

Burgess Hill, West Sussex

784-B082778

Noise Impact Assessment

PMK Consult

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Appendix A – Acoustic Terminology

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Acronyms/Abbreviations

Acronyms/Abbreviations	Definition
CADNA	Computer Aided Noise Abatement
DMRB	Design Manual for Roads and Bridges
HGV	Heavy Goods Vehicle
PPG	Planning Practice Guidance
UDP	Unitary Development Plan
UKAS	United Kingdom Accreditation Service

Executive Summary

A noise assessment has been undertaken in support of a full application for site alterations to include new external plant equipment, on the site at Unit 7, Panattoni Park, Burgess Hill, West Sussex, BN6 9ZJ.

A baseline monitoring survey was undertaken at three locations on 5th June 2019 by Sharps Redmore in connection with a planning application (application ref: DM/19/2641) for the Land South Of A2300 Gatehouse Lane Goddards Green West Sussex.

CADNA noise modelling software has been used to model predicted noise emissions from the plant using the ISO 9613-2 noise propagation methodology at the closest sensitive receptors.

The results of the BS4142 assessment predict that noise rating levels from the operation of the proposed external plant will be below the existing background noise levels at all receptor locations during the daytime and night-time periods. As such, operational noise will result in a No Observed Adverse Effect Level (NOAEL), and therefore the development will have a negligible impact in relation to noise in accordance with PPG: Noise.

1.0 Introduction

1.1 Purpose of this Report

This report presents the findings of a noise assessment to support a full application for site alterations to include new external plant equipment, on the site at Unit 7, Panattoni Park, Burgess Hill, West Sussex, BN6 9ZJ. Noise survey has been undertaken as part of planning application DM/19/2641 and the results used to verify predictions of the short-term and long-term effects of noise.

A list of acoustic terminology used in this report is provided in Appendix A.

1.2 Legislative Context

This report is intended to provide information relevant to the local planning authority and their consultees in support of a planning application for the above proposed development. Policy guidance with respect to noise is found in the National Planning Policy Framework (NPPF), published in August 2026. With regard to noise and planning, the NPPF contains the following policies:

“P3: Living conditions and pollution

1. Development proposals should be appropriate for their location, taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, whether these effects are on or off-site; and whether this is as a result of the development itself or the product of preexisting conditions in its vicinity. In assessing the potential effects of pollution, consideration should be given to the potential sensitivity of the site, and its intended occupiers and users, as well as that of the environment and population in the surrounding area (including where certain groups could be particularly vulnerable to its effects, such as children and older people).

2. Within this context development proposals should:

a. Provide healthy living conditions for occupiers and users in terms of adequate access to light and avoiding exposure to levels of air, noise, artificial light or other sources of pollution which could have an unacceptable adverse effect on health and

the quality of life. Where necessary suitable mitigation measures should be incorporated to secure acceptable living conditions;

b. Not give rise to, or contribute to, an unacceptable level of access to daylight and sunlight for neighbouring residents and occupiers, or unacceptable levels of air, noise, artificial light, water, soil or other forms of pollution on or beyond the site.

Adverse impacts of this nature should be avoided where possible, or else mitigated to an acceptable degree. Where possible, opportunities should be taken to reduce pollution affecting the wider area (such as through traffic and travel management or improved external lighting);

d. Mitigate and reduce to a minimum potential adverse impacts resulting from noise, not result in levels of noise exposure which would have a significant observed adverse effect, and maintain the character of tranquil areas (those areas that have remained relatively undisturbed by noise from human sources and are prized for their recreational and amenity value for this reason);”

“P4: Impact of development on existing activities:

1. Existing businesses, community facilities, public services and defence and security activities should not have unreasonable restrictions placed on their current or permitted operation as a result of development being approved after they were established. This means that development proposals should be capable of being integrated effectively with existing business, community and public service activities and infrastructure in their vicinity (including, but not limited to, uses such as pubs, music venues, places of worship, sports clubs, blue light services, defence, electricity network infrastructure and industrial and waste sites).

2. Where the operation of an existing activity could have a significant adverse effect on a proposed new development in its vicinity, development proposals should:

- a. Identify the nature of the potential impacts, informed where necessary by early discussions between the applicant (i.e. the ‘agent of change’) and those existing uses which could be affected by the proposal to inform the scope for mitigation; and
- b. Be able to demonstrate that suitable mitigation can be provided before first occupation of the development, if it is to be acceptable. Planning conditions or obligations should be used to secure agreed mitigation measures.

3. This policy applies to new development involving changes of use of land and property, as well as to new construction, and includes situations where new development may interfere with the operation of electronic communications networks. Both lawful current and permitted levels of operation of existing activities should be taken into account when applying this policy.”

Planning Practice Guidance (PPG): Noise provides further guidance with regard to the assessment of noise within the context of Planning Policy. The overall aim of this guidance, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England (NPSE), is to **“identify whether the overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.”**

A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the PPG and repeated below in Table 1.1.

Table 1.1: PPG Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No Specific Measures Required
No Observed Adverse Effect Level (NOAEL)			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level (LOAEL)			
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 and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
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

The NPPF, NPSE and PPG do not, however, present absolute noise level criteria which define SOAEL, LOAEL and NOEL which is applicable to all sources of noise in all situations. Therefore, within the context of the Proposed Development, national planning policy and appropriate guidance documents including 'BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound' (2014) have been used. Section 2.0 presents the noise level criteria used as a basis of this assessment.

The PPG also states that neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of the proposed development.

Furthermore, the PPG: Noise identifies at Paragraph: 011 Reference ID: 30-011-20190722 the requirement for developments proposals to incorporate measures to mitigating the impact of noise on residential developments. In particular:

“Noise impacts may be partially offset if residents have access to one or more of:

- a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling;*
- a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced if this area is exposed to noise levels that result in significant adverse effects;*
- a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or*
- a relatively quiet, protected, external publicly accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5-minute walking distance).*

1.3 Local & Regional Policy Context

Upon review of the site record on the Mid Sussex District Council planning portal, the following noise related comment for planning application DM/19/2641 was identified:

Condition 20:

“Noise from Plant and Machinery (operational): The rating level of noise emitted from fixed plant and equipment associated with the proposed development shall not exceed 44 dB LAeq1hour during the day period (0700 to 2300 hours), and 38 dB LAeq5min during the night period (2300 to 0700 hours). These limits apply at the nearest façade of any residential property. The measurements and assessment shall be made according to the provisions of BS 4142:2014. Note: The rating level shall include the character corrections for tonality, impulsivity, distinguishability and

intermittency. Reason: To protect the amenity of neighbouring residents and to accord with Policies DP26 and DP29 of the Mid Sussex District Plan 2014-2031.”

1.4 Acoustic Consultants' Qualifications and Professional Memberships

The lead project Acoustic Consultant is Yanko Yankov. The report has been checked by Michaela Moffatt and verified by Dawit Abraham. Relevant qualifications, membership and experience are summarised in Table 1.2.

Table 1.2: Acoustic Consultants' Qualifications & Experience

Name	Education	Experience in Undertaking Noise Assessments (Start date of working in noise & acoustics)	Attained Associate Membership of the Institute of Acoustics (date)	Attained Membership of the Institute of Acoustics (date)
Yanko Yankov	Beng 2015	Nov 2017	Jan 2018	March 2022
Michaela Moffatt	BSc 2015 PgDip 2016 MSc 2018	Nov 2015	Jan 2017	Dec 2022
Dawit Abraham	BSc 2008 MSc 2010	Oct 2010	Jan 2011	Jan 2015

2.0 Assessment Criteria

In order to enable the assessment of the proposed development in terms of LOAEL and SOAEL, Table 2.1 presents equivalent noise levels and associated actions with the target noise level criteria identified. The noise level criteria detailed below have been derived from standards and design guidance:

- BS4142:2014 'Method for rating industrial and commercial sound'

A full bibliography of documents referenced within this report is provided within Appendix B.

Table 2.1: Noise Level Criteria and Actions

Noise Sources	Noise Level Criteria	Justification for Effect Level-Action Required
No Observed Adverse Effect Level (NOAEL)		
Fixed plant and equipment located externally or internally with louvered ventilation grilles	Difference between Rating Level ($L_{Ar,T}$) dB and existing background level $L_{A90,T}$ dB is less than or equal to 0dB	Justification for Effect Level: Below low impact threshold in BS4142:2014 Action Required: None
Lowest Observed Adverse Effect Level (LOAEL)		
Fixed plant and equipment located externally or internally with louvered ventilation grilles	Difference between Rating Level ($L_{Ar,T}$) dB and existing background sound level $L_{A90,T}$ dB is between 1-4dB.	Justification for Effect Level: Lower rating levels relative to measured background indicate it is less likely for adverse impacts to occur (depending on context). Action Required: Reduce to a minimum the exceedance over 0dB above background threshold through good acoustic design where practicable, or demonstrate contextual reasoning as to why adverse effects are not predicted
Significant Observed Adverse Effect Level (SOAEL)		
Fixed plant and equipment located externally or internally with louvered ventilation grilles	Difference between Rating Level ($L_{Ar,T}$) dB and existing background sound level $L_{A90,T}$ dB is between 5-9dB.	Justification for Effect Level: Within adverse impact threshold in BS4142:2014. Action Required Additional mitigation required to achieve effect of LOAEL or less.
Unacceptable Observed Adverse Effect Level (UOAEL)		
Fixed plant and equipment located externally or internally with louvered ventilation grilles	Difference between Rating Level ($L_{Ar,T}$) dB and existing background sound level $L_{A90,T}$ dB is equal to or greater than 10dB	Justification for Effect Level: Within significant adverse impact threshold in BS4142:2014 Action Required: Additional mitigation required to achieve effect of LOAEL or less.

3.0 Assessment Methodology

3.1 Noise Modelling Methodology

Three-dimensional noise modelling has been undertaken based on the monitoring data to predict noise levels at a number of locations both horizontally and vertically. CADNA noise modelling software has been used. This model is based on ISO 9613-2 noise propagation methodology and allows for detailed prediction of noise levels to be undertaken for large numbers of receptor points and different noise emission scenarios both horizontally and vertically. The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data and model settings as given in Table 3.1 have been used.

Table 3.1: Modelling Parameters Sources and Input Data

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels – around site	DEFRA	LIDAR 1m DTM
Building heights – around site	Tetra Tech Observations	• 4.0m height for one-storey properties • 8.0 m height for two storey properties • 3.0m per additional storey
Receptor positions*	Tetra Tech	• 1.5 m for ground floor properties • 4.0m height for first-floor properties
Modelling Parameters	Tetra Tech	• Ground Absorption: 0.6 • Order of Reflections: 3 • Noise Contour Plot Grid • Receiver Spacing: 10.0
Proposed Plans	Ashton Smith	Drawing Title: Proposed Site Plan Drawing No: 8161 - SMR - 00 - ZZ - DR - A - 2003 - S2 - P4
*All receptors modelled 0.05m from building façade unless otherwise stated.		

It is acknowledged that a number of the values of parameters chosen will affect the overall noise levels presented in this report. However, it should be noted that the values used, as identified above, are worst-case.

3.2 Model Input Data

Information regarding noise emissions from proposed plant has been determined using manufacturer data.

Data contained within Table 3.2 presents noise information and Figure 3.1 shows the locations of the proposed plant.

Table 3.2: Summary of Noise Input Data (Sound Power Levels)

Noise Source	Type	Octave Band Sound Power Level ($L_w(A)$)								Sound Power Level ($L_w(A)$)	Source
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz		
Axial Fans with attenuators x19 (900-1400 1D EP)	Point Source	80	76	74	65	64	65	62	59	72	Manufacturer Data

Figure 3.1: Plant Locations



3.3 Sensitive Receptors

3.3.1 Existing Sensitive Receptor Locations

Table 3.3 summarises receptor locations that have been selected to represent worst-case sensitive receptors with respect to direct noise from the site. Façades of the nearest noise sensitive properties to the development site have been represented. The locations of the receptors are presented within Figure 3.2.

Table 3.3: Existing Sensitive Receptor Locations

Ref.	Description	Type of Use	Height (m) Daytime / Night-time
R01	1 Hamblin Cottages	Residential	1.5/4.0
R02	2 Hurstfield Cottages	Residential	1.5/4.0
R03	The Priory Hospital	Residential	1.5/4.0
R04	Lyes Farm	Residential	1.5/4.0
R05	Gatehouse Farm	Residential	1.5/4.0
R06	Gatehouse Lane X Loverose Lane	Residential	1.5/4.0
R07	33 The Oaks	Residential	1.5/4.0

Figure 3.2: Existing Sensitive Receptor Locations



4.0 Noise Survey

4.1 Noise Survey Details

A baseline monitoring survey was undertaken at three locations over a 24hr period on 4th and 5th June 2019 by Sharps Redmore in connection with a planning application (application ref: DM/19/2641) for the Land South Of A2300 Gatehouse Lane Goddards Green West Sussex (as specified in Table 4.1 and shown in Figure 4.1 below).

Measurements were taken in general accordance with BS 7445-1:2003 '*The Description and Measurement of Environmental Noise: Guide to quantities and procedures*'. Weather conditions during the survey period were observed as being dry. Anemometer readings confirmed that wind speeds were less than 5 ms⁻¹ at all times during the survey, with a predominant south-western wind direction during the survey.

Upon review of the site record on the Mid Sussex District Council planning portal, the following noise related comment for planning application DM/19/2641 was identified:

Condition 20:

"Noise from Plant and Machinery (operational): The rating level of noise emitted from fixed plant and equipment associated with the proposed development shall not exceed 44 dB L_{Aeq1hour} during the day period (0700 to 2300 hours), and 38 dB L_{Aeq5min} during the night period (2300 to 0700 hours). These limits apply at the nearest façade of any residential property. The measurements and assessment shall be made according to the provisions of BS 4142:2014. Note: The rating level shall include the character corrections for tonality, impulsivity, distinguishability and intermittency. Reason: To protect the amenity of neighbouring residents and to accord with Policies DP26 and DP29 of the Mid Sussex District Plan 2014-2031."

The requirements of this condition are met in the assessment undertaken including the use of 44dB and 38dB as background levels, the use of BS 4142, and the use of character corrections.

Therefore, the use of the 2018 survey data is considered a conservative approach, as the lower historical background sound levels provide a robust basis for the assessment and represent a reasonable worst-case scenario.

4.2 Representative Background Noise Levels

Using the requirement from Mid Sussex District Council planning portal, related to planning application DM/19/2641 Condition 20 Table 4.1 presents the representative background noise levels for the existing sensitive receptors within the area.

Table 4.1: Representative Background Noise Levels (All Receptors)

Receptors	Time Period	Representative Background Noise Level ($L_{A90,T}$ dB)
R01 – R04	Daytime (07:00 – 23:00)	44
	Night-time (23:00 – 07:00)	38

The representative noise levels presented in Table 4.1 have been used to inform the assessment presented in Section 5.0.

5.0 Assessment of Effects

5.1 Operational Phase

5.1.1 Building Services Plant Noise Assessment

The results of the plant noise assessment are presented within **Table 5.1**, and the locations of plant included within the assessment are presented within **Figure 3.1**.

Table 5.1: BS4142 Assessment

Location	Existing Measured Background L_{A90}		Noise rating level from plant		BS 4142 Score	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
R01	44	38	6	6	-38	-32
R02	44	38	1	1	-43	-37
R03	44	38	34	34	-10	-4
R04	44	38	8	8	-36	-30
R05	44	38	2	2	-43	-37
R06	44	38	35	35	-9	-3
R07	44	38	3	3	-41	-35

All values are sound pressure levels in dBA re: 2×10^{-5} Pa.

All calculations used to derive the above table (including averaging of background noise levels and predicted source noise levels) have been undertaken to 1 decimal place to avoid perpetuation of rounding errors. However, in accordance with BS4142 para 8.6 the levels are expressed as integers (with 0.5 dB being rounded up). This may mean that the arithmetic in the above table may appear to be up to 1 dB incorrect due to this rounding.

As demonstrated within **Table 5.1** the results of the assessment indicate that the BS4142 Noise Rating Levels at sensitive façades of the existing noise sensitive properties are at least 9dB below existing background noise levels during the daytime and at least 3dB below existing background noise levels during the night-time period. As such, this falls within the No Observed Adverse Effect Level (NOAEL).

Figure 5.1: Noise Contour Plot Night-time ($L_{Aeq,15min}$)



6.0 Conclusion

A noise assessment has been undertaken in support of a full application for site alterations to include new external plant equipment, on the site at Unit 7, Panattoni Park, Burgess Hill, West Sussex, BN6 9ZJ.

The results of the BS4142 predict that noise levels will be below the existing background noise levels at all receptor locations during the daytime and night-time. As such it is considered that no mitigation is required.

The NPPF provides test points against which the proposed development has been assessed. Considering these points, the following conclusions can be drawn:

NPPF Policy P3: Living Conditions and Pollution

Based upon the assessments presented, it is considered that the development does not adversely affect or put sensitive receptors at risk from noise pollution, and no significant adverse effects are predicted to occur.

NPPF Policy P4: Impact of Development on Existing Activities

Considering the existing use of the site and wider development site, it is not considered that any existing businesses wanting to develop would be restricted by the proposals.

Planning Practice Guidance: Noise

It has been predicted that on-site operational noise effects associated with the Development will be below the No Observed Adverse Effect Level (NOAEL), and therefore the development will have a negligible impact in relation to noise.

Appendices

Appendix A – Acoustic Terminology

Acoustic Terminology

- dB** Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise, i.e. whether it is high-pitched, low-pitched, or with no distinct tonal character. These measurements are usually undertaken in octave or third octave frequency bands. If these values are summed logarithmically, a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.
- dB(A)** Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or third octave band values, before summing them logarithmically. As a result the single dBA value provides a good representation of how loud a sound is.
- L_{Aeq}** Since almost all sounds vary or fluctuate with time it is helpful, instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The L_{Aeq, 07:00 – 23:00} for example, describes the equivalent continuous noise level over the 16-hour period between 7 am and 11 pm. During this time period the L_{pA} at any particular time is likely to have been either greater or lower than the L_{Aeq, 07:00 – 23:00}.
- L_{Amin}** The L_{Amin} is the quietest instantaneous noise level. This is usually the quietest 125 milliseconds measured during any given period of time.
- L_{Amax}** The L_{Amax} is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.
- L_n** Another method of describing, with a single value, a noise level which varies over a given time period is, instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dBA is exceeded for say, 6 minutes within one hour, then that level can be described as being exceeded for 10% of the total measurement period. This is denoted as the L_{A10, 1 hr} = x dB.
- The L_{A10} index is often used in the description of road traffic noise, whilst the L_{A90}, the noise level exceeded for 90% of the measurement period, is the usual descriptor for underlying background noise. L_{A1} and L_{Amax} are common descriptors of construction noise.
- R_w** The *weighted sound reduction index* determined using the above *measurement* procedure, but weighted in accordance with the procedures set down in BS EN ISO 717-1. Partitioning and building board manufacturers commonly use this index to describe the inherent sound insulation performance of their products.

Appendix B – References

- British Standards Institute (BSI). (2003). BS 7445-1:2003. *Description and Measurement of Environmental Noise - Part 1: Guide to Quantities and Procedures*. United Kingdom.
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