Artillery House
11-19 Artillery Row
London
SW1P 1RH

Environmental Noise Survey and Plant Noise Assessment Report

29227/PNA1

27 September 2021

For:
Cityspace

Hann Tucker Associates
Consultants in Acoustics Noise & Vibration

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Document Control

Rev	Date	Comment	Prepared and Authorised by	
0	27/09/2021	-		
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Attachments

1.0 Introduction

New items of external plant are proposed to be installed at Artillery House, 11-19 Artillery Row, London.

Hann Tucker Associates have therefore been instructed to undertake a detailed background noise level survey, propose suitable plant noise emission criteria based on the requirements of the Local Authority and to undertake a detailed plant noise impact assessment to determine the suitability of the proposed plant.

2.0 Objectives

To establish by means of a detailed unmanned survey the existing $L_{Amax,}$ L_{Aeq} and L_{A90} environmental noise levels at a single secure and accessible on-site position, using fully computerised noise monitoring equipment.

To propose noise emission limits from the development with reference to the requirements of the Local Authority. To assess the noise emissions from the proposed plant, based upon data 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 Site Description

3.1 Location

The site falls within the jurisdiction of City of Westminster. The location is shown in the Location Map below.

Location Map (maps.google.co.uk)

3.2 Description

The building is ground plus 8 storey development located in the City of Westminster.

The surrounding area is predominantly commercial units at ground floor with office/residential developments at upper floors. The nearest residential building, 8 Artillery Row, is located on the opposite side of Artillery Row. The top floor of 8 Artillery Row is approximately level with the roof of Artillery House.

The site is shown in the Site Plan below.

Site Plan (maps.google.co.uk)

4.0 Acoustic Terminology

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

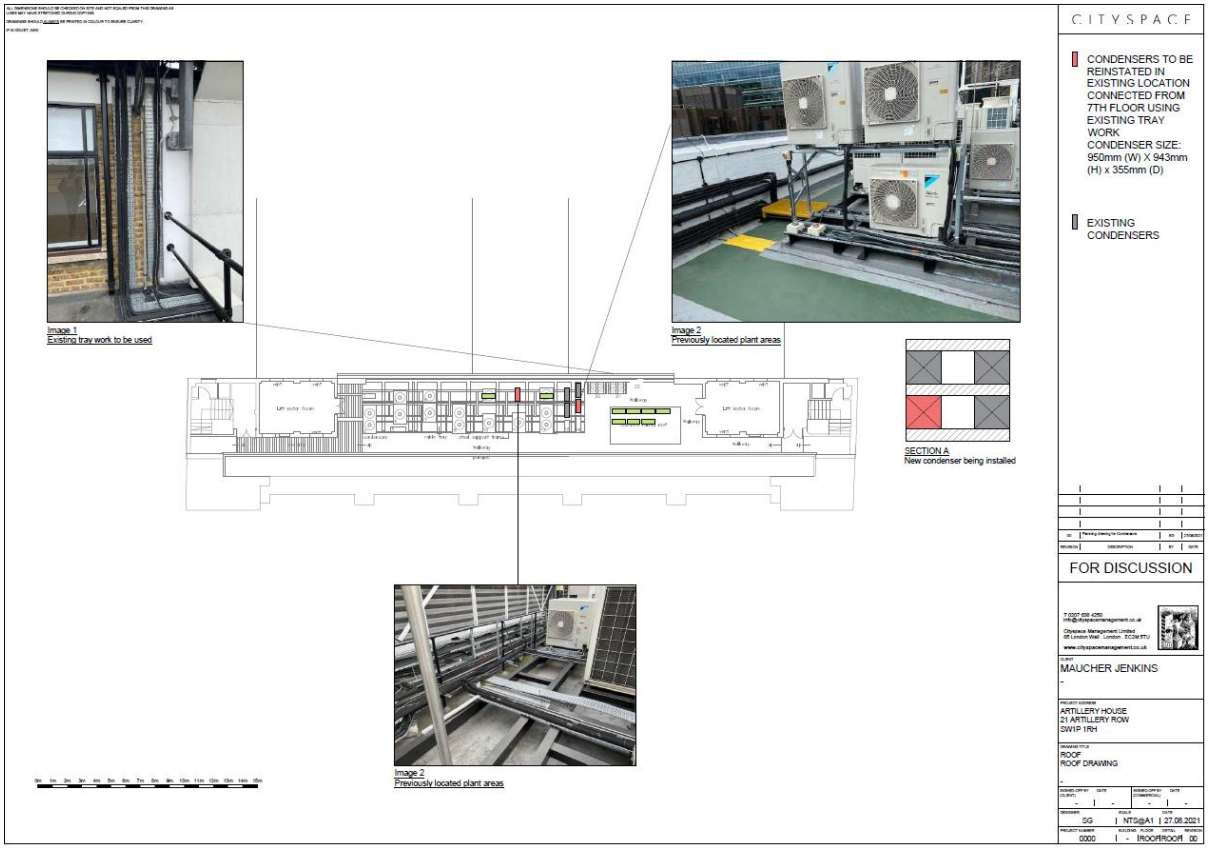
5.0 Project Proposals

5.1 Proposed Plant

We understand the proposed plant comprises 2no. PKA-M71KA condensers.

5.2 Drawings

Our acoustic analyses is based on the Roof Drawing (dated 27.08.21) provided by Cityspace.



6.0 Acoustic Standards and Guidelines

6.1 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.

6.2 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."

6.3 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

6.4 Local Authority Requirements

Noise from plant & machinery

For areas above WHO Guideline levels, where the existing external ambient noise level exceeds WHO Guideline levels of either LAeq, 16hrs 55dB daytime (07.00-23.00 hrs) or LAeq, 8hrs 45dB night-time 23.00-07.00hrs)

(1) Where noise emitted from the proposed plant and machinery will not contain tones or will not be intermittent, the 'A' weighted sound pressure level from the plant and machinery (including non-emergency auxiliary plant and generators) hereby permitted, when operating at

its noisiest, shall not at any time exceed a value of 10 dB below the minimum external background noise, at a point 1 metre outside any window of any residential property, unless and until a fixed maximum noise level is approved by the City Council. The background level should be expressed in terms of the lowest LA90, 15 mins during the proposed hours of operation. The plant-specific noise level should be expressed as LAeqTm, and shall be representative of the plant operating at its maximum.

(2) Where noise emitted from the proposed plant and machinery will contain tones or will be intermittent, the 'A' weighted sound pressure level from the plant and machinery (including non-emergency auxiliary plant and generators) hereby permitted, when operating at its noisiest, shall not at any time exceed a value of 15 dB below the minimum external background noise, at a point 1 metre outside any window of any residential property, unless and until a fixed maximum noise level is approved by the City Council. The background level should be expressed in terms of the lowest LA90, 15 mins during the proposed hours of operation. The plant-specific noise level should be expressed as LAeqTm, and shall be representative of the plant operating at its maximum.

7.0 Survey Methodology

The survey was undertaken by John Ridpath (MIOA).

7.1 Procedure

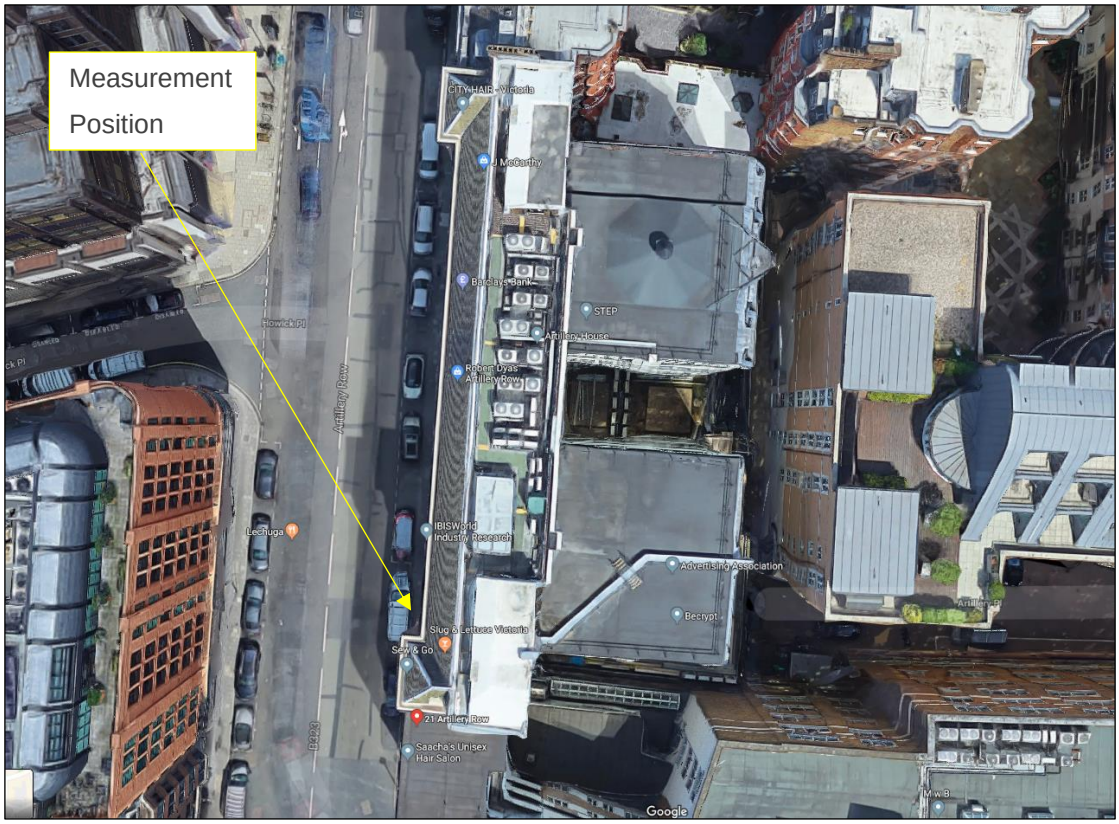
Fully automated environmental noise monitoring was undertaken from approximately 10:00 hours on Friday 17th September 2021 to 10:00 hours on Monday 20th September 2021.

During the periods we were on site the wind conditions were calm and the sky was generally patchy cloud, We understand that generally throughout the survey period the weather conditions were similar to those observed 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.

7.2 Measurement Position

The microphone was attached to a pole and located approximately 1.5m horizontally away from the southern end of the rooftop overlooking Artillery Row. The measurement position was screened from the existing plant on the roof of Artillery House.



Plan Showing Measurement Position (maps.google.co.uk)

7.3 Instrumentation

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

Description	Manufacturer	Type	Serial Number	Calibration
Type 1 Data Logging Sound Level Meter	Larson Davis	824	3838	Calibration on 02/07/2021
Type 1 Calibrator	Bruel & Kjaer	4231	2610161	Calibration on 06/07/2021

The sound level meter, including the extension cable, was calibrated prior to and on completion of the surveys. 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.

8.0 Results

The results have been plotted on Time History Graph 29227/TH1 enclosed, presenting the 15 minute A-weighted (dBA) 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:

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**
49 dBA	46 dBA	46 dBA

9.0 Discussion Of Noise Climate

During the periods we were on site the dominant noise source was noted to be local road traffic movements.

10.0 Plant Noise Emission Criteria

On the basis of the above and the results of the environmental noise survey and the requirements of City of Westminster, we propose that the following plant noise emission criteria be achieved at 1 metre from the nearest noise sensitive window.

Proposed Plant Noise Emission Limit (dBA)	
Daytime (07:00 – 23:00 hours)	**Night-time (23:00 – 07:00 hours)**
39 dBA	**36 dBA**

The above criteria are to be achieved with all of the proposed plant operating simultaneously.

It should be noted that the above are subject to the final approval of the Local Authority.

11.0 Plant Noise Impact Assessment

11.1 Plant Noise Data

We understand the manufacturer's noise data for the equipment to be as follows:

2 No. PUZ-ZM71VHA condensers – Noise Rating 49dBA @ 1m heating mode, 47dBA @ 1m cooling mode.

11.2 Location of Plant

The proposed locations of the 2 No. condenser units (shown in red) are indicated in the following drawing:

11.3 Plant Noise Impact Assessment

We understand that the proposed units will be operational during daytime/night-time hours.

The following table summarises our predictions of atmospheric noise emissions from the proposed plant to the nearest noise sensitive residential window.

	Sound Pressure Level (dBA)
Plant Noise Emission Level (heating mode)	49 dBA @ 1m
No. units correction (2)	+3
Distance Correction (27m approx.)	-28
Barrier Correction	0
Façade Reflection	+3
Calculated Noise Level at 1m from Receptor	27 dBA

Our calculations indicate that the proposed plant, should be capable of achieving the requirements of the Local Authority outlined in Section 10.0.

12.0 Conclusions

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

Plant noise emission criteria have been recommended based on the results of the noise survey and with reference to the Local Authority's requirements.

An assessment has been carried out to determine the plant noise emissions at the nearest noise sensitive window.

The assessment indicates that the proposed plant, should be capable of achieving the proposed environmental noise criteria at the nearest noise sensitive residential window.

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).

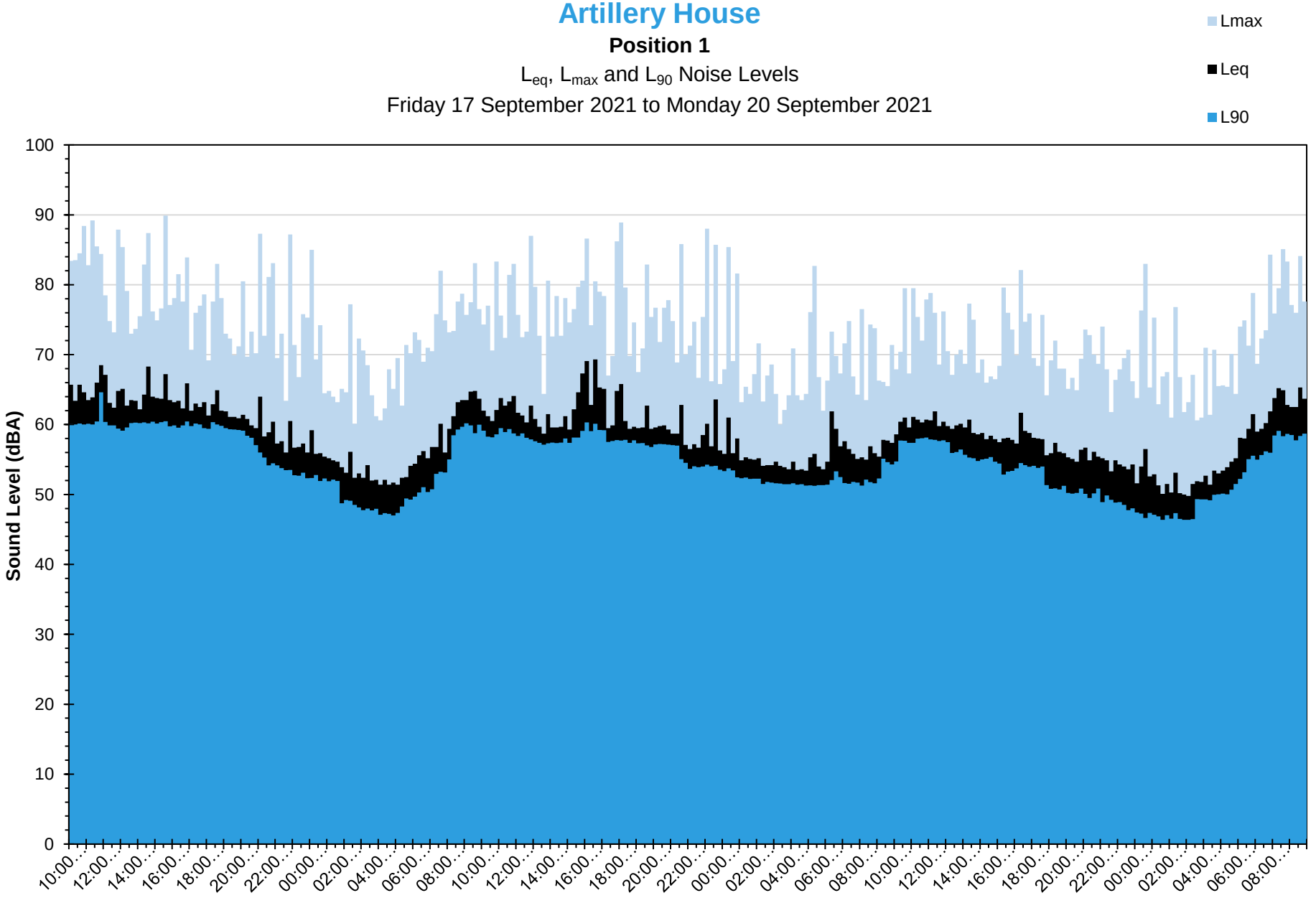
Sound Power Level (SWL or L_w) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

Artillery House

Position 1

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

Friday 17 September 2021 to Monday 20 September 2021



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