
VANGUARDIA

A BURO HAPPOLD COMPANY

Porsche Mid Sussex

Noise Impact Assessment

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Glossary

Term	Definition
A-weighting	The human ear is not equally sensitive to all frequencies of sound. It is relatively much less sensitive to very low frequencies such as 'mains hum', and to very high frequencies such as the call of a bat, than to the 'mid-frequencies' important for human voice communication. In order to make sound level meters, which would otherwise be indiscriminate in registering sound pressures, respond in a way which reflects human perception of sound, they usually are fitted with a set of filters to progressively filter out the high and low frequency energy. The filters are made to an internationally standardised specification and the filtered noise level is said to be 'A-weighted'. Sometimes A-weighted decibel levels are denoted 'dB(A)', but the correct, internationally standardised format for reporting requires the 'A' to be appended to the noise descriptor, e.g. $L_{Aeq,T}$, L_{Amax} , etc.
Ambient Noise	This is the totally encompassing sound at the measurement position over a specified time interval and usually comprises sound from many different sources both near and far.
Attenuation	A general term used to indicate the reduction of noise, or the amount (in decibels) by which it is reduced.
Averaging	In the absence of a dominant steady source, the sound level at a point, indoors or outdoors, varies continuously. For example, the variation may be over a few dB about an average value in a quiet room, or over 10 dB or more in a noisy outdoor environment. In order to define a level to represent the relative level of noise in the space it is necessary to define that average value. The most common averaging methods are energy averaging (L_{Aeq}) and statistical averaging (L_{AN} where N is a percentage between 1 and 100). The $L_{A10,T}$, the noise level exceeded for 10% of the measurement time interval T, is commonly used in the UK for the assessment of road traffic noise.
Background Noise Level, $L_{A90,T}$	Background noise level is a term used to describe that level to which the noise falls during quiet spells, when there is lull in passing traffic for example. It is quantified by the $L_{A90,T}$ which is the noise level that is exceeded for 90% of the measurement time interval, T.
Decibels	Noise conventionally is measured in decibels (dB). The decibel is a logarithmic unit and decibel levels do not add and subtract arithmetically. An increase or decrease of 3 dB in the level of a steady noise is about the smallest that is noticeable. It represents a doubling or halving of noise energy. An increase or decrease of 10 dB represents a ten-fold change in noise energy, and is perceived as a doubling or halving of loudness. The threshold of hearing for a typical young, healthy adult is 0 dB A-weighted sound pressure level. A noise level of 140 dB(A) can cause physical pain. Most people listen to their televisions at about 60 to 65 dB(A). Alongside a busy main road the ambient noise level may be in the 70 to 80 dB(A) range; on a quiet day in the country it might be as low as 30 dB, in town 40 to 50 dB(A).
Decibel Addition	If two similar noise sources operate together their combined noise level at an observer's position some distance away is 3 dB higher than the noise level generated by just one of them. If two further machines are switched on the noise level generated by all four at the observer's position is 3 dB higher than the level generated by the two. If the number of machines is again doubled, to eight, the noise level increases by another 3 dB, and so on.
L_{Aeq}	The 'equivalent continuous A-weighted sound pressure level' is an average of the fluctuating sound energy in a space. It is the value of the A-weighted sound pressure level of a continuous, steady sound that, over the specified time period, T seconds, has the same root mean square sound pressure as the varying sound. It can be likened to the mean petrol consumption of a car over a specific journey during which the instantaneous consumption peaked during periods of acceleration and fell during periods of coasting or braking.
Façade level	Road and railway traffic noise levels often are specified in terms of the sound level at a position 1 m in front of the most exposed façade of potentially noise sensitive premises. Such levels are assumed to be 3 dB(A) higher than sound levels measured at an equivalent position away from the noise reflected off the building façade and any other surfaces (excluding the ground).
Music Noise Level (MNL)	The L_{Aeq} of the music noise measured at a particular location without interference from extraneous ambient noise.

1 Introduction

Vanguardia Ltd. has been appointed by Jardine Motors Group to assess the potential noise impacts associated with the proposed development of the Porsche Centre car showroom and service workshop in Sayers Common, Mid Sussex.

The purpose of the noise assessment contained in this report is to determine the likely noise impact of the proposed development at nearby sensitive receptors, and to provide details of any proposed mitigation that may be required to comply with the relevant national and local planning policy objectives.

The proposed development is in the jurisdiction of Mid Sussex District Council, who were consulted with regard to the noise survey and assessment methodology.

2 Site and Proposed Development

The development site is located to the north of Sayers Common on the B2118. The existing site is comprised of a disused newspaper distribution centre.

The proposed development will be a Porsche car showroom used for the sale and repair of sports cars. The centre is to be equipped with a service workshop, car deck and car preparation building with jet washing facilities and vehicle inspection.

The operating times of the Porsche Centre, including the workshop and vehicle wash bays, shall be between 07:30 to 19:00 Monday to Friday, 08:30 to 17:00 on Saturday and 11:00 – 16:00 on Sunday. It is understood that there will be no workshop operations on Sundays.

The land immediately north of the site is made up of rural grassland and the Hickstead Park event space. The area east of the site is comprised of main roads A23, B2118 and Mill Lane roundabout. South of the site contains farmland and the approach into Sayers Common village. Directly west of the site lies the Hickstead Park residential area.

An overview of the site, closest noise sensitive receptors, and car preparation building is detailed below in Figure 1.



Figure 1. Site overview with locations of noise sensitive receptors and car preparation building

As seen in Figure 1 the closest noise sensitive residential receptors have been identified as:

- R1 Hickstead Park;
- R2 Sayers House (north of Christ Church, Oakhurst Lane).

It is understood that the site boundary is made up of trees and foliage which separate the development from Hickstead Park. This boundary is not expected to change with the development.

The workshop area is proposed in the northern section of the building. The internal layout of the workshop is such that operations including repairs, servicing and MOT of cars will be undertaken on the easterly façade away from Hickstead Park. The western façade is comprised of rooms for parts storage and dry vehicle preparation. The ramp for access to the rooftop car deck is situated on the western façade of the workshop.

The workshop contains two openings for cars to enter the building. Both openings are oriented to the north of the building overlooking the vehicle preparation building.

The proposed car preparation area is comprised of a building containing two indoor washing bays and an inspection area located to the side under a canopy. Washing of cars is intended to be carried out inside the building, with the northern and southern building facades containing doors. The ground floor layout of the Porsche showroom is presented in Figure 2.



Figure 2. Site plan (Ground floor)

As part of the intended works, five Mitsubishi PURY-EP400YNW-A(-BS) air conditioning units and four extract flues are to be installed on the top level of the car deck (Level 2). It is understood that, in general, the plant units and flues are only intended to operate during opening hours of the Porsche Centre. The flues will not operate on a Sunday. However, there may be certain times of the year when the plant operates outside normal opening hours, e.g. in hot or cold weather the system will be time-controlled to bring the building to temperature ahead of opening. It is understood that in these circumstances the plant may operate as early as 06:30. The first and second floor layout detailing the location of the plant and flues are detailed in Figure 3.

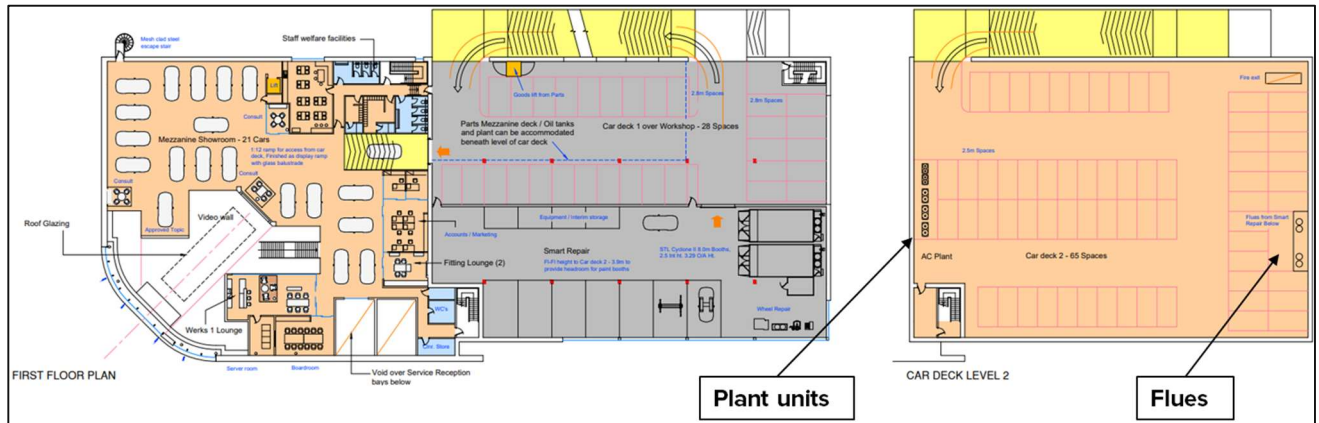


Figure 3. Site plan (first and top floor)

The Transport Statement (230406-Porsche-Mid Sussex-Final) forecasts a reduction in vehicular trips compared to the current use of the site, so no increase in noise from road traffic is predicted.

In summary, the sources of noise associated with the proposed development that are considered to have the potential to result in an adverse impact, or significant adverse impact, at nearby sensitive receptors include:

1. Mechanical plant noise from proposed air-conditioning units,
2. Extract fan noise from proposed flue chimney stacks,
3. Noise from the car servicing workshop breaking out through the building fabric; and
4. Jet wash activities taking place within the car preparation building.

3 Policy and Guidance

3.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF), last amended in September 2023 sets out the Government Planning Policy for England. It aims to devolve planning decision making to local planning authorities, asserting the primacy of local development plans and sustainable development. It encourages local planning authorities to set their own standards (although not as fixed thresholds) and adopt a more holistic approach to sustainable development.

The relevant paragraphs concerning noise in the NPPF are:

- Paragraph 174e: Specifies that new and existing development should be prevented from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution and, wherever possible, should help to improve local environmental conditions.
- Paragraph 185: "Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:
 - a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development - and avoid noise giving rise to significant adverse impacts on health and the quality of life;
 - b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."
- Paragraph 187: "Planning policies and decisions should also 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. "

The NPPF makes direct reference to the Noise Policy Statement for England for advice on the achievement of these policy aims and particularly for the explanation of "adverse impacts".

3.2 Noise Policy Statement for England (2010)

The overarching Government policy on noise is set out in the Noise Policy Statement for England (NPSE). It seeks to clarify the underlying principles and aims in past and existing policy documents, legislation and guidance in relation to all forms of noise including environmental noise, neighbour noise and neighbourhood noise (but not noise in the workplace).

It uses the established concepts of No Observed Effect Level (NOEL) and Lowest Observed Adverse Effect Level (LOAEL). The NPSE extends these by introducing Significant Observed Adverse Effect Level (SOAEL). This is the level above which significant adverse effects on health and quality of life occur. However, the explanatory note to the NPSE

states that it is not possible to identify a single objective value to define SOAEL for noise that is applicable to all sources of noise in all situations. It is likely to be different for different noise sources, for different receptors and at different times.

The NPSE's vision is to:

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

This long-term vision is supported by the following aims:

- *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.*

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

The second aim of the NPSE refers to noise impacts that lie somewhere between LOAEL and SOAEL. The NPSE asserts that, while this means that all reasonable steps should be taken to mitigate and minimise adverse effects, this does not mean that such adverse effects cannot occur.

In a decision letter associated with the Thames Tideway Tunnel project, the Government clarified the meaning of the phrase 'sustainable development' as follows:

The National Planning Policy Framework, the National Planning Practice Guidance on noise and the Noise Policy Statement for England are all clear that noise management should be determined in the context of sustainable development including the environmental, economic and social benefits of the proposal.

3.3 Local Policy and Consultation

Vanguardia agreed the noise survey and methodology with Joseph Swift from Mid Sussex Council on Wednesday 7th June 2023.

It was agreed that the assessment methodology would be based on the principles of the relevant national guidance, British Standard (BS) 4142:2014+A1:2019.

In addition, the predicted noise impact has been assessed according to the recommendations outlined in the Planning Noise Advice Document: Sussex. Annex 1 of this document provides recommended noise thresholds at sensitive receptors based on the type of development. In the context of industrial and commercial sites and plant, these are:

- *"1. The rating level of plant, where practicable, shall be no greater than the existing background sound levels, when measured in accordance with BS 4142;*
- *3. apply the indoor ambient noise levels in Tables 4 and 6 of BS8233;*
- *4. apply the WHO 2009 Community Noise guidelines for outdoor amenity areas."*

3.4 BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound

The assessment of potential sound impacts from operation of the Proposed Development has been undertaken using the methodology outlined in BS 4142. This methodology provides an initial estimate of impact based on the difference between sound from the source being assessed, corrected for acoustic features where required (the rating sound level), and the existing background sound level at the receptor location. The initial assessment of impact can be subsequently modified due to various contextual considerations if necessary.

As mentioned above, the standard states that certain characteristics, if apparent at the receptor location, can increase the extent of the impact over that expected from a simple difference in noise levels. These characteristics include tonality, impulsivity and intermittency. The standard describes various options for taking any such features into account and for determining what is described in the standard as a 'rating level'.

The standard states that an initial estimate of the extent of the impact can be determined by subtracting the representative background sound level from the rating level. The greater the difference the greater the magnitude of the initial impact estimate. The standard states that:

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

The standard states that while the difference between the rating level and background sound level provides an initial estimate of the impact, an effective assessment cannot be conducted without considering the context. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.

4 Baseline Noise Survey

A baseline noise survey was undertaken for the proposed development between Monday 19th June and Monday 3rd July 2023.

The survey was comprised of two long-term unattended measurements. The purpose of the baseline noise survey was to determine typical background and ambient sound levels at the nearest residential receptors from the existing Porsche Centre.

The measurements were carried out with a Class 1 sound level meter (SLM) at a height of 1.2 metres. The sound level meters have traceable laboratory calibration history, and were field calibrated before and after the measurements, with no significant drift in calibration observed. Further details of the equipment used in the survey is outlined in Appendix D of this report.

The weather conditions during the survey were reviewed using data from a local weather station based in Shoreham Airport. Weather periods with precipitation and wind speeds over 5 m/s were removed from the data set. Weather data for the survey period is presented in Appendix A of this report.

A summary of the monitoring locations used for the baseline survey is presented in Figure 4.

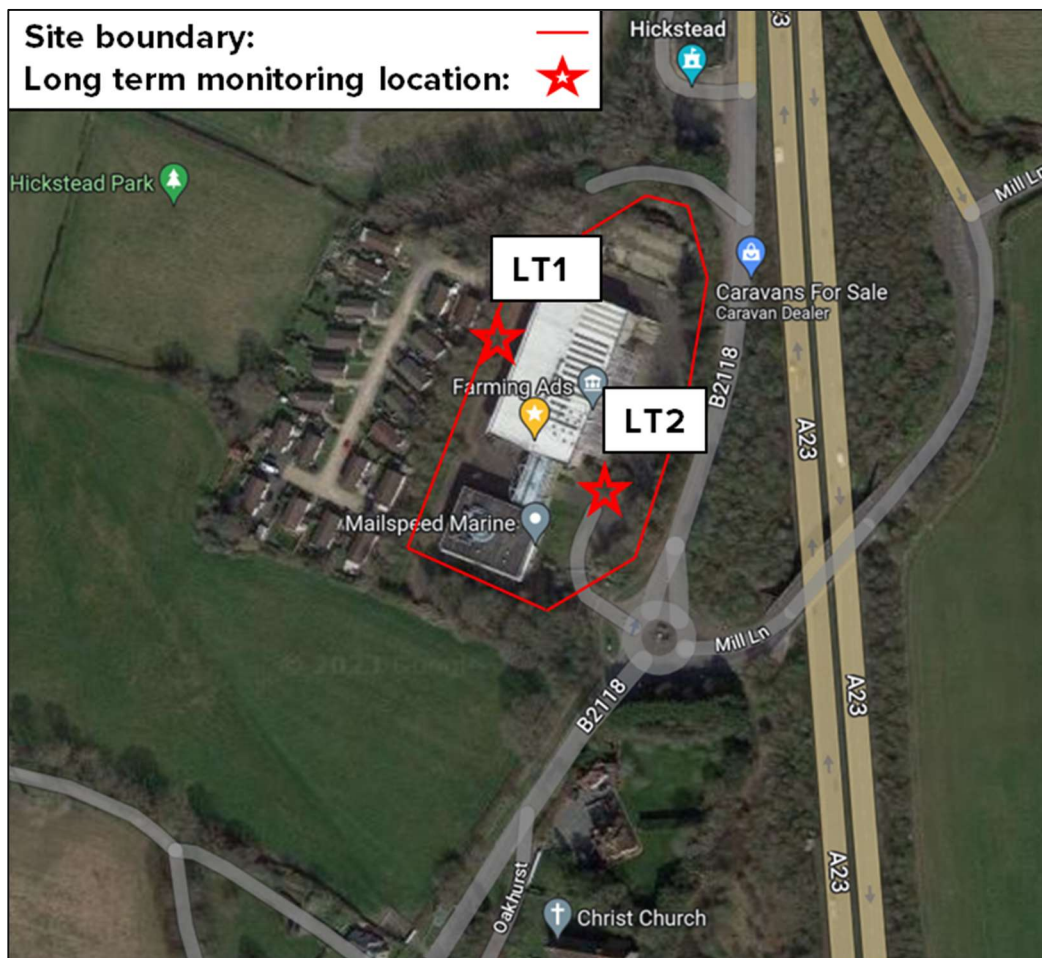


Figure 4. Baseline noise survey positions

The position of measurement LT1 was selected to represent the noise levels at Hickstead Park residential receptors. The equipment was secured on the western side of the existing development within the site boundary.

The position of measurement LT2 was selected to represent the noise levels at Sayers House residential receptor. The equipment was secured within the site boundary at an equidistant location from the B2118.

The dominant source of noise at the development site was road traffic noise from B2118, Mill Lane roundabout and A23. The traffic flowing along A23 was observed as dominant and continuous. Traffic flowing on B2118 and Mill Lane roundabout was intermittent.

Measurement position LT2 had a clear line of sight with B2118, Mill Lane roundabout and A23. The existing warehouse provided screening to the roads at LT1.

At the time of the survey installation, it was understood that the Hickstead Park show jumping event would be taking place between Wednesday 21st to Sunday 25th June. Noise data over this period has been analysed and discarded as necessary.

4.1 Measured Noise Data

To determine the typical background sound level at the receptors, a statistical analysis of the long-term noise data was carried out to identify the most common background sound level during the proposed opening hours of the Porsche Centre on a weekday (07:30 – 19:00), Saturday (08:30 – 17:00) and Sunday (11:00 – 16:00).

Additional analysis was undertaken to account for plant operating outside opening hours, e.g. during hot or cold times of the year: Weekdays (06:30 – 07:30), Saturday (07:30 – 08:30), Sunday (10:00 – 11:00). A summary of results outlining the periods of assessment are presented in Table 1, Table 2 and Table 3.

Table 1. Summary of weekday long-term measurement data

Position	Time period, T	Unattended Measured Noise Data	
		Ambient, dB L _{Aeq,15mins}	Modal Background Noise Level, dB L _{A90, 15 minutes}
LT1	07:30 – 19:00	53	50
	06:30 – 07:30	54	52
LT2	07:30 – 19:00	61	59
	06:30 – 07:30	61	59

Table 2. Summary of long-term measurement data - Saturday

Position	Time period, T	Unattended Measured Noise Data	
		Ambient, dB L _{Aeq,15mins}	Modal Background Noise Level, dB L _{A90, 15 minutes}
LT1	08:30 – 17:00	53	49
	07:30 – 08:30	52	50
LT2	08:30 – 17:00	61	58
	07:30 – 08:30	59	55

Table 3. Summary of long-term measurement data - Sunday

Position	Time period, T	Unattended Measured Noise Data	
		Ambient, dB L _{Aeq,15mins}	Modal Background Noise Level, dB L _{A90, 15 minutes}
LT1	11:00 – 16:00	53	50
	10:00 – 11:00	51	49
LT2	11:00 – 16:00	58	59
	10:00 – 11:00	61	55

4.2 Summary of Jet Wash Noise

Noise data used for this assessment references measured data recorded by Vanguardia in relation to a similar development at Porsche Centre, Cambridge (VC-0051669-0820-0-EN-RP-001).

For that assessment, to inform the assessment of noise impact arising from jet wash noise, overall A-weighted and linear octave band sound pressure levels were measured at 3 m from the car from one typical sized family car. The results of the measurements including the calculated sound power level are presented in Table 4, Table 5 and Table 6.

Worst case has been assumed by using the loudest measurement to characterise the typical level from the jet wash. Actual levels would reasonably be expected to be lower.

Table 4. Summary of measured sound level from pressure washing activity

Measurement number	Duration T (minutes)	Start Time	L _{Aeq}	L _{Amax}	Pressure washer mode of operation
1	3	13:02	73	84	On
2	2	13:05	67	71	Off
3	1	13:08	71	78	On

Table 5. 1/1 octave band sound spectrum levels measured of measurement number 1

Average noise level (dB L _{Aeq}) at Octave Band Centre Frequency						
63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
78	71	67	70	64	68	64

Table 6. 1/1 octave band sound power level from jet wash noise source

Octave Band Sound Power Level						
63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
96	89	85	88	82	86	82

4.3 Summary of Workshop Noise

With respect to noise break out from the workshop, this assessment uses noise data measured by Vanguardia at a similar development at Porsche Centre, Guildford (VC-103094-EN-RP-0001).

During that assessment, overall A-weighted and linear octave band sound pressure levels were measured in the middle of the similarly sized service workshop room, with typical working activity taking place, and are presented in Table 7. In each case the dominant noise sources were observed as being: radio; technicians talking; engines running or idling; intermittent use of air tools; metallic noise of tools being lifted/set down.

Table 7. Typical broadband sound levels measured in the Porsche Centre, Guildford service workshop

Start Time	Measurement duration (minutes)	Ambient noise level (dB L _{Aeq} , 5 min)
12:28	5	68
12:33	5	69
12:38	5	69

Table 8. Typical 1/1 octave band sound levels measured in the Porsche Centre, Guildford service workshop

Average noise level (dB L _{Aeq} , 1min) at Octave Band Centre Frequency						
63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
73	67	66	64	61	62	60

Table 8 presents a logarithmic average of the measured sound pressure levels (dB L_{eq}, 1 min) in each octave band between 63 Hz and 4 kHz, using the one-minute time history from each of the five-minute measurements presented in Table 7. This is considered representative of a reverberant internal sound pressure level occurring during a typical working day (i.e. when all technicians are in, carrying out usual duties on customer vehicles).

5 Noise Impact Assessment

5.1 Specific Noise Levels

Jet Wash

To predict the noise impact from the jet wash at the receptors, the measured noise data detailed in Table 6 was used to establish the resulting internal reverberant sound pressure level, based on the room dimensions and the acoustic properties (absorption coefficients) of the internal finishes. Sound levels produced at the receptor locations were then calculated, taking into account geometrical divergence from the source.

Workshop Noise

Noise break-out from the workshop has been assessed using the noise data presented in Table 7 and Table 8 and the acoustic transmission loss characteristics of the building facades.

It has been assumed, based on consultation with the development architects, that the workshop eastern and western façades is of a masonry wall build (100 mm breeze block). The northern facade is understood to be a composite panel construction. Since no detail of the acoustic performance of the composite panel is currently available, a sound reduction index, based on a 100 mm Kingspan Quadcore KS 1000 wall panel, has been assumed. In reality, it is expected that the composite panel will have a higher performance than that of the assumed Kingspan unit; predictions of the workshop noise breakout are therefore considered conservative.

Mechanical HVAC Plant and Extract Flues

Spectral data from the manufacturer's noise data sheet were used to calculate the specific noise level at the residential receptors, taking into account geometrical divergence from the source. The mechanical plant data sheets containing spectral data used in this assessment is presented in Appendix B and Appendix C.

5.2 Derivation of Rating Level

Jet Wash

The noise from the jet wash was subjectively assessed as being neither tonal nor impulsive. In addition, the measured spectral noise data does not indicate tonal character, but rather a relatively broadband spectrum. As a result, no rating correction has been applied to account for tonality or impulsivity.

While it is understood that the jet wash will be continuously operational throughout the opening hours of the Porsche Centre, the jet wash hose is only expected to be in use intermittently, as was observed. To account for this, a rating correction of + 3 dB has been identified as appropriate at R1, in line with the guidance given in BS 4142. The predicted level at R2 is sufficiently low compared to the ambient noise that no acoustic feature correction is necessary.

Workshop

It is understood that the noise associated with the workshop is intermittent due to a variety of different noise sources in the environment. However, the resulting noise break out levels from the workshop at the receptor are significantly below the existing background noise level, therefore no acoustic features are expected to be audible at any of the receptors, and no rating correction has been applied.

Mechanical HVAC Plant and Extract Flues

The mechanical plant and flues are expected to be operational throughout the opening hours of the Porsche Centre. The manufacturer's data sheets do not indicate tonality, neither do the plant units or flues typically exhibit sound of a tonal or impulsive nature. Therefore, no corrections have been applied to the specific noise level to obtain the rating level.

Calculation Assumptions

To represent worst case, geometrical divergence has been calculated based on horizontal distances only, in hemispherical space with hard ground assumed. Attenuation due to air absorption, ground effects and screening (from buildings, parapets, parked cars, etc.) have not been included.

The predicted contribution from each source at the two closest receptors is summarised in Table 9 and Table 10.

Table 9. Calculated contributions at Hickstead Park

Source	Octave band centre frequency Hz							dB(A)
	63	125	250	500	1000	2000	4000	
Air Handling Plant	47	37	40	38	33	28	23	39
Workshop (West Façade)	36	22	18	9	-4	-3	-6	14
Jet Washes	46	41	38	40	37	38	36	44
Spray Booth Flues	46	47	39	29	36	30	25	40
TOTAL	51	49	44	42	40	39	37	46

Table 10. Calculated contributions at Sayers House

Source	Octave band centre frequency Hz							dB(A)
	63	125	250	500	1000	2000	4000	
Air Handling Plant	28	21	15	12	10	6	2	15
Workshop (East Façade)	27	23	21	14	15	8	-4	19
Jet Washes	36	30	25	28	22	25	21	31
Spray Booth Flues	36	37	29	19	26	20	15	29
TOTAL	40	38	31	29	28	26	22	33

5.3 BS 4142 Assessment

The results of the BS 4142 assessment present the predicted cumulative noise level from the noise sources at the Porsche Centre to the receptors. Table 11 to

Table 16 present the weekday, Saturday and Sunday opening hours of the Porsche Centre, including the pre-opening hours, which only includes plant in operation.

Table 11. BS 4142 initial assessment – weekday opening hours (07:30 – 19:00)

Receptor	Background, dB L _{A90} , 15mins	Specific Level, dB L _{Aeq} , 15 mins	Correction, dB	Rating Level, dB, L _{AR}	Rating over background
Hickstead Park	50	46	3	49	-1
Sayers House	59	33	0	33	-26

Table 12. BS 4142 initial assessment – weekday hours (06:30 – 07:30)

Receptor	Background, dB L _{A90} , 15mins	Specific Level, dB L _{Aeq} , 15 mins	Correction, dB	Rating Level, dB, L _{AR}	Rating over background
Hickstead Park	52	46	3	49	-3
Sayers House	59	33	0	33	-26

Table 13. BS 4142 initial assessment – Saturday opening hours (08:30 – 17:00)

Receptor	Background, dB L _{A90} , 15mins	Specific Level, dB L _{Aeq} , 15 mins	Correction, dB	Rating Level, dB, L _{AR}	Rating over background
Hickstead Park	49	46	3	49	0
Sayers House	58	33	0	33	-25

Table 14. BS 4142 initial assessment – Saturday hours (07:30 – 08:30)

Receptor	Background, dB L _{A90} , 15mins	Specific Level, dB L _{Aeq} , 15 mins	Correction, dB	Rating Level, dB, L _{AR}	Rating over background
Hickstead Park	55	33	0	33	-22
Sayers House	55	33	0	33	-22

Table 15. BS 4142 initial assessment – Sunday opening hours (11:00 – 16:00)

Receptor	Background, dB L _{A90} , 15mins	Specific Level, dB L _{Aeq} , 15 mins	Correction, dB	Rating Level, dB, L _{AR}	Rating over background
Hickstead Park	50	46	3	49	-1
Sayers House	59	33	0	33	-26

Table 16. BS 4142 initial assessment – Sunday hours (10:00 – 11:00)

Receptor	Background, dB L _{A90} , 15mins	Specific Level, dB L _{Aeq} , 15 mins	Correction, dB	Rating Level, dB, L _{AR}	Rating over background
Hickstead Park	49	46	3	49	0
Sayers House	55	33	0	33	-22

The results show that worst-case rating levels predicted at the receptors are equivalent to or lower than the typical background sound level during all proposed opening hours and early morning periods.

BS 4142:2014+A1:2019 states that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on context. The context here is that conservative worst case has been assumed in the selection of source noise levels as well as in the calculation methodologies used, so uncertainty in the assessment is minimised.

As the combined predicted rating level from the various sources of noise considered in the assessment is at, or below the background sound level, no adverse or significant adverse effects are expected due to operation of the associated noise from the Porsche Centre. It is therefore considered that no additional mitigation measures are required to reduce noise levels from the Proposed Development.

The maximum predicted rating level is 49 dB(A) at R1. In accordance with BS 8233:2014, the predicted noise level falls within the design criteria for external areas that are used for amenity spaces (50 – 55 dB $L_{Aeq,T}$). In the context of a partially open window (assuming 15 dB of attenuation), this value falls within the criteria for acceptable internal noise levels (35 dB $L_{Aeq,T}$).

6 Conclusion

Vanguardia Ltd. was appointed by Jardine Motors Group to assess the potential noise impacts associated with the proposed development of the Porsche Centre car showroom and service workshop in Sayers Common, Mid Sussex.

Appropriate national planning policy and guidance have informed the assessment methodology, including the method for rating industrial or commercial noise outlined in BS 4142:2014+A1:2019.

In order to determine typical background sound levels (L_{A90}) at the nearest residential receptors to the proposed Porsche Centre, a baseline noise survey was undertaken in the area around the site between Monday 19th June and Monday 3rd July 2023.

As a precautionary approach in line with the guidance given in BS 4142, a rating correction of +3 dB was applied to account for the intermittency of the jet wash that may be audible at the closest residence.

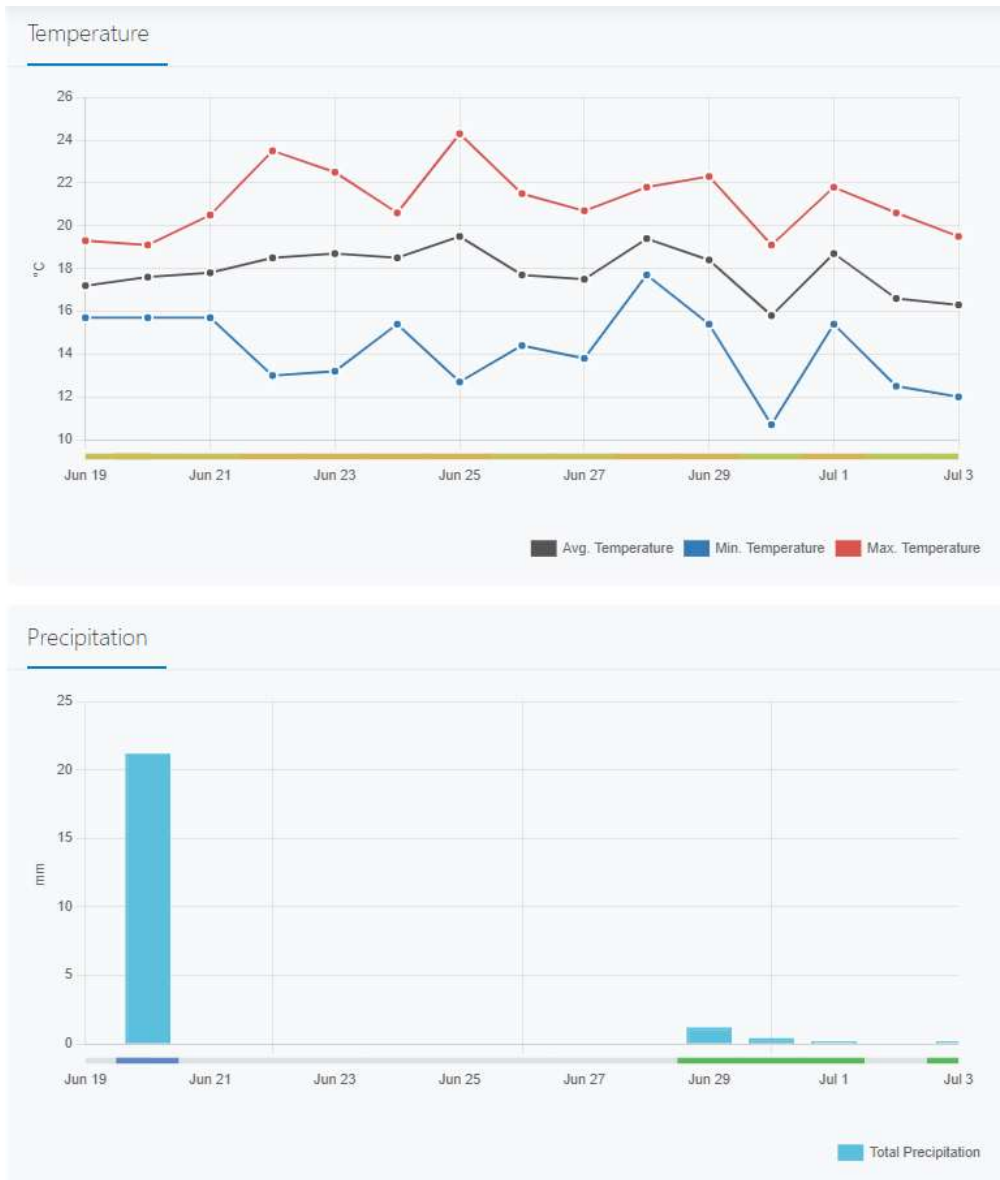
The BS 4142 assessment considers the opening hours of the Porsche Centre on a weekday (07:30 – 19:00), Saturday (08:30 – 17:00) and Sunday (11:00 – 16:00), as well as pre-opening hours (an hour before opening on each day) to account for heating and cooling plant that may operate prior to the centre opening.

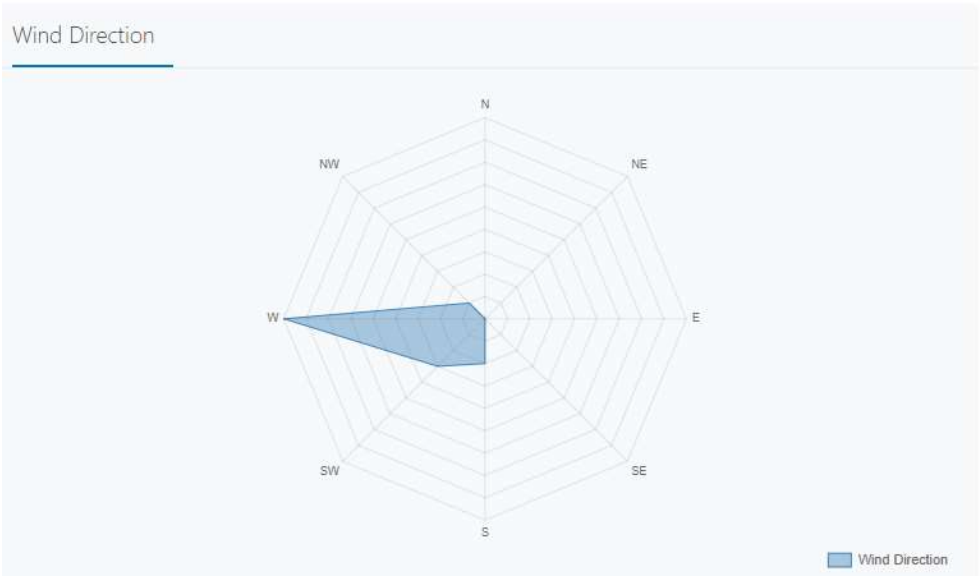
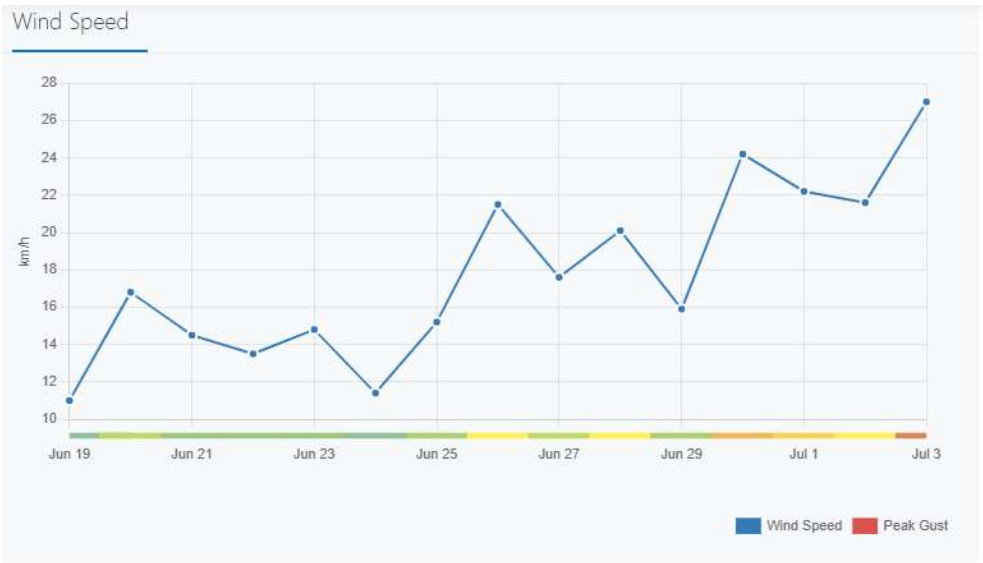
The assessment results indicate that the rating noise levels predicted at the receptors are at or below the typical background sound level during proposed opening hours and pre-opening hours.

BS 4142 states that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact. As the predicted rating level from the cumulative operational noise at the Porsche Centre is at or below the background sound level, no adverse or significant adverse effects are expected and no mitigation measures are required.

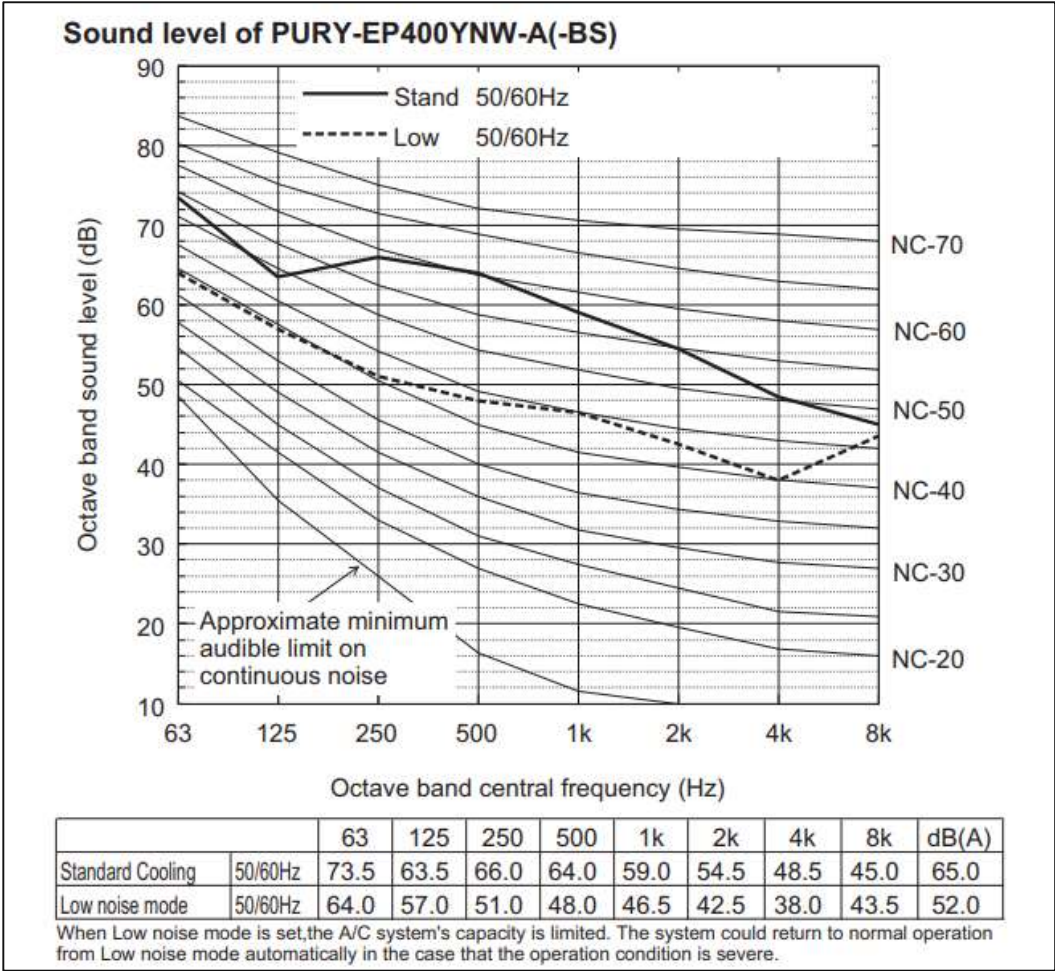
Appendix A Meteorological Conditions

The following information was accessed from Meteostat from Hove Airport weather station.
<https://meteostat.net/en/place/gb/hove?s=03876&t=2023-06-19/2023-07-03>

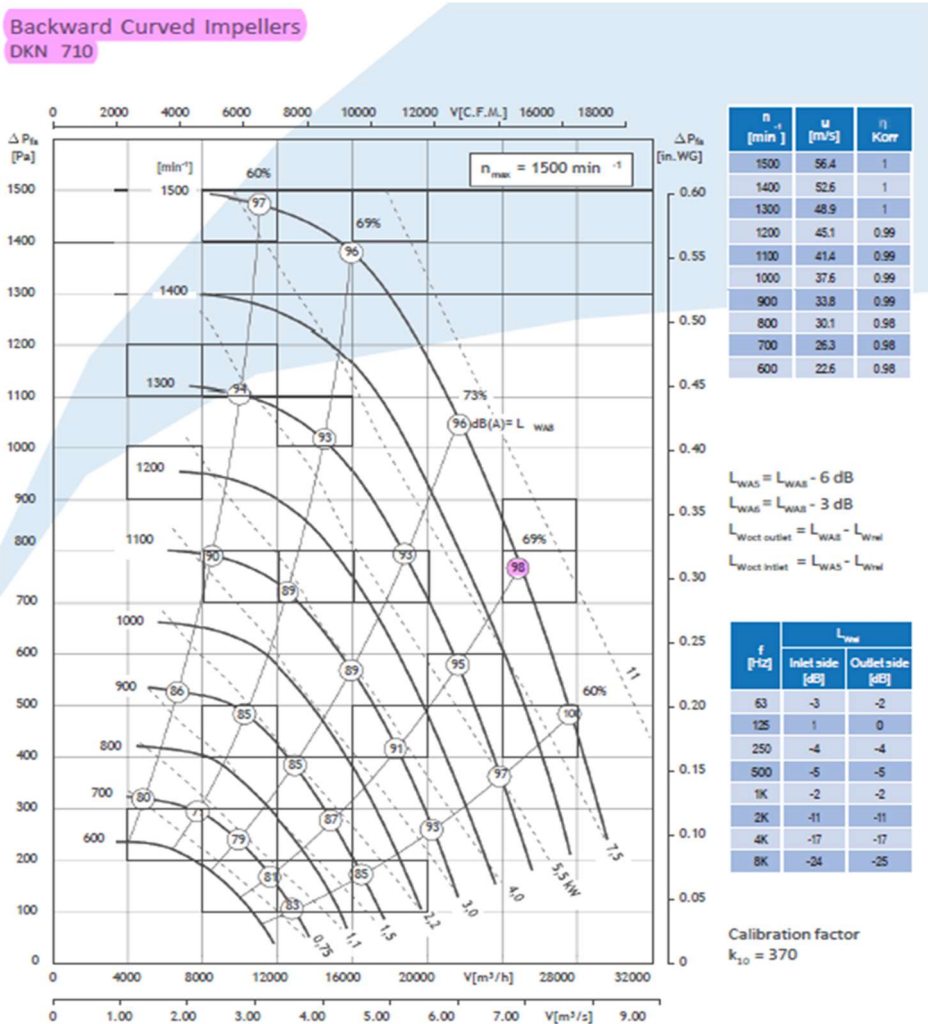




Appendix B HVAC Acoustic Datasheet



Appendix C Extract Flue Acoustic Datasheet



Type C Dynamic Attenuation

Bore Dia. mm (D)	Length	63	125	250	500	1K	2K	4K	8K
710	1D	3	5	8	15	19	15	14	12
	2D	5	6	10	20	26	23	18	17
800	1D	4	5	8	16	19	15	14	13
	2D	5	7	11	22	23	21	16	14
900	1D	4	5	9	17	19	15	14	13
	2D	5	7	12	24	23	21	16	15
1000	1D	5	5	11	18	19	15	14	13
	2D	6	8	13	25	24	22	17	15

Appendix D Noise Survey Instrumentation

Table 17. Noise survey instrumentation used.

Measurement Location	Equipment	Model	Serial Number
LT1	Sound Analyser	Larson Davis LxT SE	7082
	Pre-amp	Preamp PRMLxT1L	77678
	Microphone	Mic 377B02	338712
	Calibrator	Larson Davis CAL 200	16906
LT2	Sound Analyser	Larson Davis LxT SE	3318
	Pre-amp	Preamp PRMLxT1L	70086
	Microphone	Mic 377B02	314541
	Calibrator	Larson Davis CAL 200	16906

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