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Noise Impact Assessment Report

Change of use of a redundant agricultural barn to commercial use comprising Class B8 (Storage) at:

Broomlands Farm
Robin Hood Lane
Warnham
West Sussex
RH12 3RR

Report Reference 20765.NIA-RPT.01

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EXECUTIVE SUMMARY

ES Acoustics Ltd have been commissioned by The Broadbridge Heath Trust to prepare a noise impact assessment in support of a planning application for the proposed change of use of a redundant agricultural barn to a commercial use comprising Class B8 (Storage) at Broomlands Farm, Robin Hood Lane, Warnham, West Sussex, RH12 3RR.

An environmental noise survey and noise impact assessment have been undertaken to assess the noise impact from various activities associated with the proposed B8 Storage use.

Representative background sound levels and residual sound levels have been measured over the key operating periods in accordance with BS 4142:2014+A1:2019.

The measured background sound levels alongside relevant assessment scenarios relating to general vehicle noise and HGV movements have allowed a BS 4142:2014+A1:2019 assessment to be undertaken to establish the likelihood of adverse impact of the proposed operations.

The assessment scenarios are as follows:

1. General Vehicle Movements: 4 no. two-way vehicle movements in the morning and evening peak hours to represent a worst-case scenario with regards to general traffic movements
2. HGV Movements: from the site entrance on Robin Hood Lane to the front of the unit, and from the front of the unit to the site entrance on Robin Hood Lane

The Rating Noise Level of each assessment scenario is predicted as shown in the table below, compared with the residual noise level and representative background noise level:

Scenario	Period	Existing Residual Noise Level dB $L_{Aeq, T}$	Existing Background Sound Level dB L_{A90}	Rating Level at Receptor Façade dB $L_{Aeq, T}$	+/- compared against background dB
1	Typical weekday	55 – 56	45	36	-9
	Typical Saturday	51	41	36	-5
2	Typical weekday	55 – 56	45	45	0
	Typical Saturday	51	41	45	+4

The methodology within BS 4142:2014+A1:2019 notes that the initial noise impact can be estimated by comparing the Rating Level due to the sound sources under assessment with the existing background noise level (L_{A90}) when the noise source is not operating. The lower the rating level is relative to the measured background sound level, the less likely it is that there will be an adverse impact or significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound having a low impact, depending on the context. Note that contextual factors must be considered in order to draw final conclusions on the actual noise impact.

When considering both the comparison of Rating Level vs background sound level, and the contextual factors in this specific scenario, it has been concluded that:

- **Scenario 1 (general vehicle movements):** In all cases, the Rating Level compared with the background sound level is sufficiently low to be indicative of a low likelihood of adverse impact. Contextual factors have further justified this outcome.
- **Scenario 2 (HGV movements):** During a typical weekday, the Rating Level compared with the background sound levels would be sufficiently low to be indicative of a low likelihood of adverse impact. Contextual factors have further justified this outcome. During a typical Saturday, the Rating Level compared with the background sound levels would be indicative of a possible adverse impact. However, when considering the contextual factors of the scenario (principally the absolute sound level and the number of occurrences of the noise event level), it is the professional opinion of ES Acoustics that this scenario would also be indicative of a low likelihood of adverse impact.

Note that the calculations and assessment scenarios consider that the best practicable means of noise control for the use of the site are followed, as detailed within Section 6 of this report.

Noise limits for any potential future external building services plant installations have been set to ensure that the amenity of the surrounding residential receptors is maintained, as summarised in the table below:

Receiver	**Lowest Background Sound Level** **dB L_{A90}**	**Maximum plant noise Rating Level at 1m from receptor window** **dB $L_{Ar,Tr}$**	**Maximum plant Specific Noise Level at 1m from receptor window** **dB $L_{Ar,Tr}$**
1m from the window of all nearby noise sensitive receptors	41	36	31

It is concluded that the proposed B8 Storage use would be acceptable at the site and would not have a negative impact on the surrounding residential properties.

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1 INTRODUCTION

ES Acoustics Ltd have been instructed by The Broadbridge Heath Trust to prepare a noise impact assessment in support of a planning application for the proposed change of use of a redundant agricultural barn to a commercial use comprising Class B8 (Storage) at Broomlands Farm, Robin Hood Lane, Warnham, West Sussex, RH12 3RR.

The purpose of this report is to;

- Review appropriate national and local planning policy, legislation and guidance relevant to the proposal;
- Undertake an environmental noise survey on site to determine background noise levels representative of the closest noise sensitive receptor locations;
- Undertake a noise impact assessment of the proposed operations and activities in accordance with BS 4142:2014+A1:2019 to assess the likelihood of adverse impact of the proposal whilst taking into account the context in which the sound occurs; and
- Where appropriate provide outline mitigation advice to ensure no adverse impact upon the closest noise sensitive receptors.

2 SITE CONTEXT AND BACKGROUND INFORMATION

2.1 Site Description

The application site comprises land and buildings at Broomlands Farm, which is situated approximately 500m to the north of Broadbridge Heath and approximately 1.2km south of the built-up area of Warnham. The buildings sit in a plot that extends to an area of 0.72 hectares and is made up of a large area of hardstanding with 4 traditional farm buildings.

The farm buildings were historically an integral part of a wider dairy farm on the site. Since the decline of dairy farming on the estate, the buildings have become redundant and have fallen into disrepair. The proposed development seeks to revitalize the larger barn (building 1) and lean-to (building 2) positioned to the north and provide the site with a sustainable new future through a sensitive and high-quality conversion.

The application buildings are bordered by a smaller redundant barn to the south-west and two further barns further southwest. An older farm building is currently being converted to residential use (approved by Horsham District Council planning reference DC/20/0716) to the west. Two residential dwellings are positioned to the north-east and north-west of the plot.

An indicative site plan is shown in Figure 1 below, which shows the application site boundary (red), application site (orange) and closest noise sensitive receptors (green):



Figure 1 Indicative site plan (Image Reference: Batcheller and Monkhouse Location Plan - Crown copyright and database right 2024 (licence number 100059532)

2.2 Proposal

The applicant seeks a change of use from agricultural to commercial use comprising storage (Class B8).

As part of the development and refurbishment, the buildings would be reclad with green metal sheeting to elevations with roller shutter doors at the front and pedestrian exit doors to the northern side.

Vehicles would access the site via the shared access to the north of the site along Robin Hood Lane, which would be no change to the existing situation.

Parking for the site and future use would be provided to the east of the commercial units, as shown in Figure 2 below.



Figure 2 Block plan showing proposed parking spaces to the east of the commercial units

The purpose of this report is to establish the suitability of the site for B8 use with respect to noise. At this stage a specific site operator is not yet known. Therefore, a detailed noise impact assessment of specific activities and operations would not be possible at this stage. Generally speaking, the key noise associated with a B8 use would vehicular activity, including both staff and customer vehicles visiting the site as well as HGV movements.

As part of the supporting information submitted with the planning application, a Transport Note has been prepared by i-Transport (dated 5th March 2024) for the proposed change of use. The statement details the site context, accessibility, existing use, highlights the proposed operation and use and summarises the cumulative impacts of the scheme on traffic and transport grounds. The proposed use trip generation for the B8 storage use as noted in the Transport Note are copied below for ease of reference:

Time Period	Vehicular Trip Rates (per 100sqm)			Trip Generation (780sqm)		
	Arr	Dep	T-W	Arr	Dep	T-W
Morning Peak Hour (0800-0900)	0.363	0.112	0.475	3	1	4
Evening Peak Hour (1700-1800)	0.064	0.320	0.384	1	2	3
Daily (0700-1900)	2.380	2.443	4.823	19	19	38

Table 1 Proposed B8 Use: Warehousing (Commercial) – Total Vehicle Trip Rates and Trip Generation (taken from Table 5.1 of Transport Note prepared by i-Transport, 5th March 2024)

As well as total vehicle trip rates, the rates associated with HGV movements are also reported within the Transport Note as follows:

Time Period	Vehicular Trip Rates (per 100sqm)			Trip Generation (780sqm)		
	Arr	Dep	T-W	Arr	Dep	T-W
Daily (0700-1900)	0.667	0.593	1.260	5	5	10

Table 2 Proposed B8 Use: Warehousing (Commercial) – HGV Trip Rates and Trip Generation (taken from Table 5.2 of Transport Note prepared by i-Transport, 5th March 2024)

A summary of the trip generation exercise within the Transport Note indicates that the proposed B8 use has the potential to generate the following:

- *An additional 3-4 two-way vehicle movements in the morning and evening peak hours (equivalent to one vehicle every 15-20 minutes)*
- *Around 40 two-way additional vehicle movements across a 12-hour day*
- *Of the total daily vehicle movements, around a quarter of these could be HGV vehicle movements which would occur for the most-part outside of the typical network peak hours.*

It is understood that the applicants would be expecting the following conditions to be attached to any planning approval:

- Storage use only;
- Hours of operation being limited to: 0800 hours and 1700 hours on Mondays to Fridays inclusive, 0800 hours and 1300 hours on Saturdays. At no time on Sundays;
- No steel stocking or heavy plant hire;
- No external storage; and
- No external lighting or flood lighting.

The noise impact assessment would consider the proposed operating hours as defined above and assess the transport scenarios presented within the Transport Note to determine the suitability of the site for B8 use with respect to noise.

Note that while some noise could occur within the proposed buildings themselves, a detailed assessment of this aspect is not yet possible until a future operator is established along with the specific activities, operations and equipment that might be used as part of their business. However, given that the external building fabric of the newly clad barns can be designed to contain whatever noise is generated within the premises, this is not of particular concern.

3 POLICY, LEGISLATION AND GUIDANCE

This section of the report presents the key guidance and legislation relevant to the assessment of noise from the proposed site use.

3.1 National Policy

3.1.1 National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) superseded and replaced Planning Policy Guidance Note 24 (PPG24), which previously covered issues relating to noise and planning in England.

The paragraphs relating to noise state:

180. Planning policies and decisions should contribute to and enhance the natural and local environment by; […]

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

191. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; […]

193. 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.

3.1.2 Noise Policy Statement for England (NPSE)

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

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

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

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life*

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

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

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

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

3.1.3 National Planning Practice Guidance (NPPG)

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

Response	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect	No specific measures required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific Measures required
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate & reduce to a minimum
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 3 Noise exposure hierachy

3.2 Local Policy

As noted within the Planning Statement (Batcheller Monkhouse, March 2024), the local Development Plan comprises the Horsham District Planning Framework (2015) and Warnham Neighbourhood Plan (2019). The Draft Horsham District Local Plan 2019-2036 is also currently being reviewed and is considered below. Policy and guidance with respect to noise has been reviewed and summarised below.

3.2.1 Horsham District Planning Framework (2015)

Policy 24, Strategic Policy: Environmental Protection

The high quality of the district's environment will be protected through the planning process and the provision of local guidance documents. Taking into account any relevant Planning Guidance Documents, developments will be expected to minimise exposure to and the emission of pollutants including noise, odour, air and light pollution and ensure that they:

1. *Address land contamination by promoting the appropriate re-use of sites and requiring the delivery of appropriate remediation;*
2. *Are appropriate to their location, taking account of ground conditions and land instability;*
3. *Maintain or improve the environmental quality of any watercourses, groundwater and drinking water supplies, and prevents contaminated run-off to surface water sewers;*

4. *Minimise the air pollution and greenhouse gas emissions in order to protect human health and the environment;*
5. *Contribute to the implementation of local Air Quality Action Plans and do not conflict with its objectives;*
6. *Maintain or reduce the number of people exposed to poor air quality including odour. Consideration should be given to development that will result in new public exposure, particularly where vulnerable people (e.g. the elderly, care homes or schools) would be exposed to the areas of poor air quality; and*
7. *Ensure that the cumulative impact of all relevant committed developments is appropriately assessed.*

Policy 33, Development Principles

In order to conserve and enhance the natural and built environment developments shall be required to:

2. *Ensure that it is designed to avoid unacceptable harm to the amenity of occupiers/users of nearby property and land, for example through overlooking or noise, whilst having regard to the sensitivities of surrounding development.*

3.2.2 Draft Horsham District Local Plan 2019-2036)

Policy 25 provides an update on Policy 24 as detailed in Section 3.2.1, and reads as follows:

Policy 25 - Strategic Policy: Environmental Protection

The high quality of the District's environment will be protected through the planning process and the provision of local guidance documents. Taking into account any relevant Planning Guidance Documents, developments will be expected to minimise exposure to, and the emission of, pollutants including noise, odour, vibration, air and light pollution arising from all stages of development. Development proposals must ensure that they:

1. *Address land contamination by promoting the appropriate re-use of sites and requiring the delivery of appropriate remediation. Proposals where contamination is known or suspected, or the site is within the vicinity of contaminated land, must be accompanied by a Land Contamination Assessment;*
2. *Are appropriate to their location, taking account of ground conditions and land instability;*
3. *Maintain or improve the environmental quality of any watercourses, groundwater and drinking water supplies, and prevent contaminated run-off to surface water sewers;*
4. *Minimise the impact of lighting on neighbouring uses and the wider landscape, including potential glare and spillage. Proposals where illumination is to be installed must be accompanied by a Lighting Assessment;*
5. *Demonstrate that users of residential and other noise sensitive development will not be exposed to unacceptable noise disturbance from existing or future users. Development proposals which are*

known or suspected to be noise generators, or to be sensitive to noise from nearby sites, must be accompanied by a Noise Assessment;

6. *Minimise the air pollution and greenhouse gas emissions in order to protect human health and the environment;*
7. *Contribute to the implementation of local Air Quality Action Plans and do not conflict with is objectives;*
8. *Maintain or reduce the number of people exposed to poor air quality including odour. Consideration should be given to development that will result in new public exposure, particularly where vulnerable people (e.g. the elderly, care homes or schools) would be exposed to the areas of poor air quality; and*
9. *Ensure that the cumulative impact of all relevant committed developments is appropriately assessed.*

Policy 34 provides an update on Policy 3 as detailed in Section 3.2.1, and reads as follows:

Strategic Policy 34 - Development Principles

In order to conserve and enhance the natural and built environment, all proposals for development will be required to:

3. *Be designed to avoid unacceptable harm to the amenity of existing and future occupiers or users of nearby property and land, for example through overlooking, dominance or overshadowing, traffic generation and general activity, noise, odour and/or vibration, whilst also having regard to the sensitivities/impact of surrounding development;*

3.2.3 Warnham Neighbourhood Plan (2019)

No specific planning policy is provided that would apply to this particular development and assessment.

3.3 National Legislation

3.3.1 Environmental Protection Act 1990 (EPA 1990)

Section 79 of the EPA 1990 defines statutory noise nuisance as '*noise emitted from premises so as to be prejudicial to health or a nuisance'*, and notes that Local Planning Authorities have a duty to inspect and detect such nuisances in their area. The specifics of noise nuisance are not defined, however, and the law only requires that the investigating officer be of the opinion that the effect of the noise in question on the average reasonable person would cause a nuisance or be prejudicial to health.

Section 80 of the EPA 1990 provides Local Planning Authorities with powers to serve an abatement notice requiring the cessation of a nuisance or requiring works to be undertaken to prevent their occurrence.

It should be noted that annoyance is not necessarily a noise nuisance, with noise nuisance being defined in Common Law as "*an unlawful interference with a person's use or enjoyment of land, or of some right over, or in connection with it*" (Read v Lyons and Co. Ltd, 1945). Noise nuisances are often assessed against the judgment of Mr Justice Luxmoore as "*interfering with the ordinary physical comfort of human*

existence not merely according to elegant or dainty modes of living but according to plain and sober and simple notions obtaining among English people" (Vanderport v the Mayfair Hotel Co Ltd, 1930). Therefore, the interference in question must be unreasonable such that it can be considered a noise nuisance.

It should be noted that businesses have a defence against noise nuisance of 'best practicable means', which is defined in section 79(9) of the Act as follows:

- *'practicable' means reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications.*
- *'the means' to be employed include the design, installation, maintenance and manner and periods of operation of plant and machinery and the design, construction and maintenance of buildings and structures.*
- *The test is to apply only so far as is compatible with any duty imposed by law and only so far as is compatible with safety and safe working conditions, and with the exigencies of any emergency or unforeseeable circumstances.*

A noise management plan and best practicable means of ensuring noise is minimised on site will be outlined within this report.

3.4 Best Practice and Guidance

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

BS 4142:2014+A1:2019 provides a methodology for rating and assessing the impacts of industrial and commercial sound at noise sensitive receptors. The scope of the standard covers the following:

- *sound from industrial and manufacturing processes;*
- *sound from fixed installations which comprise mechanical and electrical plant and equipment;*
- *sound from the loading and unloading of goods and materials at industrial and/or commercial premises;*
- *sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site*

Whilst the noise emissions associated with the temporary generators and powered hand tools would fall within the scope of BS 4142:2014+A1:2019, noise associated with the games and human speech would not. However, in the absence of more suitable guidance, all activities would be assessed in accordance with BS 4142:2014+A1:2019 to ensure that a robust assessment scenario is considered.

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

Typically, the greater this difference, the greater the magnitude of the impact

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

Note that the assessment reference periods that should be considered are:

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

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

The definitions noted above are described below:

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

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

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

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

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

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

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

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

ES Acoustics Notes regarding Context:

The notes presented below are informed by the BS 4142:2014+A1:2019 Technical Note prepared by the Association of Noise Consultant Good Practice Working Group.

Assessment context is often misunderstood or applied incorrectly, and the notes are therefore presented to provide a clear picture on what aspects of context should be considered when assessing the overall impact of a particular scenario:

Subclause 11(1)

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

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

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

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

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

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

Subclause 11(2)

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

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

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

Subclause 11(3)

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

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

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

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

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

Table 4 BS 8233:2014 indoor ambient noise levels for dwellings

Whilst it is accepted that the levels presented above are for steady external noise sources without a specific character, the guidance provides useful context as to what acceptable internal noise levels are in an ideal situation.

Predicted noise levels from site activities would be compared against the noise levels shown above to provide an indication of acceptability and likelihood of adverse impact in accordance with National Planning Policy.

4 ENVIRONMENTAL NOISE SURVEY

4.1 Measurement Location and Procedure

An initial appraisal of the site determined road traffic noise from Robin Hood Lane and noise associated with the existing agricultural use to be the dominant noise sources at the time of the site visits.

A noise survey was undertaken on the proposed site as shown in Figure 3, which would be considered representative of the closest noise sensitive receptors around the site (highlighted in green):

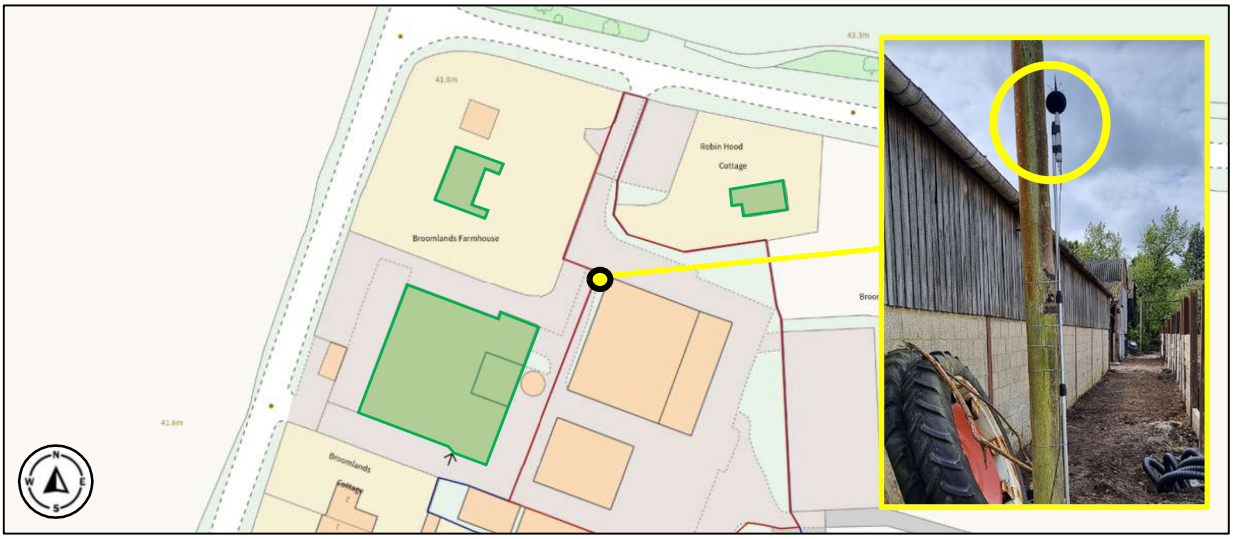


Figure 3 Noise survey measurement location (Image Reference: Batcheller and Monkhouse Location Plan - Crown copyright and database right 2024 (licence number 100059532)

The environmental noise measurement procedure complied with ISO 1996-2:2017 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels'*, with automated monitoring undertaken between 11:05 on 26/04/2024 and 11:50 on 29/04/2024 using a 5-minute integration periods.

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

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

4.2 Measurement Equipment

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

Equipment	Make and Model	Serial Number
Sound Level Meter	Svantek 977 Class 1 Sound Level Meter	34191
Microphone Capsule	Svantek MK 255	77747
Microphone Preamplifier	Svantek SV 12L	32446
Calibrator	Svantek SV36 Class 1 Sound Calibrator	122255

Table 5 Noise survey equipment

4.3 Weather Conditions

Weather conditions during the automated monitoring were generally dry with light winds and therefore suitable for the measurement of environmental noise.

Temperature and precipitation data has been sourced from the EGKK weather station[1], which reported limited periods of precipitation throughout the survey period as noted in Table 6.

The levels of precipitation reported on the 26th April would not have negatively affected the survey results. The levels of precipitation reported on the 27th and 28th April occurred between 18:00 on 27th and 07:00 on the 28th as a generally continuous event, which has been highlighted in red and omitted from the data analysis on the environmental noise time history in Appendix B.

Measurements of wind speed were undertaken with a handheld anemometer on site during the installation and collection visits, with wind speeds reported below 5 m/s on both occasions.

A summary of the weather data is reported in the table below:

Date	Temperature min to max ° C	Precipitation mm
26/04/2024	4.9 – 11.2	1.1
27/04/2024	5.9 – 11.7	15.8
28/04/2024	6.8 – 12.0	16.0
29/04/2024	6.0 – 15.0	0

Table 6 Weather data

4.4 Survey Results

An environmental noise time history graph of the noise survey data is presented in Appendix B, with a summary of the measurement results presented in Table 7.

During the site visit it was noted that a small generator was operational within the agricultural barn on the 26th April, resulting in higher residual noise levels when compared with the remainder of the survey. This clearly seen on the time history within Appendix B between the hours of 11:05 – 15:25.

Date	Time Period	Residual Sound Level $L_{Aeq,\,T}$ (dB)	Modal Background Noise Level L_{A90} (dB)
26/04/24 to 27/04/24	Daytime 11:05-23:00	61 (56*)	56 (45*)
	Night-time 23:00-07:00	45	39
27/04/24 to 28/04/24	Daytime 07:00-23:00	50	41
	Night-time 23:00-07:00	49	37
28/04/24 to 29/04/24	Daytime 07:00-23:00	48	38
	Night-time 23:00-07:00	48	42
29/04/24	Daytime 07:00-11:50	55	46

Table 7 Measured noise levels during daytime and night-time
***modal background in absence of generator use**

A summary of the noise levels during the proposed operating hours are further analysed in Table 8.

[1] Weather Station ID: EGKK, located 14 km from the site at Latitude 51.15, Longitude -0.18

Date	Day	Time Period	Residual Sound Level $L_{Aeq,\ T}$ (dB)	Modal Background Noise Level L_{A90} (dB)
26/04/24	Friday	08:00-17:00	63 (56*)	56 (45*)
27/04/24	Saturday	08:00-13:00	51	41
28/04/24	Sunday	n/a	n/a	n/a
29/04/24	Monday	08:00-17:00	55	46

Table 8 Measured noise levels during proposed operating hours
***noise levels in absence of generator use**

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

In terms of quantifying what background sound levels are typical during particular time periods, ESA have derived representative background sound levels as the modal values during the time periods in question.

In terms of particular circumstances and periods of interest, the specific time periods where the commercial units could be use have been considered.

In order to ensure a worst-case scenario and assessment, we would consider the lowest representative background noise level established during weekdays as L_{A90} 45 dB and during Saturdays as L_{A90} 41 dB.

5 NOISE IMPACT ASSESSMENT

The following sections presents noise emissions from all proposed operations and assessment scenarios in accordance with BS 4142:2014+A1:2019.

5.1 Assessment Scenarios

In order to provide a realistic and robust assessment of the proposed use, the following scenarios would be assessed:

1. 4 no. two-way vehicle movements in the morning and evening peak hours to represent a worst-case scenario with regards to general traffic movements
2. HGV movement from the site entrance on Robin Hood Lane to the front of the unit, and from the front of the unit to the site entrance on Robin Hood Lane

Due to the variation in the background sound level when comparing the weekdays with Saturdays (L_{A90} 45 dB during weekdays and L_{A90} 41 dB on Saturdays), assessments would be provided for both of the scenarios above whilst considering a typical weekday and a typical Saturday.

Note that as all proposed operations and activities would be within daytime hours, the reference period required for the BS 4142:2014+A1:2019 assessment would be 1-hour.

5.2 Specific Sound Levels

The key noise activities that would be expected with the proposed use of the site are defined below:

- Vehicles movements as they enter and exit the site from Robin Hood Lane and park within the designated parking spaces to the east of the commercial units
- Vehicle doors and boots opening and closing
- Loading of goods from the branch to the vehicle
- HGV movement from the site entrance on Robin Hood Lane to the front of the unit on arrival, and from the front of the unit to Robin Hood Lane on departure

Sound power levels for the activities above have been sourced from sound propagation prediction and mapping software, SoundPlan 8.2, and are shown in the table below:

Activity	Description	Sound Power Level dB(A)
General Vehicle Movements	Car driving on asphalt at 30km/h L_w/m, m^2	47*
	Car engine starting L_w	95
	Car door slamming L_w	98
HGV Movements	Truck: accelerated passing L_w/m, m^2	62*
	Truck: backout alerter L_w/m, m^2	61
	Truck: start engine L_w	100

Table 9 Sound power levels of specific sources
***Level relating to one event per hour**

5.3 Noise Modelling Exercise

Noise modelling of the assessment scenarios presented above would be undertaken using SoundPlan 8.2 to present a clear representation of the expected noise levels at the closest noise sensitive receptor properties. Specific details of each scenario are described below.

5.3.1 Vehicles Arriving and Leaving

Noise associated with general vehicle movements will be assessed within the boundary of the application site from the site entrance on Robin Hood Lane to the car parking area to the east of the commercial units.

BS 4142:2014+A1:2019 notes that "*sound of an industrial and/or commercial nature does not include sound from the passage of vehicles on public roads and railway systems*", and therefore noise from general vehicles would not be considered while passing on Robin Hood Lane.

The worst-case scenario would include 8 no. total vehicle movements, representing 4 no. vehicles entering the site and 4 no. vehicles leaving the site.

5.3.2 Vehicle doors and boots opening and closing / loading, & vehicle engines starting

Vehicle doors/boots opening and closing would be considered as a point source in the 4 no. parking spaces closest to the nearest noise sensitive receptor to ensure a worst-case scenario. For each vehicle attending the unit, 3 no. 'door slamming' events would be considered (1 no. event as the driver leaves the vehicle upon arrival, 1 no. event as the driver loads goods into the boot, 1 no. event as the driver enters the vehicle before leaving). It is assumed that any loading activity would be undertaken by hand.

The noise event associated with the vehicle's engine starting would be considered as point sources in the same 4 no. parking spaces as described above.

5.3.3 HGV Movements

With regards to HGV movements to the commercial units, the tracking path would be considered as shown in Figure 4. It would be assumed that the vehicle would travel forwards from the entrance on Robin Hood Lane to the furthest point shown on the figure to the south of Robin Hood Cottage, and then reverse to a suitable position in front/inside the unit. The vehicle would then leave in a forward's path from the front/inside the unit to the site entrance on Robin Hood Lane before departing on the main road network.



Figure 4 HGV vehicle tracking plan

5.3.4 Noise Mapping Results

Proprietary modelling software SoundPlan 8.2 has been used to provide a visual representation of Rating Levels for the scenarios outlined above.

The calculation algorithms set out in ISO 9613-2:1996 "*Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation*" have been used and the model assumes:

- A ground absorption factor of 0.5
- Façade receptor heights of 1.5m and 4m to reflect two storey dwellings, with grid maps presented at a height of 1.5m above ground (note that highest façade level is always presented)
- Attenuation predicted for 500Hz in accordance with ISO9613-2 when only A-weighted sound power levels known

The resultant noise maps for each assessment scenario are presented below. Full sized maps are presented in Appendix C.

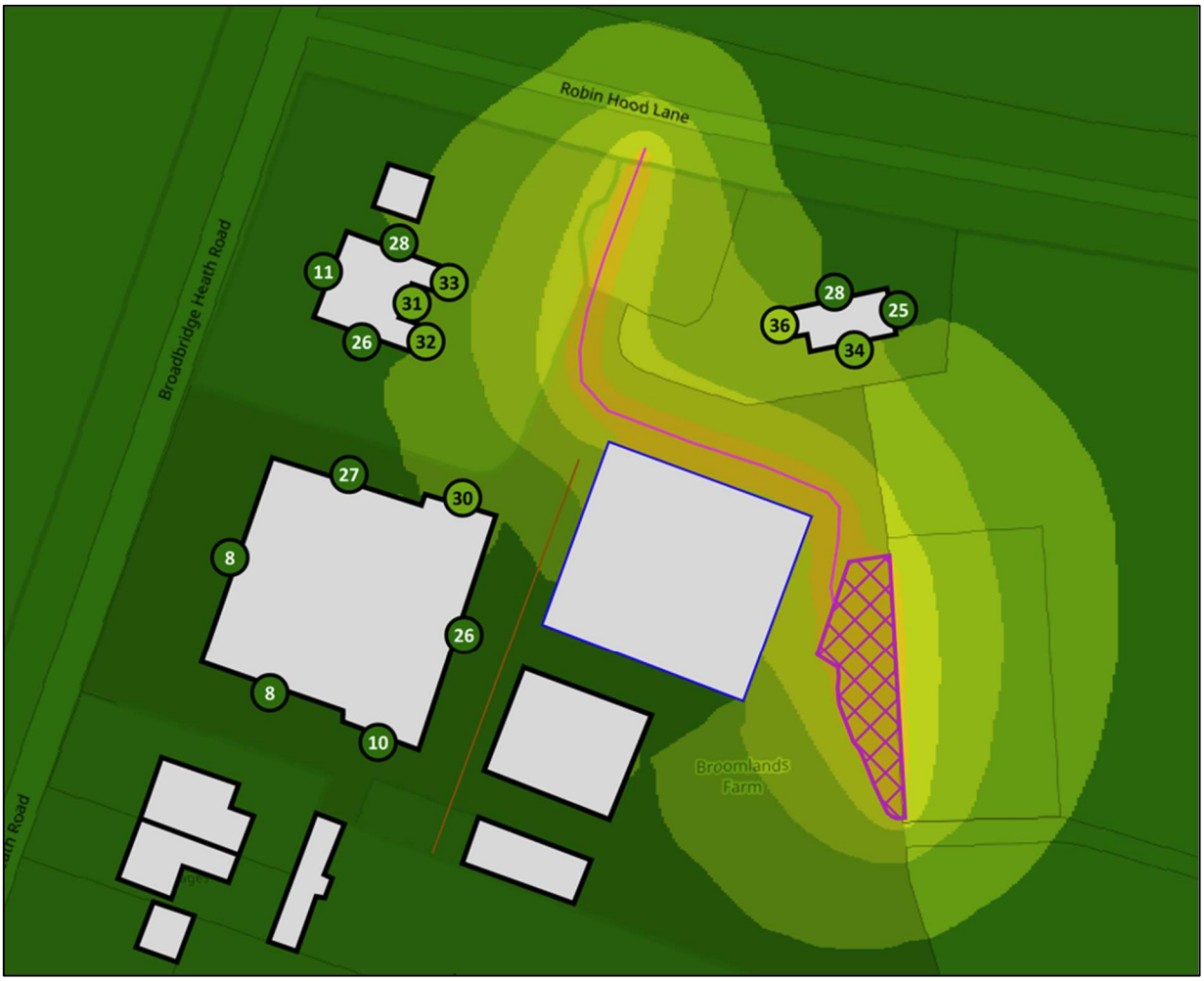


Figure 5 Scenario 1 - 4 no. two-way vehicle movements in the morning and evening peak hours to represent a worst-case scenario with regards to general traffic movements

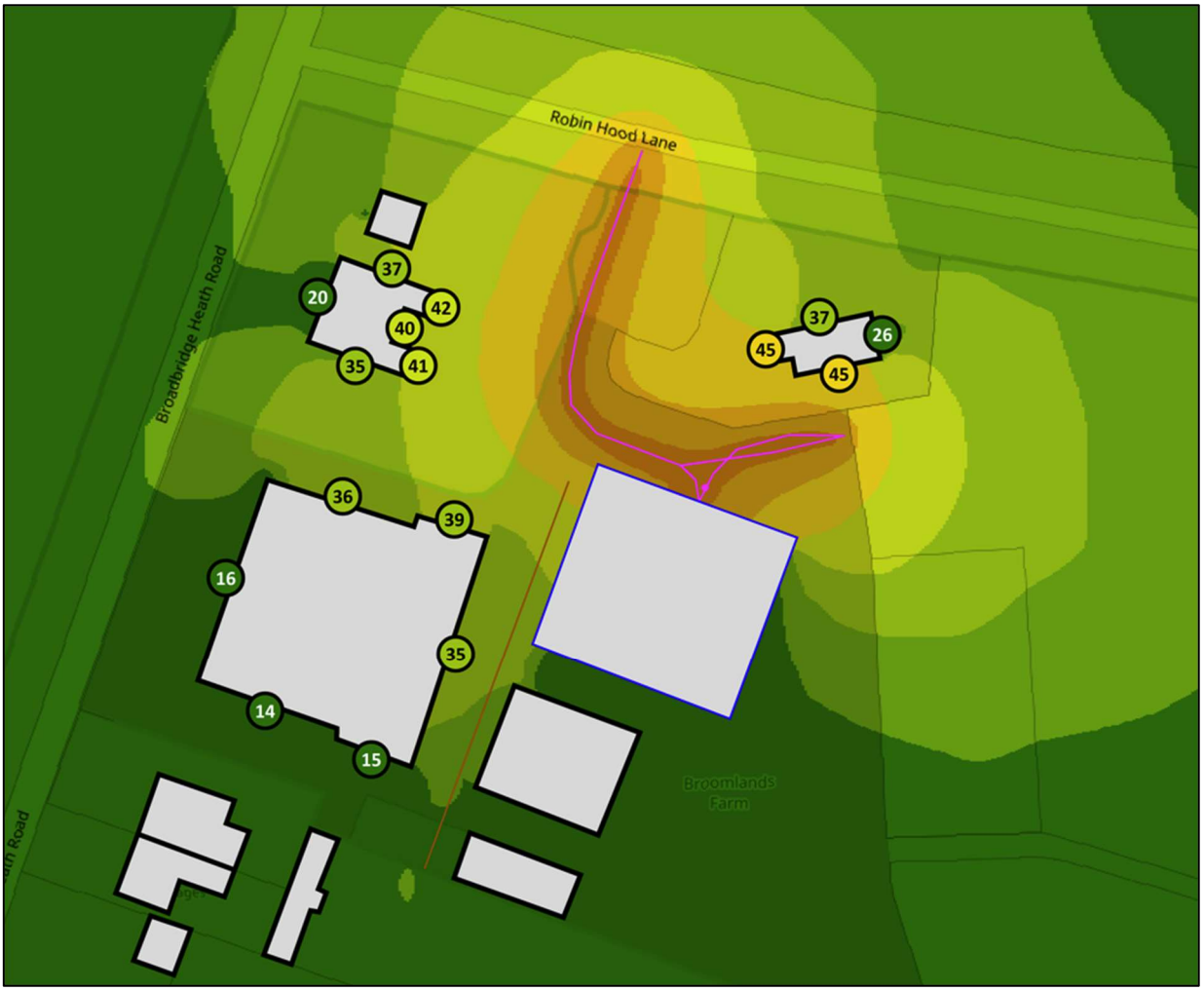


Figure 6 Scenario 2 - HGV movement from the site entrance on Robin Hood Lane to the front of the unit, and from the front of the unit to the site entrance on Robin Hood Lane

5.4 Rating Levels

The table below compares the highest Rating Levels calculated for each scenario against the background noise levels on a typical weekday and Saturday:

Scenario	Period	Existing Residual Noise Level dB $L_{Aeq, T}$	Existing Background Sound Level dB L_{A90}	Rating Level at Receptor Façade dB $L_{Aeq, T}$	+/- compared against background dB
1	Typical weekday	55 – 56	45	36	-9
	Typical Saturday	51	41	36	-5
2	Typical weekday	55 – 56	45	45	0
	Typical Saturday	51	41	45	+4

Table 10 Comparison of the Rating Level and Background Level for each assessment scenario

The methodology within BS 4142:2014+A1:2019 notes that the initial noise impact can be estimated by comparing the Rating Level due to the sound sources under assessment with the existing background noise level (L_{A90}) when the noise source is not operating.

The lower the rating level is relative to the measured background sound level, the less likely it is that there will be an adverse impact or significant adverse impact. Where the rating level does not exceed the

background sound level, this is an indication of the specific sound having a low impact, depending on the context.

Note that contextual factors must also be considered to draw final conclusions on the actual noise impact.

5.5 Contextual Factors

As noted within the BS 4142:2014+A1:2019 guidance, a crucial and important step in assessing the noise impact is the consideration of the context in which the sound under assessment occurs. As outlined in Section 3.4.1, the three types of context which should be considered are:

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

5.5.1 Aspects of the Absolute Level

With respect to the absolute level, the worst-case Rating Level calculated for Scenario 1 (typical vehicle movements) is broadly comparable to what BS 4142:1997 defined as a low Rating Level (being less than about 35dB $L_{Ar,Tr}$), in addition to being broadly comparable to the *internal* noise level guidance of BS 8233:2014 during daytime hours. World Health Organization guidelines note sleep disturbance can occur with a partially open window when external noise levels are in excess of 45 dB(A), which is 9 dB above the Rating Level for typical vehicle movements. It should of course be noted that the noise in question would not occur during night-time hours and therefore would not impact on sleep but is referenced purely to provide context as to what the numerical decibel level could represent.

With regards to Scenario 2 (HGV movements), the worst-case Rating Level is comparable to the external level at which the World Health Organization guidelines note sleep disturbance can occur with a partially open window. Given the relative proximity of the residential properties to the application site and the number of occurrences of the noise event level, this would not be considered excessive.

5.5.2 Aspects of Character

With regards to aspects of character at the receptor property, the dominant source of the prevailing background noise at the receptor façade is intermittent road traffic noise from the Robin Hood Lane and Broadbridge Heath Road/Bailing Hill.

The previous site use would include similar noise sources as those assessed, and the assessment should not be viewed as a completely new source with a new acoustic character being introduced to the area.

As noted within the Transport Note, *"…a Prior Notification application was submitted at the site in November 2023 for the "Change of use of two redundant agricultural barns to a flexible commercial use comprising Class B8 (Storage) and Class E(g) (Business)" (application reference: DC/23/1997). The COU was proposed under Class R of Schedule 2, Part 3 of the GPDO 2015 (as amended 2021). However, historical approval for the equestrian rehabilitation centre, meant that the site was not eligible to benefit*

from a Class R application to allow the COU under Permitted Development. Therefore, the applicant decided to withdraw the application in January 2024. Despite this, comments had been received from WSCC Highways before the withdrawal, indicating no objection". Within the comments, WSCC stated that they "*would not anticipate that such a change of use would result in a significant material intensification of movements to or from the site*", which would also mean that there would not be expected to be an intensification of the noise level generated by the site/site activities.

It is also noted that the history of the immediate surrounding area is one of a mix used environment including agricultural/commercial and residential use. The existing noise context of the area and the residential receptors within it would be expectant of various noise sources.

With regards to the character of the actual noise under assessment, it is important to note that noise from general vehicles and HGV movements would not be constant and would occur sporadically throughout the day. In terms of the worst-case scenario of HGV movements, the Transport Note suggests a maximum of 4 no. HGV movement per day, which should be taken into account when establishing the likelihood of adverse impact.

5.5.3 Aspects of the Receptor

With regards to aspects of the receptor property itself, it is understood that as the receptor properties are of a certain age, the only means to reduce internal heat gains during hot summer months would be via openable windows. The calculations above consider the noise emissions at 1m from the external face of the window to account for the fact that the receptor may need to open their window for enhanced rates of ventilation. BS 8233:2014 notes that a partially open window would provide 10-15 dB attenuation from outside to inside, meaning that the resultant internal noise level due to the assessment scenarios would be in the range of 21-35 dB(A) while the window is partially open. In all cases, this would be either equal to or below the recommended internal noise level of 35 dB(A) stipulated in the standard. In cases where the window is closed, higher levels of attenuation would be provided. A typical double-glazed window would provide in the region of 30 dB attenuation, meaning that the expected internal noise level would be no higher than of 5 dB(A), which is non-significant.

Generally speaking, a large proportion of people within the UK work within daytime hours when the proposed B8 units would be in use. Therefore, there would be significant periods of time where the receptor would therefore not be present while the B8 operations are occurring. The exception to this is on Saturdays, where residents would likely be home. With this in mind, we would consider Saturdays to be more noise sensitive than a typical weekday in the context of establishing the likelihood of adverse impact.

5.6 Assessment of Impacts

As noted in BS 4142:2014+A1:2019, the overall noise impact can only be established once contextual aspects are considered. Considering the calculated Rating Levels compared to the background sound

levels, and the context in which the sound occurs, ESA would consider the likelihood of adverse impact of each assessment scenario as shown in the table below:

Scenario	Day	+/- compared against background dB	Likelihood of Adverse Impact
1	Typical weekday	-9	Low
	Typical Saturday	-5	Low
2	Typical weekday	0	Low
	Typical Saturday	+4	Low

Table 11 Assessment of likelihood of adverse impacts

As shown in the table above, all scenarios would be considered to have a low likelihood of adverse impact. We would consider the calculated Rating Levels to be comparable to the Lowest Observed Adverse Effect Level (LOAEL) in accordance with National Planning Policy guidelines.

While the HGV movement scenario on Saturdays is +4 dB above the background sound level, we would consider this to have a low impact given that no more than 1 no. HGV movement sequence would occur in any given one-hour period. The likelihood of adverse impact would increase if this was to occur multiple times in any given one-hour period. If a future business operator requires this, then a simple response would be to avoid or limit HGV movements on Saturdays and require all HGV movements to occur within the weekdays.

Best practicable means for any HGV operations and activity is presented in Section 6.0 for consideration. The noise impact assessment assumes that the best practicable means are followed, including the use of white noise reversing alarms on all HGVs that operate out of the site.

6 BEST PRACTICABLE MEANS FOR HGV OPERATIONS

This section provides best practical means for on how to minimise noise from deliveries. While introducing physical noise control measures can improve noise emissions, a crucial factor in the over noise control strategy is ensuring good driver/staff behaviour and working practices with regards to noise generation.

Various measures are presented below:

- Ensuring all staff are briefed and trained appropriately, in accordance with the information presented in this section
- Making sure all equipment is in good working order and maintained or modernised to minimise noise when in operation
- Ensure roller shutter doors are well maintained to minimise noise when opening and closing. We would recommend that the roller shutter doors installed are mechanically operated and a 'low noise' type
- Ensure the surrounding external areas are clear of obstructions so HGVs can manoeuvre easily
- Keep doors other than roller shutter doors closed to ensure noise does not escape the buildings unnecessarily
- Where possible, prepare all empty handling units, salvage and returns behind closed doors. Check they are in the correct condition and position and at the right height before taking them out. This will minimise outdoor activity and unnecessary noise
- Think about how to minimise contact between hard surfaces, particularly metal on metal, during the unloading/loading processes. For example, use rubber matting and buffering material on doors
- Make sure the commercial unit is ready for the vehicle before it arrives – gates and doors should be open to avoid the vehicle idling
- Make sure the driver knows the precise location of the site access point and is aware of any local access issues
- Reversing alarms should be switched off or modified for white noise, if not subject to health and safety requirements. Further details are provided below
- Avoid other unnecessary noise generation is avoided, including:
    - Ensure staff do not shout or whistle to get the attention of colleagues
    - Switch off any radios (both within the commercial units and within the HGV) when doors are open
    - Do not sound vehicle horn

- Engines should be switched off immediately when not manoeuvring, however, try to minimise start-ups and avoid over-revving
- Minimise the frequency of opening and closing vehicle doors, and do so quietly
- Be aware of how far your voice can carry when talking outside
- If opening a gate/cellar flap/roller shutter door to gain access, do so gently and as little as possible
- Lower flaps on tail-lifts carefully and quietly
- Minimise excessive air brake noise
- When working in the HGV load space avoid banging cages into the vehicle walls
- When finished unloading/loading, close up the vehicle quietly

With regards to the white noise reversing alarm, we would recommend that any HGVs operating out of the site are fitted with the following to minimise noise:

White Noise Alarm	Product Name	More Information
	Brigade: BBS-tek White Sound Vision Alert: EA5050 Multi-frequency reversing alarm Grote: 73310 Multi-frequency back up alarm	brigade-electronics.com beaconsandlightbars.co.uk grote.com

Table 12 Low noise alarms

7 EXTERNAL BUILDING SERVICES PLANT AND EQUIPMENT

As part of the development, it may be necessary to install external building services plant and equipment such as ventilation or extraction systems.

We would recommend that a condition is applied in the event that any future external building services plant is required, as follows:

"An acoustic assessment should be prepared in accordance with BS 4142:2014+A1:2019 including all propose noise-generating fixed plant, and shall be submitted to the local planning authority for approval prior to the use of the fixed plant, along with a scheme of mitigation to ensure that:

1) *At any time the plant is operational, the rating level calculated according to BS 4142:2014+A1:2019 shall not exceed 5 dB(A) below the measured typical L_{A90} background levels at any noise sensitive receptor, and additionally,*

2) *That the measured or calculated plant specific noise level (i.e. in the absence of rating penalties) shall not exceed 10 dB(A) below the typical L_{A90} background levels [subject to a lower specific noise level requirement of 30dB(A)] at any noise sensitive receptor.*

Once approved the scheme of mitigation shall be implemented in full prior to the use commencing and permanently maintained thereafter and replaced in whole or in part as often is required to ensure compliance with the noise levels."

Noise emission limits have been established at 1m from the façades of the closest receptors based on the proposed condition above, as shown in Table 13:

Receiver	**Lowest Background Sound Level** **dB L_{A90}**	**Maximum plant noise Rating Level at 1m from receptor window** **dB $L_{Ar,Tr}$**	**Maximum plant Specific Noise Level at 1m from receptor window** **dB $L_{Ar,Tr}$**
1m from the window of all nearby noise sensitive receptors	41	36	31

Table 13 Noise limits for external plant

Plant noise emission limits apply to the cumulative noise level from all proposed items of plant operating at their standard duty and are applicable at 1 metre from the window of the nearest noise sensitive receptor/s.

If external building services plant is proposed at a future date, a detailed noise assessment should be undertaken considering the specific make and model of the plant to be installed, the installation locations, noise propagation paths and acoustic feature corrections. Note that suitable attenuation measures should be specified (e.g. acoustic screening or acoustic attenuators) where required to comply with these noise emission limits.

8 CONCLUSION

ES Acoustics Ltd have been commissioned by The Broadbridge Heath Trust to prepare a noise impact assessment in support of a planning application for the proposed change of use of a redundant agricultural barn to a commercial use comprising Class B8 (Storage) at Broomlands Farm, Robin Hood Lane, Warnham, West Sussex, RH12 3RR.

An environmental noise survey has been undertaken on site to establish background sound levels representative of the closest noise sensitive receptors relative to the application site.

Based on the proposed use of the site, noise assessment scenarios have been presented using suitably sourced noise data.

Calculations of expected noise levels at the closest noise sensitive receptors for each assessment scenario has been undertaken in accordance with BS 4142:2014+A1:2019 for comparison with representative background sound levels.

It has been concluded that noise emissions from the proposed Class B8 (Storage) business operations at the site would be considered to have a low likelihood of adverse impact in accordance with BS 4142:2014+A1:2019, and would be equivalent to the Lowest Observed Adverse Effect Level (LOAEL) in accordance with National Planning Policy. Further analysis has demonstrated that internal noise levels within the receptor properties would be below or comparable with the recognised British Standard requirements, depending on the scenario.

Note that the calculations and assessment scenarios consider that the best practicable means for the use of the site are followed, as detailed within Section 6.

Noise limits for any potential future external building services plant installations have been set to ensure that the amenity of the surrounding residential receptors is maintained.

It is concluded that the proposed B8 Storage use would be acceptable at the site and would not have a negative impact on the surrounding residential properties.

APPENDIX A

ACOUSTIC TERMINOLOGY

Decibel scale - dB

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

Addition of noise from several sources

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

Subjective impression of noise

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

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

'A' Weighted Frequency Filter - dB(A)

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

$L_{Aeq, T}$

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

L_{A90}

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

L_{A10}

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

L_{AFmax}

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

APPENDIX A

ACOUSTIC TERMINOLOGY

Octave Bands

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

Noise Rating (NR) Curves

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

Airborne sound

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

Impact sound

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

Flanking sound

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

Structure-borne noise

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

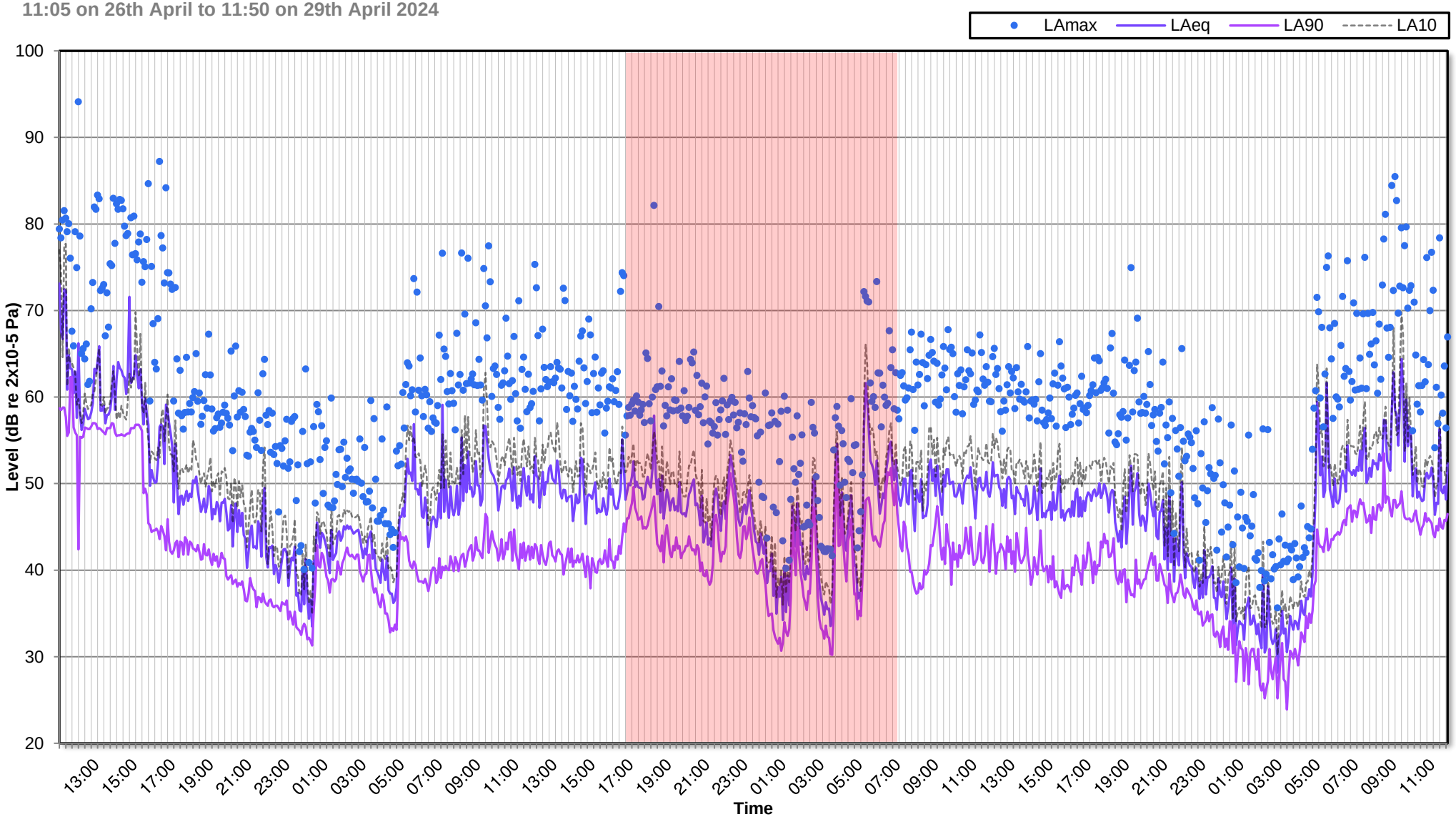
Reverberant sound

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

APPENDIX B

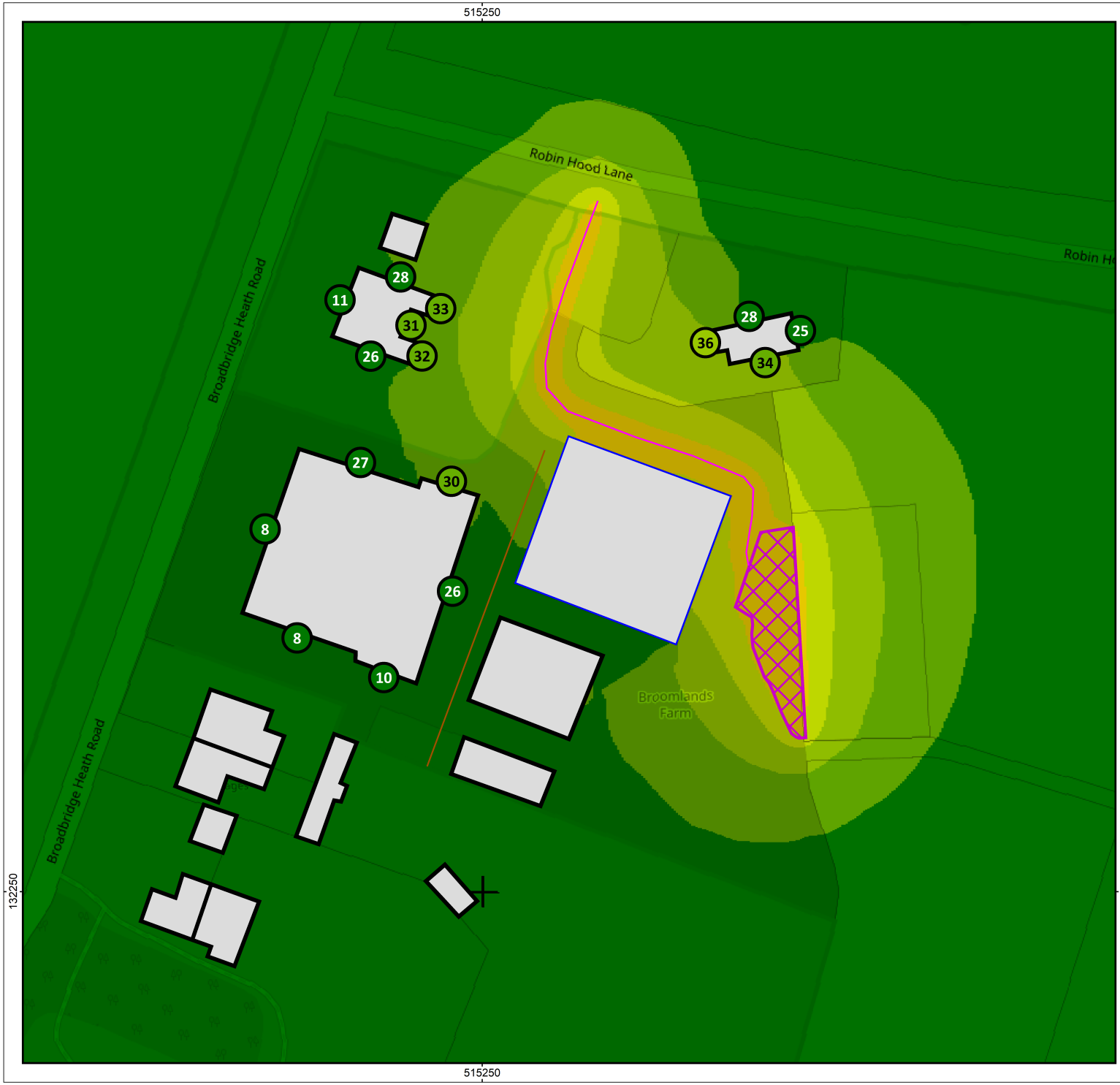
ENVIRONMENTAL NOISE TIME HISTORY GRAPH

20765.BS4142-RPT.01
11:05 on 26th April to 11:50 on 29th April 2024



APPENDIX C

NOISE MAPS FOR EACH ASSESSMENT SCENARIO



Customer: The Broadbridge Heath Trust
Project: Broomlands Farm
Project-No. 20765

SoundPLAN

Map 1

Scenario 1: 4 no. two-way vehicle movements in the morning and evening peak hours to represent a worst-case scenario with regards to general traffic movements

Grid Noise Map Calculation at 1.5 m above ground

Project engineers: Daniel Green MIOA
Created: 30/04/2024
Processed with SoundPLAN 8.2, Update 09/11/2022

Levels LAeq, 1hr
in dB(A)

<	30
30 -	35
35 -	40
40 -	45
45 -	50
50 -	55
55 -	60
60 -	65
65 -	70
>=	70

Legend

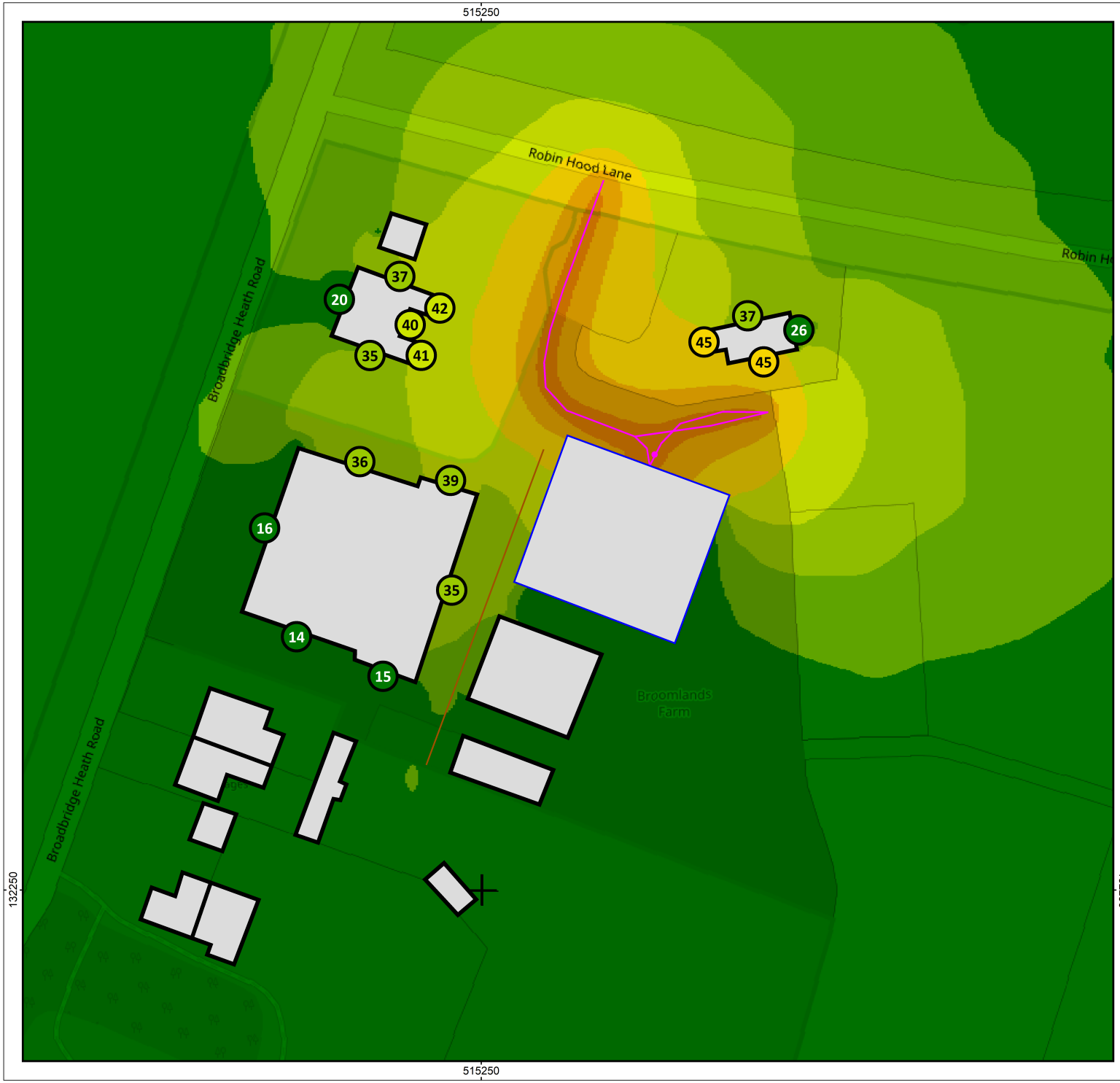
- Building
- Facade Point
- Wall / Fence
- Line noise source
- Parking area noise source

N

Length scale 1:674

0 5 10 20 30 40 m

Noise Modelling & Map Prepared By: es acoustics



Customer: The Broadbridge Heath Trust
Project: Broomlands Farm
Project-No. 20765

SoundPLAN

Map 2

Scenario 2: HGV movements

Grid Noise Map Calculation at 1.5 m above ground

Project engineers: Daniel Green MIOA
Created: 07/05/2024
Processed with SoundPLAN 8.2, Update 09/11/2022

Levels LAeq, 1hr

in dB(A)

<	30
30 -	35
35 -	40
40 -	45
45 -	50
50 -	55
55 -	60
60 -	65
65 -	70
>=	70

Legend

- Building
- Facade Point
- Wall / Fence
- Line noise source
- Point noise source

N

Length scale 1:674

0 5 10 20 30 40 m

Noise Modelling & Map Prepared By: es acoustics