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LAWRENCE BAKER LIMITED

THE MOUNT CARE HOME, WARGRAVE

Noise Impact Assessment for Roof Mounted Building Services Plant Items

A0194-REP01

15 December 2025

Document History

Document Reference	Author	Document Reference
A0194-REP01	[redacted] Ian Etchells BEng MIOA	15 December 2025
Revision Level	**Revision Date**	**Description**

CONTENTS

1. INTRODUCTION

1.1. This report contains details of a noise impact assessment carried out for roof mounted building services plant to be installed at The Mount care home development, School Hill, Wargrave, RG10 8DY. The development received planning approval (application reference: 222456) during June 2023 subject to conditions. This assessment has been commissioned by the Principal Contractor, Lawrence Baker Limited, pursuant with an application for a Section 73 amendment relating to the roof mounted plant.

1.2. Although none of the planning conditions refer specifically to noise, the Local Planning Authority requested via email on 14th October 2025 that a noise impact assessment be provided in relation to roof mounted plant items. It is understood that the LPA's acoustic requirement is for the combined noise level from roof mounted plant items to not exceed the representative background sound level (and preferably to fall below this level) outside the nearest sensitive receptors.

1.3. The following steps have therefore been followed in preparing this noise impact assessment:

a) Noise monitoring over an extended period of time in order to determine representative background sound levels in the area during daytime and night-time periods;

b) Development of a noise propagation model to accurately determine levels of noise from the proposed roof mounted plant items that will impact upon the nearest noise sensitive receptors;

c) Comparison of the predicted plant noise levels with background sound levels in order to determine the level of impact in accordance with BS4142 and assess any requirements for mitigation.

1.4. At the time of preparing this assessment the care home was in the latter stages of construction, with the building envelope complete and the majority of internal walls installed. The roof mounted plant items referred to in this assessment had yet to be installed.

1.5. A glossary of acoustics terms referred to within this report is presented in Appendix A.

2. SITE AND SURROUNDINGS

2.1. The rectangular development site lies off School Hill, Wargrave, within a predominantly residential area.

2.2. To the north of the development site lie the gardens of properties along Silverdale Road. To the east the site is bounded by the rear gardens of three bungalows on Beverley Gardens.

2.3. A public footpath runs along the southern site boundary, providing access to the Robert Piggot C of E Infant School, the playing field of which lies adjacent to the southern site boundary with the school building lying further east. To the south (beyond the public footpath and closer to School Hill) is a modern development, Wyatt Close, which is a private road featuring six luxury detached houses. The back gardens of some of these houses face the southern boundary of the development site.

2.4. School Hill runs along the western site boundary. On the opposite side of School Hill lies the Robert Piggot C of E Junior School and a row of detached houses.

2.5. Traffic along School Hill is relatively light exhibiting only intermittent vehicle movements (outside of school drop off and pick-up times).

2.6. The development site and surrounding dwellings are shown in Figure 1.

Figure 1 Location of Development Site and Nearest Noise Sensitive Receptors (image: Google Earth)

3. DESCRIPTION OF PROPOSALS

3.1. The Mount Care Home development comprises two and part three storey elements containing a total of 65 beds. The envelope of the building is of traditional brickwork construction.

3.2. The general arrangement of the development site, including the care home building, car parking and landscaping are shown in Figure 2.

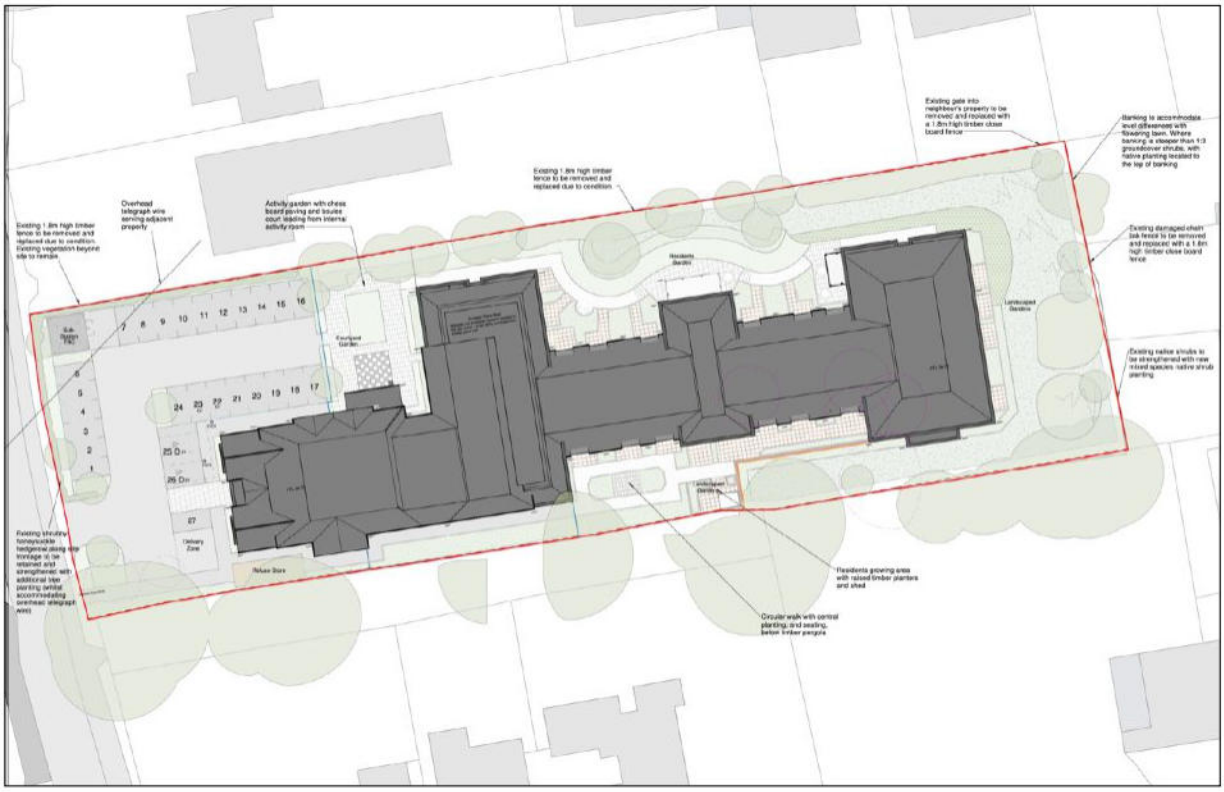


Figure 2 Development Site Layout

3.3. Items of building services plant mounted on the roof of the building and included in this assessment are summarised in Table 1 and their locations are shown on a roof layout plan contained in Appendix B.

3.4. The plant items will operate on a 24 basis, however a number of plant items will operate in a quieter night/silent mode at night producing the reduced noise levels indicated in Table 1.

3.5. Although three Midea MH-SU65-RN8L heating air source heat pumps (ASHP-H01, ASHP-H02 & ASHP-H03) will be located on the second floor roof, only two of these units will operate at any one time, the third being utilised as a standby/backup unit.

Unit Label	Plant Decscription	Sound Power Level (SWL) / Sound Pressure Level at Distance (SPL)
ACU-201	Toshiba MMY-MAP1806 Air Conditioning Unit	61dBA @ 1m (SPL) (Night mode 54dBA @ 1m SPL)
ACU-202	Toshiba MMY-MAP1006 Air Conditioning Unit	59dBA @ 1m (SPL) (Night mode 50dBA @ 1m SPL)
ACU-203	Toshiba MMY-MAP1006 Air Conditioning Unit	59dBA @ 1m (SPL) (Night mode 50dBA @ 1m SPL)
ACU-204	Toshiba RAV-GM901ATP-E Air Conditioning Unit	51dBA @ 1m (SPL) (Night mode 45dBA @ 1m SPL)
ACU-205	Toshiba RAV-GM901ATP-E Air Conditioning Unit	51dBA @ 1m (SPL) (Night mode 45dBA @ 1m SPL)
ACU-206	Toshiba RAV-GM801ATP-E Air Conditioning Unit	48dBA @ 1m (SPL) (Night mode 43dBA @ 1m SPL)
ACU-207	Toshiba RAV-GM801ATP-E Air Conditioning Unit	48dBA @ 1m (SPL) (Night mode 43dBA @ 1m SPL)
ASHP-D01	Mitsubishi ESA30EH2-25 Domestic Air Source Heat Pump	58dBA @ 1m (SPL)
ASHP-D02	Mitsubishi ESA30EH2-25 Domestic Air Source Heat Pump	58dBA @ 1m (SPL)
ASHP-H01	Midea MH-SU65-RN8L Heating Air Source Heat Pump	64dBA @ 1m (SPL) (Silent Mode 58dB @ 1m)
ASHP-H02	Midea MH-SU65-RN8L Heating Air Source Heat Pump	64dBA @ 1m (SPL) (Silent Mode 58dB @ 1m)
ASHP-H03	Midea MH-SU65-RN8L Heating Air Source Heat Pump	64dBA @ 1m (SPL) (Silent Mode 58dB @ 1m)
HRU-202	Mitsubishi LGH-65RVX3-E Heat Recovery Unit	37dBA @ 1m (SPL) (radiated from casing)
HRU-301	Mitsubishi LGH-65RVX3-E Heat Recovery Unit	37dBA @ 1m (SPL) (radiated from casing)
KSF-301	MUB 042 450EC-K Multibox Kitchen Supply Fan	50dBA (SWL) radiated from casing
		50dBA (SWL) radiated from inlet (includes reductions from proposed 900mm long inlet attenuator and duct end reflection)

Table 1 List of Roof Mounted Building Services Plant Items Included in Assessment

3.6. The manufacturers' acoustic data for each of the plant items in Table 1 are presented in Appendix C.

4. ENVIRONMENTAL NOISE SURVEY

4.1. This section describes how representative background sound levels in the area were determined in order to provide a baseline against which noise emissions from the roof mounted plant items can be compared in order to assess compliance with the Local Planning Authority's acoustic criteria.

Noise Survey Method

4.2. An unattended survey of external noise levels was carried out at the development site between 11:00hrs on 18th November and 09:40hrs on 21st November 2025.

4.3. Noise measurements were taken using a microphone positioned on a tripod in the south east corner of the development site at the location indicated in Figure 3. The location was chosen in order to minimise the influence of daytime construction activities on the measurements, including the movements of a telehandler in the goods area located at the front of the site. The measurement position is also considered to provide results that are representative of the lowest background sound levels outside the adjoining dwellings due to its distance from School Hill.

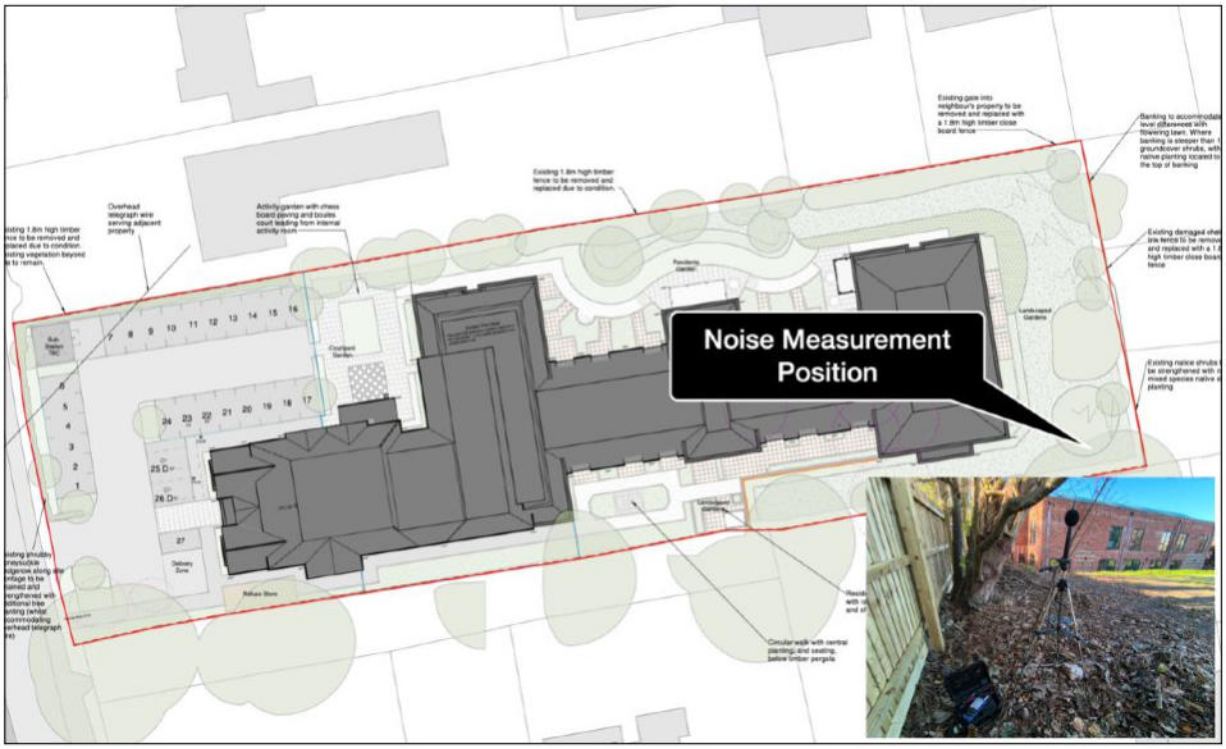


Figure 3 Location of Measurement Microphone

4.4. The microphone was fitted with a weather protection kit and the instrumentation was set to continuously log measured noise levels over 15 minute intervals and simultaneously record audio, thereby allowing extraneous noise events to be identified and excluded from the analysis during post-processing of the survey results using NTi Audio's Data Explorer software. One second interval noise levels were also stored in order to allow parameters to be re-calculated over other time periods if required.

4.5. Noise measurements were undertaken in general accordance with the guidance presented in ISO 1996: 2017: *Acoustics. Description, measurement and assessment of environmental noise.*

4.6. Calibration checks were carried out immediately before and after the survey period using an acoustic calibrator; no drift in the instrumentation's sensitivity was detected.

4.7. Full noise survey details and results are presented in Appendix D.

Noise Survey Results

4.8. The results of the noise survey are summarised in Figure 4.

Figure 4 Noise Levels Measured During Survey Period

4.9. The noise environment at the measurement position was primarily influenced by construction activities during daytime site hours (07:30hrs to 17:00hrs), distant road traffic noise from School Hill and more distant roads, aircraft noise and birdsong.

4.10. Plateaus in the daytime background sound levels measured during the last two daytime survey periods were caused by steady noise from a painter's heater located externally on the pathway along the rear of the building.

4.11. Average daytime (07:00hrs to 23:00hrs) and night-time (23:00hrs to 07:00hrs) ambient noise levels measured during the survey were 50dB $L_{Aeq,16hour}$, and 40dB $L_{Aeq,8hour}$ respectively.

4.12. Figure 5 contains histograms of the background sound levels measured during daytime and night-time periods. From the histograms it is concluded that the representative background sounds level during daytime and night-time periods were 37dB $L_{A90,15min}$ and 29dB $L_{A90,15min}$ respectively.

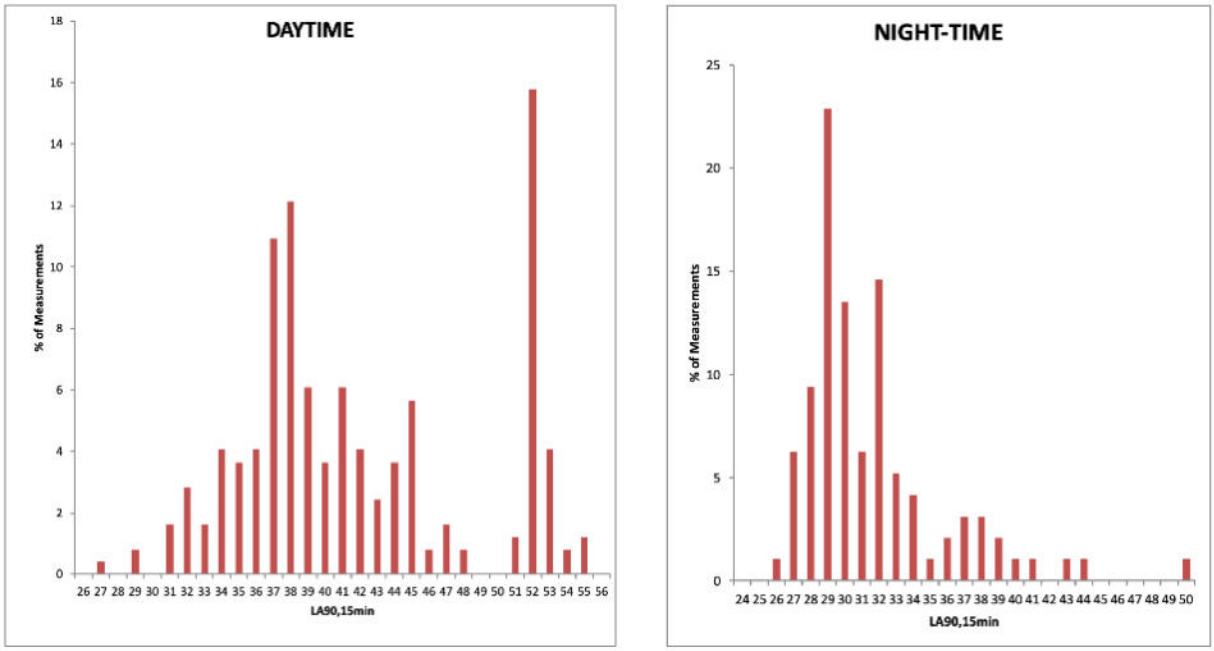


Figure 5 Background Sound Levels Measured During Daytime and Night-time Survey Periods

5. NOISE PROPAGATION MODEL

5.1. A noise propagation model has been produced using CadnaA noise prediction software[1] in order to facilitate the calculation of plant noise levels impacting upon the nearest sensitive premises to the development site.

5.2. Calculations within the model have been carried out with the condenser units modelled as point noise sources in accordance with ISO 9613-2:1996 *Acoustics - Attenuation of sound during propagation outdoors, Part 2: General method of calculation*. The model takes into account propagation effects including attenuation with distance, screening by and reflections (second order) from buildings, air and ground absorption.

5.3. Octave band sound power levels for the proposed plant items were derived from sound pressure level data published by the equipment manufacturers and have been used within the model. Octave band spectrum shapes for the smaller condenser units (ACU-204, ACU-205, ACU-206 & ACU-207) are not published by Toshiba and have therefore been derived from similar sized units manufactured by Mitsubishi (model SUZ-M25VA).

5.4. The general arrangement of the noise propagation model is shown in Figure 6.

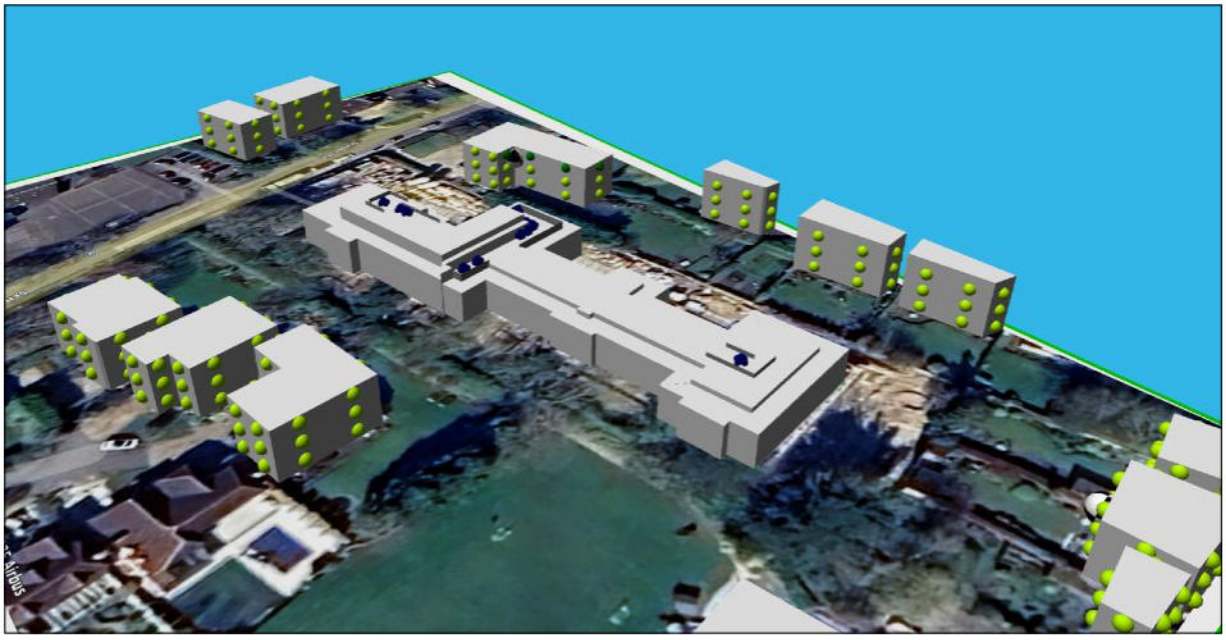


Figure 6 General Arrangement of Noise Propagation Model

[1] Cadna-A software by Datakustik GmbH.

5.5. Overnight noise levels have been calculated in the model using the reduced night/silent mode noise levels referred to in Table 1.

5.6. In practice it is unlikely that all plant items will operate simultaneously as load conditions will vary dynamically throughout the day and night as well as seasonally. The noise levels calculated by the model should therefore be considered to represent the 'worst case'.

5.7. Figure 7 indicates the facade noise levels calculated outside the nearest sensitive premises during daytime. The figure confirms that the nearest houses to the north and south will be subject to noise levels of up to 37dB L_{Aeq} and 33dB L_{Aeq} respectively, i.e. no higher than the representative background sound level of 37dB L_{A90} during daytime. Plant noise levels calculated outside dwellings lying to the east and west will reach up to 28dB L_{Aeq}.

5.8. Plant noise levels outside the Robert Piggot C of E Infant School during daytime are calculated to reach up to 25dB L_{Aeq}. The resultant noise levels within the school building, assuming windows are open for ventilation or cooling, are expected to reach no higher than 15dB L_{Aeq} which is comfortably below the design limit of 35dB L_{Aeq} recommended by Building Bulletin 93[2] for intrusive noise within general teaching spaces.

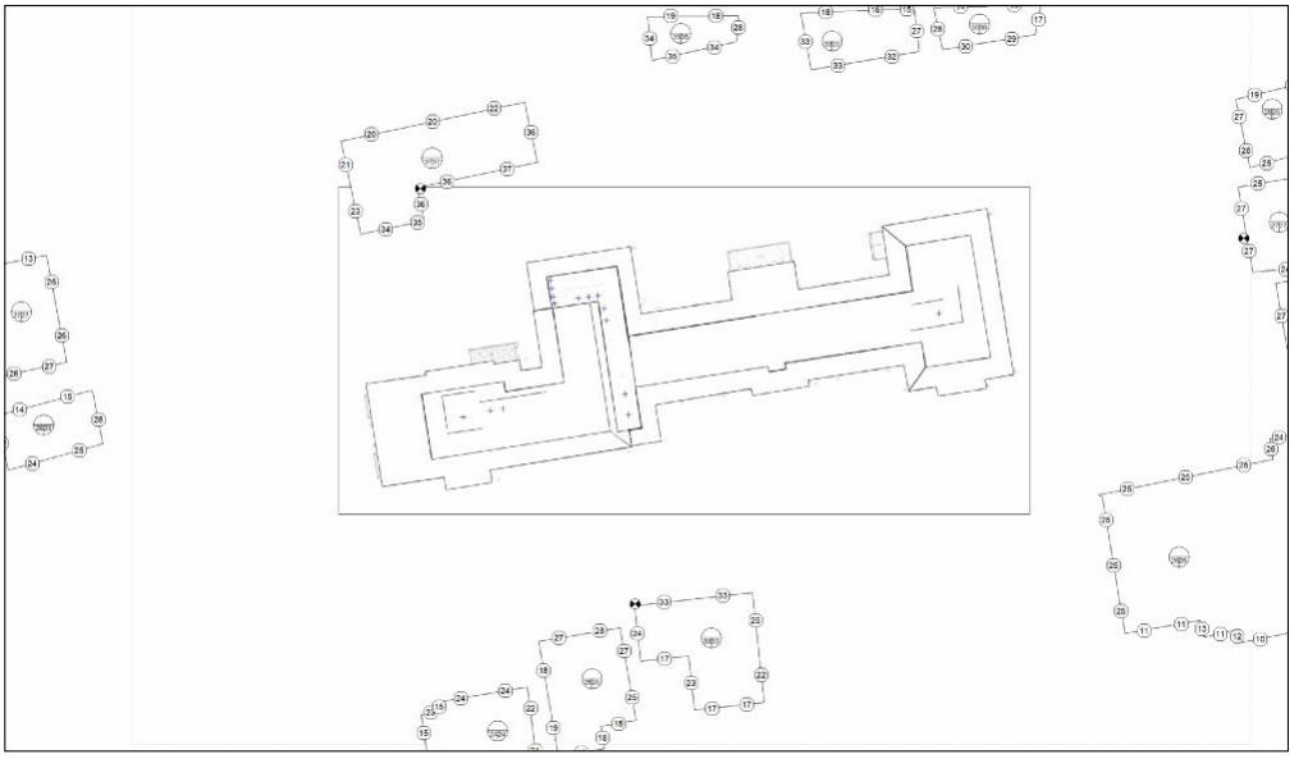


Figure 7 Daytime Facade Noise Levels Calculated Outside Nearest Sensitive Premises

[2] Building Bulletin 93, *Acoustic Design of Schools - Performance Standards*, DfE December 2014

5.9. Figure 8 indicates the facade noise levels calculated outside the nearest sensitive premises at night. The figure confirms that the nearest houses to the north and south will be subject to plant noise levels of up to 31dB L_{Aeq} and 30dB L_{Aeq} respectively, i.e. marginally exceeding the representative background sound level of 29dB L_{A90} at night.

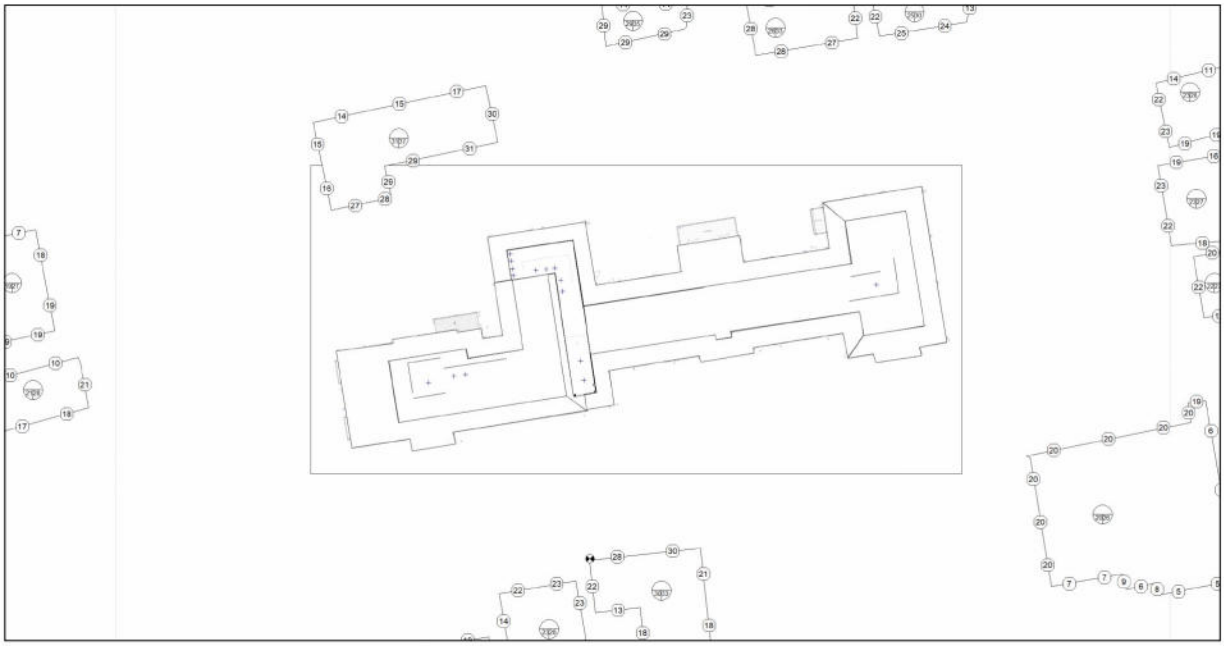


Figure 8 Night-time Facade Noise Levels Calculated Outside Nearest Sensitive Premises

5.10. As the calculated plant noise levels at night will exceed the representative background sound level outside the nearest dwellings it is necessary to provide additional noise mitigation measures as discussed in the following section of this report.

6. NOISE IMPACT ASSESSMENT & MITIGATION

6.1. The Local Planning Authority has confirmed that their planning criterion for plant noise requires that it be limited to a level of no higher than the representative background sound level outside the noise nearest sensitive receptors, which includes dwellings and schools.

6.2. The environmental noise survey at the development site has confirmed that the representative background sound levels in the area are 37dB L_{A90} and 29dB L_{A90} during daytime and nigh-time periods respectively. Therefore, in order to comply with LPA's requirements the total plant noise levels must not exceed these values outside the nearest sensitive receptors during daytime and at night.

6.3. The noise propagation modelling exercise referred to in Section 5 has confirmed that plant noise levels will meet the daytime noise limit outside the nearest receptors during daytime but marginally exceed the night-time noise limit, thereby necessitating the introduction of mitigation measures.

6.4. A number of options for screening neighbouring sensitive receptors against plant noise have been evaluated within the noise propagation model in order to develop a suitable noise mitigation scheme. The option of completely enclosing the noisiest items of plant within acoustic enclosures has been reviewed and discounted due to a lack of available space and the resultant loss of adequate airflow to the plant items.

6.5. The proposed noise mitigation scheme is to introduce localised 2.0m and 2.2m high acoustic screens on the roof in the locations shown in Figure 9, avoiding the hatched zones required to facilitate adequate airflow for the plant items. The screens may be close boarded timber fencing or an alternative solid construction with a surface mass of at least 10kg/m^2 (e.g. proprietary modular acoustic panels with a perforated liner facing toward the plant). Any penetrations within the screens for pipework, cabling or structural support elements must be fully sealed.

6.6. Figure 10 shows the calculated plant noise levels outside the nearest sensitive receptors during daytime with the proposed acoustic screens included in the noise propagation model. The nearest dwellings to the north and south are shown to be subject to plant noise levels of up to 34dB L_{Aeq} and 32dB L_{Aeq} respectively, both levels falling below the representative background sound level of 37dB L_{A90}.

6.7. Figure 11 shows the calculated plant noise levels outside the nearest sensitive receptors at night with the proposed acoustic screens included in the noise propagation model. The nearest dwellings to the north and south are shown to be subject to plant noise levels of up to 27dB L_{Aeq}, thereby falling below the representative background sound level of 29dB L_{A90}.

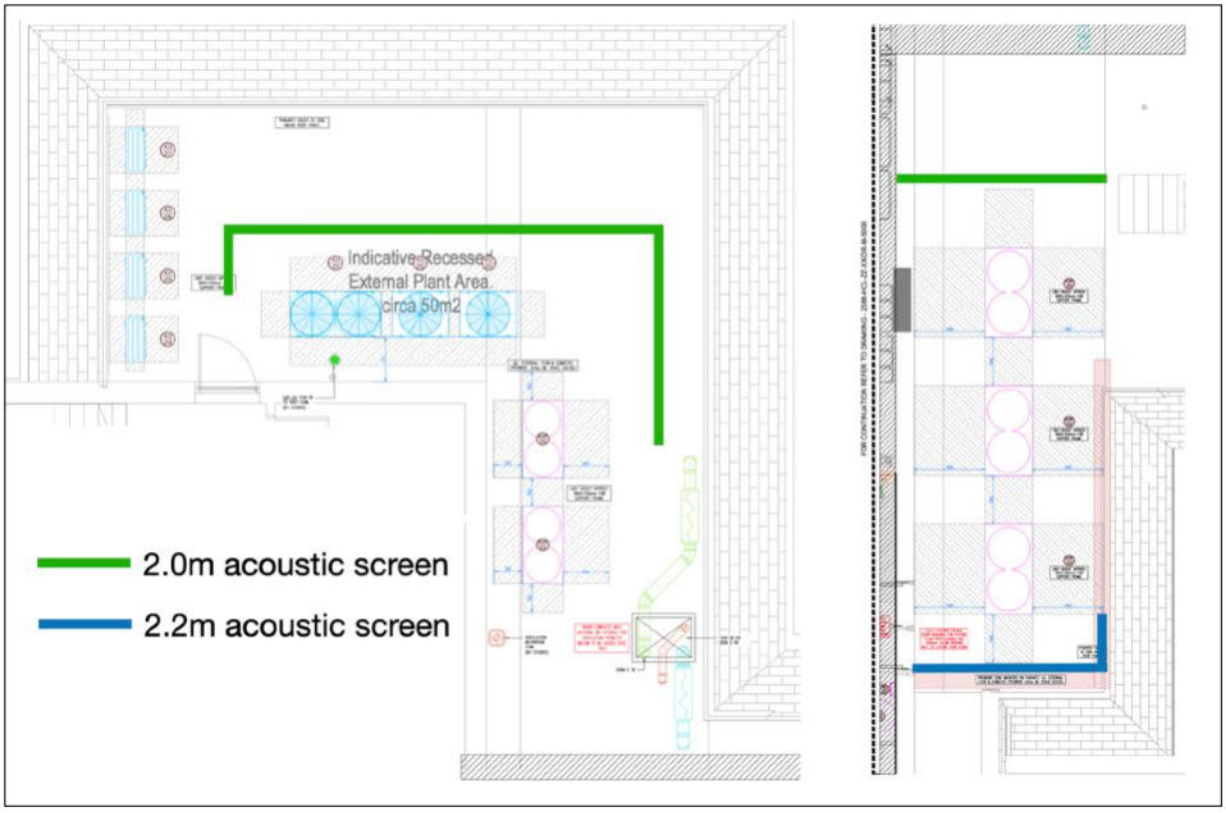


Figure 9 Recommend Noise Mitigation Scheme

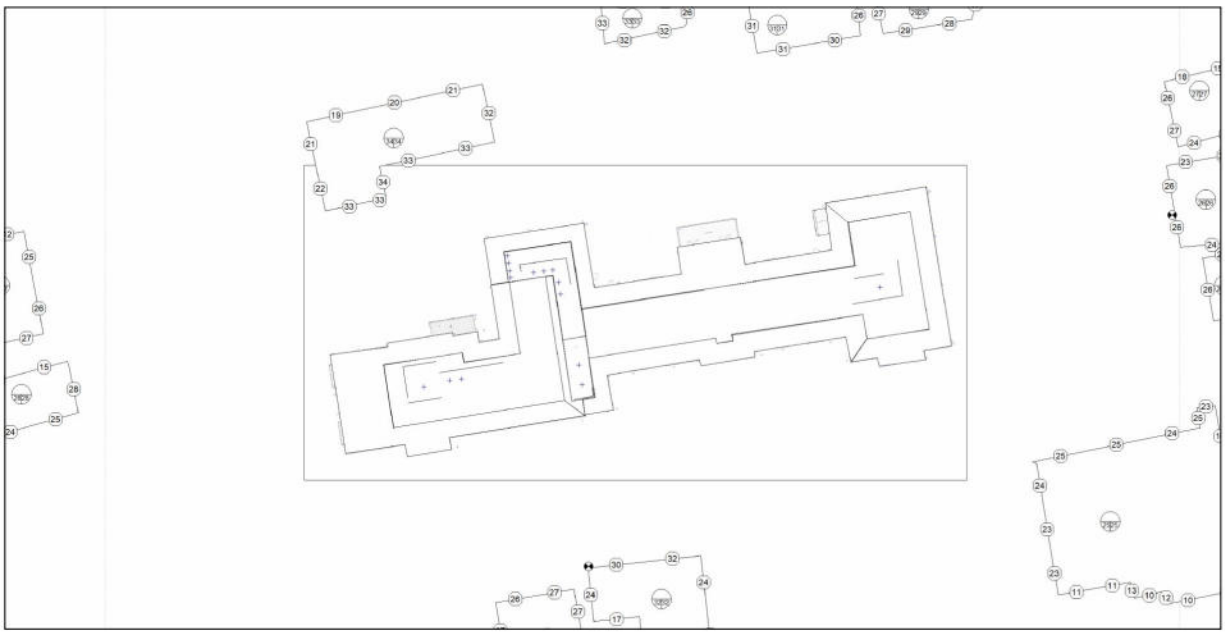


Figure 10 Daytime Facade Noise Levels With Acoustic Screening

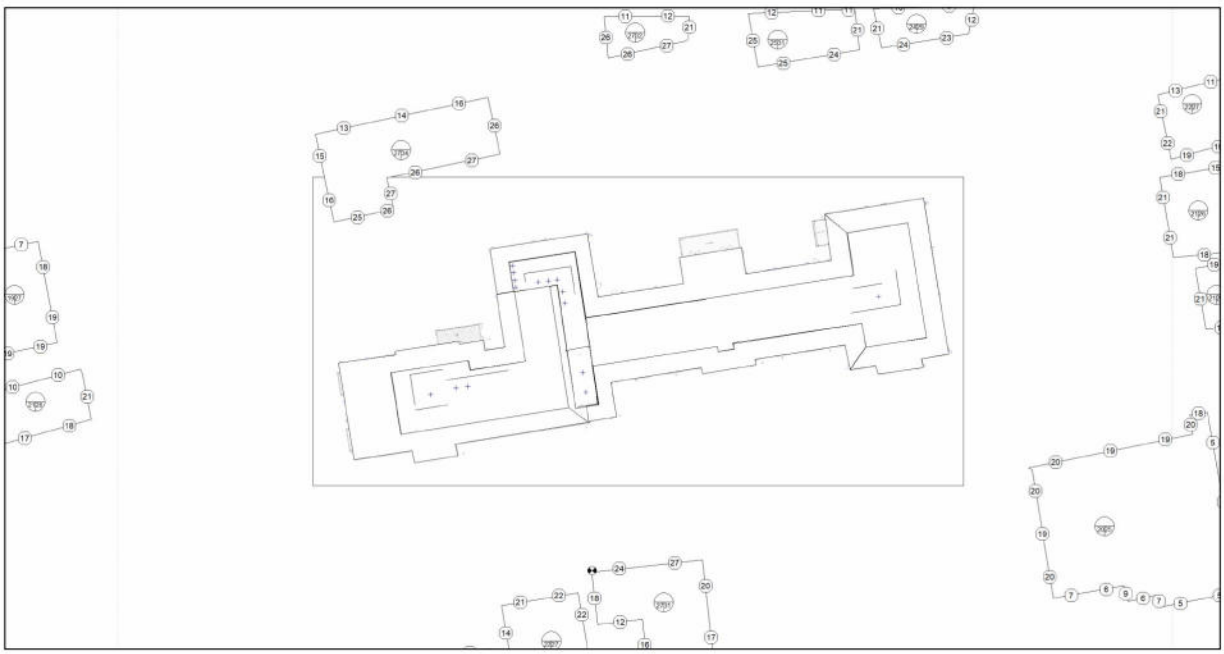


Figure 11 Night-time Facade Noise Levels With Acoustic Screening

6.8. The calculated plant noise levels may also be assessed in accordance with the methodology presented in BS4142 2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* in order to determine likely impact. The methodology of BS4142 is outlined in Appendix E and involves converting the calculated plant noise levels to Rating Levels, which are then compared with the background sound level. BS4142 advises the following - '*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 context*'. Rating Levels are determined by correcting the predicted plant noise levels (L_{Aeq}) for the proportion of time during the assessment period in which they occur[3] and by applying additional 'penalties' for features such as intermittency and tonality etc.

6.9. For this assessment the roof mounted air conditioning units and heat pumps will operate intermittently depending on load and will therefore incur a +3dB correction for intermittency in order to convert their noise levels to BS4142 Rating Levels. However, this correction is likely to be reduced or cancelled by correcting for the proportion of time during the assessment periods when the plant is not operating or at 100% capacity (which will vary hourly and seasonally). Given these considerations it is therefore considered likely that the predicted plant noise levels will give rise to BS4142 Rating Levels that do not exceed the representative background sound levels during daytime and at night.

[3] e.g. a noise level occurring for 50% of the assessment period would be subject to a correction of -3dB when converting to a Rating Level. A correction of -6dB would apply if the noise only occurred during 25% of the assessment period.

6.10. It is also worth noting that the predicted plant noise levels at night are particularly low in absolute terms (with the proposed mitigation scheme), reaching no higher than 27dB L_{Aeq} outside the nearest dwellings. Associated plant noise levels within those dwellings will fall below 10dB L_{Aeq}, assuming bedroom windows are closed, which is likely to be inaudible and would fall below the measurement range of modern field instrumentation. With bedroom windows open the associated internal noise level would not be expected to exceed 15dB L_{Aeq}. For context, new dwellings are typically designed to limit intrusive noise from outside to a level of no higher than 30dB L_{Aeq} within bedrooms at night.

7. CONCLUSIONS

7.1. A noise survey has been carried out at The Mount care home development off School Hill, Wargrave, and has determined that representative background sound levels in the area during daytime and at night are 37dB L_{A90} and 29dB L_{A90} respectively.

7.2. Noise propagation modelling has confirmed that the simultaneous operation of all roof mounted plant items will marginally exceed the representative background sound level outside the nearest dwellings to the development at night, thereby failing to comply with the Local Planning Authority's acoustic criteria.

7.3. A number of options for providing localised acoustic screening around the roof mounted air conditioning units and heat pumps have therefore been examined within the noise propagation model in order to review their efficacy. As a result of this exercise a noise mitigation scheme has been developed and is explained in Section 6 of this report.

7.4. The proposed noise mitigation scheme involves the installation of three acoustic screens, ranging in height from 2m to 2.2m, at the locations shown Figure 9 of this report. The noise propagation model has confirmed that the screens will limit plant noise levels to no higher than 34dB L_{Aeq} and 27dB L_{Aeq} outside the nearest dwellings to the development during daytime and night-time periods respectively. However, in practice the resultant noise levels are likely to be lower as not all plant items will typically operate simultaneously and/or at 100% capacity. The predicted plant noise levels are also very low in absolute terms and would not result in levels exceeding 15dB L_{Aeq} at night within the bedrooms of the nearest dwellings whilst their windows are open.

7.5. It is also concluded that the associated BS4142 Rating Levels of the plant noise are unlikely to exceed the representative background sound levels, thereby indicating a low impact.

Appendix A - Glossary of Acoustic Terms

Decibel, dB

This is the unit to measure sound. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). We therefore use a logarithmic scale to describe sound pressure level, intensities and sound power levels. The logarithms used are to base 10; hence, an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in acoustic pressure in Pascals. Subjectively, this corresponds to a doubling in the perceived loudness of sound.

Octave and Third Octave Bands

The human ear is sensitive to sound over a range of approximately 20 Hz to 10 kHz, and is generally more sensitive to medium and high frequencies than to low frequencies. In order to define the frequency content of a noise, the spectrum is divided into frequency bands, and the sound pressure level is measured in each band. The most commonly used frequency bands are octave bands, in which the mid frequency of each band is twice that of the band below it. For finer analysis, each octave band may be split into three one-third octave bands o in some cases, fine frequency bands.

A-Weighting

Normal hearing covers the frequency range from about 20Hz to 20KHz but sensitivity is greatest between about 500Hz and 8KHz. The "A-Weighting" is an electronic filters network incorporated in sound level meters which approximately corresponds to the frequency response of the ear. The unit of measurement of A-weighted sound level is dBA.

$L_{Aeq,T}$

The equivalent continuous A-weighted sound pressure level. It is a value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound, that within a specified time interval, T, has the same mean squared sound pressure as the sound under consideration that varies with time.

L_{Amax}

The maximum instantaneous A-weighted sound pressure level occurring during the measurement period. L_{Amax} is often referred to when examining noise intrusion to dwellings and sleep disturbance. Acoustic design noise limits for bedrooms are often specified in terms of a permissible L_{Amax} value.

L_{Amin}

The minimum A-weighted sound pressure level occurring during the measurement period.

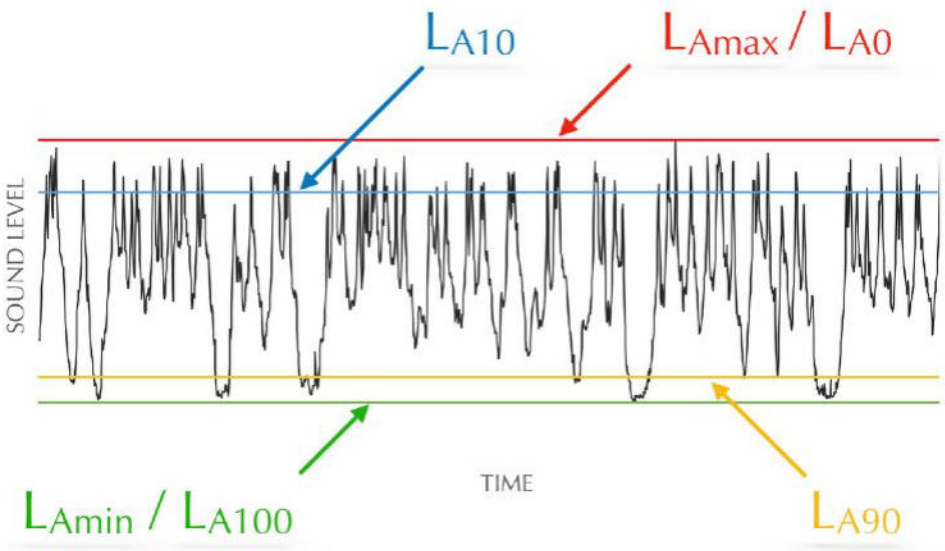
Statistical Level: L_{90}

The sound pressure level exceeded for 90% of the measurement time. Indicative of the general background noise level in the absence of any higher level short duration events that occur during the period.

Statistical Level: L_{10}

This is the sound pressure level exceeded for 10% of the measurement time. It is widely used to measure traffic noise. For a given measurement period, the L_{10} level is by definition greater than or equal to the L_{90} level.

The relationship between the parameters described above is indicated in the attached figure.



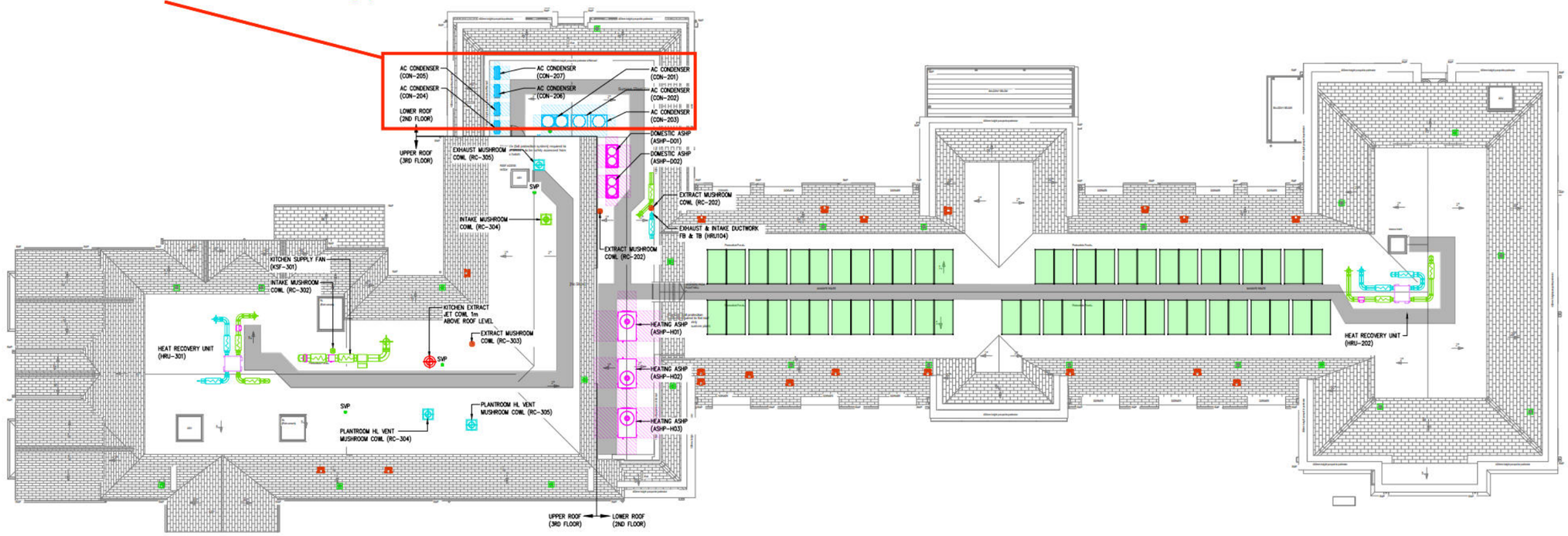
Sound Insulation

The use of structures and materials designed to reduce the transmission of sound from one room or area of a building to another, from the exterior to the interior of a building or between the exterior and interior of a building.

Appendix B - Roof Layout Plan

LEGEND	
SYMBOL	DESCRIPTION
	PHOTOVOLTAIC PANELS
	SVP VENT TERMINATION ABOVE ROOF LEVEL
	TILE REPLACEMENT VENT FOR DRAINAGE STACK VENTILATION (BY OTHERS)
	INTAKE VENTILATION MUSHROOM COWL
	EXTRACT VENTILATION MUSHROOM COWL
	TILE REPLACEMENT VENT FOR DIRTY EXTRACT EXHAUST (BY OTHERS)
	ACCESS WALKWAY
	MECHANICAL EQUIPMENT MAINTENANCE SPACE
	AIR CONDITIONING UNIT MAINTENANCE SPACE

Air Conditioning Unit References Changed to
ACU-201, ACU-202 etc since drawing produced



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5813-POZ-XX-ZZ-DR-A-2053	C01	16.07.24	17.07.24	18.07.24

REV	DATE	DETAILS OF REVISION	BY
P02	08.09.25	ISSUED FOR INFORMATION	WA
P01	03.01.25	ISSUED FOR INFORMATION	WA

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CLIENT
LAWRENCE BAKER
(AEDIFICA UK LTD)

PROJECT
PROPOSED 65 BED CARE HOME
WARGRAVE

DRAWING TITLE
MECHANICAL SERVICES
ROOF LEVEL
COORDINATED ROOF PLAN

Issue Status
FOR INFORMATION

Original Size	Scale	Drawn
A0	1:100	WA
HCL Project No.	Suitability	Checked
2388	-	CC

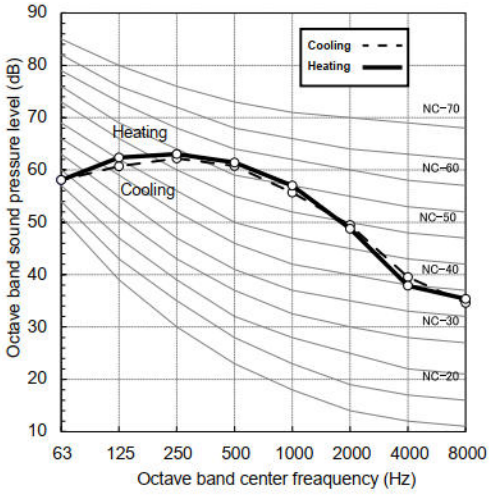
Project Originator Volume Level Type Role Number
2388 - HCL - ZZ - XX - DR - M - 9001

Appendix C - Plant Manufacturers' Acoustic Data

ACU-101

MMY-MAP1806FT8P-E

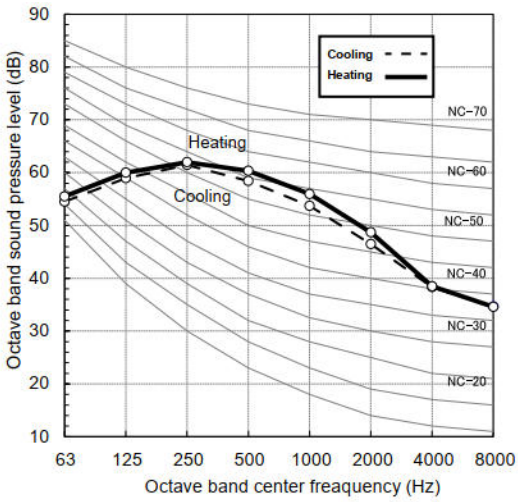
Sound pressure Level (dB(A))	Cooling	Heating
	61.0	62.0



ACU-102 & ACU-103

MMY-MAP1006FT8P-E

Sound pressure Level (dB(A))	Cooling	Heating
	59.0	61.0



ACU-204 & ACU-205

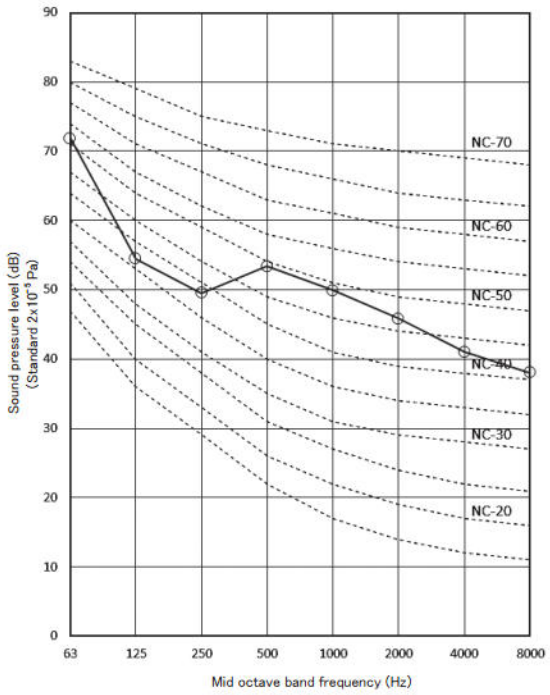
Technical data			RAV-GM901ATP-E
Cooling capacity	kW	❄	8,00
Outdoor temperature operating range (min.-max.)	°C	❄	-15/+46
Heating capacity	kW	☀	9,00
Outdoor temperature operating range (min.-max.)	°C	☀	-15/+15
Sound pressure level (low/med/high)	dB(A)	❄	51
Sound pressure level (low/med/high)	dB(A)	☀	55
Sound pressure level (night operation)	dB(A)	❄	44/45

ACU-206 & ACU-207

Technical data			RAV-GM801ATP-E
Cooling capacity	kW	❄	6,70
Outdoor temperature operating range (min.-max.)	°C	❄	-15/+46
Heating capacity	kW	☀	7,70
Outdoor temperature operating range (min.-max.)	°C	☀	-15/+15
Sound pressure level (low/med/high)	dB(A)	❄	48
Sound pressure level (low/med/high)	dB(A)	☀	52
Sound pressure level (night operation, @ 1m)	dB(A)	❄	41/43

ASHP-D01 & ASHP-D02

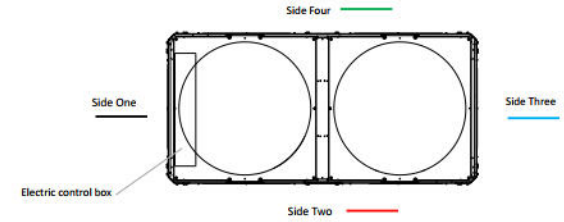
(2) Sound pressure level



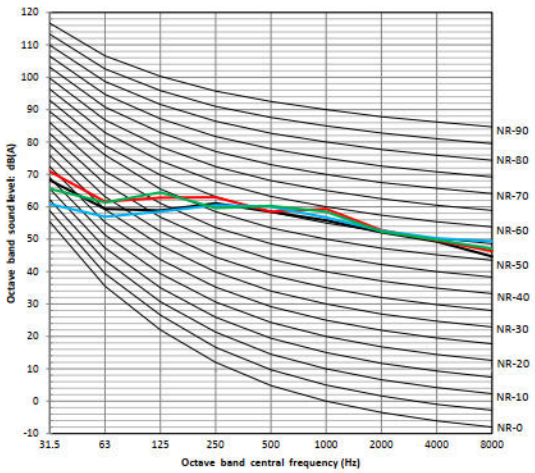
ASHP-H01, ASHP-H02 & ASHP-H03

7 Octave Band Levels

For 65/75kW



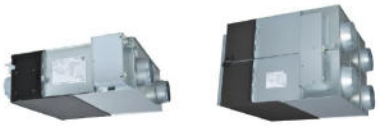
Test condition: Outdoor ambient temperature 35°C DB. EWT 12°C, LWT 7°C



HRU-202 & HRU-301

Ventilation | **Product Information**

LGH-RVX3-E
Commercial Series



MODEL			LGH-15RVX3-E	LGH-25RVX3-E	LGH-35RVX3-E	LGH-50RVX3-E	LGH-65RVX3-E	LGH-80RVX3-E	LGH-100RVX3-E	LGH-160RVX3-E	LGH-200RVX3-E
25%	Air Volume	m³/h	38	63	88	125	163	200	250	400	500
(Default speed 1)		l/s	10	17	24	35	45	56	69	111	139
	External Static Pressure	Pa	8	8	10	10	10	11	12	11	11
	Temperature Exchange Efficiency	Heating %	81.5	88.0	82.0	75.0	82.0	80.0	83.5	80.0	83.5
		Cooling %	78.0	85.0	79.0	73.0	80.0	78.0	82.5	78.0	82.5
	Enthalpy Exchange Efficiency	Heating %	80.5	84.0	80.0	73.0	80.0	73.5	75.5	73.5	76.0
		Cooling %	73.0	75.0	74.5	68.0	74.0	70.5	73.5	70.5	71.0
	Specific Fan Power	W/(l/s)	0.96	0.63	0.62	0.43	0.44	0.41	0.39	0.41	0.41
	Input Power	W	10	11	15	15	20	23	27	45	57
	Sound Pressure Level	dB(A)	17.0	17.0	17.0	17.0	17.5	18.0	18.5	18.0	18.0
50%	Air Volume	m³/h	75	125	175	250	325	400	500	800	1000
(Default speed 2)		l/s	21	35	49	69	90	111	139	222	278
	External Static Pressure	Pa	30	30	40	38	38	43	48	43	43
	Temperature Exchange Efficiency	Heating %	78.0	81.0	79.0	73.5	78.5	78.0	79.5	78.0	79.5
		Cooling %	73.5	79.0	74.0	71.0	74.5	75.5	77.0	75.5	76.0
	Enthalpy Exchange Efficiency	Heating %	76.5	75.5	77.5	72.0	76.5	70.5	68.5	70.5	67.5
		Cooling %	66.0	68.0	68.5	63.0	66.5	65.0	66.0	65.0	65.0
	Specific Fan Power	W/(l/s)	0.72	0.60	0.60	0.49	0.56	0.58	0.60	0.58	0.59
	Input Power	W	15	21	29	34	51	64	83	128	163
	Sound Pressure Level	dB(A)	18.0	19.5	19.0	21.0	24.0	25.0	27.0	26.0	27.5
75%	Air Volume	m³/h	113	188	263	375	488	600	750	1200	1500
(Default speed 3)		l/s	31	52	73	104	135	167	208	333	417
	External Static Pressure	Pa	68	68	90	85	85	96	107	96	96
	Temperature Exchange Efficiency	Heating %	75.5	78.5	77.0	71.5	75.0	76.5	77.0	76.5	77.5
		Cooling %	70.5	76.5	71.0	67.0	70.0	70.0	72.0	70.0	71.5
	Enthalpy Exchange Efficiency	Heating %	73.5	72.0	74.5	69.5	72.0	65.0	63.0	65.0	64.0
		Cooling %	62.0	63.5	64.5	58.0	60.0	58.5	61.0	58.5	60.0
	Specific Fan Power	W/(l/s)	0.96	0.81	0.84	0.78	0.89	0.96	1.01	0.97	1.00
	Input Power	W	30	42	61	81	120	160	210	324	416
	Sound Pressure Level	dB(A)	22.0	25.0	24.5	27.0	31.5	33.5	35.0	35.0	36.0
100%	Air Volume	m³/h	150	250	350	500	650	800	1000	1600	2000
(Default speed 4)		l/s	42	69	97	139	181	222	278	444	556
	External Static Pressure	Pa	120	120	160	150	150	170	190	170	170
	Temperature Exchange Efficiency	Heating %	73.5	75.5	75.0	70.5	72.5	75.0	75.5	75.0	76.5
		Cooling %	65.5	70.5	66.5	63.5	65.0	65.0	67.5	65.0	66.5
	Enthalpy Exchange Efficiency	Heating %	70.5	69.0	72.0	68.5	69.5	62.0	60.5	62.0	60.5
		Cooling %	58.0	59.0	60.0	53.5	55.5	54.5	55.5	54.5	57.0
	Specific Fan Power	W/(l/s)	1.32	1.08	1.23	1.33	1.36	1.54	1.58	1.55	1.54
	Input Power	W	55	75	120	185	245	343	438	687	855
	Sound Pressure Level	dB(A)	27.0	30.5	30.5	35.0	37.5	39.0	40.0	41.0	41.5
DUCT SIZE		mm	100	150	150	200	200	250	250	[illegible]	[illegible]
WEIGHT		kg	20	22	30	33	41	47	53	96	108
DIMENSIONS	Width x Depth x Height	mm	780 x 610 x 289	780 x 735 x 289	888 x 874 x 331	888 x 1016 x 331	908 x 954 x 404	1144 x 1004 x 404	1144 x 1231 x 404	1144 x 1004 x 808	1144 x 1231 x 808
ELECTRICAL POWER SUPPLY			220-240V, 50Hz								
Maximum Current		A	0.57	0.88	1.37	1.86	2.37	3.23	3.77	4.74	5.40
FUSE RATING (BS88) - HRC (A)		A	6	6	6	6	6	6	6	10	10
HEAT EXCHANGER			Paper with specially treated Cellulose Membrane								
STANDARD FILTER			ISO 16890 Coarse 60%*1								

Notes: Running current, power consumption, recovery efficiency, and sound levels are based on the above default airflow rates at 25%, 50%, 75%, and 100%. Specific duty point data is available upon request. Supply and exhaust fan speeds can be individually commissioned between 25% and 100% in 5% increments. Sound Pressure Level measured at 1.5m under the centre of the bottom panel. Air flow rates, external static pressure and specific fan powers tested to BS EN13053: 2019. Energy recovery efficiencies tested to BS EN308: 2022.
*1: EN 779:G4 equivalent according to 'REHVA Filter Class Conversion between EN 779 and EN ISO 16890-1'.

KSF-301

Sound power level		63	125	250	500	1k	2k	4k	8k	Total
Inlet	dB(A)	45	62	64	69	74	72	66	56	78
Outlet	dB(A)	47	63	65	70	75	74	67	58	79
Surrounding	dB(A)	25	43	40	39	45	46	34	21	50
Sound pressure level at 3m (20m² Sabine)	dB(A)	-	-	-	-	-	-	-	-	43
Sound pressure level at 3m free field	dB(A)	-	-	-	-	-	-	-	-	29

allaway acoustics

PROJECT NAME: AEDIFICA WARGRAVE (KITCHEN ATTENUATORS)
DATE: 09/10/2025
PROJECT No: 101991
SCHEDULE No: 135101991Q4

Item	System Reference	Code	Suffix	DWG	L1	L2/ID	W	H	Vol	PD	Wt	No.		Performance, dB							
					mm	mm	mm	mm	m³/s	Pa	kg	Off.		63	125	250	500	1k	2k	4k	8k
1	ATT-201 - KEF EXHAUST	PLP	GM	A13G	900	400			0.91	20	27	1	IL	4	12	14	22	24	22	24	21
2	ATT-202 - KEF EXTRACT	PLP	GM	A13G	900	400			0.91	20	27	1	IL	4	12	14	22	24	22	24	21
3	ATT-305 - KSF INTAKE	PLP	G	A13G	900	400			0.774	20	27	1	IL	4	11	17	27	32	32	30	25
4	ATT-306 - KSF SUPPLY	PLP	G	A13G	900	400			0.774	20	27	1	IL	4	11	17	27	32	32	30	25

NOTES

Appendix D - Noise Survey Details and Results

Survey Location

The Mount Care Home
School Hill
Wargrave
RG10 8DY

Survey Dates

11:00hrs Tuesday 18th November to 09:40hrs Friday 21st November 2025

Weather Conditions

Calm and dry throughout. Temperatures - typically 4-8ºC daytime and -3 to 1ºC at night.

Instrumentation

Equipment Description	Type Number	Manufacturer	Serial Number	Date of Last Laboratory Calibration/Verification
Sound Level Meter	XL2-TA	NTi Audio	A2A-11085-E0	19 and 20 September 2024
Pre-amp/ Microphone	M2230	NTi Audio	6647/A15224	19 and 20 September 2024
Calibrator	CAL200	NTi Audio	12583	24 September 2025
Microphone Weather Protection Kit	WP30	NTi Audio	-	-
Tripod	-	-	-	-

Table D1 - Results of Noise Survey

Start Time	L_{Aeq}	L_{Amax}	L_{A90}
11:00	45.5	57.5	38.1
11:15	45.6	63.2	36.9
11:30	46.8	65.6	37.9
11:45	49.4	68.4	37.9
12:00	49.3	63.8	42.1
12:15	47.6	62.2	41.1
12:30	48.3	61.8	43.0
12:45	49.9	64.0	44.3
13:00	52.5	64.8	42.6
13:15	48.8	63.0	40.4
13:30	52.6	64.4	44.9
13:45	53.5	64.4	51.9
14:00	52.3	61.1	51.7
14:15	52.7	61.8	51.6
14:30	52.9	66.2	51.4
14:45	52.7	64.0	51.3
15:00	51.9	59.9	51.2
15:15	55.5	74.2	51.3
15:30	51.8	61.3	51.4
15:45	52.9	65.7	51.4
16:00	48.1	64.2	37.9
16:15	52.4	71.1	39.1
16:30	46.2	70.4	37.5
16:45	47.2	66.4	37.3
17:00	44.0	57.9	37.1
17:15	49.4	71.0	37.2
17:30	43.1	57.7	37.7
17:45	38.8	50.9	36.6
18:00	42.7	60.2	36.8
18:15	38.8	47.1	36.3

Start Time	L_{Aeq}	L_{Amax}	L_{A90}
18:30	39.4	54.5	37.0
18:45	40.2	52.6	36.7
19:00	46.2	62.5	36.8
19:15	39.6	54.8	36.5
19:30	40.2	55.4	36.4
19:45	38.5	51.1	36.2
20:00	39.2	56.0	35.8
20:15	40.7	55.0	35.2
20:30	36.6	54.2	34.9
20:45	39.2	56.1	35.2
21:00	37.8	54.6	34.1
21:15	39.6	56.1	34.8
21:30	42.2	60.7	35.0
21:45	35.5	47.7	33.3
22:00	36.2	47.9	33.5
22:15	41.0	60.0	32.6
22:30	34.8	48.3	31.9
22:45	41.8	61.0	31.9
23:00	33.5	48.9	31.1
23:15	40.7	56.9	31.4
23:30	33.2	52.3	30.3
23:45	30.8	36.8	29.4
00:00	31.2	37.5	29.2
00:15	31.5	37.9	29.5
00:30	29.7	35.2	28.3
00:45	30.1	35.9	28.6
01:00	30.0	41.9	28.6
01:15	29.7	39.2	28.3
01:30	29.8	40.1	28.1
01:45	29.4	34.7	28.2
02:00	29.4	46.3	28.1

Start Time	L_{Aeq}	L_{Amax}	L_{A90}
02:15	29.4	43.6	27.7
02:30	28.6	42.7	27.2
02:45	29.2	43.4	27.4
03:00	29.3	41.9	26.7
03:15	28.5	47.7	26.7
03:30	35.7	49.1	27.1
03:45	33.3	51.5	28.2
04:00	39.7	55.4	30.5
04:15	38.0	51.3	31.9
04:30	49.1	58.8	43.3
04:45	54.3	67.7	49.3
05:00	44.6	67.0	39.1
05:15	41.4	58.2	36.3
05:30	44.8	61.8	38.1
05:45	47.5	58.7	42.4
06:00	46.0	63.6	40.4
06:15	43.5	56.3	38.9
06:30	41.5	55.8	37.8
06:45	44.9	58.7	37.7
07:00	45.4	59.5	40.5
07:15	43.5	59.5	40.1
07:30	46.7	70.6	40.7
07:45	49.0	65.1	43.3
08:00	55.1	66.1	50.7
08:15	54.2	60.1	53.2
08:30	56.5	67.8	54.9
08:45	56.0	66.4	54.7
09:00	56.3	69.5	55.0
09:15	55.4	67.2	53.6
09:30	54.2	63.6	53.0
09:45	54.0	61.8	52.9

Start Time	L_{Aeq}	L_{Amax}	L_{A90}
10:00	54.5	70.1	52.5
10:15	53.8	58.4	52.8
10:30	54.1	64.2	52.9
10:45	54.2	61.9	52.9
11:00	53.9	61.0	52.7
11:15	51.6	73.5	46.1
11:30	51.2	62.5	45.5
11:45	51.5	64.0	45.6
12:00	49.8	65.2	44.8
12:15	50.0	61.1	45.0
12:30	53.1	65.0	47.7
12:45	53.4	64.8	47.1
13:00	53.9	64.2	46.5
13:15	54.1	67.3	46.1
13:30	54.1	69.6	44.7
13:45	53.8	64.2	44.9
14:00	51.2	64.1	44.5
14:15	49.6	61.6	43.7
14:30	51.2	61.7	44.4
14:45	51.7	65.0	44.2
15:00	51.9	66.6	44.1
15:15	50.8	63.8	44.5
15:30	48.8	66.0	42.5
15:45	49.5	59.9	44.1
16:00	51.2	69.5	43.8
16:15	48.3	59.9	43.1
16:30	48.9	65.4	43.3
16:45	49.6	66.0	43.0
17:00	46.0	54.4	41.3
17:15	46.7	62.1	39.5
17:30	42.8	56.9	38.1

Start Time	L_{Aeq}	L_{Amax}	L_{A90}
17:45	41.4	55.4	37.6
18:00	41.4	56.7	37.5
18:15	45.0	57.5	38.5
18:30	42.7	56.0	38.2
18:45	43.2	53.9	38.5
19:00	43.7	60.6	37.3
19:15	41.0	53.6	37.7
19:30	42.2	58.3	37.4
19:45	42.1	56.5	37.7
20:00	41.8	56.5	36.6
20:15	41.3	53.7	36.3
20:30	40.6	52.3	36.4
20:45	39.7	58.9	36.1
21:00	43.4	65.0	35.5
21:15	38.8	55.0	34.8
21:30	36.5	46.5	33.6
21:45	36.3	53.0	32.3
22:00	36.6	53.5	32.6
22:15	35.6	50.4	32.0
22:30	34.2	45.6	31.3
22:45	35.3	51.0	31.1
23:00	35.5	55.0	29.8
23:15	36.8	49.4	32.0
23:30	35.3	48.0	30.7
23:45	34.3	55.8	29.9
00:00	37.1	50.9	32.3
00:15	38.3	53.3	32.0
00:30	35.6	51.1	29.6
00:45	38.1	53.9	30.0
01:00	37.4	50.0	28.7
01:15	29.1	42.5	26.1

Start Time	L_{Aeq}	L_{Amax}	L_{A90}
01:30	29.4	40.8	27.0
01:45	32.0	46.0	28.0
02:00	30.1	38.7	28.1
02:15	35.6	54.9	27.7
02:30	27.9	38.6	25.8
02:45	31.2	47.7	26.7
03:00	30.6	45.4	26.5
03:15	35.8	48.2	30.0
03:30	32.5	49.0	28.3
03:45	35.7	52.7	28.7
04:00	37.0	53.6	28.1
04:15	33.8	53.3	28.4
04:30	37.3	55.5	30.1
04:45	35.3	50.9	29.7
05:00	37.0	55.0	28.8
05:15	36.1	52.7	30.5
05:30	38.5	54.7	31.3
05:45	38.9	56.9	32.1
06:00	38.0	50.9	33.8
06:15	37.1	45.6	34.5
06:30	38.3	49.0	35.6
06:45	41.0	57.3	36.2
07:00	40.6	55.4	38.2
07:15	44.4	56.2	39.9
07:30	44.4	59.6	41.3
07:45	45.5	58.1	41.8
08:00	45.3	61.7	41.6
08:15	52.9	65.8	43.7
08:30	53.0	60.8	52.4
08:45	53.2	60.2	52.5
09:00	54.4	78.9	51.4

Start Time	L_{Aeq}	L_{Amax}	L_{A90}
09:15	52.8	61.9	51.4
09:30	52.7	68.6	51.5
09:45	53.0	65.5	51.6
10:00	52.9	65.6	51.2
10:15	52.7	66.4	51.0
10:30	52.8	65.7	51.3
10:45	52.4	61.9	51.3
11:00	54.1	69.4	51.8
11:15	52.5	61.4	51.3
11:30	52.3	61.4	51.3
11:45	52.2	63.2	51.3
12:00	54.2	69.9	51.8
12:15	54.2	70.2	52.0
12:30	54.3	73.2	51.9
12:45	53.8	66.0	52.2
13:00	54.2	62.6	51.9
13:15	54.5	69.6	51.9
13:30	53.7	63.9	51.8
13:45	54.0	65.4	51.3
14:00	53.1	64.4	51.7
14:15	53.5	68.2	51.5
14:30	53.4	62.8	51.9
14:45	53.0	63.0	51.5
15:00	52.0	61.8	51.1
15:15	52.0	61.4	51.2
15:30	51.5	61.4	50.9
15:45	45.2	61.0	38.8
16:00	45.3	69.2	40.9
16:15	42.6	56.6	37.6
16:30	45.3	61.1	37.7
16:45	39.2	53.8	36.2

Start Time	L_{Aeq}	L_{Amax}	L_{A90}
17:00	44.0	59.0	35.9
17:15	38.3	49.3	35.1
17:30	46.6	64.9	36.1
17:45	38.6	49.9	36.3
18:00	39.6	53.5	36.9
18:15	42.8	55.1	37.9
18:30	40.3	48.9	38.2
18:45	40.9	58.9	37.7
19:00	42.9	58.6	38.3
19:15	39.9	47.2	37.4
19:30	40.1	49.1	37.2
19:45	42.1	57.7	38.0
20:00	40.2	51.5	36.1
20:15	40.0	53.0	36.1
20:30	41.6	53.1	36.8
20:45	38.9	49.5	35.5
21:00	40.7	56.2	35.7
21:15	36.5	47.5	34.2
21:30	36.6	47.9	33.2
21:45	41.9	59.1	33.3
22:00	40.0	56.2	34.6
22:15	37.6	50.3	33.5
22:30	37.1	56.3	33.8
22:45	40.1	72.2	33.9
23:00	35.5	55.7	31.2
23:15	34.2	44.9	31.1
23:30	34.8	50.4	31.5
23:45	35.1	44.5	31.1
00:00	37.5	47.2	33.1
00:15	37.5	48.0	32.9
00:30	36.3	46.5	31.3

Start Time	L_{Aeq}	L_{Amax}	L_{A90}
00:45	36.5	47.9	31.0
01:00	36.0	48.5	31.3
01:15	39.8	53.9	33.9
01:30	37.9	56.7	32.4
01:45	34.8	44.6	28.9
02:00	32.2	45.3	28.4
02:15	33.8	44.5	28.3
02:30	35.7	48.6	29.6
02:45	30.3	40.4	27.8
03:00	36.9	57.6	28.3
03:15	32.2	40.4	29.1
03:30	35.4	54.0	28.1
03:45	30.1	42.3	27.1
04:00	33.4	49.2	28.0
04:15	33.7	52.3	28.3
04:30	35.3	56.6	29.6
04:45	34.4	48.1	28.5
05:00	35.7	51.0	29.1
05:15	40.6	63.3	31.3
05:30	37.6	52.8	31.5
05:45	38.8	55.9	33.2
06:00	35.6	46.9	32.4
06:15	38.6	53.1	35.2
06:30	39.3	53.9	36.9
06:45	42.3	64.6	37.6
07:00	42.2	56.8	37.6
07:15	43.5	60.6	39.8
07:30	43.0	55.3	40.1
07:45	43.0	56.8	40.3
08:00	48.5	59.5	40.3
08:15	51.8	56.5	51.4

Start Time	L_{Aeq}	L_{Amax}	L_{A90}
08:30	52.1	59.5	51.5
08:45	52.3	61.2	51.6
09:00	53.6	76.4	51.3
09:15	54.2	72.9	51.4
09:30	54.4	73.4	51.1

Appendix E - Summary of BS4142 Assessment Method

1. British Standard 4142:2014 *Methods for rating and assessing industrial and commercial sound* offers a method for rating the impact on or likelihood of complaints from residential properties affected by noise produced by fixed installations of an industrial nature, such as building services plant.

2. The assessment method in BS4142 is based upon the difference between the background sound level (i.e. the underlying noise level measured in the absence of the noise under consideration) and the 'Rating Level' of the noise under consideration at the nearest sensitive receptors.

3. The background sound level is expressed in terms of $L_{A90,T}$ which represents the sound level exceeded for 90% of the assessment period.

4. Noise produced by the source under consideration is referred to as the 'specific sound level' and is expressed in terms of the $L_{Aeq,T}$ parameter which represents a measure of the average level of sound energy produced by the source. The Rating Level of the noise source is derived from the specific sound level by applying corrections (penalties) if applicable, when the source's noise exhibits identifiable characteristics such as discrete tones, intermittency or impulsivity (e.g. bangs or pulses).

5. BS4142 advises '*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.*'

6. BS4142 facilitates an estimate of noise impact by subtracting the measured background sound level from the Rating Level and interpreting the result in accordance with the following guidance:

> *Typically, the greater this difference, the greater the sound magnitude of the impact.*
>
> *A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on context.*
>
> *A difference of around +5dB is likely to be an indication of an adverse impact, depending on 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 context.*

7. BS4142 advises that '*adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.*'