



Jumbo Self Drive Ltd
2A Sheffield Road, Birdwell
Barnsley, S70 5UZ

Proposed Vehicle Repair and Maintenance Workshops

Application Ref: 2022/1096/INVALID

R23.1782-1-AG

Noise Impact Assessment



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EXECUTIVE SUMMARY

Spire Environmental Consultants Limited have been appointed by MBooth Design on behalf of Jumbo Self Drive Ltd to undertake an environmental noise assessment for the erection of vehicle repair and maintenance workshops at 2A Sheffield Road, Birdwell, Barnsley, S70 5UZ.

The existing noise environment is influenced by road traffic noise from the A61 trunk road, vehicle car wash and valeting operations and vehicle maintenance operations. The assessment has considered the noise impact of vehicle repair and car wrapping operations at the proposed workshops.

Baseline noise surveys were undertaken for a continuous 7-day period on the site boundary with the closest residential receptor at 2, Sheffield Road. The calculated sound exposure levels from specific activities were incorporated into the report and assessed against BS 4142:2014 + A1:2019.

The BS 4142:2014 + A1:2019 assessment indicates the combined operation of the vehicle repair and car wrapping operations at the proposed workshops are 7 dB below the typical lowest background sound levels and will therefore be of a low impact at 2 Sheffield Road, Birdwell.

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1. INTRODUCTION

Appointment & Background

- 1.1 Spire Environmental Consultants Limited have been appointed by MBooth Design Ltd on behalf of Jumbo Self Drive Ltd, to undertake an environmental noise assessment of the erection of replacement vehicle repair and maintenance workshops at 2A Sheffield Road, Birdwell, Barnsley, S70 5UZ.
- 1.2 There are 2no light industrial units included in this application. Unit 1 is proposed to be a vehicle repair workshop and Unit 2 (closest to the closest existing residential property at 2, Sheffield Road) is to be a used for car wrapping.
- 1.3 Background noise monitoring was conducted for a continuous 7-day period, on the site boundary with the closest residential receptor at 2, Sheffield Road.
- 1.4 This report is necessarily technical in nature, so to assist the reader, a glossary of acoustic terminology can be found in **Appendix A**.

Site Setting

- 1.5 The site boundary of the proposed vehicle repair and maintenance workshops is shown within the red line in **Figure 1** (below).



Figure 1: Site location

Proposed Development

- 1.6 It is proposed the existing building will be demolished and replaced with 2no workshops (Units 1 & 2). These are shown in **Figure 2** (below).



Figure 2: Existing and proposed site plans

Vehicle repair (Unit 1) noise sources

- 1.7 Vehicle repair operations are proposed in Unit 1. The noise sources associated with vehicle repair operations are shown in Table 1 (below). They have been measured at an existing vehicle repair premises in Buxton, Derbyshire. The operational period of each activity is also shown. Each noise measurement was taken at a distance of 1m from each source. The measured ambient noise levels have been predicted to the closest residential receptor at 2 Sheffield Road, Birdwell. The noise predictions have been taken at closest approach. The noise sources (except car idling) will be within a building, therefore a 10dB(A) attenuation has been assumed.

Vehicle repair noise sources	Operational period (minutes)	Noise level @ 1m dB LAeq,T	Predicted to 2 Sheffield Road dB LAeq,1h
Vehicle jack	10	72.5	24.1
Two post lift up	10	65.1	16.7
Two post lift down	10	65.4	17.0
Milwaukee impact gun	1	85.0	26.6
Sealey SA 241 air drill buffing inside a tyre	1	97.1	38.7
Corgi EM 8340 balancing wheel	15	83.6	37.0
Hoffman Megamount 7 breaking tyre beads	15	76.8	30.2
Hoffman Megamount 7 removing tyre	15	77.2	30.6
Hoffman Megamount 7 refitting tyre	15	65.0	18.4
Hoffman Megamount 7 inflating tyre	15	82.1	35.5
HPC Plusair compressor draining tank	1	78.5	20.1
HPC Plusair compressor operating	1	79.9	21.5
Deflate tyre using tyre vale key	10	80.1	31.7
Car idling at vehicle repair entrance	10	55.0	8.8

Table 1: Vehicle repair (Unit 1) noise sources

Car wrapping (Unit 2) noise sources

- 1.8 Car wrapping operations are proposed in Unit 2. The noise sources associated with car wrapping operations are shown in Table 2 (below). The operational period of each activity is also shown. Each noise measurement was taken at a distance of 1m from each source. The measured ambient noise levels have been predicted to the closest residential receptor at 2 Sheffield Road, Birdwell. The noise predictions have been taken at closest approach. The noise sources (except car idling) will be within a building, therefore a 10dB(A) attenuation has been assumed.

Car wrapping noise sources	Operational period (minutes)	Noise level @ 1m dB LAeq,T	Predicted to 2 Sheffield Road dB LAeq,1h
Bosch Professional GHG 23-66 heat gun	15	65.0	21.0
Car idling at wrapping entrance	10	55.0	11.4

Table 2: Vehicle wrapping (Unit 2) noise sources

Existing Sensitive Receptor

- 1.9 The closest existing noise sensitive receptor (NSR 1) has been considered within the noise assessment, shown below in **Table 3**.

NSR Number	Description	Grid Co-ordinates		Bearing from site	Distance to vehicle wrapping	Distance to vehicle repair
		Easting	Northing			
NSR 1	2 Sheffield Road	434494	401679	SE	26	35

Table 3: Closest noise sensitive receptor

2. STANDARDS AND GUIDANCE

National Planning Policy Framework (NPPF)

- 2.1 Published in February 2019, this document sets out the Government's planning policies for England and supersedes the previous NPPF published in 2012. It makes the following reference to noise in the section entitled *Conserving and enhancing the natural environment*:

"170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

[...]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans."

- 2.2 It also makes the following references to noise in the Section entitled *Ground conditions and pollution*:

"180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010)."

And

"182. 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."

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

2.3 This standard describes methods for rating and assessing the following:

- Sound from industrial and manufacturing processes.
- Sound from fixed installations which comprise mechanical and electrical plant and equipment.
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site.

2.4 The methods 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 advises the purpose of the methodology includes the assessment of sound from any plant and activities associated with existing industrial and/or commercial uses at proposed residential dwellings.

2.5 If appropriate, the specific sound level of the source ($L_{Aeq,T}$) is corrected, by the application of one or more corrections for acoustic features such as tonal qualities and/or distinct impulses, to give a 'rating' level ($L_{Ar,T}$). The Standard effectively compares and rates the difference between the rating level of the specific sound and the typical background sound level ($L_{A90,T}$) in the absence of the specific sound.

2.6 The Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) the source in question operates or is proposed to operate in the future.

2.7 Comparing the rating level with the background sound level, BS 4142 states:

"Typically, the greater this difference, the greater the magnitude of 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."

2.8 BS 4142 states that where the initial impact needs to be modified due to the context, consideration should be given following.

- Absolute level of sound.
- Character of the residual and specific sound; and,
- Sensitivity of the receptor.

2.9 The overall impact may be modified when the above factors are considered.

BS 8233:2014: Guidance On Sound Insulation And Noise Reduction For Buildings

2.10 This standard provides guidance for the control of noise in and around buildings. The guidance provided within the document is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

- 2.11 The guidance provided includes appropriate internal and external noise level criteria which are applicable to dwellings for steady external noise sources. It is stated that it is desirable that the internal ambient noise level does not exceed the following criteria set out in **Table 4** below:

Table 4: Summary of internal ambient noise levels to be achieved in habitable rooms

Activity	Location	Internal noise level criteria (L _{Aeq,T} dB)	
		Daytime (07:00 –23:00 hrs)	Night-time (23:00 –07:00 hrs)
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30

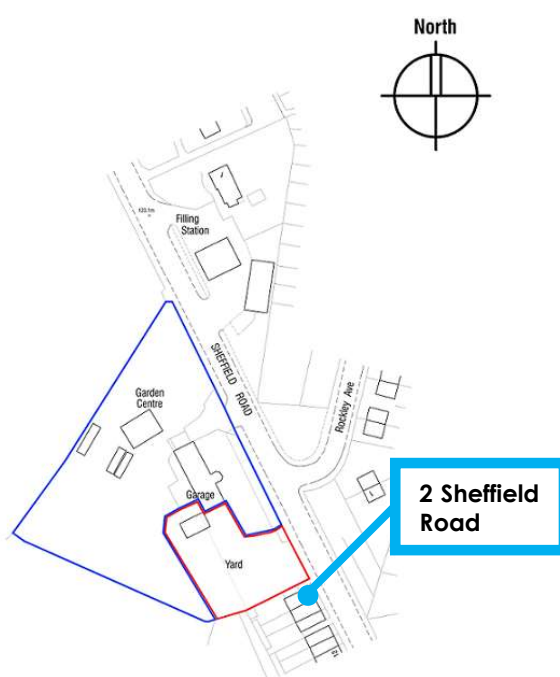
- 2.12 Whilst BS 8233:2014 recognises that a guideline value may be set in terms of SEL or L_{Afmax} for the assessment of regular individual noise events that can cause sleep disturbance during the night-time, a specific criterion is not stipulated. Accordingly, reference has been made in this assessment to the World Health Organisation (WHO) 1999: *Guidelines for Community Noise*.
- 2.13 With respect to external amenity space such as gardens and patios it is stated that it is desirable that the 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. It is then confirmed that higher external noise criteria may be appropriate under certain circumstances such as within city centres urban areas, and locations adjoining the strategic transportation network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource.

3. BASELINE NOISE SURVEY

Baseline Survey Methodology

- 3.1 A baseline noise survey has been undertaken on the site boundary to determine the prevailing noise climate at the nearest noise sensitive receptor at 2 Sheffield Road (shown in **Figure 3** below).

Figure 3: Noise sensitive receptor



- 3.2 The background noise monitoring was conducted on the site boundary with 2 Sheffield Road, Birdwell, using a tripod mounted (1.2 m from the ground) type 1 sound level meter.

Measurement Equipment

- 3.3 The baseline noise survey was undertaken using a Class 1 sound level meter. A calibration check was undertaken prior to and upon completion of the survey. No significant calibration drift was found to have occurred. All laboratory calibration (biennial for the sound level meter and annual for the calibrator) was up-to-date at the time. The equipment used for the survey is summarised in **Table 5** below.

Table 5: Noise monitoring equipment

Equipment	Manufacturer	Serial Number	Calibration due Date
Sound Level Meter		G056483	14 Sep 2023
Acoustic Calibrator		55186	26 Nov 2022

Meteorological Conditions

- 3.4 Representative weather conditions obtained from Leeds Bradford Airport for the survey period are shown in **Table 6** below.

Date	Temperature °C	Wind speed (m/s)	Wind direction	Precipitation
Tuesday 17 January	-3.9 – 1.1	3.6 – 9.4	W	None
Wednesday 18 January	-1.1 – 3.9	4.5 – 9.4	NW	None
Thursday 19 January	-1.1 – 2.8	3.1 – 9.8	W	None
Friday 20 January	0 – 3.9	2.2 – 7.2	NW	None
Saturday 21 January	-3.9 – 1.1	1.3 – 3.1	SE	None
Sunday 22 January	-2.8 – 2.2	0.4 – 3.1	SE	None
Monday 23 January	0 – 5.0	0.4 – 3.1	Variable	None
Tuesday 24 January	3.9 – 7.2	0.9 – 4.5	SW	None

Table 6 – Weather conditions during the survey periods

- 3.5 During the survey periods, the temperature was between -3.9 and 7.2 °C. The wind speed was between 0.4 and 9.8 m/s. The wind speed was above 5m/s between Tuesday 17 and Friday 20 January. These periods will be excluded from the background assessment periods in the report. The wind direction was from the west, north west, south east, south west and a variable direction. There was no precipitation during the survey period.

Operational hours

- 3.6 The proposed operating hours of the vehicle repair and car wrapping operations are as follows:

Monday – Sunday 08:00 – 17:00 hours

- 3.7 The background noise levels during the proposed operating hours of the vehicle repair and car wrapping operations are shown in Table 7 (below). The full results are shown in Appendix B.

Survey Period	dB LAeq,1h	dB LA90,1h	dB LAmax,f,1h
*Tuesday 17 January	59.7 – 60.7	56.1 – 57.2	70.7 – 72.4
Wednesday 18 January	58.9 – 60.8	55.3 – 58.3	70.3 – 81.2
Thursday 19 January	56.0 – 59.7	52.7 – 57.1	66.1 – 79.4
Friday 20 January	58.5 – 61.6	54.2 – 57.0	68.2 – 80.1
Saturday 21 January	56.7 – 59.0	50.6 – 53.1	69.0 – 82.8
Sunday 22 January	52.8 – 67.2	45.3 – 59.6	65.6 – 92.0
Monday 23 January	55.0 – 60.0	48.6 – 55.1	69.8 – 78.0

* 14:00 – 17:00 hours only

Table 7 Measured noise levels during proposed operational hours

- 3.8 During the proposed operational hours, the calculated free-field ambient noise level was between 52.8 and 67.2 $L_{Aeq,1h}$. The corresponding background sound level was between 45.3 and 59.6 $L_{A90,1h}$. The noise climate was influenced by road traffic noise from the A61 trunk road, jet washing, compressor and vacuum noise from the car/wash and valeting operations and vehicle repair operations.

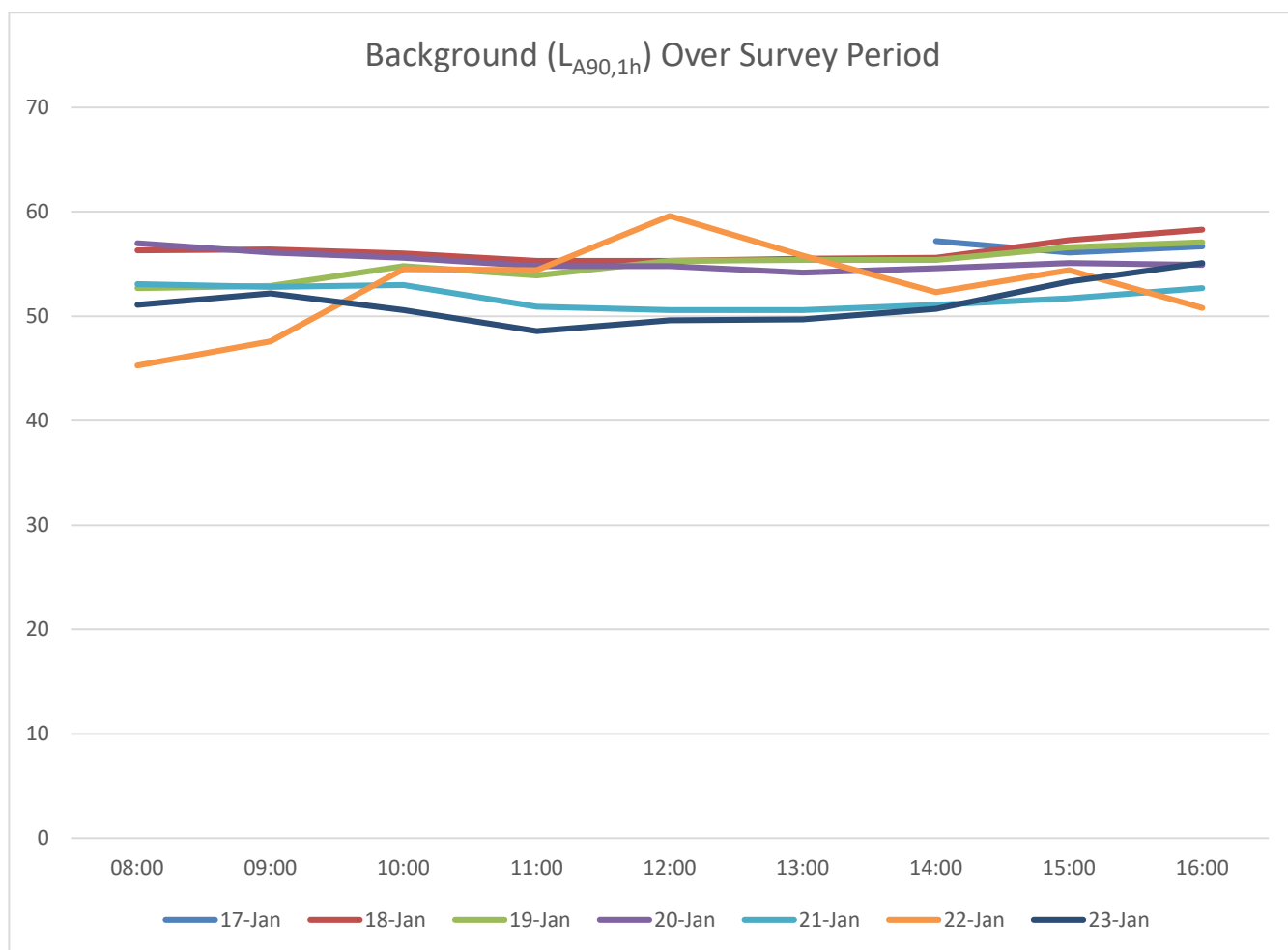


Figure 2 Measured noise levels during proposed operational hours

- 3.9 The measured background sound level during the proposed operational hours (08:00 – 17:00) on the site boundary with 2 Sheffield Road, Birdwell is shown in Figure 2 (above). Typical background sound level during the survey period do not regularly fall below 50 $L_{A90,1h}$.

4. NOISE ASSESSMENT

- 4.1 The noise assessment has considered the noise sources associated with the operation of a vehicle repair workshop in Unit 1 and car wrapping workshop in Unit 2.
- 4.2 The combined operations of the sound exposure levels of specific activities during the proposed operations at Units 1 & 2 have been predicted to the closest residential property at 2 Sheffield Road, Birdwell. These are shown in Appendix C.
- 4.3 The typical lowest background sound level during the proposed operational periods was 50 $L_{Aeq,1h}$. The noise survey results are shown in Appendix B. These are summarised in Table 7 and Figure 2.

Table 8 – BS 4142 Assessment

Description	2 Sheffield Road
Combined operations	43 $L_{Aeq,1h}$
Acoustic correction	0
Rating Level	43
Background sound level	50 $L_{A90,1h}$
Excess over background	- 7
BS 4142 impact	Low impact

- 4.4 The BS 4142 assessment shown in Table 8 shows the cumulative noise impact during combined vehicle repair and car wrapping operations in Units 1 & 2, for a worst-case 1-hour period.
- 4.5 An acoustic correction has not been applied as the noise sources will not be out of character with the existing operation of a car wash/valeting facility and vehicle repair operations, which are currently taking place on the site.
- 4.6 At 2 Sheffield Road, Birdwell the BS 4142 assessment is 7 dB below the existing background sound level. This is indicative of a low impact.

5. MEASUREMENT UNCERTAINTY

- 5.1 As part of this updated noise assessment, we have considered the potential uncertainties in the noise measurements undertaken. These are discussed below.

Background Noise Assessment

- 5.2 Background noise levels were taken for a continuous 7-day period. However, as wind speeds were above 5 m/s, only four days of the background noise data were below this threshold.
- 5.3 The dominant noise sources were road traffic noise from the A61 trunk road and jet wash/compressor and vacuum from the car wash/valeting operations. The lowest background sound level of 45.3 $L_{A90,1h}$ occurred between 08:00 and 09:00 on Sunday 22 January. This was an isolated period, typical lowest background sound levels were rarely below 50 $L_{A90,1h}$.
- 5.4 If the lowest background sound level was used in the assessment, the background sound level reduction will be 5 dB.

Site Noise Levels

- 5.5 The site noise levels were obtained from existing on-site measurements from a vehicle repair workshop in Buxton, Derbyshire. More modern, lower noise level equipment is likely to be used. Therefore, the likely noise reduction will be around 1 dB(A).

Uncertainty Conclusions

- 5.6 When taking all of the factors into consideration, the background noise levels could be decreased by 5 dB. More modern, lower noise equipment will be likely to be used, therefore the reduction is 1 dB(A). However, predicted noise level will remain below the background sound level, therefore the overall conclusion of the assessment remain the same.

6. CONCLUSIONS

- 6.1 Spire Environmental Consultants Limited has been appointed by Jumbo Self Drive Ltd to undertake an environmental noise assessment for proposed car repair (Unit 1) and car wrapping operations (Unit 2) at 2A Sheffield Road, Birdwell, Barnsley, S70 5UZ.
- 6.2 Combined site operations from Units 1 & 2 were predicted to 2A Sheffield Road. These were operated for representative periods during a typical worst-case hour.
- 6.3 Baseline noise monitoring was undertaken on the site boundary of 2A Sheffield Road Garage for a continuous 7-day period. The survey, and subsequent assessment work, have been undertaken in accordance with current standards and guidance.
- 6.4 A detailed noise assessment has been undertaken to determine the likely impact of the vehicle repair and car wrapping operations at Units 1 & 2 at 2 Sheffield Road, Birdwell.
- 6.5 The assessment indicates that noise from the combined operations from Units 1 & 2 is below the existing background noise level. In accordance with BS 4142, this is indicative of a low impact
- 6.6 When considering the measurement uncertainty, there would be no change to the outcome of this assessment.

APPENDICES

APPENDIX A: Glossary of Terms

Noise

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq} , L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

Acoustic Terminology

Term	Description
dB (decibel)	The scale on which sound pressure level is expressed. Sound pressure level is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2x10 ⁻⁵ Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e., 'A' - weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
L _{Aeq,T}	L _{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
L _{Amax}	L _{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L _{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L _{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L ₁₀ and L ₉₀	If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The L _n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L ₁₀ is the level exceeded for 10% of the time, and the L ₉₀ is the level exceeded for 90% of the time.
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally, as measured outside and away from buildings.
Façade Level	A sound field determined at a distance of 1m in front of a large sound reflecting object such as a building façade.

APPENDIX B: Measured Noise Levels

Table B1: Results from ML1

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Daytime					
17/01/2023 14:00:00	1-hour	60.7	63.4	57.2	71.9
17/01/2023 15:00:00	1-hour	59.7	61.9	56.1	70.7
17/01/2023 16:00:00	1-hour	60.1	62.7	56.7	72.4
17/01/2023 17:00:00	1-hour	58.8	60.6	55.8	79.4
17/01/2023 18:00:00	1-hour	58.4	60.6	55.1	74.2
17/01/2023 19:00:00	1-hour	56.9	59.7	51.6	73.5
17/01/2023 20:00:00	1-hour	55.1	58.3	49.3	78.3
17/01/2023 21:00:00	1-hour	54.9	58.4	48.6	64.8
17/01/2023 22:00:00	1-hour	53.7	57.6	45.8	66.6
Over survey period		58.2	60.4	52.9	79.4

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Night-time					
17/01/2023 23:00:00	1-hour	51.1	54.4	45.1	69.0
18/01/2023 00:00:00	1-hour	49.1	51.3	43.6	66.6
18/01/2023 01:00:00	1-hour	47.3	49.0	41.5	68.0
18/01/2023 02:00:00	1-hour	47.5	49.5	41.8	66.6
18/01/2023 03:00:00	1-hour	46.8	48.7	40.6	62.1
18/01/2023 04:00:00	1-hour	51.8	54.5	46.6	70.5
18/01/2023 05:00:00	1-hour	55.8	58.6	51.2	71.2
18/01/2023 06:00:00	1-hour	57.8	59.9	54.7	64.8
Over survey period		52.7	53.2	45.6	71.2

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Daytime					
18/01/2023 07:00:00	1-hour	59.4	60.9	57.2	65.9
18/01/2023 08:00:00	1-hour	59.1	60.8	56.3	72.5
18/01/2023 09:00:00	1-hour	58.9	60.7	56.4	77.1
18/01/2023 10:00:00	1-hour	58.9	60.4	56.0	79.4
18/01/2023 11:00:00	1-hour	59.1	61.9	55.3	72.4
18/01/2023 12:00:00	1-hour	59.0	61.7	55.3	76.1
18/01/2023 13:00:00	1-hour	60.0	62.9	55.5	76.5
18/01/2023 14:00:00	1-hour	59.4	61.9	55.6	70.3
18/01/2023 15:00:00	1-hour	60.8	63.4	57.3	81.2
18/01/2023 16:00:00	1-hour	60.4	62.0	58.3	71.9
18/01/2023 17:00:00	1-hour	59.0	60.2	56.8	86.3
18/01/2023 18:00:00	1-hour	57.2	58.8	54.8	73.6
18/01/2023 19:00:00	1-hour	56.0	57.6	53.4	77.3
18/01/2023 20:00:00	1-hour	55.1	57.1	52.0	71.1
18/01/2023 21:00:00	1-hour	54.0	56.3	50.8	64.3
18/01/2023 22:00:00	1-hour	52.8	55.7	47.2	65.9
Over survey period		58.6	60.1	54.9	86.3

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Night-time					
18/01/2023 23:00:00	1-hour	50.2	52.8	46.0	62.8
19/01/2023 00:00:00	1-hour	49.1	51.4	44.2	64.4
19/01/2023 01:00:00	1-hour	48.2	50.5	43.4	61.6
19/01/2023 02:00:00	1-hour	48.7	50.8	44.7	61.1
19/01/2023 03:00:00	1-hour	48.3	50.4	43.8	61.2
19/01/2023 04:00:00	1-hour	50.1	52.8	45.6	68.8
19/01/2023 05:00:00	1-hour	52.9	56.3	45.1	71.4
19/01/2023 06:00:00	1-hour	55.2	57.5	51.7	63.5
Over survey period		51.1	52.8	45.6	71.4

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Daytime					
19/01/2023 07:00:00	1-hour	55.7	57.6	52.4	65.7
19/01/2023 08:00:00	1-hour	56.0	58.1	52.7	78.7
19/01/2023 09:00:00	1-hour	56.8	58.8	52.9	78.5
19/01/2023 10:00:00	1-hour	57.4	59.3	54.8	71.8
19/01/2023 11:00:00	1-hour	57.3	59.5	53.9	69.8
19/01/2023 12:00:00	1-hour	58.1	60.3	55.3	66.1
19/01/2023 13:00:00	1-hour	58.4	60.7	55.4	67.2
19/01/2023 14:00:00	1-hour	58.0	59.9	55.4	70.8
19/01/2023 15:00:00	1-hour	59.7	61.1	56.6	79.4
19/01/2023 16:00:00	1-hour	59.4	61.0	57.1	77.4
19/01/2023 17:00:00	1-hour	59.6	61.3	57.0	79.2
19/01/2023 18:00:00	1-hour	59.2	61.1	56.4	71.2
19/01/2023 19:00:00	1-hour	58.4	60.3	55.3	79.6
19/01/2023 20:00:00	1-hour	57.1	59.4	53.5	82.5
19/01/2023 21:00:00	1-hour	56.3	58.7	52.7	79.6
19/01/2023 22:00:00	1-hour	55.0	57.8	50.2	69.6
Over survey period		57.9	59.7	54.5	82.5

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Night-time					
19/01/2023 23:00:00	1-hour	52.4	55.2	47.6	67.9
20/01/2023 00:00:00	1-hour	50.2	52.6	45.3	68.6
20/01/2023 01:00:00	1-hour	49.5	51.0	45.4	67.8
20/01/2023 02:00:00	1-hour	49.9	51.9	44.4	65.6
20/01/2023 03:00:00	1-hour	49.5	51.7	43.9	64.7
20/01/2023 04:00:00	1-hour	51.6	54.0	46.7	67.8
20/01/2023 05:00:00	1-hour	55.9	58.9	51.5	64.9
20/01/2023 06:00:00	1-hour	58.0	60.4	54.4	66.5
Over survey period		53.3	54.5	47.4	68.6

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Daytime					
20/01/2023 07:00:00	1-hour	60.1	60.9	56.1	76.8
20/01/2023 08:00:00	1-hour	61.6	65.0	57.0	80.1
20/01/2023 09:00:00	1-hour	59.3	61.7	56.1	68.5
20/01/2023 10:00:00	1-hour	58.6	60.7	55.6	68.2
20/01/2023 11:00:00	1-hour	58.5	61.2	54.8	70.5
20/01/2023 12:00:00	1-hour	58.7	61.3	54.8	76.4
20/01/2023 13:00:00	1-hour	58.8	61.6	54.2	72.6
20/01/2023 14:00:00	1-hour	59.3	62.1	54.6	69.6
20/01/2023 15:00:00	1-hour	59.5	62.0	55.1	75.4
20/01/2023 16:00:00	1-hour	59.7	62.2	54.9	77.3
20/01/2023 17:00:00	1-hour	57.3	59.2	54.1	74.1
20/01/2023 18:00:00	1-hour	59.2	61.9	54.2	76.8
20/01/2023 19:00:00	1-hour	57.7	60.2	52.5	77.4
20/01/2023 20:00:00	1-hour	54.8	57.6	48.8	75.1
20/01/2023 21:00:00	1-hour	55.3	58.0	48.8	78.3
20/01/2023 22:00:00	1-hour	54.9	57.7	49.4	71.0
Over survey period		58.7	60.8	53.8	80.1

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Night-time					
20/01/2023 23:00:00	1-hour	53.5	56.8	46.6	74.0
21/01/2023 00:00:00	1-hour	50.7	54.8	42.8	67.8
21/01/2023 01:00:00	1-hour	50.0	52.8	44.5	64.9
21/01/2023 02:00:00	1-hour	49.4	52.8	42.3	66.4
21/01/2023 03:00:00	1-hour	47.3	48.9	40.7	69.0
21/01/2023 04:00:00	1-hour	48.8	51.2	43.3	63.0
21/01/2023 05:00:00	1-hour	52.3	55.9	45.3	72.5
21/01/2023 06:00:00	1-hour	52.2	55.7	46.4	67.6
Over survey period		50.9	53.6	44.0	74.0

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Daytime					
21/01/2023 07:00:00	1-hour	53.8	57.3	47.4	64.0
21/01/2023 08:00:00	1-hour	56.7	58.8	53.1	80.3
21/01/2023 09:00:00	1-hour	58.8	62.1	52.8	82.7
21/01/2023 10:00:00	1-hour	59.0	62.2	53.0	82.8
21/01/2023 11:00:00	1-hour	57.6	61.7	50.9	69.6
21/01/2023 12:00:00	1-hour	58.6	62.4	50.6	71.4
21/01/2023 13:00:00	1-hour	57.9	61.8	50.6	70.8
21/01/2023 14:00:00	1-hour	59.0	62.9	51.1	81.6
21/01/2023 15:00:00	1-hour	58.6	61.8	51.7	73.8
21/01/2023 16:00:00	1-hour	58.1	61.3	52.7	69.0
21/01/2023 17:00:00	1-hour	56.5	58.5	51.3	84.3
21/01/2023 18:00:00	1-hour	56.7	59.2	51.2	76.4
21/01/2023 19:00:00	1-hour	57.3	59.6	48.8	91.3
21/01/2023 20:00:00	1-hour	56.0	59.3	49.2	76.2
21/01/2023 21:00:00	1-hour	54.3	58.3	45.1	73.4
21/01/2023 22:00:00	1-hour	54.3	58.0	46.6	71.1
Over survey period		57.4	60.3	50.4	91.3

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Night-time					
21/01/2023 23:00:00	1-hour	52.3	56.4	45.0	69.5
22/01/2023 00:00:00	1-hour	51.1	55.4	42.1	68.3
22/01/2023 01:00:00	1-hour	49.3	53.1	39.7	69.3
22/01/2023 02:00:00	1-hour	47.4	49.6	38.0	69.7
22/01/2023 03:00:00	1-hour	47.5	50.3	35.5	67.4
22/01/2023 04:00:00	1-hour	46.8	48.4	35.6	67.8
22/01/2023 05:00:00	1-hour	50.0	54.4	39.3	69.0
22/01/2023 06:00:00	1-hour	49.7	53.5	41.7	71.7
Over survey period		49.6	52.6	39.6	71.7

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Daytime					
22/01/2023 07:00:00	1-hour	51.8	55.9	43.7	64.8
22/01/2023 08:00:00	1-hour	52.8	56.6	45.3	65.6
22/01/2023 09:00:00	1-hour	55.2	58.0	47.6	72.5
22/01/2023 10:00:00	1-hour	61.7	65.3	54.5	81.3
22/01/2023 11:00:00	1-hour	62.2	65.7	54.4	81.6
22/01/2023 12:00:00	1-hour	67.2	69.8	59.6	89.1
22/01/2023 13:00:00	1-hour	64.6	65.9	55.8	92.0
22/01/2023 14:00:00	1-hour	60.1	64.0	52.3	74.9
22/01/2023 15:00:00	1-hour	61.0	63.7	54.4	72.4
22/01/2023 16:00:00	1-hour	60.2	64.1	50.8	85.4
22/01/2023 17:00:00	1-hour	54.8	57.7	48.5	68.8
22/01/2023 18:00:00	1-hour	54.5	57.7	47.3	69.0
22/01/2023 19:00:00	1-hour	53.6	56.8	45.8	77.0
22/01/2023 20:00:00	1-hour	52.6	56.1	44.6	74.1
22/01/2023 21:00:00	1-hour	51.9	55.8	41.1	74.8
22/01/2023 22:00:00	1-hour	49.7	53.6	40.6	70.2
Over survey period		60.4	60.4	49.1	92.0

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Night-time					
22/01/2023 23:00:00	1-hour	49.2	53.3	39.2	67.8
23/01/2023 00:00:00	1-hour	46.7	49.8	38.0	64.7
23/01/2023 01:00:00	1-hour	45.3	46.1	36.0	70.8
23/01/2023 02:00:00	1-hour	45.3	48.2	34.9	63.2
23/01/2023 03:00:00	1-hour	46.2	48.2	37.3	64.2
23/01/2023 04:00:00	1-hour	50.2	54.0	42.7	64.8
23/01/2023 05:00:00	1-hour	54.1	57.8	46.0	68.0
23/01/2023 06:00:00	1-hour	55.2	58.3	48.8	69.6
Over survey period		50.7	52.0	40.4	70.8

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Daytime					
23/01/2023 07:00:00	1-hour	56.4	58.8	52.2	65.7
23/01/2023 08:00:00	1-hour	55.0	57.1	51.1	78.0
23/01/2023 09:00:00	1-hour	57.8	61.2	52.2	77.5
23/01/2023 10:00:00	1-hour	57.0	60.7	50.6	72.5
23/01/2023 11:00:00	1-hour	57.5	61.4	48.6	70.0
23/01/2023 12:00:00	1-hour	58.6	62.2	49.6	73.8
23/01/2023 13:00:00	1-hour	58.5	62.4	49.7	69.8
23/01/2023 14:00:00	1-hour	58.9	62.5	50.7	76.5
23/01/2023 15:00:00	1-hour	59.7	63.0	53.3	72.3
23/01/2023 16:00:00	1-hour	60.0	63.3	55.1	71.2
23/01/2023 17:00:00	1-hour	56.4	58.3	52.5	77.7
23/01/2023 18:00:00	1-hour	56.8	59.2	52.6	66.8
23/01/2023 19:00:00	1-hour	56.7	59.4	51.6	82.7
23/01/2023 20:00:00	1-hour	54.3	57.2	47.3	77.6
23/01/2023 21:00:00	1-hour	54.9	57.8	48.9	68.8
23/01/2023 22:00:00	1-hour	53.2	56.6	46.2	75.5
Over survey period		57.4	60.1	50.8	82.7

Table B1 (Continued)

Start time & date	Period (T)	dB LAeq,T	dB LA10,T	dB LA90,T	dB LAfmax
Night-time					
23/01/2023 23:00:00	1-hour	50.2	53.5	44.4	66.8
24/01/2023 00:00:00	1-hour	50.4	53.4	45.0	66.9
24/01/2023 01:00:00	1-hour	49.3	51.9	43.4	65.8
24/01/2023 02:00:00	1-hour	50.0	53.2	43.0	66.5
24/01/2023 03:00:00	1-hour	50.2	51.8	43.5	72.5
24/01/2023 04:00:00	1-hour	52.9	56.3	45.4	70.2
24/01/2023 05:00:00	1-hour	57.1	60.2	51.9	68.8
24/01/2023 06:00:00	1-hour	58.3	61.2	53.1	67.7
Over survey period		53.7	55.2	46.2	72.5

APPENDIX C: Sound Exposure Level Calculations

Table C1 Vehicle Jack

2 Sheffield Road	Sound exposure level calculations $dB_{LAeq,1h}$
Vehicle jack @ 1m	72.5
Cycle duration	10 mins
Number of cycles	1
Correction for 1h reference period – dB(A)	-7.78
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level $dB_{LAeq,1h}$	24.1

Table C2 Two post lift (up)

2 Sheffield Road	Sound exposure level calculations $dB_{LAeq,1h}$
Two post lift (up) @ 1m	65.1
Cycle duration	10 mins
Number of cycles	1
Correction for 1h reference period – dB(A)	-7.78
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level $dB_{LAeq,1h}$	16.7

Table C3 Two post lift (down)

2 Sheffield Road	Sound exposure level calculations dBL_{Aeq,1h}
Two post lift (down) @ 1m	65.4
Cycle duration	10 mins
Number of cycles	1
Correction for 1h reference period – dB(A)	-7.78
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level dBL_{Aeq,1h}	17.0

Table C4 Milwaukee impact gun

2 Sheffield Road	Sound exposure level calculations dBL_{Aeq,1h}
Milwaukee impact gun @ 1m	85.0
Cycle duration	1 min
Number of cycles	1
Correction for 1h reference period – dB(A)	-17.78
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level dBL_{Aeq,1h}	26.6

Table C5 Sealey SA 241 air drill buffing inside a tyre

2 Sheffield Road	Sound exposure level calculations dBL _{Aeq,1h}
Sealey SA 241 air drill buffing inside a tyre@ 1m	97.1
Cycle duration	1 min
Number of cycles	1
Correction for 1h reference period – dB(A)	-17.78
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level dBL_{Aeq,1h}	38.7

Table C6 Corgi EM 8340 balancing wheel

2 Sheffield Road	Sound exposure level calculations dBL _{Aeq,1h}
Corgi EM 8340 balancing wheel @ 1m	83.6
Cycle duration	15 mins
Number of cycles	1
Correction for 1h reference period – dB(A)	-6.02
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level dBL_{Aeq,1h}	37.0

Table C7 Hoffmann Megamount 7 breaking tyre beads

2 Sheffield Road	Sound exposure level calculations $dB_{LAeq,1h}$
Hoffman Megamount 7 breaking tyre beads @ 1m	76.8
Cycle duration	15 mins
Number of cycles	1
Correction for 1h reference period – dB(A)	-6.02
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level $dB_{LAeq,1h}$	30.2

Table C8 Hoffmann Megamount 7 removing tyre

2 Sheffield Road	Sound exposure level calculations $dB_{LAeq,1h}$
Hoffman Megamount 7 removing tyre @ 1m	77.2
Cycle duration	15 mins
Number of cycles	1
Correction for 1h reference period – dB(A)	-6.02
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level $dB_{LAeq,1h}$	30.6

Table C9 Hoffmann Megamount 7 refitting tyre

2 Sheffield Road	Sound exposure level calculations dBL_{Aeq,1h}
Hoffman Megamount 7 refitting tyre @ 1m	65.0
Cycle duration	15 mins
Number of cycles	1
Correction for 1h reference period – dB(A)	-6.02
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level dBL_{Aeq,1h}	18.4

Table C10 Hoffmann Megamount 7 inflating tyre

2 Sheffield Road	Sound exposure level calculations dBL_{Aeq,1h}
Hoffman Megamount 7 inflating tyre@ 1m	82.1
Cycle duration	15 mins
Number of cycles	1
Correction for 1h reference period – dB(A)	-6.02
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level dBL_{Aeq,1h}	35.5

Table C11 HPC Plusair compressor draining tank

2 Sheffield Road	Sound exposure level calculations dBL_{Aeq,1h}
HPC Plusair compressor draining tank @ 1m	78.5
Cycle duration	1 min
Number of cycles	1
Correction for 1h reference period – dB(A)	-17.78
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level dBL_{Aeq,1h}	20.1

Table C12 HPC Plusair compressor operating

2 Sheffield Road	Sound exposure level calculations dBL_{Aeq,1h}
HPC Plusair compressor operating @ 1m	79.9
Cycle duration	1 min
Number of cycles	1
Correction for 1h reference period – dB(A)	-17.78
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level dBL_{Aeq,1h}	21.5

Table C13 Deflate tyre using valve key

2 Sheffield Road	Sound exposure level calculations dBL_{Aeq,1h}
Deflate tyre using tyre valve key @ 1m	80.1
Cycle duration	10 mins
Number of cycles	1
Correction for 1h reference period – dB(A)	-7.78
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Barrier correction	-10
Sound exposure level dBL_{Aeq,1h}	31.7

Table C14 Bosch Professional GHG 23-66 Professional heat gun

2 Sheffield Road	Sound exposure level calculations dBL_{Aeq,1h}
Bosch Professional GHG 23-66 heat gun @ 1m	65.0
Cycle duration	15 min
Number of cycles	1
Correction for 1h reference period – dB(A)	-6.02
Distance, source to receiver (m)	26
Distance correction dB(A)	-28.0
Barrier correction	-10.0
Sound exposure level dBL_{Aeq,1h}	21.0

Table C15 Vehicle repair cars idling

NSR 1	Sound exposure level calculations dBL _{Aeq,1h}
SEL of 1 car idling at vehicle repair entrance @ 1m	55.0
Cycle duration	10 min
Number of cycles	1
Correction for 1h reference period – dB(A)	-15.6
Distance, source to receiver (m)	35
Distance correction dB(A)	-30.6
Sound exposure level dBL_{Aeq,1h}	8.8

Table C16 Vehicle wrapping cars idling

2 Sheffield Road	Sound exposure level calculations dBL _{Aeq,1h}
SEL of 1 car idling at vehicle wrapping entrance @ 1m	55.0
Cycle duration	10 min
Number of cycles	1
Correction for 1h reference period – dB(A)	-15.6
Distance, source to receiver (m)	26
Distance correction dB(A)	-28.0
Sound exposure level dBL_{Aeq,1h}	11.4

Table C17 Combined operations

2 Sheffield Road	Sound exposure level calculations dBL_{Aeq,1h}
Vehicle jack	24.1
Two post lift up	16.7
Two post lift down	17.0
Milwaukee impact gun	26.6
Sealey SA 241 air drill buffing inside a tyre	38.7
Corgi EM 8340 balancing wheel	37.0
Hoffman Megamount 7 breaking tyre beads	30.2
Hoffman Megamount 7 removing tyre	30.6
Hoffman Megamount 7 refitting tyre	18.4
Hoffman Megamount 7 inflating tyre	35.5
HPC Plusair compressor draining tank	20.1
HPC Plusair compressor operating	21.5
Deflate tyre using tyre vale key	31.7
Bosch Professional GHG 23-66 heat gun	21.0
Car idling at vehicle repair entrance	8.8
Car idling at vehicle wrapping entrance	11.4
Sound exposure level dBL_{Aeq,1h}	43.2



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