125 Kingsway

Environmental Noise Survey and Noise Impact Assessment Report

26682/NIA1

16 May 2019

For:
LTB
5th Floor
WeWork 10 Devonshire Square
London
EC2M 4YP

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Document Control

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Attachments

1.0 Introduction

It is proposed to use a first floor flat roof of 125 Kingsway as an outdoor amenity space.

A planning condition has been imposed by the local authority to assess the noise impact from the proposed outdoor first floor flat roof amenity space, on the amenities of the adjoining premises.

Hann Tucker Associates have therefore been commissioned to undertake an environmental noise survey and noise impact assessment in order to assess its suitability

This report presents the methodology and findings of our noise survey and assessment in the context of national planning policies and the policy of the Local Authority.

2.0 Objectives

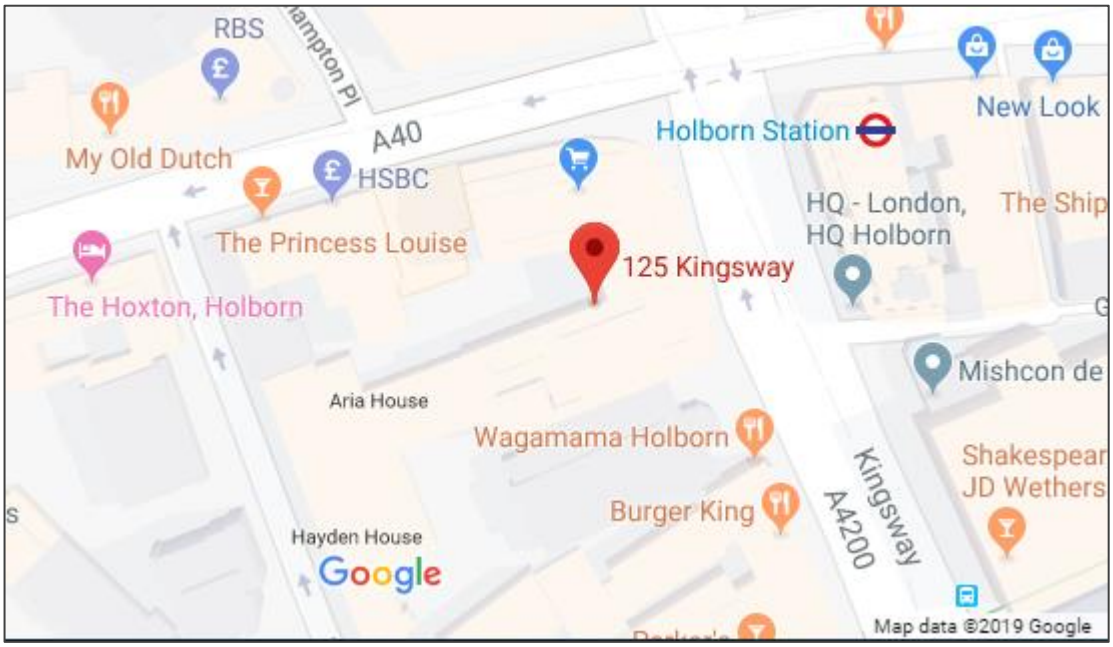
To establish, by means of detailed 24 hour daytime and night-time fully automated environmental noise monitoring, the existing A-weighted (dBA) L_{90}, L_{eq} and L_{max} environmental noise levels at a selected accessible position, thought to be representative of the nearest affected property.

Based on the results of the noise survey, to assess the noise impact from the proposed outdoor first floor flat roof amenity space, on the amenities of the adjoining premises.

3.0 Site Description

3.1 Location

The Site falls within London Borough of Camden's jurisdiction. The location is shown in the following Location Map.



3.2 Description

125 Kingsway is an 8 storey WeWork office building located on the corner of Kingsway and High Holborn. The immediate surrounding area is predominantly commercial in nature of varying height. To the west (rear) of the site are some residential dwellings approximately 10m away from the edge of the proposed roof terrace. Some of the residential dwellings are screens from the proposed terrace by the building envelope. At the beginning and end of the nose survey, we noted the dominant noise sources to be from nearby building services plant and traffic noise on surrounding roads.

4.0 Acoustic Terminology

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

5.0 Methodology

5.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 11:00 hours on Wednesday 17 April 2019 to 11:00 hours on Thursday 18 April 2019.

During the periods we were on site the wind conditions were moderate. The sky was generally patchy cloud. We understand that generally throughout the survey period the weather conditions were similar to this. These conditions are considered suitable for obtaining

representative measurement results.

Measurements were taken continuously of the A-weighted (dBA) L_{90}, L_{eq} and L_{max} sound pressure levels over 15 minute periods.

5.2 Measurement Position

The noise level measurements were undertaken at a single position as described in the table below.

Position No	Description
1	The sound level meter was located on the 1st floor roof terrace. The microphone was attached to a pole approximately 2m above roof floor level and away from any reflecting surfaces.

The position is shown on the plan below.

5.3 Instrumentation

The instrumentation used during the survey is presented in the table below:

Position	Description	Manufacturer	Type	Serial Number	Calibration
1	Type 1 ½" Condenser Microphone	Bruel & Kjaer	4189	2470594	Calibration on 20/06/2018
	Preamp	Larson Davis	PRM902	3936	Calibration on 20/06/2018
	Type 1 Data Logging Sound Level Meter	Larson Davis	824	3157	Calibration on 20/06/2018
-	Type 1 Calibrator	Larson Davis	CAL200	3082	Calibration on 08/08/2018

The sound level mete, including the extension cable, was calibrated prior to and on completion of the survey. No significant change was found to have occurred (no more than 0.1dB).

The sound level meter was located in an environmental case with the microphone connected to the sound level meter via an extension cable. The microphone was fitted with a windshield.

6.0 Results

The results have been plotted on Time History Graphs 26682/TH1.01 enclosed, presenting the 15 minute A-weighted (dBA) L_{90}, L_{eq} and L_{max} noise levels at the measurement position throughout the duration of the survey.

The daytime $L_{Aeq(16\text{-}hour)}$ and night-time $L_{Aeq(8\text{-}hour)}$ noise levels for each position are presented in the table below:

L_{AeqT} Noise Level (dB re 2 x 10^{-5} Pa)			
Position	**Daytime (09:00 – 17:00) Hours**	**Evening (17:00 –23:00) Hours**	**Night-Time (23:00 – 09:00) Hours**
1	54 dBA	53 dBA	49 dBA

7.0 Discussion of Noise Climate

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However at the beginning and end of the survey period the dominant noise source was noted to be from road traffic on surrounding roads and from nearby building services plant.

8.0 Relevant Planning Policies and Guidance

8.1 Local Planning Condition (2018/6267/P)

4. Prior to the use of the 1st floor flat roof as an outdoor amenity space, details of acoustic screening to the 1st floor terrace area shall be submitted and approved by the Council. The approved mitigation measures shall be installed prior to the frst of use the terrace as outdoor amenity space.

Reason: To safeguard the amenities of the adjoining premises and the area generally in accordance with the requirements of Policies A1 and A4 of the Camden Local Plan 2017.

8.2 British Standard BS8233: 2014

British Standard 8233: 2014 “Guidance on sound insulation and noise reduction for buildings” provides guidance for the control of noise in and around buildings.

8.2.1 Internal Areas

BS8233:2014 Section 7.7.2 titled “Internal ambient noise levels for dwellings” states:

“In general for steady external noise sources, it is desirable that internal ambient noise levels do not exceed the following guideline values:

Activity	***Location***	***Desirable Internal Ambient Criteria***	
		07:00 – 23:00	***23:00 to 07:00***
Resting	*Living Rooms*	*35 dB $L_{Aeq,16hour}$*	-
Dining	*Dining Room/Area*	*40 dB $L_{Aeq,16hour}$*	-
Sleeping (Daytime Resting)	*Bedroom*	*35 dB $L_{Aeq,16hour}$*	*30 dB $L_{Aeq,8hour}$*

Note 1 The above table provides recommended levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Groundborne noise is assessed separately and is not included as part of these targets, as human response to groundborne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

Note 2 The levels shown in the above table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the levels recommended in the above table.

Note 3 These levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks nigh or News Year's Eve.

Note 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values.

Note 5 If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.

If applicable, any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment.

Note 6 Attention is drawn to the Building Regulations.

Note 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."

8.2.2 External Amenity Areas

BS823:2014 Section 7.7.3.2 titled "Design criteria for external noise" states:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$[1], with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be

included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens, and terraces, which might be intended to be used for relaxation. In high-noise areas consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space."

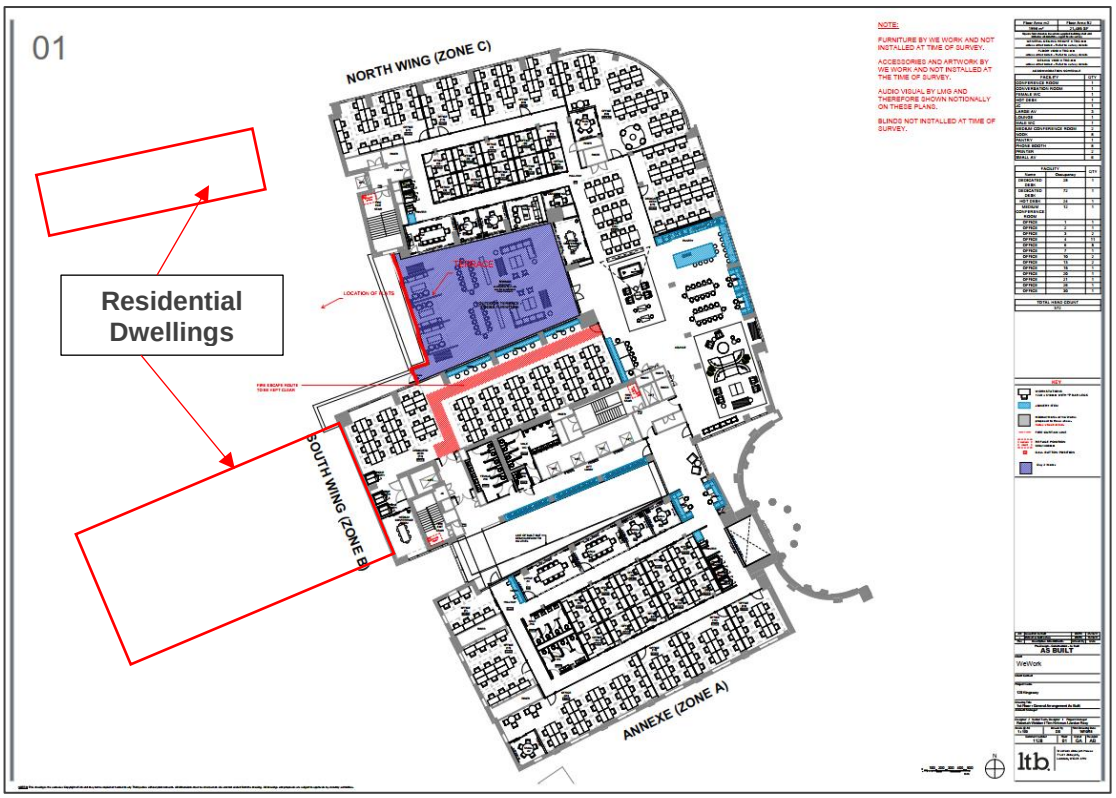
8.3 Planning Practice Guidance on Noise

Planning Practice Guidance (PPG) under the NPPF has been published by the Government as a web based resource at http://planningguidance.planningportal.gov.uk/blog/guidance/. This includes specific guidance on Noise although, like the NPPF and NPSE the PPG does not provide any quantitative advice. It seeks to illustrate a range of effect levels in terms of examples of outcomes as set out in the following table:

Perception	Examples of Outcomes	Increasing effect level	Action
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable hard, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

9.0 Noise Impact Assessment

The following plant shows the layout for the proposed roof terrace:



It is proposed to install an acoustic screen along the western boundary of the roof terrace. The nearest residential dwellings are approximately 20m from the centre of the roof terrace to the northwest and southwest. The residential dwellings to the northwest are partially screen from the roof terrace by the building envelop. The residential dwellings are 5 storeys higher than the roof terrace and thus overlook the area. Therefore any proposed screen to the roof terrace is ineffective for dwellings that overlook the area.

9.1 Noise impact to Adjacent External Amenity Space

During our visit we noted there to be no external amenity space for the residential dwellings. Therefore the guidance given in Section 8.2.2 should not apply.

9.2 Noise Impact at the Nearest Residential Dwelling

We understand the roof terrace shall be used between 09:00 and 17:00 Monday to Friday only. We believe the roof terrace has a capacity of circa 100 people.

If we were to consider people talking at a noise levels of 60dBA this would be towards the upper end of the normal speech range and commensurate with a loud conversation. Assuming there is one listener to each talker, 50% of the 100 proposed covers, plus 10 member of staff could be talking simultaneously. The total noise arising from speech can be calculated using the following formula:

$\sum=10 \log (n*10^{(60/10)})$ Where n = number of people talking simultaneously.

Using the above formula and 20m distance loss our calculations indicate a total noise level of 52dBA at the nearest residential window. This is 2dBA below the daytime (09:00-17:00) L_{aeq} measured to be 54dBA. This figure does not take into account any screening. A screen would reduce the noise from the roof terrace by approximately a further 8dBA. However this would only benefit dwellings that do not have direct line of sight to the roof terrace.

The above only considers noise level outside the dwelling. The overriding factor should be what the internal noise levels are. It is generally accepted that the typical noise reduction achieved with partially opened windows is around 15dBA (ref. BS 8233:2014 Annex G.1) and 33dBA reduction through conventional thermal double glazing. This value is the difference between dBA levels measured outside and inside typical dwellings, therefore 3dBA should be added to free field noise levels to determine outside levels.

As mentioned before, a screen would only benefit dwellings that do not have direct line of sight to the roof terrace. Negating the effects of a screen, a simple assessment thus indicates a noise level of 40dBA may be expected within the residential dwellings with partially opened windows and 22dBA though a closed window. With the windows closed the outcome would be that noise would not be noticeable and thus would have no observed effect..

10.0 Conclusions

It is proposed to use a first floor roof terrace of 125 Kingsway as an outdoor amenity space.

A detailed environmental noise survey has been undertaken in order to establish the currently prevailing environmental noise climate around the site.

The environmental noise impact upon the residential dwellings from the proposed roof terrace has been assessed. Our calculations indicate a total noise level of 52dBA at the nearest residential window. This figure does not take into account any screening. A screen would reduce the noise from the roof terrace by approximately a further 8dBA. However this would only benefit dwellings that do not have direct line of sight to the roof terrace.

The above only considers noise level outside the dwelling. The overriding factor should be what the internal noise levels are. A simple assessment indicates a noise level of 40dBA may be expected within the residential dwellings with partially opened windows and 22dBA though a closed window. With the windows closed the outcome would be that noise would not be noticeable and thus would have no observed effect.

Appendix A

The acoustic terms used in this report are defined as follows:

dB — Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).

dBA — The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The $_A$ subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted

It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

$L_{90,T}$ — L_{90} is the noise level exceeded for 90% of the period *T* (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.

$L_{eq,T}$ — $L_{eq,T}$ is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, *T*.

L_{max} — L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

L_p — Sound Pressure Level (SPL) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).

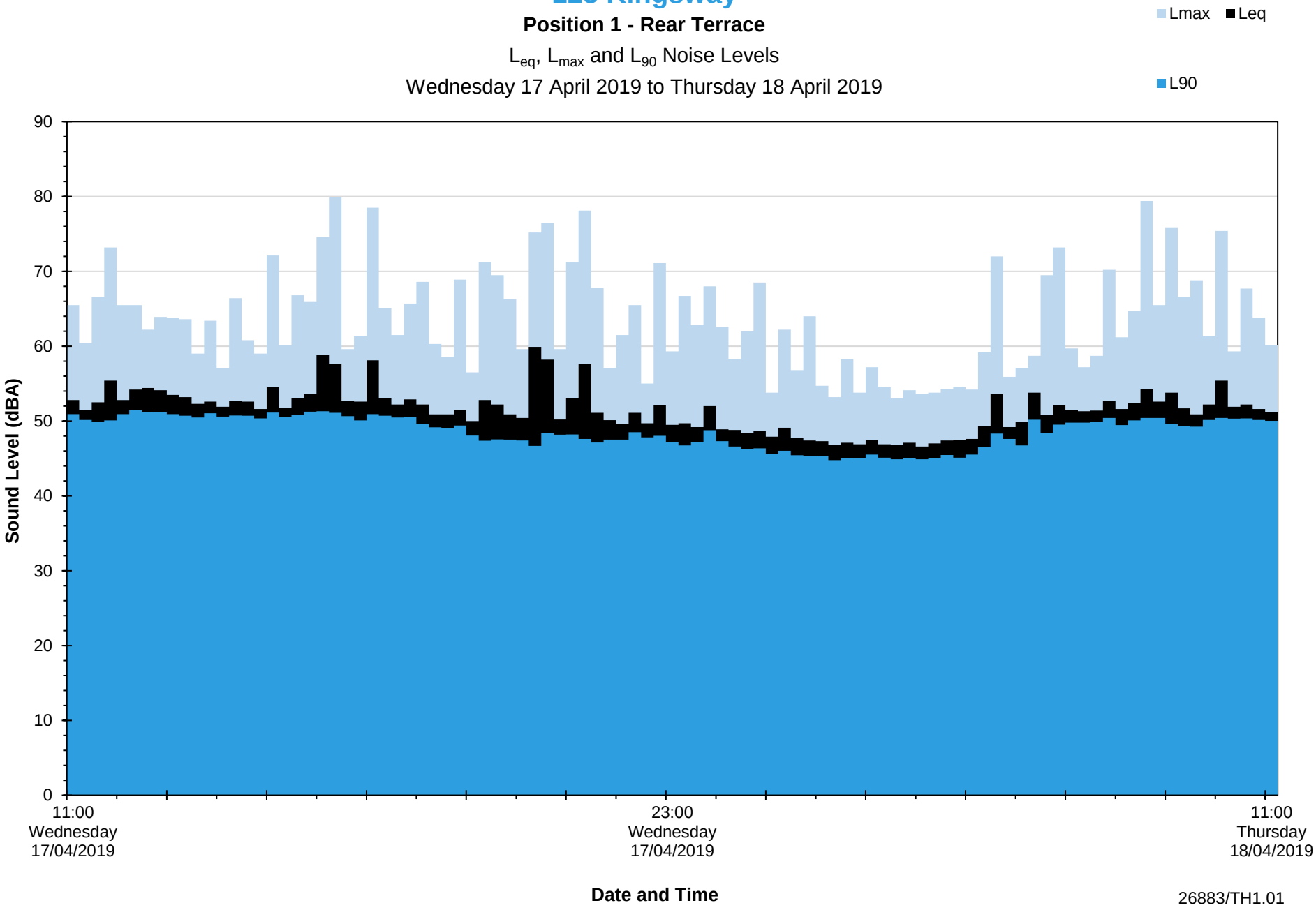
L_w — Sound Power Level (SWL) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

125 Kingsway

Position 1 - Rear Terrace

L_{eq}, L_{max} and L_{90} Noise Levels

Wednesday 17 April 2019 to Thursday 18 April 2019



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