

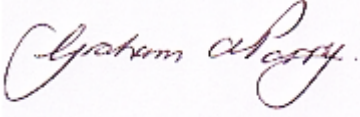
Report for:

Savoys Properties

12 Tilbury Close, Caversham, Reading
Noise Assessment

Status: Final

Date: 14.07.2022

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Date	14.07.2022
Version Number	A4768/N/003
Status	Final

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1. INTRODUCTION

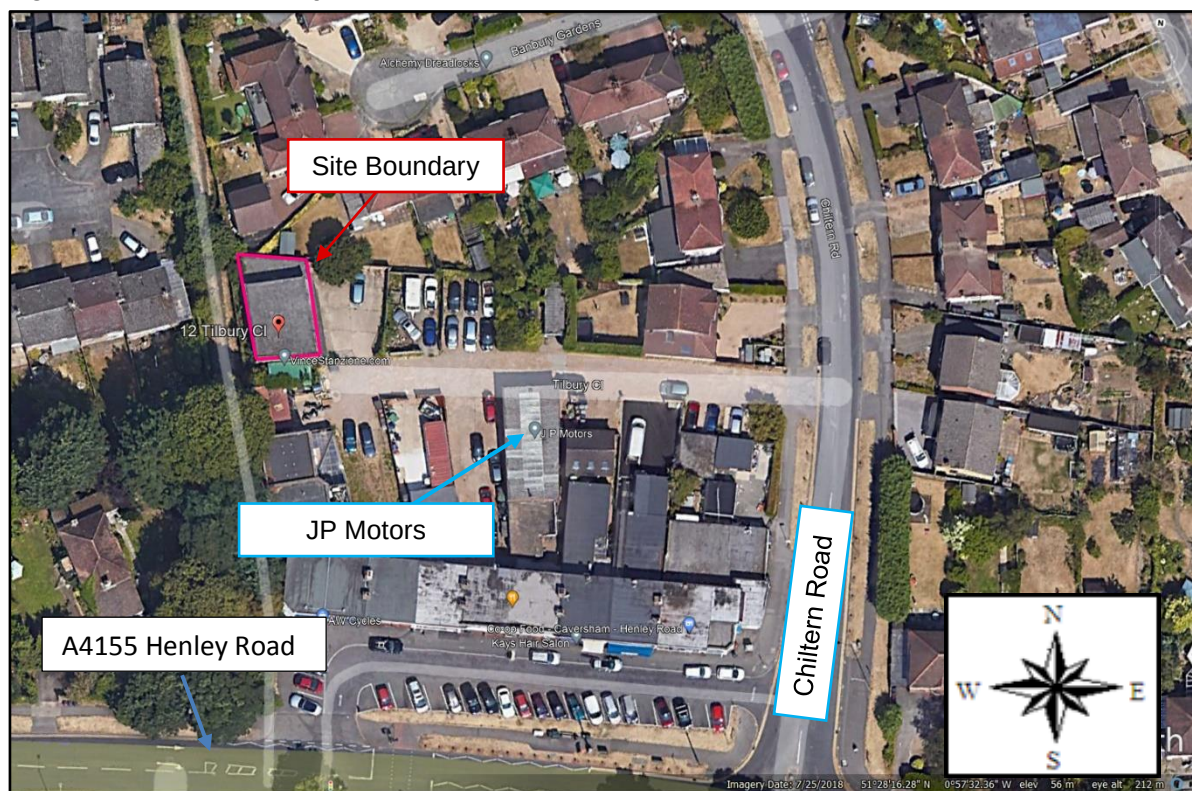
ACCON UK Limited (ACCON) has been commissioned by Savoys Properties to provide a noise assessment for the proposed development at 12 Tilbury Close, Caversham, Reading. The noise assessment is required to support the change of use from commercial, business and service (Class E - Offices) into 4 studio units / dwellings (Class C3) at ground and first floor.

The site is located within the administrative boundary of Reading Borough Council (RBC).

The site location is identified in **Figure 1.1**. A Glossary of Acoustic Terminology is provided in **Appendix 1**.

This assessment is required to determine the impact of noise emissions on the proposed change of use development from local noise sources, principally the commercial vehicle repair workshop and MOT Centre, JP Motors, which is located 27 metres from the proposed residential development on the south side of Tilbury Close. The room layout is identified in **Figure F.5**.

Figure 1.1: Site Boundary



2. THE NATURE, MEASUREMENT AND EFFECT OF NOISE

Noise is often defined as sound that is undesired by the recipient. Whilst it is impossible to measure nuisance caused by noise directly, it is possible to characterise the loudness of that noise. 'Loudness' is related to both sound pressure and frequency, both of which can be measured. The human ear is sensitive to a wide range of sound levels. The sound pressure level of the threshold of pain is over a million times that of the quietest audible sound. In order to reduce the relative magnitudes of the numbers involved, a logarithmic scale of decibels (dB) is normally used, based on a reference level of the lowest audible sound.

The response of the human ear is not constant over all frequencies. It is therefore usual to weight the measured frequencies to approximate the human response. The resulting 'A' weighted decibel, dB (A), has been shown to correlate closely to the subjective human response.

When related to changes in noise, a change of ten decibels, for example, from 60 dB (A) to 70 dB (A), would represent a doubling in 'loudness'. Similarly, a decrease in noise, for example, from 70 dB (A) to 60 dB (A), would represent a halving in 'loudness'. A change of 3 dB (A) is generally considered to be just perceptible¹. **Table 2.1** details typical noise levels.

Table 2.1: Typical Noise Levels

Approximate Noise Level (dB(A))	Example
0	Limit of hearing
30	Rural area at night
40	Library
50	Quiet office
60	Normal conversation at 1 m
70	In car noise without radio
80	Household vacuum cleaner at 1 m
100	Pneumatic drill at 1 m
120	Threshold of pain

¹ Institute of Environmental Management and Assessment (2014). Guidelines for environmental noise impact assessment.

3. POLICY AND GUIDANCE

In order to determine the potential constraints on the site with respect to noise it is necessary to consider the proposed land use in line with planning policy where it is related to noise.

3.1. National Planning Policy Framework

The revised National Planning Policy Framework (NPPF as amended in July 2021) supersedes the 2012, 2018 and 2019 versions of the NPPF. The purpose of the planning system is to contribute to the achievement of sustainable development. There are three dimensions to sustainable development: economic, social and environmental. The environmental role is to contribute to protecting and enhancing our natural, built and historic environment; and as part of this, make effective use of land, help to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate to adapt to climate change including moving to a low carbon economy.

One of the core planning principles is to contribute to conserving and enhancing the natural environment and reducing pollution. Allocations of land for development should prefer land of lesser value, where consistent with other policies in the Framework. The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

Paragraph 185 of the NPPF states:

“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 (see Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food and Rural Affairs, 2010));*
- 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.”*

Additionally, Paragraph 187 states:

“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.”

3.2. Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was developed by DEFRA and published in March 2010. The vision of the NPSE 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 Noise Policy Statement for England (NPSE) aims to *'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.'*

Based on concepts from toxicology, it introduces three 'Effect Levels' relevant to the assessment of noise. These are:

- NOEL: No Observed Effect Level: This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
- LOAEL: Lowest Observed Adverse Effect Level: This is the level above which adverse effects on health and quality of life can be detected; and
- SOAEL: Significant Observed Adverse Effect Level: This is the level above which significant adverse effects on health and quality of life occur.

3.3. Planning Practice Guidance

The Planning Practice Guidance for Noise (PPG-N) was published in March 2014 and most recently updated in July 2019. The PPG-N suggests that the most appropriate and cost-effective solutions to potential noise issues are best identified when good acoustic design is considered early in the planning process.

The PPG-N provides the following advice on how to determine the noise impact on development:

"Plan-making and decision making need to take account of the acoustic environment and in doing so consider:

- *Whether or not a significant adverse effect is occurring or likely to occur;*
- *Whether or not an adverse effect is occurring or likely to occur; and*
- *Whether or not a good standard of amenity can be achieved.*

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek

experienced specialist assistance when applying this policy.” (Paragraph 003 Reference ID 30-003-20190722)

The document goes on to acknowledge the levels of noise exposure at which an effect may occur as provided in the NPSE and introduces a fourth effect level:

- UAE: Unacceptable Adverse Effect: Extensive and regular changes in behaviour and/or an inability to mitigate the effect of noise lead to psychological stress or physical effects.

Importantly, where residential development is proposed in the vicinity of existing businesses, community facilities or other activities that produce noise, the PPG-N advises that the applicant (or ‘agent of change’) will need to clearly identify the effects of the existing businesses that may cause a nuisance (including noise) and clearly define the mitigation measures being proposed to address any potential significant adverse effects that are identified. The agent of change needs to not only consider the current activities of the business, but the permitted activities too, even if they are not occurring at the time of the application being made. The PPG-N acknowledges that *“It can be helpful for developers to provide information to prospective purchasers or occupants about mitigation measures that have been put in place, to raise awareness and reduce the risk of post-purchase/occupancy complaints.”* (Paragraph 009 Reference ID 30-009-20190722).

It is important to understand that as the PPG-N does not specifically provide any advice with respect to noise levels/limits for different sources of noise, it is appropriate to consider other sources of advice and guidance documents when considering whether new developments would be sensitive to the prevailing acoustic environment and the PPG-N signposts a number of appropriate guidance documents.

3.4. Permitted Development – Class MA

Class MA of the General Permitted Development Order provides the following requirements.

Conditions

MA.2. (1) Development under Class MA is permitted subject to the conditions:

(2) Before beginning development under Class MA, the developer must apply to the local planning authority for a determination as to whether the prior approval of the authority will be required as to—

(d) impacts of noise from commercial premises on the intended occupiers of the development;

3.5. Reading Borough Council

A planning application was previously submitted to RBC (Planning Application Number: 220313) in March 2022 for the proposed change of use of ground and first floors from Class E (Offices) to C3 (dwelling houses) to comprise 4 studio units. The application was made as a Prior Notification under Class MA, Part 3 of Schedule 2 of the Town and Country Planning (General Permitted Development) Order 2015.

At the time of that application it was accompanied with a noise report which relied principally on predicted noise levels from the garage activities. That application was subsequently withdrawn.

3.6. Professional Practice Guidance on Planning and Noise: New Residential Development

The Professional Practice Guidance (ProPG) on Planning and Noise for New Residential Development was published in May 2017 and has been produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England.

The recommended approach detailed in the ProPG includes a framework to enable situations where noise is not an issue to be clearly determined, and to help identify the extent of risk at noisier sites. The recommended approach provides opportunities to incorporate effective design interventions that will enable residential development to proceed in areas that might otherwise have been considered unsuitable.

The ProPG provides advice for Local Planning Authorities and developers, and their respective professional advisers. It aims to complement Government planning and noise policy and guidance. In particular, it strives to:

- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
- Encourage the process of good acoustic design in and around new residential developments;
- Outline what should be taken into account in deciding planning applications for new noise-sensitive developments;
- Improve understanding of how to determine the extent of potential noise impact and effect; and
- Assist the delivery of sustainable development.

The two sequential stages of the recommended approach are:

- Stage 1: an initial noise risk assessment of the proposed development site; and
- Stage 2: a systematic consideration of four key elements.

The four key elements to be undertaken in parallel during Stage 2 of the recommended approach are:

- Element 1: demonstrating a “Good Acoustic Design Process”;
- Element 2: observing internal “Noise Level Guidelines”;
- Element 3: undertaking an “External Amenity Noise Assessment”; and
- Element 4: consideration of “Other Relevant Issues”.

Figure 3.1 below identifies the guidance given in the ProPG when undertaking the risk assessment stage for a site.

Figure 3.1: Phase 1 – Noise Risk Assessment

Noise Risk Assessment	Potential Effect Without Noise Mitigation	Pre-Planning Application Advice
Indicative Daytime Noise Levels L_{Aeq}, 16hr Indicative Night-time Noise Levels L_{Aeq}, 8hr	Increasing risk of adverse effect	High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice. As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrates that a significant adverse noise impact will be avoided in the finished development. At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.
	No adverse effect	These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.
Notes: - Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures. - Indicative noise levels are the combined free-field noise levels from all sources of transport noise and may also include industrial/commercial noise where this is present but is “not dominant”. - L_{Aeq}, 16hr is for daytime 0700 - 2300, L_{Aeq}, 8hr is for night-time 2300 - 0700. - An indication that there may be more than 10 noise events at night (2300 - 0700) with L_{AFmax} > 60 dB means the site should not be regarded as negligible risk.		

Figure 3.2 below identifies the internal noise level criteria provided in the ProPG.

Figure 3.2: ProPG Noise Levels

Activity	Location	0700-2300 Hours	2300-0700 Hours
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$ 45 dB L_{AFmax} ^{Note 4}

Notes:

1. The Table provides recommended internal L_{Aeq} target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Ground-borne noise is assessed separately and is not included as part of these targets, as human response to ground-borne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.
2. The internal L_{Aeq} target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the internal L_{Aeq} target levels recommended in the Table.
3. These internal L_{Aeq} target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.
4. Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{AFmax} , depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB L_{AFmax} more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events (see Appendix A).
5. Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7.
6. Attention is drawn to the requirements of the Building Regulations.
7. Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing "unacceptable" noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form (see Section 3.D).

3.7. British Standard BS 8233:2014

BS 8233 *Guidance on sound insulation and noise reduction for buildings* has a number of design criteria for intrusive external noise without a specific character. The guidelines are designed to achieve reasonable resting/sleeping conditions in bedrooms and good listening conditions in other rooms. The most appropriate noise levels for the residential environment are reproduced in **Table 3.1**.

Table 3.1: Indoor Ambient Noise Levels for Dwellings

Activity	Location	Daytime 0700 hrs to 2300 hrs	Night-time 2300 hrs to 0700 hrs
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

Although there are no limits set for external noise levels in BS 8233 the following guidance is provided at paragraph 7.7.3.2:

“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.”

3.8. British Standard BS 4142:2014

BS 4142:2014 *Methods for rating and assessing industrial and commercial sound* provides a method for the measurement and rating of industrial or commercial type noise sources and background noise levels outside dwellings. The ‘rating level’ (defined in the BS) is used to rate the noise level of the source (this is defined as the ‘specific sound level’) outside residential dwellings.

The rating level is determined by assessing the character of the noise and applying an acoustic feature correction, if appropriate, to the specific sound level. Corrections are applied for the tonality, impulsivity, intermittency or other distinctive characteristics of the noise source which can all increase the impact of noise.

The initial assessment described in BS 4142 to determine whether an adverse impact is likely is based on establishing the difference between the rating level and the background noise

level outside the residential property of interest. The British Standard states that the following points should be considered:

- *“Typically, the greater this difference, the greater the magnitude of the impact.*
- *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.*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.”*

Where it is considered that the initial assessment of the impact needs to be modified due to the context in which the noise is occurring, BS 4142 suggests that all pertinent factors are taken into consideration, including:

- “The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound² levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

- The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.*

² The residual sound is defined as the ambient sound level at the assessment location in the absence of the specific sound source.

- iii. *The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:*
 - i. *facade insulation treatment;*
 - ii. *ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and*
 - iii. *acoustic screening.”*

There is also a requirement within BS 4142:2014 to consider the uncertainty in the measurement and assessment procedure and it is stated that: “*The level of uncertainty associated with a measurement of sound level depends upon a number of factors, including:*

- a. *the complexity of the sound source and the level of variability in sound emission from the source;*
- b. *the complexity and level of variability of the residual acoustic environment;*
- c. *the level of residual sound in the presence of the specific sound at the measurement location;*
- d. *the location(s) selected for taking the measurements;*
- e. *the distance between sources of sound and the measurement location and intervening ground conditions;*
- f. *the number of measurements taken;*
- g. *the measurement time intervals;*
- h. *the range of times when the measurements have been taken;*
- i. *the range of suitable weather conditions during which measurements have been taken;*
- j. *the measurement method and variability between different practitioners in the way the method is applied;*
- k. *the level of rounding of each measurement recorded; and*
- l. *the instrumentation used.”*

4. NOISE MEASUREMENT SURVEY

A noise measurement survey was carried out in order to determine the extent to which the site is currently affected by noise from the commercial vehicle repair workshop situated on the south side of Tilbury Close (JP Motors).

Noise measurements were carried out commencing at 1510 hrs on Tuesday 21st June 2022 for a 24 hour period at one semi-permanent noise monitoring position (MP1) at one metre from the façade of the proposed change of use building. The monitoring position was chosen to have the maximum angle of view towards the open garage workshop area. The noise measurement position has been identified in **Figure F.1**. **Figures 5.2 to 5.4** provide photographs of the noise measurement location.

The weather conditions recorded at the start of the measurement period were partially cloudy (10% cloud cover) with a temperature of 21°C. The average wind speed was approximately 2 m/s with gusts up to a maximum of 3.5 m/s from a south-easterly direction.

At the end of the measurement period, there was no cloud with a temperature of 24°C and wind speeds of less than 2 m/s.

The noise measurement survey utilised a Svantek 971 Class 1 Sound Level Meter. The sound level meter holds a current certificate of calibration, which is available on request. The equipment was field calibrated before and after the measurement period to ensure that it had remained within reasonable calibration limits (± 0.5 dB). Additionally, the sound level meter was set to record audio files to facilitate the identification of noise events associated with the activities at JP Motors.

The Noise Measurement Position (MP1) was located at first floor level on the southeast façade of the development building with direct line of sight towards JP Motors. The general noise climate was primarily related to road traffic noise from vehicle movements within Tilbury Close and from the Henley Road and intermittent noise from JP Motors.

A summary of the estimated free-field noise levels is identified in **Table 4.1**. The free-field noise levels are the noise levels measured at 1m from the building façade, with a correction of -3 dB applied to convert the façade noise levels to free-field noise levels.

Table 4.1: Summary of Measured Free-field Noise Levels

Position	Period (Hours)	$L_{Aeq, T}$ (dB)	L_{AFmax} (dB)	Average $L_{A10, 5min}$ (dB)	Average $L_{A90, 5 min}$ (dB)	Modal $L_{A90, 5min}$ (dB)
MP1	0700 – 2300	45	79	46	38	44
	2300 - 0700	39	73 (57)	38	30	33

Note: The levels stated are logarithmic averages for $L_{Aeq, T}$ and arithmetic averages for $L_{A10, T}$ and $L_{A9, T}$. The L_{AFmax} is the highest of the 5-minute maximum sound levels measured during the measurement period. The L_{AFmax} in brackets is the tenth highest L_{AFmax} during this period.

5. ACOUSTIC DESIGN STATEMENT

5.1. Stage 1: ProPG Initial Site Noise Risk Assessment

The daytime noise level for the southeast façade, with direct line of sight towards JP Motors is 45 dB $L_{Aeq, 16hr}$ and the night-time noise level is 39 dB $L_{Aeq, 8hr}$. The noise levels at the south-eastern façade of the building indicate that the site is generally of a low risk of adverse noise effect from general road traffic noise during the daytime and night-time periods.

5.2. Stage 2: Internal Noise Levels

5.2.1. Predicted Noise Levels

Table 5.1 identifies the predicted internal noise levels with windows open, assuming that a partially open window provides 15 dB sound reduction. It can be seen that the predicted internal noise levels with open windows do not exceed the target internal noise levels set out in **Section 3.7** for the daytime and night-time periods or for the night-time L_{AFmax} .

Table 5.1: Predicted Internal Noise Levels with Open Windows

Façade	Measured External Noise Levels (dB)			Predicted Internal Noise Levels (dB) With Open Windows		
	Daytime $L_{Aeq, 18hr}$	Night-time $L_{Aeq, 8hr}$	Night-time L_{AFmax}	Daytime $L_{Aeq, 18hr}$	Night-time $L_{Aeq, 8hr}$	Night-time L_{AFmax}
Southern Façade	45	39	57	30	24	42

Note: The night-time L_{AFmax} is the tenth highest L_{AFmax} during the night-time period.

It should be noted that whilst internal noise levels would be compliant with BS8233 with open windows, the proposed secondary glazing and MVHR system will ensure that internal noise levels are lower still and acceptable.

5.3. Commercial Noise Assessment

5.3.1. Specific Sound Levels

As there is a commercial vehicle repair workshop on the south side of Tilbury Close, east of the proposed change of use development, it is appropriate to consider the noise impact from this commercial use. It should be noted that JP Motors only operates during normal business hours.

The recorded noise measurement data from MP1 has been reviewed in detail from the statistical data and the audio recordings and it is apparent that there were regular noise events resulting from the use of tools and machinery at JP Motors which were distinguishable from the general road traffic noise from Tilbury Close and the A4155 Henley Road.

Motor vehicle garages typically use a range of different relatively high noise level tools during the workday. Typically, some of the highest identifiable noise levels occur when an impact

gun is used to remove the wheels on a vehicle although in any one hour the typical on-time is two minutes (3 cars).

5.3.2. Background Sound Levels

The daytime background sound level ($L_{A90,1hr}$) in the absence of any garage activities has been utilised in the BS4142 assessment.

5.3.3. BS 4142 Assessment

Table 5.2 presents the results of a BS 4142 assessment based on a detailed review of the noise measurement data and the identification of individual noise source activities emanating from the garage workshop.

Table 5.2: Daytime BS 4142 Assessment for operational hours of the garage workshop

Results	Noise Level (dB)	Relevant Clause of BS 4142:2019	Commentary
Background Sound Level $L_{A90, T}$ (dB)	41	8.1, 8.2	The background sound level measured at MP1 when the garage is not operational
Specific Sound Level $L_{Aeq, T}$ (dB)	40	7.3	Based on a detailed review of the statistical data and the audio files
Acoustic Feature Correction (dB)	3	9.1, 9.2, 9.3	An Acoustic Feature Correction of +3 dB for intermittency
Rating Sound Level $L_{Aeq, 1hr}$ (dB)	43		(Specific Sound Level + Acoustic Feature Correction)
Excess of Rating Sound Level over Background Sound Level	+2		
Estimate of Impact	Below an indication of an Adverse Impact		

5.3.4. Discussion of Uncertainty

ACCON carried out a 24-hour semi-permanent noise measurement survey spanning a weekday to obtain typical background sound levels at the southern façade of the proposed noise sensitive receptor. It is considered that the noise measurement period was carried out on reasonably typical days for background sound levels and that the activities at the garage were typical with three vehicles in the garage at any one time.

The noise measurements were carried out in accordance with BS 7445 Part 1 *Description and measurement of environmental noise* during weather conditions suitable for noise measurements.

It is considered that the effects of uncertainty have been minimised as far as possible based on the information available to support this assessment.

5.3.5. Discussion of Context

When considering the impact of noise using BS 4142 it is necessary to consider the context of the noise. The proposed development is situated in an existing area of commercial and residential uses.

The opening hours for JP Motors are from 0830hrs to 1730hrs every weekday, except on Fridays when it is open from 0830hrs to 1630hrs. JP Motors is closed on Saturdays and Sundays. As these opening hours are only within the daytime period, it was not necessary to assess the night-time period using BS 4142.

6. NOISE MITIGATION

It is proposed to include secondary glazing for all habitable rooms and the development will include a mechanical ventilation and heat recovery system (MVHR). The layout of the rooms and the location of the MVHR is identified in **Figure F.5**.

The secondary glazing system will be a SelectaGlaze system which will result in an overall minimum noise reduction of 39 dB(Rw) in combination with a primary glazed window system and a minimum 50mm cavity.

The MVHR system will be a Vectaire Ventilation System or similar with acoustic attenuation. The inclusion of the MVHR system will ensure that an adequate level of ventilation is provided such that windows would not need to be opened although all windows will remain openable if required.

7. CONCLUSIONS

An environmental noise measurement survey has been carried out at the site. An assessment of internal noise levels has identified that the internal noise criteria of BS 8233 for general traffic noise would be achieved with open windows. The proposed development includes the provision of secondary glazing and an MVHR system.

An assessment in line with BS 4142:2014+A1:2019 has been carried out to determine the impact of commercial noise on the proposed residential use of 12, Tilbury Close, resulting from the existing commercial vehicle repair workshop, JP Motors, to the southeast of the site. The assessment has demonstrated that there would be low impact from the commercial noise on the proposed dwellings such that if the operational hours or days of operation were to change then the impact would remain low.

The proposed change of use development scheme is not expected to experience a significant adverse noise impact and the site is considered acceptable for the proposed residential use under the requirements of class MA of the GPDO.

7.1. Recommendations to the Decisions Maker

On the basis of the above, it is recommended that there should be no objection to granting consent for the proposed change of use development on noise grounds.

ADDITIONAL FIGURES

Figure F.1: Noise Measurement Position



Figure F.2: Noise Measurement Equipment



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Figure F.3: Noise Measurement Equipment



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Figure F.4: Noise Measurement Equipment

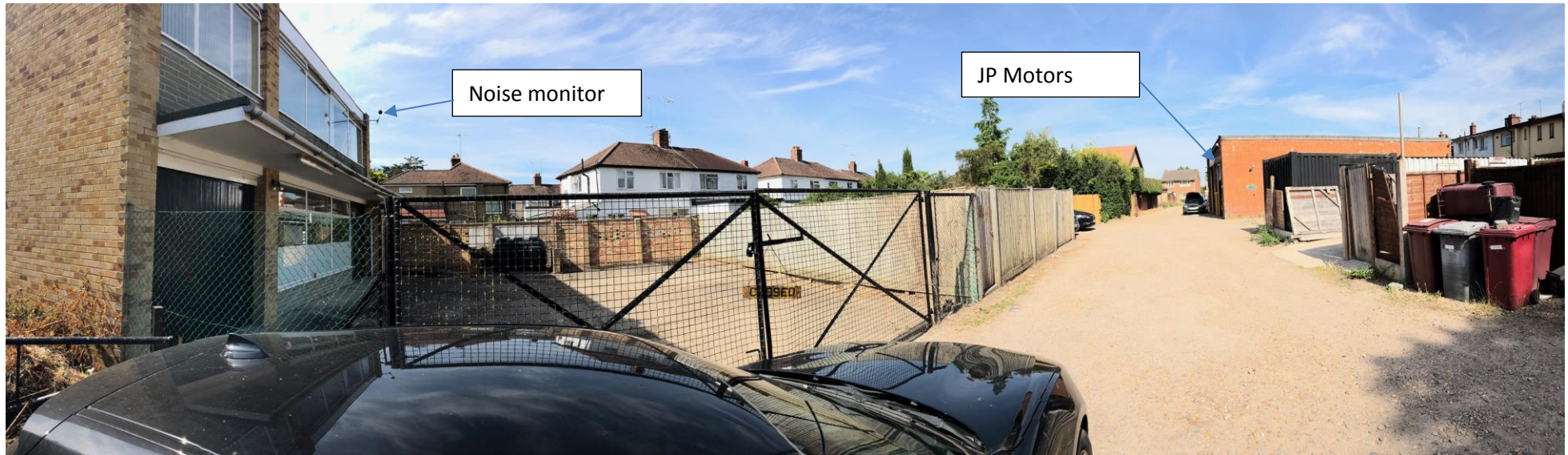
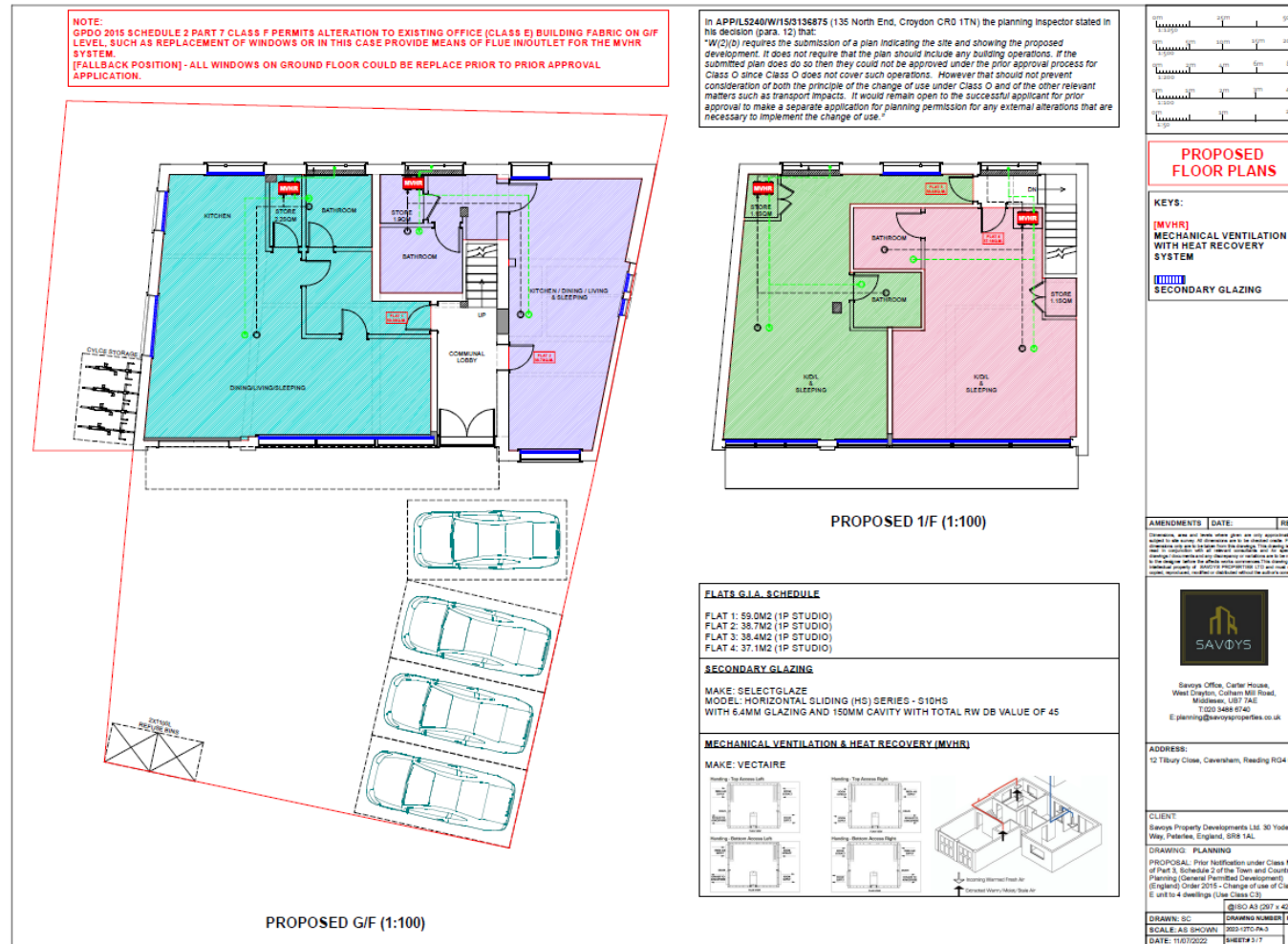


Figure F.5: Ground & First floor room layouts



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APPENDICES

Appendix 1

Glossary of Acoustic Terminology

Term	Description
'A'-Weighting	<i>This is the main way of adjusting measured sound pressure levels to take into account human hearing, and our uneven frequency response.</i>
Decibel (dB)	<i>This is a tenth (deci) of a bel. Decibel can be measure of the magnitude of sound, changes in sound level and a measure of sound insulation. Decibels are not an absolute unit of measurement but are an expression of ratio between two quantities expressed in logarithmic form.</i>
$L_{Aeq, T}$ (Ambient / Period Sound Level)	<i>The equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period, T. T may be as short as 1 second when used to describe a single event, or as long as 24 hours when used to describe the noise climate at a specific location. $L_{Aeq, T}$ can be measured directly with an integrating sound level meter.</i>
$L_{A90, T}$ (Background Sound Level)	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 90 per cent of a given time period. The $L_{A90, T}$ is used to describe the background noise levels at a particular location.</i>
L_{Amax}	<i>The 'A'-weighted maximum sound pressure level measured over a measurement period. Typically measured with 'fast' weighting (125 ms) or 'slow' weighting (1s).</i>
Rating Level, $L_{Ar, Tr}$	<i>The specific sound level plus any adjustment for the characteristic features of the sound.</i>
Residual Sound Level, $L_r = L_{Aeq, T}$	<i>Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that does not contribute to the ambient sound.</i>
Specific Sound Level, $L_s = L_{Aeq, Tr}$	<i>The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr.</i>



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