B&Q Twickenham

Environmental Noise Survey and Noise Impact Assessment Report

31101/NIA1

10 November 2023

For:
B&Q Limited
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Hann Tucker Associates

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Report 31101/NIA1

Document Control

Rev	Date	Comment	Prepared by	Authorised by
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Hann Tucker Associates

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Attachments

1.0 Introduction

In order to provide delivery services at B&Q Twickenham on Sundays and bank holidays, planning permission is required.

Hann Tucker Associates have been commissioned to undertake a delivery noise impact assessment. Our assessment considers potential noise generated by the proposed delivery vehicle with regard to the worst affected noise sensitive residential properties.

This report presents the methodology and findings of our noise survey, as well as our indicative assessment of potential delivery noise impacts.

2.0 Objectives

To establish by means of an unmanned 72-hour survey the existing L_{Amax}, L_{Aeq} and L_{A90} environmental road, rail and air traffic noise levels at up to 1No. secure and accessible on-site positions, using fully computerised noise monitoring equipment.

The survey will enable noise emission limits from the development to be identified with reference to the requirements of the Local Authority and/or the application of BS 4142: 2014 and to minimise the possibility of noise nuisance to neighbours.

To assess the effect of a single delivery vehicle visiting the site, based upon information with which we are provided, and comment upon the acceptability.

To advise on noise control measures if required with reference to the requirements of the Local Authority.

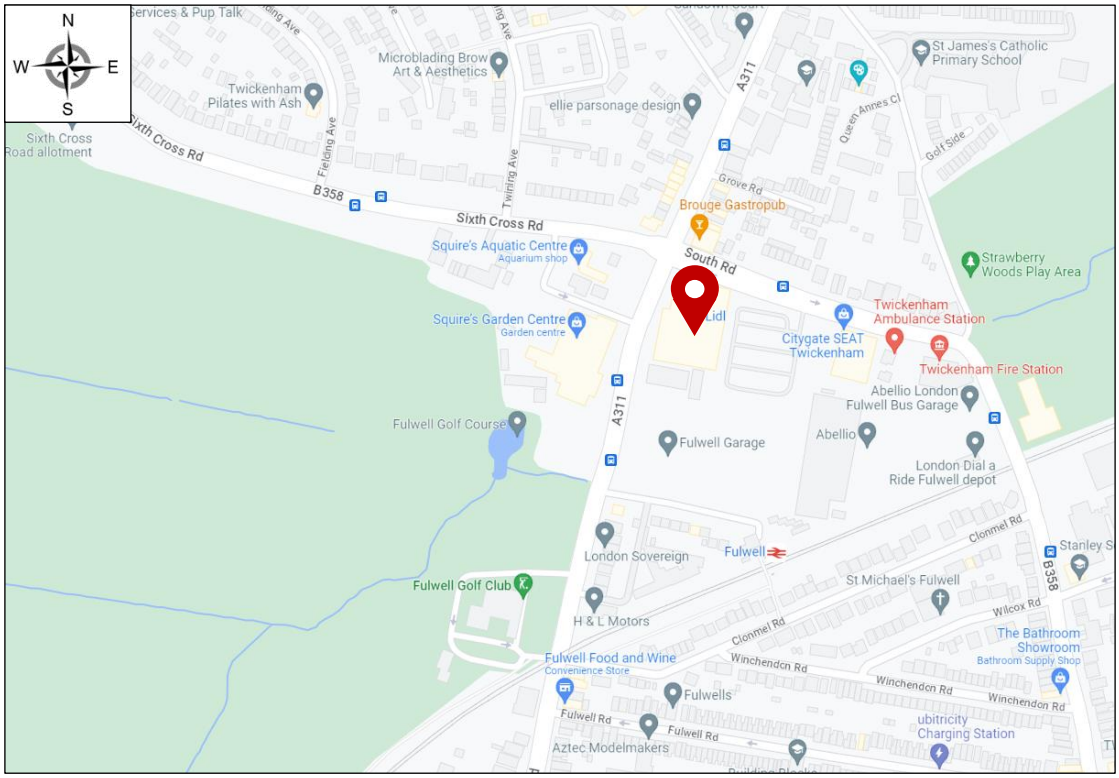
3.0 Acoustic Terminology

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

4.0 Site Description

4.1 Location

The site is located at 50 South Road, Twickenham, TW2 5NT. The location is shown in the Location Map below.



Location map (Map Data © 2023 Google)

The site falls within the jurisdiction of London Borough of Richmond upon Thames.

4.2 Description

The site is located in a mixed-use area, which includes commercial premises to the west, south and east of the site, and residential premises and a pub (Brouge Gastropub) to the north. The site is bounded to the north by South Road, to the west by Wellington Road, and to the south and east by commercial premises (Lidl, London United Busways Ltd, Abellio, Citygate SEAT).

The nearest noise sensitive premises are considered to be the residential premises near the north boundary of the property.

The site is shown in the Site Plan below.

Site Plan (Imagery © 2023 Getmapping plc, Infoterra Ltd & Bluesky, Maxar Technologies, The GeoInformation Group, Map Data © 2023 Google)

5.0 Acoustic Standards and Guidelines

5.1 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010 (i.e. before the NPPF). The NPSE is the overarching statement of noise policy for England and applies to all forms of noise other than occupational noise, setting out the long term vision of Government noise policy which is to:

"Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development."

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life."*

The Explanatory Note to the NPSE has three concepts for the assessment of noise in this country:

NOEL – No Observed Effect Level
This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

LOAEL – Lowest Observable Adverse Effect Level
This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level
This is the level above which significant adverse effects on health and quality of life occur.

None of these three levels are defined numerically and for the SOAEL the NPSE makes it clear that the noise level is likely to vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research to investigate what may represent an SOAEL for noise is acknowledged in the NPSE and the NPSE asserts that not stating specific SOAEL levels provides policy flexibility in the period until there is further evidence and guidance.

The NPSE concludes by explaining in a little more detail how the LOAEL and SOAEL relate to the three NPSE noise policy aims listed above. It starts with the aim of avoiding significant adverse effects on health and quality of life, then addresses the situation where the noise impact falls between the LOAEL and the SOAEL when *"all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development."* The final aim envisages pro-active management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development which include the need to minimise travel distance between housing and employment uses in an area.

5.2 National Planning Policy Framework (NPPF)

The following paragraphs are from the NPPF (published July 2021):

185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

187. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."

Paragraph 185 also references the Noise Policy Statement for England (NPSE). This document does not refer to specific noise levels but instead sets out three aims:

- "Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."

5.3 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

Perception	Examples of Outcomes	Increasing effect level	Action
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

5.4 Local Authority Requirements

The site lies within the jurisdiction of London Borough of Richmond upon Thames. Their advice regarding delivery and collections' noise emissions is as follows:

"The Borough recognises that throughout London, there is a need to reduce congestion and air pollution and the retiming of deliveries is one method to assist with this sustainability objective. The Borough will therefore apply a risk based approach to applications where vehicle delivery-noise may be a source of disturbance.

Where applications are for retiming of deliveries, the use of quiet technology is also encouraged in the context of wider sustainability aims.

A Delivery Noise Management Plan may also be required and should include:

- *risk based approach*
- *noise assessment, where appropriate*
- *introduction of physical and managerial controls including quiet technology*

Further guidance on managing noise from deliveries has been produced by the Borough and is available upon request."

5.5 BS 4142:2014 + A1:2019

When setting delivery noise emission criteria reference is commonly made to BS 4142:2014 "*Methods for rating and assessing industrial and commercial sound".*

The procedure contained in BS 4142:2014 provides an assessment of the likely effects of sound on people when comparing the specific noise levels from the source with representative background noise levels. Where the noise contains "a tone, impulse or other characteristic" then various corrections can be added to the specific (source) noise level to obtain the "rating level".

BS 4142 states that: *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs". An estimation of the impact of the specific noise can be obtained by the difference of the rating noise level and the background noise level and considering the following:*

• *"Typically, the greater this difference, the greater the magnitude of the impact."*

• *"A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."*

• *"A difference of around +5dB 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."*

The determination of the "rating level" and the "background level" are both open to interpretation, depending on the context.

In summary it is not possible to set delivery noise emission criteria purely on the basis of BS 4142:2014+A1:2019. It is reasonable to infer from the above, however, that a difference of around -5dB corresponds to "No Observed Effect Level" as defined in the Noise Policy Statement for England. It is also reasonable to infer from the above that if the plant noise rating level does not exceed the existing background noise level outside any noise sensitive residential window, then the plant noise is of "low impact".

5.6 World Health Organisation Guidelines on Community Noise

BS8233:2014 is based upon the current World Health Organisation (WHO) guidance "*Guidelines on Community Noise".* A summary of the noise guidelines relevant to the proposed scheme is presented in the table below.

Residential Environment	Critical Health Effect(s)	L_{Aeq}	L_{AFmax}	Time Base
Outdoor living area	Serious annoyance, daytime and evening	55	-	07:00-23:00
	Moderate annoyance, daytime and evening	50	-	07:00-23:00
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	-	07:00-23:00
Inside bedrooms	Sleep disturbance, night-time	30	45	23:00-07:00
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	60	23:00-07:00

These WHO guidelines are based, in almost all cases, on the lower threshold below which the occurrence rates of any particular effect can be assumed to be negligible.

5.7 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.

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 - 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 $L_{Aeq,8hour}$*

6.0 Survey Methodology

The survey was undertaken by Rebeca Sanchez, MSc(Hons), LArch, AMIOA.

6.1 Procedure

Fully automated environmental noise monitoring was undertaken from approximately 11:45 hours on Friday 03 November 2023 to 11:00 hours on Monday 6 November 2023.

During the periods we were on site the wind conditions were calm. The sky was generally overcast. We understand that generally throughout the survey period the weather conditions were dry with short periods of light rain. 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.

6.2 Measurement Position

The sound level meter was installed inside a small security box with the microphone protruding out of the box.

The security box was fixed to a lamp post facing South Road with the microphone at a height of approximately 2m above ground level.

In order to minimise the effect of the box, the microphone was orientated vertically downwards such that it was not screened from the road.

The position is shown on the plan below.

Plan showing the unmanned measurement position (Imagery © 2023 Getmapping plc, Infoterra Ltd & Bluesky, Maxar Technologies, The GeoInformation Group, Map Data © 2023 Google)

6.3 Instrumentation

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

Description	Manufacturer	Type	Serial Number	Calibration
Data Logging Sound Level Meter	Svantek	971	72538	Calibration on 02/08/2023
½" Condenser Microphone	ACO Pacific	7052E	75560	Calibration on 02/08/2023
Preamp	Svantek	SV18	83547	Calibration on 02/08/2023
Type 1 Calibrator	Bruel & Kjaer	4230	1558535	Calibration on 27/07/2023

The sound level meter was calibrated prior to and on completion of the surveys. No significant change was found to have occurred (no more than 0.2dB).

The microphone was fitted with a windshield.

7.0 Results

The results have been plotted on Time History Graph 31101/TH1 enclosed, presenting the 15-minute A-weighted (dBA) L_{max}, L_{90} and L_{eq} noise levels at the measurement position throughout the duration of the survey.

The lowest $L_{A90\ (15\ min)}$ measurements recorded during the survey are presented in the table below:

Date	Lowest Measured $L_{A90(15min)}$ Background Noise Level (dB re 2 x 10^{-5} Pa)		
	Daytime (07:00 – 23:00) Hours	Night-Time (23:00 – 07:00) Hours	24 Hours
Friday 03/11/2023	45 dBA [1]	38 dBA	38 dBA
Saturday 04/11/2023	47 dBA	35 dBA	35 dBA
Sunday 05/11/2023	41 dBA	35 dBA	35 dBA
Monday 06/11/2023	51 dBA [1]	-	-

[1] Insufficient data for specified time period due to survey start/end time.

The above levels are as measured at the measurement positions and include local reflections.

8.0 Discussion Of Noise Climate

Due to the nature of the survey, i.e. unattended, 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 noise climate was noted to be dominated by noise from the nearby road network.

9.0 Delivery Noise Impact Assessment

9.1 Assessment Overview

As we understand it, there is going to be only one delivery van (<7.5T box van with a tail lift) performing the loading/unloading service required to fulfil ‘click and collect’ orders. In the absence of specific information about the number of movements the delivery van is going to perform during the day, we have calculated the maximum permissible number of delivery events consistent with achieving London Borough of Richmond upon Thames requirements for commercial noise egress.

Our assessment has been based on data obtained from noise measurements of similar delivery activities undertaken by Hann Tucker Associates, and the proposed site plan to judge the significance of potential noise impacts on nearby dwellings.

9.2 Noise Data

Hann Tucker Associates have previously undertaken noise measurements of similar delivery activities as summarised below. From these we have calculated the Single Event Level (SEL, defined as the constant sound level of the same energy in one second as the entire event).

Activity	Duration (s)	Typical Leq Noise level at 5 m (dBA)	Single Event Level SEL at 5m LAeq,1second (dB)
H.G.V. manoeuvring including reversing bleepers, air brakes and cab door slam	30	74	89
General loading and unloading activities	900	61	91
H.G.V. departing site	10	74	84
Total SEL			**93**

9.3 Assessment Summary

Based on a “worst case” design of the site (i.e., partial screening and shortest reasonable distance between source and receptor), rating noise levels from delivery vehicle activities would be expected to be as follows:

- With a maximum number of daytime ‘events’ limited to **1No** per hour, noise rating levels would be expected to be less than the prevailing background sound level at the nearest receptor.

With reference to the assumptions outlined above, noise rating levels from delivery activities from the unit could be expected to be as follows.

Description		Noise Level
Background Noise Level*		41 dB $L_{A90,15min}$
Calculated Specific Noise Level at nearest noise sensitive receptor		38 dB $L_{Aeq,1hr}$
Acoustic character corrections	Intermittency	+3 dB
BS4142 Rating Level		41 dB
Excess of Rating Level over Background Noise Level (dB)		0 dB

*Background Noise Level corresponding to Sunday during daytime.

Our BS4142 assessment predicts no excess of the rating level over the background noise level. With reference to Section 5.5 this corresponds to the BS4142 level for 'low impact'. It is also reasonable to infer that it achieves the "No Observed Effect Level" as defined in the Noise Policy Statement for England (NPSE).

10.0 Best Practice Guidance

The following best practice management measures should be employed in order to ensure that noise impact from the operation of the site is minimised.

- Vehicle reversing alarms should be set to the minimum required for safe and efficient operations (white-noise alerts preferred to beeps).
- Vehicle engines should be turned off whilst stationary for prolonged periods.
- Restrict drop heights during loading to the minimum required for safe and efficient operations.
- Care should be taken to ensure the surface of the site used by vehicles is as smooth as possible. E.g., no raised manhole covers, maintenance of surface to ensure no potholes or similar steep changes in surface level.
- Playing of radios and undue shouting in the service yard should be prohibited.

11.0 Conclusions

An environmental noise survey has been undertaken in order to establish the currently prevailing noise levels.

The acoustic requirements of national/local policies, current industry guidelines and other relevant documentation have been reviewed and used to inform an assessment of potential industrial impacts associated with the proposed development.

Our BS4142 assessment of delivery noise predicts no excess of the rating level over the background noise level. With reference to Section 5.5 this corresponds to the BS4142 level for 'low impact'. It is also reasonable to infer that it achieves the "No Observed Effect Level" as defined in the Noise Policy Statement for England (NPSE).

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.

Sound Pressure Level (L_p) 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).

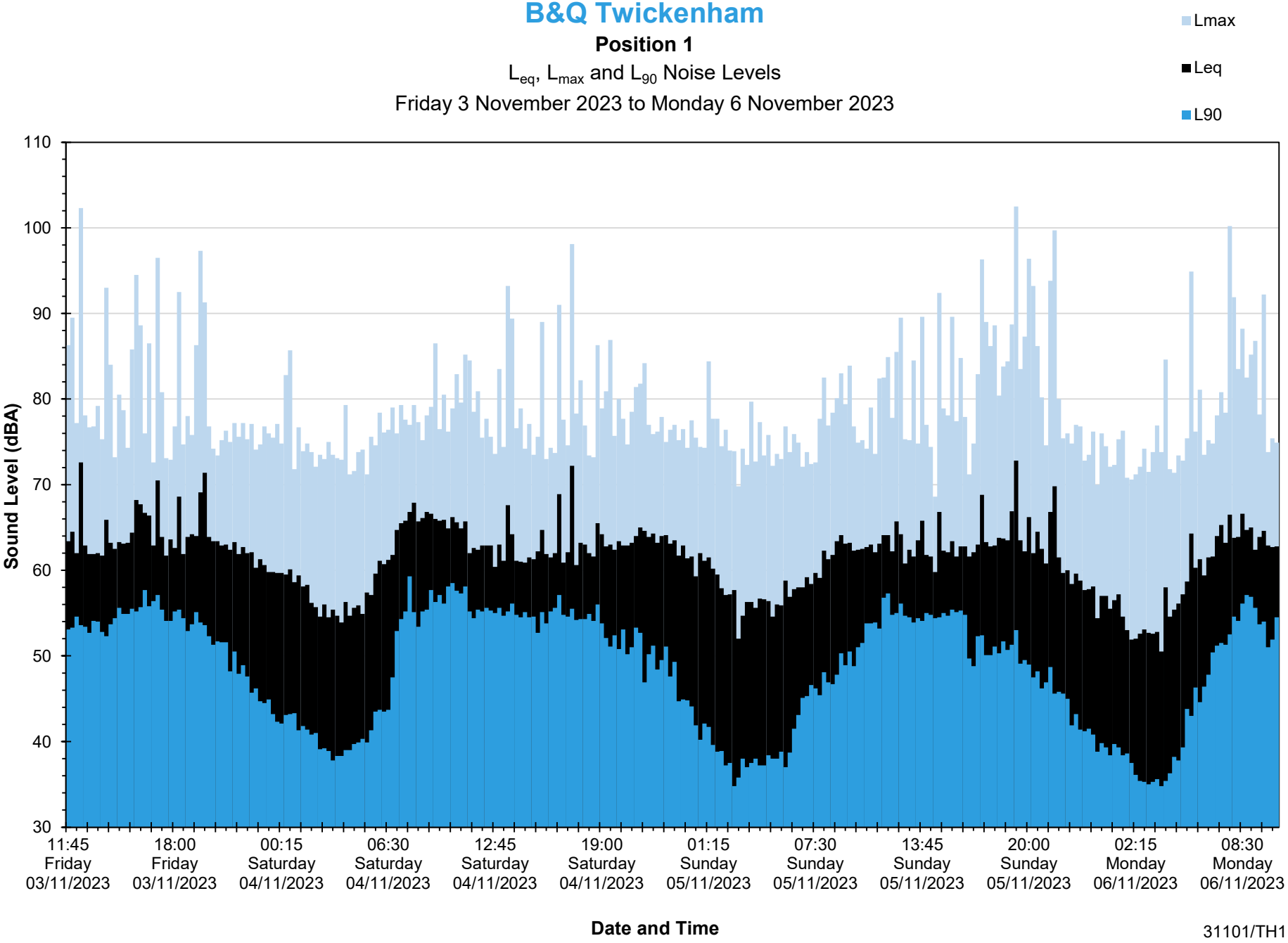
Sound Power Level (SWL or L_w) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

B&Q Twickenham

Position 1

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

Friday 3 November 2023 to Monday 6 November 2023



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