ACOUSTIC CONSULTANTS LTD

Noise Impact Assessment

Mavern House Care Home
Proposed Air Source Heat Pump

Reference: 10425/SF

Client:
TESN Projects Ltd

Document Control

Version:	Revision Description:	Date:	Author:	Reviewed by:	Approved by:
1.0	First Issue	18/09/2023	Sam Frankcom	Samuel Lawrence	Blake Lucas

The report has been prepared in good faith, with all reasonable skill and care, based on information provided or available at the time of its preparation and within the scope of work agreement with the Client. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above. The report is provided for the sole use of the named Client and is confidential to them and their professional advisors. No responsibility is accepted to other parties.

The report limits itself to addressing solely on the noise, acoustic, and vibration aspects as included in this report. We provide advice only in relation to noise, vibration and acoustics. It is recommended that appropriate expert advice is sought on all the ramifications (e.g. CDM, structural, condensation, fire, legal, etc.) associated with any proposals in this report or as advised and concerning the appointment. It should be noted that noise predictions are based on the current information as we understand it and, on the performances noted in this report. Any modification to these parameters can alter the predicted level. All predictions are in any event subject to a degree of tolerance of normally plus or minus three decibels. If this tolerance is not acceptable, then it would be necessary to consider further measures.

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1. Introduction

TESN Projects LTD appointed Acoustic Consultants Limited to undertake a noise impact assessment for the proposed Air Source Heat Pump (ASHP) associated with the proposals at Mavern House Care Home.

The noise impact assessment is based on the results of an on-site noise survey and noise level predictions using manufacturer's plant data.

The noise impact assessment has been undertaken in accordance with the guidance in the National Planning Policy Framework (NPPF), Noise Policy Statement for England (NPSE), National Planning Practice Guidance (NPPG) and British Standard 4142:2014+A1:2019 (BS4142).

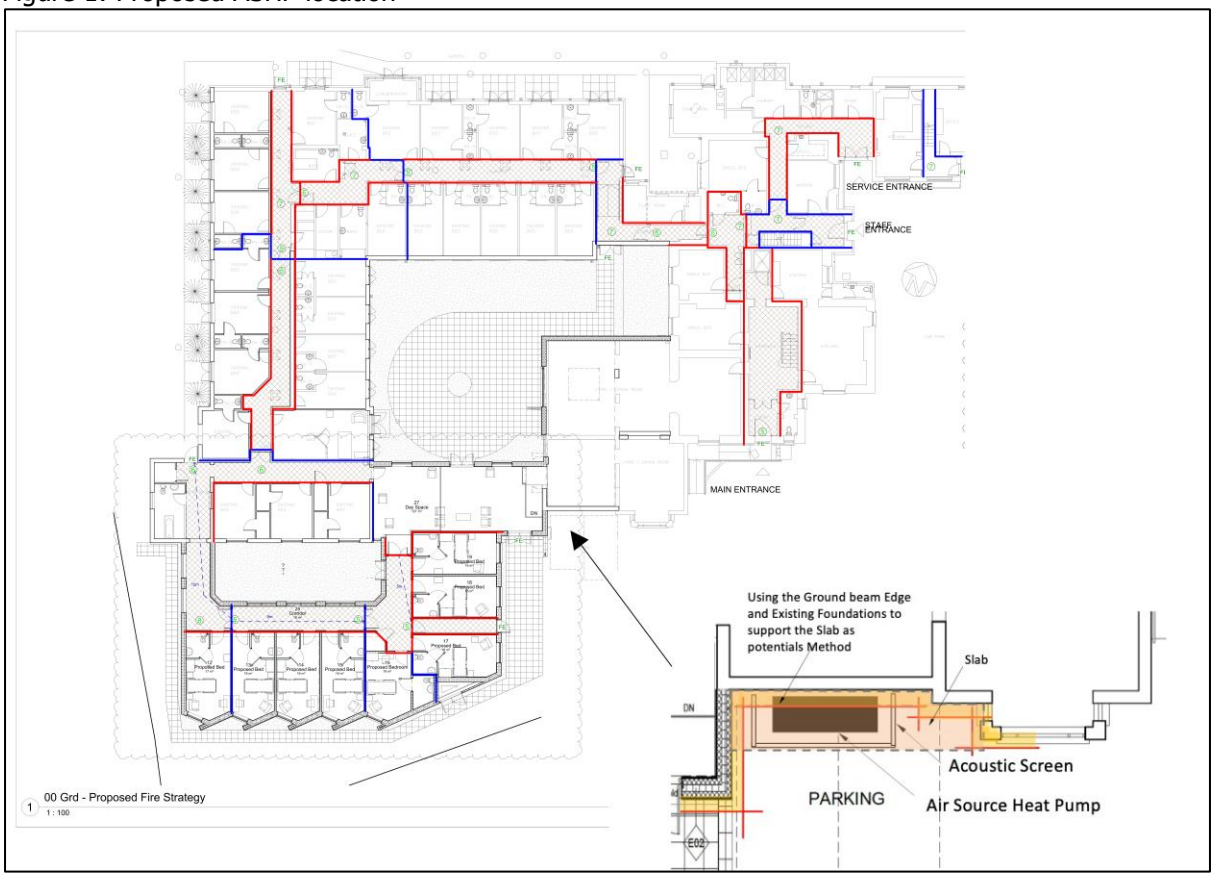
2. Site & Proposals

Mavern House Care Home is located within a rural, residential area to the northwest of Melksham. It is proposed to install an air source heat pump (ASHP) at ground floor level for a residential development.

The nearest existing residential receiver to the proposed ASHP is a dwelling approximately 20 metres to the east of the proposals.

The proposed plant location is provided in the figure below.

Figure 1: Proposed ASHP location



3. Planning & Noise

3.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012 and revised in September 2023. Section 15 entitled 'Conserving and enhancing the natural environment' addresses noise as a requirement of planning. Paragraph 174 states:

"174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate."

Paragraph 185 states:

"185. 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. "

The document does not prescribe any assessment methodology or criteria to assess the adverse effect of noise, and refers you to the NPSE.

3.2. Noise Policy Statement for England

The NPPF refers to the Noise Policy Statement for England (NPSE). This was published in March 2010 and aims to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion and applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise.

The NPSE sets out the long-term vision of Government noise policy. This long-term vision is supported by three noise policy aims which are as follows:

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

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

The NPSE introduces the concept of "Significant adverse" and "Adverse" impacts of noise which relate to the noise policy aims. These are applied as follows:

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.

LOAEL – Lowest Observed Adverse Effect Level - This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level - This is the level above which significant adverse effects on health and quality of life occur. With regard to where there is potential for noise impact it states the following in relation to the second noise policy aim:

"The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur."

The NPSE does not provide any assessment criteria for the noted effect levels and each case must be considered on its own merits. The NPSE does, however, emphasise that in dealing with noise, Local Planning Authorities are required to take a balanced approach in considering the benefits of development against any adverse effects which arise. Paragraph 2.18 of the NPSE is particularly relevant in this respect and states:

"There is a need to integrate consideration of the economic and social benefits of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focusing solely on the noise impact without taking into account other related factors."

The planning need is outside the scope of noise and acoustics and will need to be addressed by others.

3.3. National Planning Practice Guidance, Noise

The National Planning Practice Guidance (NPPG) on noise, referred to here, is based on the current version (July 2019) as provided on the Planning Guidance Website. It states that *"Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment."*

The document provides generic guidance on how to determine the impact of noise and what factors could be a concern. It includes the option types to mitigate any adverse effects of noise stating that there are four broad types of mitigation. These are engineering, layout, using planning conditions or obligations and noise insulation. Paragraph 5 of the NPPG provides a table identifying the effect level and examples of effect relating to the impact effect levels provided in the NPSE. The table is duplicated on the following page.

Table 1: NPPG Noise – Perception of Effect Levels

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not Present	No Effect	No Observed Effect	No specific measures required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise.	Significant Observed Adverse Effect	Avoid

Response	Examples of Outcomes	Increasing Effect Level	Action
	Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.		
Present and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

The table does not provide any objective assessment which equates to the noted effect levels.

The NPPG identifies that where noise is audible it is not necessarily intrusive. The effect and impact on people are based primarily on the level of noise.

The Noise Policy Statement for England (NPSE) states that noise levels above the Lowest Observed Adverse Effect Level are acceptable in planning where reduced to a minimum when taken into account against all other planning considerations.

Section 4 of this report identifies guidance which is considered to provide noise criteria equivalent to effect levels below the Lowest Observed Adverse Effect Level. This is where the perception of noise is "not noticeable" or "noticeable but not intrusive" as indicated in Table 1 above.

4. Assessment Criteria

British Standard 4142:2014 entitled 'Method for rating and assessing industrial and commercial sound' use outdoor sound levels to assess the likely effects of sound upon people who might be inside or outside a dwelling or other premises used for residential purposes. The principle is that of establishing the 'difference' between the 'rating level' and the 'background sound level'.

The 'rating level' is the 'specific sound level' of the source over a period of one hour during the day (07:00 to 23:00 hours) and over a period of 15 minutes during the night (23:00 to 07:00 hours). Section 9 entitled 'Rating Level' states: *"Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level."*

An acoustic character correction should be added to the 'specific sound level' if it exhibits any tonality, impulsivity, other specific characteristics and/or intermittency at the assessment location. The value of the character correction varies, dependent on the prominence of the character of the sound source at the assessment location.

In Section 11 of the Standard, entitled 'Assessment of the Impacts', it states: *"Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (see Clause 8) from the rating level (see Clause 9) and consider 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 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."*

5. Baseline Noise Monitoring

A baseline noise survey was undertaken over a weekend period, between the 1st and 4th of September 2023, to determine the existing noise climate at the site.

5.1. Monitoring Equipment

Sound Pressure Levels were measured using a Class 1 sound level meter with a half-inch condenser microphone, using the 'fast' setting. The equipment is checked regularly using a Quality System meeting the requirements of British Standard EN ISO/IEC 17025:2017 "General requirements for the competence of testing and calibration laboratories"; in accordance with British Standard EN 10012:2003 "Measurement management systems. Requirements for measurement processes and measuring equipment"; and traceable to the National Standards.

This equipment was checked and calibrated as noted below and the certificates are available for inspection.

Table 2: Equipment used and calibration dates

Equipment Description / Manufacturer / Type	Serial Number	Date of Calibration	Calibration Certification Number
SLM, Svantek, 959	14784	07/04/2022	1502194-1
Pre-Amplifier, Svantek, SV12L	18685	07/04/2022	1502194-1
Microphone, GRAS, 40AE	183810	07/04/2022	1502194-1
Calibrator, Larson Davis CAL200	18293	26/10/2022	42246

The equipment was calibrated before and after use with no significant drift detected.

5.2. Weather Conditions

The weather conditions during the survey are given in the table below. Weather conditions have been determined from on-site observations and weather history data from timeanddate.com.

Table 3: Weather conditions at the monitoring location over the survey period

Date	Wind Speed (m/s)	Prevailing wind Direction	Temperature (°C)	Precipitation Time (hrs)	Cloud Cover (%)
1st – 4th September 2023	≤5	E	14 - 27	0	20

These weather conditions are not expected to have any adverse effect on the collected noise data.

5.3. Monitoring Procedure

The microphone was situated on a tripod in a free-field position, approximately 3 metres from the ground to avoid screening from the nearby-dwelling's boundary fence. The prominent noise source was local road traffic.

On site construction noise was present on the Friday afternoon & Monday morning but is not expected to have had an adverse effect on the measured data.

The monitoring location and location of the nearest existing noise sensitive receiver (NSR) is provided in the figure below.

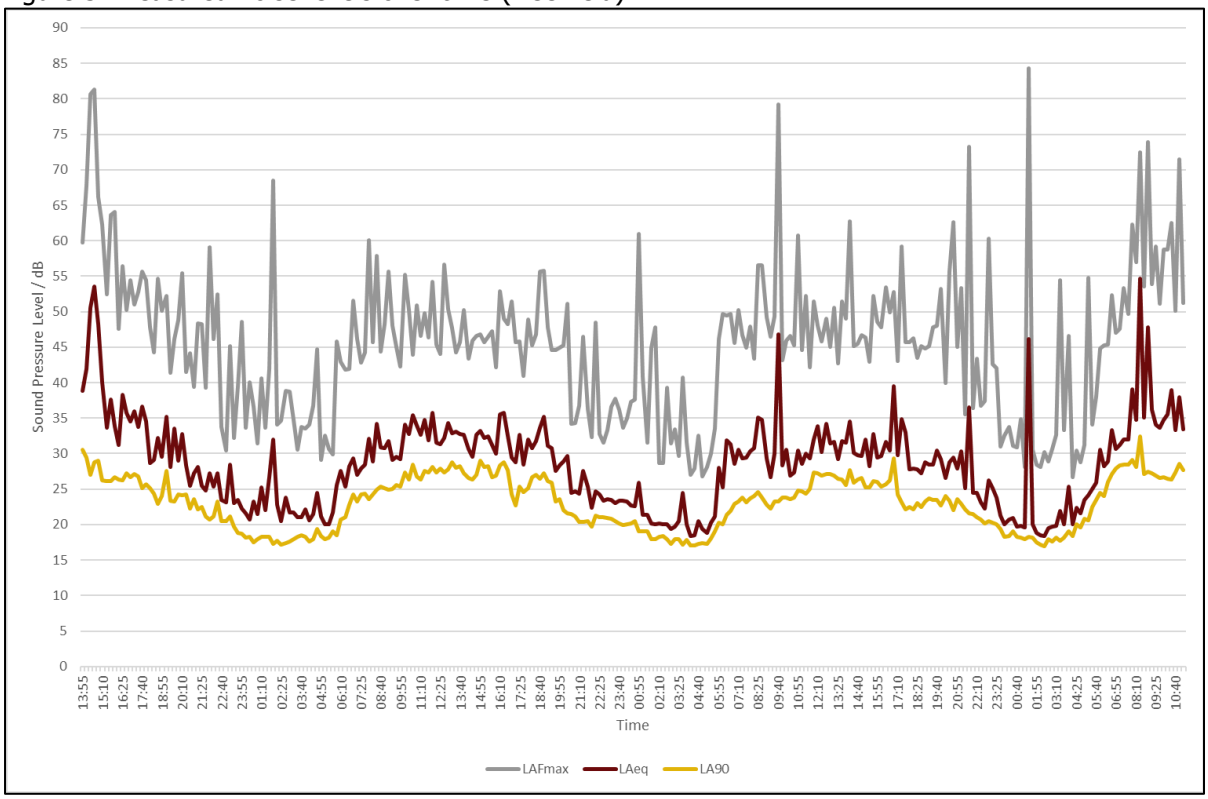
Figure 2: Monitoring and existing NSR location



5.4. Measured Noise Levels

The chart below shows the measured maximum (L_{AFmax}), equivalent (L_{Aeq}) and background (L_{A90}) noise levels ($L_{15\ minutes}$) over the duration of the survey period.

Figure 3: Measured noise levels over time (free field)



The table below details the free field background (L_{A90}) and equivalent (L_{Aeq}) noise levels during both the daytime and night time.

Table 4: Equivalent and background noise levels at monitoring location (free field)

Period	Equivalent, $L_{Aeq,\ 15\ minutes}$ dB		Background, $L_{A90,\ 15\ minutes}$ dB	
	Range	Typical	Range	Mode
Daytime, 07:00 – 23:00 hrs	22 - 55	30	20 - 32	27
Night Time, 23:00 – 07:00 hrs	18 - 46	23	17 - 28	18

6. Predicted Noise Level

6.1. Proposals

6.1.1. Proposed Plant

We have been advised it is proposed to install 1 ASHP unit at ground floor level on the southeastern façade of the proposed development. We have been advised that the proposed plant details are as follows:

Table 5: Manufacturers sound power level (L_w)of proposed plant

Plant	Manufacturers L_w
Mitsubishi PUZ-HWM140VHA(-BS)	67 dBA

It should be noted that any changes to the schedule, location or layout of the plant will affect the predicted levels at the NSR and, as such, will need reassessing.

It is assumed that the plant will at all hours during the day and night.

6.1.2. Proposed Acoustic Barrier

It is understood that it is proposed to surround the proposed ASHP with an acoustic barrier. A barrier will not be sufficient to mitigate noise from the proposed ASHP on nearby NSRs. Also, an acoustic barrier in close proximity to the proposed ASHP may obstruct airflow to the unit and, as such, may not be fit for purpose. Therefore, we recommend an acoustic enclosure as an alternate method of mitigation.

In the assessment below, we have assumed there will be no acoustic barrier around the plant.

6.2. Acoustic Enclosure

An acoustic enclosure is required to suitably mitigate noise levels at both existing and proposed NSRs.

This enclosure should attenuate noise level emission by a minimum of 31 dBA. The enclosure supplier should confirm this is achievable.

If the attenuation above is deemed not possible by an enclosure alone, a selection of quieter plant, relocation of plant and or a combination of these mitigation methods is advised.

6.3. Predicted Specific Sound Levels

6.3.1. Existing Dwelling

The nearest existing NSR is understood to be a first-floor window of a residential dwelling on School Lane, approximately 20 metres from the proposed ASHP location.

Accounting for quarter sphere propagation, distance attenuation, and attenuation of an acoustic enclosure specified in Section 6.2, the predicted specific sound level at the NSR is 15 dB $L_{Aeq,T}$.

6.3.2. Proposed Dwelling

The nearest proposed NSR is understood to be a ground-floor bedroom window of proposed bedroom 19, approximately 7 metres from the proposed ASHP location.

Accounting for quarter sphere propagation, distance attenuation, and attenuation of an acoustic enclosure specified in Section 6.2, the predicted specific sound level at the NSR is 24 dB $L_{Aeq,T}$.

7. British Standard 4142 Assessment

7.1. Initial Estimate of Impact

A British Standard 4142:2014 assessment has been undertaken at the existing noise sensitive receivers on the site.

7.1.1. Background Noise Level and Sound Level Criteria

From the measured data at MLB, we have determined a typical free-field background level of 27 dB $L_{A90,\ 15\ minutes}$ during the day and 18 dB $L_{A90,\ 15\ minutes}$ during the night. This is considered representative of the worst-case NSR.

7.1.2. Predicted Specific Sound Level

The predicted specific sound level at the existing NSR is 15 dB $L_{Aeq,T}$ and is 24 dB $L_{Aeq,T}$ at the worst-case proposed NSR.

These are the levels determined at the noise sensitive receivers without any character corrections applied.

7.1.3. Character Corrections

Character corrections should be added to the 'specific sound level' if it exhibits any *tonality, impulsivity, other specific characteristics and/or intermittency* at the assessment location. The corrections are as follows:

- *Tonality* – Plant of this type is not normally tonal in nature; the supplier should confirm this. No character correction for tonality has been applied.
- *Intermittency* – Intermittency may be perceptible at the NSRs. A character correction of +3 dB is required for intermittency.
- *Impulsivity* – Plant of this type is not normally impulsive in nature. No character correction for impulsivity has been applied.
- *Other Sound Characteristics* – We do not believe any correction is necessary for other sound characteristics.

7.1.4. Initial Estimate

Therefore, the British Standard 4142:2014 initial estimate at the NSR is as follows.

Table 6: British Standard 4142:2014 initial estimate for existing & proposed NSRs

Parameter	Existing NSR		Proposed NSR	
	Day	Night	Day	Night
Background Sound Level, $L_{A90,\,T}$	27 dB	18 dB	27 dB	18 dB
Specific Sound Level, $L_{Aeq,\,T}$	15 dB	15 dB	24 dB	24 dB
Character correction	+3 dB	+3 dB	+3 dB	+3 dB
Rating Level, $L_{Ar(T)}$	18 dB	18 dB	27 dB	27 dB
Excess of rating over background level	-9 dB	+0 dB	+0 dB	+9 dB

At the existing receiver the plant rating noise level could result in no impact during the day and night, when assessed to BS4142.

At the proposed receiver, the plant rating noise level could be of an no impact during the day and could have an adverse impact during the night, when assessed to BS4142.

The context of the site must also be considered.

7.2. Context

With regard to context, British Standard 4142:2014 states:

"Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following".

7.2.1. Absolute Levels

> *"1) Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night. Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse."*

With regard to 'absolute levels', the most relevant guidance is British Standard 8233:2014. Section 7.7.2 Table 4 of the British Standard provides internal ambient noise levels for dwellings from noise sources 'without a specific character' and are based on existing guidelines issued by the World Health Organisation in 1999. We would advise the rating level is considered to allow for the character of the source. Internally to a dwelling during the night, the internal ambient noise levels should not exceed 30 dB $L_{Aeq(16hr)}$.

The internal level is approximately 15 dB quieter than the external free-field level (as stated by the BS8233:2014 and WHO 1999) allowing for the attenuation of a partially open window.

Therefore, based on the external rating noise level noted above, the internal absolute level for the worst-case proposed NSR (bedroom 19) during the night is as follows.

Table 9: Assessment of night-time impact against BS8233/WHO Internal Noise Criteria

Predicted External Rating Level, dB $L_{Ar,T}$	Open Window Correction, dB(A)	Predicted Internal Level, dB(A)	Within Criteria?
27	-15	12	Yes

As can be seen from the table above, the internal noise level (with character) of the worst-case proposed NSR is within the British Standard 8233:2014 equivalent noise level criteria for night-time rooms. We would therefore consider plant noise to be of low impact when absolute levels are considered.

7.3. Summary of Assessment

At both existing and proposed NSRs, with suitable mitigation measures implemented and context considered, we would consider the noise impact of the proposed ASHP to fall within the Low Observed Adverse Effect Level (LOAEL) of the NPPG and NPSE.

Plant noise from the proposals may be noticeable but would not cause a change in behaviour or attitude and achieves the aims of the National Planning Policy Framework (NPPF).

8. Summary & Conclusions

TESN Projects LTD appointed Acoustic Consultants Limited to undertake a noise impact assessment for the proposed Air Source Heat Pump (ASHP) associated with the residential proposals at Mavern House care home.

The noise impact assessment is based on the results of an on-site noise survey and noise level predictions using the provided plant data.

A noise impact assessment has been undertaken in accordance with the guidance in the National Planning Policy Framework (NPPF), Noise Policy Statement for England (NPSE), National Planning Practice Guidance (NPPG) and British Standard 4142:2014 (BS4142).

With suitable noise mitigation measures implemented, the predicted noise level of plant is considered acceptable and of a low impact in terms of BS4142 at both the existing and proposed noise sensitive receptors. Plant noise from the proposals would not cause a change in behaviour or attitude at the existing NSRs and achieves the aims of the National Planning Policy Framework (NPPF).

9. Appendix 1 – Glossary of Acoustic Terminology

A-weighted sound pressure pA – value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network.

A-weighted sound pressure level, L_{pA} - quantity of A-weighted sound pressure given by the following formula in decibels (dBA)

$L_{pA} = 10 \log_{10} (p_A/p_0)^2$

where:

p_A is the A-weighted sound pressure in pascals (Pa);
p_0 is the reference sound pressure (20 µPa)

Background sound level, $L_{A90,T}$– A-weighted sound pressure level that is exceeded by the residual sound assessment location for 90% of a given time interval, T, measured using weighting F and quoted to the nearest whole number of decibels

Break-in - noise transmission into a structure from outside.

Decibel (dB) – The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithms are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ – value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, T = t2 – t1, has the same mean-squared sound pressure as a sound that varies with time, and is given by the following equation:

$$L_{AeqT} = 10\lg_{10}\left\{(1/T)\int_{t1}^{t2}[p_A(t)^2/p_0^2]dt\right\} \quad (1)$$

where:

p_0 is the reference sound pressure (20 µPa); and
$p_A(t)$ is the instantaneous A-weighted sound pressure (Pa) at time t

NOTE The equivalent continuous A-weighted sound pressure level is quoted to the nearest whole number of decibels.

Facade level – sound pressure level 1 m in front of the façade. Facade level measurements of L_{pA} are typically 1 dB to 3 dB higher than corresponding free-field measurements because of the reflection from the facade.

Free-field level – sound pressure level away from reflecting surfaces. Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source).

Octave and Third Octave Bands – The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequencies than to low frequencies within the range. There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band lower. For example, two adjacent octave bands are 250 Hz and 500 Hz. Third octave bands provide a fine resolution by dividing each octave band into three bands. For example, third octave bands would be 160 Hz, 250 Hz, 315 Hz for the same 250 Hz octave band.

Sound pressure level – Sound pressure level is stated on many of the charts. It is the amplitude of the acoustic pressure fluctuations in a sound wave, fundamentally measured in Pascals (Pa), typically from 20 micro-Pascals to 100 Pascals, but commonly simplified onto the decibel scale.

Sound reduction index, R – laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.

Specific sound level, $L_s = L_{Aeq,Tr}$ – equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r.

Structure-borne noise – audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements.

Rating level, $L_{Ar,Tr}$ – Specific sound level plus any adjustment for the characteristic features of the sound.

Reverberation Time, T – The reverberation time is defined as the time taken for a noise level in an enclosed space to decay by 60 dB from a steady level once the noise source has stopped. It is measured in seconds. Often a 60 dB decay cannot be measured so the reverberation time is measured over a lesser range and corrected back to the time for a 60 dB drop assuming a constant decay rate. Common parameters are T20 (time taken for a 20 dB decay multiplied by three) and T30 (time taken for a 30 dB decay multiplied by two).

Vibration Dose Value, VDV – measure of the total vibration experienced over a specified period of time.

Estimated Vibration Dose Value, eVDV – estimation of the total vibration experienced over a specified period of time. This is usually based on the number of events and shortened measurement data.

Weighted sound reduction index, R_w – Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. The weighted sound reduction index is used to characterize the insulation of a material or product that has been measured in a laboratory (see BS EN ISO 717-1).



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