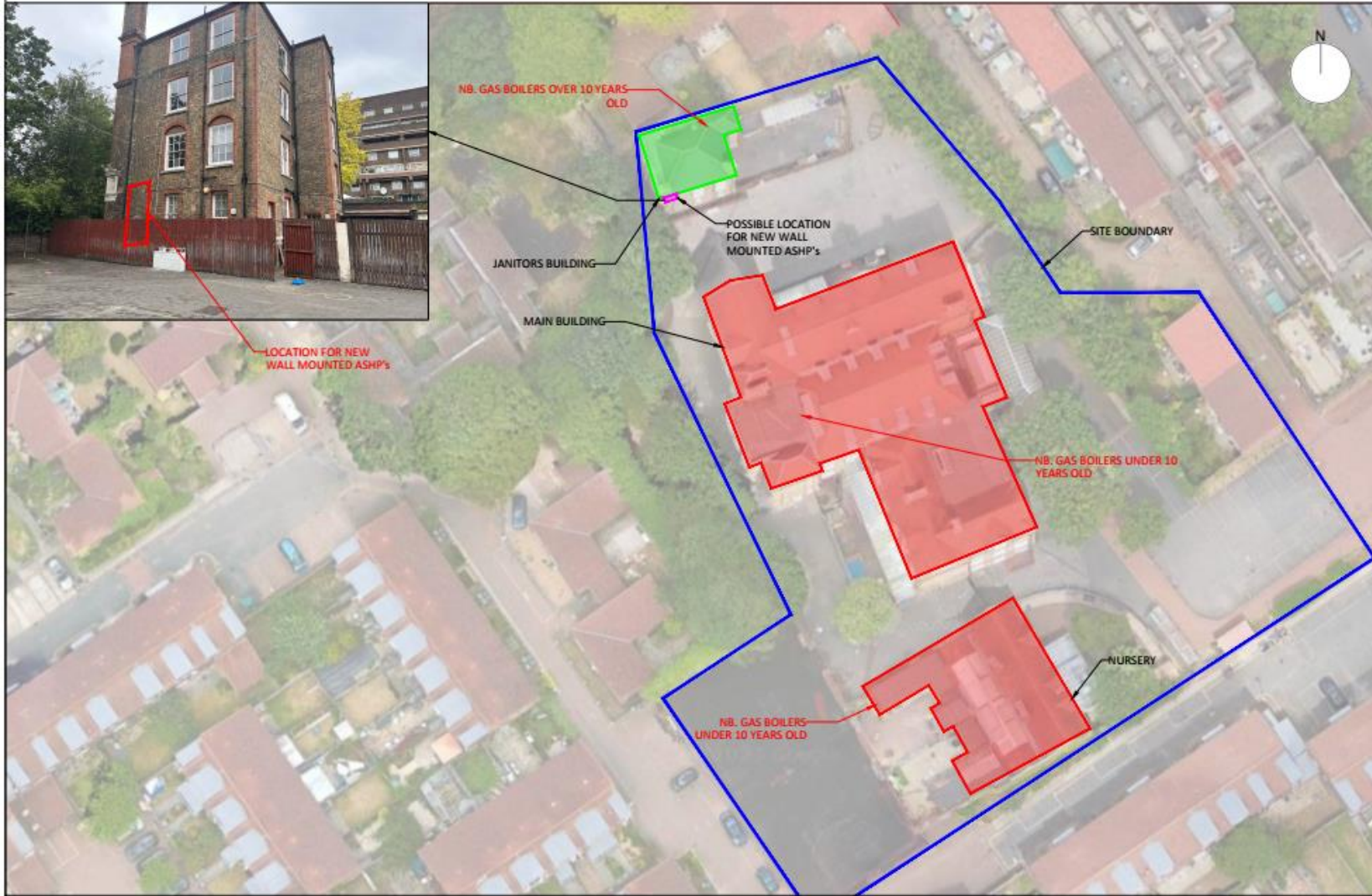
Appendix A – Site Plan (SP1)

Source: Google Earth



Appendix A – Site Plan (SP2)

Source: Provided by Client



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-  BUILDING OUTLINE WITHIN SCOPE
-  BUILDING OUTLINE OUTSIDE SCOPE
-  UNDERGROUND SERVICES TRENCH
-  ABOVE GROUND SERVICES
-  UNDERGROUND ELECTRICAL SUPPLY
-  ABOVE GROUND ELECTRICAL SUPPLY
-  EXISTING PLANTROOM
-  PROPOSED ASHP LOCATION
-  SITE BOUNDARY

Rev	Revision Description	Dwn	Chk	Date
PSD	General Amendments	MicA	EE	27/07/23
P01	First Issue	MicA	EE	05/08/23

PRELIMINARY



project title:
LAMBETH PSDS3B

drawing title:
HILL MEAD PRIMARY SCHOOL
SITE OVERVIEW LAYOUT

drawing no: CN2302-ALT+HIL+XI+DR-Z-1005
Rev: P02

date: 27/07/2023
scale: 1:500
drawn by: AMcA
checked by: EE



Site Overview Layout
Scale 1:500



Appendix A – Site Plan (SP3)

Source: Provided by Client



Existing Site Layout
Scale 1:200

Proposed Site Layout
Scale 1:200



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Rev	Revision Description	Rev	Rev	Date
PD1	Final Issue	MR	EE	25/07/23

PRELIMINARY

project title:
LAMBETH PSDS3B

drawing title:
**HILL MEAD PRIMARY SCHOOL
EXISTING & PROPOSED SITE LAYOUTS**

drawing no: **CN2302-ALT-HIL-XX-DR-2-1006** Rev: **PD1**

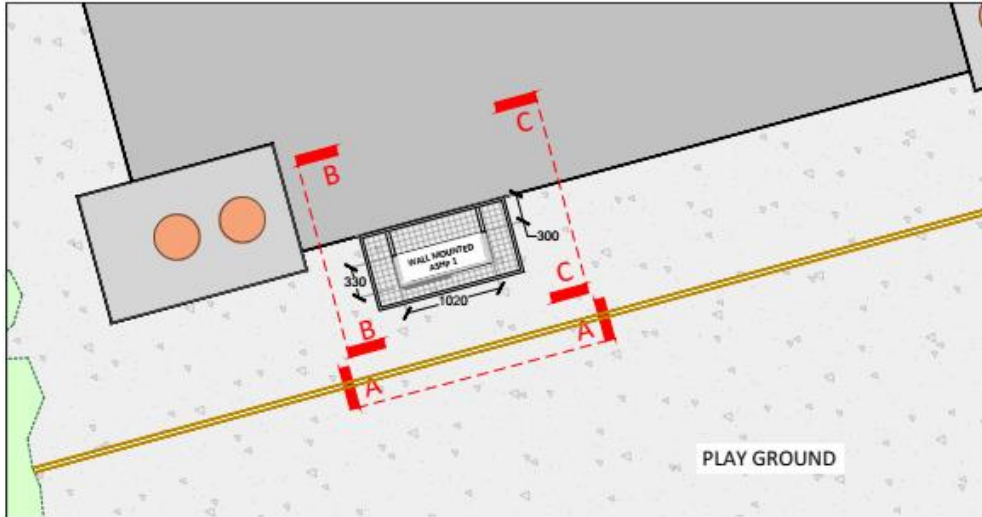
date: **25/07/2023** scale: **1:200**

drawn by: **MR** checked by: **EE**



Appendix A – Site Plan (SP4)

Source: Provided by Client



Wall Mounted ASHP Location

ASHP Enclosure Layout
Scale 1:50

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SCHEDULE OF FINISHES

-ASHP UNITS OUTER CASING - GREY

Rev	Revision Description	Des	Chk	Date
P01	Final Issue	MJR	EE	19/07/23

status:
PRELIMINARY



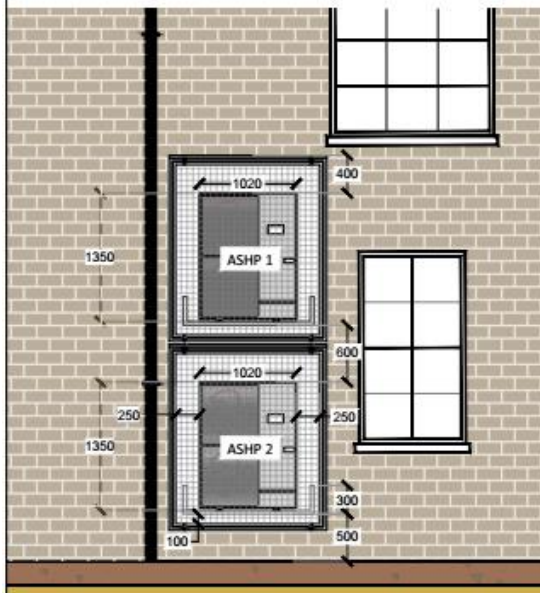
project title:
LAMBETH PSDS3B

drawing title:
HILL MEAD PRIMARY SCHOOL ASHP ENCLOSURE LAYOUT & ELEVATIONS

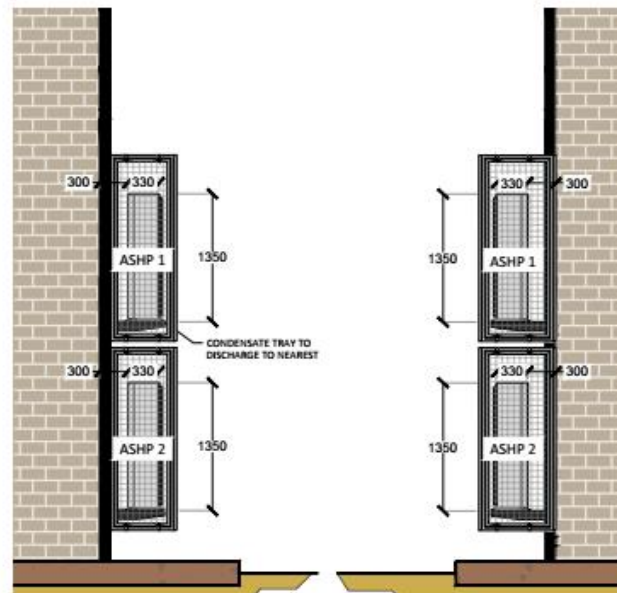
drawing no: CN2302-ALT-HIL-XX-DR-Z-1009 Rev: P01

date: 19/07/2023 scale: 1:50

drawn by: MJR checked by: EE



Elevation A
Scale 1:50

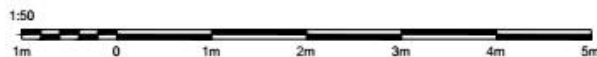


Elevation B
Scale 1:50

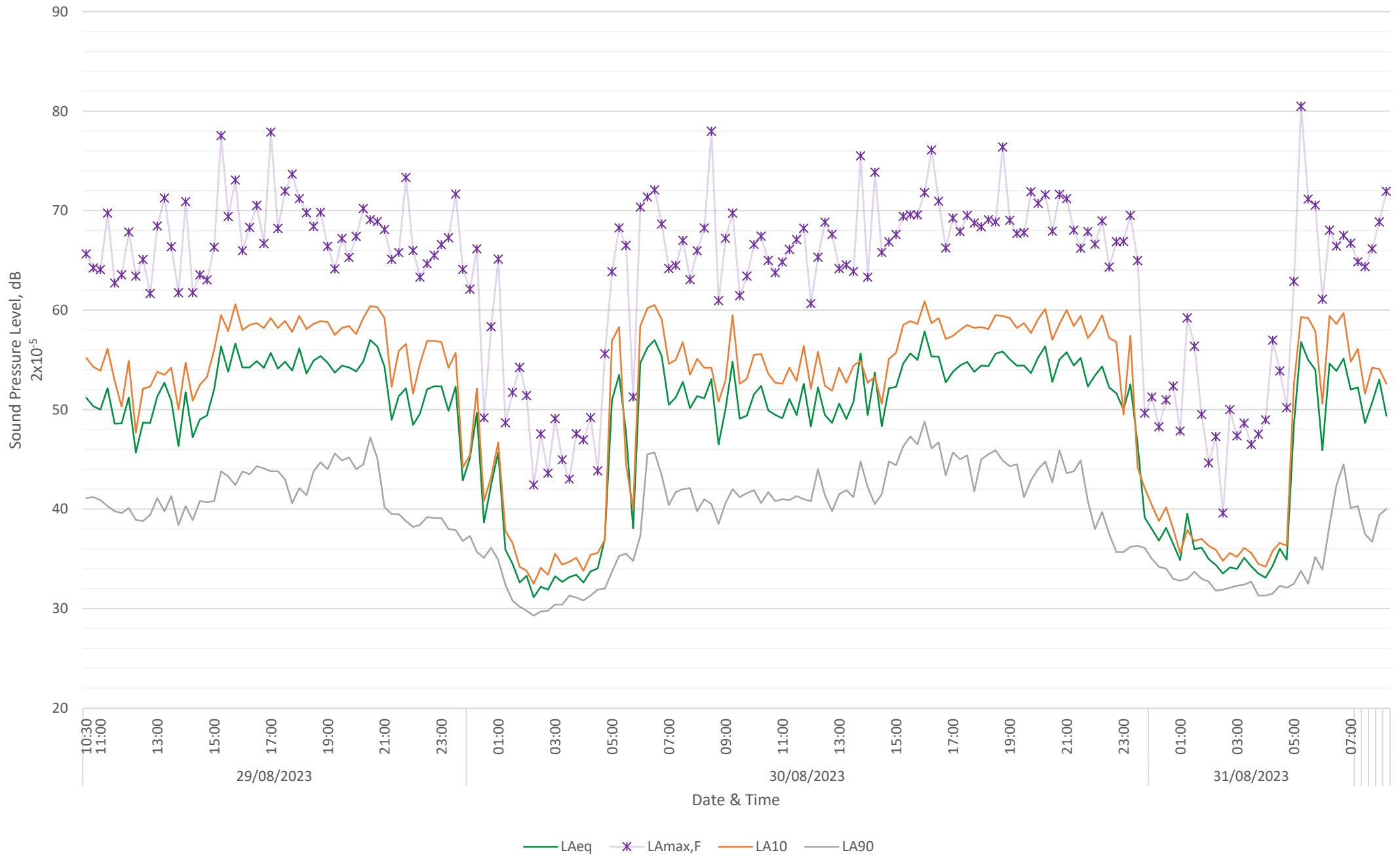
Elevation C
Scale 1:50



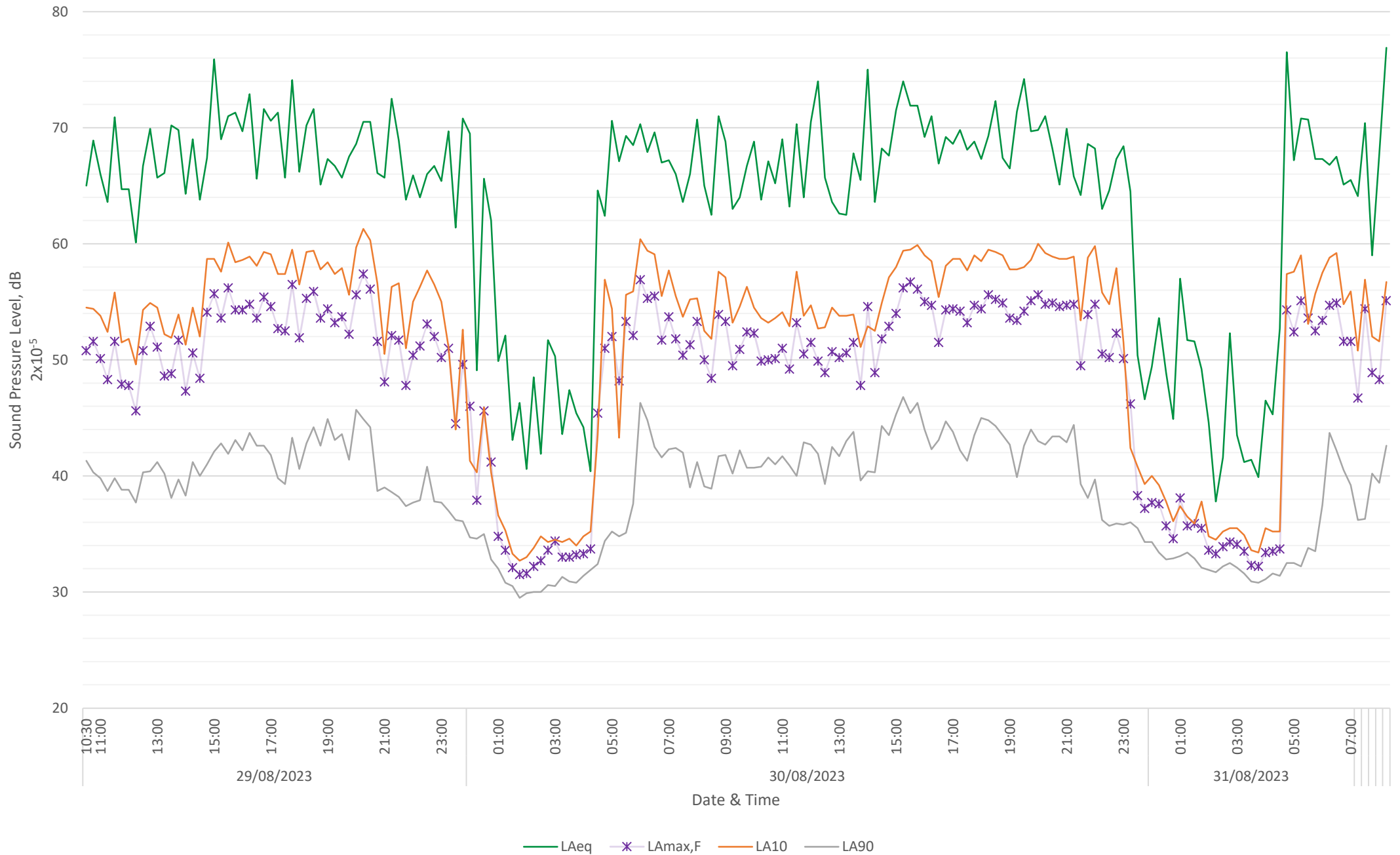
Typical Wall Mounted ASHP



Hill Mead School, Moorland Road, London
Tuesday 29 August 2023 - Thursday 31 August 2023
Position 1



Hill Mead School, Moorland Road, London
 Tuesday 29 August 2023 - Thursday 31 August 2023
 Position 2



Appendix C – Plant Manufacturer’s Specifications

Mitsubishi PUZ-HWM140VHA(-BS)

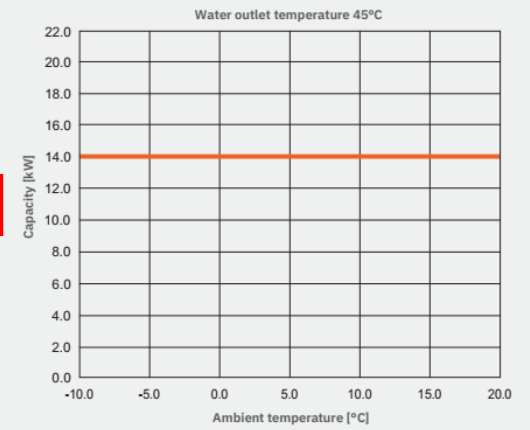
Heating

Product Information

PUZ-HWM140VHA(-BS)
Ecodan R32
Monobloc Air Source Heat Pump

OUTDOOR UNIT		PUZ-HWM140VHA(-BS)
HEAT PUMP SPACE HEATER - 55°C	ErP Rating	A++
	η_{hp}	131%
	SCOP (MCS)	3.26
HEAT PUMP SPACE HEATER - 35°C	ErP Rating	A+++
	η_{hp}	176%
	SCOP (MCS)	4.33
HEAT PUMP COMBINATION HEATER - Large Profile ¹	ErP Rating	A+
	η_{hp}	130%
HEATING ² (A-7/W35)	Capacity (kW)	14
	Power Input (kW)	5.71
	COP	2.45
OPERATING AMBIENT TEMPERATURE (°C DB)		-28 ~ +35
SOUND DATA ³	Pressure Level at 1m (dBA)	53
	Power Level (dBA) ⁴	67
WATER DATA	Flow Rate (l/min)	40.1
	Water Pressure Drop (kPa)	20
	Water Pressure Drop (kPa)	20
DIMENSIONS (mm)	Width	1020
	Depth	330 + 30*7
	Height	1350
WEIGHT (kg)		132
ELECTRICAL DATA	Electrical Supply	220-240V, 50Hz
	Phase	Single
	Nominal Running Current [MAX] (A) ⁵	13.8 [35]
	Fuse Rating - MCB Sizes (A) ⁶	40
REFRIGERANT CHARGE (kg) / CO ₂ EQUIVALENT (t)	R32 (GWP 675)	3.3

NOMINAL HEATING CAPACITY



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.

Low Noise mode accessory (reference PAC-SA89TA-EP) available for VHA chassis.

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.

⁷ Grille.

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

Appendix D - HA Calculations



Noise Sensitive Receiver 1

	Frequency Spectral Data (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
Mitsubishi PUZ-HWM140VHA(-BS)* Lw	41	53	61	65	63	59	57	43	67
Mitsubishi PUZ-HWM140VHA(-BS)* Lw	41	53	61	65	63	59	57	43	67
Calculated Cumulative Plant SPL	33	45	53	57	55	51	49	35	59
BS4142 Penalty for Intermittency	3	3	3	3	3	3	3	3	
BS4142 Penalty for Tonality	2	2	2	2	2	2	2	2	
Reflections	3	3	3	3	3	3	3	3	
Distance propagation (30m)	-30	-30	-30	-30	-30	-30	-30	-30	
Partial line of site	-5	-5	-5	-5	-5	-5	-5	-5	
Calculated rating level at NSR1	6	18	26	30	28	24	22	8	33

*spectral data extrapolated from a similar unit

Noise Criteria	36
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BS8233: Internal Night Time Levels

	Frequency Spectral Data (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
Calculated level at NSR	6	18	26	30	28	24	22	8	33
Partially Open Window Attenuation	-10	-10	-10	-10	-10	-10	-10	-10	
Calculated level in Internal Receiver	-4	8	16	20	18	14	12	0	23

BS8233 Night Time Criteria	30
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Noise Sensitive Receiver 2

	Frequency Spectral Data (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
Mitsubishi PUZ-HWM140VHA(-BS)* Lw	41	53	61	65	63	59	57	43	67
Mitsubishi PUZ-HWM140VHA(-BS)* Lw	41	53	61	65	63	59	57	43	67
Calculated Cumulative Plant SPL	33	45	53	57	55	51	49	35	59
BS4142 Penalty for Intermittency	3	3	3	3	3	3	3	3	
BS4142 Penalty for Tonality	2	2	2	2	2	2	2	2	
Reflections	3	3	3	3	3	3	3	3	
Distance propagation (45m)	-33	-33	-33	-33	-33	-33	-33	-33	
Partial line of site	-5	-5	-5	-5	-5	-5	-5	-5	
Calculated rating level at NSR1	3	15	23	27	25	21	19	5	29

*spectral data extrapolated from a similar unit

Noise Criteria	36
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BS8233: Internal Night Time Levels

	Frequency Spectral Data (Hz)								
	63	125	250	500	1000	2000	4000	8000	dB(A)
Calculated level at NSR	3	15	23	27	25	21	19	5	29
Partially Open Window Attenuation	-10	-10	-10	-10	-10	-10	-10	-10	
Calculated level in Internal Receiver	-7	5	13	17	15	11	9	0	19

BS8233 Night Time Criteria	30
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