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Environmental Noise Impact Assessment.
ENIA

Address:

2 Lamp Office Court, Lambs Conduit Street,
London WC1N 3NF

Client:

Dominik Chung
Architect
Ben Pentreath & Associates

Current Rev 0.1 -10 September 2021
Rev 0.0 - 07 September 2021

Acoustic Consultant: Simone Longo

MA – AIA - ALP 109901 / INAC/260 Member of the acoustic network UK

Acoustic Report – ENIA Rev 0.1 Environmental Noise Impact Assessment. 2 Lamp Office Court, Lambs Conduit Street London WC1N 3NF Engineer: Simone Longo MA – AIA - ALP 109901 / INAC/260	N. M. & S. www.noisemeasurements.co.uk - www.nmsacoustics.com e: info@nmsacoustics.com t: 0800 014 8482 - m: 07887561945.

Summary:

1.0 Survey address.

1.1 The environmental noise survey object of this report has been carried out at the rear of 55-56 Lambs Conduit Street London WC1N 3NF, the measuring microphone was positioned in correspondence with the nearest noise-sensitive window at 1 m from the building façade.

1.2 Fig below shows the details of the proposed installation.

1.2.1 In “A” is the microphone position used for the noise survey.

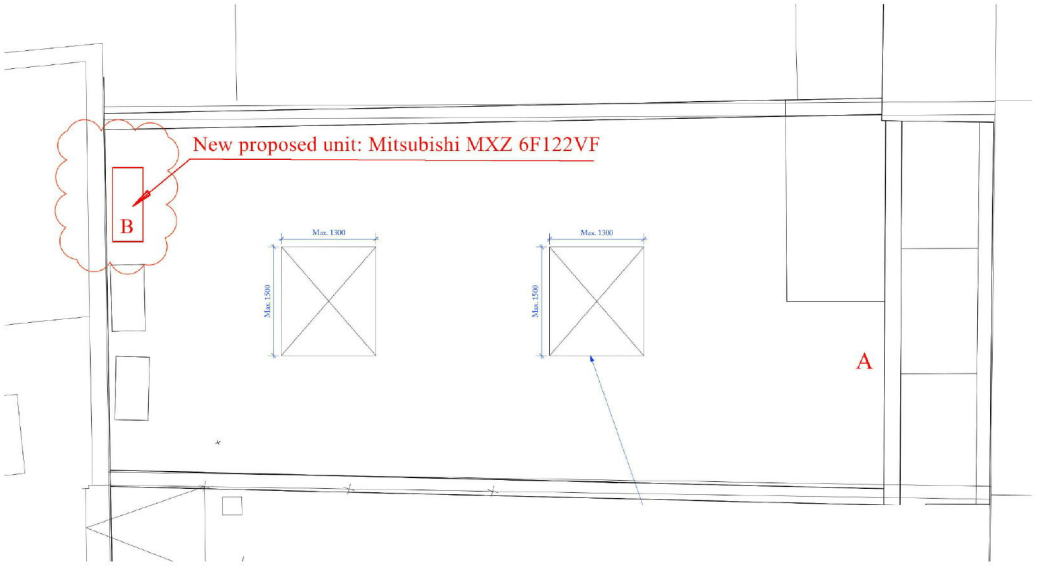
1.2.2 In “B” is the proposed installation site of the unit.

1.2.3 "A", "C" and "D" indicate the nearest noise-sensitive façades.

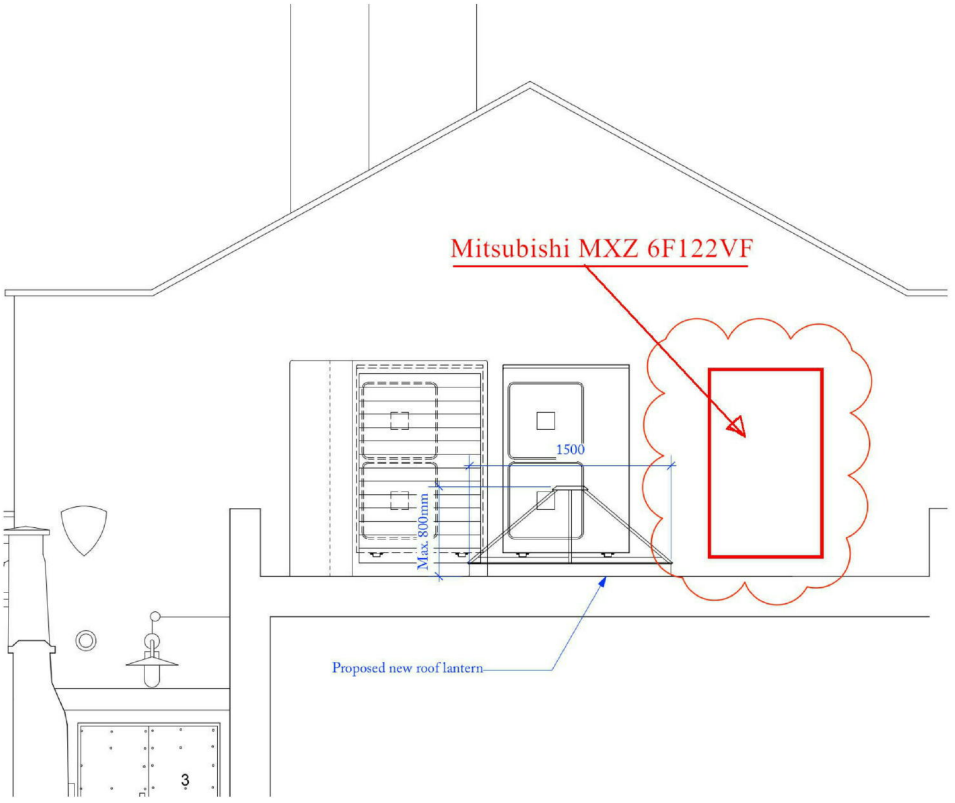
1.2.4 Façade in “D” is in the acoustic shadow (yellow area) caused by the rear wall at the back of the unit (see picture below).

1.2.5 The shortest path for the noise to travel to the nearest noise-sensitive location is in front of the unit affecting façade "A", noise emission in this direction should be estimated taking into account a correction for the rear wall reflection from the back of the unit projecting in direction of "A".

1.3 Below architect, drawings to show the location of the proposed installation in detail.



1.4 Another (side) view facing the front of the unit as seen from point "A".



2.0 Environmental Noise Survey details.

2.1 Operating hours:

2.1.1 The proposed operating hours for the unit is from 8 am to 18.00 Monday to Saturday.

2.1.2 To estimate the lowest representative background noise LA90,15 min at the sensitive location a precision sound level meter (SLM) was used to monitor the ambient noise during operating hours of the proposed unit, the survey took place on Friday 13 March 2015.

2.1.3 Another sample-based survey was carried out on the 5th of September 2018 to cover the period of lowest background noise with updated information about the environmental noise at the location.

3.0 Weather condition.

3.1 During the survey no wind or atmospheric precipitations.

4.0 Environmental noise survey results.

4.1 The lowest representative environmental background noise recorded within the period of interest is given in the table below.

Lowest LA90,*15min.*		
13/03/15	Time @ 17.48	46.4 dB LA90,15min
05/10/18	Time @ 16.01	50.7 dB LA90,15min

5.0 Subjective analysis of the environmental noise or soundscape at the site.

5.1 On the 13 of March 2015, the specific location at the rear of the building was relatively quiet for a city center, the soundscape was primarily dominated by slow traffic noise.

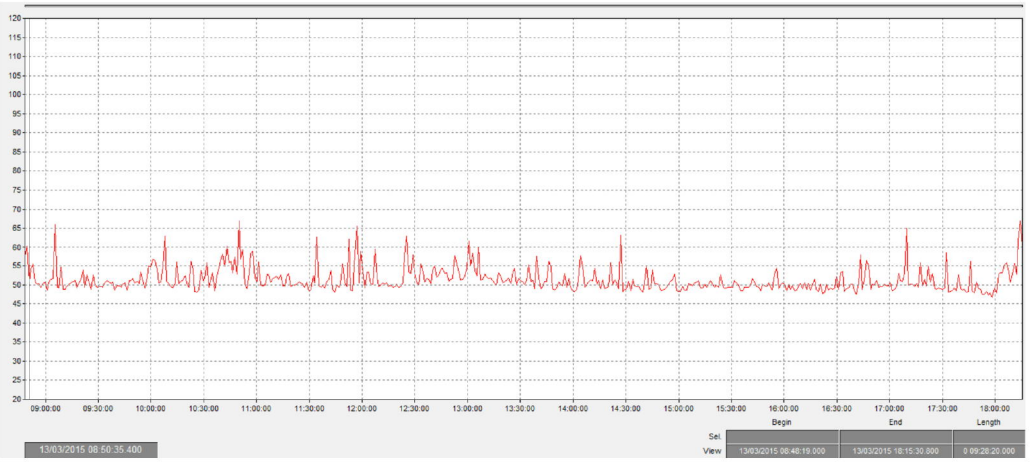
5.2 During the more recent survey on the 5th of September 2018, the ambient noise in the area changed due to the presence of a hairdresser business, the hairdresser rear door is open therefore noise emission from voices hairdryer and music affect the nearby area which includes the noise-sensitive facade.

5.3 The location remains a quiet place considering the central position but the early soundscape now is changed to include human activity and music noise.

6.0 Time histogram of the survey

6.1 As follow the time VS Level histograms of the surveys.

6.1.1 Graph Time VS Level relative to the survey 13/03/2015.



6.1.2 Graph Time VS Level relative to the survey 05/10/2018.

7.0 Instrumentation.

7.1 Table showing instrumentation data.

Instrument type:	Norsonic Sound Analyser Nor-140	Serial no:	1402725
Preamplifier type:	Norsonic Type Nor-1209	Serial no:	12247
Microphone type:	Norsonic Type Nor-1225	Serial no:	24301
UKAS ILAC periodic laboratory verification by:	UKAS LABORATORY 0789 CERTIFICATE U30923		
Date of last verification:	08/09/19		
Calibrator type:	Norsonic Type 1251	Serial no:	31943
UKAS ILAC periodic laboratory verification by:	UKAS LABORATORY 0789 CERTIFICATE U30921		
Date of last verification:	10/09/20		
Measurement title:	EA assessment: Sampling-based.	Date:	
Measurement duration: sampling hours.	Continuous integration.	Period length: 15 min.	Filter bandwidth: (A) 1/1 – 1/3
Initial calibration level:	113.9 dB	Sampling frequency: 50 ms	End calibration level: 113.9 dB

8.0 Personnel

8.1 **Simone Longo**

NMS principal consultant AMIOA MA

Third-party accreditation:

ALP10/991-INAC260 Certificate of Competence in Acoustics (EU)

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9.0 Uncertainty consideration.

9.1 During both the early and late survey the weather condition was good with no wind, the measurement was taken during the period of interest but the early survey was taken in a cold month as opposed to the late survey that was taken at a time when the temperature was around 20 Centigrades, for this reason, it can be said the late survey confirm the early results and the higher ambient noise readings are justified by the warmer weather which causes the hairdresser shop to operate with the rear door wide open for ventilation, this should be considered a transitory situation and the earlier survey result confirmed as conservative readings of the ambient noise in the area, for these circumstances uncertainty for the estimated background noise level will be low in the range of +/- 1-2 dB.

10.0 Planning policies and guidance.

The National Planning Policy Framework, the Noise Policy Statement for England (NPSE).

The National Planning Policy Framework (NPPF) came into force in March 2012 and represents the government's commitment to sustainable development, through its intention to make the planning system more streamlined, localized, and less restrictive. It aims to do this by reducing regulatory burdens and by placing sustainability at the heart of the development process.

Concerning acoustic design and noise control, the NPPF provides a set of overarching aims, broadly reflecting those already contained in the Noise Policy Statement for England (NPSE). They are directed towards the avoidance of significant adverse impacts and reduction of other adverse impacts on health and quality of life; set within the context of the Government's policy on sustainable development.

BS 4142 2014 +A1:2019

BS 4142 is used to assess the impact of industrial and commercial sound. It covers a range of methods starting with subjective through objective, to the reference method. An assessor can decide what level of detail is appropriate in each case. The standard also provides an assessment method for the problem of tones and an assessment method for impulsive sounds. It acknowledges that the influence of the context in which the sound is heard is a significant modifier of the impact, in line with subjective assessments.

The standard supports current UK planning guidance and Environment Agency requirements on noise impact assessments.

11.0 Proposed Plant.

11.1 Assessment based on the following submitted drawings.

11.1.1 2LOC A-103 Proposed Roof Plan DRAFT.

11.1.2 2LOC A-112 Proposed Full Roof Plan DRAFT.

11.1.3 2LOC A-203 Proposed West Elevation 2 DRAFT.

The proposed plant consists of an external heat pump unit part of an air conditioning system.

12.0 Plant details:

12.1 The proposed plant unit manufacture published data:

12.2 Maker / Brand: Mitsubishi MXZ 6F122VF

12.2.1 Manufacture declared noise emission published data-sheet: 57/55 dBA

13.0 Predictive noise impact assessment.

13.1 As follow is a simplified predictive calculation to estimate the specific noise emission from the proposed plant to the nearest noise-sensitive window.

13.2 The specific noise emission is given by the manufacture at 57dBA this is assumed to be at a 1 m hemispherical free field.

13.3 To account for the rear wall reflection a correction of 6 dBA is suggested, this causes the emission to rise to 63 dBA at 1m from the unit.

13.4 The distance from the installation position and facade “A” is 15 m therefore the noise emission measured at 1 m needs to travel 13 m to arrive at 1 m from the nearest sensitive window.

13.5 Using the distance law formula, the attenuation of the noise emission due to distance can be computed to 41 dBA

13.6 Penalties and correction.

13.6.1 It is unknown if the new proposed unit will emit tonal noise as this is not evident from the manufacture data, it must be assumed the unit does not emit tonal noise. Impulsive noise is also unlikely due to the nature of the units.

13.7 A further correction needs to be added to the noise emission due to the façade reflection at the receptor, a 6 dBA is suggested causing the specific emission to raise at 47 dBA.

13.8 To estimate the environmental noise impact of the unit, the calculated emission is subtracted from the lowest representative background noise, in this case (47- 46)= 1.

13.9 The subtraction indicates the unit noise emission is 1 dBA above background noise. According to council requirements, the unit noise should arrive at 10 dBA below background noise to the nearest noise-sensitive facade therefore noise mitigation must be studied to attenuate noise by 11 dBA.

14.0 Proposed noise mitigation measure.

14.1 To comply with regulations a suitable reduction of the noise emission should be achieved, the reduction should be no less than 11 dBA.

14.2 To achieve the specific noise reduction we suggest an acoustic screen made of two acoustic louvers arranged around the unit to form an enclosure.

14.3 Make and model n:

14.3.1 Fantec Sound Bar Louvre – SBL1 Manufacture declared noise attenuation -12 dBA.

14.4 Enclosure makeup.

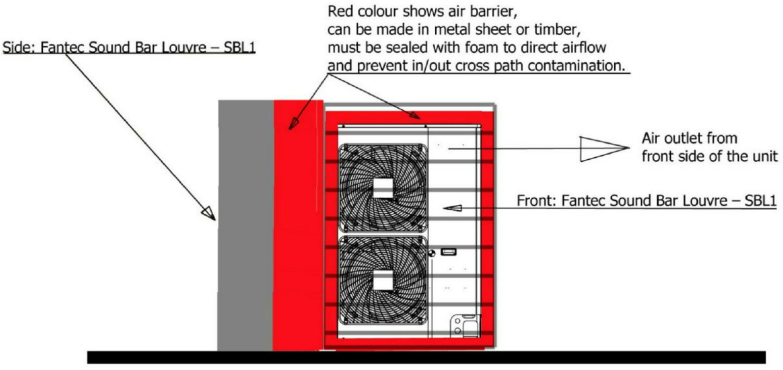
14.4.1 As follow a graphic diagram to shows the enclosure makeup and an indicative list of materials to be used, please note the sketch is indicative and not to scale.

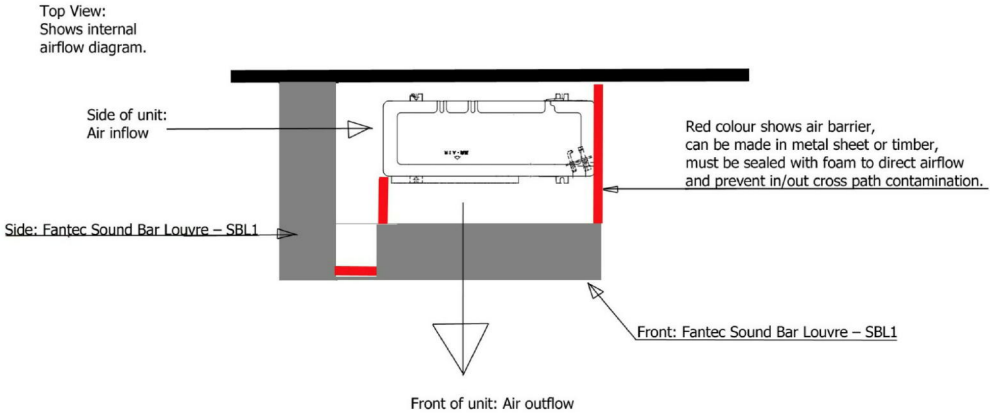
14.4.2 Air intake (side of the unit) 1 Fantec Sound Bar Louvre – SBL1 Output (front of the unit) 1 Fantec Sound Bar Louvre – SBL1

14.4.3 To form an enclosure the two soundbar louver needs to be joined by additional barriers (marked in red) and to prevent recirculation of air from the outlet to the intake, the barrier walls can be made either in timber or metal sheet, as long as they form an airtight barrier to the airflow.

14.4.4 Acoustic mastic or foam can be used for sealing the gaps.

14.4.5 The top side and bottom side of the unit enclosure must be also closed to form a forced circulation of air from the side intake to the front outlet.


Red colour shows air barrier,
can be made in metal sheet or timber,
must be sealed with foam to direct airflow
and prevent in/out cross path contamination.
Side: Fantec Sound Bar Louvre – SBL1
Air outlet from
front side of the unit
Front: Fantec Sound Bar Louvre – SBL1


Top View:
Shows internal
airflow diagram.
Side of unit:
Air inflow
Red colour shows air barrier,
can be made in metal sheet or timber,
must be sealed with foam to direct airflow
and prevent in/out cross path contamination.
Side: Fantec Sound Bar Louvre – SBL1
Front: Fantec Sound Bar Louvre – SBL1
Front of unit: Air outflow

15.0 Conclusion.

15.1 This environmental noise impact assessment reveals the proposed unit requires a noise mitigation measure to prevent any adverse noise impact and details of a suitable system are proved.

15.2 With the suggested mitigation in place, the unit will be of no detrimental impact to the surrounding amenities, and planning permission should be granted.

Approved for Issue on behalf of

Noise Measurements & Solutions

Simone Longo Acoustic Engineer MA – AIA - ALP 109901 / INAC/260 – Member of the Acoustic Network UK.

Founder and director of Noise Measurements & Solutions.

Appendix A

SOURCE OF INFORMATION

Information used in this assessment has been obtained from the following sources:

- BS8233: 2014 Sound Insulation and noise reduction for buildings – Code of Practice.
- BS4142: 2014 Method for rating industrial noise affecting mixed residential and industrial areas.
- BS7445: 1991: Description and measurement of environmental noise.
- Engineering and noise control Third edition.
- Acoustic calculations: NOR-Review software.

Appendix C

Numerical information:

Calculation interval (absolute time)	Effective duration	L 90.0%: LAF(spl) (dB)
13/03/2015 08:48:19.000 - 13/03/2015 18:16:34.550		
13/03/2015 08:48:19.000 - 13/03/2015 09:03:18.999	0 00:15:00.000	48.2 dB
13/03/2015 09:03:19.000 - 13/03/2015 09:18:18.999	0 00:15:00.000	48.4 dB
13/03/2015 09:18:19.000 - 13/03/2015 09:33:18.999	0 00:15:00.000	48.3 dB
13/03/2015 09:33:19.000 - 13/03/2015 09:48:18.999	0 00:15:00.000	48.3 dB
13/03/2015 09:48:19.000 - 13/03/2015 10:03:18.999	0 00:15:00.000	48.7 dB
13/03/2015 10:03:19.000 - 13/03/2015 10:18:18.999	0 00:15:00.000	48.5 dB
13/03/2015 10:18:19.000 - 13/03/2015 10:33:18.999	0 00:15:00.000	47.9 dB
13/03/2015 10:33:19.000 - 13/03/2015 10:48:18.999	0 00:15:00.000	48.7 dB
13/03/2015 10:48:19.000 - 13/03/2015 11:03:18.999	0 00:15:00.000	48.9 dB
13/03/2015 11:03:19.000 - 13/03/2015 11:18:18.999	0 00:15:00.000	48.6 dB
13/03/2015 11:18:19.000 - 13/03/2015 11:33:18.999	0 00:15:00.000	48.0 dB
13/03/2015 11:33:19.000 - 13/03/2015 11:48:18.999	0 00:15:00.000	48.0 dB
13/03/2015 11:48:19.000 - 13/03/2015 12:03:18.999	0 00:15:00.000	48.1 dB
13/03/2015 12:03:19.000 - 13/03/2015 12:18:18.999	0 00:15:00.000	48.8 dB
13/03/2015 12:18:19.000 - 13/03/2015 12:33:18.999	0 00:15:00.000	48.8 dB
13/03/2015 12:33:19.000 - 13/03/2015 12:48:18.999	0 00:15:00.000	49.5 dB
13/03/2015 12:48:19.000 - 13/03/2015 13:03:18.999	0 00:15:00.000	50.2 dB
13/03/2015 13:03:19.000 - 13/03/2015 13:18:18.999	0 00:15:00.000	49.3 dB
13/03/2015 13:18:19.000 - 13/03/2015 13:33:18.999	0 00:15:00.000	49.1 dB
13/03/2015 13:33:19.000 - 13/03/2015 13:48:18.999	0 00:15:00.000	48.5 dB
13/03/2015 13:48:19.000 - 13/03/2015 14:03:18.999	0 00:15:00.000	47.9 dB
13/03/2015 14:03:19.000 - 13/03/2015 14:18:18.999	0 00:15:00.000	48.3 dB
13/03/2015 14:18:19.000 - 13/03/2015 14:33:18.999	0 00:15:00.000	47.6 dB
13/03/2015 14:33:19.000 - 13/03/2015 14:48:18.999	0 00:15:00.000	47.6 dB
13/03/2015 14:48:19.000 - 13/03/2015 15:03:18.999	0 00:15:00.000	47.5 dB
13/03/2015 15:03:19.000 - 13/03/2015 15:18:18.999	0 00:15:00.000	48.2 dB
13/03/2015 15:18:19.000 - 13/03/2015 15:33:18.999	0 00:15:00.000	48.2 dB
13/03/2015 15:33:19.000 - 13/03/2015 15:48:18.999	0 00:15:00.000	47.9 dB
13/03/2015 15:48:19.000 - 13/03/2015 16:03:18.999	0 00:15:00.000	48.0 dB
13/03/2015 16:03:19.000 - 13/03/2015 16:18:18.999	0 00:15:00.000	47.7 dB
13/03/2015 16:18:19.000 - 13/03/2015 16:33:18.999	0 00:15:00.000	47.4 dB
13/03/2015 16:33:19.000 - 13/03/2015 16:48:18.999	0 00:15:00.000	47.2 dB
13/03/2015 16:48:19.000 - 13/03/2015 17:03:18.999	0 00:15:00.000	47.5 dB
13/03/2015 17:03:19.000 - 13/03/2015 17:18:18.999	0 00:15:00.000	48.1 dB
13/03/2015 17:18:19.000 - 13/03/2015 17:33:18.999	0 00:15:00.000	47.6 dB
13/03/2015 17:33:19.000 - 13/03/2015 17:48:18.999	0 00:15:00.000	47.3 dB
13/03/2015 17:48:19.000 - 13/03/2015 18:03:18.999	0 00:15:00.000	46.4 dB
13/03/2015 18:03:19.000 - 13/03/2015 18:16:34.550	0 00:13:15.600	46.7 dB

05/10/2018 15:46:29.000 - 05/10/2018 17:53:34.350

Effective duration (Profile)		L 90.0%: LAF(spl) (dB)
05/10/2018 15:46:29.000 - 05/10/2018 16:01:28.999	0 00:15:00.000	50.7 dB
05/10/2018 16:31:29.000 - 05/10/2018 16:46:28.999	0 00:15:00.000	51.0 dB
05/10/2018 16:46:29.000 - 05/10/2018 17:01:28.999	0 00:15:00.000	51.3 dB
05/10/2018 17:01:29.000 - 05/10/2018 17:16:28.999	0 00:15:00.000	51.1 dB
05/10/2018 17:16:29.000 - 05/10/2018 17:31:28.999	0 00:15:00.000	51.9 dB
05/10/2018 17:31:29.000 - 05/10/2018 17:46:28.999	0 00:15:00.000	51.4 dB
05/10/2018 17:46:29.000 - 05/10/2018 17:53:34.350	0 00:07:05.400	51.5 dB

Appendix D

GLOSSARY

dB Decibel. The decibel scale measures levels relative to a reference, either a fixed reference when measuring absolute levels or another level when expressing changes. If the quantity is power- like (i.e. could be expressed in watts) the level in decibels is 10 times the common logarithm of the ratio of the measured quantity to the reference quantity. If the quantity is a physical amplitude such as pressure or voltage, and the power of the quantity is related to its square, then the decibel level is 20 times the common logarithm of the ratio of the measured quantity to the reference quantity. Thus doubling of power gives a 3 dB increase, while a doubling of pressure gives a 6 dB increase.

LA A-weighted sound pressure level. The units are decibels, abbreviated dB (or dB(A) if the subscript A is omitted). A-weighting is a frequency weighting which discriminates against low frequency and very high-frequency sound to approximate the frequency response of the human ear. The subscript s or f signifies that the time constant of the measurement is either 'slow' (1 second) or 'fast' (125 milliseconds)

LAmax The maximum value of LA reached during one or more noise events. (See reference to 's' and 'f' subscripts above).

LAeq,T Equivalent continuous sound level. The root mean square sound pressure level determined over time interval T expressed in decibels. May be regarded as the level of a notional steady sound which has the same energy in period T as an actual time-varying sound which occurs in the same period. Sound level, duration and number of events are treated such that

doubling the number of events, or doubling the duration of an event, has the same effect as doubling the number of sources (i.e. doubling the energy), which in the decibel scale is an increase of 3 dB (see above).

LA10 The A-weighted sound level in dB which is exceeded by 10% of the time period stated.

Ppv Peak particle velocity, the highest instantaneous velocity reached by a vibrating surface.

VDV Vibration Dose Value, the fourth root of the time integral of the fourth power of the frequency-weighted vibration velocity. The frequency weightings are specified in BS 6841:1987 and BS 6472:1992. The units are ms-1.75.

SELv Sound Exposure Level (or Single Event Level), the time integral of the squared sound pressure expressed in decibels. May be regarded as LAeq,T normalised so that T is one second regardless of the actual duration of the event. Is used to construct LAeq,T for a period containing many noise events, from the knowledge of the SELv for each individual event.