

GAP Plant & Tools, Whitehaven
Noise Impact Assessment Report

Client: GAP Group Ltd

Project Number: 0472020

Date: 27th July 2020



REPORT ISSUE & STATUS LOG

	Revision Number		
	1	2	3
Author	Adam Barr BSc (Hons) MIOA	Adam Barr BSc (Hons) MIOA	
Position	Director	Director	
Date of Issue	09 th June 2020	27 th July 2020	
Comment	For Issue	For Issue	

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1 INTRODUCTION

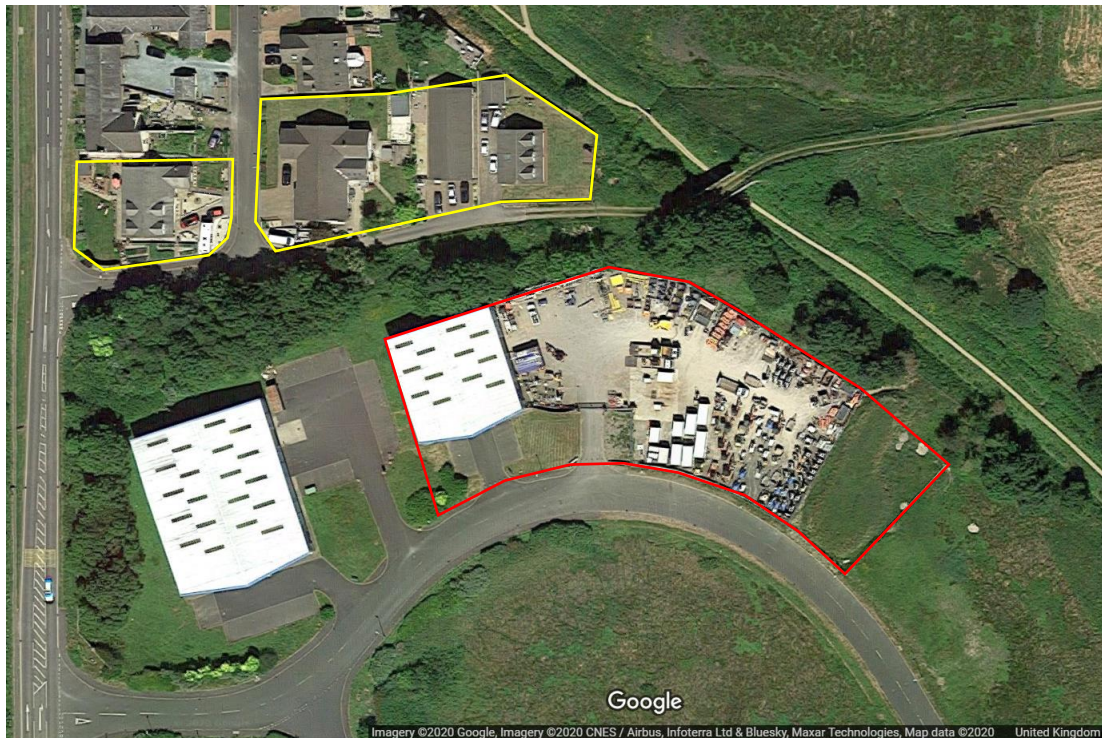
1.1 OVERVIEW

- 1.1.1 JPM Acoustics Ltd has been appointed by GAP Group Ltd to undertake a noise impact assessment to support an application for Sui Generis use of an existing and operational industrial unit on Joe McBain Avenue in Whitehaven.
- 1.1.2 This report presents an assessment of the potential noise impacts of the development on nearby sensitive receptors. The assessment has been undertaken with due consideration to relevant British Standards, Planning Policies and current guidance relating to noise.
- 1.1.3 This report is necessarily technical in nature. Therefore, to assist the reader, a glossary of acoustic terminology is included in **Appendix A**.

1.2 SITE DESCRIPTION

- 1.2.1 The GAP Plant & Tool Hire site is located on Joe McBain Avenue in Whitehaven. The site is bounded by Joe McBain Avenue to the south, an industrial/commercial unit to the west, a small area of trees to the north, beyond which is Whinrigg Drive, and open grassland to the east.
- 1.2.2 The nearest noise sensitive receptors to the development are those on Whinrigg Drive to the north.
- 1.2.3 **Figure 1-1** shows an indicative redline site boundary and the location of the nearest receptors outlined in yellow.

Figure 1-1: Site Location

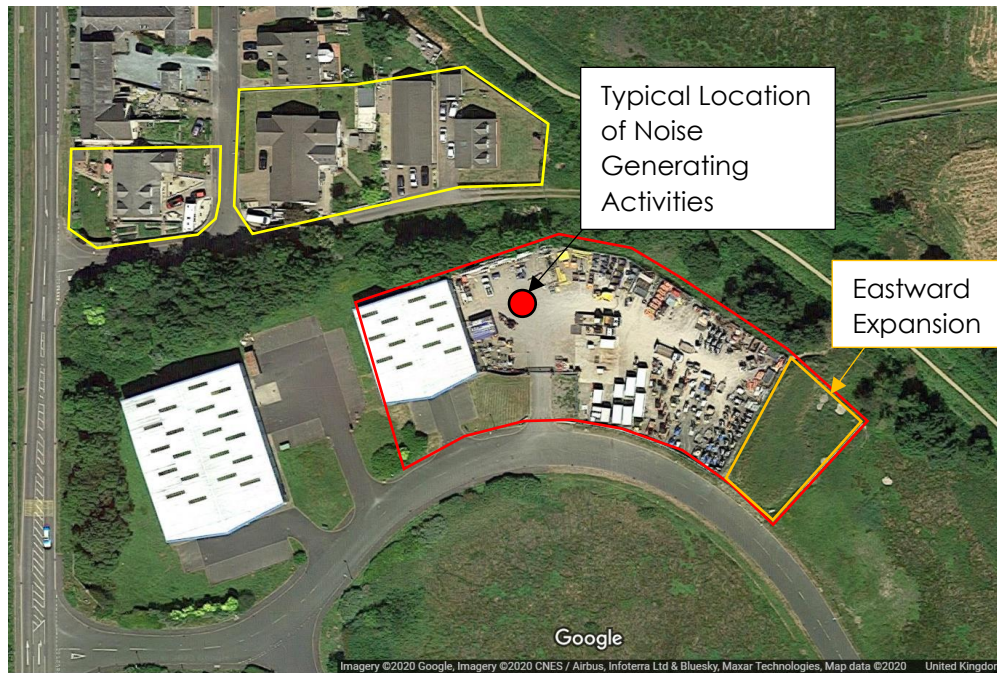


1.3 PLANNING CONTEXT AND DEVELOPMENT DESCRIPTION

- 1.3.1 The land occupied by GAP Plant & Tool Hire sits within a wider development site which has extant planning permission for industrial use including use classes B1, B2, B8 and non-food retail (application reference 4/91/0222/O). On the 7th July 1994, a reserved matters application was approved for B1, B2 or B8 uses for two units (reference 4/94/0339/O), one of which is occupied by GAP Plant & Tool Hire.
- 1.3.2 Copeland Borough Council (CBC) has suggested that the consent granted under application reference 4/94/0339/O, does not cover the current use of the site on the basis that the current use is 'Sui Generis', not B1, B2 or B8 use. Therefore, this assessment is being undertaken to support a retrospective application for Sui Generis use. The application also seeks a proposed eastward expansion of the existing eastern storage yard. The eastwards expansion will cover the remaining piece of rough land within the red line plan, as shown in **Figure 1-2**.
- 1.3.3 The majority of the noise generating activities on the site take place in the centre of the western portion of the service yard, near to the doors of the industrial unit. Noise sources include use of forklift trucks, loading of vehicles etc. **Figure 1-2** shows the typical location of noise generating activities on the site.

- 1.3.4 The GAP site operates during daytime hours only. The operational hours of the site are between 07:30 and 17:00 on weekdays. The site does, however, operate up to six times per year on a Saturday from 08:00 until 13:00.

Figure 1-2: Typical Location of Noise Generating Operations



- 1.3.5 The eastern portion of the site is mainly used for storage, as shown in **Figure 1-3** below.

Figure 1-3: Eastern Portion of the Site



- 1.3.6 It has been confirmed by CBC that no complaints regarding noise from the GAP site have ever been received.

2 LEGISLATION AND GUIDANCE

2.1 BRITISH STANDARD 4142: 2014+A1:2019: METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND (BS 4142)

2.1.1 This British 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.

2.1.2 The method uses 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.

2.1.3 In accordance with the assessment methodology, the specific sound level ($L_{Aeq,T}$) of the noise source being assessed is measured or predicted at a receptor location. A rating level ($L_{Ar,Tr}$) is then derived by adding a correction or penalty to the specific sound level for characteristic features, such as tonal qualities and/or distinct impulses, which make the source distinguishable against the residual noise climate. The British Standard effectively compares the difference between the rating level and the typical background sound level ($L_{A90,T}$) in the absence of the noise source being assessed.

2.1.4 It is advised 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) when the noise source in question is likely to operate or is proposed to operate in the future.

2.1.5 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."

1.2 BS 8233:2014: GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS (BS 8233)

- 2.1.6 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.
- 2.1.7 The standard includes recommended 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 guideline values set out in **Table 2-1**.

Table 2-1: Desirable Guideline Values from BS 8233

Activity	Location	Period	
		07:00 to 23:00 Hours, i.e. Daytime	23:00 to 07:00 Hours, i.e. Night-time
Resting	Living Room	35 dB LAeq, 16 Hour	-
Dining	Dining Room/area	40 dB LAeq, 16 Hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq, 16 Hour	30 dB LAeq, 8 Hour

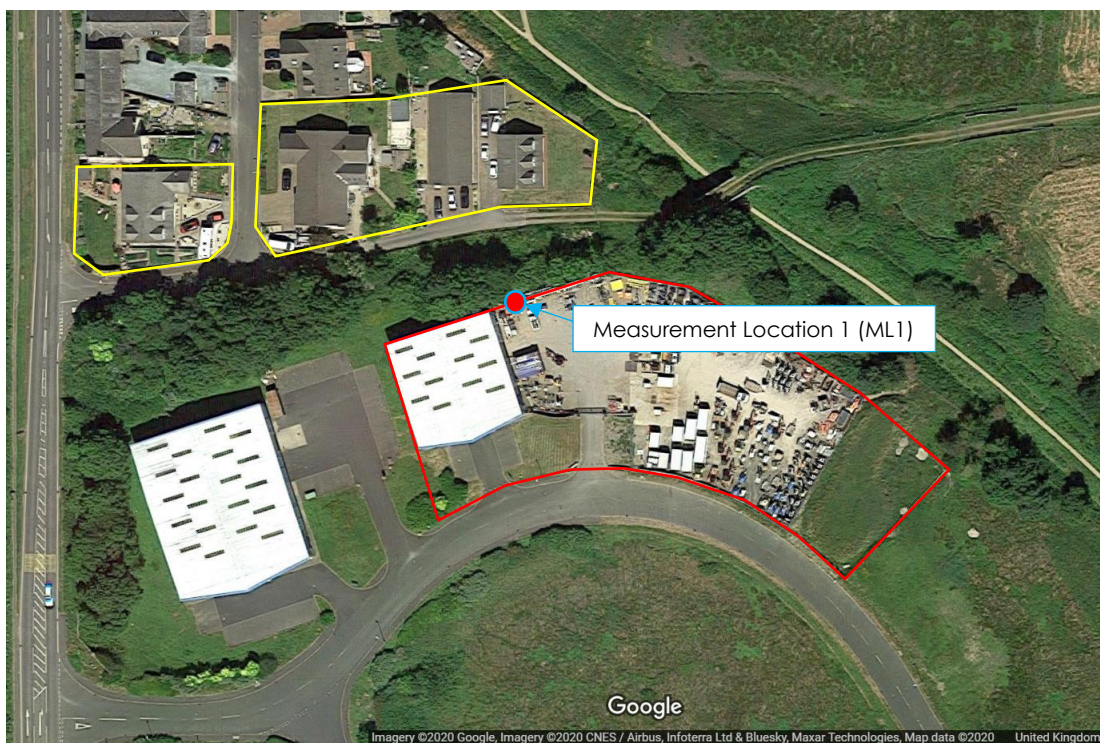
- 2.1.8 With respect to external amenity space such as gardens and patios, it is stated that it is desirable that the noise level does not exceed 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environments.

3 BASELINE NOISE SURVEY

3.1 OVERVIEW

- 3.1.1 A baseline noise survey has been undertaken to determine the prevailing noise climate at a location on the boundary of the GAP site closest to the nearest receptors. The survey included periods between 07:00 and 19:00 on the 27th May 2020. **Figure 3-1** identifies the measurement location adopted during the survey.

Figure 3-1: Baseline Noise Survey Measurement Location



- 3.1.2 Measurement Location 1 (ML1) was on the northern site boundary at a height of approximately 2 m. The measurement location was used to determine noise levels from activities within the site during operational periods, and representative background noise levels during periods when the site was not operating.
- 3.1.3 The noise climate at Measurement Location 1 was dominated by noise from the GAP site during operational hours and was dominated by natural sounds and distant road traffic noise during periods where GAP were not operating.

3.2 EQUIPMENT

- 3.2.1 The baseline noise survey was undertaken using the Class 1 specification noise measurement equipment detailed in **Table 3-1**. The measurement equipment was calibrated using a portable calibrator immediately before and after the measurements with no significant drift in calibration observed. The sound level meter, pre-amplifier and microphone were calibrated to traceable standards within 24 months prior to the measurements. The portable calibrator was calibrated within 12 months prior to the measurements.

Table 3-1: Equipment Details

Item	Make & Model	Serial Number	Calibration Due
Sound Level Meter	Svantek 971	80344	March 2022
Pre-Amplifier	Svantek SV18	71577	
Microphone	ACO Pacific 7052E	69566	
Calibrator	01dB-Stell Cal 21	34675335	November 2020

3.3 METEOROLOGICAL CONDITIONS

- 3.3.1 Weather conditions during the survey were conducive to environmental noise monitoring, it being dry with negligible winds.

3.4 RESULTS

- 3.4.1 A summary of the relevant survey results is included in **Table 3-2**.

Table 3-2: Measured Sound Pressure Levels at Measurement Location 1

Start Date and Time	Period	Sound Pressure Levels		Comment
		dB L _{Aeq,T}	dB L _{A90,T}	
27/05/2020 07:00	30-minutes	53	31	GAP Not Operating
27/05/2020 08:00	1-hour	59	40	GAP Operating
27/05/2020 09:00	1-hour	60	39	
27/05/2020 10:00	1-hour	66	38	
27/05/2020 11:00	1-hour	51	38	
27/05/2020 12:00	1-hour	49	37	
27/05/2020 13:00	1-hour	49	38	
27/05/2020 14:00	1-hour	58	35	
27/05/2020 15:00	1-hour	53	35	
27/05/2020 16:00	1-hour	58	35	
27/05/2020 17:00	1-hour	42	31	GAP Not Operating
27/05/2020 18:00	1-hour	50	31	GAP Not Operating

3.4.2 It can be seen from **Table 3-2** that during periods when GAP were not operating the background noise levels were consistently 31 dB L_{A90,1h}. Noise levels at Measurement Location 1 during operational periods ranged between 49 and 66 dB L_{Aeq,1hr} with 56 dB L_{Aeq,1hr} being the average level associated with the site.

4 ASSESSMENT

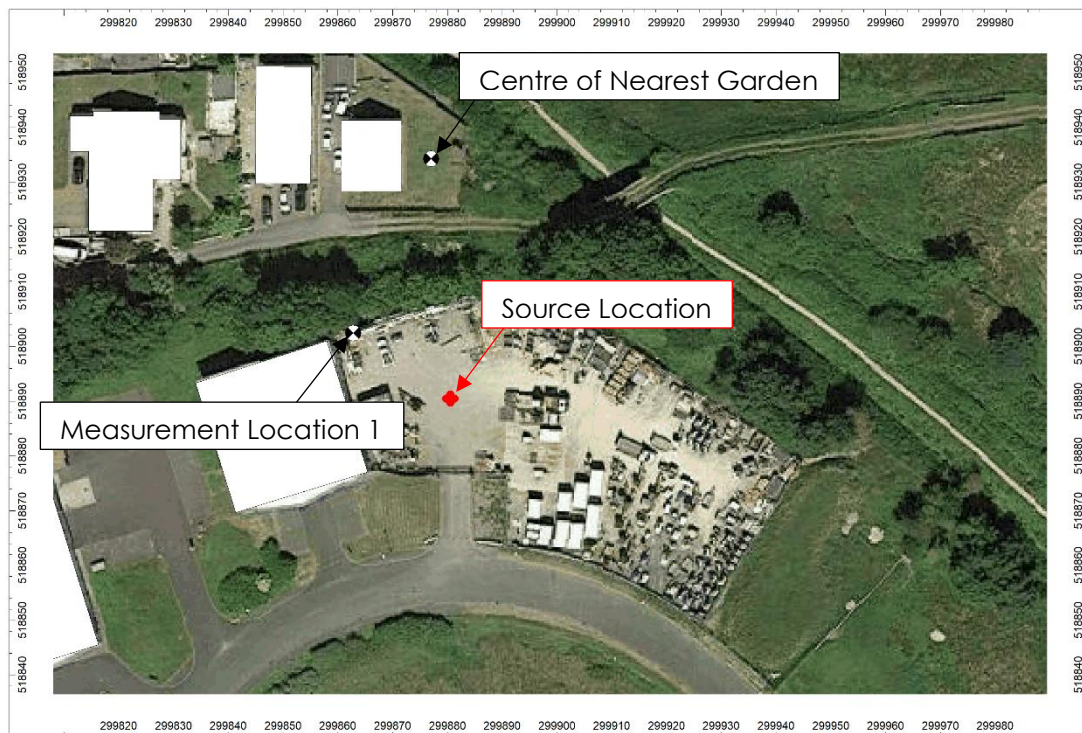
4.1 NOISE MODEL

4.1.1 A detailed noise model has been generated to calculate noise propagation from the site due to typical operations. The noise model was generated applying the following methodology:

- The model was generated using the PC based CadnaA® noise modelling package;
- The noise model was set to apply the prediction methodology from ISO 9613-2: *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*;
- To reflect the local ground cover, ground absorption was set to $G = 1$ (100% acoustically absorptive ground) with the exception of the site, which was modelled as $G=0$ (100% acoustically reflective ground);
- Buildings associated with the development and existing buildings surrounding the site were incorporated into the noise model to account for acoustic screening effects;
- The noise model accounted for the topography of the site and surrounding area by including DTM data from data.gov.uk;
- A noise source was included at the location labelled in **Figure 1-2** at a height of 1 m;
- Measurement Location 1 was included as a receiver in the noise model and was used to calibrate the noise source to the average noise level measured during operational hours; and
- A receiver has been included in the centre of the nearest residential garden at a height of 1.5 m.

4.1.2 **Figure 4-1** shows the location of the modelled noise source and receivers described above.

Figure 4-1: Noise Model Source and Receiver Locations



4.2 OPERATIONAL NOISE IMPACTS

- 4.2.1 The results of the above modelling exercise predict a noise level in the centre of the nearest garden of 40 dB $L_{Aeq,1h}$.
- 4.2.2 In accordance with guidance from BS 4142, a penalty of 6 dB should be applied where impulsivity is clearly perceptible. The resulting rating level would be 46 dB $L_{Ar,1h}$.
- 4.2.3 It can be seen from **Table 3-2** that the background sound level in the absence of noise from GAP during the daytime is 31 dB $L_{A90,1h}$. Therefore, the predicted rating level is 16 dB above the background sound level. This indicates a significant adverse impact in accordance with BS 4142, depending on the context.
- 4.2.4 The context for this assessment is that the site has been operational for several years with no noise complaints and that the area is subject to low background noise levels due to its rural setting. Therefore, it is considered appropriate to also consider the absolute noise levels generated by the site, rather than relying solely on a comparative assessment approach.
- 4.2.5 Comparing the predicted 40 dB $L_{Aeq,1h}$ noise level to the 50 dB desirable guideline value from BS 8233 indicates that noise from the site is low in absolute terms.

- 4.2.6 Even if a 6 dB correction were applied to account for the impulsivity of the source, the predicted level would still be below the desirable guideline value by a margin of 4 dB.
- 4.2.7 In accordance with BS 8233, internal noise levels can be estimated by applying a -15 dB correction to external free-field noise levels. Based on the predicted 40 dB $L_{Aeq,1h}$ noise level in the garden of the nearest dwelling, internal noise levels within the adjacent dwelling would be expected to be circa 25 dB. Comparing this to the desirable guideline value of 35 dB $L_{Aeq,16h}$ for the daytime, indicates that internal noise levels from the site are low in absolute terms. Even if a 6 dB penalty were applied for clearly perceptible impulsivity, the predicted level would still be below the desirable guideline value by a margin of 4 dB.
- 4.2.8 Given that noise levels from the site at the nearest receptors have not caused complaints, are limited to the daytime period only and are low in absolute terms, it is considered that mitigation measures are unwarranted.

5 CONCLUSION

- 5.1.1 JPM Acoustics Ltd has been appointed by GAP Group Ltd to undertake a noise impact assessment to support an application for Sui Generis use of an existing and operational industrial unit on Joe McBain Avenue.
- 5.1.2 This report presents an assessment of the potential noise impacts of the development on nearby sensitive receptors. The assessment has been undertaken with due consideration to relevant British Standards, Planning Policies and current guidance relating to noise.
- 5.1.3 The assessment draws on the results baseline noise survey undertaken on the site in May 2020. A detailed noise model of the site and surrounding areas has been generated drawing on the results of the baseline noise survey.
- 5.1.4 An assessment of noise emissions from the site undertaken in accordance with BS 4124 indicated a 'significant adverse impact' depending on the context. The context for the assessment is that the site has been operating for years without complaint and is in an area with low prevailing background sound levels. Therefore, consideration has also been given to absolute noise levels.
- 5.1.5 The noise levels from the site are predicted to be well below the desirable guideline values from BS 8233, suggesting that noise levels from the site are low in absolute terms.
- 5.1.6 Given that noise levels from the site at the nearest receptors have not caused complaints, are limited to the daytime period only and are low in absolute terms, it is considered that mitigation measures are unwarranted.
- 5.1.7 Given the findings of this assessment, it is considered that noise need not be a determining factor in granting planning consent for the ongoing operations at the site.

APPENDIX A: TECHNICAL GLOSSARY

Term	Descriptions
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20 μPa (20×10^{-6} Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds S_1 and S_2 is given by $20 \log_{10} (S_1 / S_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20 μPa .
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, 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.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Façade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast/Slow Time Weighting	Averaging times used in sound level metres.
Octave Band	A range of frequencies whose upper limit is twice the frequency of the lower limit.