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Decarbonisation Phase 2 Project, North Herts Leisure Centre, Baldock Road, Letchworth Garden City SG6 2ER

250633

Noise Impact Assessment



Sustainability at our core.

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Contents

Section	Description	Page No
	Executive Summary	4
1.0	Introduction	5
2.0	Site Location and Development Proposals	6
3.0	Noise Criteria	7
3.1	National Planning and Policy Framework (NPPF)	7
3.2	Noise Policy Statement England (NPSE)	7
3.3	NHDC Local Authority Plant Noise Criteria	8
3.4	British Standard BS 4142	8
4.0	Noise Survey	9
4.1	Noise Survey Methodology	9
4.2	Noise Climate, Sensitive Receptors, and Survey Location	9
4.3	Noise Survey Results	10
5.0	Plant Noise Impact Assessment	11
5.1	Operational Plant Noise Limits	11
5.2	Plant Sound Power Levels	11
5.3	Noise Methodology and Prediction Results	12
5.3.1	Methodology	12
5.3.2	Noise Prediction Results	13
5.4	Assessment	14
5.5	Context and Discussion	15
5.6	Assumptions and Limitations	15
	Appendix A – Glossary of Acoustic Terminology	16
	Appendix B – Unattended Noise Survey Time History and Site Photo	20
	Appendix C – Proposed AHSP Plant Datasheet	21

Noise Impact Assessment



Executive Summary

Couch Perry Wilkes Acoustics have been commissioned by North Hertfordshire District Council (NHDC) to undertake a noise impact assessment in support of the decarbonisation phase 2 project which includes the installation of new air source heat pump (ASHP) plant at the North Hertfordshire Leisure Centre (NHLC) located at Baldock Rd, Letchworth Garden City SG6 2ER.

Discussion with North Herts District Council (NHDC) concluded that the Rating Sound Level inclusive of acoustic features for new fixed mechanical plant should not exceed the existing measured background noise levels.

A review of the site during the on-site walkover and via Google Maps revealed up to 4no. noise sensitive receptors (NSRs) for consideration in the noise impact assessment.

An external noise survey was carried out at the site and the dominant noise sources found to be from road traffic. Plant noise limits were subsequently deduced from the on-site noise survey data and NHDC Rating Sound Level criteria.

The proposed building services plant including 4no. ASHP units were reviewed and incorporated into a 3-dimensional computer noise model for the prediction of plant noise at adjacent noise sensitive receptors (NSRs) during daytime and night-time hours.

Rating Sound Levels were subsequently estimated based on predicted Specific Sound Level in accordance with BS4142 guidance and assessed against the on-site measured background noise levels. The noise impact assessment concluded that predicted noise levels from the proposed ASHPs are an indication of low impact to NSRs during both daytime and night-time hours. On this basis, it is expected that the building services proposals comply with NHDC plant noise criteria.

Noise Impact Assessment



1.0 Introduction

Couch Perry Wilkes Acoustics have been commissioned by North Hertfordshire District Council (NHDC) to undertake a noise impact assessment in support of the proposed development at the North Hertfordshire Leisure Centre (NHLC) located at Baldock Rd, Letchworth Garden City SG6 2ER.

The NHLC Unit is a multi-use leisure centre containing two swimming pools, a gym, a sports hall, squash courts, spa facilities and a soft play centre. The leisure centre is located in landscaped grounds within Letchworth Garden City, a short distance from Junction 9 of the A1.

As part of this assessment, the following works have been undertaken:

- a) Consultation with NHDC on plant noise emission criteria for new fixed mechanical plant.
- b) A baseline environmental noise survey to assess Background Sound Levels and subsequent plant noise emission limits.
- c) Modelling and prediction of plant noise levels at the nearest noise sensitive premises to the Site and assessment of predicted noise emission against the requirements of NHDC.

Supporting appendices are provided, including a glossary of common acoustic terms within Appendix A.

Noise Impact Assessment

2.0 Site Location and Development Proposals

The proposed development at NHLC includes:

- Stripping out of gas boilers from ground and mezzanine plant room and the installation of low temperature air source heat pumps (ASHP).
- New plant to serve space heating and pool re-heating facilities.

Figure 2.1 presents the NHLC site location.

Figure 2.1 NHLC Site (Google Maps).



Noise Impact Assessment

3.0 Noise Criteria

3.1 National Planning and Policy Framework (NPPF)¹

The National Planning Policy Framework (NPPF) emphasizes the importance of local planning authorities in making decisions that improve the economic, social, and environmental conditions of their areas. Paragraph 198 of NPPF in particular states:

“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 impact 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.”

3.2 Noise Policy Statement England (NPSE)²

The Noise Policy Statement for England (NPSE) aims 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. It sets out the Government's planning policies for England and how these should be applied. The NPSE provides a framework for locally prepared plans for housing and other development, including noise considerations. The NPSE considers concepts from toxicology that can be applied to noise impacts. The concept details noise levels, at which the effects of an exposure may be classified into a specific category. The classification categories as detailed within the NPSE are as follows:

- No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established;
- Lowest Observable Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and
- Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.

It is important to note that the NPSE does not provide specific levels for classification categories NOEL, LOAEL, or SOAEL, as these should be determined on a case-by-case basis with the aims as follows:

1. Avoidance of adverse effects on health and quality of life
2. All reasonable steps should be taken to mitigate and minimise the effects where the impacts lay between LOAEL and SOAEL.
3. To improve health and quality of life through the pro-active management of noise while also considering the principles of sustainable development.

¹ National Planning Policy Framework, Ministry of Housing, Communities & Local Government 2024.

² Noise Policy Statement for England, Department for Environment Food and Rural Affairs 2010.

Noise Impact Assessment



3.3 NHDC Local Authority Plant Noise Criteria

Discussion with Senior Environmental Protection & Housing Officer Alan Stone of NHDC via email on 17th March 2026 has confirmed that the Rating Sound Level inclusive of noise limits from new fixed mechanical plant noise at noise sensitive receptors shall not exceed measured Background Sound Levels.

3.4 British Standard BS4142³

It is common industry practice for plant noise levels to be assessed in accordance with BS4142: 2014+A1:2019⁴.

This British Standard guidance document describes methods for rating and assessing sound of an industrial and/or commercial nature for the purposes of: (a) investigating complaints, (b) assessing sound from proposed, new, modified or additional sources of sound of an industrial/commercial nature, and (c) assessing sound at proposed new residential premises.

In summary, the procedure compares the measured (or predicted) sound level from the source (known as the Specific Sound Level immediately outside of the dwellings with the Background Sound Level (notated $L_{A90,T}$) that exists in the absence of the source in question. If the sound is tonal, impulsive, intermittent or otherwise distinctive in character at the assessment location then a character correction of between 0 dB and +9 dB is added to the Specific Sound Level (correcting for the influence from any residual sound) to obtain the Rating Level (notated $L_{Ar,Tr}$).

After making any relevant corrections the Background Sound Level is subtracted from the Rating Level and an initial estimate of the potential impact of the sound source in question is made with consideration to the following:

- Typically, the greater this 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 or more 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.

In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the standard places emphasis upon an appreciation of the “context” in which the sound occurs in arriving at any decision. Pertinent factors may include the nature of the neighbourhood, the absolute level of sound and background sound level, the character and level of sound, the sensitivity of the receptor and whether the residential premises incorporate design measures that ensure good internal acoustic conditions such as façade treatment, ventilation and acoustic screening.

³ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.

Noise Impact Assessment



4.0 Noise Survey

4.1 Noise Survey Methodology

The noise survey was undertaken by Peter Kahn MIOA between 13th – 16th March 2026 to measure the baseline noise levels for use in the noise impact assessment. Weather conditions⁴ during the noise survey were mostly dry with a short spell of light rain on Saturday 15th March between 12:00 to 18:00, and wind speed from the southwest. The noise survey duration is considered to have been taken long enough to capture suitable weather conditions as per BS7445-1⁵ and for use in this noise impact assessment report.

Table 4.1 presents noise equipment used during the noise survey. Calibration certificates are available upon request.

Table 4.1 Noise Survey Equipment Details.

Equipment	Serial Number
Norsonic 140 Sound Level Meter	1407753
Norsonic 1255 Calibrator	125526121

4.2 Noise Climate, Sensitive Receptors, and Survey Location

The dominant noise source affecting the NHLC site was observed to be from road traffic noise from Baldock Road to the north.

The nearest noise sensitive receptors (NSRs) to the proposed plant at NHLC are described in Table 4.2 and shown in Figure 4.1.

Table 4.2 Noise Sensitive Receptors and Approximate Distance to NHLC.

Sensitive Receptor	Type of Receptor	Description / Name	Approximate Distance from NHLC Plant to NSR
1	Hotel	Travelodge Letchworth Garden City to the northwest located at Ave One, Letchworth Garden City SG6 2HB.	160 m
2	Child Care Facility	Handy Child Care located to the southwest located at 9 Schoolfields, Letchworth SG6 2TZ	230 m
3	Residential	Residential property to the southwest located at 2 Schoolfields, Letchworth Garden City SG6 2TZ.	238 m
4	Residential	Residential property to the west located at 7 Quinn Way, Letchworth Garden City SG6 2TX.	297 m

⁴ Time and date [link](#).

⁵ British Standard BS 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures.

Noise Impact Assessment

Figure 4.1 Noise Sensitive Receptors and Unattended Noise Survey Location (Modified Google Maps).



4.3 Noise Survey Results

A summary of the noise monitoring data is presented in Table 4.3 while the noise survey time history and site photo is presented in Appendix C.

Table 4.3 Unattended Noise Survey Results.

Date and Start Time	Duration	Background Sound Level dB $L_{A90,T}^1$
13:45 13/03/2026 to 11:10 16/03/2026	07:00 – 23:00	50
	23:00 – 07:00	38

Table Note:

1. The reported L_{A90} figures are the statistical modal over the given time period.

It should be noted that the background noise levels at NSR 1 (Travelodge) are likely to be higher than the survey location L1 due to the location being closer to Baldock Road.

5.0 Plant Noise Impact Assessment

5.1 Operational Plant Noise Limits

Based upon the unattended noise measurement Background Sound Level, derived plant noise limits inclusive of acoustic features (Rating Sound Level) in line with NHDC plant noise criteria for the new fixed building services plant associated with NHLC are presented in Table 5.1.

Table 5.1: Noise Emission Limits for New Fixed Building Services Plant.

Plant Rating Level Limit During Plant Operating Period, $L_{A_r, Tr}$ (dB)	
Daytime (07:00 – 23:00)	Night-time (23:00 – 7:00)
50	38

5.2 Plant Sound Power Levels

The proposed plant includes 4no air source heat pumps and will be located at the northwest of NHLC shown in Figure 5.1. While an architectural screen is understood to enclosure the ASHP units, it has not been considered to provide airborne sound reduction of the plant noise and as such no attenuation has been considered.

Figure 5.1 Proposed ASHP Unit Location (Highlighted Green Left) and Plan and Elevation of AHSP Compound (Right) .

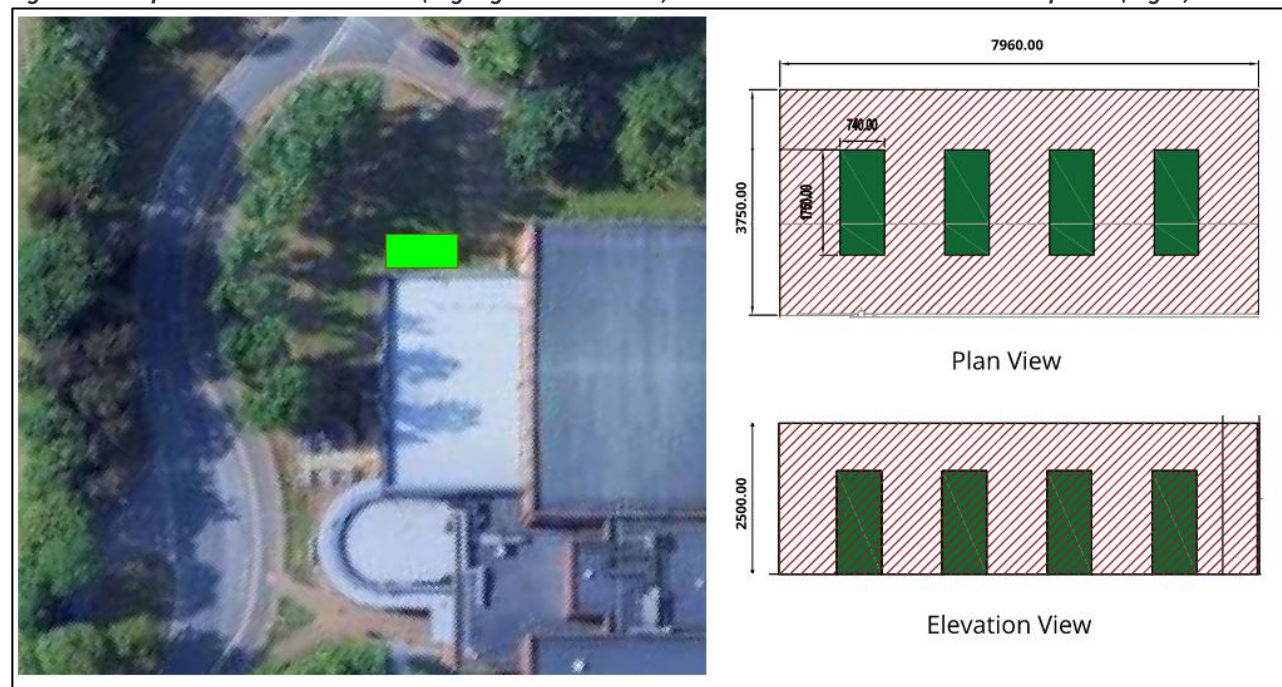


Table 5.2 presents the sound pressure levels associated with the proposed 4no ASHP units.

Table 5.2 Proposed ASHP Model and Sound Pressure Levels (dB) in Octave Bands.

Plant Model and Quantity	Sound Pressure Level L_p (dB) in Stated Octave Band Frequency (Hz)								L_w dBA
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
Mitsubishi ASHP CAHV-R450YA-HPB (-BS) 4 units L_p at 1 m	66	73	69	67	62	59	61	52	L_p 63 dBA at 1 m

5.3 Noise Methodology and Prediction Results

5.3.1 Methodology

Cumulative noise predictions have been carried out at each NSR using Cadna environmental noise software with the sound pressure level of the ASHP units. The prediction calculations have been based on the following:

- Noise predictions are carried out in accordance with BS EN ISO 9613-2⁶.
- Noise levels from manufacturer supplied plant noise data as per Table 5.2.
- The following modelling inputs have been used for the noise prediction:
 - 4no. ASHP are understood to operate constantly for up to 60 minutes during the daytime while 2no. ASHP would operate constantly for 15 minutes during the night-time assessment periods, and as such no on-time correction has been included.
 - A robust acoustic feature correction of 5 dB has been considered to account for tonality and other distinct features associated with the proposed plant.
 - The ASHP fans and compressors are considered to operate at a constant revolutions per minute and therefore temporal variation in the plant noise is not considered over the assessment period.
 - The distance from the ASHPs to the receivers exceeds twice the largest dimension of the source thereby complying with ISO 9613 for point source propagation. Therefore, the ASHPs have been modelled as point sources.
 - Noise predictions are carried out at 1 metre from building facades of each NSR.

Table 5.3 summarises the global modelling configuration parameters used in the predictions.

Table 5.3: List of Global Noise Modelling Configuration Parameters and Values.

Parameter	Value
Industry standards	ISO 9613
Co-ordinates system	British Transverse Mercator Co-ordinates
Max order of reflections	2.0
Ground absorption	1.0

⁶ ISO 9613-2:2024 Acoustics — Attenuation of sound during propagation outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoor.

Noise Impact Assessment

Parameter	Value
Building absorption	0.5

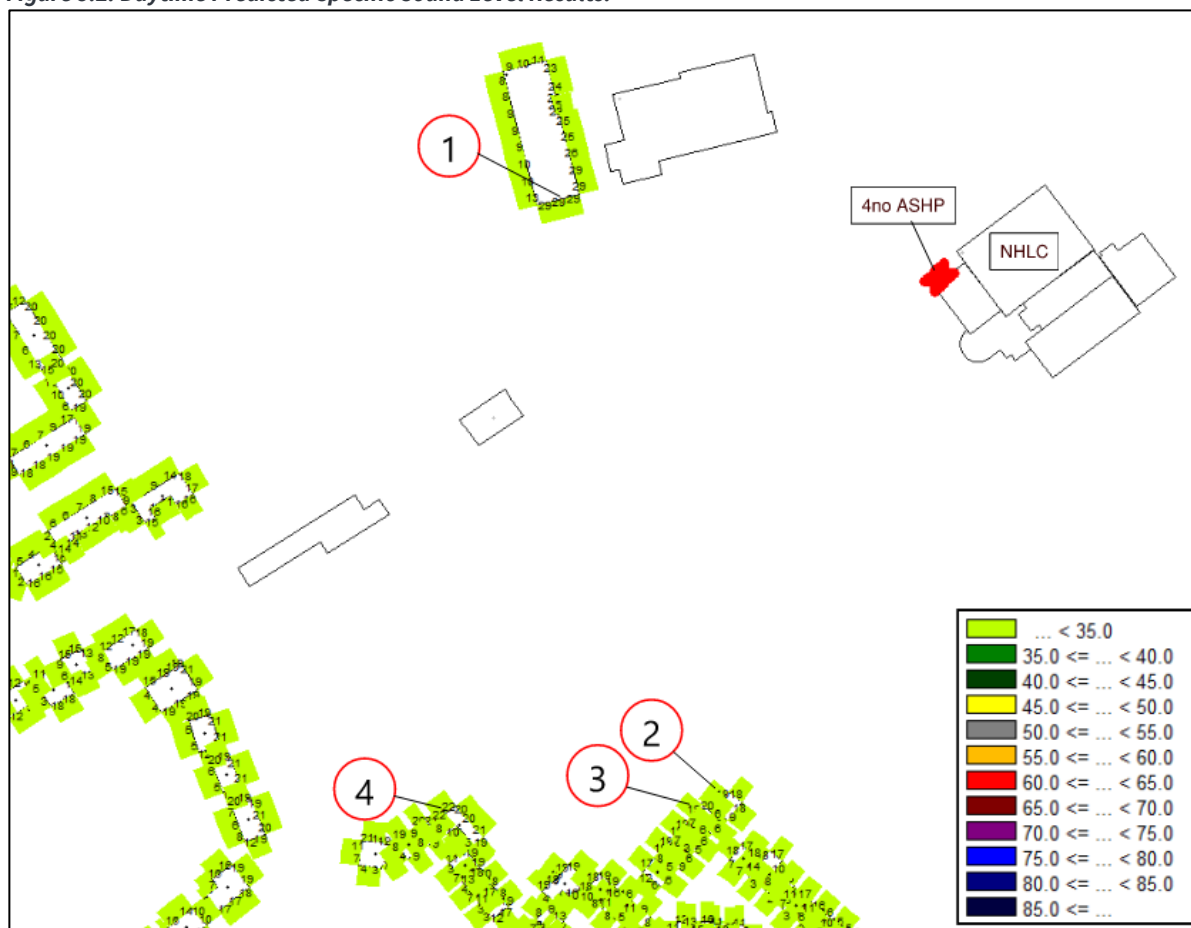
5.3.2 Noise Prediction Results

The highest predicted Rating Level predictions are presented in Table 5.4 and shown in Figure 5.2 and Figure 5.3. It should be noted that as NSR 2 is a child care facility it is only open during daytime hours and as such a night-time plant noise assessment is not considered.

Table 5.4: Daytime and Night-time Specific Sound Level Prediction Results for NSRs 1 to 4.

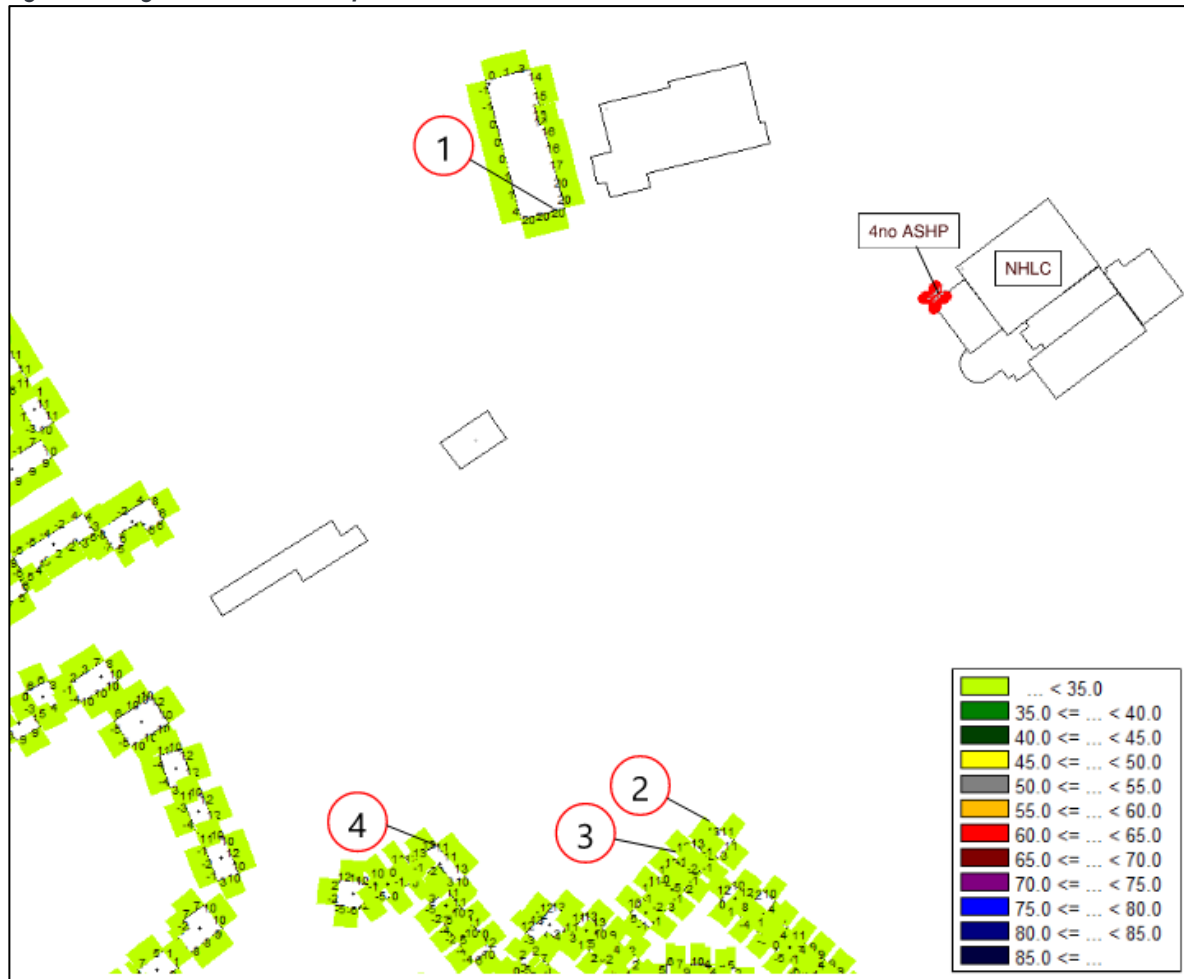
NSR	Predicted Specific Noise Level Ls (dBA)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
1	29	20
2	19	13
3	20	12
4	22	13

Figure 5.2: Daytime Predicted Specific Sound Level Results.



Noise Impact Assessment

Figure 5.3: Night-time Predicted Specific Sound Level Results.



5.4 Assessment

Table 5.5 and Table 5.6 present the plant noise assessment for the NSRs for daytime and night-time hours, respectively. As noted previously, a night-time noise assessment has not been carried out for NSR 2 as this receptor is a childcare facility only operating during daytime hours.

Table 5.5 Daytime Plant Noise Impact Assessment.

NSR	Cumulative Rating Sound Level $L_{A,T,r}$ (dB)	Daytime Plant Noise Limit (dB)	Excess Above Plant Noise Limit (dB)
1	$29 + 5 = 34$	50	-16
2	$19 + 5 = 24$	50	-26
3	$20 + 5 = 25$	50	-25
4	$22 + 5 = 27$	50	-23

Noise Impact Assessment



Table 5.6 Night-time Plant Noise Impact Assessment.

NSR	Cumulative Rating Sound Level $L_{A,T,r}$ (dB)	Night-time Plant Noise Limit (dB)	Excess Above Plant Noise Limit (dB)
1	$20 + 5 = 25$	38	-13
3	$12 + 5 = 17$	38	-21
4	$13 + 5 = 18$	38	-20

5.5 Context and Discussion

An indicative assessment has been undertaken to understand the likely noise impact of the proposed NHLC ASHP units upon adjacent existing NSRs.

While the measured environmental noise levels at proposed location of the ASHPs is considered moderately quiet, the distance between the proposed ASHP units' location and NSRs (Table 4.2) is considered large with intervening sport pitches, green space, and roads.

The indicative assessment results show that the predicted Rating Levels resulting during daytime and night-time hours will fall well below the proposed limiting daytime and night-time limits. On this basis, the likelihood of any adverse effects is predicted to be low when assessed in accordance with BS4142, and in view of NHDC plant noise criteria.

5.6 Assumptions and Limitations

The calculations are based on the proposed plant selection and proposed location provided by the project building services engineers at the time of writing this noise impact assessment. Should the plant proposals change, then additional calculations may be required.

All reasonable steps to reduce the level of uncertainty of the measurement and assessment have been undertaken. Reviews of the captured survey data identified a consistent noise environment with its environmental noise sources (road) with a typical diurnal pattern observed over the measurement period. Calculations were undertaken using industry standard propagation methodology. Input data for the 3D model was obtained from sources to best replicate the site environment including OpenStreetMap, available site plan drawings, and 3D imagery within Google Maps.

Noise Impact Assessment



Appendix A – Glossary of Acoustic Terminology

The following table contains a list of the some of the most frequently used acoustic terms we use in our reports. An explanation of what each of the terms means is also provided.

Term	Definition
Decibel, dB	Is a unit of measurement of sound and is expressed on a logarithmic (base 10) scale. The human ear has a large dynamic range in sound reception, the logarithmic scale is a convenient way of compressing a range of sound pressures into a smaller range of numbers.
Sound Pressure Level, L_p	$L_p = 20 \log_{10} \left(\frac{P_{rms}}{P_{ref}} \right) dB$ This is the pressure deviation against a reference pressure caused by a passing sound wave. Where P_{rms} is the root mean square measured pressure and P_{ref} is the reference pressure, which is 2×10^{-5} pascals for air.
Sound Power Level, L_w	$L_w = 10 \log_{10} \left(\frac{P}{P_0} \right) dB$ This is the total sound energy radiated from a given source. P_0 is the reference sound power level (1×10^{-12}) and the measured power.
Noise Rating Level, NR dB	Commonly used when describing noise from building services systems. This is a single figure value derived by plotting a noise spectrum against a set of curves. The lowest curve under which the level fits is the resulting NR level. The overall NR value is the highest of the individual NR values for each frequency band.
Frequency, Hz	$f = \frac{1}{T} = \frac{v}{\lambda}$ Where f is the frequency, T is the time to complete one cycle, v is the speed of sound and λ is the wavelength of a given sound pressure wave. Different frequencies are divided into octave and one third octave bands.
Frequency Weightings	Weightings are often applied to a spectrum of sound and act as a filter to account for different sensitivities and conditions. Weightings are often used to present a single figure value from a spectrum of sound.
A-weighted sound pressure level, L_{pA}	The sound pressure level with the A-weighting applied. The A-weighting is used for most environmental noise measurements and is used to weight a spectrum of sound to match the sensitivity of the human ear.
Measurement Time Weightings, Fast, Slow	Depending upon the measurement in question the time response of a sound level meter can be adjusted. For most measurements the Fast time weighting is selected (F) however, a slow time weighting (S) is often used to for the measurement train noise and vibration.
Equivalent continuous A-weighted sound pressure level,	An energy average and defined as the level of sound which, through a given period of time (T) would equate to the same A-weighted sound energy as the actual measured fluctuating sound.

Noise Impact Assessment



Term	Definition
$L_{Aeq,T}$	
Octave Band	A frequency band where the upper frequency of the band is twice the frequency of the lower limit.
Maximum noise Level, L_{AFmax}	With the meter set with a fast time response, F, this is the maximum instantaneous noise level measured during a given period of time.
Percentile level, $L_{AN,T}(L_{A90,T}, L_{A10,T})$	A sound pressure level which is exceeded for a given N% of a specified time period with an A-weighting and measured with a fast time response.
Background Sound/Noise Level, L_{A90}	Typically, these are amongst the lowest noise levels referenced over a given period and act to describe the noise level that is consistently exceeded 90% of the time. The background sound level excludes short term, intermittent noise sources and often acts to describe noise sources that operate consistently through a given period.
Ambient Noise Level	The most commonly used value to describe the ambient noise level the L_{Aeq} . It is the noise level in a given environment whilst it is subject to all of its normal sources of noise.
Rating Level, $L_{Ar,Tr}$	As defined in BS 4142. The equivalent continuous A-weighted sound pressure level that includes corrections for the presence of any acoustic characteristics such as tonality, impulsivity and intermittency.
Reverberation Time, T	The time needed for the sound pressure level to decrease by 60 dB after the sound source has stopped, often written RT60. T is often followed by descriptors to present type of reverberation time value. For example, a T_{mf} is the mid-frequency (500 Hz – 2 kHz) reverberation time.
Absorption Coefficient, α	The fraction of reverberant sound energy absorbed by a material. It is expressed as a value between 1.0 which equates to perfect absorption and 0 which equates to zero absorption.
Acoustic Absorption, A	$A = \alpha S$ This is a measure of how much sound energy is absorbed by a material rather than reflected. Acoustic absorption is derived from the multiplication of the absorption coefficient by the surface area, $S \text{ m}^2$ of a given material.
Absorption Class, A - E	The process of classifying materials into discreet Classes A-E, with Class A having the highest level of absorption. Each class band has upper and lower reference curve for absorption coefficients between 200 Hz and 5 kHz. Materials should be tested in accordance with BS EN ISO 354 and classified according to BS EN ISO 11654.
NRC	A single-number value ranging from 0 (no absorption) – 1 (100% absorption) describing the absorption performance of a material. NRC of a material is calculated by averaging its Sound Absorption Coefficients between 250 Hz – 2 kHz.
Sound Insulation	The capacity of building elements to reduce sound transmission between spaces across a range of frequencies.

Noise Impact Assessment



Term	Definition
Sound Reduction Index, R	$R = L_1 - L_2 + 10 \log_{10} \left(\frac{S}{A} \right) \text{ dB}$ A laboratory measure of the sound insulation performance of a material in a given frequency band or range. Where L_1 is the average sound pressure level in the source room and L_2 is the average sound pressure level in the receive room, S is the area of the tested element and A is the equivalent sound absorption area.
Weighted Sound Reduction Index, R_w	A single figure value derived from a range of frequencies that characterises the sound reduction of a material. A reference curve is compared to the measured sound reduction indices and is adjusted until the total of unfavourable deviations below the reference curve is as close to but does not exceed 32.
Weighted Level Difference, D_w	$D = L_1 - L_2$ The difference in noise level between a source room and a receive room. Where L_1 is the average sound pressure level in the source room and L_2 is the average sound pressure level in the receive room. The difference is then weighted and stated as a single figure.
Standardized Weighted Level Difference, D_{nTw}	$D_{nT} = D + 10 \log_{10} \left(\frac{T}{T_0} \right) \text{ dB}$ Where D is the measured level difference standardised for the reference reverberation time, T_0 and then weighted.
Weighted, Normalised Flanking Level Difference, D_{nFw}	The level difference via a flanking element, such as a mullion or ceiling detail, which is normalised and weighted.
Weighted, Normalised Element Level Difference, D_{new}	The level difference through a small element such as a trickle ventilator, which is normalised and weighted.
C_{tr}	A spectrum adaption term applied to the sound insulation single-number values (R_w , D_w , and $D_{nT,w}$). The C_{tr} adaption term acts to describe the performance of an element in the context of low frequency noise, such as that generated by traffic.
Impact Sound	Is the noise generated by an impact on a structure, such as walking or weight drops.
Weighted standardized impact sound pressure level, $L_{nT,w}$	$L_{nT} = L_i - 10 \log_{10} \left(\frac{T}{T_0} \right) \text{ dB}$ Where L_i is the measured impact sound pressure level standardised for the reference reverberation time, T_0. It is used to describe the impact sound insulation performance of a floor. This is a measured noise level in a receive room generated by a standardised impact source in the room above.
Insertion Loss, IL	The reduction of noise level due to the presence of a noise control device such as an attenuator, excluding any regeneration noise created by its presence. A dynamic insertion loss, DIL, would include the impact of any regenerated noise.
Cross-talk	This references noise transmission via ventilation duct or similar air path between rooms.

Noise Impact Assessment



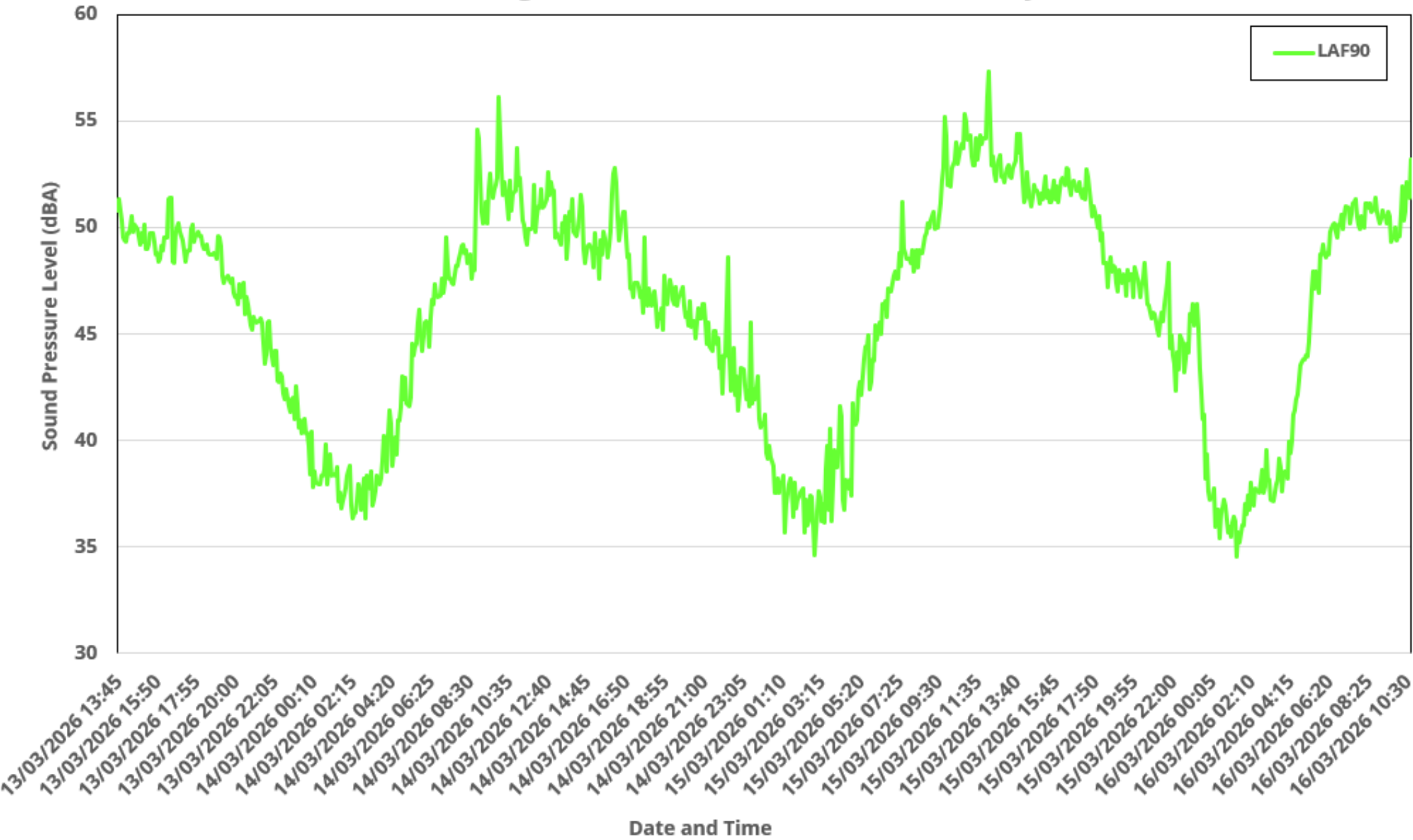
Term	Definition
Vibration	The vibratory motion of a surface can be described by the displacement (m), velocity (m/s) or the acceleration (m/s²) of its oscillation. Depending upon the circumstance it is often useful to quantify the magnitude of vibration in a range of ways, including Peak to Peak, Peak, r.m.s. and dB. A reference level of 10-6 m/s² r.m.s. is usually used for acceleration.
Ground borne noise	Where the noise propagation path from a source is transmitted through the ground into a structure and is radiated via the structure, such as noise experienced from an underground train within a building above ground.
Structure borne noise	Noise caused by vibrating of elements of a structure, the source of which is within a building or structure with common elements.
Vibration Dose Value, VDV	$VDV = (\int_0^T a^4(t) dt)^{\frac{1}{4}}$ Where a(t) is the frequency weighted acceleration (m/s²), T is the total measurement period in seconds, VDV is the Vibration Dose Value (m/s^{1.75}) and is the dose a person is expected to be exposed to over the course of the day or night.
Estimated Vibration Dose Value, eVDV	$eVDV = k \cdot a_{rms} \cdot t^{0.25}$ Where k is a constant for crest factors (typically 1.41), a_{rms} is the weighted rms acceleration and t is the cumulative time of the period Typically used on short duration measurements of transients with known durations and occurrences

Noise Impact Assessment



Appendix B – Unattended Noise Survey Time History and Site Photo

NHLC Unattended Survey L1
Background Noise Level LAF90 Time History



Noise Impact Assessment



Appendix C – Proposed AHSP Plant Datasheet

Commercial Heating Product Information



CAHV-R450YA-HPB

Ecodan Air Source Heat Pump

The Mitsubishi Electric Ecodan **CAHV** air source **heat pump** uses low GWP R454C refrigerant, offering a robust, low carbon system for the provision of sanitary hot water and space heating. This innovative heat pump solution can operate as a single system or form part of a multiple unit system, making it suitable for most commercial applications.

The multiple unit system has the ability to cascade available units to both on and off mode to meet the load from a building. As an example of this unique modulation, a 16 unit system allows 0.5kW increments of capacity, from 7.8kW all the way up to 640kW*. With cascade and rotation built in as standard, the Ecodan CAHV system is perfectly suited to commercial applications including schools and hospitals.



*At nominal conditions A7W35

Key Features & Benefits:

- Low GWP R454C refrigerant and reduced embodied carbon helps achieve CSR targets
- Achieves 70 °C outlet temperature down to -20 °C ambient temperature for continuous heating provision
- Multiple unit cascade control from 7.8kW to 640kW capacity provides design flexibility for a wide range of commercial applications
- Water flow temperatures from 24 °C to 70°C without boost heaters results in cost and energy savings
- Advanced heat exchange design combined with the properties of R454C refrigerant enables a shorter defrost time
- Low frequency compressor control improves energy efficiency and product operation
- Ability to rotate units based on accumulated run hours offers extended product life
- Requires only water and electrical connections, for ease of installation
- Hermetically-sealed monobloc design, requiring low maintenance



les.mitsubishielectric.co.uk

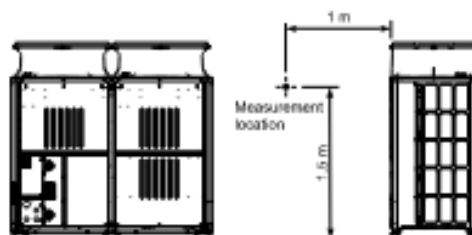
Noise Impact Assessment



2. Product Data

2-2. Sound pressure levels

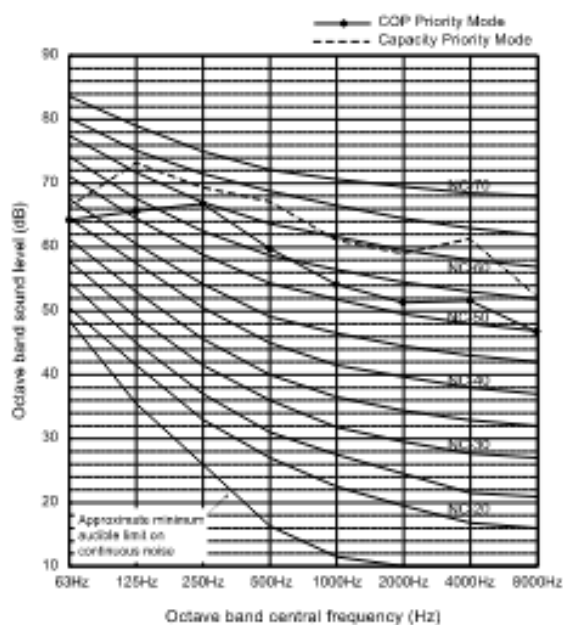
Measurement condition
CAHV-R450YA-HPB (-BS)

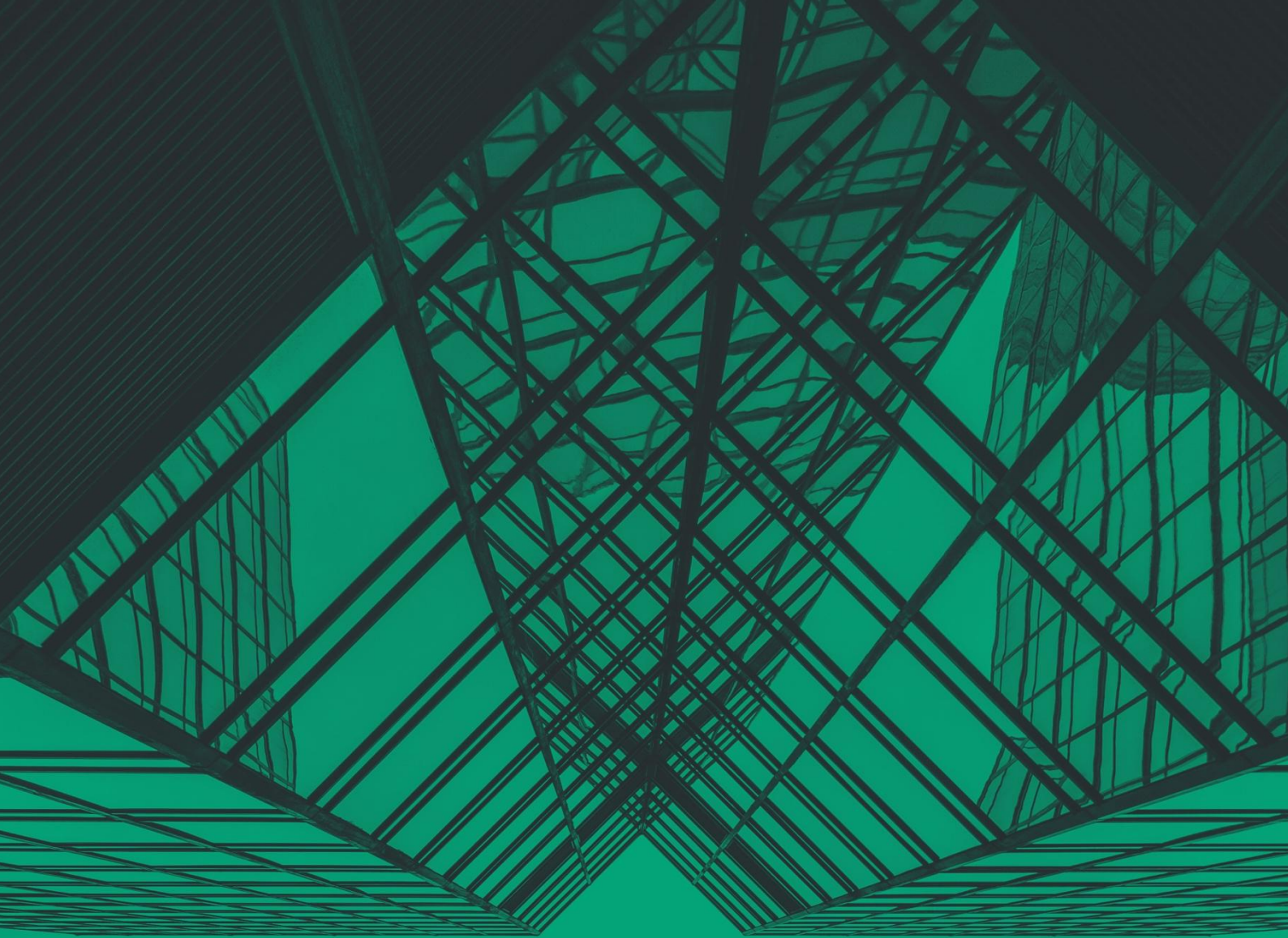


CAHV-R450YA-HPB

Sound Pressure Level: 64/72 dB (COP Priority Mode/Capacity Priority Mode)

Operation condition... COP Priority Mode: 7°CDB/6°CWB, Inlet water temp.: 40°C, Outlet water temp.: 45°C
Capacity Priority Mode: 7°CDB/6°CWB, Inlet water temp.: 65°C, Outlet water temp.: 70°C





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