

Appendix 9.1

Glossary of Acoustic Terminology

Appendix 9.1 Glossary of acoustic terminology

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is presented in Table A1 below.

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A). Note that the time constant and the period of the noise measurement should be specified. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

Term	Description
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 $20\mu\text{Pa}$ (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 $20\mu\text{Pa}$.

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.

$L_{10,T}$

A noise level index. The noise level exceeded for 10% of the time over the period T . L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.

Free-Field

Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m

Fast Time Weighting

An averaging time used in sound level meters.

Ambient Noise Level

The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).

Appendix 9.2

Environmental Noise Survey Report

Appendix 9.2 Environmental noise survey report

The recorded results for measurement position one is presented in Table 1.

Table 1: Recorded measurement results for Position 1

Period	Duration	L _{Aeq,T}	L _{A90,T}	L _{A10,T}	L _{AFmax}	L _{ASmax}
07/11/2007 13:50	30 minutes	52	47	54	79	71
07/11/2007 14:20	30 minutes	52	47	55	67	63
07/11/2007 14:50	30 minutes	52	48	54	65	61
07/11/2007 15:20	30 minutes	52	48	55	62	60
07/11/2007 15:50	30 minutes	52	49	55	62	60
07/11/2007 16:20	30 minutes	53	49	55	67	64
07/11/2007 16:50	30 minutes	54	50	56	80	75
07/11/2007 17:20	30 minutes	54	50	56	78	69
07/11/2007 17:50	30 minutes	54	50	56	83	74
07/11/2007 18:20	30 minutes	53	47	55	74	67
07/11/2007 18:50	30 minutes	51	47	54	69	61
07/11/2007 19:20	30 minutes	52	46	53	86	77
07/11/2007 19:50	30 minutes	49	44	51	66	62
07/11/2007 20:20	30 minutes	48	42	51	63	59
07/11/2007 20:50	30 minutes	47	41	50	62	59
07/11/2007 21:20	30 minutes	47	40	50	58	56
07/11/2007 21:50	30 minutes	48	40	51	64	61
07/11/2007 22:20	30 minutes	46	38	49	59	56
07/11/2007 22:50	30 minutes	46	38	49	65	60
07/11/2007 23:00	15 minutes	46	39	49	65	60
07/11/2007 23:15	15 minutes	46	36	49	65	64
07/11/2007 23:30	15 minutes	42	34	45	56	53
07/11/2007 23:45	15 minutes	41	32	45	54	51
08/11/2007 00:00	15 minutes	42	32	46	54	53
08/11/2007 00:15	15 minutes	45	33	48	62	57
08/11/2007 00:30	15 minutes	42	30	46	60	56
08/11/2007 00:45	15 minutes	39	28	43	59	55
08/11/2007 01:00	15 minutes	34	27	37	50	49

Period	Duration	L _{Aeq,T}	L _{A90,T}	L _{A10,T}	L _{AFmax}	L _{ASmax}
08/11/2007 01:15	15 minutes	37	27	41	53	50
08/11/2007 01:30	15 minutes	39	27	43	56	54
08/11/2007 01:45	15 minutes	36	25	37	58	56
08/11/2007 02:00	15 minutes	37	25	35	59	57
08/11/2007 02:15	15 minutes	39	27	41	60	58
08/11/2007 02:30	15 minutes	35	26	37	58	55
08/11/2007 02:45	15 minutes	37	27	40	54	52
08/11/2007 03:00	15 minutes	35	28	38	49	48
08/11/2007 03:15	15 minutes	36	27	39	54	51
08/11/2007 03:30	15 minutes	38	27	40	57	55
08/11/2007 03:45	15 minutes	38	28	42	55	52
08/11/2007 04:00	15 minutes	41	30	45	56	55
08/11/2007 04:15	15 minutes	38	29	41	54	53
08/11/2007 04:30	15 minutes	42	33	46	55	53
08/11/2007 04:45	15 minutes	41	32	45	60	58
08/11/2007 05:00	15 minutes	43	35	46	54	53
08/11/2007 05:15	15 minutes	44	36	48	57	56
08/11/2007 05:30	15 minutes	45	38	49	56	54
08/11/2007 05:45	15 minutes	47	40	50	58	55
08/11/2007 06:00	15 minutes	48	43	51	60	58
08/11/2007 06:15	15 minutes	49	45	52	59	55
08/11/2007 06:30	15 minutes	52	47	55	63	60
08/11/2007 06:45	15 minutes	51	48	54	62	60
08/11/2007 07:00	30 minutes	53	48	55	62	60
08/11/2007 07:30	30 minutes	54	51	56	64	61
08/11/2007 08:00	30 minutes	54	51	56	64	61
08/11/2007 08:30	30 minutes	53	49	55	61	59
08/11/2007 09:00	30 minutes	52	48	54	63	59
08/11/2007 09:30	30 minutes	51	47	53	60	57
08/11/2007 10:00	30 minutes	51	47	53	68	64

The recorded results for measurement position two are presented in Table 2.

Table 2: Recorded measurement results for Position 2

Period	Duration	L _{Aeq,T}	L _{A90,T}	L _{A10,T}	L _{AFmax}	L _{ASmax}
07/11/2007 14:29	15 minutes	66	52	71	77	79
07/11/2007 14:44	15 minutes	67	55	72	81	84
07/11/2007 14:59	15 minutes	67	54	71	76	78
07/11/2007 15:14	15 minutes	67	55	72	78	81
07/11/2007 15:29	15 minutes	66	50	70	78	79
07/11/2007 15:44	15 minutes	68	55	72	78	80
07/11/2007 15:59	15 minutes	68	55	73	78	80
07/11/2007 16:14	15 minutes	68	57	73	77	79
07/11/2007 16:29	15 minutes	67	54	72	77	78
07/11/2007 16:44	15 minutes	68	55	73	77	79
07/11/2007 16:59	15 minutes	68	56	72	87	95

The recorded results for measurement position two are presented in Table 3.

Table 3: Recorded measurement results for Position 3

Period	Duration	L _{Aeq,T}	L _{A90,T}	L _{A10,T}	L _{AFmax}	L _{ASmax}
07/11/2007 23:46	5 minutes	61	36	64	77	80
07/11/2007 23:51	5 minutes	56	35	58	74	77
07/11/2007 23:56	5 minutes	62	34	54	81	83
08/11/2007 00:01	5 minutes	64	34	67	76	79
08/11/2007 00:06	5 minutes	61	35	60	76	79
08/11/2007 00:11	5 minutes	63	35	64	78	81
08/11/2007 00:16	5 minutes	65	36	64	83	85
08/11/2007 00:21	5 minutes	57	34	54	75	77
08/11/2007 00:26	5 minutes	62	37	62	77	80
08/11/2007 00:31	5 minutes	52	35	57	62	63

The recorded results for measurement position two are presented in Table 4.

Table 4: Recorded measurement results for Position 4

Period	Duration	L_{Aeq,T}	L_{A90,T}	L_{A10,T}	L_{AFmax}	L_{ASmax}
08/11/2007 00:41	5 minutes	56	30	57	82	74
08/11/2007 00:46	5 minutes	63	26	61	82	79
08/11/2007 00:51	5 minutes	55	27	56	72	71
08/11/2007 00:56	5 minutes	35	30	37	52	44

Appendix 9.3

Assumed Construction Plant and Source Data

Appendix 9.3 Assumed construction plant and source data

ACTIVITY:	Enabling Works - Worst Case		
Static Noise Sources	Reference	Activity L _{WA}	% On Time
Tracked Excavator (clearing)	DEFRA, T2, Av 2,3,5,7	76	50
Dozer (Earthworks)	DEFRA, T2, Av 10-13	80	25
Tracked Excavator (excavation)	DEFRA, T2, Av 14-19, 20-25	75	50
Dump Truck (Tipping Fill)	DEFRA, T2, Ref 30	79	40
Hydraulic Vibratory Compactor	DEFRA, T2, ref 42	78	25
Lorries	CE Plate	97	5
ACTIVITY:	Foundations		
Tracked Excavator	C3, Av 34 - 40	111	20
Bore Piling Rig	C4, Av 33-42	115	20
Poker Vibrators	C6, 20	97	50
Crane	C7, Av 105-120	104	60
Concrete Mixer / Pump	C6, Av 33-34	104	50
Generator	C7, 54	92	100
Compressor	C7, 25	98	100
ACTIVITY:	Building Erection		
Generators for welders	C7, 57	99	100
Hand Tools	Ave C7:57-63, 75-79, C6:52-54	107	5
Concrete Pump	C6, 17	109	25
Poker Vibrators	C6, 20	97	75
Mobile Crane	C7, Av 105-120	104	50
Compressor	C7, 25	98	100
ACTIVITY:	Roads		
Dozer Levelling Ground	C3, Av 65-67	113	10
Ashphalt Melter	C8, 21	98	75
Asphalt & Chip Spreader, Road Roller and HGV	C8, 26	103	75