

Proposed residential Care Home development at

Central Avenue
Gravesend, DA12 5AW

Noise Assessment & Noise Management Plan

Report prepared on behalf of:

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and
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Limit of liability

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Chapter 1 - Introduction

Planning consent has been granted for a residential care home on the site of the former Ascott Arms, Central Avenue, Gravesend. The location of the site is shown in Figure 1A, while drawings of the development are provided in Figures 2A to 2H.

Planning Condition 15 of the consent requires “a comprehensive Noise Management Plan covering all potential noise from the new developments and its residents and how it will be controlled on an ongoing basis”.

The only significant noise sources at the development will be fixed plant consisting of:

- a mechanical ventilation system for the kitchen with a fresh air supply intake at second floor level on the western elevation of the building and an extraction termination above roof level near the western end of the building;
- a mechanical ventilation system for the laundry with a fresh air supply intake at first floor level on the western elevation of the building and an extraction termination above roof level near the western end of the building;
- a combined heat and power (CHP) unit installed internally within the plant room with the exhaust terminating within a roof well towards the western end of the roof; and
- a VRF condenser in an enclosure just to the north-west of the north-western corner of the building, to the east of and adjoining the refuse store.

The kitchen and laundry ventilation systems are expected to operate when necessary between the 08.00 and 18.00 hours only, but will not operate continuously at full load throughout this period.

The CHP unit VRF condensers will potentially operate at any time during the day and night, but will not operate continuously at full load throughout these periods.

There is no potential for noise from future residents to affect nearby residential accommodation. There may be limited potential for vehicles entering and leaving the site to generate low levels of noise at nearby residences, but any potential impacts are expected to be insignificant in the context of existing levels of road traffic prevailing in the locality.

Overall, levels of noise arising from residents and vehicle movements associated with the care home development are expected to be lower than was the case when the site was in use as a public house.

A plant noise impact assessment has therefore been undertaken on the basis of:

- a background noise monitoring exercise undertaken at the development site;
- a noise prediction exercise using a noise model; and
- an assessment using appropriate national guidance documents including BS4142: 2014.

A new substation is also required at the site, to replace a previously existing substation near the north-western corner of the site. The new substation is installed in an enclosure, so will give rise to lower noise levels than the old substation, which was not enclosed. There is therefore no potential for adverse noise impacts to arise due to the introduction of the new substation.

Chapter 2 – Noise assessment criteria

A glossary of acoustical terms is reproduced in Appendix B.

The assessment has been undertaken using the guidance provided by:

- National Planning Policy Framework (NPPF) (Ref 1);
- Noise Policy Statement for England (NPSE) (Ref 2);
- BS4142: 2014+A1:2019 ‘Guidance on sound insulation and noise reduction for buildings’ (Ref 3)
- BS8233: 2014 ‘Guidance on sound insulation and noise reduction for buildings’ (Ref 4); and
- Planning Practice Guidance on Noise provided on the UK Government website (Ref 5).

These reference documents and standards are discussed below.

2.1 National Planning Policy Framework

The current edition of the National Planning Policy Framework was published on 20 July 2021 and supersedes previous editions of the including the original that was issued in March 2012.

Paragraph 1 of the document states:

“The National Planning Policy Framework sets out the Government’s planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced.”

Paragraph 7 of the document states:

“The purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. At a similarly high level, members of the United Nations – including the United Kingdom – have agreed to pursue the 17 Global Goals for Sustainable Development in the period to 2030. These address social progress, economic well-being and environmental protection.”

Three overarching objectives of the planning system are identified, an economic objective, a social objective and an environmental objective.

Paragraph 10 of the document states:

“So that sustainable development is pursued in a positive way, at the heart of the Framework is a presumption in favour of sustainable development (paragraph 11).”

As is to be expected, much of the document deals with strategic planning issues such as:

- achieving sustainable development;
- delivering a sufficient supply of homes;
- building a strong, competitive economy;
- ensuring the vitality of town centres;
- promoting healthy and safe communities;
- promoting sustainable transport;
- supporting high quality communications;
- making effective use of land;
- achieving well-designed places;
- protecting Green Belt land;
- meeting the challenge of climate change, flooding and coastal change;
- conserving and enhancing the natural environment
- conserving and enhancing the historic environment; and
- facilitating the sustainable use of minerals.

Specific references to noise are limited, but occur in:

- paragraph 174, which states:
“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”;
- paragraph 185, which 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 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”;
- paragraph 210, which states:
“Planning policies should:
g) when developing noise limits, recognise that some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extraction”; and
- paragraph 211, which states:
“When determining planning applications, great weight should be given to the benefits of mineral extraction, including to the economy. In considering proposals for mineral extraction, minerals planning authorities should:
c) ensure that any unavoidable noise, dust and particle emissions and any blasting vibrations are controlled, mitigated or removed at source, and establish appropriate noise limits for extraction in proximity to noise sensitive properties”.

Additionally, the document refers to the Explanatory Note to the Noise Policy Statement for England.

2.2 Noise Policy Statement for England

The Noise Policy Statement for England was published by the Department for Environment, Food and Rural Affairs (Defra) in March 2010. The complete document includes the Policy Statement itself and an Explanatory Note.

Key concepts used in the NPSE are:

- NOEL or “no observed effect”, meaning the level (of noise) below which no effect on health or quality of life can be detected;
- LOAEL or “lowest observed adverse effect”, meaning the level (of noise) above which adverse effects on health and quality of life can be detected; and
- SOAEL or “significant observed adverse effect”, meaning the level (of noise) above which significant adverse effects on health and quality of life can occur.

The first aim of the NPSE is to: “Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of the policy on sustainable development”.

The second aim of the NPSE is to: “Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of the policy on sustainable development”.

The third aim of the NPSE is to: “Where possible, contribute to the improvement of health and quality of life through the effective management of environmental, neighbour and neighbourhood noise within the context of the policy on sustainable development”.

The second aim refers to the situation lies somewhere between LOAEL and SOAEL.

However, paragraph 2.3 of the Explanatory Note makes it clear that the approach to the minimisation of noise from environmental and related sources should be reasonable and balanced in stating:

- “2.3 Furthermore, the broad aim of noise management has been to separate noise sources from sensitive noise receivers and to “minimise” noise. Of course, taken in isolation and to a literal extreme, noise minimisation would mean no noise at all. In reality, although it has not always been stated, the aim has tended to be to minimise noise “as far as reasonably practical”. This concept can be found in the Environmental Protection Act 1990, where, in some circumstances, there is a defence of “best practicable means” in summary statutory nuisance proceedings.

2.3 BS 4142:2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’

Noise arising from permanent industrial or commercial sources is normally assessed using BS4142: 2014 ‘Methods for rating and assessing industrial and commercial sound’. BS 4142:2014 was published on 31 October 2014 and superseded the 1997 edition. A1:2019 was added on 30 Jun 2019.

This assessment methodology is based on a comparison being made between the noise level due to the noise industrial or commercial noise source(s) concerned and the prevailing background sound level in

the absence of the specific noise source(s) being considered. If necessary the measured or predicted L_{Aeq} for industrial noise source(s) concerned is initially corrected for percentage on-times and for significant tonal and / or impulsive components, yielding a 'rating level'.

Chapter 11 of the document, which sets out the assessment methodology, is prefaced with the following text:

“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. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs / will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.”

The document then recommends the following initial assessment methodology:

“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.

“NOTE 1 More than one assessment might be appropriate.

“a) Typically, the greater this difference, the greater the magnitude of the impact.

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

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

“d) 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.

“NOTE 2 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.”

In cases where the initial estimate of the impact should be modified due to the context the following procedure is recommended:

“1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.

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.

“2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and /or commercial nature is likely to be perceived and how people react to it.

“NOTE 3 Consideration ought to be given to evidence on human response to sound and, in particular, industrial and /or commercial sound where it is available. A number of studies are listed in the “Effects on humans of industrial and commercial sound” portion of the “Further reading” list in the Bibliography.

3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and /or outdoor acoustic conditions, such as:

- i) facade insulation treatment;
- ii) ventilation and /or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and
- iii) acoustic screening.”

2.4 BS8233: 2014 ‘Guidance on sound insulation and noise reduction for buildings’

BS8233: 2014: ‘Guidance on sound insulation and noise reduction for buildings’ provides guidance on indoor ambient noise levels for dwellings which are applicable in this case and which are set out in Table 4 of the document. These are set out below.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq,16h	-
Dining	Dining room / area	40 dB LAeq,16h	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16h	30 dB LAeq,16h

A note to this table states:

“NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.”

Applying this 5 dB relaxation yields internal noise levels as set out below.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	40 dB LAeq,16h	-
Dining	Dining room / area	45 dB LAeq,16h	-

Sleeping (daytime resting)	Bedroom	40 dB LAeq,16h	35 dB LAeq,16h
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The 1999 edition of the document also included an internal maximum noise level standard for bedrooms at night, although this does not appear in the current version. In accordance with World Health Organisation (WHO) guidance (which is still current), the 1999 edition recommended that an internal noise level of 45 dB LA_{max} should be exceeded no more than approximately 10 to 15 times per night in bedrooms.

In respect of noise levels in garden areas BS8233: 2014 states:

“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.”

Paragraph 6.2.2 of the document also states that for moderate and heavy traffic flows a 16-hour LAeq noise level can be derived from an 18-hour LA₁₀ level by subtracting 2 dB. This conversion factor was previously provided in Planning Policy Guidance note 24 ‘Planning and Noise’ (PPG24).

2.5 Planning Practice Guidance on Noise provided on the UK Government website

This guidance includes the following assessment table for environmental noise:

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a 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, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is	Observed Adverse Effect	mitigate and reduce to a minimum

	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 small actual or perceived change in the quality of life.		
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, 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. 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.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and /or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation /awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Paragraph: 005 Reference ID: 30-005-20190722 Revision date: 22 07 2019

Available at: <https://www.gov.uk/guidance/noise--2>

2.7 Requirements of the local planning authority

The requirements of the local planning authority, Gravesham Borough Council, are set out in Planning Condition 15 discussed above.

Chapter 3 – Noise monitoring exercise and derivation of reference noise levels

Background noise monitoring was undertaken at two positions identified in Figure 1 as:

- MP-AR – a position on Ascot Road, just to the north of the development site at a height of approximately 4.0 metres above local ground level; and
- MP-AC – a position within the development site, close to the site's western boundary at a height of approximately 4.0 metres above local ground level.

Monitoring was undertaken at MP-AR between 17.16 hours on Friday 8 November and 09.00 hours on Saturday 9 November 2024. Due to concerns regarding battery life, monitoring at MP-AC was undertaken for reduces period between 19.53 hours on Friday 8 November and 08.38 hours on Saturday 9 November 2024.

The only significant background noise source at these locations was distant road traffic.

Type 1 precision, integrating equipment that carries current calibration certification was used at both monitoring positions, data being logged in terms of broadband dB LAeq, dB LA10, dB LA90 and dB LAmax and 1/3 octave dB LAeq.

Full details of the noise monitoring exercise and the results obtained are provided in:

- Appendix C, which includes the results obtained at MP-AR; and
- Appendix D, which includes the results obtained at MP-AC.

Weather conditions were good throughout the noise monitoring periods. Field calibration checks were all found to be satisfactory. The results obtained may therefore be taken to be fully representative.

Noise monitoring results obtained at MP-AR

When rounded to the nearest whole dB, daytime background noise levels for the purposes of the BS4142 assessment at MP-AR were found to be:

- 35 dB LA90,1h during the evening period 18.00 to 19.00 hours;
- 34 dB LA90,1h during the evening period 19.00 to 20.00 hours;
- 31 dB LA90,1h during the evening period 20.00 to 21.00 hours;
- 30 dB LA90,1h during the evening period 21.00 to 22.00 hours;
- 28 dB LA90,1h during the evening period 22.00 to 23.00 hours;
- 30 dB LA90,1h during the morning period 07.00 to 08.00 hours; and
- 34 dB LA90,1h during the morning period 08.00 to 09.00 hours.

The worst-case representative background noise level for the times when the kitchen and laundry ventilation systems will be operating has therefore been taken to be 34 dB LA90,1h.

When rounded to the nearest whole dB, worst-case representative night-time background noise level has been taken to be 28 dB LA90,1h. The derivation of this figure is provided in Appendix C.

These background noise levels have been taken to be representative of the nearby existing residential accommodation on the northern side of the eastern end of Ascot Road.

Noise monitoring results obtained at MP-AC

When rounded to the nearest whole dB, daytime background noise levels for the purposes of the BS4142 assessment at MP-AC were found to be:

- 36 dB LA90,1h during the evening period 20.00 to 21.00 hours;
- 36 dB LA90,1h during the evening period 21.00 to 22.00 hours;
- 34 dB LA90,1h during the evening period 22.00 to 23.00 hours; and
- 36 dB LA90,1h during the morning period 07.00 to 08.00 hours.

These background noise levels are all approximately 6 dB higher than the background noise levels recorded for the same periods at MP-AR.

The worst-case representative background noise level for the times when the kitchen and laundry ventilation systems will be operating has therefore been taken to be the representative background level applying at MP-AR, which is 34 dB LA90,1h and adding 6 dB, which equates to 40 dB LA90,1h.

When rounded to the nearest whole dB, worst-case representative night-time background noise level has been taken to be 33 dB LA90,1h. The derivation of this figure is provided in Appendix C.

These background noise levels have been taken to be representative of the nearby existing residential accommodation on the eastern side of Aintree Close and on the northern side of Ascot Road opposite Aintree Close.

Chapter 4 – Predicted plant noise levels at nearby sensitive receptors

4.1 Details of proposed items of plant

The kitchen ventilation system consists of:

- a Systemair Prio 400 EC 3~ supply fan with an Allaway Acoustics ATT117 attenuator on the atmospheric side; and
- a Systemair Prio 400 EC 3~ extract fan with a Allaway Acoustics ATT205 attenuator on the atmospheric side.

Details of these fans and attenuators are provided in Appendix D.

The laundry ventilation system consists of:

- a Systemair Prio 315 EC supply fan with an Allaway Acoustics ATT115 attenuator on the atmospheric side; and
- a Systemair Prio 315 EC extract fan with no attenuator on the atmospheric side.

Details of these fans and attenuators are provided in Appendix E.

As discussed above, the kitchen and laundry ventilation systems are expected to operate when necessary between the 08.00 and 18.00 hours only, but will not operate continuously at full load throughout this period.

The CHP unit will be an EC Power XRG120.

Details of this item is provided in Appendix F.

The VRF condenser will be a Mitsubishi Electric PURY-P350YNW-A2.

Details of this item is provided in Appendix G.

The VRF condenser will be installed in a hit-and-miss enclosure having a height of 2.4 metres.

The CHP unit VRF condensers will potentially operate at any time during the day and night, but will not operate continuously at full load throughout these periods.

4.2 Predicted plant noise levels

Free-field noise levels at the nearby sensitive receptors around the development site have been predicted by means of a noise model. The topography of the noise model, including existing buildings has been taken from DEFRA and Ordnance Survey digital mapping.

Absolute worst-case predicted daytime plant noise levels with all items of plant operating on full load are shown in:

- Figure 3A, which shows predicted daytime noise levels at the height of persons seated in the external areas in the vicinity of the site;

- Figure 3B, which shows predicted daytime noise levels for the ground floor window heads in the vicinity of the site;
- Figure 3C, which shows predicted daytime noise levels for the first floor window heads in the vicinity of the site.

These noise contours include noise from the kitchen and laundry ventilation systems, so are expected to apply between 08.00 and 18.00 hours only.

Absolute worst-case predicted night-time plant noise levels are shown in:

- Figure 4A, which shows predicted night-time noise levels for the ground floor window heads in the vicinity of the site; and
- Figure 4B, which shows predicted night-time noise levels for the first floor window heads in the vicinity of the site.

From Figures 3A to 3C it can be seen that when rounded to the nearest whole dB absolute worst-case plant noise levels are predicted not to exceed:

- 25 dB LAeq,1h during the day in a rear garden to the north of the site;
- 30 dB LAeq,1h during the day in a rear garden to the west of the site;
- 26 dB LAeq,1h during the day at the location of a sensitive window to the north-east of the site;
- 28 dB LAeq,1h during the day at the location of a sensitive window to the north of the site; and
- 33 dB LAeq,1h during the day at the location of a sensitive window to the west of the site.

From Figures 4A & 4B it can be seen that when rounded to the nearest whole dB absolute worst-case plant noise levels are predicted not to exceed:

- 26 dB LAeq, 15m at night at the location of a sensitive window to the north-east of the site;
- 28 dB LAeq, 15m at night at the location of a sensitive window to the north of the site;
- 32 dB LAeq,15m at night at the location of a sensitive window to the west of the site.

Chapter 5 – Assessment

5.1 Assessment – BS4142: 2014

Noise from the proposed fixed plant is expected to be mildly tonal in nature, so it is appropriate to add a BS4142 rating correction of 2 dB to the above predicted noise levels. No other characteristics requiring the application of additional BS4142 corrections are expected.

Absolute worst-case BS4142 rating noise levels will therefore not exceed:

- 25 plus 2 = 27 dB LAeq,1h during the day in an off-site rear garden to the north of the site, which is 7 dB below the daytime background noise level of 34 dB LA90,1h representative of this location;
- 30 plus 2 = 32 dB LAeq,1h during the day in an off-site rear garden to the west of the site, which is 8 dB below the daytime background noise level of 40 dB LA90,1h representative of this location;
- 26 plus 2 = 28 dB LAeq,1h during the day at the location of a sensitive window to the north-east of the site, which is 6 dB below the daytime background noise level of 34 dB LA90,1h representative of this location;
- 28 plus 2 = 30 dB LAeq,1h during the day at the location of a sensitive window to the north of the site, which is 10 dB below the daytime background noise level of 40 dB LA90,1h representative of this location;
- 33 plus 2 = 35 dB LAeq,1h during the day at the location of a sensitive window to the west of the site, which is 5 dB below the daytime background noise level of 40 dB LA90,1h representative of this location.
- 26 plus 2 = 28 dB LAeq,15m at night at the location of a sensitive window to the north-east of the site, which is equal to the night-time background noise level of 28 dB LA90,15m representative of this location;
- 28 plus 2 = 30 dB LAeq,15m at night at the location of a sensitive window to the north of the site, which is 5 dB below the night-time background noise level of 35 dB LA90,15m representative of this location; and
- 32 plus 2 = 34 dB LAeq,15m at night at the location of a sensitive window to the west of the site, which is 1 dB below the night-time background noise level of 35 dB LA90,15m representative of this location.

In all cases, therefore, the predicted BS4142 plant rating noise levels are below or equal to the relevant background noise level.

BS4142: 2014 considers that a rating noise level that 5 dB above background is likely to be an indication of an adverse impact, depending on the context. A worst-case rating noise level that is equal to the background noise level is therefore 5 dB below the level that is likely to be an indication of an adverse impact, depending on the context. There is nothing in the context in this case to suggest that this impact will not be acceptable, meaning that the absolute worst-case predicted plant noise levels are all satisfactory when assessed using BS4142: 2014.

5.2 Assessment – BS8233: 2014

The predicted noise levels in rear gardens are well below the external noise level limits recommended by BS8233: 2014. Additionally, given the benign noise spectra expected to arise from the proposed items of plant, this level of noise is expected to be inaudible above noise from background sources, and is not expected to cause any disturbance to the occupants of the nearby rear gardens.

The worst-case daytime external plant noise level of 33 dB LAeq,t equates to an internal noise level of 33 minus 13 = 20 dB LAeq,t in the absolute worst case. This is 15 dB below the internal noise limit recommended in Table 4 of BS8233: 2014 for living rooms and bedrooms during the day.

The worst-case night-time external plant noise level of 32 dB LAeq,t equates to an internal noise level of 32 minus 13 = 19 dB LAeq,t in the absolute worst case. This is 11 dB below the internal noise limit recommended in Table 4 of BS8233: 2014 for bedrooms at night.

Again, given the benign noise spectra expected to arise from the proposed items of plant, this level of noise is expected to be inaudible above noise from background sources, and is not expected to cause any disturbance to the occupants of the nearby residential properties.

This situation is expected to be satisfactory.

5.3 Assessment using Planning Practice Guidance on Noise – Existing development

When assessed using this guidance, plant noise is expected to be generally “Not present” in the nearby residential accommodation and gardens.

Chapter 6 – Conclusions and recommendations

It has been demonstrated that with the proposed items of fixed plant, attenuators and hours of operation as specified in Chapter 4 and the associated Appendices D, E, F & G, noise levels at all nearby sensitive locations will be satisfactory and will not give rise to any adverse noise impacts.

Chapter 7 – Noise Management Plan

The only significant noise sources at the development will be fixed plant consisting of:

- a mechanical ventilation system for the kitchen with a fresh air supply intake at second floor level on the western elevation of the building and an extraction termination above roof level near the western end of the building;
- a mechanical ventilation system for the laundry with a fresh air supply intake at first floor level on the western elevation of the building and an extraction termination above roof level near the western end of the building;
- a combined heat and power (CHP) unit installed internally within the plant room with the exhaust terminating within a roof well towards the western end of the roof; and
- a VRF condenser in an enclosure just to the north-west of the north-western corner of the building, to the east of and adjoining the refuse store.

The kitchen and laundry ventilation systems are expected to operate when necessary between the 08.00 and 18.00 hours only, but will not operate continuously at full load throughout this period.

The CHP unit VRF condensers will potentially operate at any time during the day and night, but will not operate continuously at full load throughout these periods.

The kitchen ventilation system consists of:

- a Systemair Prio 400 EC 3~ supply fan with an Allaway Acoustics ATT117 attenuator on the atmospheric side; and
- a Systemair Prio 400 EC 3~ extract fan with a Allaway Acoustics ATT205 attenuator on the atmospheric side.

Details of these fans and attenuators are provided in Appendix D.

The laundry ventilation system consists of:

- a Systemair Prio 315 EC supply fan with an Allaway Acoustics ATT115 attenuator on the atmospheric side; and
- a Systemair Prio 315 EC extract fan with no attenuator on the atmospheric side.

Details of these fans and attenuators are provided in Appendix E.

As discussed above, the kitchen and laundry ventilation systems are expected to operate when necessary between the 08.00 and 18.00 hours only, but will not operate continuously at full load throughout this period.

The CHP unit will be an EC Power XRG120.

Details of this item is provided in Appendix F.

The VRF condenser will be a Mitsubishi Electric PURY-P350YNW-A2.

Details of this item is provided in Appendix G.

The CHP unit VRF condensers will potentially operate at any time during the day and night, but will not operate continuously at full load throughout these periods.

All of the above items will be maintained in accordance with manufacturers' recommendations. If it becomes necessary to replace any of the above items in the future they will be replaced by similar items that will have no potential to give rise to increased noise emissions.

The VRF condenser will be installed in a hit-and-miss enclosure having a height of 2.4 metres. The VRF enclosure will be inspected visually every six months and repaired if necessary to ensure that it remains fully functional.

References

- 1 National Planning Policy Framework; Department for Communities and Local Government; 2012
- 2 Noise Policy Statement for England; Department for Environment, Food and Rural Affairs; 2010
- 3 BS4142: 2014+A1: 2019 'Methods for rating and assessing industrial and commercial sound'; BSI
- 4 BS8233: 2014 'Guidance on sound insulation and noise reduction for buildings'; BSI
- 5 Planning Practice Guidance provided on the UK Government website:
<https://www.gov.uk/guidance/noise--2>

Figure 1

Site location plan