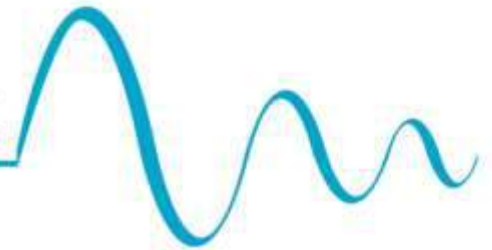


Acoustic South East



Noise Impact Assessment – Variation of Planning Condition

Report by: Scott Castle BSc (Hons) CEnvH, MCIEH MIOA

Date: 30/04/2026

Project: J3958

Issue 1

Site: **Stonehouse, Lot 8**

Client: **Lake Investments Limited**

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1 Introduction and Executive Summary

Acoustic South East have been appointed to undertake an acoustic assessment to support a planning application for a variation of condition. This is referred to as a s73 application.

Planning consent has been granted for a change of use from agricultural buildings to offices/B2/B8. This was consented under DC/25/0403 and awaits a formal decision notice to be issued.

The standards used within the reporting are as follows

- BS4142:2014-A1:2019 - Methods for rating and assessing industrial and commercial sound
- Association of Noise Consultants (ANC)-BS4142:2014-A1:2019 Technical Note
- BS8233:2014 - Guidance on Sound Insulation and Noise Reduction for Buildings
- AVOG – Acoustics, Ventilation and Overheating Guidance, 2020
- ProPG2017 - Professional Practice Guidance on Planning & Noise
- Planning Noise Advice Document Sussex, November 2023
- LA111 Noise and Vibration, revision 2, May 2020 (Formerly Design Manual for Roads and Bridges)

Handcross Road which is located South of Hill Crest Farm as the noise sensitive receptor is the dominant sound source for the daytime and night time periods. It is the case that with the existing measured high L_{Aeq} levels and overnight L_{Amax} events, it is not expected that windows would be openable for bedrooms.

The current lawful use of the application site as an anaerobic digestion facility and a robotic milking dairy does not have any hours of use applied and it is highly likely that the uses will have warranted vehicles of different sizes and capacities using the track to Handcross Road outside of normal daytime hours. Savills Rural confirm through their research that up to 37 vehicles a day and up to 183 vehicles a week would likely use the track, and given the uses, it is expected that these will and can occur outside of daytime hours. It would not be practicable to place hours of use constraints on such uses.

Whilst the Environmental Health response regarding noise (15/04/2025) suggests that daytime hours of use are necessary, these differ from the hours being suggested by the local planning authority. It is apparent that from the April 2025 response from the technical consultee to the planners, there are no references to any of the acoustic reports which had been submitted to support the application.

Previous Acoustic South East reporting indicates that the application site is sufficiently distant from the nearest receptor and when modelled, the internal sound pressure levels of the buildings remain below the measured background for the daytime and night time periods. This is the case with worst case inputs for sound pressure levels inside the two converted buildings, ie 65dB for an office and 85dB for the B2 use.

The report supports the client's proposal that varying/modifying the condition to allow vehicle movements along the track outside of normal hours would not likely cause any concern to the nearest residential receptor. These would likely be an improvement on the numbers and types of vehicles which would use the track with its current lawful use.

The assessment has included a comparison against the current measured background sound pressure levels as well as predicted internal levels inside bedrooms with open and closed windows for both L_{Aeq} and L_{Amax} events. This ensures a robust approach for the closest noise sensitive receptor which is Hill Crest Farm.

The results of the assessment indicate that the vehicle passes are at or below the measured background sound pressure levels. Vehicle passes have also been assessed with open windows and a reduced BS8233:2014 Table 4 criteria (for evening and the night time period) and these are comfortably achieved internally in bedroom spaces. The L_{Amax} values predicted internally are all below 45dB L_{Amax} , which is considered protective of sleep using ProPG2017. The worst-case vehicle movement is predicted to be 33dB $L_{Aeq,T}$ (rounded) externally and this is 18dB below the measured ambient noise levels ($L_{Aeq,T}$).

It follows logically, that if with open windows, the vehicle passes do not provide a cause for concern with regards to internal noise levels, then with closed windows, the predicted internal sound pressure levels are reduced further still.

It is argued that the local planning authority are capable of modifying the condition without adverse impact on Hill Crest Farm as the closest residential receptor.

2 Context, Noise Criteria & Noise Assessment Methodology

2.1 Context

Horsham District Council consented application 25/0403 (approved at committee in January 2026) which provided a change of use from agricultural buildings to B2/B8 uses. This was supported by an Acoustic South East document ref J3958 dated 26/02/2025.

For the avoidance of doubt, the change of use concerned an office building as well as larger B2/B8 building.

Access to the site is via a track off of Handcross Road, which passes Hill Crest Farm house located close to the junction with Handcross Road, see Figure 1 below.

However, what is relevant is that conditions have been suggested by Horsham District Council for what is effectively a daytime use only. These are considered to be overly restrictive for a future tenant of the site.

This report presents sufficient detail to ensure that the local planning authority and their technical consultees within Environmental Health have the relevant assurances in place to allow overnight access/egress to and from the site.

2.2 Site Location

For ease of reference, the consented site and the access track are presented below.

The closest residential receptor is Hillcrest Farm at approximately 412m from the consented buildings at Lot 8.



Figure 1. Site Location

2.3 Horsham District Council - Proposed Hours of Use

Horsham District Council as the local planning authority have consented the application for the site. However, to date, a decision notice has not been formally issued. However draft conditions have been presented to the client.

Condition 27 of the draft schedule states as follows:

With the exception of administrative tasks (Falling within Use Class E (g) (i)), the premises hereby permitted within Lot 8 (Anaerobic Digester and Livestock Building as shown on plan 2024/PL8 Rev C) shall not be open for trade or business (including the receipt and/or dispatch of deliveries, and/or the operation of vehicles, plant/machinery, and to visiting members of the public) except between the hours of 07:00 to 19:00 Mondays to Sundays.

It is not entirely clear where the restriction of hours has been derived from, as the Environmental Health consultee comments dated 15th April 2025 did not make any reference to the 4 separate planning acoustics submissions authored by Acoustic South East (see below).

2.4 Previous Acoustic South East Work

The following work has been presented to the Council by the client and their supporting planning consultants. For ease of reference, these are listed in Appendix C.

2.4.1 Supporting Statement 26 Feb 2025

2.4.2 J3958 – Lot 8/Stonehouse (26 February 2025)

2.4.3 J3779 – Plummers Plain (26 February 2025)

2.4.4 Addendum – 03/10/2025

2.5 Proposed Hours of Use – Amended Condition

It is proposed that the Council's condition 27 is amended as follows:

(a) Regulatory Condition: The premises hereby permitted within Lot 8 (Anaerobic Digester and Livestock Building as shown on plan 2024/PL8 Rev C) shall not be open for trade or business (including the receipt and/or dispatch of deliveries, and/or the operation of vehicles, plant/machinery) except between the hours of 07:00 to 19:00 Mondays to Sundays. other than the following restrictions: the number of staff on-site outside of these hours shall be restricted to staff and not exceed 5 (five) at any time.

(b) between the hours of 19:00hrs and 07:00hrs, the number of vehicle movements to or from the Property, undertaking collections or deliveries only, shall not exceed 16 (sixteen).

(c) between the hours of 19:00hrs and 07:00hrs, the number of vehicle movements to allow staff to attend/leave work at the Property, and not in connection with deliveries to or collections from the site, shall not exceed 10 (ten).

(d) between the hours of 19:00hrs and 07:00hrs, all loading/unloading[SL16.1][LG16.2] of vehicles shall only be carried out inside a building and with the building's doors closed, and the type and specification of door used for this purpose shall be submitted to and approved in writing by the Local Planning Authority prior to the first use of the Property

(e) between the hours of 19:00hrs and 07:00hrs, all vehicles arriving/departing, or used, on the Property shall be fitted with white noise/broadband reversing horns, and not tonal beepers.

Prior to the first use of the premises within Lot 8, details of a vehicle monitoring and site management system (including details of CCTV) shall be submitted to and approved in writing by the Local Planning Authority.

The approved monitoring equipment and associated management measures shall be installed and fully operational prior to the first use of the premises and shall thereafter be retained, maintained and operated in accordance with the approved details for the lifetime of the development. Monitoring records shall be retained on site for a period to be agreed in writing with the Local Planning Authority and shall be made available for inspection upon reasonable request.

3 Measured Site Soundscape (Hill Crest Farm)

The soundscape was deliberately measured level with Hill Crest Farm, as the closest residential receptor in order to provide a representative daytime and night time sound pressure level. The WhatThreeWords location was objective.contact.weeds and this was approximately 33m North of Handcross Road.

3.1 Subjective Site Soundscape

Whilst attending the site to set up and decommission the survey equipment, the dominant sound sources were road traffic noise from Handcross Road and bird song.

3.2 Measured Background Sound Pressure Levels ($L_{A90,15\text{minutes}}$)

For the avoidance of doubt, the L_{A90} , A weighted sound pressure level is defined as that which is exceeded by the residual sound at the assessment location for 90% of a given time interval (T), measured using time weighting, F, and quoted to the nearest whole number of decibels. Background sound pressure levels are used for a BS4142 assessment.

The measured daytime period (07:00-19:00) is 46dB $L_{A90,15\text{minutes}}$.

The measured evening period (19:00-23:00) is 39dB $L_{A90,15\text{minutes}}$.

The measured overnight period (23:00-07:00) is 29dB $L_{A90,15\text{minutes}}$.

3.3 Measured Overnight Soundscape $L_{Aeq,T}$ (19:00-07:00 hours)

The evening and overnight period (ie 19:00 through to 07:00 hours) has been calculated as 53dB $L_{Aeq,T}$. This is correct for both the logarithmic as well as the arithmetic average.

The overnight period alone (23:00-07:00 hours, $L_{Aeq,8\text{ hours}}$) has been calculated at 51dB $L_{Aeq,8\text{ hours}}$.

4 Potential Sound Sources

4.1 Buildings and Noise Escape

It has been demonstrated that in previous work that the practices being undertaken in the change of use buildings for Lot 8 have been modelled at 65dB for an office and 85dB for a B2 use, which would be consistent with staff wearing hearing protection.

Then noise break out (with doors closed) (Rating Level) based on a single skin (Kingspan insulated panel) was only 24dB when received at the nearest residential receptor, Hill House Farm.

This is 22dB below the measured daytime background of 46dB and 5dB below the measured night time period, based on a worst-case use.

Noise emissions from site are therefore not considered to be an issue.

4.2 Vehicle Movements

As noted in sections 2.1 and 2.2 above, vehicles will access/depart the site via the long track to the site which passes the residential receptor (Hill Crest Farm) located to the East.

Vehicle movements must therefore be quantified to ensure that these are not a problem to the residents in the closest residential dwelling. This is particularly important to demonstrate that any movements overnights are not a concern to residents.

For the avoidance of doubt, ASE have assumed a split in the 16 vehicle movements of 8x HGV and 8xLGV as a worst-case scenario.

As stated in section 7 below, these have been assessed as a single vehicle pass in a 15minute overnight period, consistent with the night time reference period in BS4142:2014-A1:2019.

However, any assessment, must also consider the relevance of context.

It is highly relevant to consider that the Anaerobic Digester plant and the robotic milking dairy as the lawful uses will have had numerous day-time and night time vehicle movements to and from the site.

4.3 Consented Lawful Use – Vehicle Movements

It is highly relevant to understand the present lawful uses of the agricultural site as these represent an Anaerobic Digestion facility as well as a robotic milking facility for dairy (230 cattle). These, by their very nature are not daytime only activities and will have required access 24/7.

Savills Rural carried out an assessment and identified that Heavy Goods Vehicles are likely to have attended/departed the site for the following reasons

- Milk collections
- Delivery of food concentrates
- Delivery of forage and bulk feed
- Repairs and maintenance
- Fallen stock
- Livestock sales and purchases
- Fuel and oils
- Seed, fertiliser and sprays
- Waste and recycling

Farm visits

- Sundry – e.g. the delivery of equipment and machinery

183 weekly movements of vehicles and 37 movements a day would have been typical for the lawful current use. Through Acoustic South East involvement in other AD plants, it would be typical to have tanker movement(s) considered for the night time reference period.

Inevitably, the type of vehicles accessing the site would not be subject to restrictive hours of use and will have occurred during both the daytime (07:00-23:00) and night time (23:00-07:00 hours).

Table 2.1: Summary of Digester and Associated Dairy Herd Movements	
Time Period	Average Movements
Per Day	37
Per Week	183

Figure 2. Savills Rural Assessment for Lawful Uses

5 Relevant Planning Policy and Guidance

5.1 National Planning Policy Framework (Dec 2024)

The National Planning Policy Framework (Dec 2024) defines the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so.

The following paragraphs are relevant within NPPF Section 15 (Conserving and enhancing the natural environment) states the following:

Paragraph 187(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, and

Paragraph 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 impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

Paragraph 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.

5.2 BS4142:2014 - Methods 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 L_{90} background noise level affecting the same noise-sensitive premises. The Standard provides guidance that:

- a) Typically, the greater the difference, the greater the magnitude of the impact.
- b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5dB 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 noise level, this is an indication of the specific sound source having a low impact, depending on the context.

Whilst the British Standard states that sounds of an industrial and/or commercial nature does not include sound from the passage of vehicles on public roads and railway systems, it may well be applied for deliveries being made on an access track. The newly produced BS4142:2014+A1:2019 Technical Note dated March 2020 states as follows:

“The phrase ‘on or around an industrial and/or commercial site’ (Subclause 1.1(d)) is considered to extend to haul roads within a site boundary”. Additionally, the Technical Note states :

“There may be circumstances where this seemingly clear exclusion is not adhered to. For example, it might be reasonable to undertake a BS 4142 assessment of sound from heavy goods vehicles using a public road that passes close to houses, and only serves those houses and an industrial site. Consequently, it has little traffic on it for large parts of the day and night other than the industrial heavy goods traffic.”

Within any assessment, context is critical to provide the reader/regulator an understanding of the project and the potential impact of the works being undertaken at the site. BS4142:2014-A1:2019 is clear that it is not just a numbers exercise, but that context must be considered to provide a greater understanding of the wider assessment. The following is an extract from the Standard:

Response to sound can be subjective and is affected by many factors, both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood. This edition of the standard recognizes the importance of the context in which a sound occurs. Great care has, therefore, been taken in the use of the words “sound” and “noise”. Sound can be measured by a sound level meter or other measuring system. Noise is related to a human response and is routinely described as unwanted sound, or sound that is considered undesirable or disruptive.

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.

BS4142:2014-A1:2019 also includes a number of relevant references which address circumstances where background sound pressure levels are low. Section 11(d)(1) states as follows:

“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”, and

“NOTE2, 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”. The latest edition of BS4142:2014-A1:2019 does not quantify what is to be considered as low background sound pressure levels.

The Association of Noise Consultants (ANC) BS4142:2014-A1:2019 technical note states as follows : *“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 $L_{Ar,Tr}$.”*

It is important to note that whilst BS4142:2014-A1:2019 considers noise impact externally as a result of new or changed plant/practices, the standard within A.6.3 also makes a relevant reference to the primary concern (during the night time period) will be the potential for disturbance of resident who could be sleeping with open bedroom windows and, accordingly, “other guidance, such as BS8233:2014, might be applicable in such instances”

Therefore, a BS4142:2014 assessment will be appropriate and consistent with the guidance and accompanying technical notes, it is arguable that the overnight background sound pressure levels ($L_{A90,15minutes}$) are considered to be low for the purposes of BS4142.

5.3 BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

Table 4 of BS8233:2014 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. BS8233:2014 Criteria

It is relevant to note that Table 4 criteria in BS8233:2014 relates to continuous and anonymous sound. Where there are sounds which are not continuous and anonymous, it may well be relevant to consider either a worst-case hour or a reduced internal criteria ($L_{Aeq,T}$)

5.4 Planning Noise Advice Document, Sussex, November 2023

A planning noise advice document which all Sussex local authorities have contributed to and signed up to (including Horsham District Council) remains relevant. The guidance document has been followed in respect of measurement parameters and report presentation of data.

Within section 3.6.2 of the Guidance, it is stated as follows “Any noise associated with the activity, not directly attributable to mineral extraction, such as deliveries on private land or the use of generators shall be assessed in accordance with BS4142 (Section 3.1 and 3.2 above).”

The assessment of overnight deliveries on an access track will therefore be relevant for consideration using BS4142:2014.

5.5 Summary of Guidance and Standards

Given that the site includes a private road/track, upon which deliveries will be made, it will be relevant to carry out a BS4142 assessment. Where the measured backgrounds are low (which they are), it will also be relevant to consider an alternative metric such as BS8233:2014. If and when considering the latter, attention should be given to the fact that the sounds in question may not be continuous and anonymous and require the consideration of either a worst-case hour or a reduced internal criterion (day and/or night).

When summarising, it is important to revisit the fact that this is not a new commercial site, there is an existing site which will have generated noise levels and vehicles movements, during both the daytime and night time periods. This is relevant contextually.

6 Proposed Vehicle Movements and Noise Impact

As per the proposed condition 31 above, there would be no more than 16 vehicle movements overnight. In terms of assessment, the following are reasonable deductions to make:

The working assumption is therefore 5 vehicle arrivals as part of a night shift (suggestion as prior to 23:00) and the return movement within the same night time period (ie before 07:00 hours) the next morning. This would make 10 movements in total and is consistent with proposed condition 31(c).

This leaves the potential for 16 vehicle movements as deliveries, which is consistent with proposed condition 31(b), which would equate to 8 arrivals and 8 departures.

Therefore, for deliveries purposes (31(b)) it is assumed only 1 vehicle per 15-minute period, as this is the night time reference period for BS4142:2014 which would be applicable in such circumstances as a private track.

SELS of passing vehicles have been used to predict the noise impact.

Vehicle passes were measured over an extended period on Brooklands Industrial Estate (Lancing) at a position where the vehicles slowed to approach a junction. Numerous vehicle types were measured in order to provide representative data (on a tarmacked surface) and are shown in Figure 3 below.

Vehicle Pass SEL's			
Vehicle Type	Observed Vehicles	Number of Vehicles Measured	SEL-dB(A)
Small Commercial Vehicles	Ford Torneo, Courier, Transit and Ford Ranger	4	68.6
Light Goods Vehicles (LGV)	VW Transporter, VW Van, Hyundai Van, Renault Panel Van, Mercedes Sprinter(x2), Vauxhall Movana, Peugeot Expert, Mercedes Citan	14	70.2
Heavy Goods Vehicles (HGV)	Long Wheel based, mixed solid wall and curtain wall sides (Iveco, DPD Deliveries, GB Liners removal truck, AW Jenkinson(x3)	14	79

Figure 3. Measured Vehicle SELs

6.1 SEL Calculations

The SEL calculation is as follows:

$$SEL-10*\log(T)+10*\log(N).$$

T Represents the relevant time period in seconds. To ensure an assessment in accordance with BS4142:2014-A1:2019, the daytime reference period is 3600 seconds and for the night time reference period of 15minutes, this is 900 seconds.

N represents the number of vehicle movements within the time period.

The line source within the noise modelling is then calibrated against the SEL, at the distance it was measured at.

6.2 Calculation of Vehicle Arrivals Prior to Night Shift (Evening Period 19:00-23:00 hours)

For 5 vehicle arrivals prior to 23:00 hours, the SEL calculation and calibration of the line source in the noise model will be 40dB. The noise model is then run to calibrate the line source at the calibration position. Once the line source is considered to be calibrated, the noise model predictions for Hill Crest Farm can be assessed.

6.3 Calculation of Vehicle Departures Prior to 07:00 hours (23:00 – 07:00 hours)

For 5 vehicle departures prior to 07:00 hours, the SEL calculation and calibration of the line source in the noise model will be 46dB. The reason why the figure is higher is due to the reference period being only 900 seconds, as opposed to 3600 seconds in 5.2 above.

The noise model is then run to calibrate the line source at the calibration position. Once the line source is considered to be calibrated, the noise model predictions for Hill Crest Farm can be assessed.

6.4 Calculation of Vehicle Arrivals /Departures During the Night (23:00-07:00 hours)

To present a robust case, an artic movement has been used as opposed to light vans. For a single vehicle arrival/departure within the night time period, the SEL calculation and calibration of the line source in the noise model will be 49.5dB.

The noise model is then run to calibrate the line source at the calibration position. Once the line source is considered to be calibrated, the noise model predictions for Hill Crest Farm can be assessed.

7 Noise Modelling Outputs

The noise model has been used to assess the vehicle passes as follows and their predicted external sound pressure levels at Hill Crest Farm.

Hill Crest Farm had a number of receptors applied, with these representing a ground floor bedroom on the rear single storey extension (as illustrated by the plans below in Figure 4), first floor to the rear of the main building at 4.5m and first floor windows overlooking the main road.



Figure 4. Consented Layout of Rear Ground Floor Annex

The figures predicted within IMMI in Figures 5, 6, 7, 9 and 10 below are all external, A weighted and freefield figures.

Figure 5 considers the predicted external sound pressure levels against the relevant measured soundscapes, ie evening and overnight background sound pressure levels $L_{A90,15\text{minute}}$ values.

Within Figure 5 below, it is noted that there is a marked difference in the 5 staff vehicles arriving before 23:00 hours and their potential departure prior to 07:00 hours. This is due to the calculation and specifically the reference periods stated within BS4142:2014-A1:2019. For the evening period when staff might arrive, this is still considered to be the daytime with a 1 hour reference period where the 5 vehicles have a reference period of 3600 seconds. For the night time period, the BS4142:2014-A1:2019 reference period is only 15 minutes (900 seconds).

Light Goods Vehicles and Heavy Goods Vehicles have been assessed as 1 pass per 15 minute period.

Figure 6 uses the predicted external sound pressure levels and considers the likely internal sound pressure levels with an open window which is considered to represent a worst case.

The open window assessment (Figure 6) uses the AVOG industry standard of 13dB to represent a partially open window, as well as consideration of a reduced internal criteria for internal values by 5dB, hence 30dB $L_{Aeq,1 \text{ hour}}$ for the evening period and 25dB $L_{Aeq,1 \text{ hour}}$ for the night time period.

Figure 7 considers $L_{A_{Max}}$ Values in line with ProPG2017, with an open window (assessed internally).

Figure 9 presents data values for a closed window assessment ($L_{Aeq,T}$)

Figure 10 presents data values for a closed window assessment for $L_{A_{Max}}$ events

Assessment of Overnight Vehicle Movements ($L_{Aeq,T}$ vs Measured $L_{A90,T}$)			
5 x Cars/Small Commercial Vehicles Arrival Prior to 23:00			
Receptor	Predicted External SPL	Relevant Soundscape- $L_{A90,T}$	Impact
Hillcrest GF Bedroom	20.0	39	-19.0
Hillcrest FF	18.2	39	-20.8
Hill House 1st Floor	23.2	39	-15.8
Hill House FF(2)	20.7	39	-18.3
5 x Cars/Small Commercial Vehicles Departure Prior to 07:00 hours			
Receptor	Predicted External SPL	Relevant Soundscape- $L_{A90,T}$	Impact
Hillcrest GF Bedroom	26.0	29	-3.0
Hillcrest FF	24.2	29	-4.8
Hill House 1st Floor	29.2	29	0.2
Hill House FF(2)	26.7	29	-2.3
LGV Arrival/Departure			
Receptor	Predicted External SPL	Relevant Soundscape- $L_{A90,T}$	Impact
Hillcrest GF Bedroom	20.6	29	-8.4
Hillcrest FF	18.9	29	-10.1
Hill House 1st Floor	23.9	29	-5.1
Hill House FF(2)	21.4	29	-7.6
HGV Arrival/Departure			
Receptor	Predicted External SPL	Relevant Soundscape- $L_{A90,T}$	Impact
Hillcrest GF Bedroom	29.4	29	0.4
Hillcrest FF	27.6	29	-1.4
Hill House 1st Floor	32.6	29	3.6
Hill House FF(2)	30.1	29	1.1

Figure 5. Predicted External $L_{Aeq,T}$ Freefield at Hill Crest Farm

Assessment of Overnight Vehicle Movements (Open Window Assessment)				
5 x Cars/Small Commercial Vehicles Arrival Prior to 23:00				
Receptor	Predicted External SPL	Predicted Internal SPL (With Open Window)	Relevant Internal SPL *	Difference
Hillcrest GF Bedroom	20.0	7.0	30	-23.0
Hillcrest FF	18.2	5.2	30	-24.8
Hill House1st Floor	23.2	10.2	30	-19.8
Hill House FF(2)	20.7	7.7	30	-22.3
5 x Cars/Small Commercial Vehicles Departure Prior to 07:00 hours				
Receptor	Predicted External SPL	Predicted Internal SPL (With Open Window)	Relevant Internal SPL *	Difference
Hillcrest GF Bedroom	26.0	13.0	25	-12.0
Hillcrest FF	24.2	11.2	25	-13.8
Hill House1st Floor	29.2	16.2	25	-8.8
Hill House FF(2)	26.7	13.7	25	-11.3
LGV Arrival/Departure				
Receptor	Predicted External SPL	Predicted Internal SPL (With Open Window)	Relevant Internal SPL *	Difference
Hillcrest GF Bedroom	20.6	7.6	25	-17.4
Hillcrest FF	18.9	5.9	25	-19.1
Hill House1st Floor	23.9	10.9	25	-14.1
Hill House FF(2)	21.4	8.4	25	-16.6
HGV Arrival/Departure				
Receptor	Predicted External SPL	Predicted Internal SPL (With Open Window)	Relevant Internal SPL *	Difference
Hillcrest GF Bedroom	29.4	16.4	25	-8.6
Hillcrest FF	27.6	14.6	25	-10.4
Hill House1st Floor	32.6	19.6	25	-5.4
Hill House FF(2)	30.1	17.1	25	-7.9
*Please note that due to the passing vehicle not considered to be continuous and anonymous sound, a 5dB reduction has been applied to the BS82133:2014 Table 4 values				

Figure 6. Predicted Internal Sound Pressure Levels - Open Window and Revised BS8233:2014

The noise modelling software was also used to predict L_{Amax} events from the vehicle passes.

It is however recognised that L_{Amax} events are likely to be a point or moving point sound source, and less likely to behave as a line source. In reality, the noise levels presented in Figure 7 below will be lower.

However, as a worst-case assumption, if the L_{Amax} events achieve the required internal parameters, ie less than 10 events per night above 45dB, then it is unlikely that the vehicle passes with an open window will cause any disturbance to the neighbouring residents. As a moving point source, the predicted internal impact will be further reduced.

L_{AMax} Assessment with Open Window					
Receptor	Predicted External L_{AMax}	Open Window (-13dB)	Predicted Internal L_{AMax}	ProPG2017 Guidance	Difference
5 x Cars Arrival Prior to 23:00					
Hillcrest GF Bedroom	44.0	Minus 13dB	31.0	45	-14.0
Hillcrest FF	43.3	Minus 13dB	30.3	45	-14.7
Hill House1st Floor	48.3	Minus 13dB	35.3	45	-9.7
Hill House FF(2)	45.8	Minus 13dB	32.8	45	-12.2
LGV Arrival/Departure					
Hillcrest GF Bedroom	45.3	Minus 13dB	32.3	45	-12.7
Hillcrest FF	44.6	Minus 13dB	31.6	45	-13.4
Hill House1st Floor	49.6	Minus 13dB	36.6	45	-8.4
Hill House FF(2)	47.1	Minus 13dB	34.1	45	-10.9
HGV Arrival/Departure					
Hillcrest GF Bedroom	55.8	Minus 13dB	42.8	45	-2.2
Hillcrest FF	55.2	Minus 13dB	42.2	45	-2.8
Hill House1st Floor	60.2	Minus 13dB	47.2	45	2.2
Hill House FF(2)	57.7	Minus 13dB	44.7	45	-0.3

Figure 7. Consideration of L_{AMax} Events inside a Bedroom

With the exception of a 2.2dB increase for a HGV arrival/departure at the front of the property, ALL L_{AMax} values with an open window are below the requirement of 45dB L_{AMax} measured internally. A 2.2dB increase in sound pressure levels would not likely be detected by human hearing. The soundscape at the front of the property overlooking Handcross Road with exposure to road traffic noise is discussed further in section 8.3 below.

7.1 Assessment of Overnight Vehicle Movements Against Measured Background Sound Pressure Levels

The noise model was as robust as possible and reflects real life conditions. The use of the ground floor annex plan to illustrate the positioning of the ground floor bedroom is relevant to ensure that the overnight exposures to relevant room types are properly considered.

The assessment indicates that all scenarios are at or below the measured background sound pressure levels. The minor exception to this being the first-floor windows overlooking Handcross Road, which are discussed further in section 8.3 below.

In summary, the vehicle passes are either at or below the measured background (L_{A90,15minutes}) sound pressure levels.

Whilst this section reports on the predicted external sound pressure levels, context is further discussed within section 8.

It is also recognised that the five vehicle movements prior to 07:00 hours generate a greater sound prediction than the same five vehicles prior to 23:00 hours. This is due to the reference period being assessed for the daytime (ie before 23:00) being 1 hour and the reference period for the night (23:00-07:00 hours) being only 15 minutes.

7.2 Assessment of Overnight Vehicle Movements against Predicted Internal $L_{Aeq,T}$ Levels

The assessment (Figure 6) has considered the impact of the passing vehicles overnight on residents with an open window. Also, due to the fact that the sound might not be continuous and anonymous, a reduced internal BS8233:2014 value has been applied. This relates to 30dB $L_{Aeq,T}$ prior to 23:00 hours and 25dB $L_{Aeq,8\text{ hour}}$ for the overnight period and represents a robust assessment case.

All vehicle movements are comfortably below the reduced BS8233:2014 Table 4 values for internal sound pressure levels with specific focus on the night time period.

The likely ambient noise levels are considered further in section 8.2 below.

Open windows and context are further discussed.

7.3 Assessment of Overnight Vehicle Movements Against Internal L_{Amax} Values

Figure 7 provides an assessment of vehicle passes with an open window with a focus on L_{Amax} events, being considered inside bedroom spaces.

With the exception of the first-floor room overlooking Handcross Road, all internal sound pressure levels are comfortably below 45dB L_{Amax} inside the assessed bedroom spaces. The first-floor receptors with an exposure to Handcross Road are further discussed in section 8.3 below.

Open windows and context are further discussed.

7.4 Assessment of Overnight Vehicle Movements Against (Existing) $L_{Aeq,8\text{ hours}}$

As stated in section 3.3 dealing with the existing site soundscape, the period from 19:00-07:00 hours has been measured as 53dB $L_{Aeq,T}$ and the overnight period from 23:00 to 07:00 hours as 51dB $L_{Aeq,8\text{ hours}}$.

The worst case predicted external sound pressure level ($L_{Aeq,T}$) is 33dB rounded. Unsurprisingly, this is with the pass of the artic, albeit it remains 18dB below measured ambient noise levels.

Contextually, DMRB considers a 1dB change as negligible (see section 8.3 below).

8 Discussion

8.1 Vehicle Track

The vehicle track at present is single lane width and unmade. It is proposed to resurface the track and maintain any relevant traffic calming areas, as it is recognised that it is necessary to advise drivers of the proximity of the public right of way located to the West of the track.

Given the length of the track, which is significant, there are no expectations that vehicles will be carrying out any unnecessary reversing manoeuvres. The site has sufficient capacity that any arriving vehicles can be driven into the larger buildings. The site is also not sufficiently busy that two vehicles would be required to pass on the track.

8.2 Measured Site Soundscape

The overnight data was revisited from the original survey (Nov-Dec 2024) and ranged from 50.2dB to 52.4dB $L_{Aeq,8 \text{ hour}}$. The data was revisited specifically to review whether windows at the nearest residential receptor (ie Hill Crest House) would likely be openable from both an L_{Aeq} and L_{Amax} perspective.

The attenuation from sound energy passing through a partially open window is taken to be 13dB. This is the current industry average from the Acoustics Ventilation and Overheating Guidance dated Jan 2020.

Internal sound pressure levels for a bedroom overnight are dictated by Table 4 of BS8233:2014 for $L_{Aeq,T}$ values, and ProPG2017 for L_{Amax} values. Specifically, for restful sleep, 30dB $L_{Aeq,8 \text{ hour}}$ is relevant and for ProPG, there must be no more than 10 events which exceed 45dB L_{Amax} inside the bedroom.

From the measured site soundscape, the overnight average was measured freefield as 51dB $L_{Aeq, 8 \text{ hour}}$. With an open window this would be 38dB internally $L_{Aeq,8 \text{ hour}}$ and exceed BS8233:2014 table 4 values by 8dB which would be significant.

For the assessment of L_{Amax} events, for an open window, at the survey position, it is shown that with 13dB of attenuation, there would be an average of 241 events per night above 45dB L_{Amax} . This would not permit restful sleep.

It is therefore argued that the results from the measured site soundscape, which was representatively placed adjacent to Hill Crest House is not likely to permit openable windows overnight.

8.3 Likely Noise Exposure of Hill Crest Farm From Handcross Road

Given the condition for inaudibility of the AD plant and robotic milking dairy at the nearest noise sensitive receptor, ie Hill Crest Farm, it is clear that the soundscape measured was most likely generated from road traffic noise on Handcross Road.

The survey position is therefore capable of being plotted into the model and Handcross Road drawn in as a separate line source with the track line source silenced. The model is considered to be calibrated when the measured daytime and night time conditions (58.4dB $L_{Aeq,16\text{ hour}}$ and 51dB $L_{Aeq,8\text{ hour}}$) have been achieved at the survey position.

The benefit of recreating Handcross Road is to be able to demonstrate the likely received sound pressure levels due to road traffic noise at the first-floor windows of Hill Crest Farm which overlook Handcross Road.

The 2D noise model contours are shown in Figure 8 below.

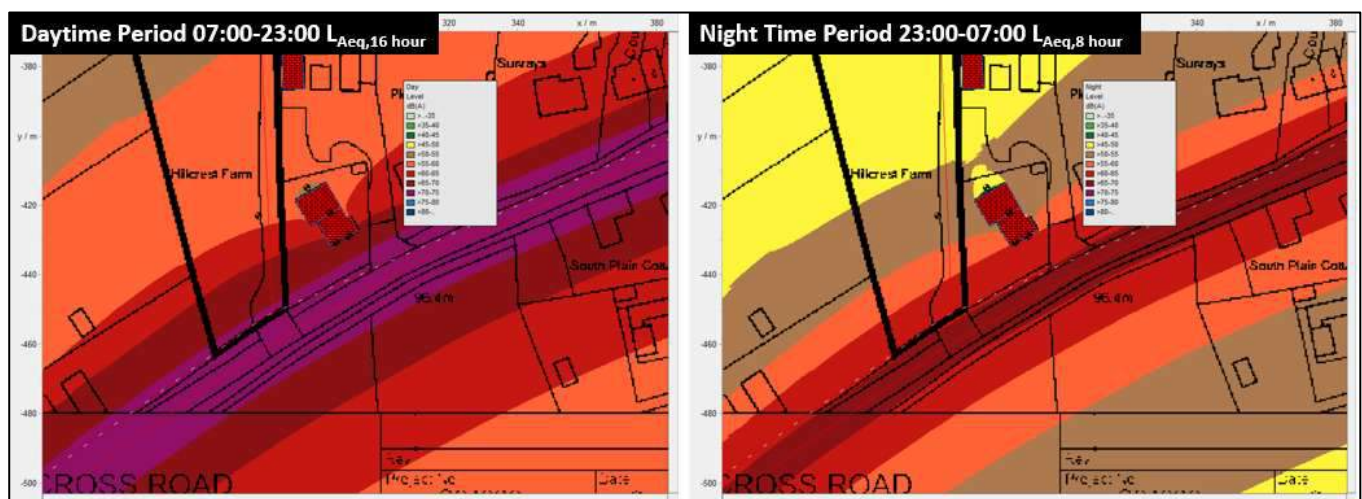


Figure 8. 2D Noise Model Contours for Daytime (left) and Night Time (Right)

For example, an artic vehicle pass down the track to the application site has a predicted external sound pressure level of 33dB and 30dB at the first-floor windows overlooking the Handcross Road.

However, data from the noise model using Handcross Road as a line source, shows 60dB at both first-floor windows overlooking Handcross Road. There are two outcomes for this:

1. The proposed $L_{Aeq,T}$ pass of a HGV is 27dB below predicted ambient noise levels.
2. Even with the artic vehicle pass combined with the roadside exposure, the artic vehicle movement would contribute to the existing site soundscape. This is demonstrated through logarithmic addition ie $10\log(10^{3.3} + 10^{6.0}) = 60\text{dB}$.

To place the combined external value in context, DMRB (LA111 Noise and Vibration, rev 2, May 2020) considers a 1dB change as negligible. It is arguable, that there is no change to the current soundscape.

The Acoustics Ventilation and Overheating Guidance (2020) has been used and specifically Table B2.2 to show the likely losses between outside freefield sound pressure levels and internal reverberant sound pressure levels. The guidance identifies that for standard thermal double-glazed windows and trickle vents, the attenuation between outside to inside is 21dB for L_{Aeq} levels and 22dB for L_{Amax} levels.

With this in mind, Figures 5 and 6 above have been recalculated to account for likely internal sound pressure levels over the night time period, with a focus on whether sleep for internal receptors is likely to be impacted.

Revised Figures 9 and 10 below show that closed windows, the received internal sound pressure levels inside Hill Crest Farm for both $L_{Aeq,T}$ and L_{Amax} events are considerably below the revised BS8233:2014 internal sound pressure criterion for the evening and overnight periods.

Assessment of Overnight Vehicle Movements (L_{Aeq} -Closed Window Assessment)				
5 x Cars Arrival Prior to 23:00				
Receptor	Predicted External SPL	Predicted Internal SPL (Closed Window)	Relevant Internal SPL*	Difference
Hillcrest GF Bedroom	20.0	-1.0	30	-31.0
Hillcrest FF	18.2	-2.8	30	-32.8
Hill House1st Floor	23.2	2.2	30	-27.8
Hill House FF(2)	20.7	-0.3	30	-30.3
5 x Cars Departure Prior to 07:00 hours				
Receptor	Predicted External SPL	Predicted Internal SPL (Closed Window)	Relevant Internal SPL*	Difference
Hillcrest GF Bedroom	26.0	5.0	25	-20.0
Hillcrest FF	24.2	3.2	25	-21.8
Hill House1st Floor	29.2	8.2	25	-16.8
Hill House FF(2)	26.7	5.7	25	-19.3
LGV Arrival/Departure				
Receptor	Predicted External SPL	Predicted Internal SPL (Closed Window)	Relevant Internal SPL*	Difference
Hillcrest GF Bedroom	20.6	-0.4	25	-25.4
Hillcrest FF	18.9	-2.1	25	-27.1
Hill House1st Floor	23.9	2.9	25	-22.1
Hill House FF(2)	21.4	0.4	25	-24.6
HGV Arrival/Departure				
Receptor	Predicted External SPL	Predicted Internal SPL (Closed Window)	Relevant Internal SPL*	Difference
Hillcrest GF Bedroom	29.4	8.4	25	-16.6
Hillcrest FF	27.6	6.6	25	-18.4
Hill House1st Floor	32.6	11.6	25	-13.4
Hill House FF(2)	30.1	9.1	25	-15.9
*Please note that due to the passing vehicle not considered to be continuous and anonymous sound, a 5dB reduction has been applied to the BS82133:2014 Table 4 values				

Figure 9. Internal Sound Pressure Levels ($L_{Aeq,T}$ -Closed Windows)

L_{AMax} Assessment with Closed Window					
Receptor	Predicted External L_{AMax}	Closed Window	Predicted Internal L_{AMax}	ProPG2017 Guidance	Difference
Small Commercial Vehicles					
Hillcrest GF Bedroom	44.0	Minus 22dB	22.0	45	-23.0
Hillcrest FF	43.3	Minus 22dB	21.3	45	-23.7
Hill House 1st Floor	48.3	Minus 22dB	26.3	45	-18.7
Hill House FF(2)	45.8	Minus 22dB	23.8	45	-21.2
LGV Arrival/Departure					
Hillcrest GF Bedroom	45.3	Minus 22dB	23.3	45	-21.7
Hillcrest FF	44.6	Minus 22dB	22.6	45	-22.4
Hill House 1st Floor	49.6	Minus 22dB	27.6	45	-17.4
Hill House FF(2)	47.1	Minus 22dB	25.1	45	-19.9
HGV Arrival/Departure					
Hillcrest GF Bedroom	55.8	Minus 22dB	33.8	45	-11.2
Hillcrest FF	55.2	Minus 22dB	33.2	45	-11.8
Hill House 1st Floor	60.2	Minus 22dB	38.2	45	-6.8
Hill House FF(2)	57.7	Minus 22dB	35.7	45	-9.3

Figure 10. Internal Sound Pressure Levels (L_{AMax} -Closed Windows)

8.4 Lawful Current Use

It is noted that there are no current restrictions in terms of hours of use for the two lawful uses as both an anaerobic digestion plant and a robotic milking parlour. In fact, if there were hours of use applied, these would be considered to be operational constraints.

8.5 Noise Model Outcomes – Future Vehicle Passes

The outcome of any assessment, especially a BS4142 assessment must always be that the findings are considered in line with context and that the outcome does not purely become a numbers exercise. The context of lawful uses is discussed below in section 8.6.

The SELS and noise modelling exercise for future vehicle passes indicated that all predicted overnight vehicle movements are comfortably below (18dB) the ambient noise level of 51dB L_{Aeq,8 hours} for the overnight period.

When considering an assessment against overnight measured background sound pressure levels, it is noted the majority of the predicted sound pressure levels are at or below the measured background sound pressure levels which is a positive indication that there are unlikely to be any noise concerns. Where these are exceeded, ie the front, first floor windows overlooking Handcross Road, section 8.3 above points to these already receiving a higher noise exposure than that measured at the survey location, some 33m from the roadside.

Given the night time soundscape likely to be experienced from Handcross Road, it is evident that opening windows would not be permissible.

Whilst a BS4142 assessment would also typically consider an on-time correction, this might not be so relevant with the vehicle passes, as these already use an SEL which takes the time of the vehicle pass into account. Notwithstanding this, the period for a commercial vehicle to travel 40m to pass the Hill Crest House is a short window in time.

It is of course recognised that for any overnight assessment, it is important to also consider L_{Amax} events. These have also been modelled and to present a robust case, again these have been considered with an open window.

The L_{Amax} events have been considered against ProPG2017 which requires that inside a bedroom, during a night time period there should not be more than 10 events per night which exceed 45dB L_{Amax} . This is to protect sleep motility.

With an open window, only the single artic pass generates an L_{Amax} event above 45dB internally, and this is again at the front windows overlooking Handcross Road. As previously stated, these first floor front windows would not likely be openable due to the night time soundscape from road traffic noise generated from Handcross Road.

It is also stated that whilst the planning condition has been worded to allow the numbers in section 2.6 above, it is not to say that such vehicle numbers will attend the site every night. It may well be the case that 5 movements occur overnight per month. When considered against the movements for lawful uses (see section 4.3), these are not significant.

8.6 Vehicle Passes from Lawful Uses

As stated, the current lawful use is as an Anaerobic Digestion plant and a robotic milking dairy for up to 230 cattle. It is highly likely that vehicles would arrive and depart the site and not be constrained by operational hours. This would definitely include milk tankers.

As stated in section 4.3, Savills Rural predict up to 37 movements a day and up to 183 movements in a week. Inevitably, due to the type of activities and processes on site, these would generate movements out of normal working hours.

An EQ Scania horse box carrier was measured with an SEL of 85.8dB on a previous Acoustic South East project and it is reasonable to consider such a vehicle might well be used in conjunction with the lawful use. Using the vehicle in the same model would produce sound pressure levels of up to 47dB $L_{Aeq,T}$ which are above the measured background of 29dB $L_{A90,15minutes}$. Similarly, it would not be uncommon for tractors, milk tankers and livestock carrying vehicles to utilise the track outside of daytime hours, which would contextually have a greater impact than an occasional vehicle pass.

It is argued that the current lawful use does not have any operational constraints in terms of hours of use and contextually, future infrequent access to the site is not likely to generate any noise concerns or disturbance to the nearby occupants of Hill Crest House.

9 Recommendations

From the evidence presented to date it is apparent that the vehicle passes are not likely to cause any concern to the residents/occupants of Hill Crest Farm. The soundscape is such that windows are likely to be closed, and contextually, any vehicle movements for the proposed use will be minimal compared to the likely uses under the current lawful applications.

Notwithstanding this, it remains relevant to ensure that there are suitable controls in place to ensure that vehicle movements and in particular overnight vehicle movements do not cause a concern. The following recommendations are suggested:

9.1 CCTV System

A relevant CCTV system is incorporated as part of the site CCTV to record the number and type of vehicles which access and depart the system overnight. This may be used by the client to determine necessity and that the proposed number of vehicles within the condition are being complied with.

If there were a camera at the top of the track as well as at the base of track, it may also be possible for the client to track the speed of the vehicles entering/departing the site.

9.2 Track Resurfacing

It is proposed that the track is resurfaced with a hard tarmac finish. This will ensure a smooth surface and will also incorporate any traffic calming measures to ensure that vehicles do not cause un-necessary clatter or noise from uneven surfaces.

It will be relevant to ensure that any modifications to the track to do not include alarms for gate openings for example, as well as raised ironworks which may contribute to un-necessary clatter as vehicles drive across inspection chambers.

9.3 Track Speed Limit

A posted speed limit to advise drivers at the top and bottom of the track would be relevant to ensure that all vehicles who use the track are aware of the relevant speed limit not to be exceeded.

9.4 Call Ahead System

Where deliveries are expected, they can be called ahead to ensure that the site is ready to receive them and any doors or openings are managed appropriately.

9.5 Tool Box Talks

For employees of the site, it will be relevant to have a toolbox talk in place to ensure that the proximity of third-party neighbours and a low site soundscape remain fully understood and that there are measures in place to ensure that any noise disturbance is minimised.

If there are regular drivers/delivery agents to the site, such tool box talks could also be delivered. The content of such talks will be variable but may well include the following:

- Engines off and no idling policy
- No radios and/or mobile phone use whilst traversing the track
- If vehicles are expected, gates can be opened in advance
- No use of the vehicle horn
- Unloading conditions
- No use of plant externally with audible alarms (ie Fork Lift Trucks)

10 Conclusion

Handcross Road which is located South of Hill Crest Farm as the noise sensitive receptor is the dominant sound source for the daytime and night time periods. It is the case that with the existing measured high L_{Aeq} levels and overnight L_{Amax} events, it is not expected that windows would be openable for bedrooms.

The current lawful use of the application site as an anaerobic digestion facility and a robotic milking dairy does not have any hours of use applied and it is highly likely that the uses will have warranted vehicles of different sizes and capacities using the track to Handcross Road outside of normal daytime hours. Savills Rural confirm through their research that up to 37 vehicles a day and up to 183 vehicles a week would likely use the track, and given the uses, it is expected that these will and can occur outside of daytime hours. It would not be practicable to place hours of use constraints on such uses.

Whilst the Environmental Health response regarding noise (15/04/2025) suggests that daytime hours of use are necessary, these differ from the hours being suggested by the local planning authority. It is apparent that from the April 2025 response from the technical consultee to the planners, there are no references to any of the acoustic reports which had been submitted to support the application.

Previous Acoustic South East reporting indicates that the application site is sufficiently distant from the nearest receptor and when modelled, the internal sound pressure levels of the buildings remain below the measured background for the daytime and night time periods. This is the case with worst case inputs for sound pressure levels inside the two converted buildings, ie 65dB for an office and 85dB for the B2 use.

The report supports the client's proposal that varying/modifying the condition to allow vehicle movements along the track outside of normal hours would not likely cause any concern to the nearest residential receptor. These would likely be an improvement on the numbers and types of vehicles which would use the track with its current lawful use.

The assessment has included a comparison against the current measured background sound pressure levels as well as predicted internal levels inside bedrooms with open and closed windows for both L_{Aeq} and L_{Amax} events. This ensures a robust approach for the closest noise sensitive receptor which is Hill Crest Farm.

The results of the assessment indicate that the vehicle passes are at or below the measured background sound pressure levels. Vehicle passes have also been assessed with open windows and a reduced BS8233:2014 Table 4 criteria (for evening and the night time period) and these are comfortably achieved internally in bedroom spaces. The L_{Amax} values predicted internally are all below 45dB L_{Amax} , which is considered protective of sleep using ProPG2017. The worst-case vehicle movement is predicted to be 33dB $L_{Aeq,T}$ (rounded) externally and this is 18dB below the measured ambient noise levels ($L_{Aeq,T}$).

It follows logically, that if with open windows, the vehicle passes do not provide a cause for concern with regards to internal noise levels, then with closed windows, the predicted internal sound pressure levels are reduced further still.

It is argued that the local planning authority are capable of modifying the condition without adverse impact on Hill Crest Farm as the closest residential receptor.

11 Appendix A – EHO Response (John Griffiths)

From: John.Griffiths
Sent: 15 April 2025 15:16
To: Planning
Subject: Your Ref: DC/25/0362; RE: Stonehouse Farm Handcross Road Plummers Plain West Sussex RH13 6NZ

Categories: Consultations

Dear Planning,

I write further to the above consultation and respond on behalf of HDC Environmental Health & Licensing Commercial Team. The Application seeks the redevelopment of two plots of land; one to replace existing industrial units and another convert an anaerobic digester to additional industrial units. A further part of the application seeks the development of residential dwelling on a third plot, but this will be considered in a separate consultation.

The sites are located in the primarily rural area of Plummers Plain, although the land with existing units immediately adjoins to domestic dwelling on Handcross Road. The existing digester is reasonably isolated, with the closest dwellings being approx. 350m to the south, although the access track which is to be retained passes adjacent to the residential Hillcrest Farm Annexe.

This Service recommends that working hours at the existing digester site be limited to 07:00am – 19:00pm Monday to Sunday. The land with existing units, being significantly closer to sensitive dwellings, should be limited in operational hours of 07:00am – 19:00pm Monday to Saturday inclusive; 08:00am – 16:00pm Sundays and Bank Holidays. Both of these principles should be secured by condition, should the application be permitted.

The following conditions are also recommended in relation to general noise breakout from the site to protect the amenity of the closest domestic dwellings, should the application be permitted:

1. Prior to commencement of operations at each unit, a scheme of design and assessment of the cumulative acoustic impact arising from the operation of all internally and externally located plant and machinery shall be submitted to and approved in writing by the local planning authority. The assessment of the acoustic impact shall be undertaken in accordance with BS 4142: 2014 (or subsequent superseding equivalent) and other relevant standards, and shall include a scheme of attenuation measures to ensure the cumulative rating level of noise emitted from the proposed plant, machinery or equipment is 5dB less than background. The acoustic impact shall not exceed NR25 in neighbouring residential rooms.
2. The use hereby permitted, or the operation of any plant, machinery or equipment, shall not commence until a post-installation noise assessment, including suitable measurements, has been carried out to confirm compliance with the noise criteria. The scheme shall be implemented in accordance with the approved details and attenuation measures, and they shall be permanently retained and maintained in working order for the duration of the use and their operation.
3. Other than deliveries and dispatches there shall be no outside working using mechanical power tools or mobile plant at any time and there shall be no operation of mechanical machinery within the light industrial units hereby approved with a sound power level of more than 75 dBA unless all windows and doors to the relevant workshop are closed. Any complaints received regarding noise working practices shall be recorded as part of the tenancy management plan and the record of complaints shall be produced on any reasonable request of a suitably authorised officer of the Council.

In addition, prior to occupation or commencement of operations at the site, a lighting scheme must be submitted for the approval of the Local Planning Authority in accordance with the Institute of Lighting Professional's Guidance notes for the reduction of obstructive light. The scheme must be designed by a suitably qualified person in accordance with the recommendations for environmental zone E2 in the ILP document "Guidance Notes for the Reduction of Obtrusive Light GN01:2011.

Given that there are domestic properties located close to the site, this Service makes the following recommendations for Conditions to minimise disturbance during the undertaking of works at the premises, should the Application be Permitted:

Demolition and/or Construction Phase

- a) Suitable assessments should be made to identify any asbestos contained within the building and controls put in place to ensure safe removal and disposal where necessary.
- b) A licensed waste removal contractor should remove all clearance debris and construction waste from site.
- c) No burning of materials should take place on site.
- d) Hours of construction activities (including deliveries and dispatch) should be limited to 08.00 – 18.00 Monday until Friday, 09.00 – 13.00 Saturdays and no activity on Sundays or Bank Holidays.

If there is anything in this email that you do not understand, or if you have any other questions or queries, please do not hesitate to contact this Service or myself directly.

Kind regards.

John Griffiths

Area Environmental Health Officer

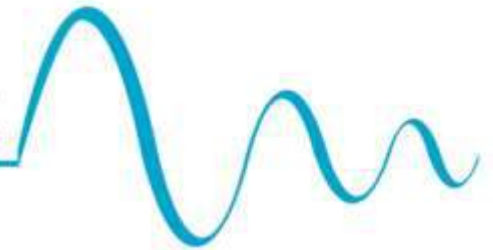
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Horsham District Council, Alberty House, Springfield Road, Horsham, West Sussex RH12 2GB
Telephone: 01403 215100 (calls may be recorded) www.horsham.gov.uk Chief Executive: Jane Eaton

12 Appendix B - Previous Acoustic South East Work

Acoustic South East



Planning Noise Assessment – Change of Use

Report by: Scott Castle BSc (Hons) CEnvH, MCIEH MIOA

Date: 26/02/2025

Project: J3958

Issue 1

Site: **Stonehouse Farm, Lot 8, Handcross.**

Client: **Lake Investments Limited**

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This report has been prepared by Acoustic South East with all reasonable skill, care and diligence and presents information included within the scope agreed with the client. If any third party whatsoever comes into possession of this report, they rely on it at their own risk and Acoustic South East accepts no duty or responsibility (Including in negligence) to any such third party.

Report by: Scott Castle BSc (Hons) CEnvH, MCIEH MIOA

Checked by: Simon Barrett BSc(Hons) MSc MIOA

Issue 1	26/02/2025	Original Issue
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1 Introduction and Executive Summary

Acoustic South East have been appointed to undertake an acoustic assessment to support a planning application for a change of use. Specifically, the two agricultural buildings located to the North of the site are proposed to become offices and B2/B8 use for a specific tenant.

Standards and guidance referenced for this assessment include:

- BS4142:2014-A1:2019 – Methods for Rating and Assessing Industrial and Commercial Sound
- BS5228:2014 – Code of Practice for Noise and Vibration Control on Construction and Open Sites (Part 1 – Noise)
- National Planning Policy Framework (NPPF), 2024
- Planning Noise Advice Document Sussex, November 2023.

A class 1 sound level meter was used to assess the site soundscape between 29th November to 5th December 2024.

IMMI noise modelling software was used to create the existing two agricultural buildings located to the North of the application site. Area sound sources were used to construct an office with an internal sound pressure level of 65dB $L_{Aeq,T}$ and for the larger B2/B8 building, an internal soundscape of 85dB $L_{Aeq,T}$ which would represent a noisy worst case workshop use with employees wearing hearing protection.

The noise break out from the two change of use buildings would generate a Rating Level or $L_{Ar,Tr}$ of 24dB at the nearest residential property. This is 22dB below the measured background and will not be audible.

A worst case hour of vehicle movements using the shared access track was also considered and this generates a $L_{Ar,Tr}$ of 47dB (which includes a 3dB character correction) at the nearest residential receptor. This is 1dB above the measured background sound pressure level and must be considered in line with the contextual factors discussed in section 9 of the report.

With the vehicle movements considered against the measured ambient soundscape, these are also comfortably below the 59-60dB $L_{Aeq,07:00-19:00}$ hours measured dataset.

Based on the information presented, the change of use for the two agricultural buildings to offices/B2/B8 should not have any adverse impact. Planning permission should not be withheld on noise grounds.

2 Caveat

The findings and outcomes contained within the report are based on the plans and assumptions provided to us by the client. It is critical that the report is read in its entirety to ensure that the information provided and the calculations thereafter remain correct and may be relied upon.

3 Context, Noise Criteria & Noise Assessment Methodology

3.1 Context

This assessment supports a change of use application being made to Horsham District Council. The application proposes change of use from the currently vacant anaerobic digestion plant (AD) to offices and B2/B8 uses.

The site is located to the North of the B2110 Handcross road, which is a 50mph road.

Access to the site is via a long driveway (352m) which slopes down towards to the site to the North.

The buildings are currently open to the elements and are proposed to be reclad and weatherproofed.

The proposed use is storage and distribution for a commercial aerospace end tenant.

It is relevant to note that the current AD site retains planning consent and will have had vehicles utilising the site access track and passing Hillcrest Farm for site access and egress.

Combined with the tenant farmer who uses the access track for their land, it is reasonable to expect that vehicles will and have passed Hillcrest Farm in the course of their day to day activities.

3.2 Site Location

The application site is detailed in red in Figure 1. Topography and terrain also play a role with approximately a 22m change in levels from the roadside access to the site.



Figure 1. Site Location and Existing (Left) and Proposed(Right)



Figure 2. Current Buildings

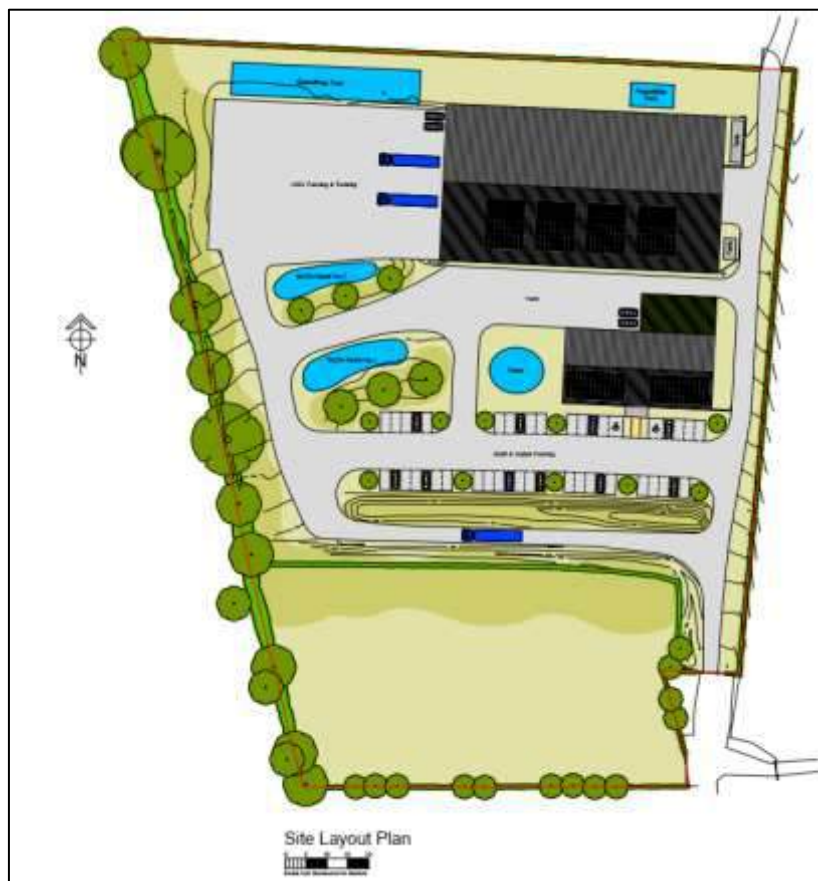


Figure 3. Proposed Buildings

3.3 Soundscape

The soundscape noted from visits to set up and decommission the survey equipment consist of road traffic noise and bird song. Note that the survey equipment was located parallel to the nearest noise sensitive receptor approximately 35m from Handcross Road.

3.4 Closest Residential Receptor

The closest residential property is that of Hillcrest Farm located approximately 412m to the South. To the north of Hillcrest Farm is horse paddocks and a sand school and farm buildings.

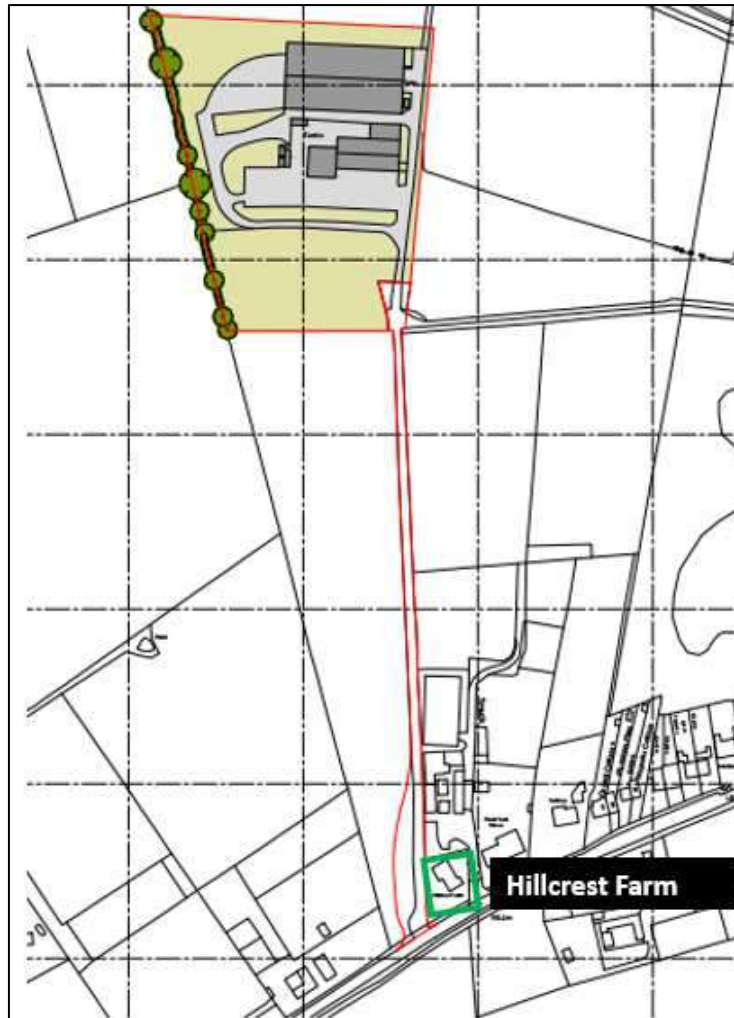


Figure 4. Closest Residential Property

3.5 Proposed Hours of Use

The buildings are proposed to be used from 07:00-19:00 hours.

3.6 Proposed Vehicle Movements

In a worst-case hour, 20 cars, 1 van and 1 articulated lorry might well visit the site.

3.7 Planning Policy and Relevant Standards

3.7.1 National Planning Policy Framework, December 2024

The National Planning Policy Framework (Dec 2024) defines the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so.

The following paragraphs are relevant within NPPF Section 15 (Conserving and enhancing the natural environment) states the following:

Paragraph 187(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, and

Paragraph 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 impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

Paragraph 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.

3.7.2 BS4142:2014-A1:2019 - Methods 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 L_{90} background noise level affecting the same noise-sensitive premises. The Standard provides guidance that:

- a) Typically, the greater the difference, the greater the magnitude of the impact.
- b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5dB 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 noise level, this is an indication of the specific sound source having a low impact, depending on the context.

3.7.3 Planning Noise Advice Document Sussex, November 2023

The document, which all Sussex local authorities are signed up (including Horsham) provides guidance on reporting. The parameters have been followed.

3.8 Methodology

A class 1 sound level meter has been used to measure the site soundscape and specifically background sound pressure levels at the approximate location of the Hillcrest Farmhouse boundary.

Noise modelling software has been used to replicate the site terrain and the position of the two buildings, albeit with significant improvements made to clad and weatherproof the buildings. Area sound sources were generated inside the noise modelling to utilise internal sound pressure levels for the office building as well as the new B2/B8 building. The noise model was then run to detail noise break out from the buildings, as well as vehicular access using the single access track to the site.

4 Site Survey

A class 1 sound level meter was set up and ran continuously with a 100-millisecond resolution from 29th November 2024 to 5th December 2024. The data was post-processed using dBTrait into $L_{Aeq,15minutes}$ and $L_{A90,15minute}$ periods to inform both ambient ($L_{Aeq,T}$) and background sound pressure levels ($L_{A90,15minutes}$).

The sound level meter was freefield, battery operated and secured in position inside a locked peli-case. The meter was field calibrated at the beginning and end of the survey at 1000Hz (114dB) without any significant drift occurring.

The rationale for positioning of the survey was to be representative of the nearest residential property, Hill Crest Farm. The survey location can be seen in Figure 4 below.

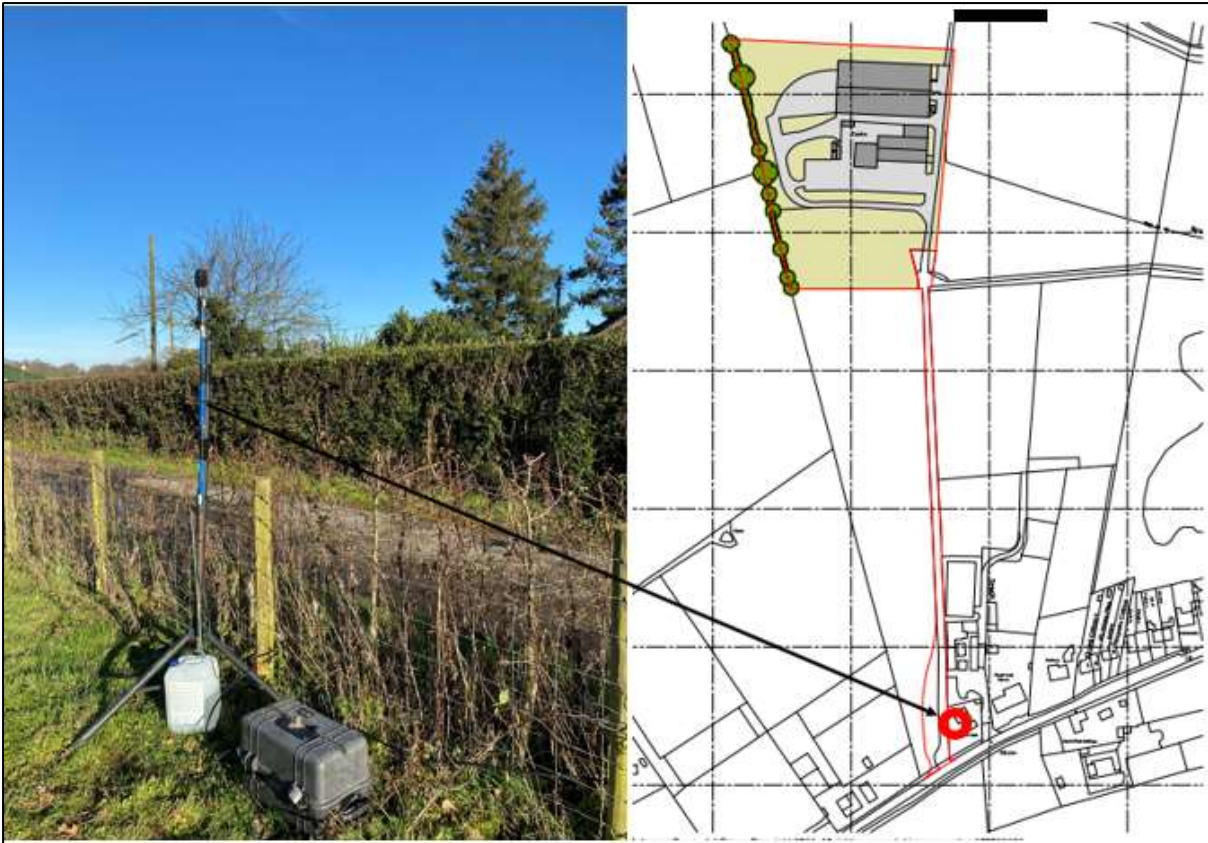


Figure 5. Sound Survey Location

Survey(s) carried out by	Scott Castle BSc (Hons) CEnvH, MCIEH MIOA
Equipment Used	01dB Black Solo- Class 1 Sound Level Meter (Unattended)
Equipment Used	Norsonic Acoustic Calibrator – Serial No. 31699
Location	Long Term Background – Monopole Mounted, 2.2m above ground level, Located at objective.contact.weeds (WhatThreeWords),TQ22765/27850
Duration	29 November to 5 th December 2024

Table 1. Survey Details

5 Measured Site Soundscape

The results below relate to the freefield survey data measured parallel to Hill Crest Farmhouse.

5.1 Measured $L_{Aeq,T}$

Figure 5, below, details the logarithmic average of the measured ambient sound levels at the survey position between 07:00 and 19:00 hours.

Logarithmic External Freefield Average Sound Pressure Levels L_{Aeq} - Daytime period					
07:00 - 19:00					
Sat 30th Nov	Sun 1st Dec	Mon 2nd Dec	Tue 3rd Dec	Wed 4th Dec	Thu 5th Dec
58.7	59.2	59.4	58.7	59.5	59.7

Figure 6. Measured Ambient Noise Level

The received soundscape adjacent to the Hill Crest Farmhouse remains relatively consistent with 59 to 60dB $L_{Aeq,T}$ (rounded) for both weekdays and weekends.

5.2 Measured Background Sound Pressure Levels ($L_{A90,15minutes}$)

The measured modal and representative background for the Hillcrest Farmhouse is 46dB $L_{A90,15minutes}$ for 07:00 to 19:00 hours.

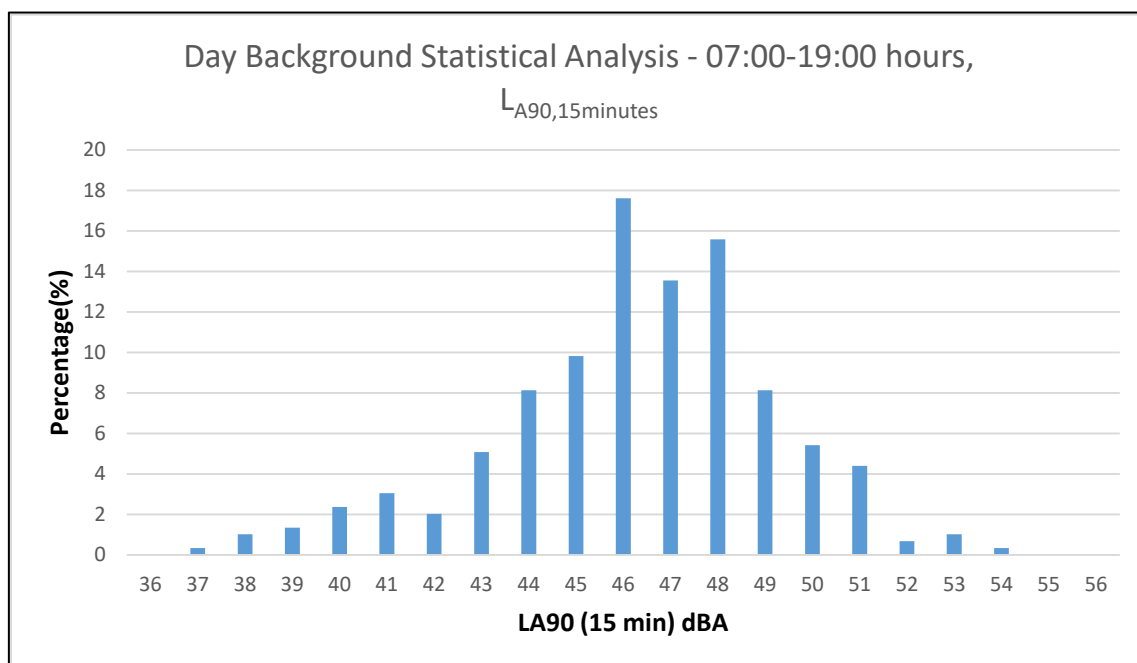


Figure 7. Measured Background Sound Pressure Levels

6 Measured Vehicle SELs and Calculated $L_{Aeq,T}$

As stated in section 3.6 above, in a worst-case hour, it would be reasonable to expect 1 van, 20 vehicles and an articulated lorry. Given the distance of the access road/track being 352m it is not likely that the vehicle will be heard for the whole time period, only when passing the residential property.

Two techniques were used to consider how the passing vehicles might impact the residential property. This is capable of being compared against ambient and background noise levels. These were to use a line source within the noise model and consider SELs of vehicle passes and also a haul route calculation from BS5228:2014-A1-2019.

6.1 SELs

For the articulated lorry, a Leyland DAF horse carrier was measured over a 100m pass. For the 20 vehicle movements, an average of a Fiat 500 and a Ford Ranger were applied and for a van, a ford transit pass was assessed, also across a 100m pass. The SELs are comprised of multiple vehicular passes and measurement in good weather conditions.

An SEL calculation was determined for each vehicle type using the following formula.

$$L_{Aeq} = SEL - 10 \log(T) + 10 \log(N)$$

T is the time period in seconds, for this instance, a worst-case hour is 3600 seconds.

N is the number of vehicular passes

With the L_{Aeq} identified, the line source as a direct path between Handcross Road and the lower electric gate, was then calibrated against the numerical value in column 4 below.

The noise modelling software was then run to consider the line source impact against Hill Crest Farm House. The worst-case receptor value, was then recorded in Column 5. The column 5 values were then summed to consider the whole impact of the hour at the residential property.

Assessment of Worst Case Hour					
Vehicle	SEL	Number	L_{Aeq} to Calibrate Line Source	Worst case L_{Aeq} at receptor	Anti-log
Artic Lorry	85.8	1	50	40.6	11481.54
20 Vehicles	72.5	20	50.1	40.7	11748.98
1 Van	73.5	1	37.9	28.5	707.9458
Sum of Vehicle Movements at Receptor Location					43.8

Figure 8. SEL Calculated Values

The predicted L_{Aeq} can then be compared against the measured $L_{Aeq,T}$ for the daytime period. In this instance, 44dB rounded is compared against 59dB $L_{Aeq,T}$ for the ambient soundscape and accordingly, is not likely to be a problem. It is also possible to compare 44dB against the measured background of 46dB $L_{A90,15minutes}$ 07:00-19:00 hours. Again, it is clear that the 44dBA is below the background sound level for the reference period, which indicates that there is unlikely to be a problem.

6.2 Haul Route Calculation

A haul route calculation has been considered from BS5228:2014-A1:2019. This uses a number of fixed variables.

F.2.5.2 Method

For mobile items of plant that pass at intervals (such as earth-moving machinery passing along a haul road), it is possible to predict an equivalent continuous sound level using the following method.

- a) *Stage 1.* The general expression for predicting the $L_{Aeq,T}$ alongside a haul road used by single engined items of mobile plant is:

$$L_{Aeq,T} = L_{WA} - 33 + 10\log_{10}Q - 10\log_{10}V - 10\log_{10}d \quad (F.6)$$

where:

L_{WA} is the sound power level of the plant, in decibels (dB);

Q is the number of vehicles per hour;

V is the average vehicle speed, in kilometres per hour (km/h);

d is the distance of receiving position from the centre of haul road, in metres (m).

Estimates of the $L_{Aeq,T}$ from a haul road used by other types of mobile plant with twin engines can be made by adding a further 3 dB(A) to the $L_{Aeq,T}$ calculated using equation (F.6).

The sound power level for the articulated truck was taken from <https://www.transport.gov.scot/media/42094/appendix-a171-typical-construction-plant-and-noise-levels.pdf>

The variables for consideration for a worst-case arctic truck pass would be as follows:

$L_{WA} = 110\text{dB}$ (Articulated Truck)

Distance to the nearest receptor – 5metres

$V =$ Speed limit in km/hour – 8km/hour

$Q =$ Number of vehicles =1

$110 - 33 + 10\log(1) - 10\log(8) - 10\log(5) = 60.9\text{dB}$.

As a worst case vehicle pass, this is 1dB more than the measured $L_{Aeq,T}$ for the daytime period and is not likely to be a concern. The assessment considers a worst case, as just that, a worst case, not a typical case.

7 Computer Noise Modelling (IMMI)

In order to see how noise varies at different positions around the proposed development it is possible to produce a noise contour map. A computer noise model has been completed using the computer package IMMI. Drawings of the area have been used to complete the noise models and the topography of the location recreated. IMMI faithfully implements the propagation method of ISO-9613:1996; Acoustics – Attenuation of sound during propagation outdoors.

The noise modelling software predicts freefield and A weighted dB values.

7.1 Noise Model Inputs

The following assumptions were made to inform the noise modelling process:

It remains important to understand the site topography. The client provided detailed topographical plans identifying the change in level from the roadside (Handcross Road) to the bottom electric gate to access the site as being a 22m level difference. A noise model was created with a 22m slope.

Hill Crest Farm as the receptor location was entered as a building with an apex roof height of 8.5m above ground level. Whilst the room layouts are not understood, an external receptor position was added at the North facing elevation for both ground floor (1.5m) and first floor (4.5m) above ground level. These consider the received freefield sound pressure levels from the two buildings and vehicle passes.

Whilst the buildings on the site are not currently weatherproof, they are being professionally clad and lined to ensure offices for the smaller AD building and B2/B8 uses for the larger of the two buildings.

Area sound sources were created for the buildings inside the noise modelling software. This allows the selection of an indoor sound pressure level and the walls and roof to be constructed accordingly.

A Kingspan quadcore KS1000Rw wall panel (insulated metal profile sheet) was used which provides 25dB(A) of attenuation. This was added to the walls and roof for both buildings to present a worst case, as in reality, further internal cladding will also occur to ensure that the buildings are suitable for day to day working, weatherproofing etc. The additional improvements will also provide additional sound attenuation, however as a worst case, only the Kingspan wall panel has been used at present.

The benefit of using an area sound source is that an internal sound pressure level can be derived and break-out and further propagation and attenuation calculated.

For the former AD and smaller building – which will be offices – an internal noise level of 65dB $L_{Aeq,T}$ was set. For the larger building with proposed B2/B8 uses, an elevated level of 85dB $L_{Aeq,T}$ was set which represents a worst case internal soundscape where individuals would be using machinery and wearing hearing protection.

The farm buildings/stables which extend to the South were added into the noise model as 2.4m in height.

No solid fencing was added between the access track and the farm and stables/equine area to the East.

There are also noted to be two, 2m bunds close to the lower access electric gate on the site. These were not added into the noise model.

Whilst the above accounts for the noise break out from the buildings, it is also relevant to consider vehicular access for the site and the number and type of vehicles which might access the premises via the track.

The worst-case vehicle movements in an hour are stated within section 3.6 and SELs were used for a 100m pass measured recently at another site.

7.2 Noise Model Outputs

7.2.1 Noise Break Out

The 2D noise contours can be seen in Figure 7 below.

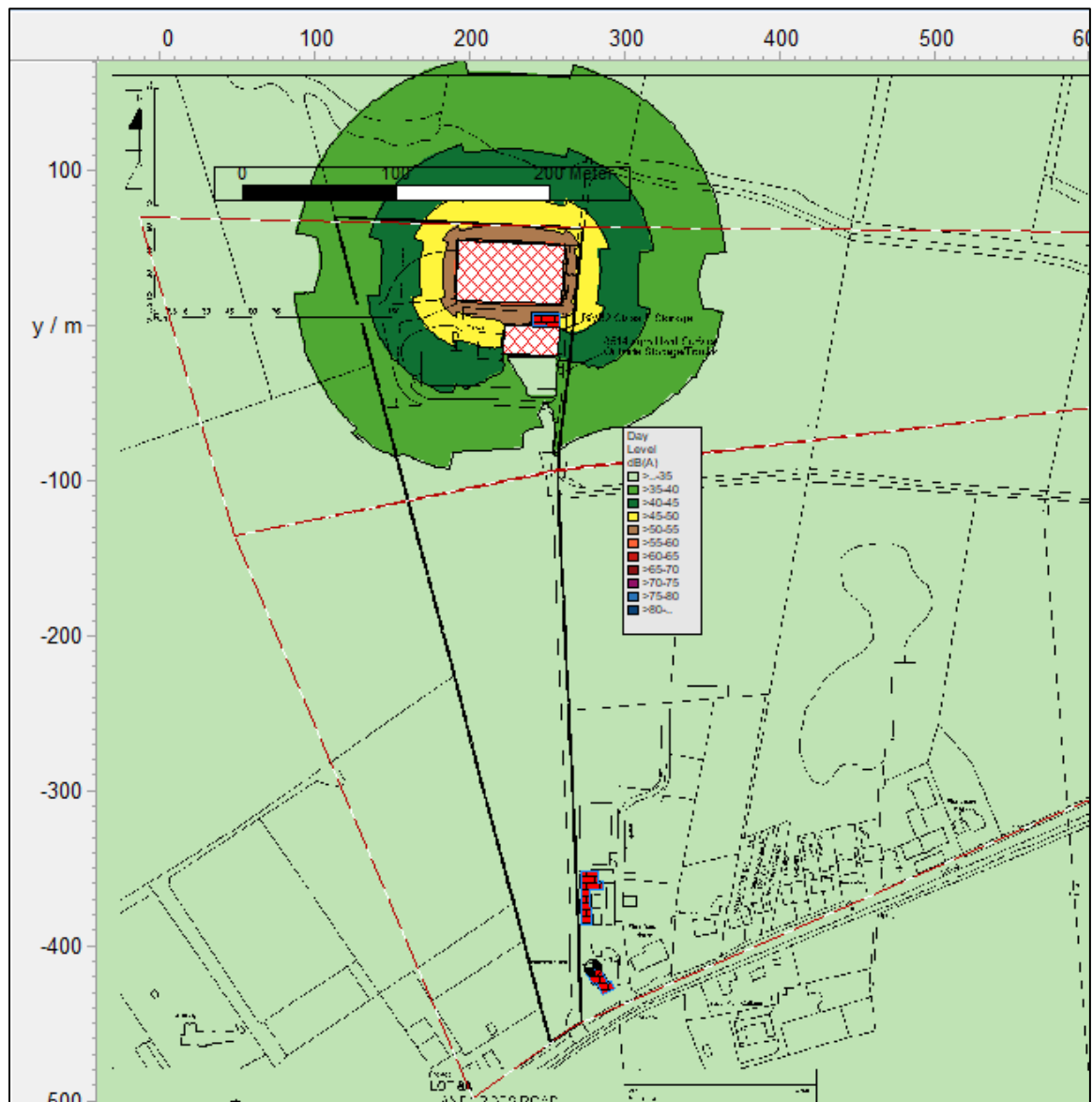


Figure 9. 2D Noise Contours of Noise Break Out from 2 Buildings.

8 BS4142:2014 A1:2019 Assessment

An assessment is possible using BS4142:2014-A1:2019 of both the building noise break out and the track.

The access track may also be assessed, as this is deemed to be private land and attention is drawn to section 1.3 whereby sound of an industrial nature and/or commercial nature does not include sound from the passage of vehicles on public roads and railway systems.

As a private/shared access track, this is capable of being quantified and has included a 3dB character correction for intermittency.

Daytime- Building Noise Breakout			
Results	Measurement Parameter		Relevant Clause
Specific sound level	$L_{Aeq(T)}$	24.1	7.3.4
On time corrected value	Worst Case Hour Considered	0	
Acoustic feature correction	0 as not likely to be audible	0	9.2
Rating level	$L_{Ar,Tr}$	24.1	9.2
Background sound level	$L_{A90(T)}$	46	8
Excess of rating level over background sound level		-21.9	11
Assessment indicates a	Considerably Below Measured Background-low/no impact		11
Uncertainty of the assessment	Discussed		10
Daytime - Worst Case Hour Vehicle Movements			
Results	Measurement Parameter		Relevant Clause
Specific sound level	$L_{Aeq(T)}$	43.8	7.3.4
On time corrected value	Worst Case Hour Considered	0	
Acoustic feature correction	Intermittancy	3	9.2
Rating level	$L_{Ar,Tr}$	46.8	9.2
Background sound level	$L_{A90(T)}$	46	8
Excess of rating level over background sound level		0.8	11
Assessment indicates a	Marginally above Background, consider with Context		11
Uncertainty of the assessment	Discussed		10

Figure 10. Assessment of Noise Breakout and Vehicle Passes.

If the two sounds were likely to occur simultaneously, then they may be logarithmically summed as follows – $10\log(10^{2.41}+10^{4.68})$ providing a Rating Level or $L_{Ar,Tr}$ of 46.8dB or rounded to 47dB.

This is 1dB above background and is heavily influenced on a worst-case hour vehicle movement. As with any BS4142:2014-A1:2019 assessment, it is relevant to consider context and discuss this and not merely rely on a single figure outcome.

9 Discussion and Context

It is appropriate to consider the relevant context of the site and the access track. The following factors assist in considering the assessment of the noise impact.

The proposed opening hours are based on daytime uses only, ie 07:00-19:00 hours.

There is minimal change in the soundscape due to the busy Handcross Road which dominates the site soundscape at the location of the nearest residential receptor.

For the buildings, these will be newly clad constructions.

For the purpose of the noise modelling, the two buildings have had minimal sound insulation applied (25dB) as well as conservative internal noise levels for the assessment. These included 65dB $L_{Aeq,T}$ internally for a busy office and 85dB $L_{Aeq,T}$ internally for the B2/B8 unit. At the latter internal sound pressure level, the building occupants would be required to wear hearing protection, which is not unreasonable for a B2 use and likely machinery noise being generated.

There is approximately 428 metres between the B2 building and the residential receptor location. This allows for considerable attenuation of noise levels.

Due to the distance and topography between the application site and the nearest residential receptor, there is no line of sight and the received sound pressure levels at the nearest residential property will not likely be audible.

The access track which serves the 2 buildings is not solely for the 2 buildings as part of the application. Contextually, the track is used by a tenant farmer for access and large machinery and vehicles already utilise the access.

For the worst-case hour of vehicle movements, this considered the noise level in relation to both the existing soundscape (L_{Aeq}) as well as the more stringent BS4142:2014 measured background sound pressure levels ($L_{A90,T}$).

For the existing soundscape, the measured survey indicates that this was 59-60dB $L_{Aeq, 07:00-19:00 \text{ hours}}$. Therefore, the predicted vehicle movements of 46.8dB $L_{Aeq, 1 \text{ hour}}$ remains comfortably below this and not likely to be audible.

For consideration against the measured background, the vehicle movements are predicted to be 0.8dB above the measured background, albeit this did include a 3dB character correction for intermittency.

Given the circumstances, the assessment identified a low/no impact.

It is acknowledged that BS4142:2014-A1:2019 is not simply a numbers exercise but must also consider the relevant context of the site such as the factors above.

It is also relevant to note that the noise modelling, by considering a line source is likely to over predict for the vehicle movements. In reality, the vehicle movements are not acting as a line source, but a moving point source and will have significantly better noise attenuation. The noise model outcomes therefore reflect a worst-case scenario.

As a point source, it would be apparent that the vehicle would pass the receptor location relatively quickly, and this would warrant a sizeable on time correction. For example, if it took 15 seconds to pass Hillcrest Farm at a low speed, this would be a 24dB reduction ($10\log(15/3600)$).

10 Uncertainty

It is relevant to reflect within reporting how uncertainty has been reduced in both the data collection and data processing areas.

The survey period was predominantly dry and weather conditions were checked against a local weather survey to the North. It was not necessary to remove data due to adverse weather conditions.

The measurements made on site included a field calibration at 1000Hz (114dB) without any significant drift having occurred. This occurred at site set up as well as the decommissioning of the site and provides confidence that the measured data may be relied upon.

Whilst a tenant is proposed for the buildings, to accommodate the B2/B8 elements which could well include machinery generated noise, a high soundscape was modelled inside the B2/B8 building without any detrimental impact on the nearest residential receptor.

For the purposes of noise modelling, no bunding or hedgerows were placed into the model, which again presents a worst-case scenario. Similarly, whilst it is recognised that the buildings will be refurbished, a standard insulated metal profile sheet with a 25dB transmission loss was used within the noise modelling.

11 Conclusion

A class 1 sound level meter was used to assess the site soundscape between 29th November to 5th December 2024.

IMMI noise modelling software was used to create the existing two agricultural buildings located to the North of the application site. Area sound sources were used to construct an office with an internal sound pressure level of 65dB $L_{Aeq,T}$ and for the larger B2/B8 building, an internal soundscape of 85dB $L_{Aeq,T}$ which would represent a noisy worst case workshop use with employees wearing hearing protection.

The noise break out from the two change of use buildings would generate a Rating Level or $L_{Ar,Tr}$ of 24dB at the nearest residential property. This is 22dB below the measured background and will not be audible.

A worst case hour of vehicle movements using the shared access track was also considered and this generates a $L_{Ar,Tr}$ of 47dB (which includes a 3dB character correction) at the nearest residential receptor. This is 1dB above the measured background sound pressure level and must be considered in line with the contextual factors discussed in section 9 of the report.

With the vehicle movements considered against the measured ambient soundscape, these are also comfortably below the 59-60dB $L_{Aeq,07:00-19:00}$ hours measured dataset.

Based on the information presented, the change of use for the two agricultural buildings to offices/B2/B8 should not have any adverse impact. Planning permission should not be withheld on noise grounds.

Acoustic South East



Retention of Temporary Planning Consent

Report by: Scott Castle BSc (Hons) CEnvH, MCIEH MIOA

Date: 26/02/2025

Project: J3779

Issue 1

Site: **Plummers Plain**

Client: **Lake Investments Limited**

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This report has been prepared by Acoustic South East with all reasonable skill, care and diligence and presents information included within the scope agreed with the client. If any third party whatsoever comes into possession of this report, they rely on it at their own risk and Acoustic South East accepts no duty or responsibility (Including in negligence) to any such third party.

Report by: Scott Castle BSc (Hons) CEnvH, MCIEH MIOA

Checked by: Simon Barrett BSc(Hons) MSc MIOA

Issue 1	26/02/2025	Original Issue
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1 Introduction and Executive Summary

Acoustic South East have been appointed to undertake an acoustic assessment to support a planning application for the retention of commercial uses within a former agricultural yard building and associated hardstanding. Specifically, previously issued temporary consents have lapsed and a planning application has been made to Horsham District Council to make the use/s permanent.

Standards and guidance referenced for this assessment include:

- BS8233 (Sound insulation and noise reduction for buildings) 2014
- National Planning Policy Framework (NPPF), 2023
- Acoustics, Ventilation and Overheating Guidance, dated Jan 2020

The current application seeks to make permanent the temporary consents previously issued by Horsham District Council. The measured survey dataset demonstrates that the previously issued planning conditions remain complied with.

The daytime soundscape indicates a drop off commensurate with the stated hours and the historic, albeit lapsed conditions. The morning soundscape, ie 06:00-07:00 hours also shows sound generating activities, albeit towards the latter part of the hour, ie 06:45 onwards which are likely to arise from the closer of the vehicle workshops/hardstands.

There is limited line of sight between the residential premises and the commercial hardstanding/buildings.

On the basis of the information presented, planning permission should not be withheld on noise grounds.

2 Context, Noise Criteria & Noise Assessment Methodology

2.1 Context

There are two applications with Horsham District Council presently and supported by this report.

The planning application with Horsham District Council is DC/23/0545. This seeks to renew the temporary planning permission for the building for another three years which was consented by application DC/19/1046.

The planning application with Horsham District Council is DC/23/1326. This seeks a retrospective change of use for class B2/B8 for the vehicle parking on the hardstand.

The building and hardstanding are operated by Stepney Commercial.

The scope of the assessment was to review the daytime and specifically the night time soundscape to identify any concerns with regards to the generation of noise. It is understood that historic management of the site had led to concerns being raised by local residents.

The site management has now changed and there are not understood to be any current noise concerns.

2.2 Site Location

The application site is detailed in red in Figure 1 with the building and hardstand application noted.

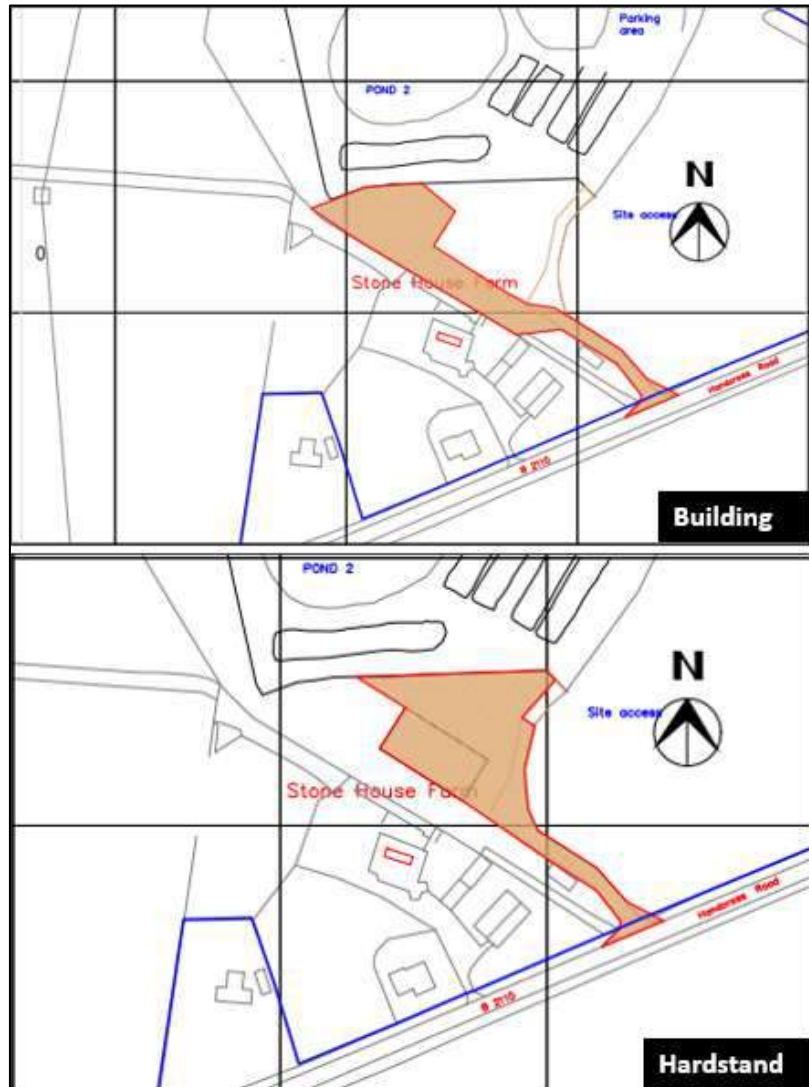


Figure 1. Site Location

2.3 Commercial Setting

The area is broken down further in Figure 2 below.



Figure 2. Review of Site/Uses

The Stepney Commercials building, and indeed hardstand is relatively distant from the residential receptor, and there are a number of building structures in place which will inevitably act as massing and barrier effects. Specifically, the vehicle workshop and the shell building will assist in limiting the propagation of sound from the Stepney Commercial activities.

The purpose of the assessment was to review the night time soundscape to ensure that there were no obvious events occurring.

2.4 Soundscape

The soundscape noted from visits to the site to install and decommission the survey equipment was dominated by road traffic noise from the A281. Birdsong was noted. A single horse was noted to be roaming in the paddock. Distant dog barking was also noted from nearby.

2.5 Closest Residential Property

The closest third-party residential receptor is Meadowcroft to the South West of the site. The hard standing has also been added for context. In terms of distance, there is approximately 48m between the hardstand and the closest façade of the property without any obvious line of sight.



Figure 3. Closest Noise Sensitive Receptor (NSR)

2.6 Business Utilising the Hardstanding

The business currently operating on the hardstand site is Stepney Commercial.

2.7 Planning Policy and Relevant Criteria

2.7.1 National Planning Policy Framework, December 2024

The National Planning Policy Framework (Dec 2024) defines the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so.

The following paragraphs are relevant within NPPF Section 15 (Conserving and enhancing the natural environment) states the following:

Paragraph 187(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, and

Paragraph 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 impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

Paragraph 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.

2.7.2 BS8233:2014 – Guidance on Sound Insulation and Noise Reduction for Buildings

Table 4 of BS8233:2014 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. BS8233:2014 Criteria

3 Sound Survey

A class 1 sound level meter was placed at a location near to the hardstanding and yard, but equally the position had to be secure and away from the horses currently in the paddock. A position on top of the ISO container was selected at TQ23237/28070 (Stockpile.Surviving.Glares WhatThreeWords). This was mounted at 4.09m in height above ground level and considered to be freefield.

The measurements were made using a 1-minute resolution in L_{Aeq} and using Fast and A weighted filters. Field calibration was undertaken in the field at the beginning and end of the survey.

Survey(s) carried out by	Scott Castle BSc(Hons) Env Health, MCIEH CEnvH PGDip Acoustics MIOA
Equipment Used	Svantek 307A Class 1 Sound Level Meter
Equipment Used	Castle Acoustic Calibrator – Serial No. 041173
Location	See below
Duration	10 th Jan to 23 rd Jan 2024

Table 2. Survey Information



Figure 4. Survey Location

4 Sound Survey Results

4.1 Daytime

It is understood that the hours of use of the closest business are 06:00-18:00 hours. The 18:00 hours has been marked on the attached graph to demonstrate a decline in sound pressure levels between 18:00 and 19:00 hours. Also marked is the commencement of Storm Isha.

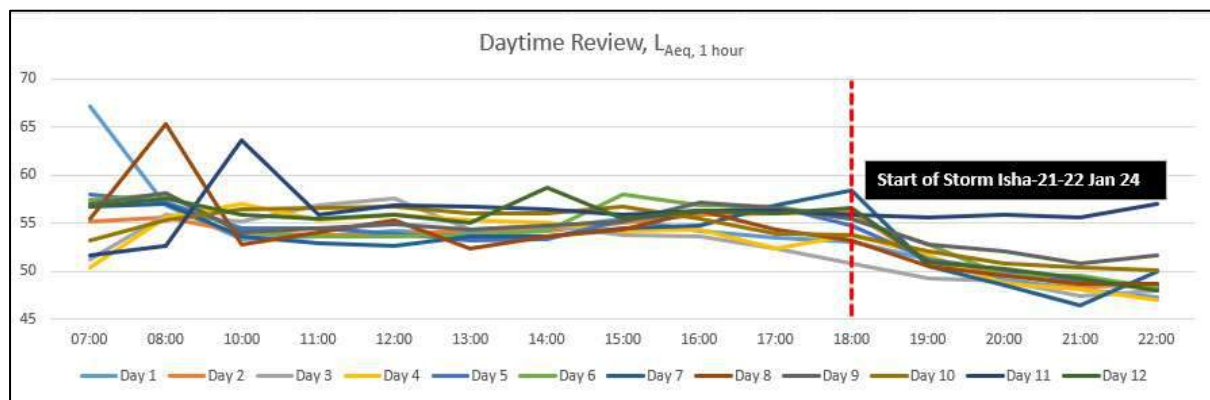


Figure 5. Time History Trace for Daytime, 07:00-23:00 hours, $L_{Aeq,1 \text{ hour}}$

4.2 Night Time

In reviewing the night time soundscape it is apparent that the noisier hours are those just before 07:00 hours and specifically, 06:00-07:00 hours. This is consistent with the nearby business which utilises the closer of the two hard stand operating from 06:00 hours, Monday to Saturday.

It is normal to expect to see a rise in the sound pressure levels in the morning period, especially before sunrise with the dawn chorus in effect.

In reviewing the $L_{Aeq,1 \text{ hour}}$ distribution for the night time period, it is apparent that the weekdays were slightly increased over the weekend periods. This is shown in Figure 6 below

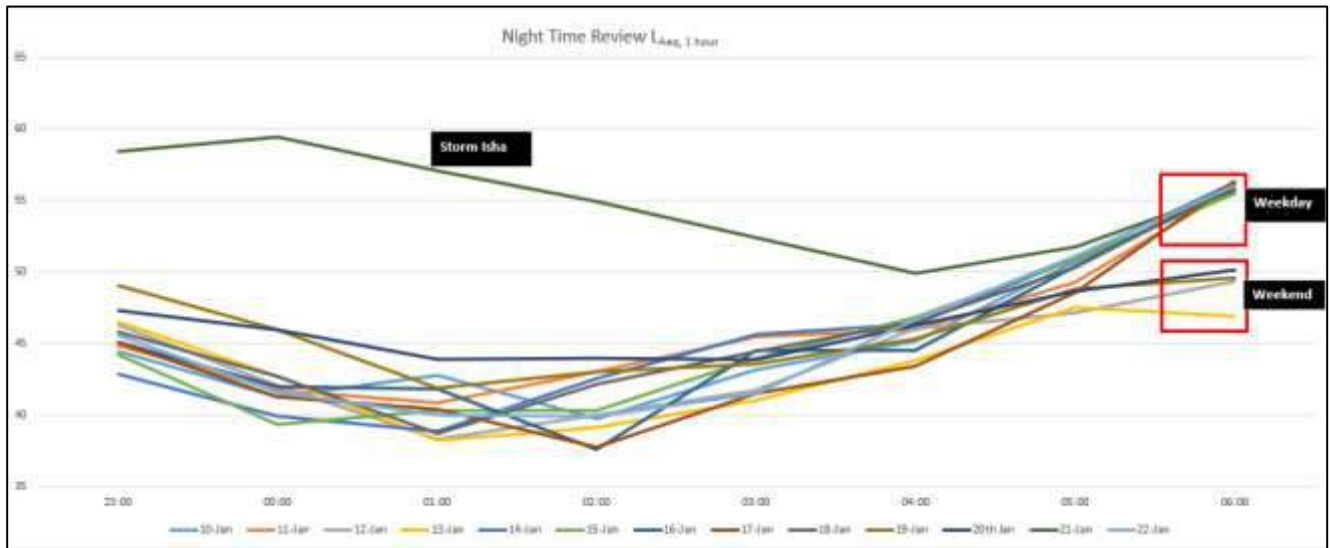


Figure 6. Time History Trace for Night Time Period, 23:00-07:00 hours, $L_{Aeq,1\text{ hour}}$

It was also apparent from Figure 6 above that night 12 data was removed due to storm Isha which occurred from the latter part of 21st to 22nd Jan 2024 and had storm warnings in place for the UK.

In reviewing a one-minute resolution for the 06:00-07:00 hours period, the weekend elements are more noticeable with lower sound pressure levels for nights 3 and 4 and nights 10 and 11 respectively which relate to the weekends.

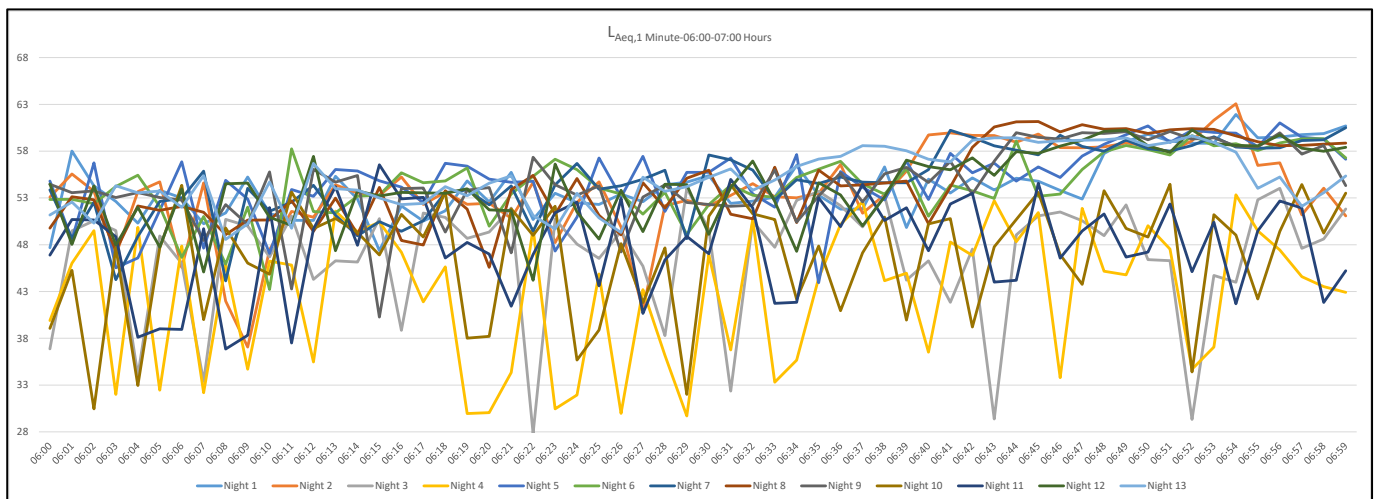


Figure 7. Time Period 06:00-07:00 hours – $L_{Aeq,1\text{ minute}}$

Figure 7 above would also indicate an increase in sound pressure levels around 06:40 hours. Again, this is consistent with the operation of the closer business to the survey position departing the site early and is consistent with the previous planning conditions applied to the site.

4.3 Distance Attenuation

Assuming a worst-case scenario of a 1-hour L_{Aeq} of 56dB, measured at the survey location the distance to the nearest property is approximately 48m. The expected attenuation is therefore $20\log(48/12)$ to provide 12dB of attenuation. This is based on the rationale of the survey identifying movements of the closest vehicle hardstand approximately 12 metres away which is operated by a waste company. This would equate to 44dB at the nearest property and with a worst-case scenario with an open window achieve 31dB $L_{Aeq, 1 \text{ hour}}$ inside the property. The night time period ie 23:00-07:00 hours for a bedroom period is 30dB $L_{Aeq, 1 \text{ hour}}$. A 1dB increase would not be noticeable.

Using an average of the 12 nights measured (ie not including Storm Isha), the sound pressure level for the whole of the night time period was 47.9dB $L_{Aeq, 8 \text{ hour}}$ at the survey location. Again, with the same attenuation provided, this is predicted to be 36dB $L_{Aeq, 8 \text{ hour}}$ externally at the nearest façade of the NSR and with an open window (13dB attenuation), this is predicted to be 23dB internally. This comfortably satisfies BS8233:2014 and WHO guideline values for internal sound pressure levels during the night time period.

Activities from Stepney Commercials hardstand due to their location (ie shielded by other commercial structures on the site) and distance from the nearest residential receptor (Meadowcroft approx. 115m) are unlikely to generate any noise concerns.

It is worth noting also that the Meadowcroft property is located much closer to the A281 and will likely experience increased sound pressure levels from the road traffic noise generated which will serve as masking noise.

5 Uncertainty

There is always uncertainty associated with measurements made on site. It was noted that dog barking occurred intermittently from an adjacent property and also there was also a horse stable adjacent to the ISO container where the microphone was located. Both sound sources will inevitably be included within the dataset. Given the proximity of Gatwick airport, it is also likely that some aviation noise is contained within the dataset. As previously stated, due to the site and more specifically, the layout of the buildings on the site, any activities at the Stepney Commercial site are likely to be attenuated before reaching any residential properties.

6 Conclusion

The current application seeks to make permanent the temporary consents previously issued by Horsham District Council. The measured survey dataset demonstrates that the previously issued planning conditions remain complied with.

The daytime soundscape indicates a drop off commensurate with the stated hours and the historic, albeit lapsed conditions. The morning soundscape, ie 06:00-07:00 hours also shows sound generating activities, albeit towards the latter part of the hour, ie 06:45 onwards which are likely to arise from the closer of the vehicle workshops/hardstands.

There is limited line of sight between the residential premises and the commercial hardstanding/buildings.

On the basis of the information presented, planning permission should not be withheld on noise grounds.

Lee Goosens
Lake Investments
(Via email)

3rd October 2025

Dear Lee

Stonehouse Farm – Lot 8, Handcross.

Further to our discussion, and recent reporting (Acoustic South East J3958 dated 19/12/2024), I write to reiterate a number of points.

Prior to these, it is relevant to understand some elements around the assessment of sound and its behaviour. Sound is argued as being measurable whilst noise is indicated as being unwanted sound (definition from the World Health Organisation, Guidelines for Community Noise dated 1999).

The Behaviour of Sound

In order to appreciate noise reports, it is important to know how sound behaves and propagates. Some details are provided in the following paragraphs.

Sound is measured in decibels (dB) and is often a relative sensation as one sound can mask another.

The dB scale is a logarithmic scale as opposed to a linear scale and it is important to note the following:

- A change in 1dB is not considered noticeable by a human
- A change is 3dB is only just considered noticeable by a human
- A change in 10dB is classed as a doubling or halving of loudness to a human, if a sound is at least 10dB below existing sound levels, it is generally considered that it does not contribute to the existing environment.
- The above is taken from Bruel and Kjaer, Measuring Sound, September 1984
- Smith,Peters,Owen, 1996 also refers as follows:

“Subjectively, an increase of 3dB is just noticeable, whereas an increase of 10dB, a tenfold increase in intensity, is judged by most people as a doubling of loudness. A 1dB increase is just detectable under the most favourable laboratory conditions.”

Sound emanating from a point source (a stationary object) reduces by 6dB each time the distance from it doubles (this is known as the inverse square law).

Sound emanating from a continuous line source (such as a road or a railway) reduces by 3dB each time the distance from it doubles.

Sound measured 1 metre from a hard surface increases by 3dB due to the reflection effect of the surface (commonly referred to as a “façade level”).

For sound to be classed as “free field”, it should be at least 3m from a reflective surface in the plane where it is measured (for example, when measuring road noise, a wall is considered to be the reflective surface but the ground is not, however when measuring aircraft noise, the opposite is true).

The image below, gives typical sound level values for everyday examples:

Painful Acoustic Trauma	140	Shotgun blast
	130	Jet engine 100 feet away
	120	Rock concert
Extremely Loud	110	Car horn, snowblower
	100	Blow dryer, subway, helicopter, chainsaw
	90	Motorcycle, lawn mower, convertible ride on highway
Very Loud	80	Factory, noisy restaurant, vacuum, screaming child
Loud	70	Car, alarm clock, city traffic
	60	Conversation, dishwasher
Moderate	50	Moderate rainfall
Faint	40	Refrigerator
	30	Whisper, library
	20	Watch ticking
	dB levels	

Figure 1. Typical Noise Level Examples

Outcomes from the Acoustic Report (J3958)

The measured sound pressure levels adjacent to the noise sensitive receptor at Hill Crest Farm were consistent across the survey period and only changed by 1dB. These were 59dB – 60dB L_{Aeq} , 07:00-19:00 hours – daytime. The soundscape at Hillcrest Farm is dominated by road traffic noise from Handcross Road.

Noise modelling software was used to predict the noise break out from the simultaneous uses of the proposed offices and the proposed B2/B8 uses.

The proposed offices were set to 65dB $L_{Aeq,T}$ internally, and the B2/B8 use was set to 85dB $L_{Aeq,T}$ internally, at an internal soundscape where employees would be required to wear hearing protection. These internal noise levels were used to represent a worst case(s).

The predicted noise break out from the proposed uses was 24dB $L_{Aeq,T}$ (rounded) at the nearest noise sensitive receptor. This was 22dB below the measured background sound pressure levels for the site and would not be audible.

To ensure a robust assessment, vehicle passes were also considered passing the long track adjacent to Hillcrest Farm. The outcome was that in a worst-case hour, the vehicle passes were predicted to be 44dB $L_{Aeq,T}$ and this was compared against 59dB $L_{Aeq,T}$ for the ambient soundscape. Again, the passes would not likely be audible.

Consented Uses

It is recognised that the current consented uses of the site are an AD plant and a robotic milking parlour. The AD plant forms the site where the offices are proposed, and the larger building is the consented milking parlour. It should be noted that the AD plant is currently in a dormant state and the milking parlour has not been fully constructed. Both uses will generate a noise impact.

Anaerobic Digestion (AD) Plant

Presently a dormant AD plant is located on part of the site.

When operational these are noisy processes with multiple pumps, stirrers, fans, deliveries (HGV), mobile plant ie dozer loaders etc to facilitate movement of waste products, condensers, fans, flares and combined heat and power plant type generators and/or engines. Such plant will also not just run during the daytime period, but elements of the plant for safety reasons will inevitably run 24/7. Images of the AD plant can be seen in Figure 2 below.



Figure 2. AD plant, site images



Figure 3. Consented Dairy/Milking parlour/Proposed B2/B8 Unit

Based on the supporting information for the DC/14/0729 application to Horsham District Council, a 237kW AD system engine was proposed. The following assumptions have been made;

The noisy elements of the AD system occur within the constructed building, as opposed to the 2 larger tanks which occupy the rectangular building adjacent (see Figure 2 above). On inspection at site, it is estimated that the building material is a Kingspan 1000 profiled insulated metal sheet with a R_w of 24dB.

From supporting documents from the original application an unsilenced engine has a sound pressure level of 103.1dB at 1m. To account for a reverberant internal space, a 6dB correction is applied. This accounts for an internal sound pressure level of 109.1 dB $L_{Aeq,T}$.

Subtracting 24dB through the Kingspan structure would provide 85dB externally. Importantly, from inside to outside, a 6dB loss to atmosphere occurs, so the outside sound pressure level is likely to be 79dB at 1m. Using a conservative 10log distance attenuation to the footpath measured at 8.4m from the building, this is estimated to be a distance attenuation/reduction in sound energy of 9.2dB. At the footpath position, the sound pressure level will therefore be 69.9dB, rounded to 70dB for the engine noise alone.

The accompanying documentation also specifically references an unsilenced gas exhaust system of 120dB at 1m. This is assumed to be the vent pipe measured at 14.4m from the building edge. Incorporating an additional 8.4m to the footpath position, this would account for 22.8m of distance to the footpath. This would account for a reduction of sound energy of 27.2dB using a 20log relationship for the point source (ie $20\log(22.8/1)=27.2$). The unsilenced gas system is therefore likely to be 92.8dB at the footpath position.

From photographs taken on site (see above), it is also apparent that there is external plant likely to have been operating too. From experience, there will inevitably also be sound generated from HGV/tractors bringing waste products to the site, shovel loaders, and other mobile plant as well as condensers, pumps etc.

Logarithmically combining the unsilenced engine and the gas system is calculated using $10\log(10^{7.0}+10^{9.28})=92.8\text{dB}$. Even if the gas system were only to be intermittent, the level of 70dB $L_{Aeq,T}$ at the footpath would be the dominant sound.

Given that there remains a planning condition around sound from the AD plant being inaudible at Hillcrest Farm, this is also capable of being calculated.

For a sound to be inaudible at a location it must generally be at least 10dB below the measured soundscape. It is known that the measured soundscape adjacent to Hillcrest Farm is 59dB $L_{Aeq,T}$. Therefore, for a sound to be inaudible at that location, it would have to be less than 49dB $L_{Aeq,T}$.

Therefore, for the AD unit being 70dB at 8.4m, inverse square law would apply and $20\log(412/8.4)$ provide a distance attenuation of 33dB. This would be predicted to be 37dB $L_{Aeq,T}$ at Hillcrest farm and as stated, given the range below the measured soundscape, this would not be audible at Hillcrest farm. The sum does also not take account of the 22m of topographical change which would likely further reduce the predicted sound pressure level at Hill Crest Farm.

It stands to reason that the noise level with the plant operating inside the AD space and the gas system would be noisy and easily apparent at the footpath location.

The proposed office and B2/B8 units using the noise modelling software predicts 47dB $L_{Aeq,T}$ at the footpath location.

Comparing the operational AD system of 70/93dB $L_{Aeq,T}$ rounded provides a substantial increase in noise levels and it is argued that the proposed office and B2/B8 units will be significantly quieter than the historic uses.

Dairy Unit

The dairy unit was consented by Horsham District Council under DC/06/1106. The planning decision notice has limited references to noise, other than deliveries/loading not to occur prior to 07:00 hours (condition 8), as well as doors to be kept closed when the facility is in operation (condition 12).

A recent Horsham application for a milking parlour (DISC/22/0306) lists a similar operation and had a milking machine measured as 75dB $L_{Aeq,1minute}$ at 1m. This complete with cows being moved into and out of the building is likely to also contribute to the soundscape, as measured at the footpath location.

In combination with the AD plant, the dairy location, would likely also be noticeable at the footpath location.

Summary

It is evidenced from the information above that the proposed offices and proposed B2/B8 unit would not be a concern at the nearest residential receptor.

It is also evidenced that the proposed new uses, would be quieter than the historic consented uses of the AD plant and the milking parlour. Whilst the location of the proposed offices and B2/B8 uses is rural, it is likely to have been dominated by a commercial/industrial soundscape.

Any questions or queries, please do not hesitate to call.

Yours sincerely



Scott Castle
Director
Acoustic South East

Enclosed : Stonehouse Farm Planning AD Description from DC/13/0259

Christopher Acker.

GREEN GAS TECHNOLOGIES LTD

DC/14/0729

System Description & Operation

Stonehouse Farm

Bob Phillips

6/13/2014

PLANNING
RECEIVED

04 JUL 2014

Name
Ref

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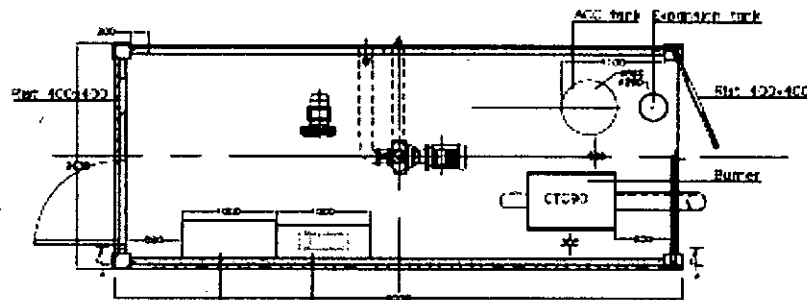
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Introduction

This document describes the proposed Anaerobic Digestion system for Stonehouse Farm, in Sussex. It will include a general disposition of the system, the system's configuration and principles of operation.

The control container houses an electrical fuse, switching gear and PLC in an Electrical Panel, human interface is via a PC.

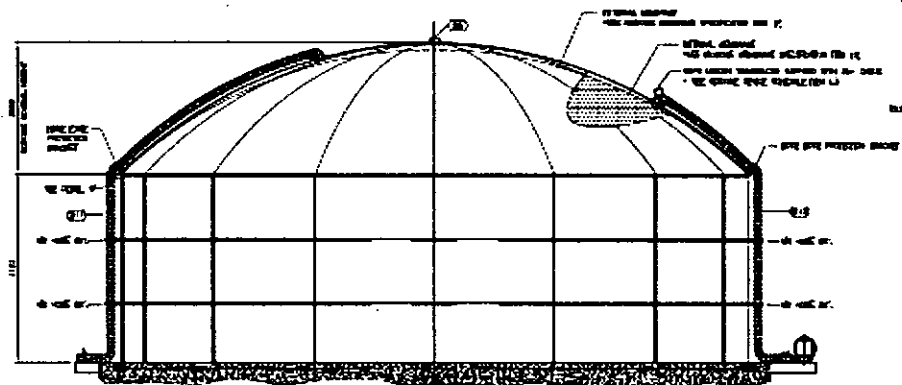
The main substrate pump is also located in the Control Container, along with the Gas Compression Fan, Water Boiler (gas fired) and hot water management system.



The container is equipped with fire and gas detection sensor, also linked to the PLC to ensure safety.

Methanation Digesters

The system will be equipped with two 550 m³ methanation digesters. The digesters will be constructed of Glass Reinforced Plastic panels. The tank when erected will stand 4,123 metres high and have a diameter of 13,66 metres.



A Biogas Class II PVC dome adds a further 2,85 metres to the height of the digester.

The tanks are double sealed with expansion compensating sealant, and are built in a depressed catchment pit at a depth of 3 metres. The whole catchment pit is in a ^{sandstone} ~~chalk~~ stratum that is lined with impervious concrete with an integrated sump equipped monitoring sensors and pumping equipment.

The pit has the capacity to retain more than the entire content of both digesters.

The digestate in the digesters will be agitated by the Gas Mix system developed by Landia. This system ensures adequate agitation of the digestate without the need for moving parts within the tank, thus negating the possibility of tank damage from within the tank.

The digester tanks will covered by PVC membrane to capture and store the biogas. This arrangement can capture and store up to 220 m³ gas each. This is equivalent to 2 hours gas supply to the CHP.

Digestate Interface to Digestate Dryer

The transfer of completed digested will take mechanically and without the digestate making contact with the atmosphere until it enters the dryer.

At this moment in time it is not known whether the dryer will be capable of streaming digestate continuously through its system or whether it operates in a batch type mode.

In any event the design of the AD system can facilitate a buffering of completed digestate at an equivalent of three days output.

Gas Interface to Combined Heat & Power (CHP) Generator

Gas will have its operational pressure increased from a raw gas pressure of 0.5mbar to 8mbar, to an operational pressure of 100mbar to feed the CHP. This will be achieved using a centrifugal turbo fan.

The compressor will be controlled and regulated by the system PLC.

Gas Flare

In the event of a CHP breakdown and an eventual accumulation of gas, the PLC will automatically start the flaring of excess gas, once the gas feed pressure from the methanation tanks reaches a pressure greater than 8mbar.

Operational Description

General

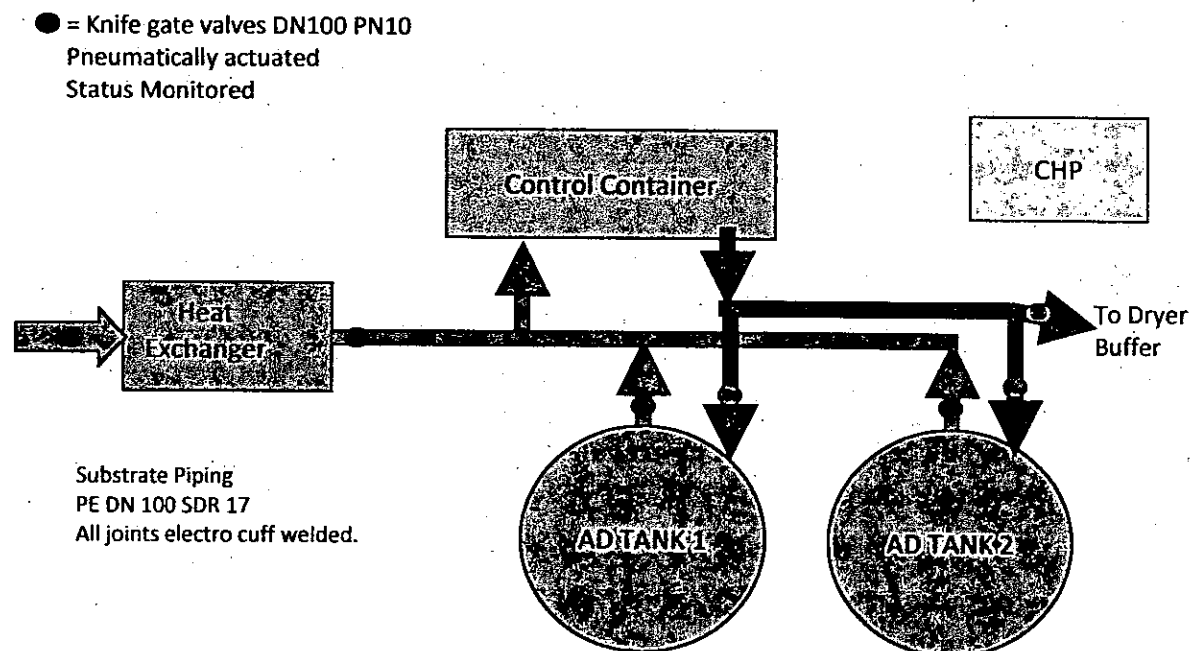
Operationally the AD system will operate as a batch flow single stage stirred process as the substrate entering the system has already been thoroughly hydrolysed.

In all likelihood the process will call for a 14 to 20 day average retention time.

The system will deliver 38m³ of substrate to the process daily portioned in batches 4 to 8 portions. The feed in rate will be determined during the system commissioning phase of the installation.

Substrate Movement

All substrate movements are controlled and monitored by the PLC in accordance with schedules developed by the operator.



The two AD tanks can operate in Mesophilic (38°C – 42°C) or Thermophilic (55°C to 58°C) depending on the requirements of the operator. The tanks can also be operated in parallel or cascaded modes.

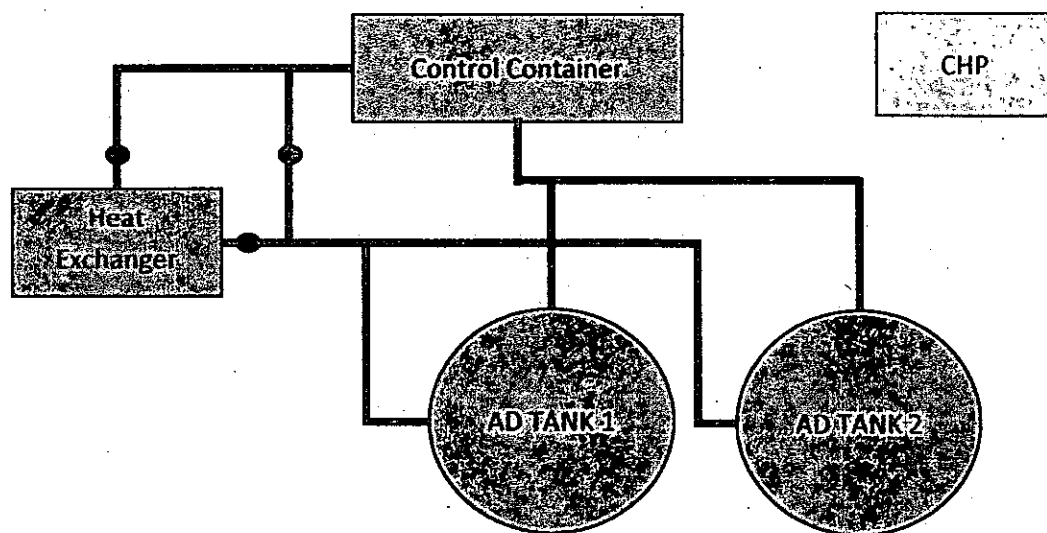
The PLC controls the flow of substrate to and from the relevant tanks via pneumatically actuated knife gate valves. These valves are equipped with position sensors. The valves are normally closed with air pressure from a compressed air reservoir holding in a closed state. A valve is activated (opened) by the activation of a magnetic switch to reverse the air pressure to the cylinder actuator.

In the event of a system failure or a power failure, all valves will be automatically closed.

All valves are checked by the PLC before and during pumping operations. Should a valve be in a wrong position or be in an in-between position the pumping operation will be inhibited and an error event broadcast in the PLC and through an SMS link up, to the operator.

Digester Heating System

In the Stonehousefarm application as much of the heat in the substrate fed to the AD plant will be conserved, thus reducing the amount of biogas used in the maintenance of the digester temperatures.



The control container includes a gas fired boiler capable of providing up to 90kW of energy to the digester tanks. To ensure a stable operation of the boiler, the hot water circuit includes an accumulator tank.

The digester heaters have their own temperature regulation circuits on the tank wall. This enables the digesters to operate in different digestion modes, mesophilic or thermophilic, as determined for the most efficient operation of the system.

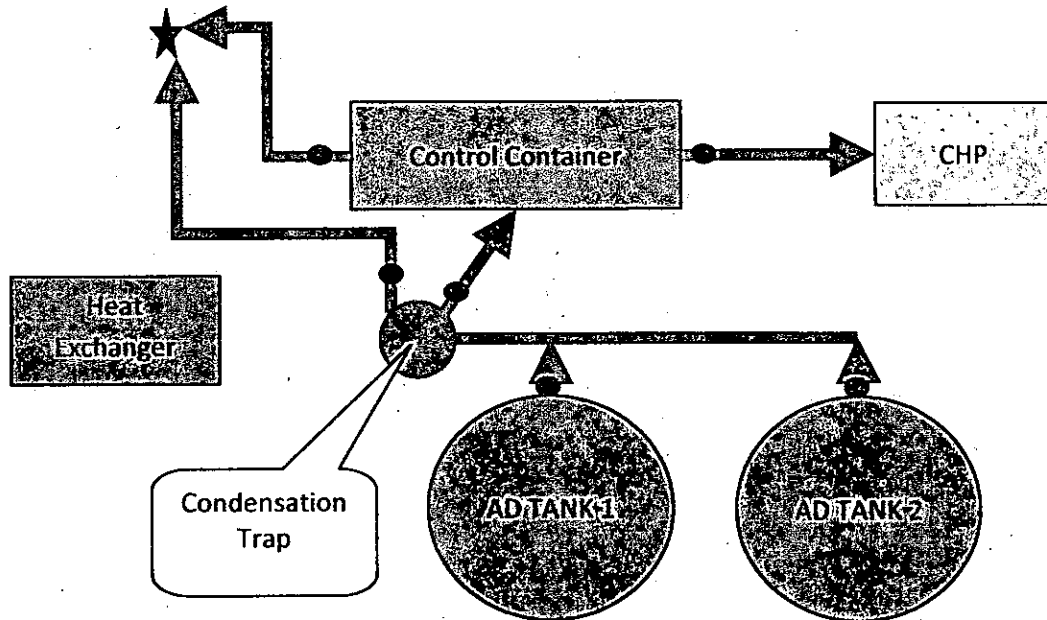
The inclusion of the heat exchanger can be selected as desired hot water system. The PLC will manage the connection and disconnection in accordance with the transfer of substrate; which it also manages.

The CHP hot water system is not necessarily integrated with the AD hot water system, but could be integrated should that be operationally required.

The main feed pipes for the flow and return of water in the system insulated 32mm alupex pipes. Each digester tank has its own circulation pump with a shunt valve controlled by the PLC from criteria regarding target temperature, max flow temperature set and the temperature measured in the digester.

The heating pipes are located in the floor of the digesters comprising 25mm alupex heater pipes embedded in heat transferring cement.

Gas Management



The gas pipe work is built using DN100 PE pipe SDR11. Apart from when joining gas equipment, all joins in the pipe work are achieved using electro-welded sleeve joints. All pipe work is tested post-installation and post maintenance using an inert gas pressure test at 3 Bar for a period of 3 hours.

All gas pipe work is within the bounds of the building within which the AD plant is installed. Should it be necessary to feed gas outside the bounds of the building, piping will continue in its PE format underground and be migrated to 2" steel piping.

All piping will be clearly marked as gas bearing.

There is no purpose built gas reservoir; each of the digester tanks has the capacity of storing 220m³ of biogas, the equivalent of 4 hours operation of the CHP.

The gas system is equipped with a condensation trap for the removal of excess water vapour in the biogas and to also reduce H₂S.

The gas, after the condenser, is piped to the Control Container where it is monitored by a gas analyser before passing to a gas compressor. The compressor compresses the gas from a pressure range of 0,2 – 8 mBar to the range 30 mBar to 100 mBar, depending on the pressure requirement of the gas fuelled equipment.

Gas pressure is monitored pre-condensation trap and post compressor. Data from sensors are fed to the PLC.

The gas flow is controlled by the PLC, monitoring gas pressure and quality. Valves located at critical points throughout the gas network, offer supervision of gas flow and isolation in maintenance situations.

Condensation Trap

The condensation trap consists of a 200 litre to 400 litre chamber filled with non-glazed porcelain beads. The raw gas from the methanation digesters is fed to the bottom of the porcelain bead bed and allowed to percolate upwards through the beads. The dried gas is fed off from the top of the chamber.

The bottom section of the chamber collects the condensate and through 25 mBar water lock. Condensate is drained to the drainage sump, a sump which is periodically sampled and tested before draining outside of the system.

Hot Flare

Flaring of excess gas is arranged in two modes; a low pressure mode for when the CHP is running but the gas production exceeds consumption; and a high pressure mode for when the CHP is out of operation and the gas production is still too high.

Generally the flare is under the control of the PLC, however manual operation is also possible.

Environment & Safety

Environment

Precipitation and Flooding

The system is installed under a roofed structure. As a result the system will be somewhat protected from precipitate flooding. However any influx of water will be well drained and all equipment is well protected from water damage.

The location of the site, on high ground, negates the possibility of flooding caused by overflowing water courses.

Bio-aerosols

Because the plant is fed from a Thermo Aerobic Digester where complete hydrolysis and pasteurisation is achieved, the substrate and resultant digestate is completely free of bio-aerosols and odour making hydrocarbons.

Accidental Discharge of Substrate or Digestate

In the event of damage to containment vessels, the digester tanks are placed in a bunded pit capable of containing the entire content of both digester tanks.

Substrate piping is both robust and protected, however if whilst carrying out maintenance of the piping system the piping is located in a impermeable cement area, with a sump for collection of eventual run-off from opening a pipe for maintenance.

Generally a procedure in the operator's manual calls for the flushing of substrate pipes prior to the commencement of a maintenance intervention.

Any accidental spills from piping, valve or pump service and maintenance will be caught up in the drainage sump and can be re-entered to system.

In the event of a total system failure and complete failure of the digesters, all substrate can be contained until it can be removed for proper disposal at another site, if necessary.

Gas Leaks and Fire

The Control Container and the roof of the building are equipped with smoke and hydro-carbon gas detectors, monitored by the PLC. In the event of them being triggered, an audio and visual alarm will be activated, along with a warning transmitted through SMS.

Depending on the nature and location of the sensor trigger, the PLC will shut down part or all of the systems operations, venting gas to the flare.

Safety

The plant will at all times be subject to current regulations and directive of Health, Safety and Environment, HSE.

The AD plant is secured in a building with controlled access.

Access to the AD plant internally to the total site will be controlled and personnel access limited. Any visitors to the plant will at all times be accompanied by a qualified system operator.

In the event of maintenance or repair of digesters or in the digester pit, personnel will be required to carry H2S detectors. Whilst there are personnel working in the digesters or in the digester pit, a safety watch is to be kept from a safe distance from the digesters.

Phillips
June 2014

A handwritten signature in dark ink, appearing to read 'R. Phillips', is written over the printed name and date.

Engine noise pressure level at 1m [dB]	75.8	76.7	89.7	96.2	98.5	97.7	93.7	89.7
Damping attenuator [dB]	-8	-15	-30	-42	-38	-44	-46	-32
dB(A) correction	-26.4	-16.1	-8.6	-3.2	0	1.2	1	-1.1
Subresult noise pressure level [dB(A)]	41.4	45.6	51.1	51	60.5	54.9	48.7	56.6
Noise pressure level at 1m [dB(A)]	63.6							

Exhaust gas system - silenced

Frequency	63	125	250	500	1k	2k	4k	8k
Soundpressure level [dB] (at 1m)	95.6	98.4	98.4	104.2	120	100.3	100.3	87
Soundpres. reduction resonance silencer	-7	-17	-23	-12	-23	-7	-3	-1
Soundpres. reduction absorption silencer	-16	-37	-35	-40	-47	-43	-38	-28
dB(A) correction	-26.4	-16.1	-8.6	-3.2	0	1.2	1	-1.1
Soundpressure level [dB] (at 1m)	46.2	28.3	31.8	49	50	51.5	60.3	56.9
Soundpressure level [dB] (at 1m)	62.8							

From: "Sioly, Cyril" <cyril.sioly@cogenco.com>
 Subject: **Noise Level 250kW**
 Date: 3 July 2014 15:04:58 GMT+01:00
 To: [REDACTED]
 Cc: [REDACTED]
 1 Attachment, 19.6 KB

Mr Cooper,

Following our phone discussion I could not find any information regarding noise data of a 250kW unit. Nevertheless please find enclosure the noise data of a 237kw unit which should have a similar noise spectrum.

Best regards

Cyril Sioly

Cogenco Limited

Mobile +44(0) 7827 982751

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Sound Pressure Levels



CGC 237	Engine: MAN E 2842 E 312
Overall level	65 dB(A)

Speed:	1500	RPM
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Engine - Unsilenced

Frequency	63	125	250	500	1k	2k	4k	8k
Engine noise pressure level [dB] (at 1m)	75.8	76.7	89.7	96.2	98.5	97.7	93.7	89.7
dB(A) correction	-26.4	-16.1	-8.6	-3.2	0	1.2	1	-1.1
Subresult noise pressure level [dB(A)]	49.4	60.6	81.1	93.0	98.5	98.9	94.7	88.6
Noise pressure level at 1m [dB(A)]	103.1							

Exhaust gas system unsilenced

Frequency	63	125	250	500	1k	2k	4k	8k
Soundpressure level [dB] (at 1m)	95.8	98.4	98.4	104.2	120	100.3	100.3	87
dB(A) correction	-26.4	-16.1	-8.6	-3.2	0	1.2	1	-1.1
Soundpressure level [dB] (at 1m)	69.2	82.3	89.8	101	120	101.5	101.3	85.9
Soundpressure level [dB] (at 1m)	120.2							

With canopy

Frequency	63	125	250	500	1k	2k	4k	8k
Engine noise pressure level [dB] (at 1m)	75.8	76.7	89.7	96.2	98.5	97.7	93.7	89.7
Damping canopy [dB]	-15	-23	-30	-35	-38	-39	-41	-40
dB(A) correction	-26.4	-16.1	-8.6	-3.2	0	1.2	1	-1.1
Subresult noise pressure level [dB(A)]	34.4	37.6	51.1	58.0	60.5	59.9	53.7	48.6
Noise pressure level at 1m [dB(A)]	65.0							

Air attenuators

Frequency	63	125	250	500	1k	2k	4k	8k
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