1A Churchway: Silverdale Project

Motorcycle Workshop Noise Assessment

Camden Council

6 February 2018

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Table of contents

1. Introduction

Atkins Acoustic, Noise and Vibration has been commissioned by Camden Council to undertake assessment of a noise impact from a fume extraction system proposed to serve a new motorcycle repair and maintenance workshop at 1A Churchway, Camden, London. The new facility is to serve members of the local community taking part in the Silverdale Motorcycling Project, and it is to be relocated from the current location at Old Tenants Hall, Harrington Street.

The purpose of the assessment is to support the planning application for the workshop at the new location. The assessment has been carried out in accordance with the requirements of Camden Council and the relevant standards and guidance, and it is based on noise surveys carried out at the existing and new sites.

To assist the reader, a glossary of acoustic terminology used in this report is provided in Appendix A.

2. Site

An indicative plan of the proposed workshop at 1A Churchway is shown in Figure 2-1 below.

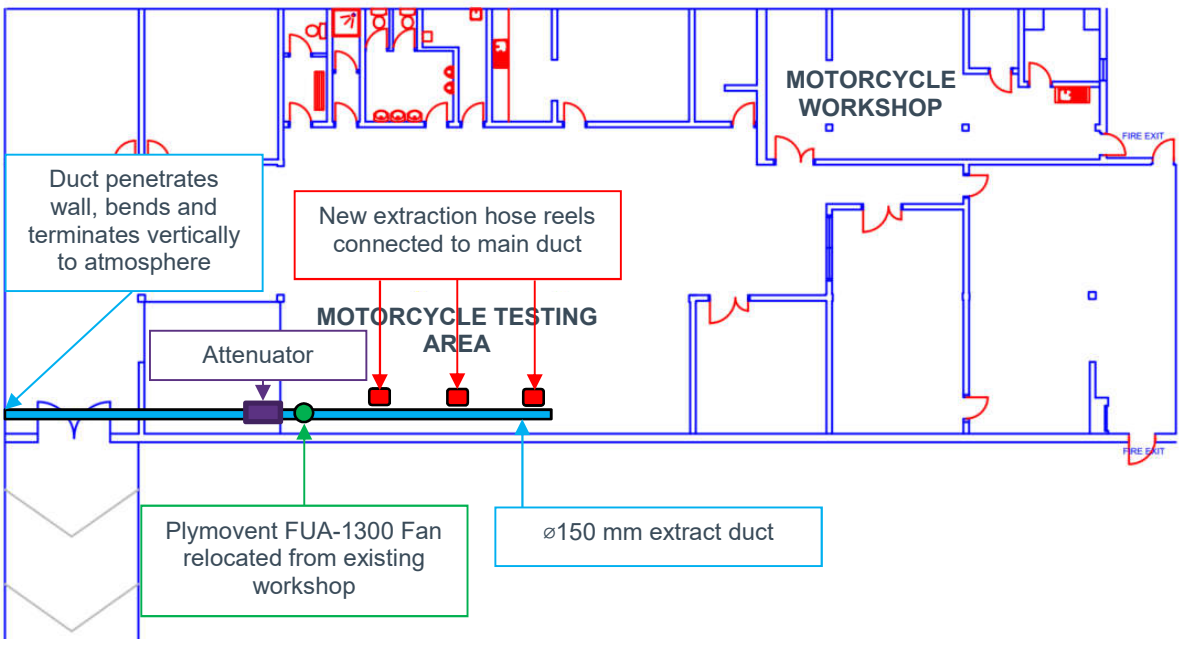


Figure 2-1 Indicative plan of the proposed workshop.

The workshop is to be located at the basement level, adjacent to an underground car park and garages serving local residential dwellings. The space will be used to carry out maintenance work on motorcycles and scooters whose operation will be occasionally tested, on average once every month for a period of up to 10 minutes. During each test, the motorcycle's engine will be operational, and the proposed fume extraction system will be used to extract the exhaust fumes to atmosphere. The testing is understood to take place between 1000-1800 hours only.

The proposed fume extraction system includes a Plymovent FUA-1300 fan, located at the ceiling above the testing area, to be relocated from the existing facility at Old Tenants Hall. New extraction ductwork (⌀150 mm) with extraction hose reels will also be installed.On the exhaust side, the duct will be approximately 10 metres long and it will include an in-line attenuator supplied by the fan's manufacturer. The exhaust duct will penetrate

a workshop wall, bend and terminate to atmosphere vertically through a collar and cowl, just above the ground level outside the workshop.

Due to the workshop being located underground in the basement, the extract fan and motorcycle engine noise will be, to a large extent, contained within the workshop space by its boundary masonry walls, concrete ceiling, as well as windows and doors. The most significant noise emissions to outside are expected to occur from the duct termination to atmosphere.

Figure 2-2 below shows the approximate location of the workshop and the proposed exhaust duct termination in relation to the surrounding residential dwellings. The closest residential receptors to the proposed fume extraction system will be north-facing ground floor windows of the residential dwellings of Wellesley House, located approximately 11 meters away and within the line of sight from the proposed exhaust duct termination (location R1).

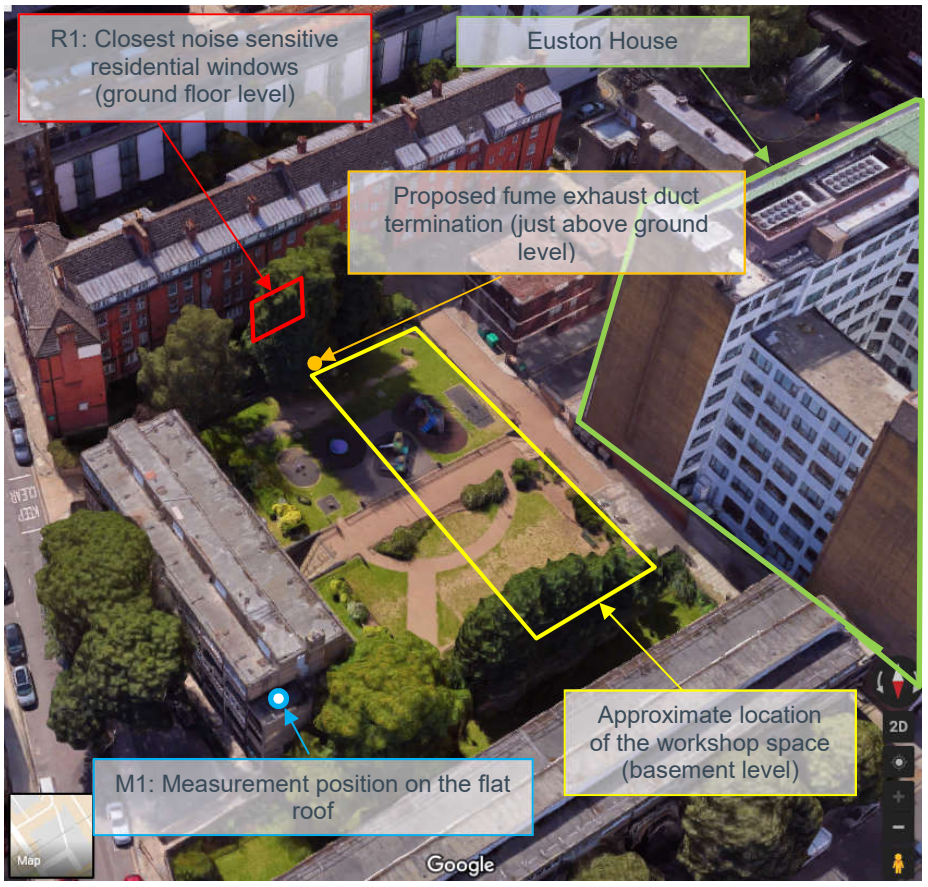


Figure 2-2 Approximate location of the proposed workshop space and exhaust ductwork termination in relation to the surrounding residential dwellings and the closest noise sensitive windows.

3. Planning policy, standards and guidance

The national and local planning policy documents pertinent to the following assessments are the National Planning Policy Framework (NPPF), the National Policy Statement for England (NPSE), and Camden Local Plan (2017). The relevant technical guidance is provided in British Standard 4142:2014 "*Methods for rating and assessing industrial and commercial sound*". A detailed summary of the relevant sections of these documents is included in Appendix B, with an outline of Camden's planning noise requirements and the key criteria from BS4142, provided below.

Camden Local Plan 2017

The current planning noise requirements for new industrial and commercial (non-anonymous) noise sources proposed within the Camden area are specified in *Appendix 3: Noise thresholds* of Camden Local Plan 2017. The relevant requirements are summarised below:

- It is recommended that BS4142:2014 is used as a reference standard when assessing non-anonymous noise of industrial or commercial nature.

- 'Rating level' of at least 10 dB below background noise at the existing noise sensitive receptors such as residential dwellings should be considered as the noise design criterion, unless the assessed noise contains audible tonal elements in which case a 'rating level' of 15 dB below background noise should be used. These thresholds are classified as the Lowest Observed Adverse Effect Levels (LOAELs), at which noise is considered to be acceptable ('Green' design criterion).

- The potential noise sensitive receptors include residential gardens and habitable residential rooms (living or dining rooms, bedrooms). For daytime operation (between 0700 and 2300) the noise should be assessed in gardens if used for main amenity, and outside the windows of any habitable rooms.

British Standard 4142:2014 "Methods for rating and assessing industrial and commercial sound"

The procedure contained in BS 4142 assesses the significance of sound which depends upon the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs/will occur.

- 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.

Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, the standard requires a character correction to be added to the specific sound level to obtain the rating level. Character corrections can be included for tonality, impulsivity, intermittency, and other sound characteristics that make it "readily distinctive".

4. Noise measurements

To provide the basis for the following assessment, noise measurements have been carried out at the existing and proposed sites. The measurements methodology and results are presented below.

4.1. Existing site (Old Tenants Hall)

Due to the absence of fan/motorcycle manufacturers' published octave band noise data, measurements of noise from Plymovent FUA-1300 fan and a representative motorcycle engine (Honda CRF100F) have been undertaken to obtain source noise data for the assessment. The measurements were carried out for the fan operating at a typical duty, with the motorcycle engine running and being tested as normal. The main aim of the measurements was to establish noise levels emitted from the fume extract system's duct termination to atmosphere, located on the roof of the building as shown in Figure 4.1 below.

Figure 4-1 Atmosphere-side fume extract duct termination above the roof of the existing workshop at Old Tenants Hall.

Readings of sound pressure level (SPL) were undertaken approximately 1.5 metre away from the exiting exhaust duct termination on the workshop's roof, approximately 90 degrees off the duct's axis. The measurements included the effect of reflections from the roof surface.

Both ambient noise (extract system/motorcycle on) and residual noise (extract system/motorcycle off) readings were taken, with the measurement periods of approximately 30 and 45 seconds, respectively. The actual extract system noise emissions (specific noise) have been calculated from the ambient and residual noise readings in accordance with BS4142.

The results of the measurements and calculations are shown in Table 4-1 below. It can be seen that the measured residual noise levels had negligible influence on the calculated specific noise levels.

Table 4-1 Measured ambient noise (extract system on), residual noise (extract system off) and the calculated specific noise (actual extract system noise levels).

Octave band centre frequency (Hz)		63	125	250	500	1k	2k	4k	8k	dB(A)
SPL (dB)	Ambient (System On)	76.9	69.4	64.9	71.2	63.1	54.9	54.9	42.7	69.9
	Residual (System Off)	65.8	57.0	51.9	55.2	48.2	44.6	39.6	32.8	55.0
	Specific (Actual System Noise)	76.7	69.2	64.7	71.0	63.0	54.5	54.7	41.1	69.8

4.2. Proposed site (1A Churchway)

Measurements of the existing environmental noise have been undertaken between approximately 0900 hours on Thursday 25th January 2018 and 0800 hours on Friday 27th January 2018, at location M1 indicated in Figure 2-2 above. The measurement location was approximately 1.5 metres above the roof level and approximately 1 metre away from the closest building façade.

The purpose of the measurements was to obtain ambient and background noise data during the proposed period of the fume extract system operation (1000-1800 hours), expressed in terms of $L_{Aeq,8hrs}$ and $L_{A90,1hour}$ indices respectively.

Weather conditions were not monitored directly at the measurement location. However, based on observations of the conditions in the London area during the measurement and third party historical weather data recorded at a weather station in the area, the weather was considered suitable for environmental noise measurements, with conditions being mostly dry with low winds throughout the survey. A period of light rain and stronger wind occurred between approximately 1500-1530 hours on Thursday 25th January. However, these conditions were not strong or persistent enough to have any significant effect on the key noise parameters used in this assessment.

During the relevant day-time period, the noise levels at the site were controlled by remote roof-top plant serving Euston House, located approximately 50 metres away from the measurement location. Analysis of the noise level history from the site indicates that the plant was operational between approximately 0630-1900 hours, which covers the period relevant for this assessment. Other significant noise sources included local and distant road traffic, as well as occasional remote day-time construction noise.

The noise data recorded at position M1 is considered representative of the noise levels outside the potentially most affected noise sensitive receptors R1 described in Section 2, due to similar distance from the Euston House plant and the road traffic. The Euston House plant noise levels could potentially be lower at receptor R1 than at position M1 due to potentially more significant acoustic screening provided by the Euston House roof edges at this location. Analysis of the noise level time history from position M1 shows that the background noise levels drop by approximately 3 dB when the Euston House plant ceases operation (just after 1900 hours). It can therefore be expected that the potential background noise reduction at receptor R1 due to additional screening will not exceed 3 dB. The uncertainty of this assessment due to potentially lower background noise levels at receptor R1 is therefore no greater than 3 dB.

Table 4-2 below shows a summary of the ambient and background noise measurement results at location M1, between the proposed hours of operation of the fume extraction system (1000-1800 hours). A time history of the measured levels, based on 1-hour averaging periods relevant to this assessment, is shown in a graphical form in Appendix C. A -3 dB façade correction has been applied to the results presented in Table 4-2 to eliminate the influence of reflections from the closest façade on the measured levels, and thus to represent free-field conditions.

Table 4-2 Measured ambient and background noise levels at location M1. The results include a -3 dB façade correction.

Location	Measurement period	Average Ambient noise (1000-1800) $L_{Aeq,8h}$ (dB)	Minimum recorded background noise level $L_{A90,1h}$ (dB)
Measurement location M1	1000-1800 hours	50	47

4.3. Measurement instrumentation

The instrumentation used for the above measurements is listed in Table 4-3 below. All equipment has Class 1 accuracy and holds the manufacturer's or traceable calibration certificates. An acoustic calibrator has been applied before and after each measurement, with no significant difference noted in levels.

Table 4-3 Instrumentation used for noise measurements.

Location	Equipment item	Type	Serial number	Date of calibration	Calibration certificate
All locations	Sound level meter	01 dB Fusion	10919	12/01/2016	CE-DTE-L-16-PVE-38365
	Microphone	GRAS 40 CE	226375	12/01/2016	CE-DTE-L-16-PVE-38365
	Pre-amplifier	Internal	-	12/01/2016	CE-DTE-L-16-PVE-38365
	Calibrator	CAL21	01120237	07/07/2017	03330/1

5. Noise assessment

In this section, the impact of noise from the proposed fume extract system on the potentially most affected residential receptors (R1) is assessed. In accordance with the requirements of Camden Council, the assessment is carried out based on the methodology and guidance included in BS4142:2014.

A summary assessment of the predicted system noise levels is presented in Table 5-1 below.

It was assumed that the influence of the in-duct propagation and end reflection losses on the noise levels measured at the existing workshop was negligible due to a very short exhaust duct run (approximately 1 metre) between the fan and the termination to atmosphere. In contrast, as described in Section 2 above, the proposed system includes a much longer exhaust duct run (approximately 10 metres), and so the influence of the in-duct propagation and end reflection losses was taken into account in the noise predictions in this case.

Based on the insertion loss data provided by the fan's manufacturer, the proposed in-line attenuator will provide approximately 14 dB of overall sound attenuation.

The proposed duct termination arrangement is similar to the arrangement at the existing site based on which the specific noise levels have been derived, i.e. in both cases the noise is emitted from a similar-sized vertical duct located just above a single large reflecting surface (roof or ground) and terminated with a weather cowl. Furthermore, the closest noise sensitive receptors to the proposed duct termination are located at a similar angle from the duct axis to the angle at which the noise emissions were measured at the existing site. It can therefore be assumed that suitable directivity corrections related to noise propagation off-axis from a duct termination over a reflecting surface at the proposed site are to a large extent already included in the specific

noise levels. One variation at the proposed site with respect to the existing site is a short (approximately 0.5 m high) wall behind the duct termination. Due to the restricted height, this wall will have limited influence on sound directivity, particularly at lower frequencies. However, to account for the presence of reflections from this wall and represent the worst-case, a conservative correction of +3 dB has been added to the calculations.

The system noise is considered not to have any distinct tonal components, and it is not impulsive or intermittent. The absence of distinct tones has been verified by analysing the system noise data in one-third octave bands. No acoustic feature corrections have therefore been included in the calculations.

Table 5-1 BS4142 assessment of the impact of noise from the proposed fume exhaust system on the closest noise sensitive receptor.

Description	Results
Ambient noise level, $L_{Aeq,T}$, 1.5 m from duct termination at existing site (extract system in typical operation)	70 dB
Residual noise level, $L_{Aeq,T}$, 1.5 m from duct termination at existing site (extract system off)	55 dB
Lowest background noise level at receptor R1 between 1000-1800 hrs, $L_{A90,1hour}$	47 dB
On time correction (10-minute duration in an hour)	$10 \log_{10} (600/3600) = -8$ dB
Duct propagation and end reflection losses	-6 dB
Attenuator	-14 dB
Specific noise level at duct termination, $L_{Aeq,1hour}$	$10 \log_{10} (10^{7.0}-10^{5.5}) – 8 – 6 – 14 = 42$ dB
Rating level at duct termination, L_{Ar}	42 dB
Distance attenuation over 11 metres to receptor R1	$20 \log_{10} (1.5/11) = -17$ dB
Reflections from wall behind the duct termination	+3 dB
Rating level at receptor R1, L_{Ar}	(42 – 17 + 3) dB = 28 dB
Background noise level at receptor R1, $L_{A90,1hour}$	47 dB
Excess of rating level over background sound level	(28 – 47) dB = -19 dB
Assessment result for receptor R1	Assessment indicates low impact

It can be seen from Table 5-1 above that the predicted extract system noise levels are significantly below the existing background noise levels at the closest noise sensitive receptors R1, which indicates low impact from this noise.

Table 5-2 below show the comparison of the predicted system noise rating level with the Camden Council's planning requirements. It can be seen that the predicted noise is significantly (9 dB) below the 'Green' design criterion, where noise is considered to be at an acceptable level and remains below the Lowest Observed Adverse Effect Level (LOAEL) with respect to the planning requirements.

Considering the predicted noise levels are significantly below the background noise levels and the 'Green' design criterion, a 3 dB uncertainty related to background noise levels, discussed in Section 4.2 above, is inconsequential to the outcomes of this assessment.

Table 5-2 Comparison of the predicted system noise rating level with the Camden Council's planning requirements.

Predicted noise rating level, L_{Ar}	'Green' design criterion (-10 dB below background)
28 dB	37 dB

6. Conclusions

Atkins Acoustic, Noise and Vibration has been commissioned by Camden Council to undertake assessment of a noise impact from a fume ventilation system proposed to serve a new motorcycle repair and maintenance workshop at 1A Churchway, Camden, London. The facility is to be relocated from the existing location at Old Tenants Hall, Harrington Street, and will serve the local community project (the Silverdale Project).

The assessment serves to support the planning application for the relocated facility, and has been carried out in accordance with the requirements of the Camden Council. The assessment was based on BS4142:2014 methodology and guidance, and included noise measurements at the existing and new sites.

The BS4142 assessment of the predicted noise emissions from the proposed fume exhaust system, which includes an in-line attenuator providing approximately 14 dB of noise reduction, indicated low impact on the closest noise sensitive residential receptors. Furthermore, the predicted noise levels remained significantly below the Lowest Observed Adverse Effect Level (LOAEL) with respect to the Camden Council's planning requirements, thus satisfying the "Green" design criterion where noise considered to be at an acceptable level.

It can therefore be concluded that, with the proposed in-line attenuator in place, noise from the proposed fume extract system should not constitute a constraint with regards to the planning application for the proposed workshop relocation.

Appendices

Appendix A. Acoustic terms

Decibel (dB)

The unit of measurement used for sound pressure levels. The scale is logarithmic rather than linear. The threshold of hearing is 0dB and the threshold of pain is 120dB. In practical terms these limits are seldom experienced and typical levels lie within the range 30dB (a quiet night time level in a bedroom) to 90dB (at the kerbside of a busy city street).

A-weighting:

An electrical frequency weighting used to represent the response of the human hearing mechanism to sound. A-weighted sound level is indicated either by placing the capital letter A after the letters dB to get dB(A) or it may be added as a subscript to the noise level parameter as in $L_{Aeq,T}$.

Percentile Level (Statistical Sound Level Indices, L_{AN}, L_{A10}, L_{A90})

L_{AN} is the dB(A) level exceeded N% of the time measured on a sound level meter with Fast(F) time weighting, e.g. L_{A90} the dB(A) level exceeded for 90% of the time, is commonly used to estimate background noise level. L_{A10}, the level exceeded for 10% of the time, is commonly used in the assessment of road traffic noise.

Research has shown that the arithmetic average of the 18, 1-hour L_{A10} levels (depicted as $L_{A10,18h}$) between 0600 and 2400 hours shows a reasonably good correlation with community responses to traffic noise. This unit is used in the UK for the assessment of road traffic noise.

Equivalent Continuous A-Weighted Sound Pressure Level ($L_{Aeq,T}$):

Equivalent continuous A-weighted sound pressure level is the steady sound level that has the same sound energy as the fluctuating A-weighted sound pressure level occurring over the same time period and at the same location.

Ambient Noise Level ($L_{Aeq,T}$):

Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

Background Noise level ($L_{AF90,T}$):

The A-weighted sound pressure level of the existing ambient noise level that is exceed for 90% of a given time period, T, measured using time weighting ‘Fast’.

Free-Field (acoustical):

Free-field means a position far away from any reflecting surfaces other than the ground. Several standards and guidelines recommend that to achieve free field conditions the microphone should be positioned at least 3.5 metres from any reflecting surfaces, other than the ground.

Facade Noise Level

A facade noise level is the noise level 1m in front of the most exposed window or door in a building facade. Sounds reflect on the façade of the building back towards the point 1m in front. The effect of the reflection is to produce a slightly higher (+2.5 dB) sound level than it would be if the building was not there.

Appendix B. Planning policy, legislation and guidance

B.1. National Policy Statement for England, 2010

The Noise Policy Statement for England (NPSE) seeks to clarify the underlying principles and aims in existing policy documents, legislation and guidance that relate to noise. The statement applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise but does not apply to noise in the workplace. The Government recognises that the effective management of noise requires a co-ordinated and long term approach that encompasses many aspects of modern society.

The long term vision of Government noise policy is set out: “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 three 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.

In its aims the NPSE uses the key phrases “significant adverse” and “adverse”. The NPSE states in its explanatory note that “there are two established concepts from toxicology that are currently being applied to noise impacts, for example by the World Health Organisation (WHO). They 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.
- The NPSE then extends this concept to include:
- SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.

The policy notes that it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is therefore necessary for the project to identify relevant SOAELs taking account of the different sources of exposure and different receptors.

B.2. National Planning Policy Framework, 2012

The National Planning Policy Framework (NPPF), which reflects the Noise Policy Statement, was introduced by the Department of Communities and Local Government (DCLG) in March 2012. The document sets out the Government’s planning policies for England and how these are expected to be applied.

The NPPF provides for the production of distinctive local and neighbourhood plans by local authorities, in consultation with local people, which should be developed to reflect the needs and priorities of their communities.

The NPPF includes the following statements relating to noise and the requirement to take it into account in the planning process:

Section 109 indicates that 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."

Section 123 is specifically related to noise, according to which, planning policy decisions should aim to:

- avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

The NPPF does not therefore provide absolute limits on noise that are acceptable or unacceptable in a given situation. It does however, set out the need to use planning decisions, including through the use of conditions, to avoid or mitigate adverse impacts on health and quality of life resulting from noise. The Planning Practice Guidance issued on 6 March 2014 by the Department for Communities and Local Government (DCLG) advises on how planning can manage potential noise impacts. In this guidance it advises that local planning authorities' planning making and decision taking should 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 is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

B.3. Camden Local Plan 2017

The Camden Council's planning noise requirements pertinent to this application are included in *Appendix 3: Noise thresholds* of Camden Local Plan 2017 which has been adopted by the council on 3 July 2017. The relevant sections of this appendix are presented below.

"The significance of noise impact varies dependent on the different noise sources, receptors and times of operation presented for consideration within a planning application. Therefore, Camden's thresholds for noise and vibration evaluate noise impact in terms of various 'effect levels' described in the National Planning Policy Framework and Planning Practice Guidance:

• NOEL – No Observed Effect Level

• LOAEL – Lowest Observed Adverse Effect Level

• SOAEL – Significant Observed Adverse Effect Level

Three basic design criteria have been set for proposed developments, these being aimed at guiding applicants as to the degree of detailed consideration needed to be given to noise in any planning application. The design

criteria outlined below are defined in the corresponding noise tables. The values will vary depending on the context, type of noise and sensitivity of the receptor:

• Green – where noise is considered to be at an acceptable level.

• Amber – where noise is observed to have an adverse effect level, but which may be considered acceptable when assessed in the context of other merits of the development.

• Red – where noise is observed to have a significant adverse effect."

*"**Industrial and Commercial Noise Sources***

A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion.

Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

Existing Noise Sensitive Receptor	***Assessment Location***	***Design Period***	***LOAEL (Green)***	***LOAEL to SOAEL (Amber)***	***SOAEL (Red)***
*Dwellings***	*Garden used for main amenity (free field) and outside living or dining or bedroom window*	*Day*	*'Rating level' 10 dB* below background*	*'Rating level' between 9 dB below and 5 dB above background*	*'Rating level' greater than 5 dB above background*
*Dwellings***	*Outside bedroom window (façade)*	*Night*	*'Rating level' 10 dB* below background and no events exceeding 57 dB L_{Amax}*	*'Rating level' between 9 dB below and 5 dB above background or noise events between 57 dB and 88 dB L_{Amax}*	*''Rating level' greater than 5 dB above background and/or events exceeding 88 dB L_{Amax}*

**10dB should be increased to 15dB if the noise contains audible tonal elements (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.*

***levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.*

The periods in Table C correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration.

There are certain smaller pieces of equipment on commercial premises, such as extract ventilation, air conditioning units and condensers, where achievement of the rating levels (ordinarily determined by a BS:4142 assessment) may not afford the necessary protection. In these cases, the Council will generally also require a NR curve specification of NR35 or below, dependant on the room (based upon measured or predicted Leq,5mins noise levels in octave bands) 1 metre from the façade of affected premises, where the noise sensitive premise is located in a quiet background area."

B.4. BS4142:2014 "Methods for rating and assessing industrial and commercial sound"

This assessment has been undertaken with reference to British Standard 4142: 2014 "Methods for rating and assessing industrial and commercial sound" (BS 4142).

BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in the standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

The standard is used to determine the rating levels for sources of sound of an industrial and/or commercial nature and the ambient, background and residual sound levels at outdoor locations. These levels could be used for the purposes of investigating complaints; assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and assessing sound at proposed new dwellings or premises used for residential purposes. However, the determination of noise amounting to a nuisance is beyond the scope of the standard.

The procedure contained in BS 4142 assesses the significance of sound which depends upon the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs/will occur.

The reference time interval for the specific sound source 'Tr' is 60 minutes during the daytime and 15 minutes during the night. The reduced reference time at night reflects the increased sensitivity to noise during this period.

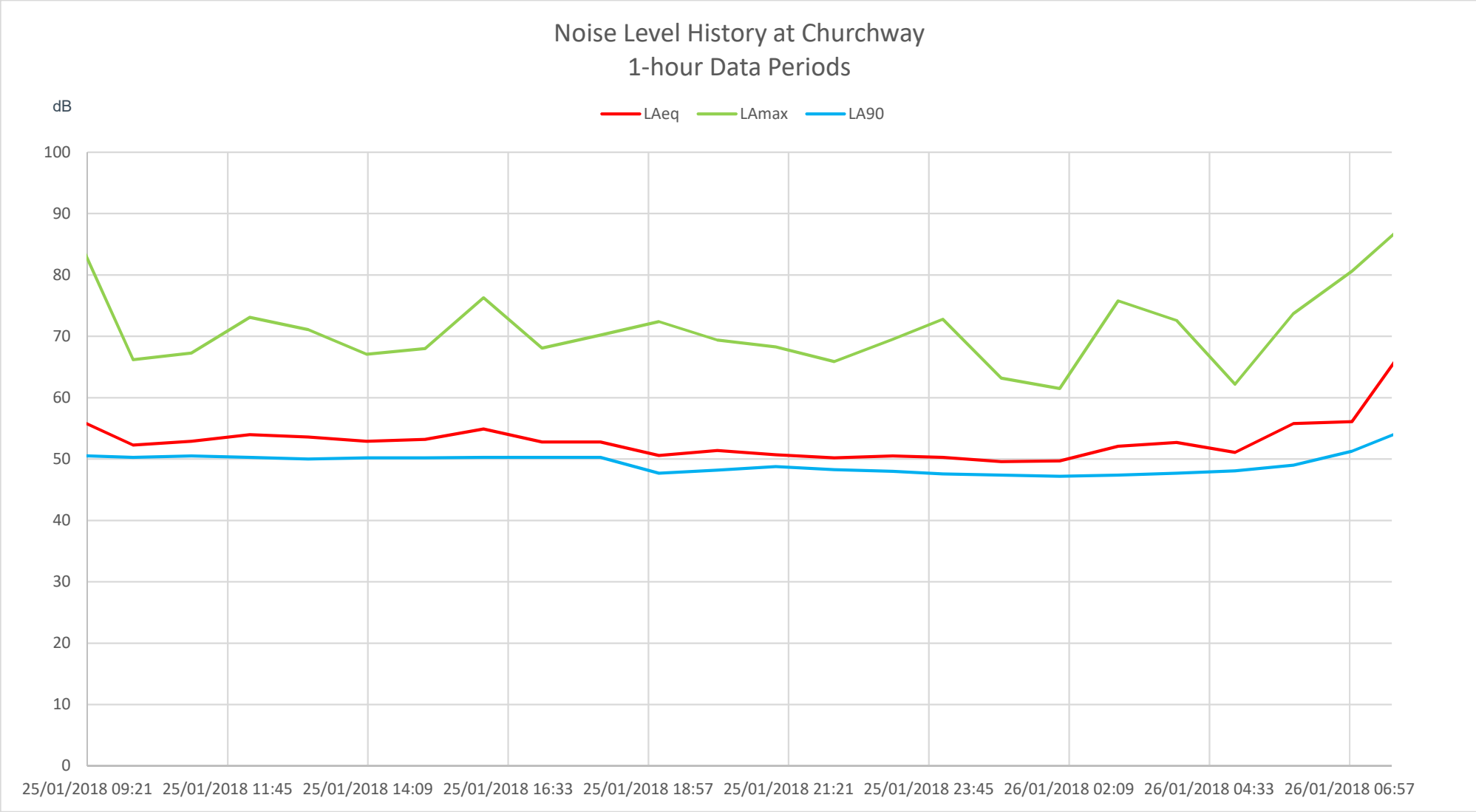
The assessment method considers the characteristics of the sound, such as tonality, impulsivity and intermittency. Corrections are applied to the specific noise source to account for these characteristics in order to obtain the rating noise level; the corrections account for acoustic features which have the potential to increase disturbances.

An initial estimate of the impact of the sound source is obtained by subtracting the measured background sound level from the rating level and considering the following:

- 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.

Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, the standard requires a character correction to be added to the specific sound level to obtain the rating level. Character corrections can be included for tonality, impulsivity, other sound characteristics that make it "readily distinctive", and intermittency.

Appendix C. Noise level history at Churchway


Noise Level History at Churchway
1-hour Data Periods
dB
LAeq
LAmax
LA90
100
90
80
70
60
50
40
30
20
10
0
25/01/2018 09:21
25/01/2018 11:45
25/01/2018 14:09
25/01/2018 16:33
25/01/2018 18:57
25/01/2018 21:21
25/01/2018 23:45
26/01/2018 02:09
26/01/2018 04:33
26/01/2018 06:57

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