Report for:

GTO Engineering

GTO Car Restoration Centre, Twyford

Noise Impact Assessment

Status: Final **Date: 18.11.2024**

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1. INTRODUCTION

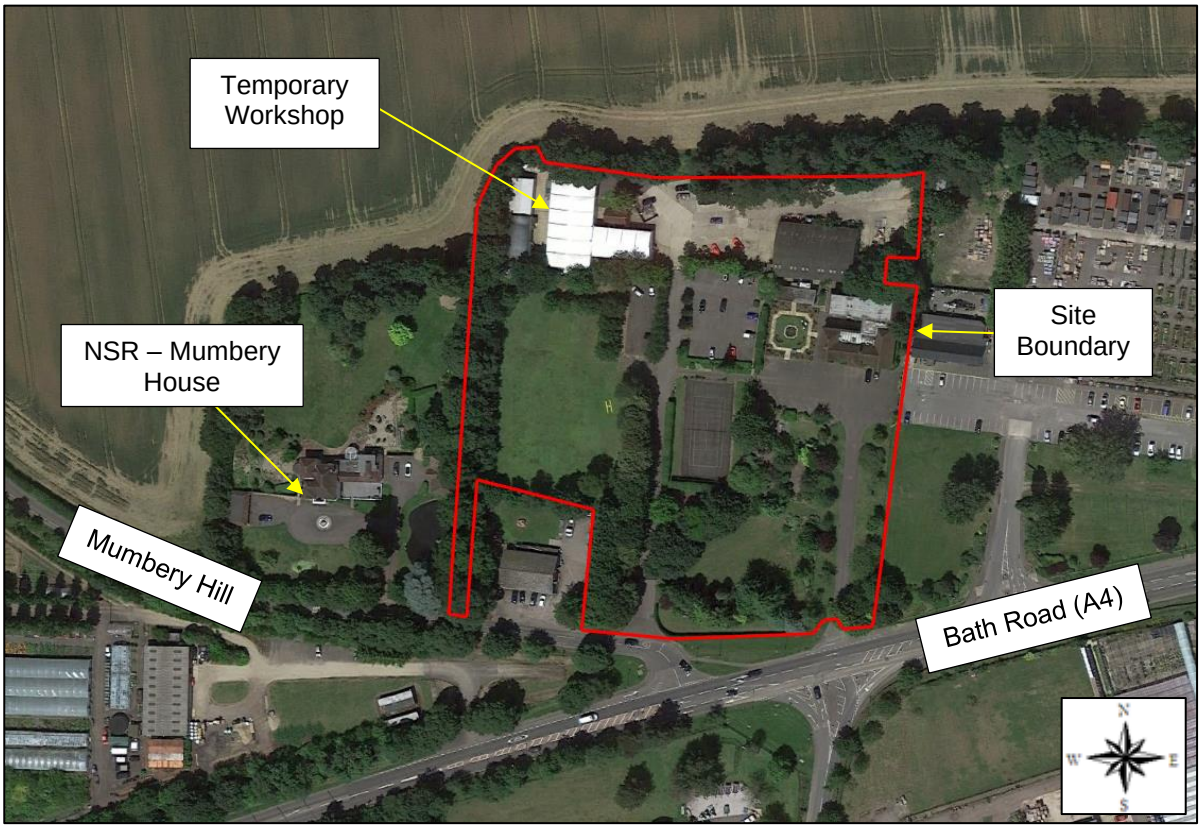
ACCON UK Limited (ACCON) has been commissioned by Murray Planning Associates on behalf of GTO Engineering to carry out a Noise Impact Assessment in relation to the proposed redesign and expansion of facilities at the existing car restoration centre at Bath Road, Twyford. The proposed development consists of the demolition of the existing storage shed and the construction of a new GTO Car Restoration Centre in its place, which would operate between 0830 hrs to 1730 hrs, Monday to Friday.

The site currently has an office building and storage shed to the east of the site and a workshop in a temporary structure to the northwest of the site. The site was previously granted planning permission (Application No. 193047, dated 21.08.2020) for the construction of a new workshop with offices in the northeast of the development site.

The site is located within the administrative boundary of Wokingham Borough Council.

Figure 1.1 provides the site location with the nearest Noise Sensitive Receptor (NSR) identified. The site boundary is outlined in red. The proposed site plan is identified in **Figure F.1**.

Figure 1.1: Site Location



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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 10 dB(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 perceptible[1]. **Table 2.1** provides typical noise levels of common sources.

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

A Glossary of Acoustic Terminology is provided in **Appendix 1**.

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

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3. NOISE ASSESSMENT CRITERIA

This section of the report identified relevant National and Local Authority policy and guidance. Additionally, appropriate British Standards and guidance documents are also referenced.

3.1. National Planning Policy Framework

The revised National Planning Policy Framework (NPPF as amended in December 2023) supersedes the 2012, 2018, 2019 and 2021 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 191 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 193 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.*"

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3.2. Noise Policy Statement for England

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:

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- 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.

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') 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. Local Authority Policy and Guidance

3.4.1. Wokingham Borough Council

Wokingham Borough Council has the following policy in relation to noise:

Managing Development Delivery Local Plan (Adopted February 2014), Policy CC06: Noise

1. Proposals must demonstrate how they have addressed noise impacts to protect noise sensitive receptors (both existing and proposed) from noise impacts in line with Appendix 1 of the MDD.

2. Noise impact of the development must be assessed. Where there is no adverse impact (No Observed Effect Level) then noise will not be a material consideration.

3. Where there is an adverse effect (Lowest Observed Adverse Effect Level to Significant Observed Adverse Effect Level), then

a) The development layout must be reviewed. Where this results in there no longer being an adverse impact then design and mitigation measures should be incorporated accordingly.

b) Where there is still an adverse impact then internal layout must be reviewed. Where this results in there no longer being an adverse impact then design and measures should be incorporated accordingly.

c) Where there is still an adverse impact then physical mitigation measures such as barriers/mechanical ventilation must be reviewed. Where this results in there no longer being an adverse impact then design and mitigation measures should be incorporated accordingly.

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d) Where there is still an adverse impact and the development falls within the significant observed adverse effect level then planning permission will normally be refused.

3.5. Noise Guidance

3.5.1. British Standard BS 4142:2014+A1:2019

BS 4142 *Methods for rating and assessing industrial and commercial sound* provides a method for the measurement and rating of industrial 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 and intermittency 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:

1) *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.

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Where residual sound[2] 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.

2) *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.*

3) *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.

3.6. Target Noise Criteria

The target noise criteria for noise emanating from the proposed Car Restoration Centre are those set out in BS 4142, such that the rating noise level will not exceed the background sound level and an indication of a low impact will be achieved.

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

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4. NOISE MEASUREMENT SURVEY

A detailed noise measurement survey was carried out at the site in order to determine the existing noise climate surrounding the Car Restoration Centre and to obtain background noise levels representative of the nearest noise sensitive receptor. An unattended noise measurement survey was carried out in order to characterise the existing noise climate over a 24-hour period and a 3-hour attended noise measurement was carried out in accordance with Paragraph 43 Shortened Measurement Procedure identified in the Department of Transport's Technical Memorandum '*Calculation of Road Traffic Noise (CRTN, 1988)'*. The noise measurements were carried out between 1000 hrs on Wednesday 13th November 2024 and 1000 hrs on Thursday 14th November 2024.

4.1. Methodology

The noise measurements utilised one Svantek 971 Class 1 Sound Level Meter (SLM) and one Norsonic 118 SLM. Both SLMs hold current certificates of calibration, which are available upon request. Before and after the noise measurement period, the equipment was field calibrated in order to ensure that the equipment had remained within reasonable calibration limits (± 0.5 dB).

At the start of the noise measurement period the weather was dry with no cloud cover, a daytime temperature of 10°C and a north-easterly wind with speeds of up to 1 m/s.

At the end of the noise measurement period the weather was dry with 100% cloud cover, an average temperature of 11°C and a north-easterly wind with speeds of up to 1 m/s. Weather conditions throughout the noise measurement survey were suitable for noise measurements.

Table 4.1 provides the locations of the noise survey measurements and the observed noise sources during the noise survey. **Figure 4.1** identifies the position of the noise measurements.

Table 4.1: Noise Survey Locations

Location Reference	Location Description	Measurement Duration	Observed Noise Sources
Measurement Position 1 (MP1)	Located in a free-field position approximately 50m north-east of the eastern façade of Mulberry House, at a height of 1.5m above ground level.	24 hours.	Noise associated with the temporary workshop, road traffic noise from the A4.
Short Term Position 1 (ST1)	Located in a free field position approximately 6m north of the A4, at a height of 1.5m above ground level.	3 hours.	Road traffic noise from the A4.

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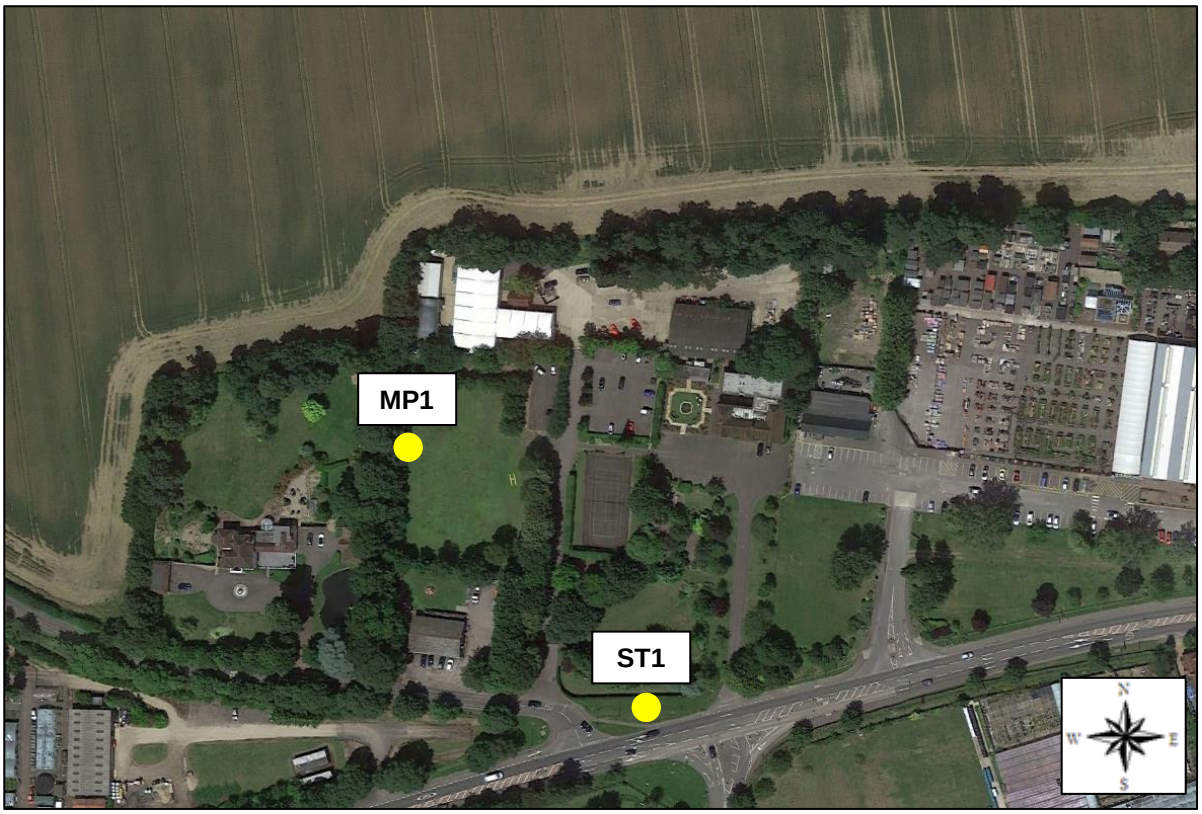
Figure 4.1: Noise Measurement Positions



4.2. Results

The summary of the unattended noise measurement data is presented in **Table 4.2**. The hourly noise measurement results for **MP1** are provided in **Appendix 2**.

Table 4.2: MP1 Unattended Noise Measurement Summary

Position	Period	$L_{Aeq, T}$ (dB)	L_{AFmax} (dB)	$L_{A10, T}$ (dB)	Mean $L_{A90, T}$ (dB)	Modal $L_{A90, T}$ (dB)
MP1	0700 hrs to 2300 hrs	52	68	54	47	47
	2300 hrs to 0700 hrs	47	60 (61)	49	35	32
Note: The levels stated are logarithmic average for $L_{Aeq, T}$ and arithmetic averages for $L_{A10, T}$ and mean $L_{A90, T}$. The L_{AFmax} is the average of the highest hourly maximum sound levels measured during the measurement period, measured with a fast time-weighting. The L_{AFmax} levels in brackets are the tenth highest L_{AFmax} noise levels measured during the measurement period.						

Figure 4.2 identifies the time history for the $L_{Aeq,T}$, L_{AFmax}, $L_{A10,T}$ and $L_{A90,T}$ at **MP1** during the noise measurement survey.

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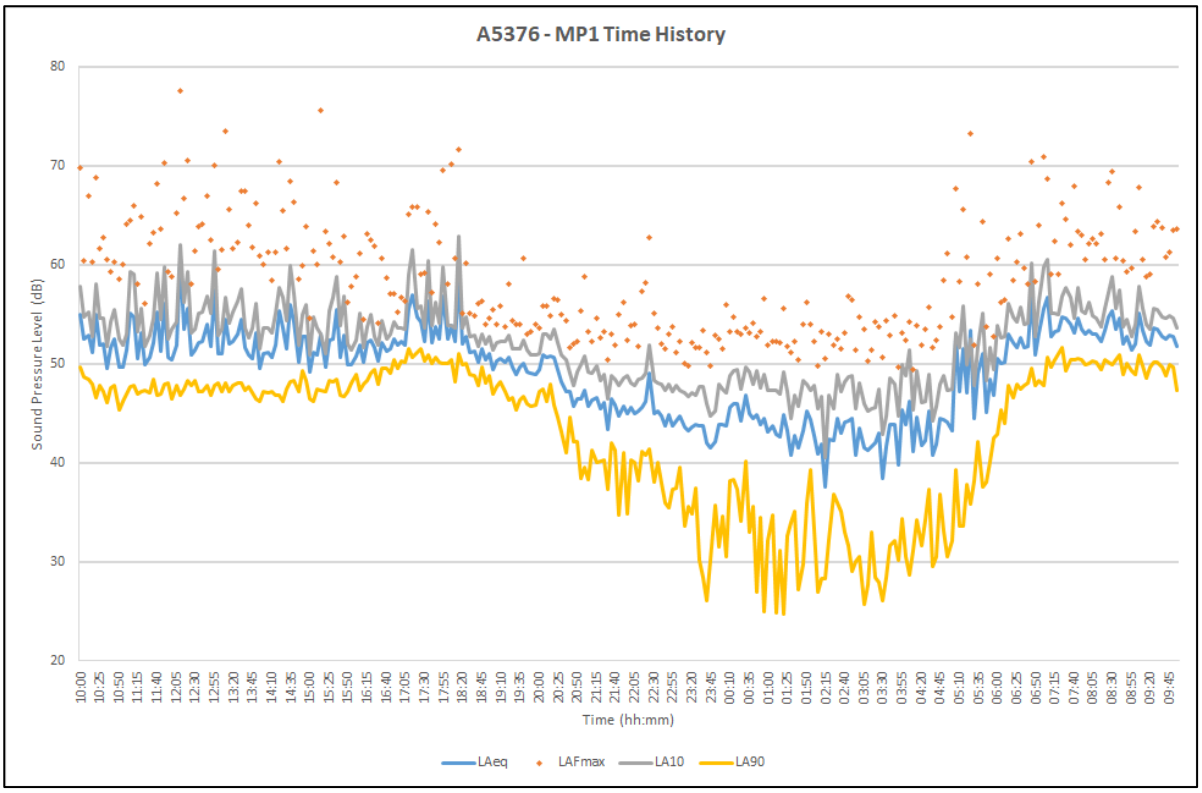
Figure 4.2: Noise Measurement Time History: MP1



The summary of the attended noise measurement data is presented in **Table 4.3**.

Table 4.3: ST1 Attended Noise Measurement Summary

Position	Period	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
ST1	1015 hrs – 1315 hrs	71	86	74	62

The calculation of the $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ noise levels for **ST1** has been carried out utilising the equations developed by TRL and Casella Stanger. A summary of the calculated free-field noise levels is identified in **Table 4.4**. The appropriate equations are provided below;

$$L_{Aeq,1h} = 0.94\ x\ L_{A10,1h} + 0.77\ dB$$

$$L_{A10,18h} = L_{A10,3h} - 1\ dB$$

$$L_{day} = 0.95\ x\ L_{A10,18h} + 1.44\ dB$$

$$L_{evening} = 0.97\ x\ L_{A10,18h} - 2.87\ dB$$

$$L_{night} = 0.90\ x\ L_{A10,18h} - 3.77\ dB$$

$$L_{Aeq,16h} = 10\log_{10}\left[\frac{1}{16}\right][12x10^{\frac{L_{day}}{10}} + 4x10^{\frac{L_{evening}}{10}}]dB$$

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Table 4.4: Calculated Period Noise Levels at ST1

Monitoring Position	Measured $L_{A10,3hr}$ (dB)	Measured 10th Highest $L_{AFmax,3hr}$ (dB)	Calculated $L_{A10,18hr}$ (dB)	Calculated $L_{Aeq,16hr}$ (dB)	Calculated $L_{Aeq,8hr}$ (dB)
ST1	74	80	73	70	62

4.3. Workshop Activity Sound Levels

During a previous site visit to GTO House on 10th August 2017, sound level measurements of the noise generating activities which will be relocated to the proposed workshop were carried out. All work on the cars were undertaken in a temporary structure on the site. The temporary structure consists of PVC wall panels that slot into a steel frame with a marquee style roof, with two shutter doors for cars to enter. The temporary structure was still being utilised during the recent noise measurement survey for work on cars, and therefore the activity sound measurements remain valid.

The work undertaken at the existing GTO Car Restoration site typically includes the use of hand tools with air compressors used occasionally. The loudest noise source in the workshop is the running noise of the engines of the cars being worked on and an exhaust extract system that attaches to the exhaust of the car. An external car lift was utilised to inspect the underside of vehicles but was not a significant contributor to the overall noise levels due to the low percentage on-time use of the lift.

Table 4.4 presents the measured sound pressure levels and the calculated sound power levels of the noisy activities in the Car Restoration workshop, which are then utilised in the noise modelling taking into account the development proposals identified in **Figure F.1**.

Table 4.5: Activity Sound Levels

Activity	Distance from Source (m)	Average Sound Level $L_{Aeq,T}$ (dB)	Derived Sound Power Level L_{WA} (dB)
Ferrari 365 GTB4 engine	1	76	84
Car lift	3	73	91
Exhaust extraction system	1	76	84

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5. NOISE IMPACT ASSESSMENT: BS 4142 ASSESSMENT

5.1. Noise Sensitive Receptors

The nearest noise sensitive receptor to the development site is Mumbery House, which is located approximately 145 metres to the southwest of the development site. The proposed permanent workshop would be further away from Mumbery House than the existing temporary structure.

There is a garden centre to the east of the site and a workshop to the south of the site, these have not been considered further as they are commercial premises and not therefore identified as noise sensitive receptors. The noise sensitive receptor location is identified in **Figure 1.1**.

5.2. Specific Sound Levels

The CadnaA noise modelling software has been utilised to determine the specific sound level of the workshop activity sound sources at the noise sensitive receptor. CadnaA is a three-dimensional noise model developed by DataKustik and has been extensively used by ACCON and others to develop noise models for a wide variety of situations and noise sources. CadnaA utilises the methodology in '*ISO 9613: Acoustics – Attenuation of sound during propagation outdoors*' to predict the sound level from area, line and point sources.

The activity sound levels measured at the existing workshop have been input into the CadnaA noise model. The model has utilised the noisiest sources in order to provide a worst-case scenario. The car lift activity has a percentage on-time of 10% to account for the approximate amount of time it is utilised, and noise from the car engine has been assumed to have a 100% on-time to provide a very worst-case scenario.

5.3. Acoustic Feature Corrections

5.3.1. Tonality

It is not expected that any plant will have any pronounced tonal components at the noise sensitive receptors and therefore no correction for tonality has been applied.

5.3.2. Impulsivity

An acoustic feature correction of +3 dB has been applied due to the impulsive nature of the workshop activities.

5.3.3. Intermittency

An acoustic feature correction of +3 dB has been applied due to the intermittent nature of the workshop activities.

5.4. BS 4142 Assessment

The new GTO Car Restoration Centre would operate between 0830 hrs to 1730 hrs, Monday to Friday. Therefore, only the daytime period is required to be assessed in line with BS 4142. The BS 4142 assessment in **Table 5.1** has assessed the potential noise impact to the ground and first floor of Mumbery House.

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Table 5.1: BS 4142 Assessment: Daytime

Results	Mumbery House: Ground Floor	Mumbery House: First Floor	Relevant Clauses of BS 4142:2014 + A1:2019	Commentary
Typical Background Sound Level $L_{A90,T}$ (dB)	47	47	8.1, 8.2	A representative background sound level measured at MP1 applied to the rear of Mumbery House
Specific Sound Level $L_{Aeq,15min}$ (dB)	31	36	7.3.7, 7.3.9, 7.3.11	Determined from the CadnaA noise model taking into account the shielding effect of existing buildings around the site
Acoustic Feature Correction (dB)	+6	+6	9.2	The acoustic features correction has been applied to account for the specific acoustic features (+3 dB for intermittency and +3 dB for impulsivity)
Rating Sound Level $L_{Aeq,15min}$ (dB)	37	42	9.2	Specific Sound Level + Acoustic Feature Correction
Difference between Rating Level and Background Sound Level	-10	-5	9.2	
Initial Estimate of Impact	Low Impact	Low Impact	11	

Table 5.1 identifies that the rating noise levels do not exceed the existing background noise levels at Mumbery House with the highest rating noise level being 5 dB below the existing background noise levels.

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According to BS 4142:2014+A1:2019, a difference of "around +5 dB" is "*likely to be an indication of an adverse impact, depending on the context*", and where the "*rating level does not exceed the background level*" it is "*a low impact, depending on context*". The initial BS 4142 assessment indicates a low impact during the daytime period.

5.5. Discussion of Context

Background sound levels measured at **MP1** have been utilised for the BS 4142 assessment which are representative of the noise levels which would occur at the north façade of Mumbery House during the operating hours of GTO House. The north façade of Mumbery House is the closest façade to the proposed workshop and therefore a worst-case scenario is assessed.

The noise sources have been modelled externally to the building in order to provide a worst-case scenario for the noise sensitive receptor noise levels, however, the noise sources will be inside the proposed building, benefiting from sound attenuation due to the building envelope. Therefore, the specific noise level at Mumbery House is likely to be significantly lower than that provided in **Table 5.1**.

The noise breakout from the existing temporary structure at the site was subjectively quiet when considered against the existing noise climate. This indicates that noise breakout is likely to be lower when a permanent structure is erected, resulting in lower noise levels than the current activity noise levels.

5.6. Discussion of Uncertainty

5.6.1. Noise Survey

The noise measurements undertaken are considered to be robust and of limited uncertainty. All equipment used was calibrated to laboratory standards and installed by suitably qualified personnel. Microphone calibration indicated that there was no significant drift in measured noise levels throughout the noise survey, indicating accurate measurements have been obtained. The noise survey was undertaken over typical weekdays during suitable weather conditions using Class 1 (IEC 61672-1:2013) sound level meters. Noise levels were mainly influenced by road traffic on the A4 which had no roadworks and appeared to be operating at its normal capacity and speed. Where source noise measurements of noisy activities were obtained, they were carried out in close proximity to the individual sources such that accurate sound power levels could be derived for calculation purposes.

5.6.2. Assessment

In order to reduce the uncertainty in calculated noise levels at sensitive receptors, standard acoustic formulae have been used to derive the sound power levels of noisy activities from the noise measurements of the sound pressure level.

Additionally, the widely used and validated method for determining calculated sound levels e.g. BS ISO 9613-2:2024 '*Attenuation of sound during propagation outdoors*' has been utilised within the CadnaA noise modelling software and the results have been subject to an internal review procedure.

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Overall, it is considered that this noise assessment represents a reasonable worst-case scenario with a low level of uncertainty in the assessment procedure, considering both the noise survey methodology and the noise predictions which were carried out.

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6. CONCLUSION

A detailed noise measurement survey was undertaken at GTO Engineering to determine the representative background noise levels in the vicinity of nearest existing noise sensitive receptors (NSRs), Mumbery House. Additionally, a previous noise measurement survey in August 2017 was carried out at the current workshop premises in order to obtain source noise measurements of the activities which have been utilised in the CadnaA noise model of the proposed workshop.

An assessment in line with BS 4142 has been carried out for the daytime period when the proposed workshop is operating. The BS 4142 assessment has indicated a low impact when utilising a worst-case scenario.

Achievement of the target noise criteria will ensure compliance with the overall aims of paragraphs 191 and 193 of the NPPF and the PPG, in that noise is not expected to result in any significant adverse effects on health or quality of life for the nearby NSR.

6.1. Recommendations to the Decision Maker

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

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ADDITIONAL FIGURES

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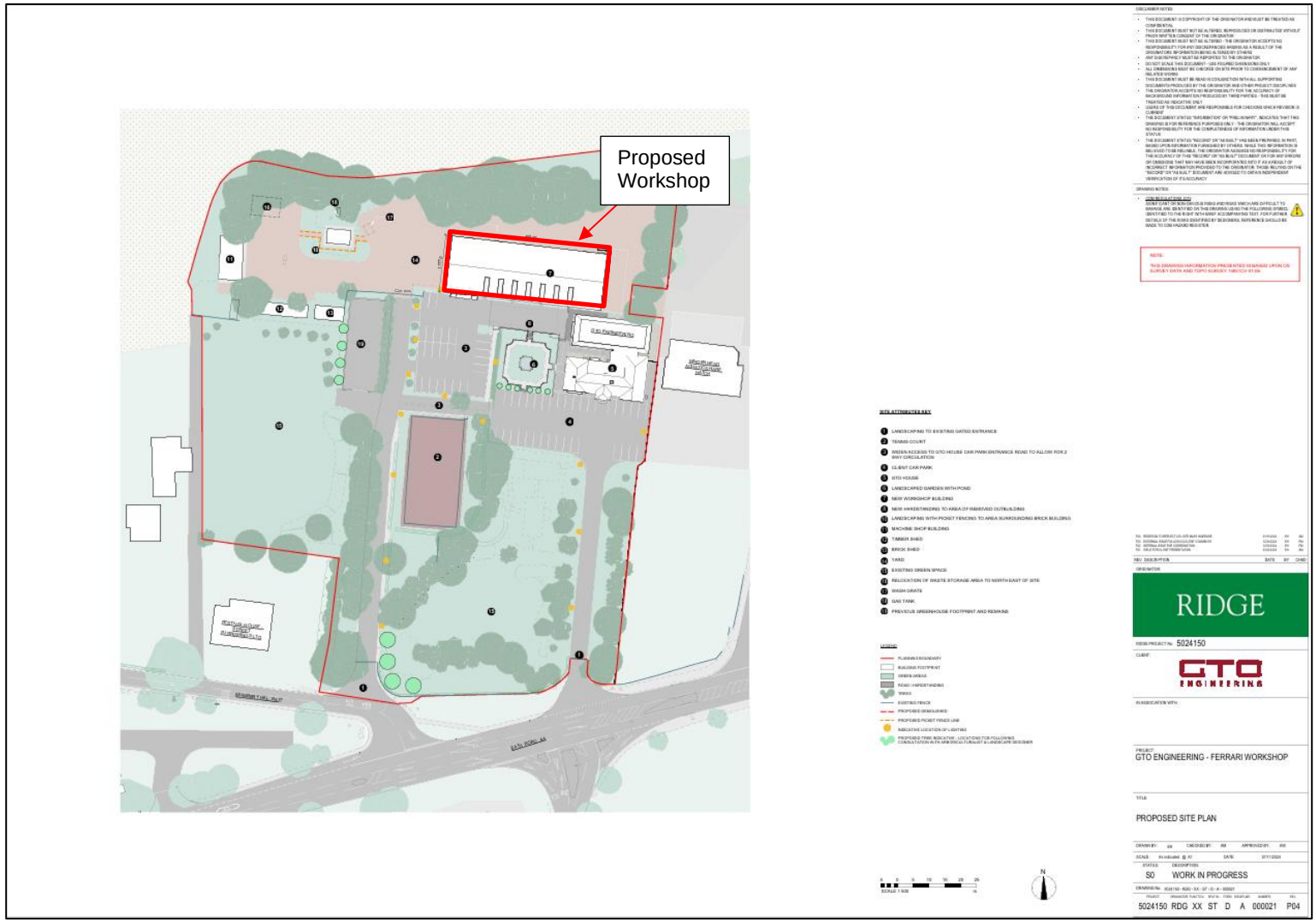
Figure F.1: Proposed Site Layout



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APPENDICES

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Appendix 1

Glossary of Acoustic Terminology

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Term	Description
'A'-Weighting	This is the main way of adjusting measured sound pressure levels to take into account human hearing, and our uneven frequency response.
Decibel (dB)	This is a tenth (Deci) of a bel. A decibel can be a 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.
Ambient /Period Sound Level, $L_{Aeq,T}$	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 specified location. $L_{Aeq, T}$ can be measured directly with an integrating sound level meter.
Road Traffic Noise Level, $L_{A10, T}$	The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 10 per cent of a given time. The $L_{A10, T}$ is used to describe road traffic noise levels at a particular location.
Background Sound Level, $L_{A90,T}$	The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 90 per cent of a given time (T). The $L_{A90, T}$ is used to describe the background noise levels at a particular location.
L_{AFmax}	The 'A'-weighted maximum sound pressure level measured over a measurement period measured with 'fast' weighting (125 ms).
Rating Level, $L_{Ar,Tr}$	The specific sound level plus any adjustment for the characteristic features of the sound.
Residual Sound Level $L_r=(L_{Aeq,T})$	Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
Specific Sound Level, $L_{Aeq,Tr}$	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.
Sound Power Level L_w	The sound power level, L_W, is the total amount of sound energy per unit of time generated by a particular sound source independent of the acoustic environment that it is in.

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Appendix 2
Noise Measurement Results

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Table 1: Hourly Noise Measurement Results at MP1

Time	$L_{Aeq,T}$ (dB)	L_{Amax} (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
07:00-08:00	54	71	57	50
08:00-09:00	53	69	55	50
09:00-10:00	53	68	55	50
10:00-11:00	52	70	55	47
11:00-12:00	53	70	56	47
12:00-13:00	55	78	56	48
13:00-14:00	52	74	55	47
14:00-15:00	53	71	55	48
15:00-16:00	52	76	54	47
16:00-17:00	52	63	53	49
17:00-18:00	55	70	56	51
18:00-19:00	53	72	54	49
19:00-20:00	50	61	52	47
20:00-21:00	49	57	51	44
21:00-22:00	46	59	49	39
22:00-23:00	46	63	48	39
23:00-00:00	43	53	47	33
00:00-01:00	45	57	49	34
01:00-02:00	43	56	47	32
02:00-03:00	43	57	47	32
03:00-04:00	43	55	46	30
04:00-05:00	44	61	48	32
05:00-06:00	49	73	51	38
06:00-07:00	53	71	55	47
Daytime (07:00-23:00)	**52**	**68**	**54**	**47**
Night-time (23:00-07:00)	**47**	**60**	**49**	**35**

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