Cole Jarman

Westminster Kingsway College Extension

Plant Noise Limits

Report 14/0677/R1-1

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Couch Perry Wilkes

Office 210
Hamilton House
Mabledon Place
London
WC1H 9BB

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0	1st Issue	19 January 2015	Josh Palmer	Neil Jarman
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Prepared by

Checked by

Cole Jarman Limited Reg. in England and Wales No. 7102436
t +44 (0)1932 829007 **f** +44 (0)1932 829003
John Cree House, 24B High Street, Addlestone, Surrey, KT15 1TN
e info@colejarman.com **w** www.colejarman.com

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Attachments

14/0677/SP1
Site plan showing noise survey measurement position.

14/0677/TH01
Time history graph of noise survey measurement results.

Glossary of Acoustic Terms

1 Introduction

1.1 It is proposed to extend the existing Westminster Kingsway College building at 211 Gray's Inn Road, London. The proposals include installation of new fixed external mechanical services plant.

1.2 Cole Jarman were appointed to carry out a noise survey at the site and to derive limiting noise levels for plant noise emissions at nearby sensitive properties.

1.3 The site of the proposed extension lies within the London Borough of Camden. A planning application has been made for the extension. Information as to how plant noise would be controlled has been requested by Camden Council.

1.4 This report details the survey and presents proposed plant noise limits, which have been calculated in accordance with Camden Development Policy 28. By designing the plant to meet these limits it can be expected that the council's requirements will be met. How this will be achieved is discussed too.

2 Site Description

2.1 The site and surrounds are shown in attached site plan 14/0677/SP1.

2.2 The Westminster Kingsway College building is four to five storeys high. The new extension is proposed partially to occupy an existing two storey high under-croft that currently forms part of a services yard on the western site boundary. The plant is to be installed on the flat roof above this side of the building.

2.3 External grounds to the Westminster Kingsway College site lie adjacent to the proposed extension site, to the north.

2.4 Gray's Inn Road runs along the eastern site boundary. It is the busiest road and dominant source of noise in the immediately surrounding area. Sidmouth Street and Heathcote Street bound the site to the north and south respectively. All three roads have a mixture of commercial and residential use buildings, including a block of four storey residential properties adjacent to the site on the corner between Gray's Inn Road and Heathcote Street.

2.5 The west of the site is bounded by Westking Place, a small access road protected by barriers at its entrances on Sidmouth Street and Heathcote Street. A row of four to five storey residential buildings (Bloomsbury Place) occupy the space opposite the proposed extension across Westking Place.

3 Noise Survey

3.1 Methodology and Instrumentation

3.1.1 Unattended noise measurements were taken at a single location from 1500 hours on Tuesday 6th January to Wednesday 7th January 2015.

3.1.2 The measurement position is shown on the attached site plan 14/0677/SP1 and described below.

MP1 – Free-field position, 2.5m above ground level, close to the north-western corner of the under-croft site of the proposed extension.

3.1.3 MP1 was chosen to quantify existing background noise levels representative of those at the residential façades opposite the site across Westking Place.

3.1.4 During the unattended survey, measurements of the L_{Aeq}, L_{Amax} and L_{A90} indices were taken over consecutive 15 minute periods (see Glossary of Acoustic Terms for an explanation of the noise units used).

3.1.5 Noise measurements were taken using the equipment listed in table T1.

Item	Manufacturer	Type
Sound Level Analyser	Norsonic	140
Acoustic Calibrator	Norsonic	1251
Weatherproof windshield	Norsonic	1212

T1 Equipment used during unattended noise survey.

3.1.6 The microphone was fitted with a windshield and the sound level meter was calibrated before and after the survey to ensure a consistent and acceptable level of accuracy was maintained throughout. No significant drift in levels was observed.

3.1.7 The weather conditions when setting up and collecting the equipment were mild, cloudy and dry with a light breeze. It is believed that no significant changes to the weather occurred during the survey period.

3.2 Results

3.2.1 The results of the unattended noise survey measurements are shown in the attached time history graph 14/0677/TH01.

3.2.2 The noise climate around the site was noted to be dominated by distant road traffic with intermittent bursts of significantly higher noise levels generated by students socialising in the adjacent external grounds.

3.2.3 The minimum $L_{A90,15mins}$ background noise levels measured during the day, evening and night time periods of the survey are presented in table T2.

Location	Minimum Background Noise Level, dB(A)		
	Daytime (0700-1900)	Evening (1900-2300)	Night time (2300-0700)
MP1 – north-western façade location of proposed under-croft infill extension	48	46	45

T2 Minimum measured $L_{A90,15mins}$ background noise levels.

4 Plant Noise Limits

4.1 Camden Development Policy 28 requires that noise levels arising from new plant or machinery are at least 5dB below the L_{A90} background noise level at 1m from the external façade of noise sensitive development.

4.2 Camden Development Policy 28 treats houses, schools, hospitals, offices, workshops and open spaces as being noise sensitive. Therefore, relative to the proposed plant locations, the nearest and most exposed façade to any noise sensitive development is at the front of the residential building immediately opposite the site across Westking Place. This is labelled as AP1 on the attached site plan 14/0677/SP1.

4.3 Plant noise limits have been derived on the above basis and are displayed in table T3.

Location	Noise Limit, dB(A)		
	Daytime (0700-1900)	Evening (1900-2300)	Night time (2300-0700)
AP1 – 1m from façade of residential buildings opposite site across Westking Place (Bloomsbury Place)	43	41	40

T3 Plant noise limits at Bloomsbury Place.

4.4 If noise emissions from the proposed plant require substantial attenuation to meet the noise limits at AP1 it may also be necessary to consider noise levels generated 1m from the nearest residential property to the east of the site on Heathcote Street. The limits should be met at other more distant windows due to the additional distance attenuation effects.

4.5 Noise limits apply to the combined effect of all plant items that run during any particular period. Plant noise that has a distinctive tonal or intermittent nature shall be subject to a further 5dB penalty in accordance with Camden Development Policy 28.

4.6 The original planning consent for the college (reference 2006/0427/P) required under condition18:

> *"Details of plant (including an acoustic report) to be installed as part of A) the college development and B) the residential development, shall be submitted to and approved by the local planning authority prior to commencement of each part of the development. The development shall only be carried out in accordance with such approved details, including specified maximum noise levels"*

4.7 At that time a plant noise assessment was undertaken by Moir Hands Acoustic consultants. In their report they proposed that plant noise levels be limited to a level 10 dB below the then existing background noise levels. That proposal was accepted by Camden Council. Based on the noise survey at that time the following noise limits were adopted:

Location	**Noise Limit, dB(A)**		
	Daytime (0700-1900)	**Evening (1900-2300)**	**Night time (2300-0700)**
Existing residences around site, (e.g. Heathcote Street)	41	(No figure)	28

T4 Plant noise limits at nearest noise sensitive development.

4.8 However, given that current policy is to design to background – 5dB these limits can be considered to be unduly onerous. The planning condition limits though relate to the total noise from plant associated with the college. Allowing for this existing plant, but working to an overall limit of background -5dB the following limits are proposed at the Heathcote Street. The table also shows the limits derived for Bloomsbury Place.

Location	Noise Limit, dB(A)		
	Daytime (0700-1900)	Evening (1900-2300)	Night time (2300-0700)
AP1 – 1m from façade of residential buildings opposite site across Westking Place (Bloomsbury Place)	43	41	40
AP2 - Existing residences around site, (e.g. Heathcote Street)	38	38	38

T5 Plant noise limits for new plant associated with the extension at nearest noise sensitive developments.

4.9 Noise limits apply to the combined effect of all plant items that run during any particular period. Plant noise that has a distinctive tonal or intermittent nature shall be subject to a further 5dB penalty in accordance with Camden Development Policy 28.

4.10 There is currently installed within the service yard a standby diesel generator. The above noise limits will not be applicable to that. As part of the development the generator position will be changed slightly. We propose that the modifications be reviewed and that mitigation of the generator be included to ensure that noise levels at all surrounding dwellings be no higher than currently when the generator is in use.

4.11 New external plant associated with the scheme will consist of an air handling unit (including condenser) and an extract fan. These equipment items will be located within the extended roof top plant enclosure. The residents will therefore be screened from the plant. However the plant will also be fitted with attenuation as required to achieve the noise limits outlined above.

5 Conclusions

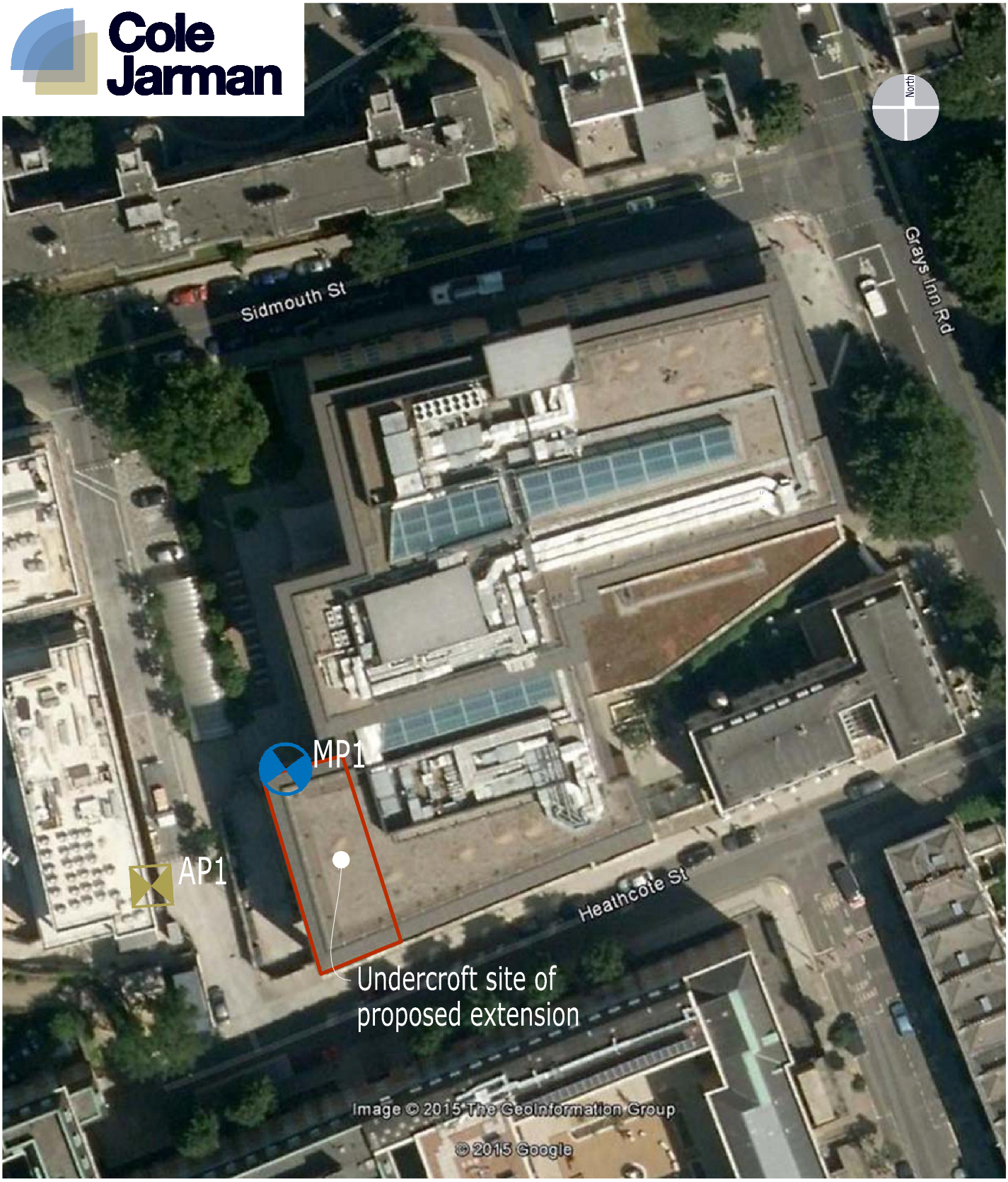
5.1 It is proposed to extend the existing Westminster Kingsway College building at 211 Gray's Inn Road, London. The proposals include installation of new fixed external mechanical services plant.

5.2 Cole Jarman have undertaken a noise survey at the site to quantify existing background noise levels representative of those at the nearest noise sensitive development.

5.3 This report presents the survey methodology and results and presents plant noise limits that apply at the nearest residential building, taking account of the existing planning consent and current Camden Council planning policy on noise.

5.4 The plant installed will be attenuated to meet those limits

End of Section



Title: Site plan showing noise survey measurement position

Figure 14/0677/SP1

Project: Westminster kingsway College Extension

Date: 19 January 2015 Revision: -

Scale: Not to scale

Cole Jarman Limited
t +44 (0)1932 829007 **f** +44 (0)1932 829003

John Cree House, 24B High Street, Addlestone, Surrey KT15 1TN
e info@colejarman.com **w** www.colejarman.com

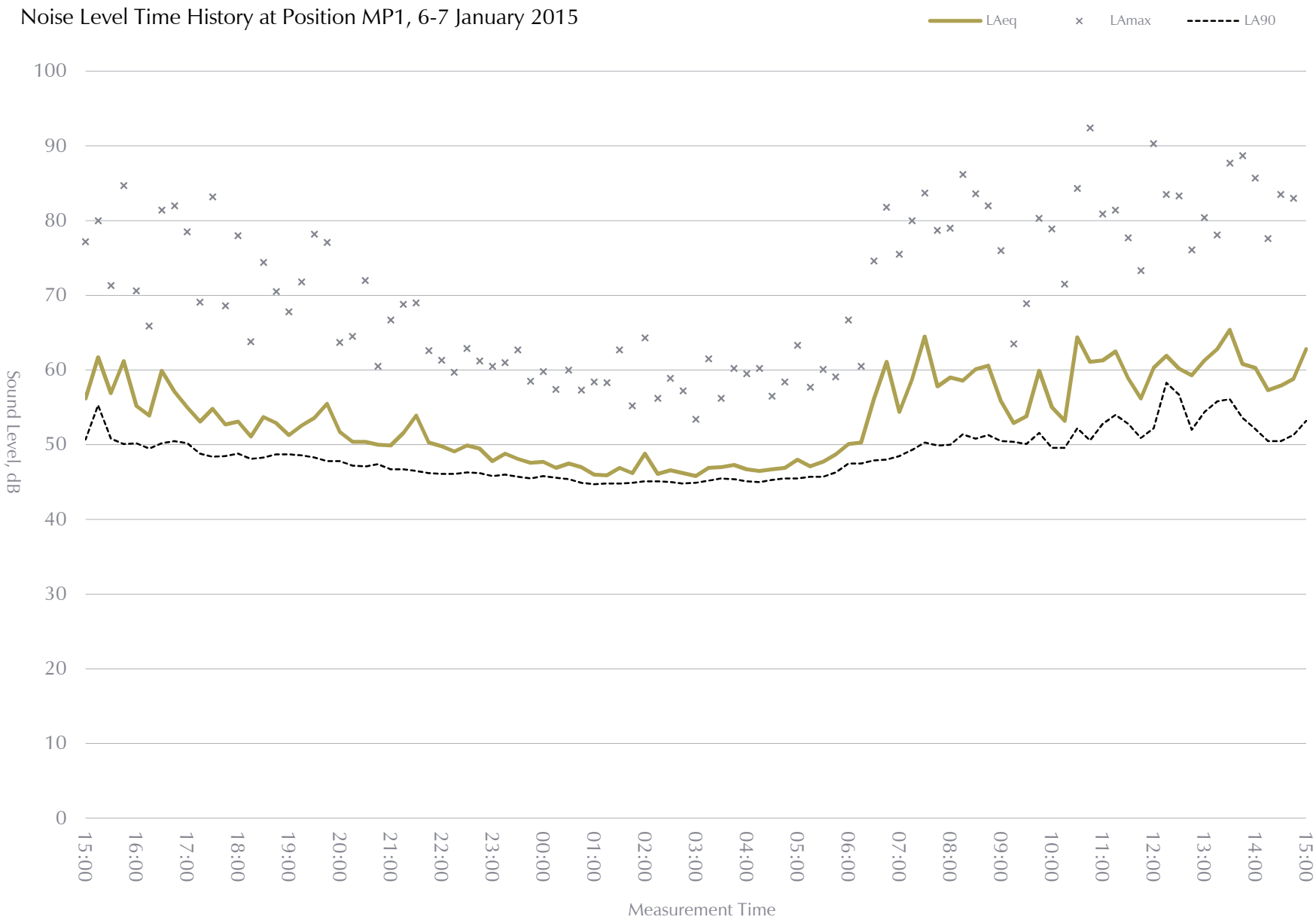


Figure 14/0677/TH01

Glossary of Acoustic Terms

L_{Aeq}:

The notional steady sound level (in dB) which over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measurement over that period. Values are sometimes written using the alternative expression dB(A) L_{eq}.

L_{Amax}:

The maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise when occasional loud noises occur, which may have little effect on the L_{Aeq} noise level. Unless described otherwise, L_{Amax} is measured using the "fast" sound level meter response.

L_{A10} & L_{A90}:

If non-steady noise is to be described, it is necessary to know both its level and degree of fluctuation. The L_{An} indices are used for this purpose. The term refers to the A-weighted level (in dB) exceeded for n% of the time specified. L_{A10} is the level exceeded for 10% of the time and as such gives an indication of the upper limit of fluctuating noise. Similarly L_{A90} gives an indication of the lower levels of fluctuating noise. It is often used to define the background noise.

L_{A10} is commonly used to describe traffic noise. Values of dB L_{An} are sometimes written using the alternative expression dB(A) L_n.

L_{AX}, L_{AE} or SEL

The single event noise exposure level which, when maintained for 1 second, contains the same quantity of sound energy as the actual time varying level of one noise event. L_{AX} values for contributing noise sources can be considered as individual building blocks in the construction of a calculated value of L_{Aeq} for the total noise. The L_{AX} term can sometimes be referred to as Exposure Level (L_{AE}) or Single Event Level (SEL).

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