

Acoustic South East

Noise Impact Assessment



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Date Written:	04/09/2026
	Issue 1
ASE Project Ref:	J4239

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1 Summary and Conclusion

Acoustic South East have been appointed to undertake an acoustic assessment to support a planning application for the introduction of two external air conditioning condensers (AC units) at Meadow View House, College Road, Ardingly, RH17 6SA.

The purpose of this assessment is to predict any effects the development could create when considering the existing nearby noise sensitive receptors (NSRs). Noise levels have been measured close to where the proposed plant will be installed.

Noise levels for the day and the night time period have been assessed in terms of the standards and guidelines listed below. Achieving these criteria will result in a good acoustic environment inside/outside the existing NSRs.

- BS4142ⁱ (2014+A12019) Method for rating industrial noise affecting mixed residential and industrial areas
- BS8233ⁱⁱ Sound insulation and noise reduction for buildings 2014
- WHOⁱⁱⁱ Guidelines for community noise 1999

Where necessary noise mitigation measures have been recommended so the adopted criteria can be achieved (low noise AC unit with a night noise mode setting).

It is considered that the planning application should not be refused on noise grounds so long as the mitigation measures are implemented into the detailed design and management plans.

2 Context and Noise Criteria

2.1 Context

2.1.1 Proposed heating system

The occupants of Meadow View House are installing two AC units

It is likely that the units will run during the day and at night, therefore an assessment of both the daytime and nighttime periods has been completed.

2.1.2 Nearby Existing Noise Sensitive Receptors NSRs

The closest NSRs are detailed below along with the survey location and the location of the proposed plant items. The nearby residential buildings have windows on both the ground and first floors facing the proposed units:



Figure 1: NSR/Survey Drawing

2.2 Local Planning Guidance

Several Local Planning Authority ('LPA') departments have collaborated to create the Planning Noise Advice Document Sussex^{iv}. The document details relevant standards that should be referred to when completing a noise impact assessment.

Based upon the local guidance, noise levels for the day and the night time period have been assessed in terms of and following the guidelines of the documents listed below:

- BS4142 (2014) Method for rating industrial noise affecting mixed residential and industrial areas
- BS8233 (Sound insulation and noise reduction for buildings) 2014
- World Health Organisation (WHO) - Guidelines for Community Noise 1999

2.1 BS8233 Noise Criteria

Table 5 of BS8233 provides the following guideline values:

Activity	Location	Time period of day	
		07:00-23:00	23:00-07:00
Resting	Living Rooms	35dB L _{Aeq,16hour}	-
Dining	Dining Room/Area	40dB L _{Aeq,16hour}	-
Sleeping (daytime resting)	Bedroom	35dB L _{Aeq,16hour}	30dB L _{Aeq,8hour}

Table 1: BS8233 Criteria

2.2 WHO Noise Criteria

The target internal levels laid out by the World Health Organisation (WHO) are similar to the BS8233 criteria above. With regard to outdoor amenity areas WHO states the following:

To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB(A) on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 50dB(A) on balconies, terraces and in outdoor living areas.

2.3 BS4142(2014+A1:2019): Method for rating and assessing industrial and commercial sound

This document provides a means of assessing the impact of industrial or commercial sound upon nearby noise-sensitive receptors, including residential properties.

It does this by comparing the Rating Level of the noise from the industrial or commercial source with the pre-existent L₉₀ background noise level affecting the same noise-sensitive premises. The Standard provides guidance that:

- Typically, the greater the difference, the greater the magnitude of the impact.
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact, depending on the context.

2.4 BS4142(2014+A1:2019): Technical Note (V1.0 2020)

For this project the background sound levels at night are very low. It should be noted that the BS4142 assessment may be less accurate when background levels are very low.

A “Technical Note” document has been prepared by members of the Association of Noise Consultants Good Practice Working Group. The note includes a section on low sound levels which would be applicable in this case. The relevant section has been copied below:

Subclause 11(1)

The standard states that the absolute level of sound can be of significance, where the residual values are low and where they are high, and should be taken into account when determining the overall impact of a particular specific sound source.

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 30dB is 10dB above a background sound level of 20dB, i.e. an initial estimate of a significant adverse impact is modified by the low rating and background sound levels.

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 $L_{Ar,Tr}$.

The WG suggest that similar values would not be unreasonable in the context of BS 4142, but that the assessor should make a judgement and justify it where appropriate.

Figure 2: ANC BS4142 Technical Note

3 Noise Survey Baseline Conditions & Results

A noise survey was carried out between the 25th & 30th June 2026 to assess the existing noise levels affecting the nearby noise sensitive receptors.

3.1 Noise Survey Details

- Survey carried out by: Harvey Bennett BSc (Hons)
- Equipment used: Svantek 971 - Type 1 Sound Level Meter (LT1)
- Weather conditions: Mixed with wind speed average mostly under 5m/s.

3.2 Noise Survey Locations

The noise survey locations can be seen on the marked up plan shown in a previous section (what3words://hoops.left.villa).

The microphone was on a tripod on a raised garden bed (2.1m above the ground, 1.6m above the bed platform and around 2.5 from the corner of the boundary fence). The microphone position has assumed to be a “free-field” position

All noise levels in this report will be free-field noise levels unless stated otherwise (including noise model predictions)

3.3 Noise Survey Results

The most commonly occurring (modal) background sound levels ($L_{A90,15min}$) can be seen below:

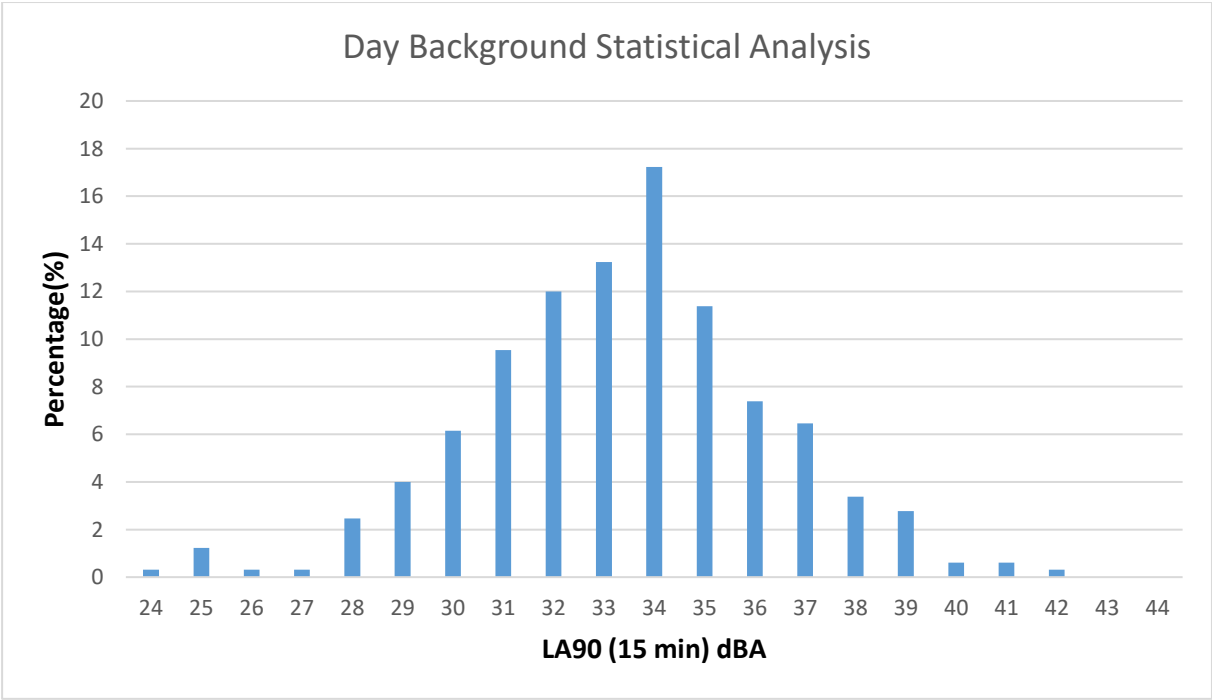


Figure 3: L90 Analysis Daytime

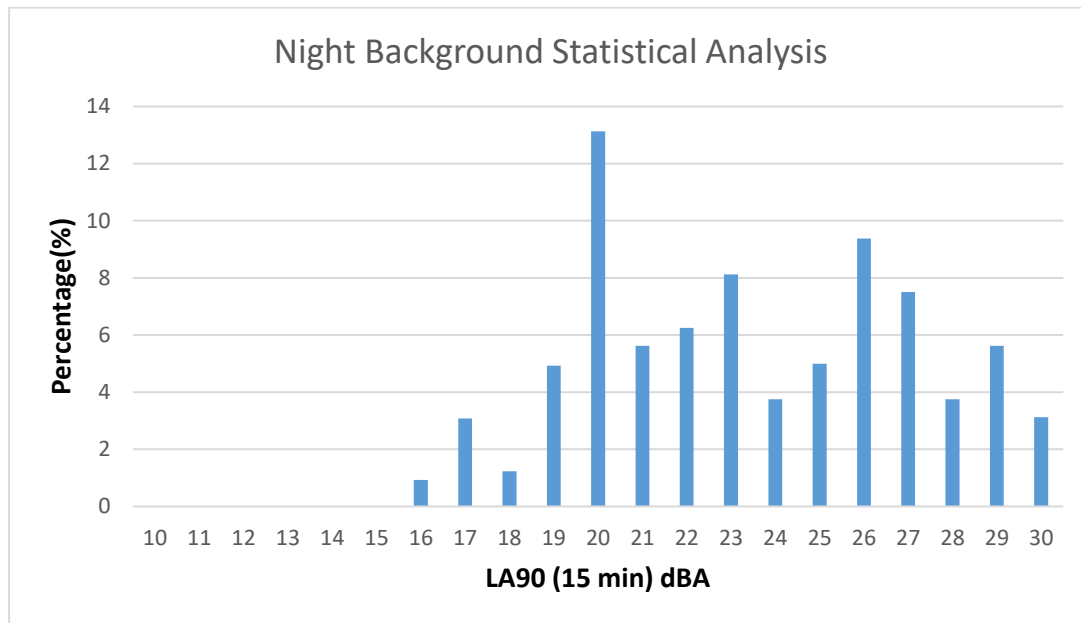


Figure 4: L90 Analysis Night-time

As shown above the measured night time sound levels are very low (10dB below the level that the technical note state as being “Low”)

The BS4142 standard sets no official way for determining the representative background sound level from a full survey dataset. The modal value is often taken as the representative value as opposed to a simple average.

Here the modal value was 20dBA but only for 13% of the time. 26dBA was the next commonly occurring value at 9% of the time.

23dBA, the average of the two most commonly occurring values, will be used as the night time background sound level (also a very low background sound level)

The graph below that shows how the 23dBA level matches fairly well with the overall survey data. It still may be a cautious value to use given that the AC units may run at the early part of the night to cool the room before being switched off, or to a lower setting, to reduce noise levels within the room being served by the AC unit.

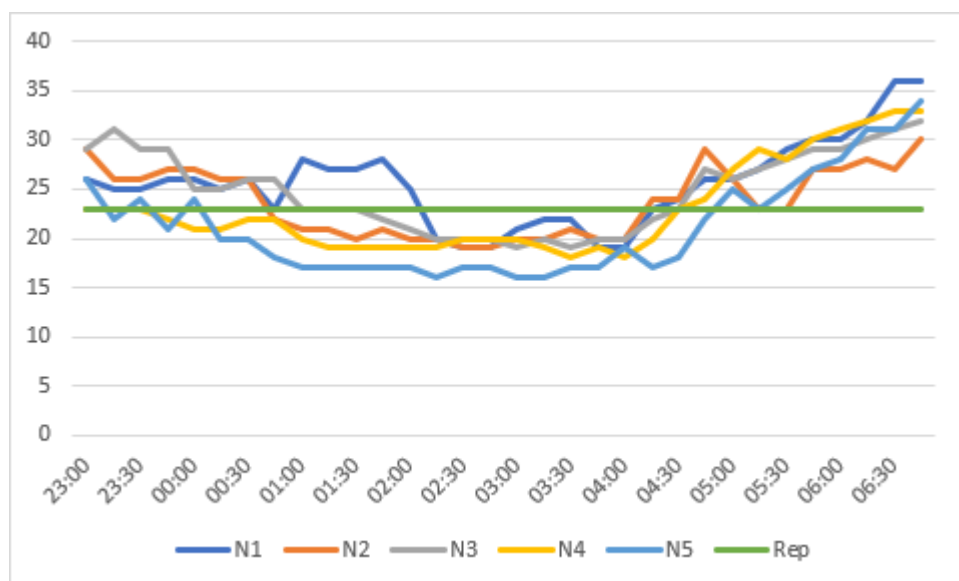


Figure 5: Night Time Survey Levels

4 Computer Noise Model

4.1 Model Details

For the planning application assessment, a computer noise model was created using the computer package IMMI. The drawings of the proposed development and plant specifications were used to complete the noise model. IMMI faithfully implements the propagation method of ISO-9613:1996; Acoustics – Attenuation of sound during propagation outdoors.

The existing buildings were added to the model along with reception points positioned outside NSR windows (RPs). The RPs predict the noise level at a discrete position within the noise model.

4.2 Plant Noise Sound Sources

Proposed plant machinery details can be found in the appendix of the report. Based on the datasheets each of the 2 AC point sources had a sound power of 58/56dBA (Day/Night). The sound power levels were entered as octave band sound levels. Reflection corrections were also added (3dB for wall and 6dB for balcony)

No on time corrections were detailed within the model I.E. all machines running continuously for the hour-long reference time period.

4.3 Noise Propagation Model

The noise model plot can be seen below:

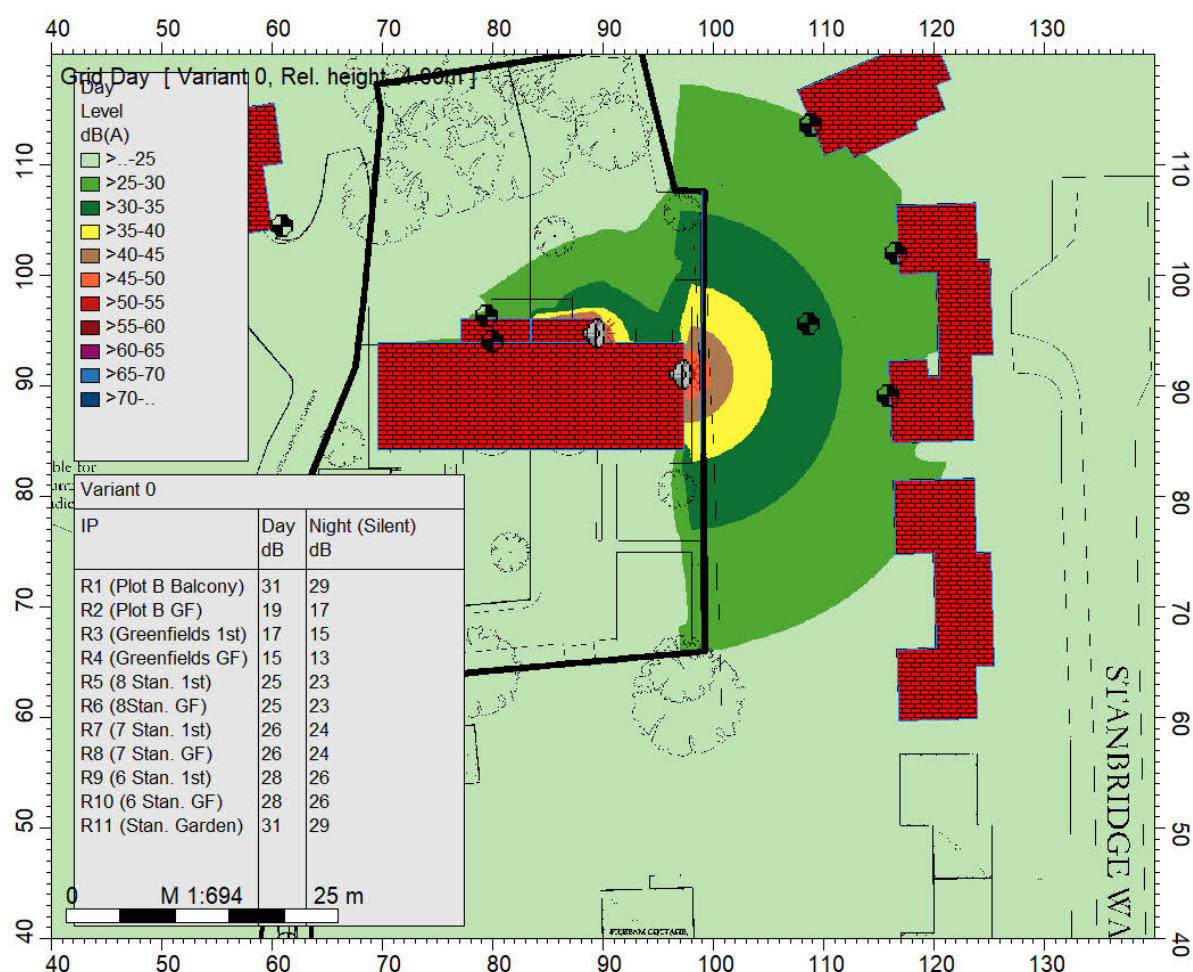


Figure 6: Noise Model

5 Noise Assessments

5.1 BS4142 Assessment

5.1.1 Representative Background Sound Level

As stated in a previous section the representative background sound levels used in the assessment will be 34dBA for the day and 23dBA for the night.

5.1.2 Noise Rating Level

It is important to differentiate between noise rating level and specific noise level. Certain acoustic features can increase the likelihood of complaint. In this instance it is assumed that the AC units are not tonal based on 1/3 octave band measurements carried out for previous projects and based on the datasheet info. It is possible the units may cut in and out depending on the required demand for hot water and heating. As such a 3dB penalty could be added for “intermittency”, however this would in part be offset by a lower sound level due to the times when the ASHPs were not operating fully. It also should be noted that the sound levels predicted by the model are low as under 31dBA. For a simple assessment the noise rating level will be as predicted by the model (I.E correction and on-time cancel each other out).

5.1.3 Assessments

Scenario	Rating Level dBA	Background dBA	Rating over Background
New Adjacent Property			
Daytime Mode	31	34	-3dB
Nighttime Mode	29	23	+6dB
New Adjacent Property (worst case position)			
Daytime Mode	31(garden)	34	-3dB
Nighttime Mode	26	23	+3dB

Table 2: BS4142 Assessment Table

5.1.4 BS4142 Context and Summary

Based on the information in the ANC technical note the background sound levels are very low at night time and the plant rating levels are low for the day and the night. The note states that “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 30dB is 10dB above a background sound level of 20dB, i.e. an initial estimate of a significant adverse impact is modified by the low rating and background sound levels”.

Based on the daytime rating level being below the background sound level and the night time rating level being 29dBA or below it is considered that in this case there should be “low impact” even though the rating level exceeds the background sound level at night time.

5.2 BS8233/WHO Assessment

It is assumed that with a wide open window the indoor sound level will be at least 10dB below the external free-field sound level (incident sound level as predicted by the model).

For the worst case RP the associated internal sound level will at worst be approximately 21/19dBA (Day/Night mode). Even the daytime mode 21dBA sound level is lower than the 30dBA target for bedrooms at night time (significantly lower than the 35dBA target for the daytime).

The 31dBA outdoor sound level is significantly lower than the lower 50dBA limit for an external amenity area,

6 Mitigation Measures

The mitigation measures included in the noise model predictions relate to ensuring the night time noise mode is used at night time (possibly a setting to select when setting up the internal room thermostat controller).

No enclosures are recommended for the low noise level Daikin units proposed. The low sound levels hopefully result in low impacts even though the sound levels may be above background for some times during the night.

7 Appendix

Technical Specifications				RXM20A	RXM25A	RXM35A	RXM42A	RXM50A	RXM60A	RXM71A
Sound power level	Cooling	Max	dBA	61	62	63	-	-	-	-
		Nom.	dBA	58	61	62	63	66	-	-
		Night quiet mode	dBA	56	58	58	-	-	-	-
		Tonal adjustment	dBA	0	0	0	-	-	-	-
	Heating	Max	dBA	61	62	63	-	-	-	-
		Nom.	dBA	58	60	61	62	63	67	-
		Night quiet mode	dBA	56	58	58	-	-	-	-
		Tonal adjustment	dBA	0	0	0	-	-	-	-

RXM25A

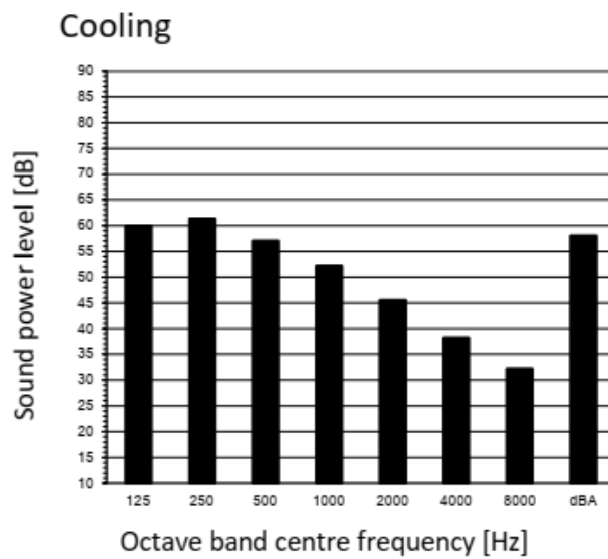


Figure 7: ASHP Details

8 References

- ⁱ BS4142 (2014+A1: 2019) "Method for rating industrial noise affecting mixed residential and industrial areas"
- ⁱⁱ British Standard BS8233 (2014) "Guidance on sound insulation and noise reduction for buildings"
- ⁱⁱⁱ WHO Guidelines for community noise 1999"
- ^{iv} Sussex Planning Noise Advice Document (March 2023)