

Retrospective Plant Noise Impact Assessment Report

Franklands Village Store, RH16 3RA

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EXECUTIVE SUMMARY

ES Acoustics Ltd have been commissioned by Franklands Village Stores Ltd to undertake an environmental noise survey and prepare a retrospective plant noise impact assessment for 5 No. installed chiller units serving the Franklands Village Store, RH16 3RA.

An environmental noise survey has been undertaken to establish background sound levels representative of the closest noise sensitive receptor locations relative to the plant location.

A plant noise survey has been undertaken to measure the existing plant noise emissions at the position of the existing plant installation location.

Noise criteria for the existing units have been based on the guidance of BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*', and informed by the findings of the noise survey, alongside consultation of additional relevant planning policy.

As the refrigeration plant remained operational throughout the monitoring period, it was not possible to obtain measurements under fully non-operational conditions. Site observations confirmed that the plant operates on a cyclical basis, with alternating periods of activity and inactivity.

Analysis of the background sound level (L_{A90}) identified periods representative of both plant operation and non-operational conditions. These have been highlighted within the statistical distribution charts in Appendix D and are shown within the table below.

Date/s	Plant Status	Period	Representative Background Noise Level L_{A90} (dB)
28 th -30 th October 2025	Plant Non-Operational	Daytime 07:00-23:00	42
		Night-time 23:00-07:00	32
	Plant Operational	Daytime 07:00-23:00	53
		Night-time 23:00-07:00	53

Based on the analysis above, ESA would therefore consider the representative background noise levels when the plant was non-operational of L_{A90} 42 dB during daytime hours and L_{A90} 32 dB during night-time hours, to ensure a robust assessment is provided.

The measured in-situ noise data of the existing chiller units in operation have been used to calculate expected noise levels at the closest noise sensitive receptor. The calculated rating levels are shown below with comparison to the noise emissions criteria:

Period	Representative Background Noise Level L_{A90} (dB)	Worst-case Specific Level at 1m from Receptor dB $L_{Aeq, Tr}$	Acoustic Feature Corrections dB	Calculated Rating Level at 1m from Receptor Façade dB $L_{Ar, Tr}$	+/- compared against criterion dB
Daytime 07:00-23:00	42	29	3	32	-10
Night-time 23:00-07:00	32	29	3	32	0

As shown in the table above, transmission of noise to the closest sensitive receptor windows due to the effects of the existing external building services plant would not exceed the representative background noise levels during the plant's daytime operational hours, provided the mitigation measures outlined in Section 5.2 are implemented.

In consideration of the relevant context, the level of 32 dB is considered unlikely to result in a significant adverse effect and would not materially alter the existing acoustic environment experienced at the receptor.

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1 INTRODUCTION

ES Acoustics Ltd have been commissioned by Franklands Village Stores Ltd to undertake an environmental noise survey and prepare a retrospective plant noise impact assessment for 5 No. installed air chiller units serving Franklands Village Store, RH16 3RA.

The purpose of this report is to;

- Review relevant national and local planning policy and guidance;
- Undertake an environmental noise survey on site to determine background noise levels at nearby noise sensitive receptor locations;
- Undertake a plant noise survey on site to determine in-situ noise emission levels of the installed plant in operation;
- Set noise emission limits for the installed plant at nearby receptors in accordance with relevant guidance; and
- Undertake a noise impact assessment and, where appropriate, provide outline mitigation advice to ensure the set noise emission limit is met.

2 SITE CONTEXT AND BACKGROUND INFORMATION

2.1 Site Description

Franklands Village Store, RH16 3RA is situated in Haywards Heath, within the jurisdiction of Mid Sussex District Council. The property is bounded by Franklands Village to the east, Reed Pond Walk to the south, and residential properties and gardens to the north and west.

2.2 Plant Installations

The existing installation consists of 5 No. chiller units serving the internal refrigeration units within the store. The plant installation location is adjacent to the west façade of the building, as shown in the figure below.

Based on the installation location of the plant, the closest noise sensitive receptor would be the residential windows on the east façade of the property, 8 Franklands Village, located at a distance of approximately 4 metres, as shown in Figure 1 below.



Figure 1 Existing plant installations and closest noise sensitive receptor location (image ref: Google Maps)

3 RELEVANT PLANNING POLICY AND GUIDANCE

A full review of relevant National Policy and Good Practice Guidance has been undertaken, as outlined in Appendix B. For ease of reference, the following documentation has been reviewed:

- *National Planning Policy Framework (NPPF)*
- *Noise Policy Statement for England (NPSE)*
- *National Planning Practice Guidance (NPPG)*
- *WHO Guidelines for Community Noise (1999)*
- *WHO Environmental Noise Guidelines for European Region (WHO, Regional office for Europe, 2018)*
- *BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'*

The site falls within the jurisdiction of Mid Sussex District Council.

Section 3.2 'Guidelines and Criteria' of The Planning Noise Advice Document Sussex: November 2023, provides the following guidelines for industrial and commercial sound sources:

"3.2.1 The rating level of the industrial or commercial sound source should, where practicable, achieve a level no greater than the representative background sound, when measured in accordance with BS 4142:2014+A1:2019. There may be instances, for specific sites, where a rating level below background is deemed appropriate. This can be determined through discussion with the Local Planning Authority (LPA). A rating level below background may be required if there are concerns for potential noise creep, for example in a High Street setting. It is considered that meeting this criterion would avoid adverse noise impacts, in the interests of ensuring a good standard of amenity and protecting human health. Where these criteria are not attainable, the noise report should explain why, and how best practicable means will be implemented to control noise in order to satisfy the LPA that the development is acceptable. At all times the reports shall have regard to the context. Good Acoustic Design will be a consideration for any mitigation proposals."

As the planning application relates to noise emissions from an existing plant installation, which would be categorised as an industrial/commercial sound source, the assessment will be undertaken in accordance with the methodology outlined in BS 4142:2014+A1:2019, as per the requirements of the Local Authority.

3.1 BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

BS 4142:2014+A1:2019 provides a methodology for rating and assessing the impacts of industrial and commercial sound at noise sensitive receptors. In the context of this report, this guidance would be relevant for any new fixed plant installations that might be installed for the scheme.

The methodology involves comparing the Rating Noise Level due to the sound source/s under assessment with the existing background sound level (L_{A90}) when the noise source is not operating to estimate the initial impact, as follows (Typically, the greater this difference, the greater the magnitude of the impact):

- a) *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context*
- b) *A difference of around +5 dB could be an indication of an adverse impact, depending on the context*
- c) *The lower the rating level is relative to the measured background sound level, the less likely it is that there will be an adverse impact or significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound having a low impact, depending on the context*

The standard notes that a noise source under assessment will have a 'low impact' when the 'rating level' of a noise source is less than the existing background sound. It is also important to note that any quantitative assessment results are assessed considering the context in which the sound occurs.

The standard notes three types of context within Clause 11, which are:

- 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.*
- 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.*

The definitions noted above are described below:

- **Specific sound** – sound source being assessed ($L_s = L_{Aeq, T_r}$)
- **Residual sound** – Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound ($L_r = L_{Aeq, T}$)
- **Ambient sound** – totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far ($L_a = L_{Aeq, T}$)
- **Background level** – sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval ($L_{A90, T}$)
- **Rating level** – specific sound level plus any adjustment for the characteristic features of the sound (L_{Ar, T_r})

With regards to background sound levels, BS 4142:2014+A1:2019 notes:

“In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.”

With regards to the ‘rating level’, the adjustments for the characteristic features of the sound are outlined below:

- **Tonality** – +2 dB for a tone which is ‘just perceptible’ at the noise receptor, +4 dB where it is ‘clearly perceptible’, and +6 dB where it is ‘highly perceptible’
- **Impulsivity** – +3 dB for a tone which is ‘just perceptible’ at the noise receptor, +6 dB where it is ‘clearly perceptible’, and +9 dB where it is ‘highly perceptible’
- **Intermittency** – +3 dB if the intermittency is readily distinctive against the residual acoustic environment
- **Other sound characteristics** – where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.

It must be noted that as the rating level is determined at the closest noise sensitive receptor, the acoustic feature corrections should be applied based on the level at receptor location, not at source. This is particularly relevant when noise propagation characteristics cause differences in sound reduction at various frequency bands.

Note that the assessment reference periods that should be considered for daytime and night-time, as defined within the standard, are:

- **One hour period** for a sound source operating during daytime hours (07:00-23:00 hours)
- **Fifteen-minute period** for a sound source operating during the night-time (23:00-07:00 hours)

3.2 ES Acoustics Notes regarding Context:

The notes presented below are informed by the BS 4142:2014+A1:2019 Technical Note prepared by the Association of Noise Consultant Good Practice Working Group. Assessment context is often misunderstood or applied incorrectly, and the notes are therefore presented to provide a clear picture on what aspects of context should be considered when assessing the overall impact of a particular scenario:

Subclause 11(1)

The second paragraph notes that absolute levels may be as, or more, important than relative outcomes where background and rating levels are low. It is important to note that both background and rating levels would need to be low for this particular caveat to apply.

BS 4142 does not indicate how the initial estimate of impact should be adjusted when background and rating levels are low, only that the absolute levels may be more important than the difference between the two values. It is likely that where the background and rating levels are low, the absolute levels might suggest a more acceptable outcome than would otherwise be suggested by the difference between the values. For example, a situation might be considered acceptable where a rating level of 30 dB is 10 dB above a background sound level of 20 dB, i.e. an initial estimate of a significant adverse impact is modified by the low rating and background sound levels. However, there may be situations where the opposite is true, and it is for the assessor to justify any modifications to the initial estimate of impact.

BS 4142 does not define 'low' in the context of background sound levels nor rating levels. The note to the Scope of the 1997 version of BS 4142 defined very low background sound levels as being less than about 30 dB L_{A90} , and low rating levels as being less than about 35 dB $L_{Ar,Tr}$. We would consider that similar values would not be unreasonable in the context of the current edition of BS 4142.

The third paragraph states that "where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts".

In the ordinary application of BS 4142 the residual sound level is not compared with the background sound level to determine the level of impact. The third paragraph is therefore taken to mean that the level of impact caused by the residual level has been determined by professional judgement or with reference to another document, such as the Noise Insulation Regulations 1975 (as amended 1988). Where professional judgement is used, it should be appropriately justified.

Where the residual sound levels are very high, a significant adverse impact might be declared in a situation where the rating level exceeds the background sound level by, say, 4 dB, i.e. since the residual sound levels are already considered to cause a significant impact, any worsening of the situation would be considered a significant adverse impact, even if the difference between the rating level and background sound level would not suggest this to be the case.

Subclause 11(2)

The second aspect of context described in BS 4142 relates to the character and level of the specific sound. In essence, whether or not the character of the sound is distinguishable from the character of the ambient or residual acoustic environment or is incongruous.

BS 4142 does not provide instruction as to how to treat the assessment outcomes in these circumstances, nor does it explain how to distinguish between this contextual consideration and the process for applying rating penalties. The latter is itself informed by the distinctive characteristics of the specific sound in the context of the residual sound environment.

Where character-based contextual matters are taken into account, the assessor should make it clear how these matters are distinct from those that informed the rating level corrections, and what the implications of these further character assessments should be. For example; new deliveries on an estate entailing rating penalties for reversing alarms and impulsive noise but these types of noise are already present at other existing premises, so contextually the impact is reduced. Conversely, where the residual level is largely comprised of natural sounds, such as the sea or birdsong, so the impact from the specific source might be increased.

Subclause 11(3)

The third contextual matter described in Clause 11 relates to the receptor itself. It is important to note that the reference at the start of this section of BS 4142 to 'the sensitivity of the receptor' refers to a generic receptor type, i.e. a dwelling, and not to the particular attitudes or responses of a particular person (although if the residential receptor type is specific it may have a bearing e.g. student accommodation).

The ANC working group notes that this part of BS 4142 allows the internal noise environment to be considered, despite BS 4142 excluding such matters from its Scope (Subclauses 1.1, 1.2 and 1.3). The working group considers that the consideration of the internal noise environment is only valid in a BS 4142 assessment where it relates to the contextual elements of the assessment.

4 NOISE SURVEYS

4.1 Measurement Location and Procedure

A noise survey was undertaken adjacent to the existing plant installation location and the closest noise sensitive receptor window, as shown in Figure 2 below.



Figure 2 Environmental noise survey position (image ref: Google Maps)

An appraisal of the site during the site visit determined road traffic noise from the adjacent Reed Pond Walk and nearby Franklands Village to be the dominant noise source at the survey and receptor positions.

The measurement procedure complied with ISO 1996-2:2017 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*', with automated monitoring undertaken between 16:00 on 28th October and 16:00 on 30th October 2025.

The key acoustic descriptors measured for this assessment are as follows:

- $L_{Aeq,T}$ (the continuous equivalent A-weighted noise level over a given time period, T); and
- $L_{A90,T}$ (the noise level exceeded for 90% of the measurement period T , referred to as the 'background' noise level).

4.2 Measurement Equipment

The table below presents the equipment used for the baseline noise survey. The equipment calibration was verified before and after use, and no abnormalities were observed.

Equipment	Make and Model	Serial Number
Sound Level Meter	NSRT MK4	ANB0hv2Y2V2XCpNQbyD5tD
Sound Level Meter	Svantek 958 Class 1 Sound Level Meter	97759
Microphone Capsule	PCB 377B02	359419
Microphone Preamplifier	PCB 378B02	179795
Calibrator	Hangzhou Aihua Instruments Co. Ltd AWA 6021A	1008779

Table 1 Noise survey equipment

4.3 Weather Conditions

Weather conditions during the automated monitoring were dry with light winds and therefore suitable for the measurement of environmental noise. Wind speed was measured alongside noise for the duration of the survey.

A summary of the wind speeds is reported in the table below:

Time Period	Average Wind Speed
28 th October Daytime	4 m/s
28 th /29 th October, Night-time	1 m/s
29 th October, Daytime	1 m/s
29 th /30 th October, Night-time	1 m/s
30 th October, Daytime	3 m/s

Table 2 Weather conditions

Data on temperature and precipitation has been sourced from the closest weather station¹ with accessible data.

A summary of the temperature and precipitation data is reported in Table 3.

Description	Installation Date 13/01/2025	Interim Date 14/01/2025	Collection Date 14/01/2025
Average Temperature (°C)	14	14	14
Precipitation (mm)	0	8.7	0.1

Table 3 Temperature and Precipitation data

Analysis of the time history and measurement results show that the levels of wind speed and precipitation have had no impact on the measured results.

¹ Weather Station: St James Park, UK. ID: 03770099999, located 11 km from the site at Latitude 51.5, Longitude -0.117

4.4 Environmental Noise Survey Results

With regards to the background sound level, BS 4142:2014+A1:2019 notes that “...it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.”

It is understood that the installed plant units could run at any time during the day or night.

It should be noted that, due to the operational requirements of the associated convenience store, the installed plant was required to remain intermittently operational throughout the survey period.

Site observations confirmed that the plant operates on a cyclical basis, with extended periods during which one or more units are active, interspersed with discernible intervals of inactivity. This cyclical operation is evident within the L_{Aeq} time-history data presented in Appendix C.

A statistical analysis of the measured background sound level (L_{A90}) identified distinct variations within the time history corresponding to the plant's operational cycle. Specific intervals have been interpreted as representative of:

- Background noise levels during plant non-operational periods, and
- Elevated levels associated with active plant operation.

These representative periods and corresponding peaks have been highlighted within the statistical distribution charts provided in Appendix D.

This approach is consistent with the principles outlined in BS 4142:2014+A1:2019 “Methods for rating and assessing industrial and commercial sound”.

A summary of the relevant measurement results is therefore presented in the table below:

Date/s	Plant Status	Period	Representative Background Noise Level L_{A90} (dB)
28 th -30 th October 2025	Plant Non-Operational	Daytime 07:00-23:00	42
		Night-time 23:00-07:00	32
	Plant Operational	Daytime 07:00-23:00	53
		Night-time 23:00-07:00	53

Table 4 Measured noise levels over the full survey

Based on the analysis above, ESA would therefore consider the representative background noise levels of L_{A90} 42 dB during daytime hours and L_{A90} 32 dB during night-time hours, to ensure a robust assessment is provided.

4.5 Plant Noise Survey Results

Manual noise measurements of the in-situ noise emissions of the plant installations in operation have been undertaken on site and are presented within the table below.

Manual measurements were undertaken for a duration of 1 hour, in order to capture the cyclical operation of the installed units, at a position 1m from the centre of the plant installation location.

The measured results have been corrected for background noise.

Unit	Octave band centre frequency, dB								dB(A)
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
SPL at 1m from plant	62	55	54	48	46	44	40	39	52

Table 5 Measured plant noise levels at 1m

The manual measurements presented above would be expected to accurately represent the operational noise emissions of the existing plant installation, when correlated against the statistical analysis presented in Table 5 above and shown within the attached Appendix D.

5 NOISE IMPACT ASSESSMENT

5.1 Predicted Unmitigated Rating Level at the Closest Receptor Façade

The Specific Sound Level of the installed chiller units have been assessed at the closest noise sensitive receptor (NSR) window.

To establish the Rating Level as required by BS 4142:2014+A1:2019, appropriate acoustic feature corrections should be applied to the Specific Sound Level. It must be noted that the acoustic feature corrections are applied based on the level at the receptor location, not at the source, as they are reflective of the sound perceived by the receptor.

Basic acoustic theory states that when one sound source is 10 dB louder than another, the louder source will mask the quieter sound. Therefore, the Specific Sound Levels calculated at the receptor locations would be considered relative to the background level when applying acoustic feature corrections, i.e. if the Specific Sound Level is sufficiently below the background level, then it would be highly unlikely that acoustic features would be perceptible.

It would be proposed to apply the following acoustic feature corrections, considering the operation of the installed plant:

Acoustic Feature	Description	Correction
Impulsivity	The operational noise emissions of the chiller units would not be considered impulsive, and therefore no correction is applied.	0 dB
Intermittency	The operation of the existing plant installation would be considered intermittent due to the cyclical nature of the plant in operation, therefore a 3 dB correction is applied	3 dB
Tonality	The spectral content of the plant noise emissions at the receptor façade shows that no frequency band exceeds those adjacent, and therefore no correction is applied.	0 dB
Other	No additional acoustic feature corrections would be applied.	0 dB
Total Acoustic Feature Corrections added to Specific Sound Level		3 dB

Table 6 Acoustic feature corrections

Table 7 compares the resultant Rating Level calculated at the receptor against the measured representative background noise level. Full calculations are shown within Appendix E1.

Period	Representative Background Noise Level	Worst-case Specific Level at 1m from Receptor	Acoustic Feature Corrections	Calculated Rating Level at 1m from Receptor Façade	+/- compared against criterion
	L_{A90} (dB)	dB L_{Aeq, Tr}	dB	dB L_{Ar, Tr}	dB
Daytime 07:00-23:00	42	35	3	38	-4
Night-time 23:00-07:00	32	35	3	38	+6

Table 7 Summary of the Rating Level at receptor

As shown in Appendix E1 and the table above, transmission of noise to the closest sensitive receptor windows due to the effects of the installed chiller units would exceed the representative background noise levels by 6 dB during night-time hours, and would therefore not comply with the assessment requirements of Mid Sussex District Council and would therefore be indicative of adverse impact as per the guidance of BS 4142:2014+A1:2019.

It would therefore be recommended to install mitigation measures, as detailed below.

5.2 Mitigation Measures

To further reduce noise emissions from the installed plant to the adjacent receptor window, it is recommended to install an acoustic barrier that fully blocks the line of sight between the plant units and the receptor window.

Given the relative position of the receptor windows to the existing plant installation, the most effective mitigation strategy would be to enhance the existing boundary fence between the plant installation location and the neighbouring residential property. This can be achieved by increasing the height of the existing boundary fence or by installing a dedicated acoustic barrier that provides horizontal line-of-sight screening to the nearest residential windows.

Predictive sound propagation modelling indicates that a barrier height of 2.6 m is required to achieve the desired acoustic attenuation. However, this height may be reduced if the barrier design incorporates an angled or canted upper section to improve acoustic shadowing. For example, if the upper 1 m portion of a 2.6 m long barrier panel were inclined at 45° toward the noise source, partially extending over the plant equipment, the resulting vertical height from ground level to the top of the barrier would be approximately 2.3 m. This layout would provide additional diffraction loss and further obstruct the direct line-of-sight path to the receptor window, thereby improving acoustic performance without a proportional increase in overall barrier height.

Where practicable, the plant should remain positioned as close as possible to the site boundary to maximise the acoustic shadow created by the barrier.

The barrier could be constructed from steel or MDF panels, designed to achieve a minimum surface density of approximately 10–15 kg/m², e.g. 1–2 mm steel (~10–16 kg/m²) or 16–18 mm MDF (~12–14 kg/m²).

The inside should be lined with 25mm Stratocell Whisper absorbing acoustic panels, or similar, to provide effective sound absorption. The absorbing panels should be securely fixed and fully cover the inside face of the panels to maximise acoustic performance, and the panels should be tightly joined to prevent flanking noise transmission.

5.3 Predicted Mitigated Rating Level at the Closest Receptor Façade

Table 8 compares the resultant mitigated Rating Level calculated at the receptor against the measured representative background noise level, following the installation of the above recommended acoustic enclosure. Full calculations are presented in Appendix E2.

Period	Representative Background Noise Level	Worst-case Specific Level at 1m from Receptor	Acoustic Feature Corrections	Calculated Rating Level at 1m from Receptor Façade	+/- compared against criterion
	L _{A90} (dB)	dB L _{Aeq, Tr}	dB	dB L _{Ar, Tr}	dB
Daytime 07:00-23:00	42	29	3	32	-10
Night-time 23:00-07:00	32	29	3	32	0

Table 8 Summary of the Rating Level at receptor

As shown in Appendix E2 and the table above, transmission of noise to the closest sensitive receptor windows due to the effects of the existing external building services plant would not exceed the representative background noise levels during the plant's daytime operational hours.

BS 4142:2014 provides the following advice regarding impact:

“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.”

5.4 Context

BS 4142:2014+A1:2019 requires that any quantitative results are assessed considering the context in which the sound occurs.

As outlined in Section 3.2, the three types of contexts which should be considered are:

- aspects of the absolute level;
- aspects of character; and
- aspects of the receptor, including physical measures designed to reduce noise.

The calculated Rating Level for the installed plant is 32 dB L_{Aeq}, including all relevant BS 4142 feature corrections. The calculated rating level, therefore, does not exceed the prevailing representative background sound levels and would therefore fully comply with the requirements of Mid Sussex District Council. In accordance with the principles of BS 4142:2014+A1:2019, this indicates that the Specific Sound Level is not likely to be perceptible above the existing baseline acoustic environment and therefore would not be regarded as objectively significant in absolute terms. From an absolute perspective, the Specific Sound Level of the plant is 13 dB below and 3 dB below the background noise level during daytime and night-time hours respectively and is therefore unlikely to be clearly discernible against the prevailing climate.

With regard to the acoustic character of the sound source, the context of the surrounding environment must be considered. The assessment location is within a suburban setting, where the dominant and persistent source of background sound is road traffic from adjacent roads. Whilst no other fixed plant

noise sources were identified in the vicinity, the continuous and broadband spectral content of the chiller units is acoustically similar to, and expected to assimilate with, the existing broadband noise contribution from road traffic. On this basis, it is reasonable to conclude that the specific sound will not be subjectively distinguishable in character against the existing ambient noise profile.

World Health Organization guidelines also note that sleep disturbance can occur with a partially open window when external noise levels are in excess of 45dB(A), which is 13 dB higher than the calculated Rating Level.

In terms of the sensitivity of the receptor, it is assumed, as a conservative case, that windows may be open to provide enhanced rates of ventilation during hot summer months. Under such conditions, occupants are exposed to existing ambient noise levels that exceed the predicted contribution of the installed chiller units, ensuring that the additional plant noise would remain acoustically insignificant. With windows closed, the building envelope provides further attenuation, resulting in even lower internal levels. Further calculations demonstrating this are presented within the following Section 5.5

In consideration of the relevant context, the level of 32 dB is considered unlikely to result in a significant adverse effect and would not materially alter the existing acoustic environment experienced at the receptor.

5.5 Further Calculations

BS 8233:2014 provides guidance on recommended internal ambient noise levels in residential spaces based on World Health Organisation (WHO) research (see Appendix B). The guidance notes that a partially open window would provide up to 15 dB attenuation from outside to inside.

Based on the levels calculated above, expected internal noise levels would be as shown in the table below:

Period	BS 8233 Internal Noise Level Recommendation dB(A)	Calculated Rating Level at 1m from Receptor Façade dB L _{Aeq, T}	Min. Attenuation Provided by Partially Open Window dB	Expected Internal Noise Level Within Receptor Property dB(A)
Daytime 07:00-23:00	35	32	-15	17
Night-time 23:00-07:00	30	32	-15	17

Table 9 Summary of expected internal sound level within receptor properties due to installed plant

The expected internal noise levels would be well below the recommended internal ambient noise level guidance of the recognised British Standard, further ensuring the amenity of the closest noise sensitive receptors.

Such a margin indicates a negligible risk of adverse impact, even under conditions with windows partially open. With windows closed, the additional attenuation provided by the building envelope would further reduce internal noise levels to well below the guideline thresholds, reinforcing the conclusion that the impact would not be significant.

5.6 Assessment of Impacts

Considering the calculated Rating Levels compared to the background sound level and the context in which the sound occurs, the existing chiller units would be expected to result in a **low likelihood of adverse impact**, in consideration of the relevant context.

6 CONCLUSION

An environmental noise survey has been undertaken at Franklands Village Store, RH16 3RA to establish background sound levels representative of the closest noise sensitive receptor locations relative to the existing external building services plant installations.

Noise criteria for the existing chiller units have been based on the guidance of BS 4142:2014+A1:2019 *'Methods for rating and assessing industrial and commercial sound'*, and informed by the findings of the noise survey, alongside consultation of additional relevant planning policy.

Measured plant noise data of the installed plant in operation have been undertaken for comparison with the noise guidance.

It has been concluded that noise emissions from the existing external building services plant would be considered as having a **low likelihood of adverse impact**, in consideration of the relevant context, provided the mitigation measures outlined in Section 5.2 are implemented.

GLOSSARY OF ACOUSTIC TERMINOLOGY

Decibel scale - dB

The decibel (dB) is a relative unit of measurement used in acoustics. The dB is a logarithmic ratio between a measured level and a reference level of 0 dB (i.e the threshold of human hearing). Simply put, the decibel compresses the wide range of sounds we hear into more manageable numbers.

Addition of noise from several sources

Sound produced by multiple sound sources are added logarithmically e.g. power ratio of 2 = 3dB, power ratio of 10 = 10dB. Therefore, two equally intense sound sources operating simultaneously produce a sound level which is 3dB higher than a single source e.g. 60dB + 60dB = 63dB.

Subjective impression of noise

Human response to sound is highly individualized and often based on psychological factors such as emotion and expectation. Sensitivity to sound typically depends on the loudness, pitch, duration of the occurrence, and time of occurrence (e.g. a sound source could cause annoyance during the night where it would not during the day). The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level	Change in perceived loudness
1 dB	Imperceptible
3 dB	Just barely perceptible
6 dB	Clearly noticeable
10 dB	About twice as loud

'A' Weighted Frequency Filter - dB(A)

The human ear is not equally sensitive in all frequencies. The A-weighting filter was devised to take this into account when undertaking noise measurements and allows a sound level meter to replicate the human ears response to sound.

$L_{Aeq, T}$

Sound can fluctuate widely over a given period. L_{Aeq} is the A-weighted equivalent continuous sound level, with T denoting the time period over which the fluctuating sound levels were averaged e.g. $L_{Aeq, 16h}$ is the equivalent continuous noise level over an 16 hour period.

L_{A90}

A-weighted sound level exceeded for 90% of the measurement period, calculated via statistical analysis. The L_{A90} descriptor is typically used to establish background sound levels for noise impact assessments

L_{A10}

A-weighted sound level exceeded for 10% of the measurement period, calculated via statistical analysis.

L_{AFmax}

A-weighted sound level maximum sound pressure level that has been measured over a given time period

GLOSSARY OF ACOUSTIC TERMINOLOGY

Octave Bands

The audio or frequency spectrum of the human ear is in the range of 20Hz to 20 kHz. The spectrum tells how the energy of the sound signal is distributed in frequency. Octave bands divides the audio spectrum into 10 equal parts. The International Standards Organisation defines the centre frequency of these bands as 31.5Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1kHz, 2kHz, 4kHz, 8kHz and 16kHz.

Noise Rating (NR) Curves

A method of rating noise using a set of curves relating octave band sound pressure levels. Typically used for building services systems within offices

Airborne sound

Sound radiated from a source into the surrounding air e.g. musical instruments, tv/radio, machinery/equipment. Airborne sound insulation refers to the reduction or attenuation of airborne sound, usually via a solid partition between a source and receiver.

Impact sound

Sound resulting from the impact between colliding objects, e.g. footfall impact upon a floor. Impact sound insulation refers to the resistance of a floor to the transmission of impact sound, typically via the installation of a 'resilient layer'

Flanking sound

The transmission of airborne sound between two adjacent rooms by paths other than via the separating partition between the rooms, e.g. the abutment point of a wall and floor.

Structure-borne noise

Noise caused by the vibration of elements of a structure. This can result in reradiated noise, whereby the vibrating element transmits airborne sound into a space e.g. vibration caused by mechanical plant installed within a plant room which is not adequately isolated from the structure, or construction/demolition work in an adjacent building.

Reverberant sound

Sound in an enclosed space (usually a room), which results from repeated reflections at the boundaries. Reverberation time is the time taken for a steady sound level in an enclosed space to decay by 60dB, measured from the moment the sound source is switched off. A example of a typically reverberant space would be a classic church. Absorptive materials can be used to reduce reflections and reverberation times.

PLANNING POLICY AND RELEVANT ACOUSTIC GUIDANCE REVIEW

1 NATIONAL POLICY

1.1 National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) covers issues relating to noise and planning in England.

The paragraphs relating to noise state:

187. *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*
198. *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; [...]*
200. *Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.*

1.2 Noise Policy Statement for England (NPSE)

The Noise Policy Statement for England (NPSE) was developed by DEFRA and published in March 2010. The long-term vision of the Government noise policy is to '*Promote good health and good quality of life through the effective management of noise within the context of Government policy on sustainable development.*'

The NPSE vision noted above is supported by the following aims:

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;*

PLANNING POLICY AND RELEVANT ACOUSTIC GUIDANCE REVIEW

- 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 outlines observed effect levels relating to the above, as follows:

- *No observed effect level (NOEL): this is the level of noise exposure below which no effect at all on health or quality of life can be detected;*
- *Lowest observed adverse effect level (LOAEL): this is the level of noise exposure above which adverse effects on health and quality of life can be detected;*
- *Significant observed adverse effect level (SOAEL): This is the level of noise exposure above which significant adverse effects on health and quality of life occur;*

Noise effect levels are not set at absolute noise level targets, but instead vary depending on the context and character of the noise and site-specific factors which may impact on the severity of the effect. The NPSE states:

'It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.'

1.3 National Planning Practice Guidance (NPPG)

The NPPG provides practical guidance on how the NPPF should be applied as well as and guidance on the factors influencing whether noise may be a concern at the planning stage and how adverse effects can be mitigated. The table below summarises the effect levels presented within the NPSE, as follows:

Response	Examples of Outcomes	Increasing Effect Level	Action
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, 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
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 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.	Observed Adverse Effect	Mitigate & reduce to a minimum

PLANNING POLICY AND RELEVANT ACOUSTIC GUIDANCE REVIEW

Response	Examples of Outcomes	Increasing Effect Level	Action
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

Table 1 Noise exposure hierarchy

2 BEST PRACTICE AND GUIDANCE

2.1.1 World Health Organization (WHO) Guidelines

WHO Guidelines for Community Noise (1999) provides guideline values for community noise in specific environments. This has since been supplemented by WHO Environmental Noise Guidelines for European Region (WHO, Regional office for Europe, 2018).

The WHO guideline values most relevant to new residential development are outlined in the table below:

Specific Environment	Critical Health Effects	L _{Aeq, T} [dB]	L _{Afmax} [dB]	Time Base
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	n/a	07:00-23:00
	Sleep disturbance night-time	30	45	23:00-07:00
Dwelling, outdoors	Sleep disturbance, window open (outdoor values)	45	60	23:00-07:00
Outdoor living area	Serious annoyance, daytime and evening	55	n/a	07:00-23:00
	Moderate annoyance, daytime and evening	50	n/a	07:00-23:00

Table 2 Guideline Values from WHO Guidelines for Community Noise (1999)

The effects of noise in dwellings are typically sleep disturbance, annoyance and speech interference. For bedrooms the critical effect is sleep disturbance. Indoor guideline values for bedrooms at night are 30dB L_{Aeq} for continuous noise and 45dB L_{Amax} for single sound events, but the guidance also notes that lower noise levels may be disturbing depending on the nature of the noise source.

2.2 BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'

Table 4 of BS 8233:2014 (reproduced below) provides guidance on recommended internal ambient noise levels in residential spaces based on World Health Organization (WHO) research.

APPENDIX B

PLANNING POLICY AND RELEVANT ACOUSTIC GUIDANCE REVIEW

Room	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Living Room	$\leq 35 \text{ dB } L_{Aeq,16hr}$	N/A
Dining Room	$\leq 40 \text{ dB } L_{Aeq,16hr}$	N/A
Bedroom	$\leq 35 \text{ dB } L_{Aeq,16hr}$	$\leq 30 \text{ dB } L_{Aeq,8hr}$

Table 3 BS 8233:2014 indoor ambient noise levels for dwellings

The following notes should be considered alongside the levels presented above:

- The levels presented above are for steady external noise sources without a specific character. Noise is considered to have a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate*
- The levels are based on annual average data and do not have to be achieved in all circumstances e.g. it is normal to exclude occasional events, such as fireworks night or New Year's Eve*
- 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*
- If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level*
- The levels outlined above are not applicable under "purge ventilation" conditions as defined by Approved Document F of the Building Regulations, as this should only occur occasionally e.g. to remove odour from painting or burnt food). However, the levels above should be achieved whilst providing sufficient background ventilation, either via passive or mechanical methods*

It should be noted that the 2014 version of BS 8233:2014 does not include any specific requirement for maximum instantaneous noise levels (L_{max}) within dwellings. However, methodology for the assessment of maximum noise levels is included in ProPG and referenced in WHO guidelines.

Section 7.7.3.2 of BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' presents desirable guideline levels for amenity areas. The section is presented in its entirety below:

"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 $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ 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.

Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these

PLANNING POLICY AND RELEVANT ACOUSTIC GUIDANCE REVIEW

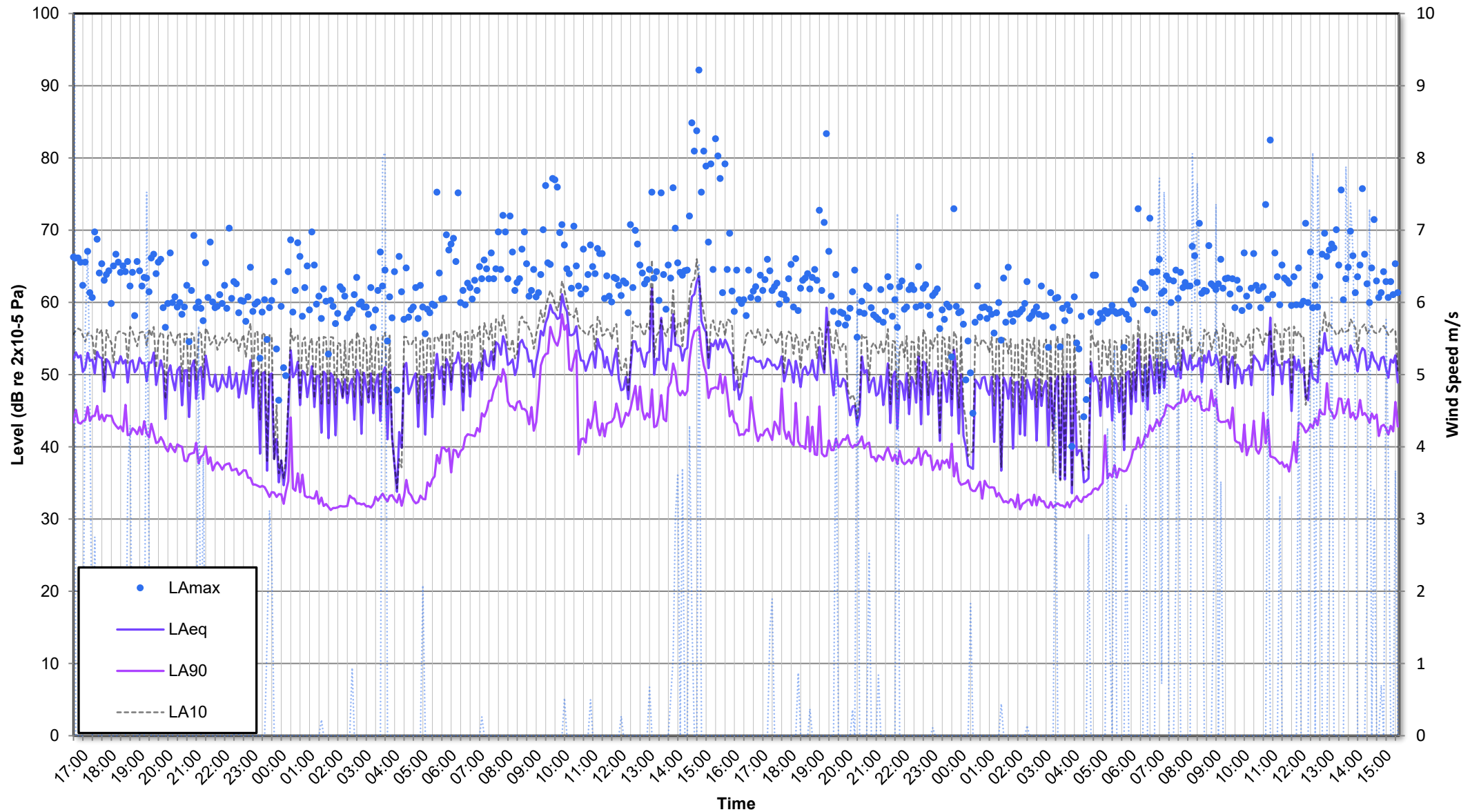
locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space.”

APPENDIX C

ENVIRONMENTAL NOISE TIME HISTORY

22342.PNIA-RPT.01

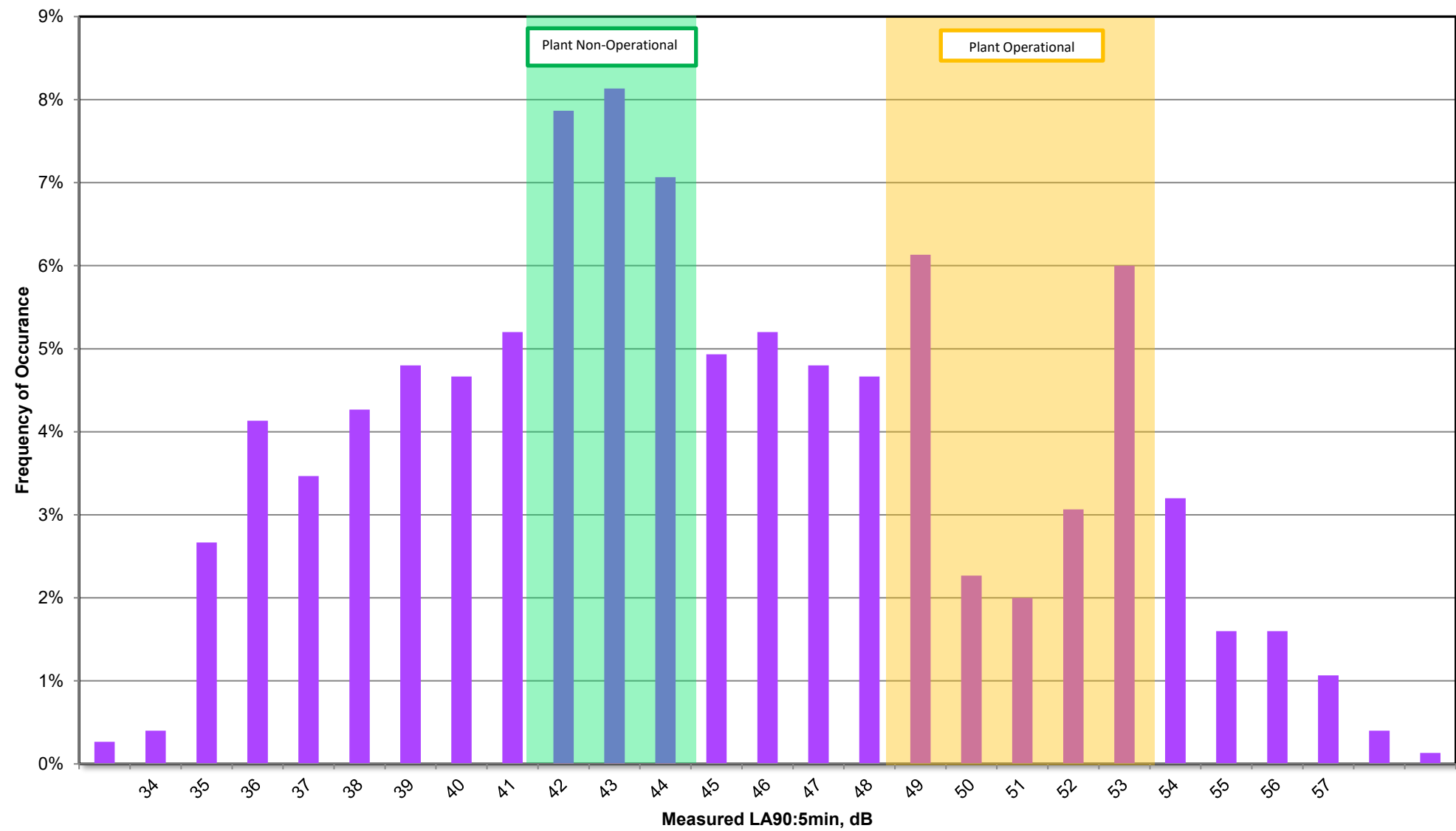
16:00 on 28th October to 16:00 on 30th October 2025



APPENDIX D

BACKGROUND NOISE STATISTICAL DISTRIBUTION CHART

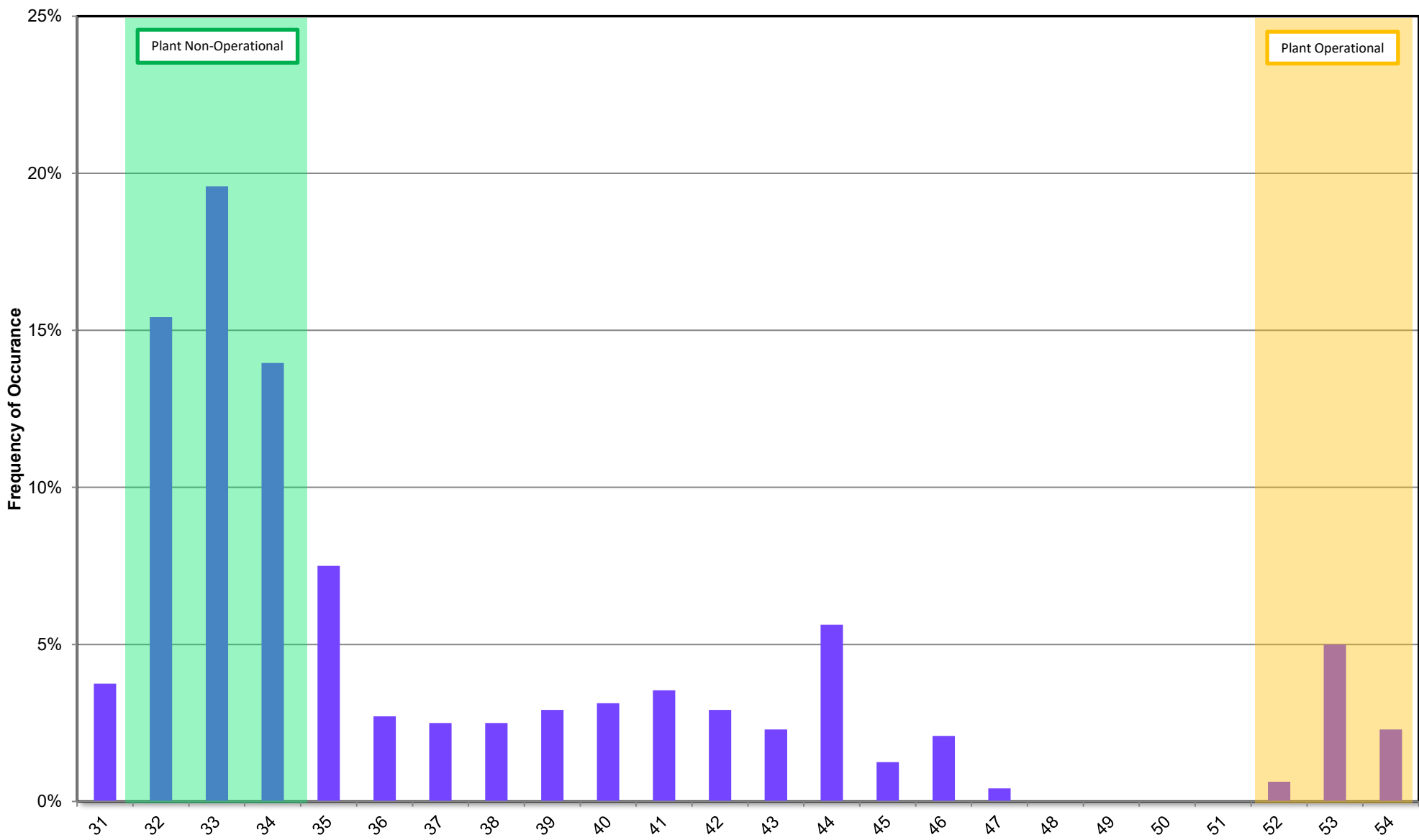
22342.ENIA-RPT.01
Daytime Statistical Distribution of Background Levels
16:00 on 28th October to 16:00 on 30th October 2025



APPENDIX D

BACKGROUND NOISE STATISTICAL DISTRIBUTION CHART

22342.ENIA-RPT.01
Night-time Statistical Distribution of Background Levels
16:00 on 28th Ocotber to 16:00 on 30th October 2025



APPENDIX E1

UNMITIGATED PLANT NOISE EMISSION CALCULATIONS

Source: Installed chiller units at Franklands Village Store				Frequency, Hz								dB(A)
Receiver: Residential windows on east façade of 8 Franklands Village				63	125	250	500	1k	2k	4k	8k	
Installed Chiller Units (Measured Sound Pressure Level)				62	55	54	48	46	44	40	39	52
Minimum attenuation provided by distance (4m), dB				-12	-12	-12	-12	-12	-12	-12	-12	
Minimum attenuation provided by partial screening from existing boundary fence, dB				-5	-5	-5	-5	-5	-5	-5	-5	
Total Specific Noise Level of all units at Receptor Façade, dB				45	38	37	31	29	27	23	22	35
BS4142 Acoustic Feature Corrections												
Impulsivity												0
Intermittency												3
Tonality												0
Total Rating Noise Level at Receptor Façade, dB												38

Daytime Minimum Background Noise Level		35
Night-time Minimum Background Noise Level		31

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